



FCC TEST REPORT (15.247)

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MODEL NO.: TL-WDN3800

FCC ID: TE7WDN3800

IC: 8853A-WDN3800

RECEIVED: Dec. 11, 2012

TESTED: Dec. 13, 2012 to Mar. 13, 2013

ISSUED: Mar. 22, 2013

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF121211E05	Original release	Mar. 22, 2013



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1. CERTIFICATION

PRODUCT: N600 Wireless Dual Band PCI Express Adapter
BRAND NAME: TP-LINK
MODEL NO.: TL-WDN3800
TEST SAMPLE: PROTOTYPE
APPLICANT: TP-LINK TECHNOLOGIES CO., LTD.
TESTED: Dec. 13, 2012 to Mar. 13, 2013
STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**
Canada RSS-210 Issue 8 (2010-12)
Canada RSS-Gen Issue 3 (2010-12)
ANSI C63.10-2009

The above equipment (Model: TL-WDN3800) 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:** Mar. 22, 2013
(Midoli Peng, Specialist)

APPROVED BY : , **DATE:** Mar. 22, 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) ; RSS-210; RSS-Gen				
STANDARD SECTION		TEST TYPE	RESULT	REMARK
FCC Part 15	RSS-Gen			
15.207	RSS-Gen 7.2.4	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is - 9.67dB at 0.20534MHz
15.247(d) 15.209	RSS-210 A8.5	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 2288.00MHz
15.247(d)	RSS-210 A8.5	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	RSS-210 A8.2 (a)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	RSS-210 A8.2 (4)	Conducted Output power	PASS	Meet the requirement of limit.
15.247(e)	RSS-210 A8.2 (b)	Power Spectral Density	PASS	Meet the requirement of limit.
-	RSS-Gen 4.6	Occupied Bandwidth Measurement	-	Meet the requirement
15.203	-	Antenna Requirement	PASS	Antenna connector is SMA Straight Plug Reverse not a standard connector.



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For 5GHz, 5725~5850MHz Band

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247) ; RSS-210; RSS-Gen

STANDARD SECTION		TEST TYPE	RESULT	REMARK
FCC Part 15	RSS-Gen			
15.207	RSS-Gen 7.2.4	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -9.32dB at 0.20899MHz
15.247(d) 15.209	RSS-210 A8.5	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -2.5dB at 5080.0MHz
15.247(d)	RSS-210 A8.5	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	RSS-210 A8.2 (a)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	RSS-210 A8.2 (4)	Conducted Output power	PASS	Meet the requirement of limit.
15.247(e)	RSS-210 A8.2 (b)	Power Spectral Density	PASS	Meet the requirement of limit.
-	RSS-Gen 4.6	Occupied Bandwidth Measurement	-	Meet the requirement
15.203	-	Antenna Requirement	PASS	Antenna connector is SMA Straight Plug Reverse not a standard connector.

NOTE: The EUT was operating in 2.400 ~ 2.4835GHz, 5.15~5.35GHz 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 5.15~5.35GHz RF parameters was recorded in another test report.



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2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

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

Measurement	Value
Conducted emissions	2.98 dB
Radiated emissions (30MHz-1GHz)	5.43 dB
Radiated emissions (1GHz -6GHz)	3.54 dB
Radiated emissions (6GHz -18GHz)	4.08 dB
Radiated emissions (18GHz -40GHz)	4.11 dB



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3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	N600 Wireless Dual Band PCI Express Adapter
MODEL NO.	TL-WDN3800
POWER SUPPLY	DC 5V from host equipment
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS,OFDM
TRANSFER RATE	802.11b: up to 11Mbps 802.11a / g: up to 54Mbps 802.11n: up to 300Mbps
OPERATING FREQUENCY	For 15.407 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz
	For 15.247 2.4GHz: 2.412 ~ 2.462GHz 5GHz: 5.745 ~ 5.825GHz
NUMBER OF CHANNEL	For 15.407 8 for 802.11a, 802.11n (HT20) 4 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: 16.784mW 802.11n (HT20): 23.016mW 802.11n (HT40): 42.428mW
	For 15.247 (2.4GHz) 802.11b: 229.874mW 802.11g: 339.739mW 802.11n (HT20): 335.961mW 802.11n (HT20): 358.015mW
	For 15.247 (5GHz) 802.11a: 292.455mW 802.11n (HT20): 286.123mW 802.11n (HT40): 276.370mW
ANTENNA TYPE	Please see NOTE



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DATA CABLE	NA
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	NA

NOTE:

1. The antenna provided to the EUT, please refer to the following table:

Transmitter Circuit	Brand	Model	Antenna Type	Antenna Gain (dBi)	Connector Type	Diversity	Frequency range (GHz to GHz)
Chain (0)	TAI HWA	C636-510034-A	Dipole	2	SMA Straight Plug Reverse	Yes	2.4~2.5 5.15~5.825
Chain (1)	TAI HWA	C636-510034-A	Dipole	2	SMA Straight Plug Reverse	Yes	2.4~2.5 5.15~5.825

2. 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

3. 2.4GHz and 5GHz technology cannot transmit at same time.

4. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 15.

5. The EUT was pre-tested under following test modes:

Pre-test Mode	PC	Antenna
Mode A	Laying-flat type	90°
Mode B	Stand-up type	90°
Mode C	Laying-flat type	180°
Mode D	Stand-up type	180°

From the above modes, the worst case was found in **Mode A**. Therefore only the test data of the mode was recorded in this report individually.

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

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

POWER LINE CONDUCTED EMISSION TEST:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	6	OFDM	BPSK	6
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)
802.11g	1 to 11	6	OFDM	BPSK	6
802.11a	149 to 165	149	OFDM	BPSK	6



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RADIATED EMISSION TEST (ABOVE 1 GHz):

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
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



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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(SYSTEM)	TESTED BY
PLC	25deg. C, 62%RH	120Vac, 60Hz	Jason Huang
RE<1G	23deg. C, 67%RH	120Vac, 60Hz	Robert Cheng
RE ³ 1G	23deg. C, 67%RH	120Vac, 60Hz	Robert Cheng
APCM	25deg. C, 60%RH	120Vac, 60Hz	Nelson Teng
OB	25deg. C, 60%RH	120Vac, 60Hz	Nelson Teng

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)

Canada RSS-210 Issue 8 (2010-12)

Canada RSS-Gen Issue 3 (2010-12)

558074 D01 DTS Meas Guidance v02

662911 D01 Multiple Transmitter Output v01 r02

ANSI C63.10-2009

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

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



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3.4 DESCRIPTION OF SUPPORT UNITS

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

For conducted emission test					
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	PERSONAL COMPUTER	DELL	DCSM	394QL1S	FCC DoC
2	MONITOR	DELL	2007FPb	CN-0DC2144663363 V-12WS	FCC DoC
3	PRINTER	EPSON	LQ-300+II	G88Y074083	FCC DoC
4	MODEM	ACEEX	1414	0206026779	IFAXDM1414
5	KEYBOARD	DELL	SK-8115	MY-0J4635-71619-67 V-0354	FCC DoC
6	MOUSE	DELL	MO56UO	516045397	NA
For other test items					
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	PERSONAL COMPUTER	IBM	A65	L3B4724	FCC DoC
2	MONITOR	ADI	G1000	240058T00100081	NA
3	PRINTER	EPSON	LQ-300+II	G88Y074015	FCC DoC
4	MODEM	ACEEX	1414	0206026779	IFAXDM1414
5	KEYBOARD	BTC	KB-5200T	F24800406	E5XKB5122WTH0 110
6	MOUSE	BTC	M851	G00347024440	FCC DoC

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	VGA cable (1.4m, with 2 cores)
3	Printer cable (1.8m)
4	Modem cable (1m)
5	USB cable (2m)
6	USB cable (2m)

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



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

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

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

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS 30	100287	Feb. 29, 2012	Feb. 28, 2013
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK 8127	8127-523	Sep. 19, 2012	Sep. 20, 2013
Line-Impedance Stabilization Network (for Peripheral) ROHDE & SCHWARZ	ESH3-Z5	848773/004	Oct. 29, 2012	Oct. 28, 2013
RF Cable (JYEBAO)	5DFB	COACAB-002	Aug. 05, 2012	Aug. 04, 2013
50 ohms Terminator	50	3	Oct. 23, 2012	Oct. 22, 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. A.
3. The VCCI Con A Registration No. is C-817.
4. Tested Date: Dec. 13, 2012

4.1.3 TEST PROCEDURES

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

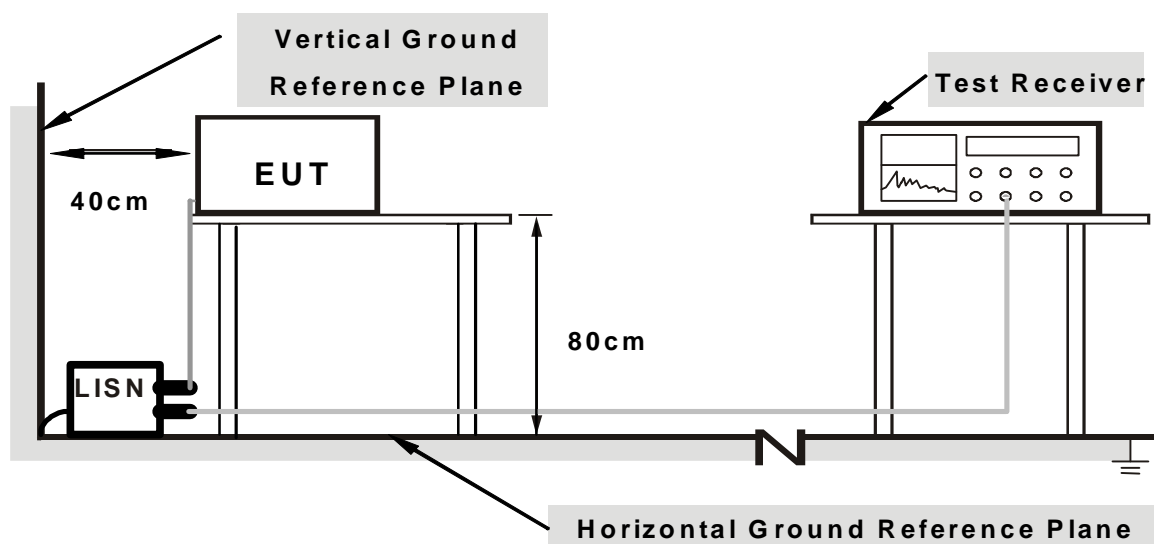
NOTE:

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

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

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

4.1.6 EUT OPERATING CONDITIONS

1. Connect the EUT with the support unit 1 (PC) which is placed on a testing table.
2. The communication partner run test program “art.exe” to enable EUT under transmission/receiving condition continuously at specific channel frequency.



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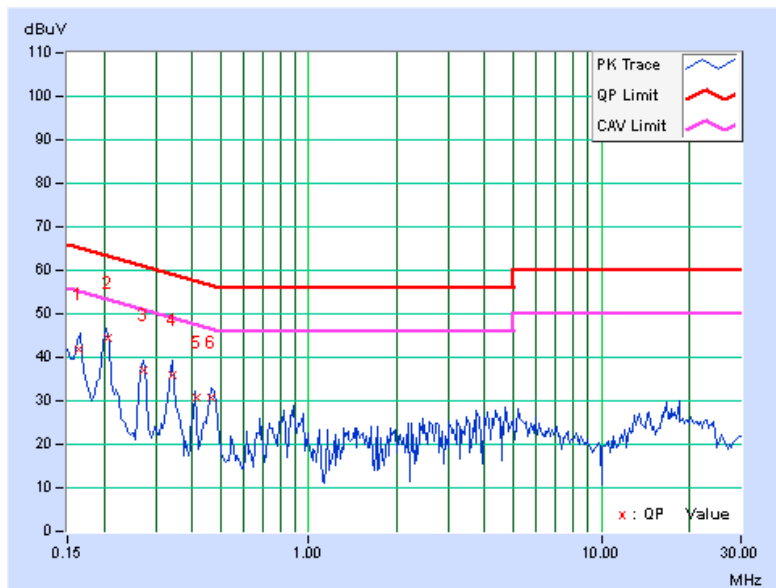
4.1.7 TEST RESULTS

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	0.16428	0.10	41.68	40.83	41.78	40.93	65.24	55.24	-23.47	-14.32
2	0.20534	0.11	44.48	43.61	44.59	43.72	63.39	53.39	-18.80	-9.67
3	0.27374	0.13	36.86	33.71	36.99	33.84	61.00	51.00	-24.02	-17.17
4	0.34356	0.15	35.85	34.48	36.00	34.63	59.12	49.12	-23.12	-14.49
5	0.41256	0.16	30.59	29.19	30.75	29.35	57.60	47.60	-26.85	-18.25
6	0.46535	0.16	30.74	27.77	30.90	27.93	56.60	46.60	-25.69	-18.66

REMARKS:

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

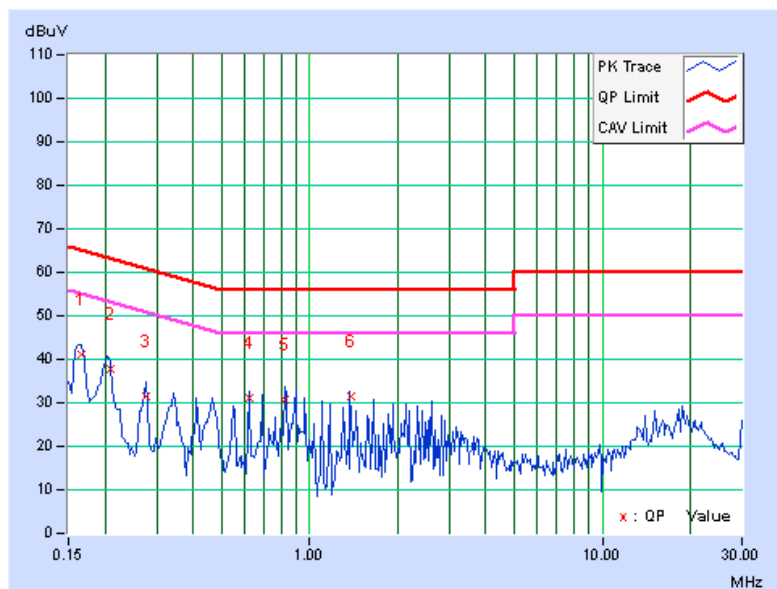


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16572	0.15	41.05	40.20	41.20	40.35	65.17	55.17	-23.98	-14.83
2	0.20819	0.15	37.66	36.19	37.81	36.34	63.28	53.28	-25.47	-16.94
3	0.27590	0.17	31.37	27.43	31.54	27.60	60.94	50.94	-29.40	-23.34
4	0.62050	0.20	31.02	30.08	31.22	30.28	56.00	46.00	-24.78	-15.72
5	0.82828	0.21	30.63	28.33	30.84	28.54	56.00	46.00	-25.16	-17.46
6	1.37940	0.24	31.16	29.86	31.40	30.10	56.00	46.00	-24.60	-15.90

REMARKS:

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





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4.2 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

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

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

NOTE:

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



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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
Pre-Selector Agilent	N9039A	MY46520310	Sep. 03, 2012	Sep. 02, 2013
Signal Generator Agilent	N5181A	MY49060347	July 24, 2012	July 23, 2013
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-04	Nov. 14, 2012	Nov. 13, 2013
Pre-Amplifier Agilent	8449B	3008A02465	Feb. 26, 2013	Feb. 25, 2014
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: Feb. 27 to 28, 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.

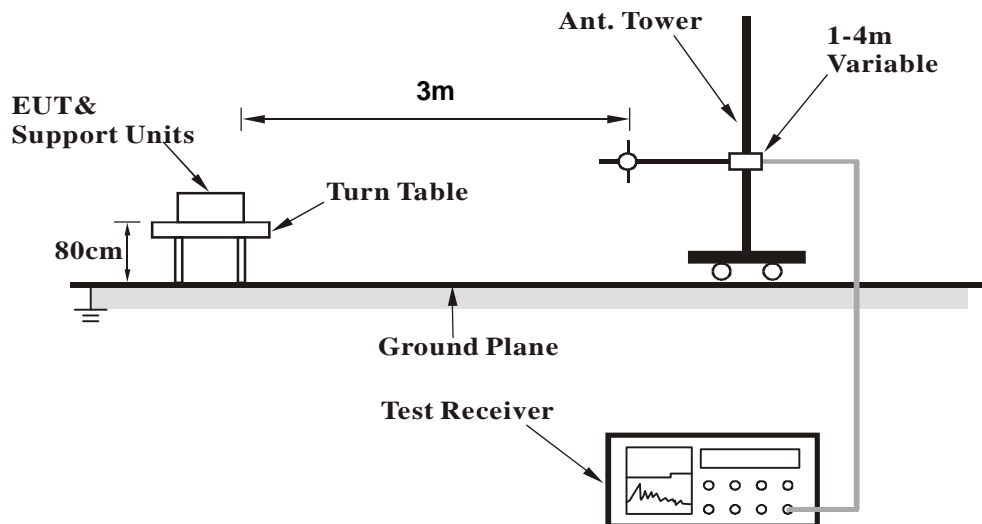
NOTE:

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

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	87.08	31.6 QP	40.0	-8.4	2.00 H	12	22.92	8.67
2	162.13	27.6 QP	43.5	-15.9	1.50 H	63	13.46	14.15
3	298.70	34.5 QP	46.0	-11.5	1.00 H	109	19.22	15.26
4	432.04	36.3 QP	46.0	-9.7	2.00 H	130	17.85	18.48
5	632.89	35.2 QP	46.0	-10.8	1.00 H	111	12.45	22.72
6	799.51	35.6 QP	46.0	-10.5	1.00 H	13	9.88	25.67
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	162.04	31.4 QP	43.5	-12.1	1.00 V	253	17.23	14.16
2	333.16	31.3 QP	46.0	-14.7	1.50 V	360	15.17	16.13
3	527.97	36.7 QP	46.0	-9.3	1.00 V	282	16.04	20.70
4	566.34	36.7 QP	46.0	-9.3	1.00 V	4	15.19	21.52
5	698.73	32.9 QP	46.0	-13.1	1.50 V	113	9.25	23.69
6	799.51	35.3 QP	46.0	-10.8	2.00 V	115	9.58	25.67

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.

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	2333.20	60.1 PK	74.0	-13.9	1.00 H	280	27.50	32.60
2	2333.20	44.4 AV	54.0	-9.6	1.00 H	280	11.80	32.60
3	*2412.00	101.2 PK			1.00 H	280	68.36	32.84
4	*2412.00	98.5 AV			1.00 H	280	65.66	32.84
5	4824.00	52.8 PK	74.0	-21.2	1.01 H	32	10.53	42.27
6	4824.00	45.4 AV	54.0	-8.6	1.01 H	32	3.13	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	2333.20	61.6 PK	74.0	-12.4	1.12 V	309	29.00	32.60
2	2333.20	52.4 AV	54.0	-1.6	1.12 V	309	19.80	32.60
3	*2412.00	112.2 PK			1.06 V	53	79.36	32.84
4	*2412.00	109.5 AV			1.06 V	53	76.66	32.84
5	2494.00	60.0 PK	74.0	-14.0	1.12 V	309	26.95	33.05
6	2494.00	50.9 AV	54.0	-3.1	1.12 V	309	17.85	33.05
7	4824.00	55.7 PK	74.0	-18.3	1.07 V	24	13.43	42.27
8	4824.00	52.8 AV	54.0	-1.2	1.07 V	24	10.53	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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2358.25	57.5 PK	74.0	-16.5	1.00 H	274	24.82	32.68
2	2358.25	46.4 AV	54.0	-7.6	1.00 H	274	13.72	32.68
3	*2437.00	105.6 PK			1.00 H	274	72.69	32.91
4	*2437.00	101.5 AV			1.00 H	274	68.59	32.91
5	2497.86	59.1 PK	74.0	-14.9	1.00 H	274	26.04	33.06
6	2497.86	44.6 AV	54.0	-9.4	1.00 H	274	11.54	33.06
7	4874.00	52.9 PK	74.0	-21.1	1.00 H	32	10.58	42.32
8	4874.00	47.6 AV	54.0	-6.4	1.00 H	32	5.28	42.32
9	7311.00	57.1 PK	74.0	-16.9	1.00 H	152	10.15	46.95
10	7311.00	43.7 AV	54.0	-10.3	1.00 H	152	-3.25	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	2358.25	61.0 PK	74.0	-13.0	1.16 V	360	28.32	32.68
2	2358.25	50.5 AV	54.0	-3.5	1.16 V	360	17.82	32.68
3	*2437.00	111.9 PK			1.16 V	360	78.99	32.91
4	*2437.00	109.7 AV			1.16 V	360	76.79	32.91
5	2497.86	60.8 PK	74.0	-13.2	1.16 V	360	27.74	33.06
6	2497.86	47.0 AV	54.0	-7.0	1.16 V	360	13.94	33.06
7	4874.00	55.6 PK	74.0	-18.4	1.02 V	336	13.28	42.32
8	4874.00	52.1 AV	54.0	-1.9	1.02 V	336	9.78	42.32
9	7311.00	55.8 PK	74.0	-18.2	1.00 V	156	8.85	46.95
10	7311.00	44.7 AV	54.0	-9.3	1.00 V	156	-2.25	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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.7 PK			1.00 H	275	71.73	32.97
2	*2462.00	100.6 AV			1.00 H	275	67.63	32.97
3	2483.50	58.6 PK	74.0	-15.4	1.00 H	360	25.57	33.03
4	2483.50	44.4 AV	54.0	-9.6	1.00 H	360	11.37	33.03
5	4924.00	50.0 PK	74.0	-24.0	1.02 H	316	7.68	42.32
6	4924.00	42.6 AV	54.0	-11.4	1.02 H	316	0.28	42.32
7	7386.00	55.5 PK	74.0	-18.5	1.00 H	78	8.31	47.19
8	7386.00	43.3 AV	54.0	-10.7	1.00 H	78	-3.89	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	2288.00	60.2 PK	74.0	-13.8	1.14 V	310	27.75	32.45
2	2288.00	53.0 AV	54.0	-1.0	1.14 V	310	20.55	32.45
3	*2462.00	112.6 PK			1.04 V	53	79.63	32.97
4	*2462.00	110.2 AV			1.04 V	53	77.23	32.97
5	2483.50	60.1 PK	74.0	-13.9	1.04 V	53	27.07	33.03
6	2483.50	47.5 AV	54.0	-6.5	1.04 V	53	14.47	33.03
7	4924.00	55.8 PK	74.0	-18.2	1.00 V	351	13.48	42.32
8	4924.00	52.8 AV	54.0	-1.2	1.00 V	351	10.48	42.32
9	7386.00	55.0 PK	74.0	-19.0	1.00 V	68	7.81	47.19
10	7386.00	43.6 AV	54.0	-10.4	1.00 V	68	-3.59	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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



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802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.2 PK	74.0	-14.8	1.00 H	269	26.42	32.78
2	2390.00	44.8 AV	54.0	-9.2	1.00 H	269	12.02	32.78
3	*2412.00	97.5 PK			1.00 H	270	64.66	32.84
4	*2412.00	88.2 AV			1.00 H	270	55.36	32.84
5	4824.00	52.9 PK	74.0	-21.1	1.00 H	32	10.63	42.27
6	4824.00	45.7 AV	54.0	-8.3	1.00 H	32	3.43	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	59.0 PK	74.0	-15.0	1.05 V	54	26.22	32.78
2	2390.00	47.8 AV	54.0	-6.2	1.05 V	54	15.02	32.78
3	*2412.00	108.8 PK			1.05 V	54	75.96	32.84
4	*2412.00	99.3 AV			1.05 V	54	66.46	32.84
5	4824.00	50.9 PK	74.0	-23.1	1.00 V	124	8.63	42.27
6	4824.00	44.1 AV	54.0	-9.9	1.00 V	124	1.83	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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.6 PK	74.0	-17.4	1.00 H	271	23.82	32.78
2	2390.00	43.4 AV	54.0	-10.6	1.00 H	271	10.62	32.78
3	*2437.00	103.5 PK			1.00 H	271	70.59	32.91
4	*2437.00	92.7 AV			1.00 H	271	59.79	32.91
5	2483.50	57.8 PK	74.0	-16.2	1.00 H	271	24.77	33.03
6	2483.50	43.7 AV	54.0	-10.3	1.00 H	271	10.67	33.03
7	4874.00	50.4 PK	74.0	-23.6	1.06 H	123	8.08	42.32
8	4874.00	43.7 AV	54.0	-10.3	1.06 H	123	1.38	42.32
9	7311.00	56.8 PK	74.0	-17.2	1.00 H	140	9.85	46.95
10	7311.00	43.4 AV	54.0	-10.6	1.00 H	140	-3.55	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	2390.00	60.3 PK	74.0	-13.7	1.15 V	15	27.52	32.78
2	2390.00	47.1 AV	54.0	-6.9	1.15 V	15	14.32	32.78
3	*2437.00	111.8 PK			1.06 V	53	78.89	32.91
4	*2437.00	102.5 AV			1.06 V	53	69.59	32.91
5	2483.50	60.7 PK	74.0	-13.3	1.15 V	15	27.67	33.03
6	2483.50	46.8 AV	54.0	-7.2	1.15 V	15	13.77	33.03
7	4874.00	50.9 PK	74.0	-23.1	1.06 V	117	8.58	42.32
8	4874.00	44.1 AV	54.0	-9.9	1.06 V	117	1.78	42.32
9	7311.00	56.9 PK	74.0	-17.1	1.03 V	134	9.95	46.95
10	7311.00	43.9 AV	54.0	-10.1	1.03 V	134	-3.05	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).
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	97.6 PK			1.00 H	270	64.63	32.97
2	*2462.00	88.1 AV			1.00 H	270	55.13	32.97
3	2483.50	57.6 PK	74.0	-16.4	1.00 H	270	24.57	33.03
4	2483.50	44.1 AV	54.0	-9.9	1.00 H	270	11.07	33.03
5	4924.00	49.9 PK	74.0	-24.1	1.02 H	110	7.58	42.32
6	4924.00	43.3 AV	54.0	-10.7	1.02 H	110	0.98	42.32
7	7386.00	55.6 PK	74.0	-18.4	1.00 H	137	8.41	47.19
8	7386.00	42.5 AV	54.0	-11.5	1.00 H	137	-4.69	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	108.6 PK			1.05 V	53	75.63	32.97
2	*2462.00	99.4 AV			1.05 V	53	66.43	32.97
3	2483.50	63.0 PK	74.0	-11.0	1.16 V	15	29.97	33.03
4	2483.50	46.0 AV	54.0	-8.0	1.16 V	15	12.97	33.03
5	4924.00	50.8 PK	74.0	-23.2	1.10 V	110	8.48	42.32
6	4924.00	43.9 AV	54.0	-10.1	1.10 V	110	1.58	42.32
7	7386.00	57.0 PK	74.0	-17.0	1.00 V	131	9.81	47.19
8	7386.00	44.1 AV	54.0	-9.9	1.00 V	131	-3.09	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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency.

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.2 PK	74.0	-16.8	1.00 H	274	24.42	32.78
2	2390.00	43.6 AV	54.0	-10.4	1.00 H	274	10.82	32.78
3	*2412.00	97.5 PK			1.00 H	274	64.66	32.84
4	*2412.00	87.2 AV			1.00 H	274	54.36	32.84
5	4824.00	50.0 PK	74.0	-24.0	1.04 H	99	7.73	42.27
6	4824.00	43.7 AV	54.0	-10.3	1.04 H	99	1.43	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	59.0 PK	74.0	-15.0	1.07 V	54	26.22	32.78
2	2390.00	49.0 AV	54.0	-5.0	1.07 V	54	16.22	32.78
3	*2412.00	109.3 PK			1.07 V	54	76.46	32.84
4	*2412.00	99.1 AV			1.07 V	54	66.26	32.84
5	4824.00	50.6 PK	74.0	-23.4	1.13 V	90	8.33	42.27
6	4824.00	43.7 AV	54.0	-10.3	1.13 V	90	1.43	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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.5 PK	74.0	-17.5	1.00 H	275	23.72	32.78
2	2390.00	43.2 AV	54.0	-10.8	1.00 H	275	10.42	32.78
3	*2437.00	102.3 PK			1.00 H	275	69.39	32.91
4	*2437.00	92.1 AV			1.00 H	275	59.19	32.91
5	2483.50	57.1 PK	74.0	-16.9	1.00 H	275	24.07	33.03
6	2483.50	42.9 AV	54.0	-11.1	1.00 H	275	9.87	33.03
7	4874.00	49.4 PK	74.0	-24.6	1.05 H	94	7.08	42.32
8	4874.00	43.2 AV	54.0	-10.8	1.05 H	94	0.88	42.32
9	7311.00	54.6 PK	74.0	-19.4	1.00 H	138	7.65	46.95
10	7311.00	41.7 AV	54.0	-12.3	1.00 H	138	-5.25	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	2390.00	59.8 PK	74.0	-14.2	1.17 V	15	27.02	32.78
2	2390.00	46.9 AV	54.0	-7.1	1.17 V	15	14.12	32.78
3	*2437.00	111.9 PK			1.07 V	52	78.99	32.91
4	*2437.00	102.3 AV			1.07 V	52	69.39	32.91
5	2483.50	60.1 PK	74.0	-13.9	1.17 V	15	27.07	33.03
6	2483.50	46.5 AV	54.0	-7.5	1.17 V	15	13.47	33.03
7	4874.00	50.2 PK	74.0	-23.8	1.13 V	125	7.88	42.32
8	4874.00	43.5 AV	54.0	-10.5	1.13 V	125	1.18	42.32
9	7311.00	56.3 PK	74.0	-17.7	1.00 V	145	9.35	46.95
10	7311.00	43.5 AV	54.0	-10.5	1.00 V	145	-3.45	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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	97.1 PK			1.00 H	274	64.13	32.97
2	*2462.00	88.1 AV			1.00 H	274	55.13	32.97
3	2483.50	56.2 PK	74.0	-17.8	1.00 H	274	23.17	33.03
4	2483.50	43.1 AV	54.0	-10.9	1.00 H	274	10.07	33.03
5	4924.00	48.3 PK	74.0	-25.7	1.06 H	99	5.98	42.32
6	4924.00	42.4 AV	54.0	-11.6	1.06 H	99	0.08	42.32
7	7386.00	54.8 PK	74.0	-19.2	1.00 H	141	7.61	47.19
8	7386.00	42.0 AV	54.0	-12.0	1.00 H	141	-5.19	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	108.7 PK			1.07 V	52	75.73	32.97
2	*2462.00	99.4 AV			1.07 V	52	66.43	32.97
3	2483.50	60.7 PK	74.0	-13.3	1.17 V	10	27.67	33.03
4	2483.50	46.0 AV	54.0	-8.0	1.17 V	10	12.97	33.03
5	4924.00	49.1 PK	74.0	-24.9	1.13 V	137	6.78	42.32
6	4924.00	42.8 AV	54.0	-11.2	1.13 V	137	0.48	42.32
7	7386.00	56.3 PK	74.0	-17.7	1.00 V	150	9.11	47.19
8	7386.00	43.4 AV	54.0	-10.6	1.00 V	150	-3.79	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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency.



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802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.3 PK	74.0	-17.7	1.00 H	273	23.52	32.78
2	2390.00	43.0 AV	54.0	-11.0	1.00 H	273	10.22	32.78
3	*2422.00	94.1 PK			1.00 H	273	61.23	32.87
4	*2422.00	85.2 AV			1.00 H	273	52.33	32.87
5	4844.00	47.6 PK	74.0	-26.4	1.05 H	111	5.31	42.29
6	4844.00	42.2 AV	54.0	-11.8	1.05 H	111	-0.09	42.29
7	7266.00	54.0 PK	74.0	-20.0	1.00 H	144	7.19	46.81
8	7266.00	41.4 AV	54.0	-12.6	1.00 H	144	-5.41	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	68.1 PK	74.0	-5.9	1.06 V	54	35.32	32.78
2	2390.00	51.9 AV	54.0	-2.1	1.06 V	54	19.12	32.78
3	*2422.00	105.1 PK			1.06 V	54	72.23	32.87
4	*2422.00	95.8 AV			1.06 V	54	62.93	32.87
5	4844.00	49.2 PK	74.0	-24.8	1.09 V	135	6.91	42.29
6	4844.00	42.8 AV	54.0	-11.2	1.09 V	135	0.51	42.29
7	7266.00	55.7 PK	74.0	-18.3	1.00 V	143	8.89	46.81
8	7266.00	42.7 AV	54.0	-11.3	1.00 V	143	-4.11	46.81

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



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.5 PK	74.0	-17.5	1.00 H	275	23.72	32.78
2	2390.00	43.2 AV	54.0	-10.8	1.00 H	275	10.42	32.78
3	*2437.00	95.8 PK			1.00 H	275	62.89	32.91
4	*2437.00	88.1 AV			1.00 H	275	55.19	32.91
5	2483.50	57.1 PK	74.0	-16.9	1.00 H	275	24.07	33.03
6	2483.50	42.8 AV	54.0	-11.2	1.00 H	275	9.77	33.03
7	4874.00	47.7 PK	74.0	-26.3	1.11 H	100	5.38	42.32
8	4874.00	42.6 AV	54.0	-11.4	1.11 H	100	0.28	42.32
9	7311.00	53.3 PK	74.0	-20.7	1.00 H	137	6.35	46.95
10	7311.00	40.9 AV	54.0	-13.1	1.00 H	137	-6.05	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	2390.00	67.1 PK	74.0	-6.9	1.05 V	51	34.32	32.78
2	2390.00	51.4 AV	54.0	-2.6	1.05 V	51	18.62	32.78
3	*2437.00	108.5 PK			1.05 V	51	75.59	32.91
4	*2437.00	99.1 AV			1.05 V	51	66.19	32.91
5	2483.50	72.0 PK	74.0	-2.0	1.16 V	11	38.97	33.03
6	2483.50	49.4 AV	54.0	-4.6	1.16 V	11	16.37	33.03
7	4874.00	48.8 PK	74.0	-25.2	1.08 V	133	6.48	42.32
8	4874.00	42.6 AV	54.0	-11.4	1.08 V	133	0.28	42.32
9	7311.00	55.3 PK	74.0	-18.7	1.00 V	128	8.35	46.95
10	7311.00	42.6 AV	54.0	-11.4	1.00 V	128	-4.35	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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	94.0 PK			1.00 H	275	61.05	32.95
2	*2452.00	84.1 AV			1.00 H	275	51.15	32.95
3	2483.50	57.4 PK	74.0	-16.6	1.00 H	275	24.37	33.03
4	2483.50	42.8 AV	54.0	-11.2	1.00 H	275	9.77	33.03
5	4904.00	47.4 PK	74.0	-26.6	1.04 H	63	5.06	42.34
6	4904.00	42.5 AV	54.0	-11.5	1.04 H	63	0.16	42.34
7	7356.00	52.4 PK	74.0	-21.6	1.00 H	152	5.31	47.09
8	7356.00	40.3 AV	54.0	-13.7	1.00 H	152	-6.79	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	103.7 PK			1.05 V	48	70.75	32.95
2	*2452.00	94.5 AV			1.05 V	48	61.55	32.95
3	2483.50	69.9 PK	74.0	-4.1	1.05 V	48	36.87	33.03
4	2483.50	50.3 AV	54.0	-3.7	1.05 V	48	17.27	33.03
5	4904.00	48.7 PK	74.0	-25.3	1.01 V	124	6.36	42.34
6	4904.00	42.5 AV	54.0	-11.5	1.01 V	124	0.16	42.34
7	7356.00	55.5 PK	74.0	-18.5	1.00 V	110	8.41	47.09
8	7356.00	42.7 AV	54.0	-11.3	1.00 V	110	-4.39	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).
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. 13, 2013

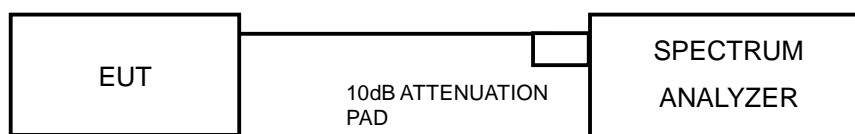
4.3.3 TEST PROCEDURE

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.



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4.3.7 TEST RESULTS

802.11b

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	10.23	10.87	0.5	PASS
6	2437	10.66	10.19	0.5	PASS
11	2462	10.38	10.17	0.5	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	16.63	16.61	0.5	PASS
6	2437	16.63	16.62	0.5	PASS
11	2462	16.62	16.56	0.5	PASS

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	17.87	17.87	0.5	PASS
6	2437	17.87	17.85	0.5	PASS
11	2462	17.86	17.83	0.5	PASS

802.11n (HT40)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
3	2422	36.67	36.65	0.5	PASS
6	2437	36.65	36.68	0.5	PASS
9	2452	36.71	36.66	0.5	PASS

4.4 OCCUPIED BANDWIDTH MEASUREMENT

4.4.1 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. 13, 2013

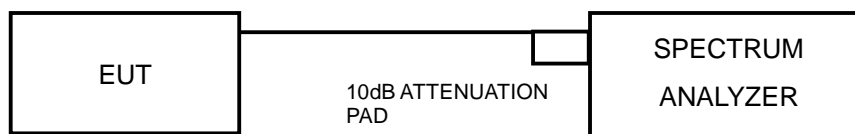
4.4.2 TEST PROCEDURE

- 1) Set RBW \geq 1% of the emission bandwidth.
- 2) Set the VBW \geq 3 x RBW.
- 3) Detector = Peak.
- 4) Trace mode = max hold.
- 5) Record the 99% emission bandwidth.

4.4.3 DEVIATION FROM TEST STANDARD

No deviation

4.4.4 TEST SETUP



4.4.5 EUT OPERATING CONDITIONS

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



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4.4.6 TEST RESULTS

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		CHAIN 0	CHAIN 1
1	2412	13.80	13.68
6	2437	13.80	13.68
11	2462	13.68	13.80

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		CHAIN 0	CHAIN 1
1	2412	16.92	16.80
6	2437	16.92	16.92
11	2462	17.04	16.80

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		CHAIN 0	CHAIN 1
1	2412	18.00	18.00
6	2437	18.12	18.00
11	2462	18.00	18.00

802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		CHAIN 0	CHAIN 1
3	2422	37.40	37.80
6	2437	38.00	37.80
9	2452	37.80	37.40

4.5 CONDUCTED OUTPUT POWER MEASUREMENT

4.5.1 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 \geq 40 MHz for any NANT;

Array Gain = $5 \log(\text{NANT}/\text{NSS})$ 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 = $10 \log(\text{NANT}/\text{NSS})$ dB.

4.5.2 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. 13, 2013

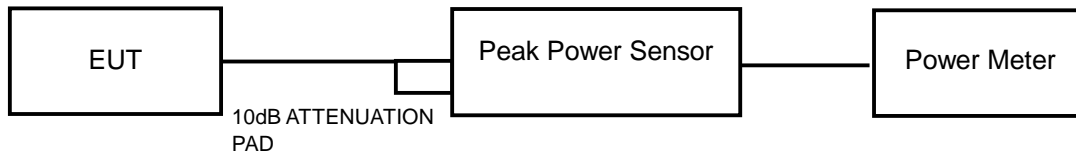
4.5.3 TEST PROCEDURES

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

4.5.4 DEVIATION FROM TEST STANDARD

No deviation.

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6



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4.5.7 TEST RESULTS

802.11b

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	20.1	20.4	211.977	23.26	30	PASS
6	2437	20.4	20.8	229.874	23.61	30	PASS
11	2462	20.0	20.3	207.152	23.16	30	PASS

802.11g

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	19.7	20.0	193.325	22.86	30	PASS
6	2437	22.4	22.2	339.739	25.31	30	PASS
11	2462	19.6	19.9	188.925	22.76	30	PASS

802.11n (HT20)

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	19.8	19.9	193.223	22.86	30	PASS
6	2437	22.4	22.1	335.961	25.26	30	PASS
11	2462	19.5	19.9	186.849	22.71	30	PASS

802.11n (HT40)

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
3	2422	18.6	17.8	132.700	21.23	30	PASS
6	2437	23.0	22.0	358.015	25.54	30	PASS
9	2452	18.1	18.2	130.634	21.16	30	PASS

4.6 AVERAGE OUTPUT POWER

4.6.1 FOR REFERENCE.

4.6.2 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

4.6.3 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.

4.6.4 TEST SETUP



4.6.5 EUT OPERATING CONDITIONS

Same as Item 4.3.6



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4.6.6 TEST RESULTS

802.11b

CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
1	2412	17.80	18.20	126.325	21.01
6	2437	18.20	18.50	136.864	21.36
11	2462	17.73	18.00	122.389	20.88

802.11g

CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
1	2412	11.3	11.5	27.615	14.41
6	2437	14.5	14.6	57.024	17.56
11	2462	11.1	11.73	27.776	14.44

802.11n (HT20)

CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
1	2412	11.2	11.5	27.308	14.36
6	2437	14.5	14.6	57.024	17.56
11	2462	11.1	11.7	27.673	14.42

802.11n (HT40)

CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
3	2422	10.5	10.79	23.215	13.66
6	2437	15.1	14.40	59.901	17.77
9	2452	9.9	10.1	20.005	13.01

4.7 POWER SPECTRAL DENSITY MEASUREMENT

4.7.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

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. 13, 2013

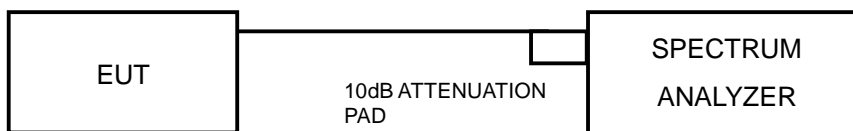
4.7.3 TEST PROCEDURE

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.

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

4.7.5 TEST SETUP



4.7.6 EUT OPERATING CONDITION

Same as Item 4.3.6



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4.7.7 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	-4.85	3.01	-1.84	8	PASS
	6	2437	-5.36	3.01	-2.35	8	PASS
	11	2462	-5.31	3.01	-2.30	8	PASS
1	1	2412	-5.58	3.01	-2.57	8	PASS
	6	2437	-5.57	3.01	-2.56	8	PASS
	11	2462	-6.80	3.01	-3.79	8	PASS

NOTE: Directional gain = $2\text{dBi} + 10\log(2) = 5.01\text{dBi} < 6\text{dBi}$, 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	-13.52	3.01	-10.51	8	PASS
	6	2437	-11.07	3.01	-8.06	8	PASS
	11	2462	-14.21	3.01	-11.20	8	PASS
1	1	2412	-13.92	3.01	-10.91	8	PASS
	6	2437	-11.42	3.01	-8.41	8	PASS
	11	2462	-14.14	3.01	-11.13	8	PASS

NOTE: Directional gain = $2\text{dBi} + 10\log(2) = 5.01\text{dBi} < 6\text{dBi}$, so the power density limit shall not be reduced.



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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	-14.08	3.01	-11.07	8	PASS
	6	2437	-11.78	3.01	-8.77	8	PASS
	11	2462	-14.50	3.01	-11.49	8	PASS
1	1	2412	-14.10	3.01	-11.09	8	PASS
	6	2437	-11.07	3.01	-8.06	8	PASS
	11	2462	-14.62	3.01	-11.61	8	PASS

NOTE: Directional gain = $2\text{dBi} + 10\log(2) = 5.01\text{dBi} < 6\text{dBi}$, so the power density limit shall not be reduced.

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	-16.87	3.01	-13.86	8	PASS
	6	2437	-13.94	3.01	-10.93	8	PASS
	9	2452	-19.60	3.01	-16.59	8	PASS
1	3	2422	-17.12	3.01	-14.11	8	PASS
	6	2437	-12.89	3.01	-9.88	8	PASS
	9	2452	-17.81	3.01	-14.80	8	PASS

NOTE: Directional gain = $2\text{dBi} + 10\log(2) = 5.01\text{dBi} < 6\text{dBi}$, so the power density limit shall not be reduced.



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4.8 CONDUCTED OUT-BAND EMISSION MEASUREMENT

4.8.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

4.8.2 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. 13, 2013

4.8.3 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.

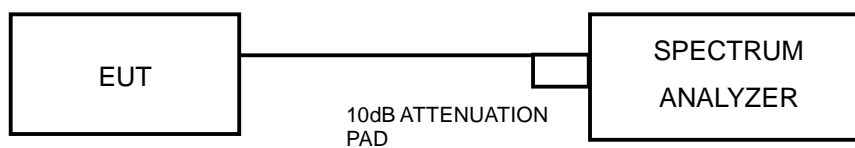
Measurement Procedure –Unwanted Emission Level

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.

4.8.4 DEVIATION FROM TEST STANDARD

No deviation

4.8.5 TEST SETUP



4.8.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.8.7 TEST RESULTS

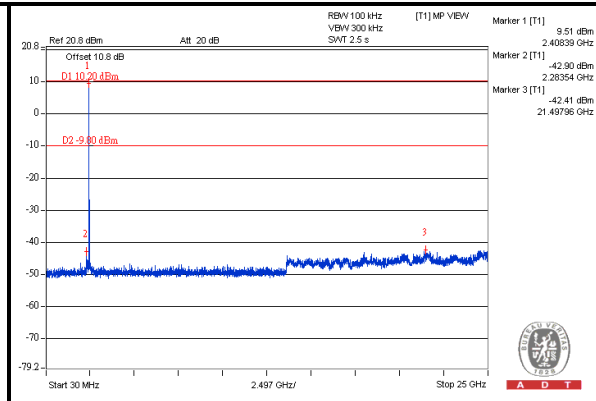
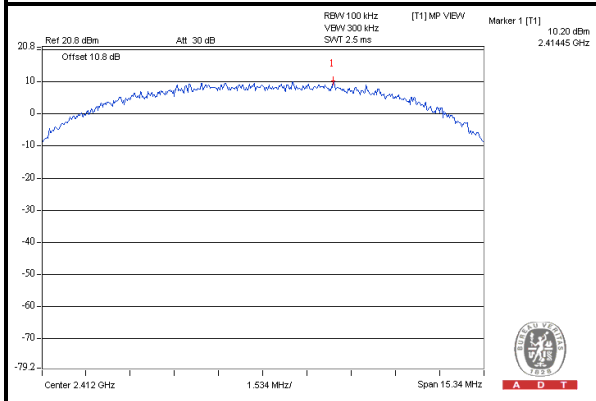
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.



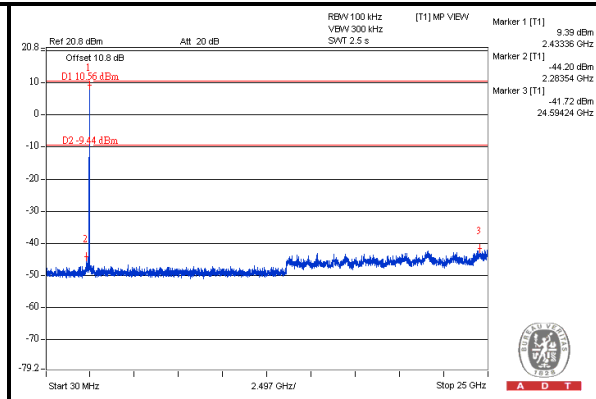
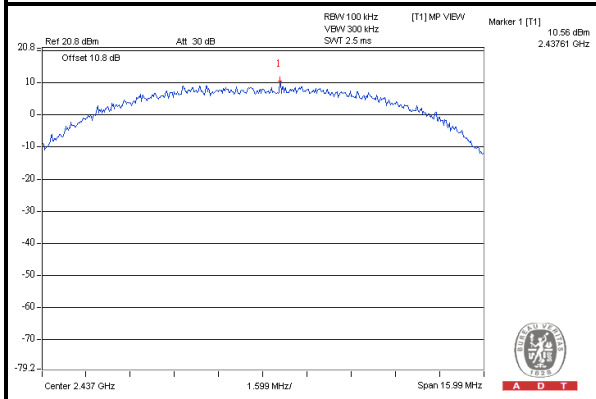
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802.11b:

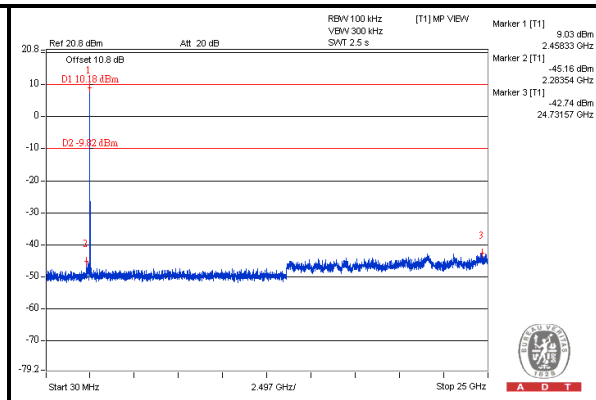
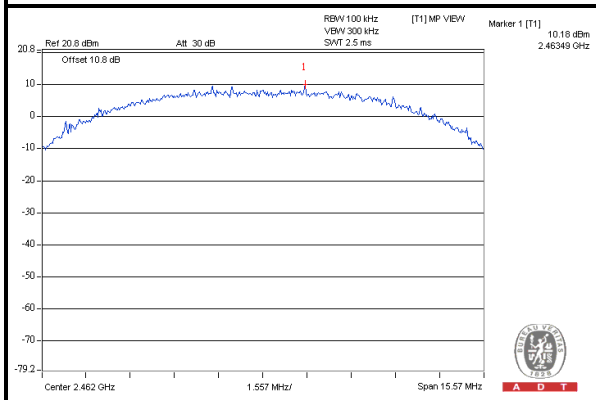
For Chain 0 CH 1



CH 6



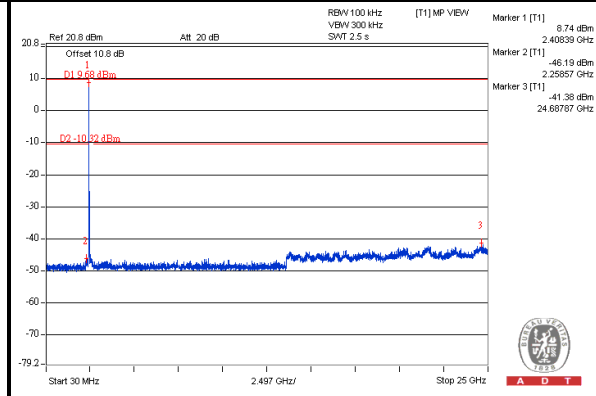
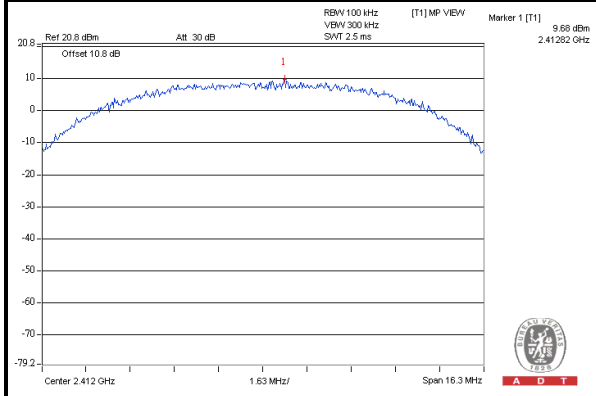
CH 11



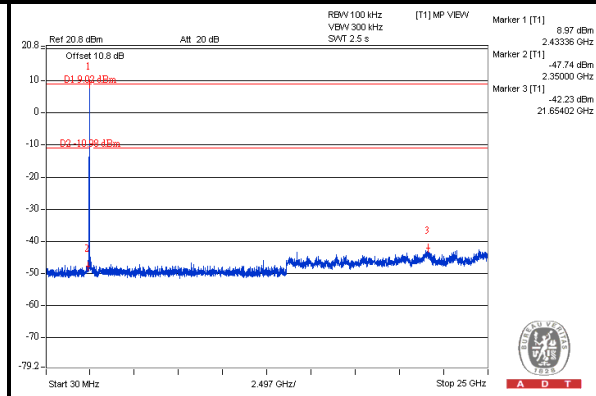
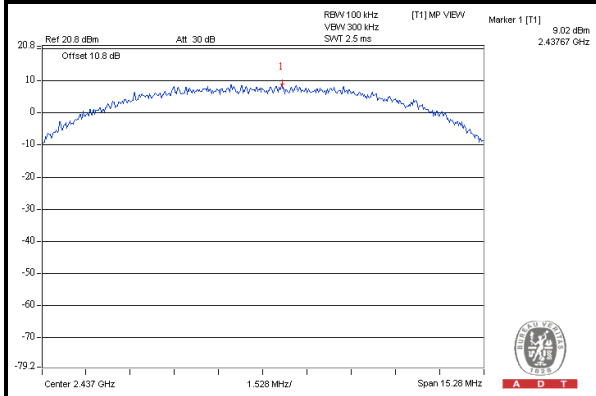


A D T

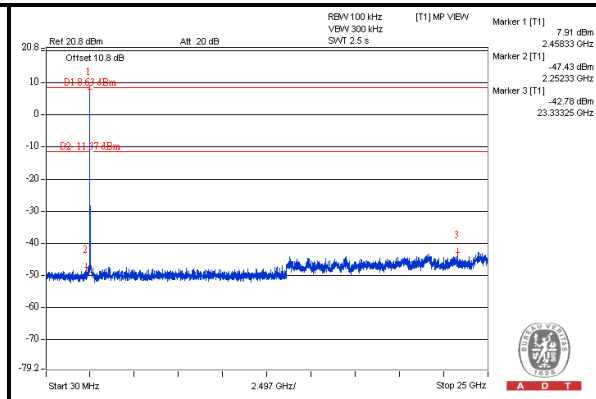
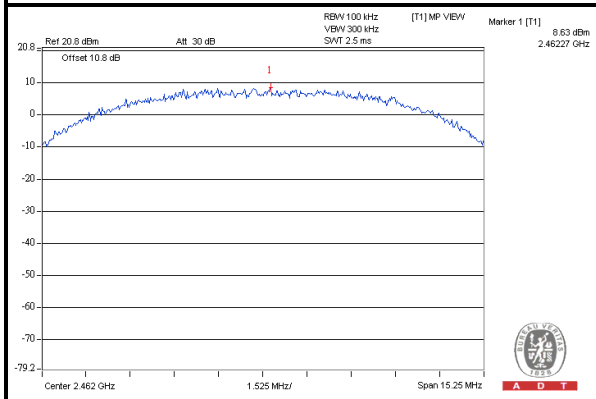
For Chain 1 CH 1



CH 6



CH 11

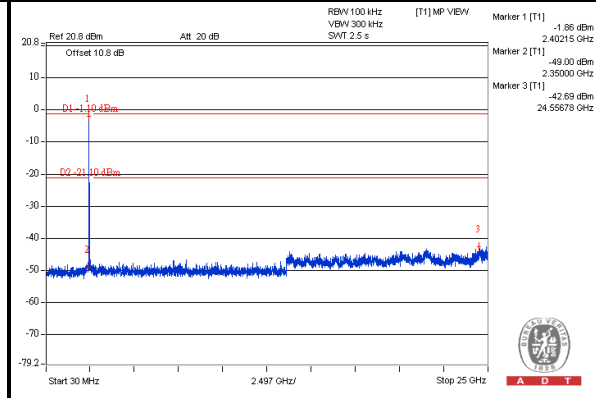
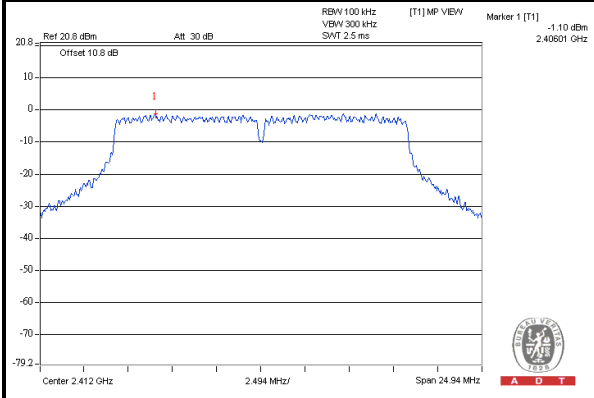




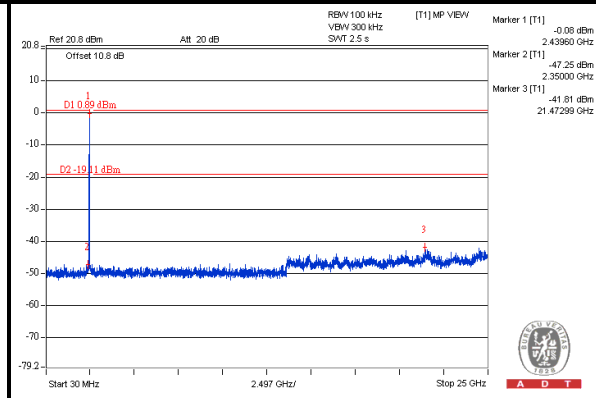
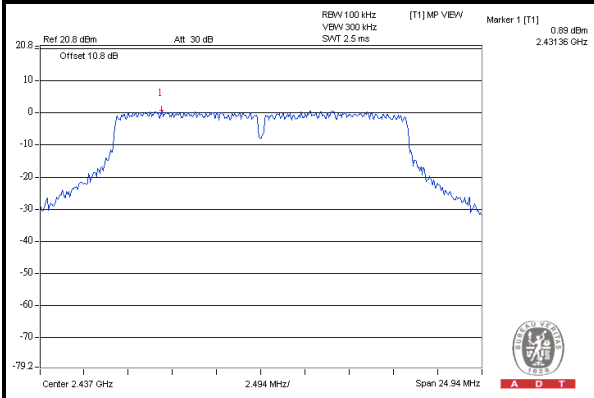
A D T

802.11g:

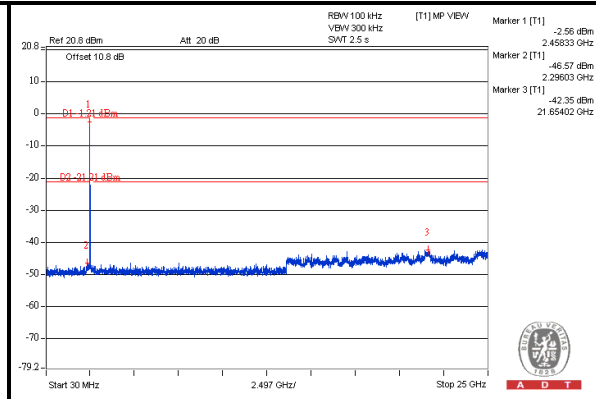
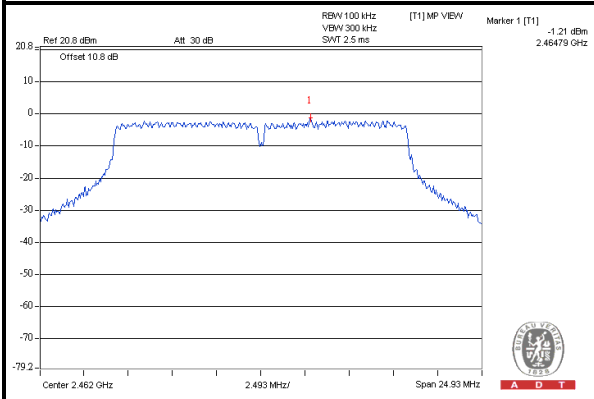
For Chain 0
CH 1



CH 6



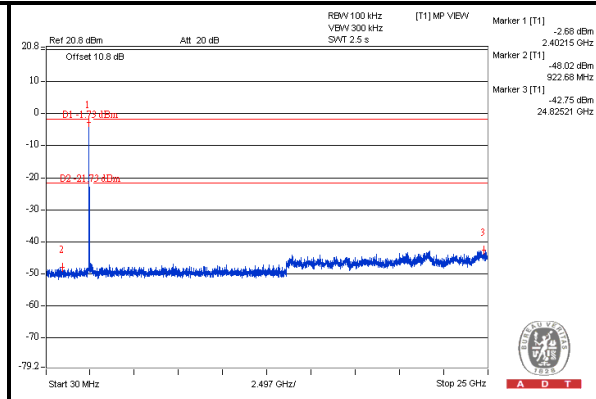
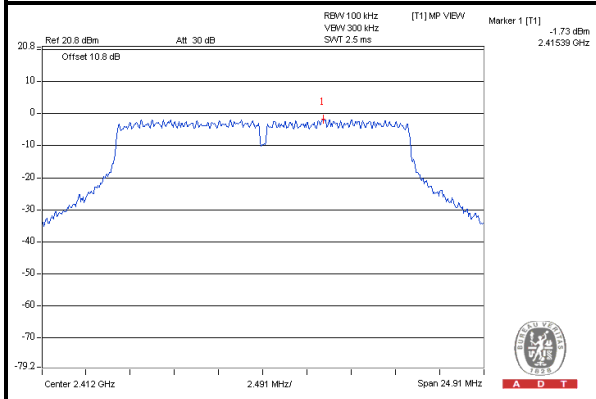
CH 11



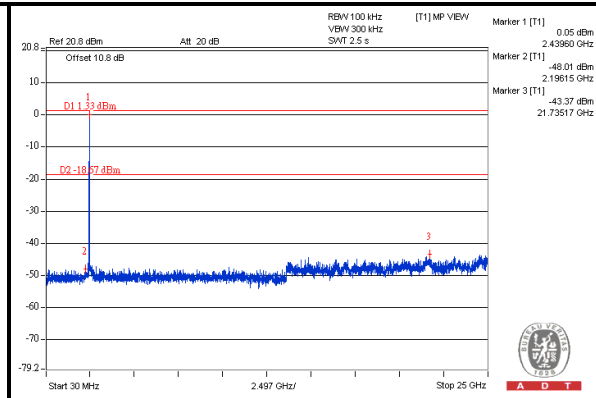
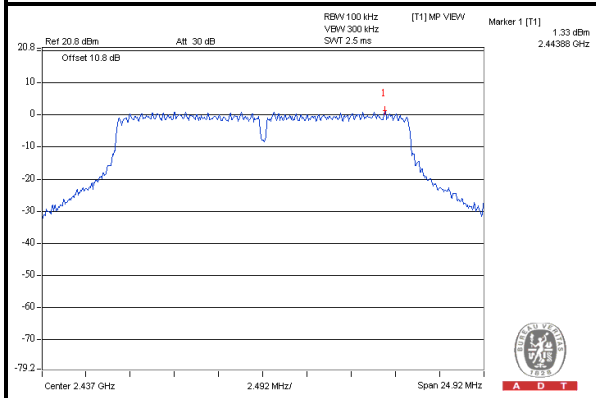


A D T

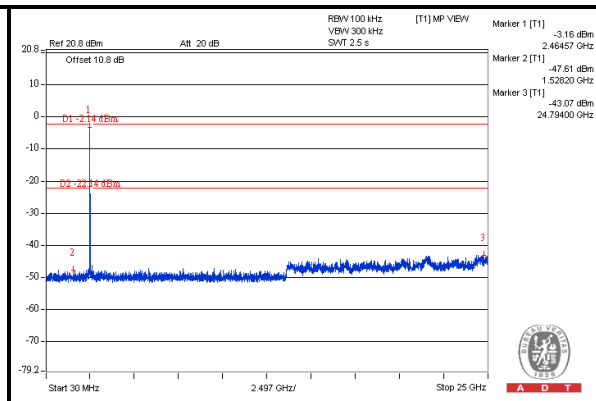
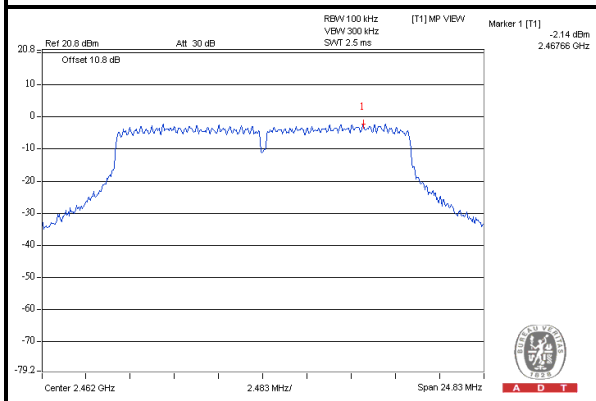
For Chain 1 CH 1



CH 6



CH 11

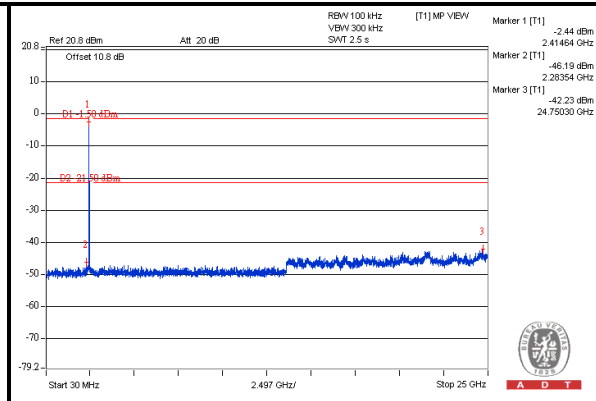
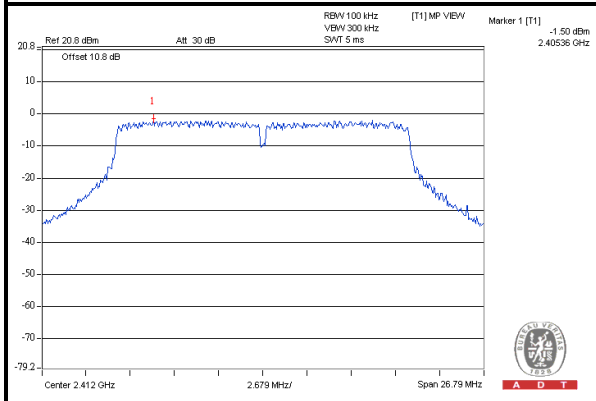




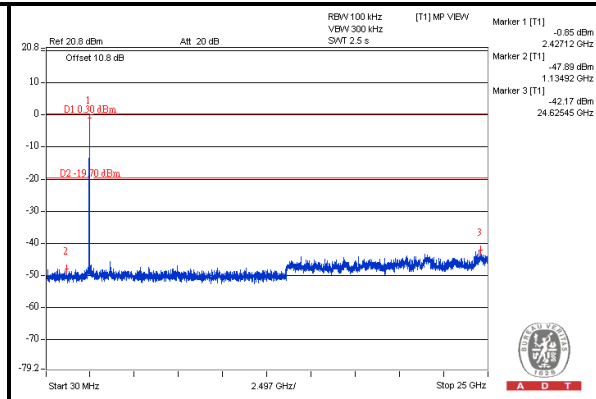
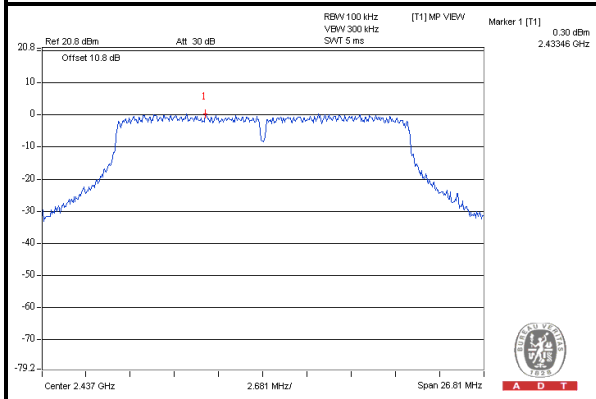
A D T

802.11n (HT20):

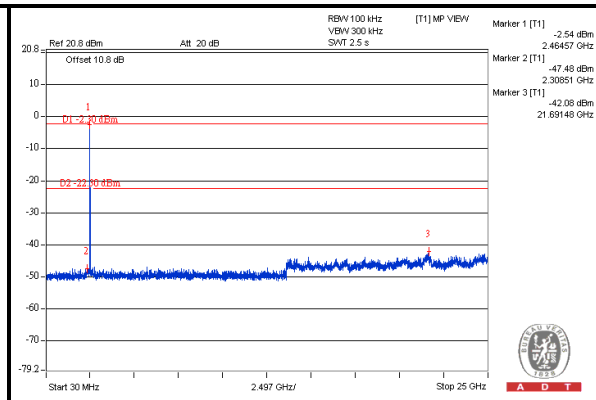
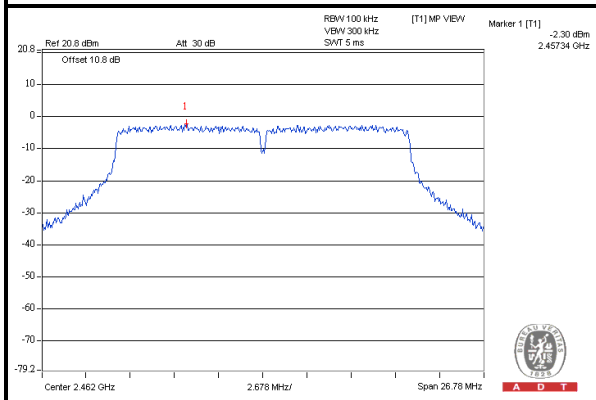
For Chain 0 CH 1



CH 6



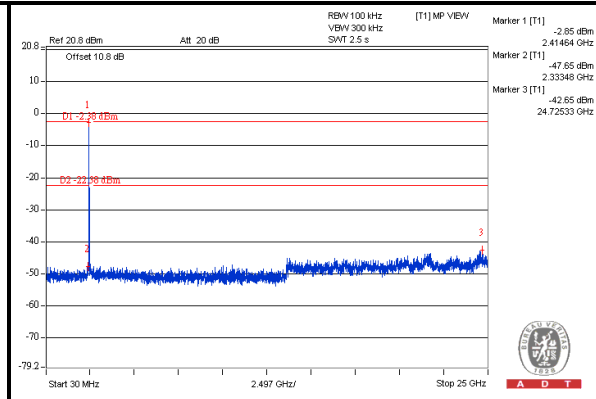
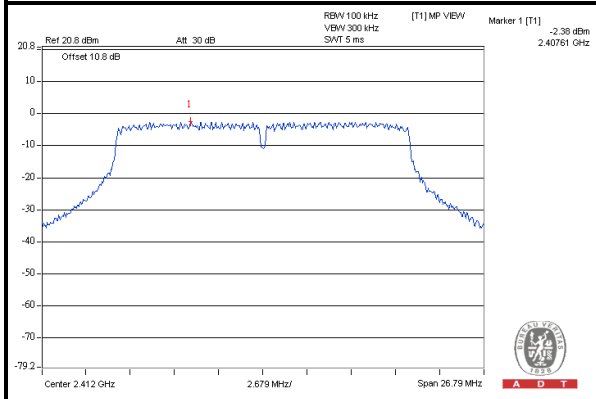
CH 11



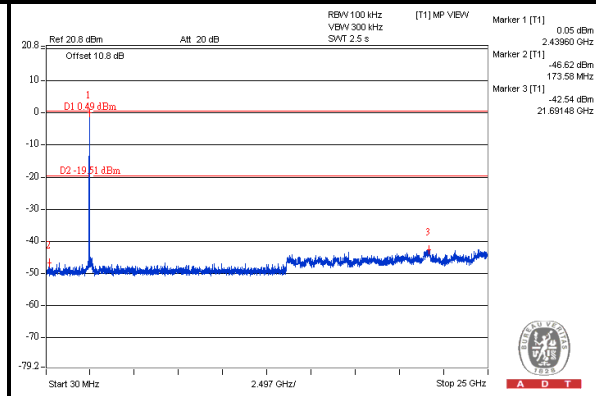
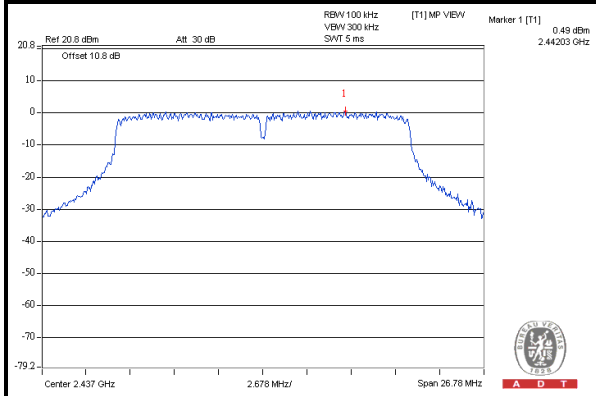


A D T

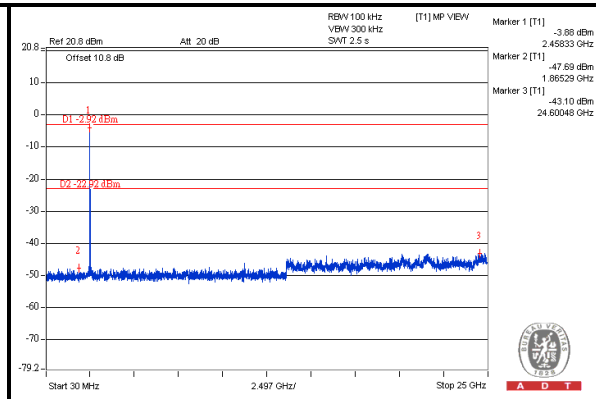
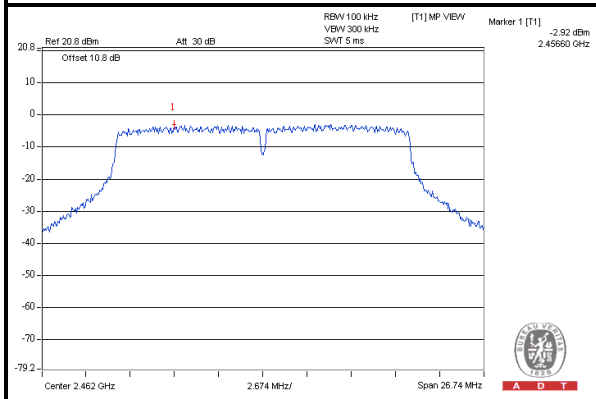
For Chain 1 CH 1



CH 6



CH 11

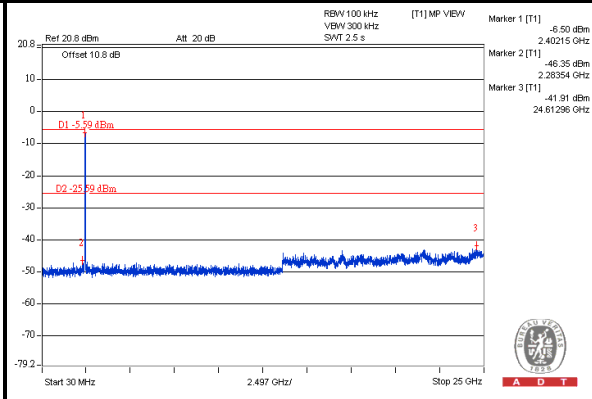
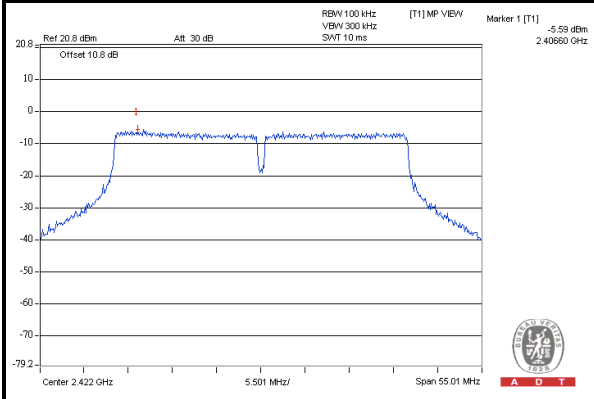




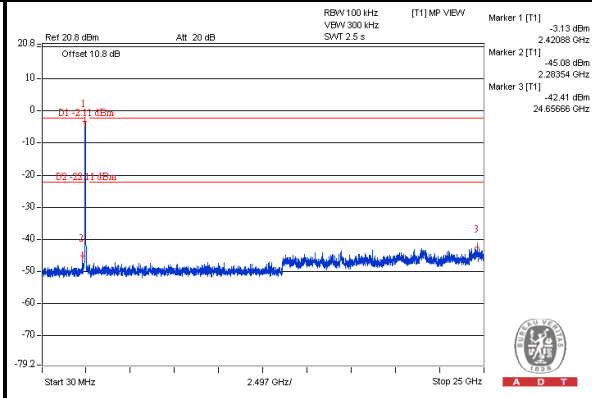
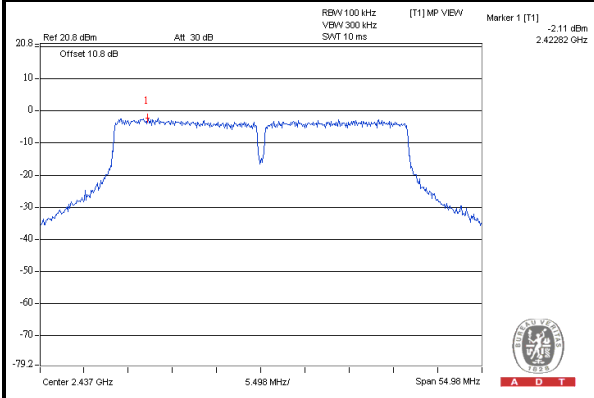
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802.11n (HT40):

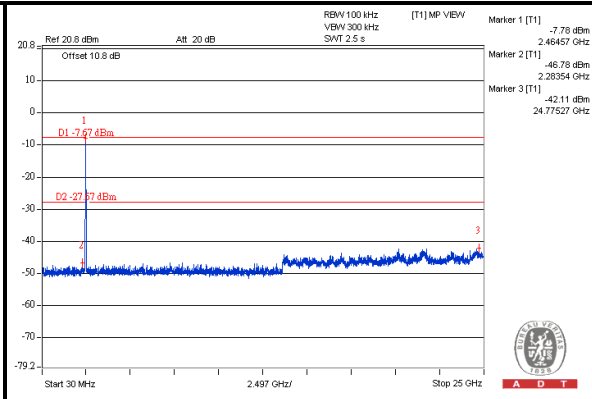
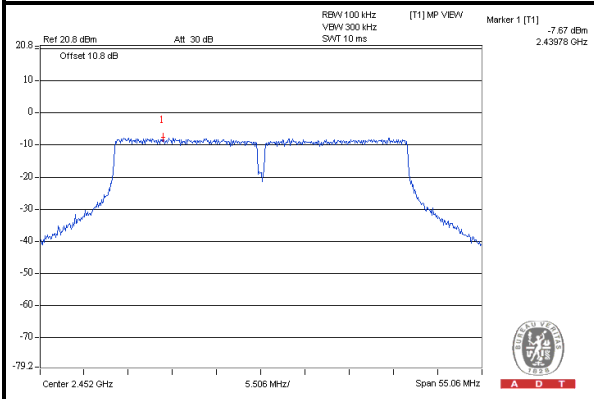
For Chain 0 CH 3



CH 6



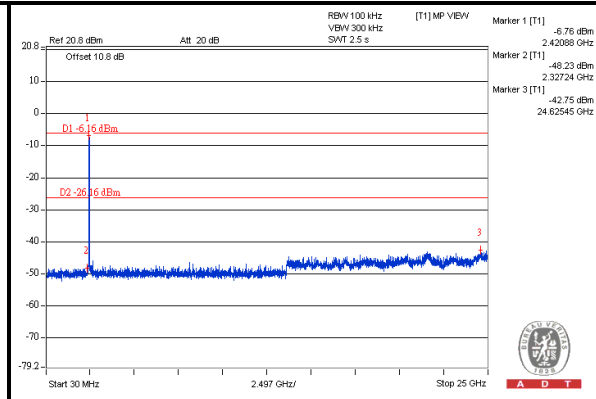
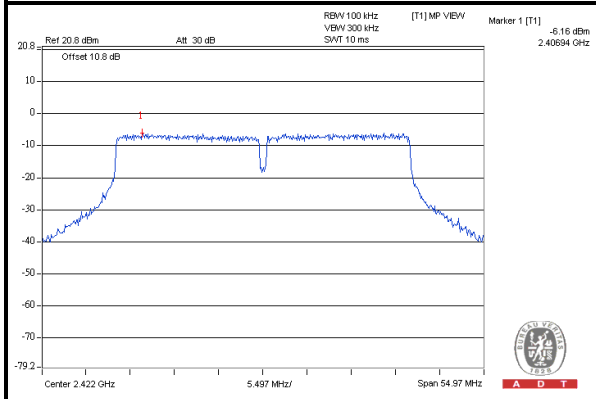
CH 9



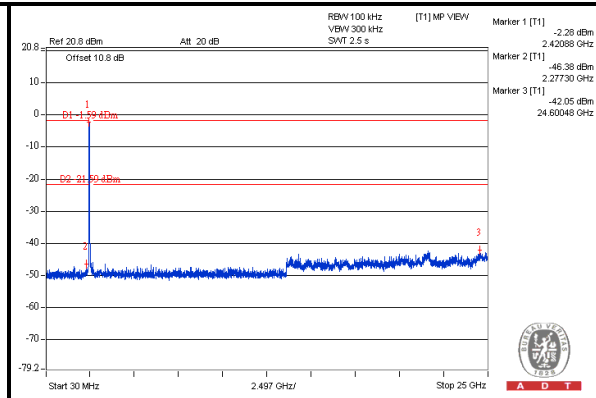
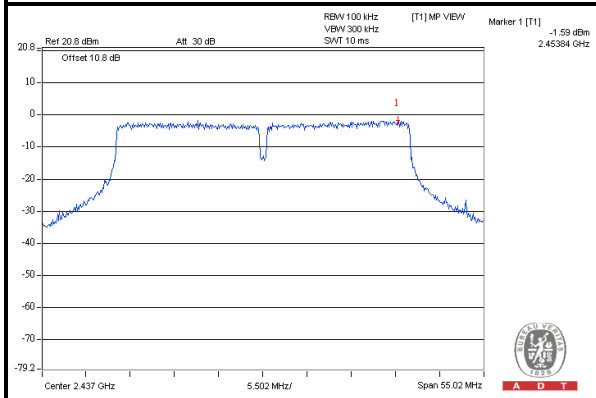


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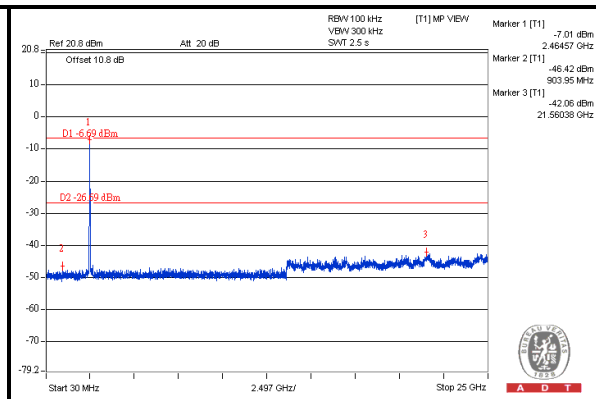
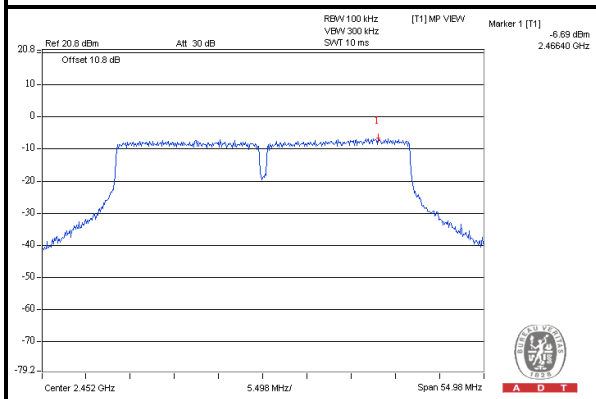
For Chain 1 CH 3



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 ROHDE & SCHWARZ	ESCS 30	100287	Feb. 29, 2012	Feb. 28, 2013
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK 8127	8127-523	Sep. 19, 2012	Sep. 20, 2013
Line-Impedance Stabilization Network (for Peripheral) ROHDE & SCHWARZ	ESH3-Z5	848773/004	Oct. 29, 2012	Oct. 28, 2013
RF Cable (JYEBAO)	5DFB	COACAB-002	Aug. 05, 2012	Aug. 04, 2013
50 ohms Terminator	50	3	Oct. 23, 2012	Oct. 22, 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. A.
3. The VCCI Con A Registration No. is C-817.
4. Tested Date: Dec. 13, 2012

5.1.3 TEST PROCEDURES

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

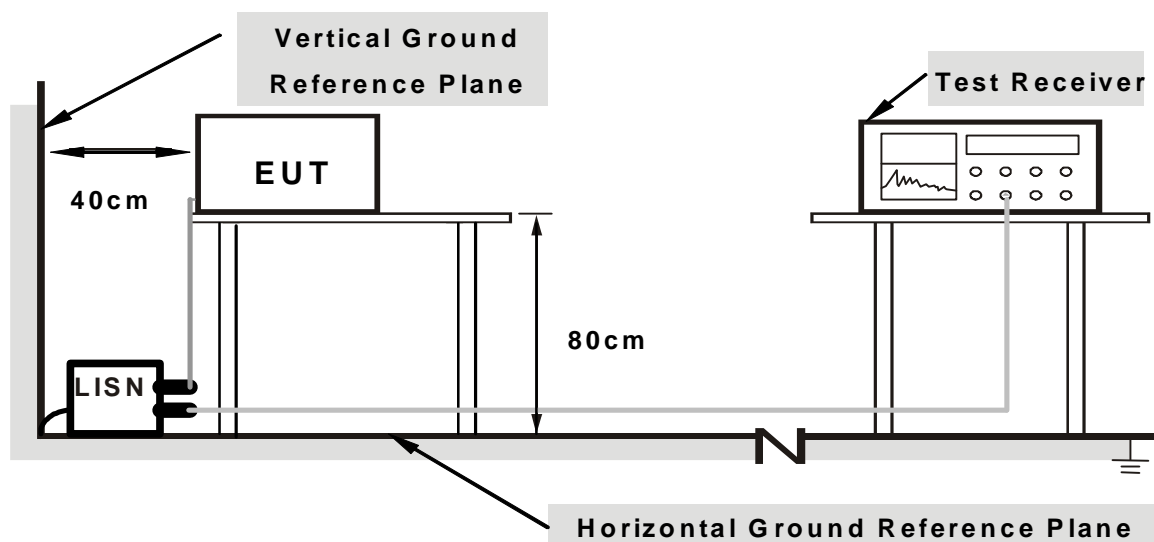
NOTE:

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

5.1.4 DEVIATION FROM TEST STANDARD

No deviation

5.1.5 TEST SETUP



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

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

5.1.6 EUT OPERATING CONDITIONS

Same as the 4.1.6

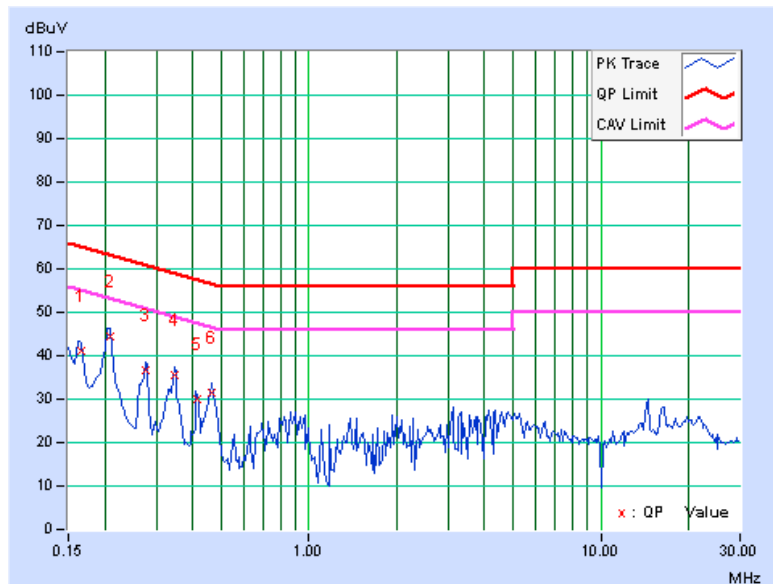
5.1.7 TEST RESULTS

PHASE	Line (L)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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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	0.16542	0.10	40.86	39.95	40.96	40.05	65.19	55.19	-24.23	-15.14
2	0.20899	0.11	44.18	43.81	44.29	43.92	63.25	53.25	-18.95	-9.32
3	0.27585	0.13	36.50	33.37	36.63	33.50	60.94	50.94	-24.31	-17.44
4	0.34667	0.15	35.36	34.38	35.51	34.53	59.04	49.04	-23.54	-14.52
5	0.41607	0.16	29.88	28.85	30.04	29.01	57.53	47.53	-27.49	-18.52
6	0.46480	0.16	31.39	28.50	31.55	28.66	56.61	46.61	-25.05	-17.94

REMARKS:

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





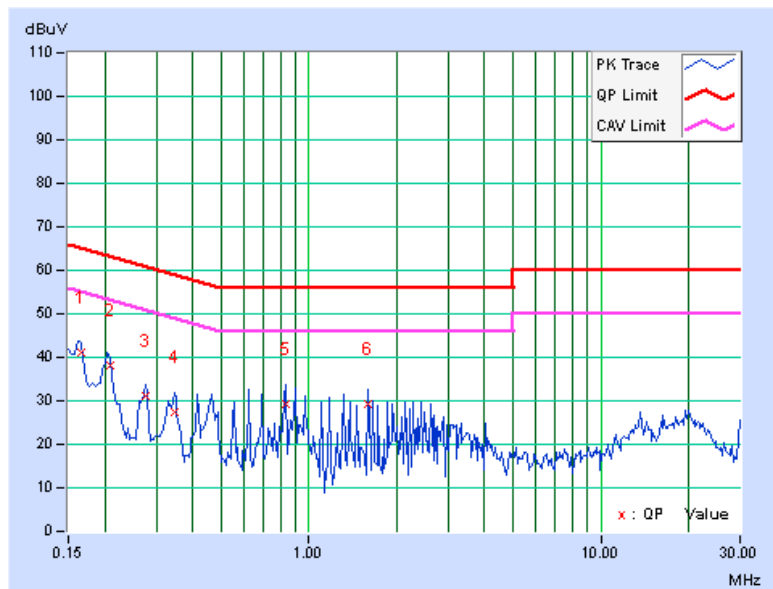
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PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor [dB]	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	0.15	41.01	39.95	41.16	40.10	65.18	55.18	-24.02	-15.08
2	0.20904	0.15	38.01	36.93	38.16	37.08	63.24	53.24	-25.08	-16.16
3	0.27685	0.17	30.88	26.93	31.05	27.10	60.91	50.91	-29.86	-23.81
4	0.34856	0.18	27.18	24.02	27.36	24.20	59.00	49.00	-31.64	-24.80
5	0.83179	0.21	29.00	27.36	29.21	27.57	56.00	46.00	-26.79	-18.43
6	1.59359	0.25	28.93	26.75	29.18	27.00	56.00	46.00	-26.82	-19.00

REMARKS:

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





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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 30dB below the highest level of the desired power:

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

NOTE:

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



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5.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer Agilent	E4446A	MY48250253	Sep. 03, 2012	Sep. 02, 2013
Pre-Selector Agilent	N9039A	MY46520310	Sep. 03, 2012	Sep. 02, 2013
Signal Generator Agilent	N5181A	MY49060347	July 24, 2012	July 23, 2013
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-04	Nov. 14, 2012	Nov. 13, 2013
Pre-Amplifier Agilent	8449B	3008A02465	Feb. 26, 2013	Feb. 25, 2014
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: Feb. 27 to 28, 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.

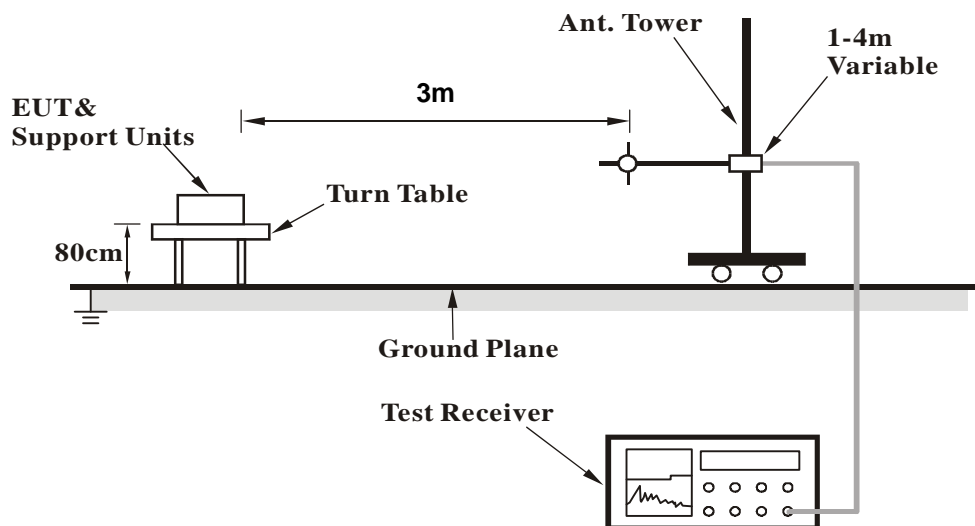
NOTE:

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	87.10	31.7 QP	40.0	-8.4	1.50 H	88	22.98	8.67
2	162.30	28.0 QP	43.5	-15.5	1.35 H	300	13.87	14.14
3	300.00	34.8 QP	46.0	-11.2	1.47 H	68	19.47	15.31
4	432.03	36.8 QP	46.0	-9.2	1.37 H	77	18.30	18.48
5	632.87	35.5 QP	46.0	-10.5	1.74 H	278	12.76	22.72
6	799.70	35.6 QP	46.0	-10.4	1.36 H	268	9.93	25.67
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	162.09	31.5 QP	43.5	-12.1	1.34 V	98	17.29	14.16
2	333.40	31.6 QP	46.0	-14.4	1.01 V	287	15.51	16.13
3	530.00	36.8 QP	46.0	-9.2	1.07 V	65	16.06	20.74
4	566.39	36.8 QP	46.0	-9.3	1.24 V	214	15.23	21.52
5	698.78	33.0 QP	46.0	-13.0	1.00 V	324	9.30	23.69
6	799.53	35.3 QP	46.0	-10.7	1.24 V	214	9.64	25.67

REMARKS:

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



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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	*5745.00	105.4 PK			1.00 H	210	61.92	43.48
2	*5745.00	98.5 AV			1.00 H	210	55.02	43.48
3	11490.00	58.4 PK	74.0	-15.6	1.00 H	300	8.22	50.18
4	11490.00	46.0 AV	54.0	-8.0	1.00 H	300	-4.18	50.18

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	5080.00	59.6 PK	74.0	-14.4	1.59 V	220	17.22	42.38
2	5080.00	51.5 AV	54.0	-2.5	1.59 V	220	9.12	42.38
3	*5745.00	114.8 PK			1.19 V	54	71.32	43.48
4	*5745.00	107.0 AV			1.19 V	54	63.52	43.48
5	11490.00	59.9 PK	74.0	-14.1	1.26 V	11	9.72	50.18
6	11490.00	47.7 AV	54.0	-6.3	1.26 V	11	-2.48	50.18

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 limit value is defined as per 15.247.



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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	*5785.00	104.7 PK			1.00 H	192	61.18	43.52
2	*5785.00	98.0 AV			1.00 H	192	54.48	43.52
3	11570.00	58.1 PK	74.0	-15.9	1.02 H	321	7.92	50.18
4	11570.00	45.9 AV	54.0	-8.1	1.02 H	321	-4.28	50.18

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	5080.00	59.5 PK	74.0	-14.5	1.62 V	213	17.12	42.38
2	5080.00	51.4 AV	54.0	-2.6	1.62 V	213	9.02	42.38
3	*5785.00	114.5 PK			1.14 V	36	70.98	43.52
4	*5785.00	106.9 AV			1.14 V	36	63.38	43.52
5	11570.00	59.5 PK	74.0	-14.5	1.26 V	9	9.32	50.18
6	11570.00	47.2 AV	54.0	-6.8	1.26 V	9	-2.98	50.18

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 limit value is defined as per 15.247.



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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	*5825.00	104.4 PK			1.00 H	184	60.79	43.61
2	*5825.00	97.6 AV			1.00 H	184	53.99	43.61
3	11650.00	57.9 PK	74.0	-16.1	1.00 H	320	7.48	50.42
4	11650.00	45.5 AV	54.0	-8.5	1.00 H	320	-4.92	50.42

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	5080.00	59.1 PK	74.0	-14.9	1.64 V	197	16.72	42.38
2	5080.00	51.0 AV	54.0	-3.0	1.64 V	197	8.62	42.38
3	*5825.00	113.5 PK			1.06 V	8	69.89	43.61
4	*5825.00	106.6 AV			1.06 V	8	62.99	43.61
5	11650.00	60.0 PK	74.0	-14.0	1.26 V	6	9.58	50.42
6	11650.00	47.8 AV	54.0	-6.2	1.26 V	6	-2.62	50.42

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 limit value is defined as per 15.247.

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	*5745.00	104.4 PK			1.00 H	190	60.92	43.48
2	*5745.00	97.3 AV			1.00 H	190	53.82	43.48
3	11490.00	57.5 PK	74.0	-16.5	1.00 H	305	7.32	50.18
4	11490.00	45.1 AV	54.0	-8.9	1.00 H	305	-5.08	50.18
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	5080.00	58.7 PK	74.0	-15.3	1.63 V	164	16.32	42.38
2	5080.00	50.7 AV	54.0	-3.3	1.63 V	164	8.32	42.38
3	*5745.00	112.9 PK			1.02 V	10	69.42	43.48
4	*5745.00	105.8 AV			1.02 V	10	62.32	43.48
5	11490.00	60.7 PK	74.0	-13.3	1.19 V	200	10.52	50.18
6	11490.00	48.3 AV	54.0	-5.7	1.19 V	200	-1.88	50.18

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 limit value is defined as per 15.247.



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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	*5785.00	104.0 PK			1.00 H	157	60.48	43.52
2	*5785.00	97.0 AV			1.00 H	157	53.48	43.52
3	11570.00	57.6 PK	74.0	-16.4	1.03 H	314	7.42	50.18
4	11570.00	45.2 AV	54.0	-8.8	1.03 H	314	-4.98	50.18

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	5080.00	58.3 PK	74.0	-15.7	1.66 V	178	15.92	42.38
2	5080.00	50.1 AV	54.0	-3.9	1.66 V	178	7.72	42.38
3	*5785.00	113.3 PK			1.00 V	19	69.78	43.52
4	*5785.00	106.3 AV			1.00 V	19	62.78	43.52
5	11570.00	60.1 PK	74.0	-13.9	1.15 V	183	9.92	50.18
6	11570.00	48.0 AV	54.0	-6.0	1.15 V	183	-2.18	50.18

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 limit value is defined as per 15.247.



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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	*5825.00	103.4 PK			1.00 H	118	59.79	43.61
2	*5825.00	96.1 AV			1.00 H	118	52.49	43.61
3	11650.00	57.4 PK	74.0	-16.6	1.00 H	323	6.98	50.42
4	11650.00	45.2 AV	54.0	-8.8	1.00 H	323	-5.22	50.42

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	5080.00	58.3 PK	74.0	-15.7	1.60 V	150	15.92	42.38
2	5080.00	50.1 AV	54.0	-3.9	1.60 V	150	7.72	42.38
3	*5825.00	113.1 PK			1.00 V	25	69.49	43.61
4	*5825.00	106.5 AV			1.00 V	25	62.89	43.61
5	11650.00	59.3 PK	74.0	-14.7	1.21 V	197	8.88	50.42
6	11650.00	47.6 AV	54.0	-6.4	1.21 V	197	-2.82	50.42

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 limit value is defined as per 15.247.



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	101.1 PK			1.00 H	210	57.62	43.48
2	*5755.00	94.2 AV			1.00 H	210	50.72	43.48
3	11510.00	57.5 PK	74.0	-16.5	1.00 H	323	7.33	50.17
4	11510.00	45.6 AV	54.0	-8.4	1.00 H	323	-4.57	50.17

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	5080.00	58.5 PK	74.0	-15.5	1.52 V	153	16.12	42.38
2	5080.00	50.2 AV	54.0	-3.8	1.52 V	153	7.82	42.38
3	*5755.00	109.8 PK			1.00 V	25	66.32	43.48
4	*5755.00	102.9 AV			1.00 V	25	59.42	43.48
5	11510.00	59.0 PK	74.0	-15.0	1.26 V	198	8.83	50.17
6	11510.00	47.2 AV	54.0	-6.8	1.26 V	198	-2.97	50.17

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 limit value is defined as per 15.247.



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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	100.3 PK			1.00 H	201	56.77	43.53
2	*5795.00	93.6 AV			1.00 H	201	50.07	43.53
3	11590.00	57.0 PK	74.0	-17.0	1.00 H	311	6.81	50.19
4	11590.00	45.2 AV	54.0	-8.8	1.00 H	311	-4.99	50.19

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	5080.00	58.4 PK	74.0	-15.6	1.51 V	159	16.02	42.38
2	5080.00	50.4 AV	54.0	-3.6	1.51 V	159	8.02	42.38
3	*5795.00	109.2 PK			1.00 V	23	65.67	43.53
4	*5795.00	102.3 AV			1.00 V	23	58.77	43.53
5	11590.00	58.2 PK	74.0	-15.8	1.20 V	186	8.01	50.19
6	11590.00	46.7 AV	54.0	-7.3	1.20 V	186	-3.49	50.19

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.

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 : Mar. 13, 2013

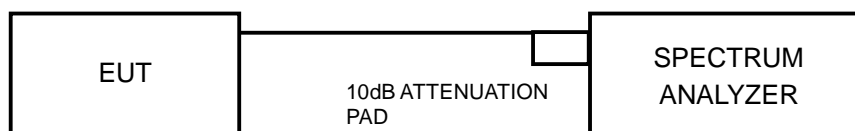
5.3.3 TEST PROCEDURE

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.



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5.3.7 TEST RESULTS

802.11a

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	16.62	16.62	0.5	PASS
157	5785	16.64	16.62	0.5	PASS
165	5825	16.55	16.56	0.5	PASS

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	17.88	17.88	0.5	PASS
157	5785	17.88	17.88	0.5	PASS
165	5825	17.87	17.82	0.5	PASS

802.11n (HT40)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
151	5755	36.58	36.67	0.5	PASS
159	5795	36.60	36.69	0.5	PASS



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5.4 OCCUPIED BANDWIDTH MEASUREMENT

5.4.1 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. 13, 2013

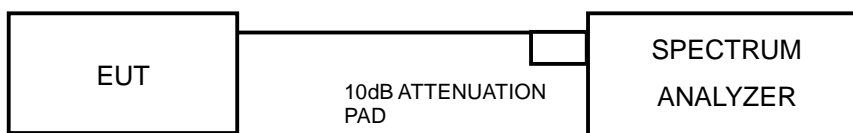
5.4.2 TEST PROCEDURE

- 1) Set RBW \geq 1% of the emission bandwidth.
- 2) Set the VBW \geq 3 x RBW.
- 3) Detector = Peak.
- 4) Trace mode = max hold.
- 5) Record the 99% emission bandwidth.

5.4.3 DEVIATION FROM TEST STANDARD

No deviation

5.4.4 TEST SETUP



5.4.5 EUT OPERATING CONDITIONS

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

5.4.6 TEST RESULTS

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		CHAIN 0	CHAIN 1
149	5745	17.28	17.52
157	5785	17.16	17.28
165	5825	17.04	17.88

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		CHAIN 0	CHAIN 1
149	5745	18.12	18.24
157	5785	18.36	18.48
165	5825	18.24	18.72

802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		CHAIN 0	CHAIN 1
151	5755	37.20	37.80
159	5795	38.00	38.00

5.5 CONDUCTED OUTPUT POWER MEASUREMENT

5.5.1 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 \geq 40 MHz for any NANT;

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

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

5.5.2 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. 13, 2013

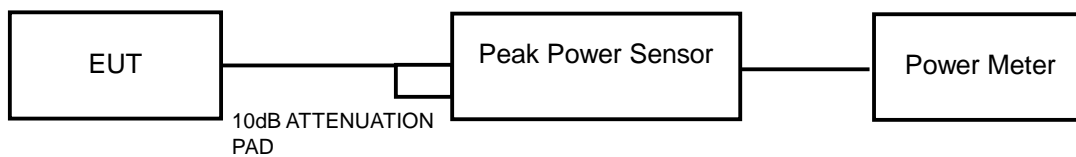
5.5.3 TEST PROCEDURES

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

5.5.4 DEVIATION FROM TEST STANDARD

No deviation.

5.5.5 TEST SETUP



5.5.6 EUT OPERATING CONDITIONS

Same as Item 5.3.6



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5.5.7 TEST RESULTS

802.11a

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	21.60	21.70	292.455	24.66	30	PASS
157	5785	21.40	21.30	272.934	24.36	30	PASS
165	5825	21.30	21.51	276.475	24.42	30	PASS

802.11n (HT20)

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	21.40	21.60	282.582	24.51	30	PASS
157	5785	21.60	21.51	286.123	24.57	30	PASS
165	5825	21.50	21.41	279.611	24.47	30	PASS

802.11n (HT40)

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
151	5755	21.20	21.60	276.370	24.41	30	PASS
159	5795	21.30	21.50	276.150	24.41	30	PASS



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5.6 AVERAGE OUTPUT POWER

5.6.1 FOR REFERENCE.

5.6.2 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

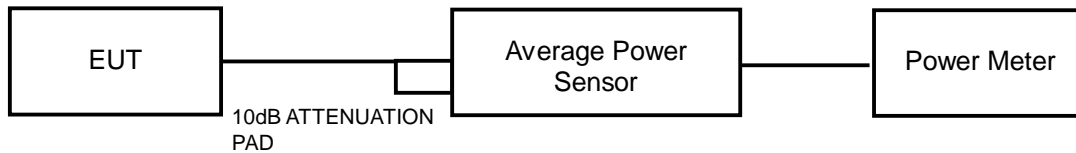
Note:

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

5.6.3 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.

5.6.4 TEST SETUP



5.6.5 EUT OPERATING CONDITIONS

Same as Item 4.3.6



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5.6.6 TEST RESULTS

802.11a

CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
149	5745	15.46	14.81	65.425	18.16
157	5785	14.31	14.68	56.353	17.51
165	5825	14.28	14.65	55.966	17.48

802.11n (HT20)

CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
149	5745	14.85	14.81	60.818	17.84
157	5785	14.89	14.78	60.893	17.85
165	5825	14.86	14.55	59.130	17.72

802.11n (HT40)

CHAN.	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
151	5755	14.67	14.51	57.558	17.60
159	5795	14.72	14.67	58.957	17.71

5.7 POWER SPECTRAL DENSITY MEASUREMENT

5.7.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

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 : Mar. 13, 2013

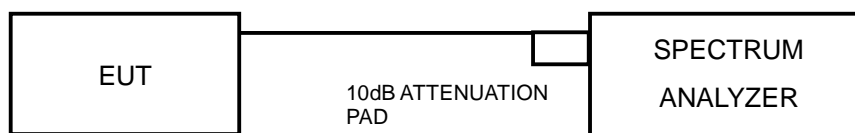
5.7.3 TEST PROCEDURE

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.

5.7.4 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

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	-8.73	3.01	-5.72	8	PASS
	157	5785	-11.19	3.01	-8.18	8	PASS
	165	5825	-11.63	3.01	-8.62	8	PASS
1	149	5745	-8.41	3.01	-5.40	8	PASS
	157	5785	-8.58	3.01	-5.57	8	PASS
	165	5825	-7.75	3.01	-4.74	8	PASS

NOTE: Directional gain = $2\text{dBi} + 10\log(2) = 5.01\text{dBi} < 6\text{dBi}$, 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	149	5745	-10.56	3.01	-7.55	8	PASS
	157	5785	-9.88	3.01	-6.87	8	PASS
	165	5825	-11.23	3.01	-8.22	8	PASS
1	149	5745	-10.08	3.01	-7.07	8	PASS
	157	5785	-9.92	3.01	-6.91	8	PASS
	165	5825	-8.85	3.01	-5.84	8	PASS

NOTE: Directional gain = $2\text{dBi} + 10\log(2) = 5.01\text{dBi} < 6\text{dBi}$, so the power density limit shall not be reduced.

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	-13.65	3.01	-10.64	8	PASS
	159	5795	-13.65	3.01	-10.64	8	PASS
1	151	5755	-13.98	3.01	-10.97	8	PASS
	159	5795	-12.87	3.01	-9.86	8	PASS

NOTE: Directional gain = $2\text{dBi} + 10\log(2) = 5.01\text{dBi} < 6\text{dBi}$, so the power density limit shall not be reduced.

5.8 CONDUCTED OUT-BAND EMISSION MEASUREMENT

5.8.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

5.8.2 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. 13, 2013

5.8.3 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.

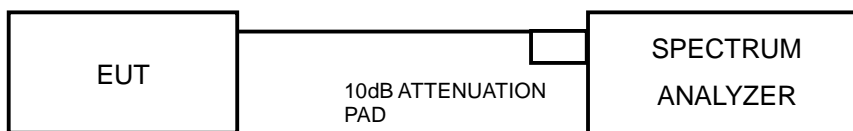
Measurement Procedure –Unwanted Emission Level

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.

5.8.4 DEVIATION FROM TEST STANDARD

No deviation

5.8.5 TEST SETUP



5.8.6 EUT OPERATING CONDITION

Same as Item 4.3.6

5.8.7 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.

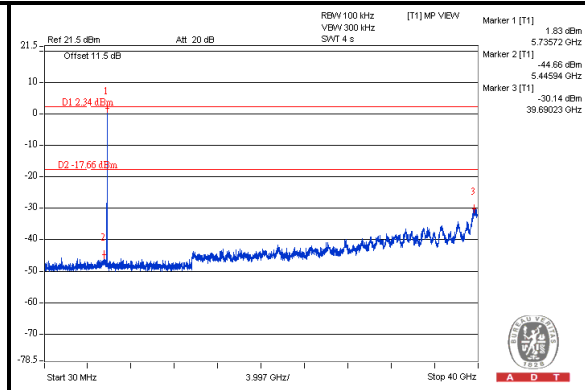
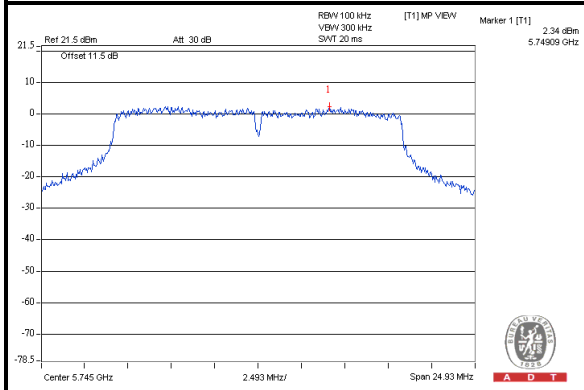


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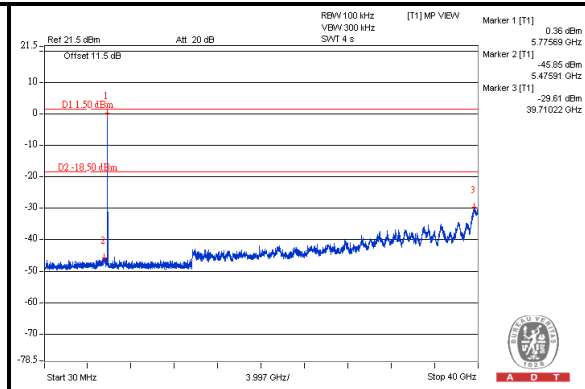
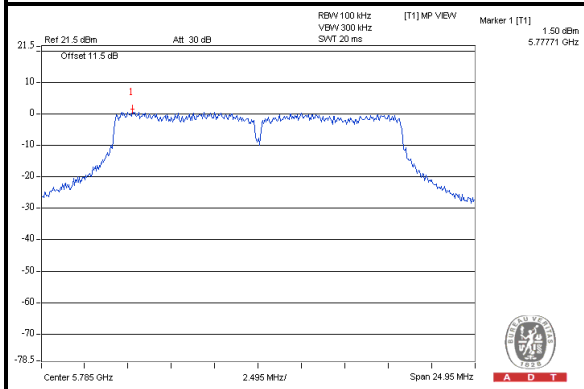
802.11a

For Chain 0

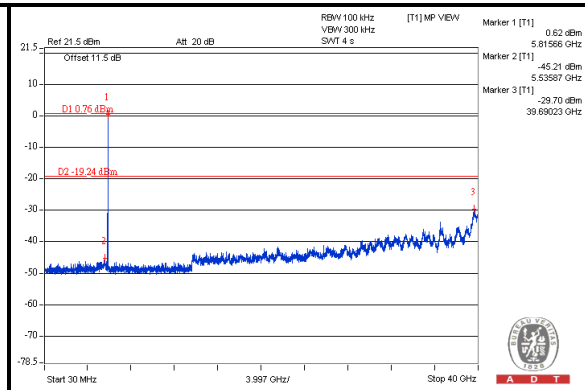
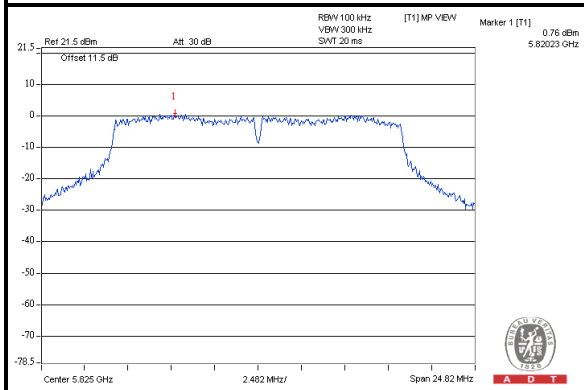
CH 149



CH 157



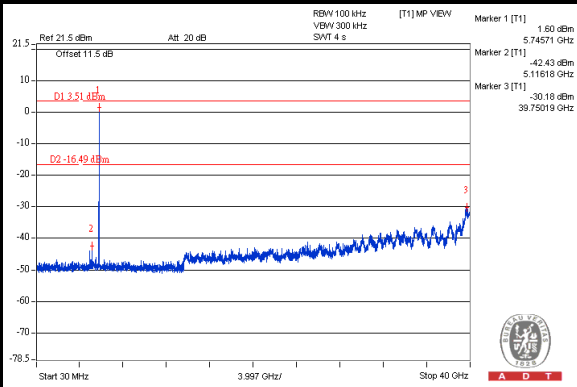
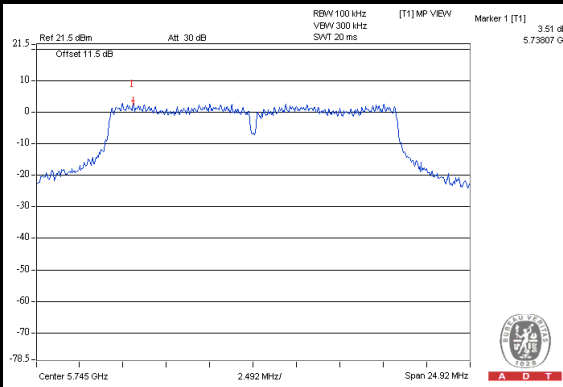
CH 165



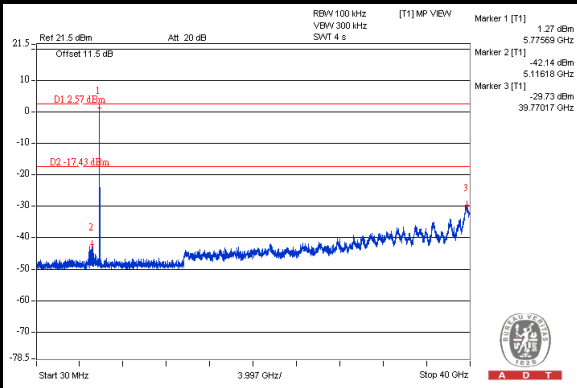
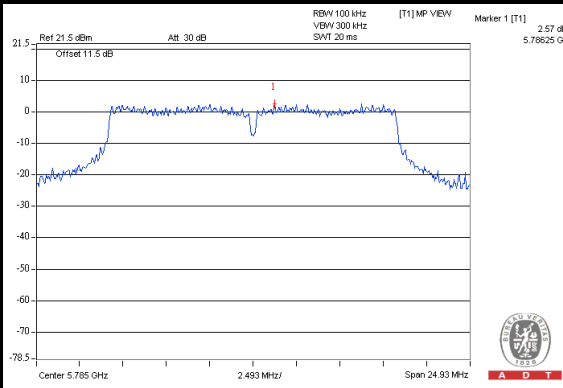


A D T

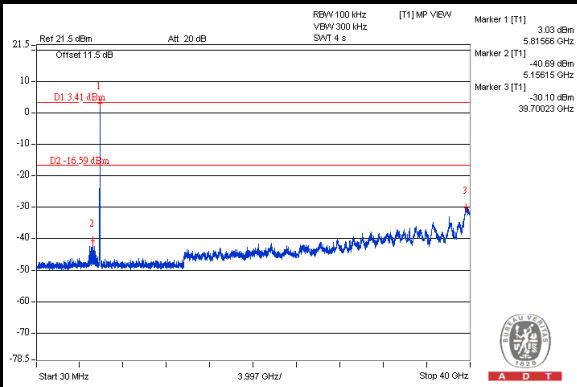
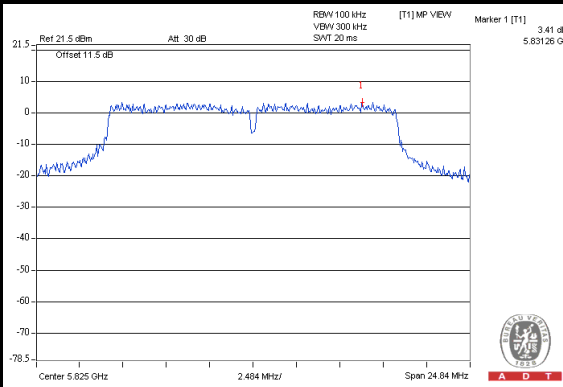
For Chain 1 CH 149



CH 157



CH 165

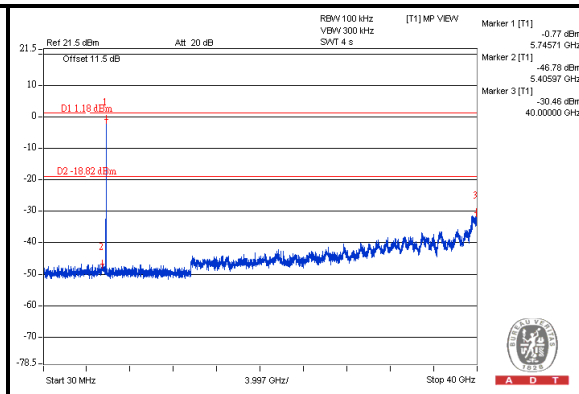
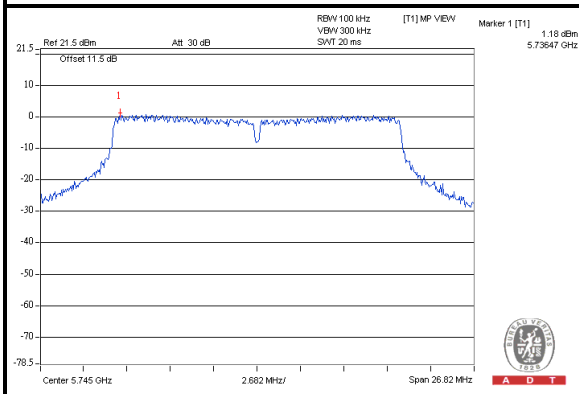




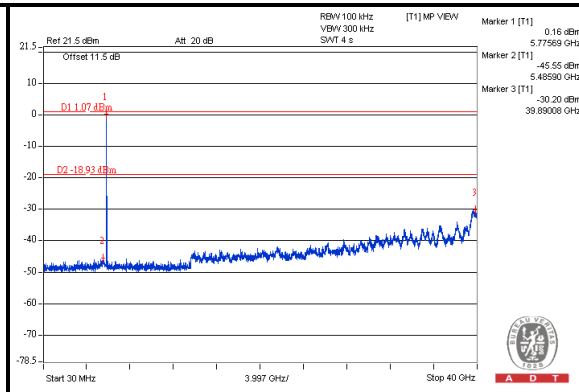
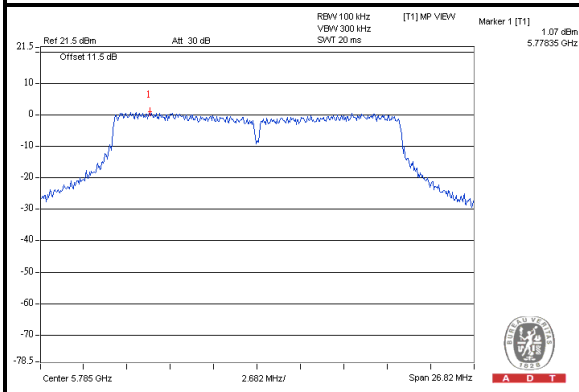
A D T

802.11n (HT20)

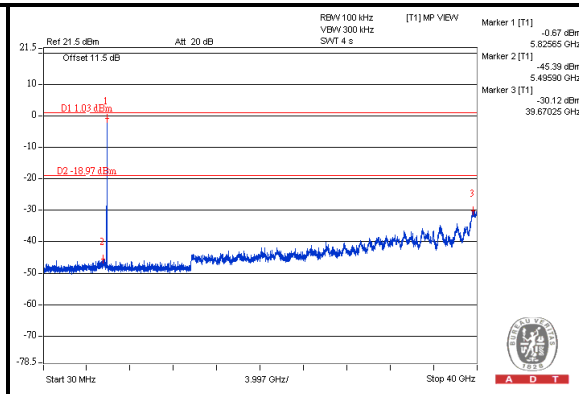
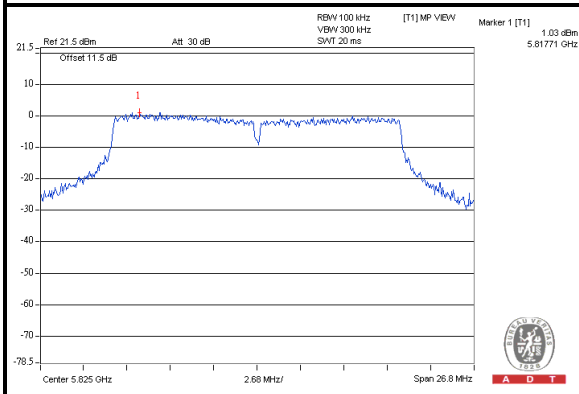
For Chain 0 CH 149



CH 157



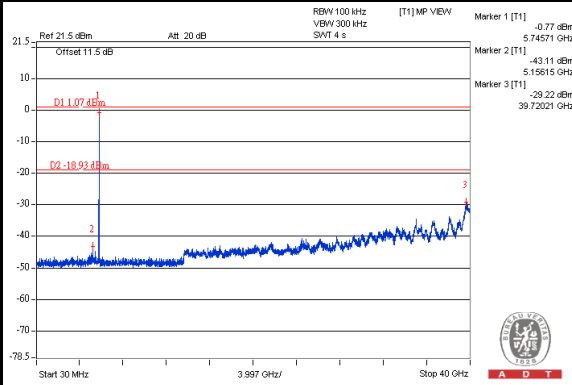
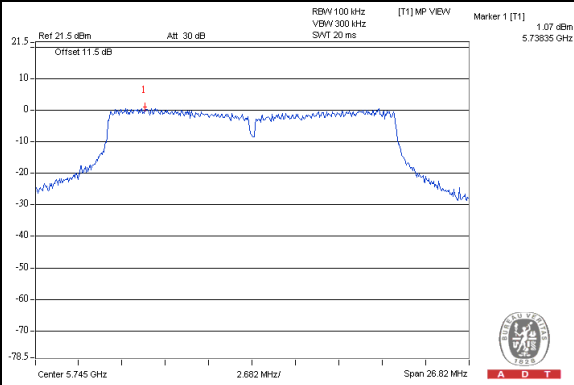
CH 165



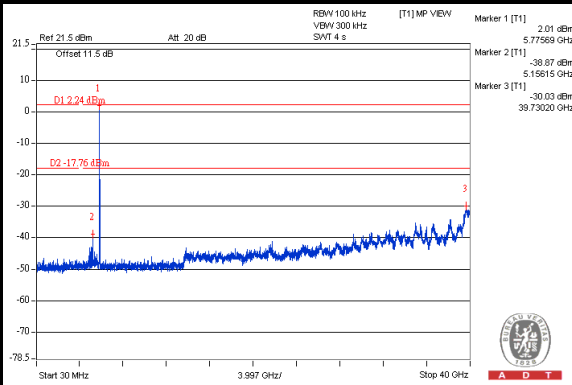
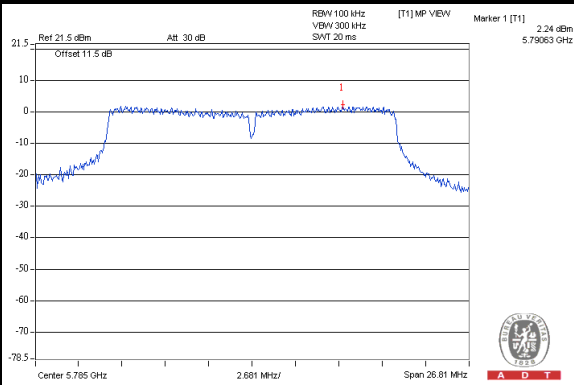


A D T

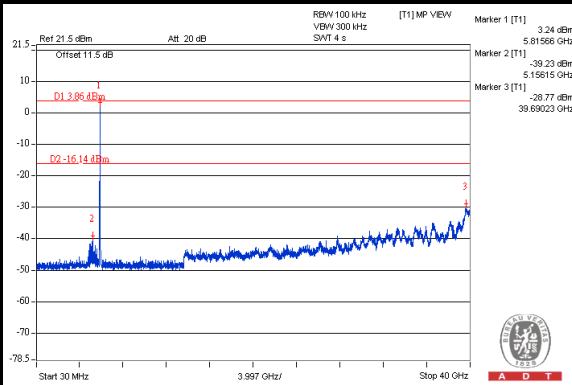
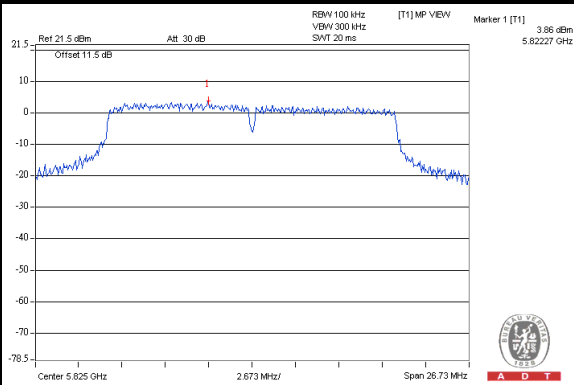
For Chain 1 CH 149



CH 157



CH 165

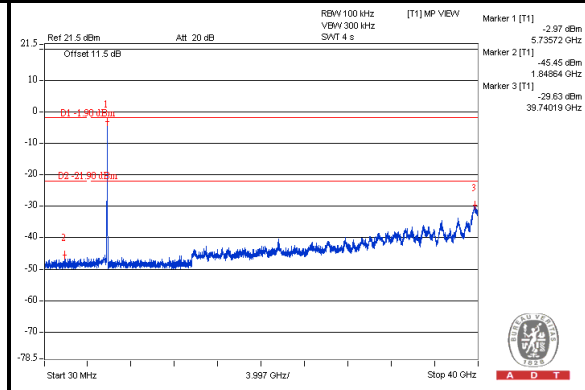
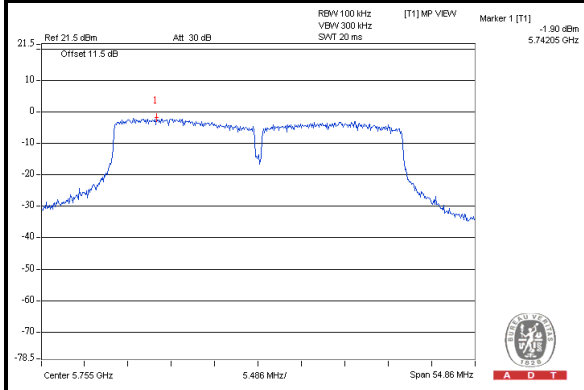




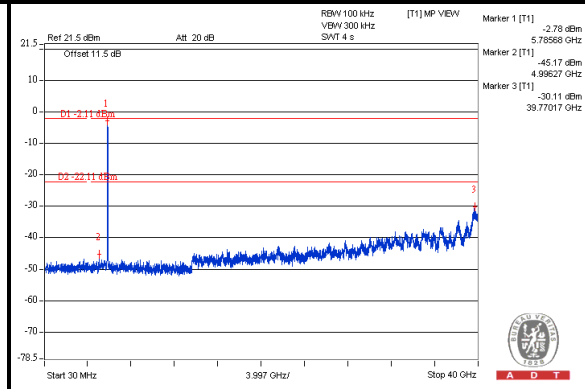
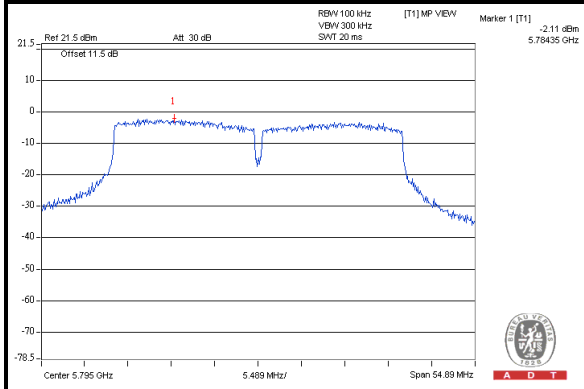
A D T

802.11n (HT40)

For Chain 0 CH 151



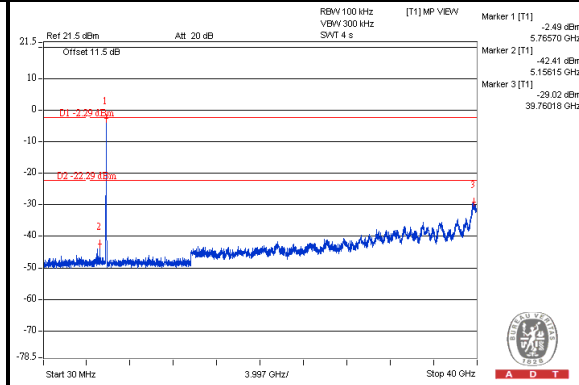
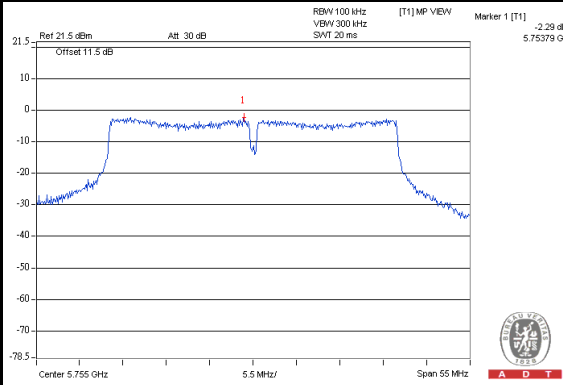
CH 159



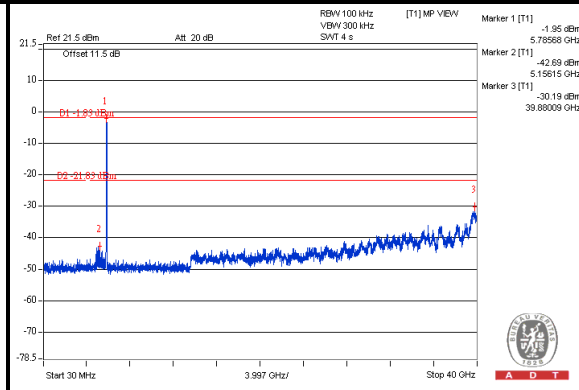
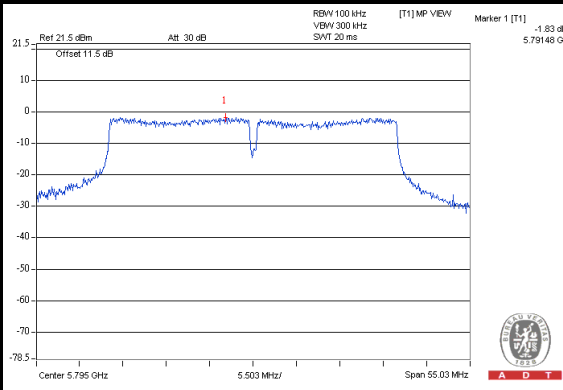


A D T

For Chain 1 CH 151



CH 159





A D T

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:

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Fax: 886-2-26052943

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Web Site: www.bureauveritas-adt.com

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



A D T

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.

--- END ---