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FCC TEST REPORT (15.247)

REPORT NO.: RF141003E10

MODEL NO.: EX6150

FCC ID: PY314300283

RECEIVED: Oct. 03, 2014

TESTED: Oct. 09 to Dec. 09, 2014

ISSUED: Jan. 12, 2015

APPLICANT: NETGEAR, Inc.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF141003E10	Original release	Jan. 12, 2015



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1. CERTIFICATION

PRODUCT: AC1200 WiFi Range Extender
BRAND NAME: NETGEAR
MODEL NO.: EX6150
TEST SAMPLE: ENGINEERING SAMPLE
APPLICANT: NETGEAR, Inc.
TESTED: Oct. 09 to Dec. 09, 2014
STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**
ANSI C63.10-2009

The above equipment (Model: EX6150) 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:** Jan. 12, 2015
(Lori Chung, Specialist)

Approved by :  , **Date:** Jan. 12, 2015
(May Chen, Manager)



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2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 2.4GHz, 2400~2483.5MHz Band

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -15.29dB at 0.21641MHz.
15.205 15.209 15.247(d)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 2390.00MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted Output power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is i-pex not a standard connector.

For 5GHz, 5725~5850MHz Band

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -8.85dB at 0.22422MHz.
15.205 15.209 15.247(d)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -3.9dB at 40.767MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted Output Power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is i-pex not a standard connector.

NOTE: The EUT was operating in 2.400 ~ 2.4835GHz, 5.15~5.25GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 2.400 ~ 2.4835GHz and 5.725~5.850GHz. For the 5.15~5.25GHz RF parameters was recorded in another test report.



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2.1 MEASUREMENT UNCERTAINTY

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

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

Measurement	Value
Conducted emissions	2.86 dB
Radiated emissions (30MHz-1GHz)	5.37 dB
Radiated emissions (1GHz -6GHz)	3.65 dB
Radiated emissions (6GHz -18GHz)	3.88 dB
Radiated emissions (18GHz -40GHz)	4.11 dB



3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	AC1200 WiFi Range Extender
MODEL NO.	EX6150
POWER SUPPLY	AC 100-240V, 0.2A, 50-60Hz
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode
MODULATION TECHNOLOGY	DSSS,OFDM
TRANSFER RATE	802.11b: up to 11Mbps 802.11a / g: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
OPERATING FREQUENCY	For 15.407 5GHz: 5.18 ~ 5.24GHz
	For 15.247 2.4GHz: 2.412 ~ 2.462GHz 5GHz: 5.745 ~ 5.825GHz
NUMBER OF CHANNEL	For 15.407 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)
	For 15.247 2.4GHz: 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40) 5GHz: 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)

MAXIMUM OUTPUT POWER	For 15.407 802.11a: 303.086mW 802.11ac (VHT20): 299.592mW 802.11ac (VHT40): 266.722mW 802.11ac (VHT80): 58.423mW	
	For 15.247 (2.4GHz) 802.11b: 212.595mW 802.11g: 616.801mW 802.11n (HT20): 471.291mW 802.11n (HT40): 122.807mW	
	For 15.247 (5GHz) 802.11a: 333.071mW 802.11ac (VHT20): 329.636mW 802.11ac (VHT40): 329.259mW 802.11ac (VHT80): 270.487mW	
	ANTENNA TYPE	Refer to note as below
	DATA CABLE	NA
I/O PORTS	Refer to user's manual	
ASSOCIATED DEVICES	NA	

Note:

1. 2.4GHz and 5GHz technology can transmit at same time.
2. The antennas provided to the EUT, please refer to the following table:

PCB Chain No.	Brand	Model	Antenna Gain(dBi) < including cable loss>	Frequency range (MHz ~ MHz)	Antenna Type	Connector Type	Cable Length (mm)
Chain 0	NETGEAR	NA	3.1	2400~2500	Dipole	i-pec	50
			2.7	5150~5250			
			2.9	5250~5350			
			2.2	5470~5725			
			2.6	5725~5850			
Chain 1	NETGEAR	NA	3.1	2400~2500	Dipole	i-pec	50
			2.7	5150~5250			
			2.9	5250~5350			
			2.2	5470~5725			
			2.6	5725~5850			

3. The EUT incorporates a MIMO function.

2.4GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11b	1 ~ 11Mbps	2TX	2RX
802.11g	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
5GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11a	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11ac (VHT20)	MCS 0~8, Nss=1	2TX	2RX
	MCS 0~8, Nss=2	2TX	2RX
802.11ac (VHT40)	MCS 0~9, Nss=1	2TX	2RX
	MCS 0~9, Nss=2	2TX	2RX
802.11ac (VHT80)	MCS 0~9, Nss=1	2TX	2RX
	MCS 0~9, Nss=2	2TX	2RX

Note: The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

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



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), 802.11ac (VHT20):

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), 802.11ac (VHT40):

CHANNEL	FREQUENCY
151	5755 MHz
159	5795 MHz

1 channel is provided for 802.11ac (VHT80):

CHANNEL	FREQUENCY
155	5775 MHz



3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

For 2.4GHz:

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

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

Note:

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

POWER LINE CONDUCTED EMISSION TEST:

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

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

RADIATED EMISSION TEST (BELOW 1 GHz):

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

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



RADIATED EMISSION TEST (ABOVE 1 GHz):

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

ANTENNA PORT CONDUCTED MEASUREMENT:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

CONDUCTED OUT-BAND EMISSION MEASUREMENT:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5



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TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
PLC	25deg. C, 70,%RH	120Vac, 60Hz	Mike Hsieh
RE<1G	22deg. C, 69%RH	120Vac, 60Hz	Tim Ho
RE≥1G	22deg. C, 67%RH	120Vac, 60Hz	Tim Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen
OB	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen



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For 5GHz:

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

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

Note:

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

POWER LINE CONDUCTED EMISSION TEST:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	149 to 165	157	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)
802.11a	149 to 165	157	OFDM	BPSK	6



RADIATED EMISSION TEST (ABOVE 1 GHz):

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)	151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)	155	155	OFDM	BPSK	29.3

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)
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)	151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)	155	155	OFDM	BPSK	29.3

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)
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)	151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)	155	155	OFDM	BPSK	29.3



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TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
PLC	25deg. C, 70,%RH	120Vac, 60Hz	Mike Hsieh
RE<1G	22deg. C, 69%RH	120Vac, 60Hz	Tim Ho
RE≥1G	23deg. C, 68%RH	120Vac, 60Hz	Tim Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen
OB	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen



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3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)

558074 D01 DTS Meas Guidance v03r02

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2009

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

3.4 DUTY CYCLE OF TEST SIGNAL

Duty cycle of test signal is $\geq 98\%$, duty factor is not required.

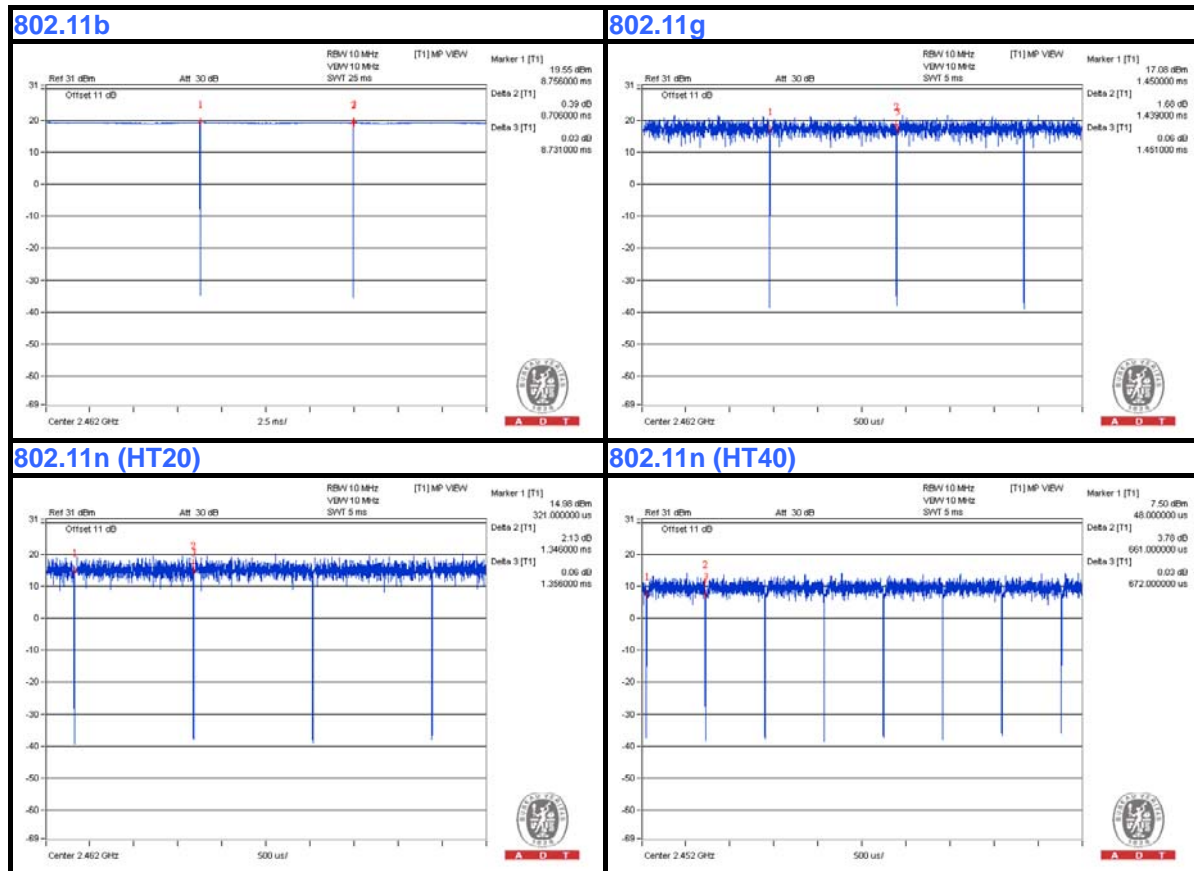
For 2.4GHz

802.11b: Duty cycle = 8.706 ms/8.731 ms = 0.997

802.11g: Duty cycle = 1.439 ms/1.451 ms = 0.992

802.11n (HT20): Duty cycle = 1.346 ms/1.356 ms = 0.993

802.11n (HT40): Duty cycle = 0.661 ms/0.672 ms = 0.984



If duty cycle of test signal is $\geq 98\%$, duty factor is not required.

If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

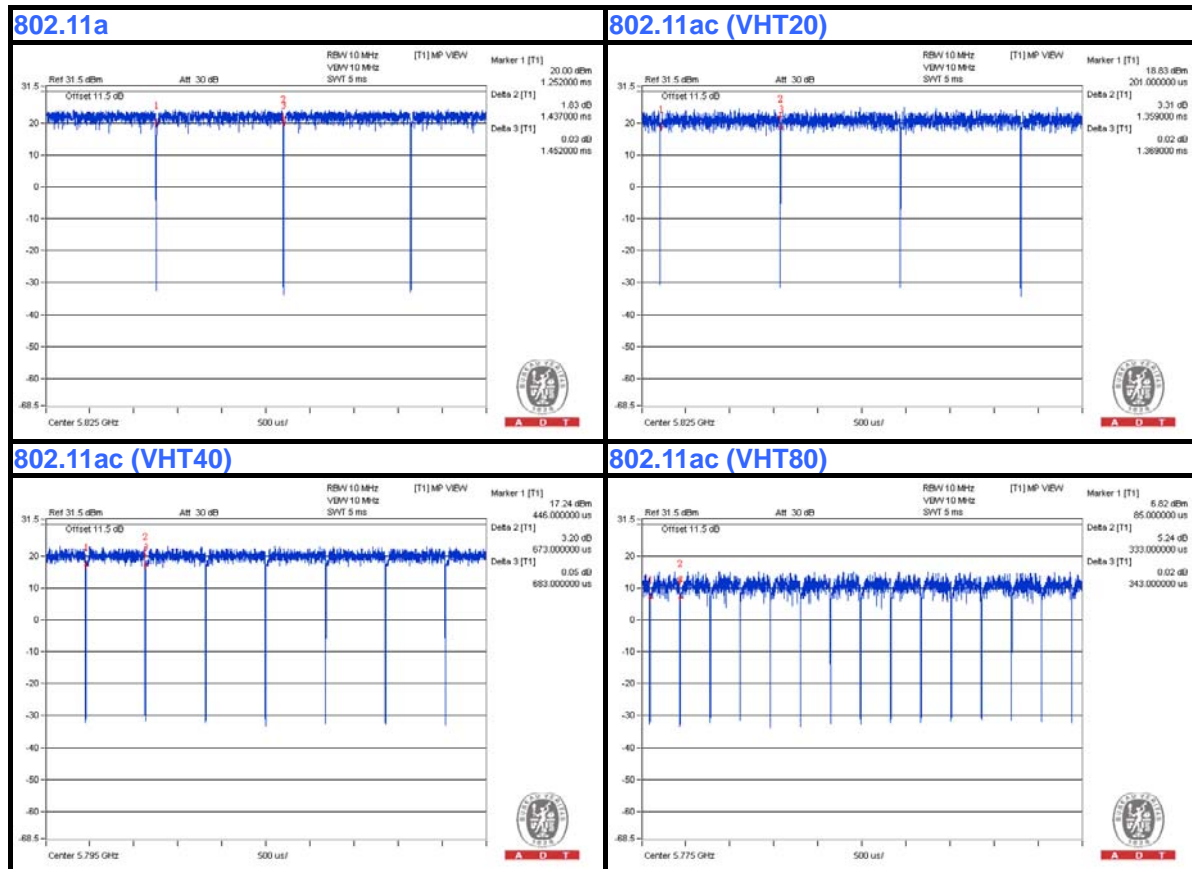
For 5GHz

802.11a: Duty cycle = 1.437 ms/1.452 ms = 0.99

802.11ac (VHT20): Duty cycle = 1.359 ms/1.369 ms = 0.993

802.11ac (VHT40): Duty cycle = 0.673 ms/0.683 ms = 0.985

802.11ac (VHT80): Duty cycle = 0.333 ms/0.343 ms = 0.971, Duty factor = $10 * \log(1/0.971) = 0.13$



3.5 DESCRIPTION OF SUPPORT UNITS

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

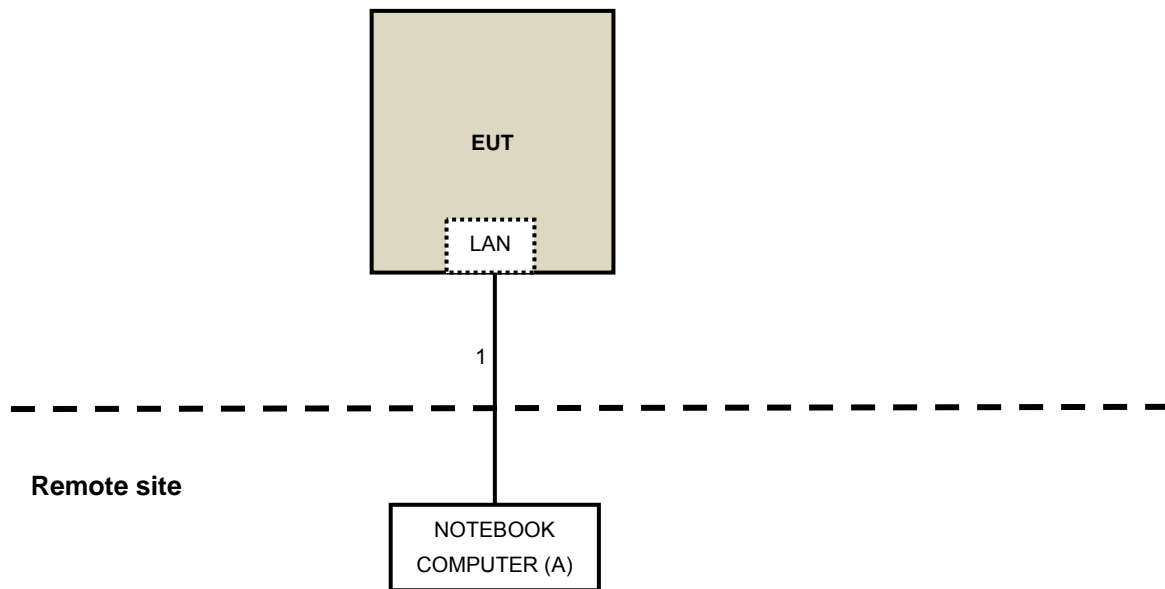
No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	NOTEBOOK COMPUTER	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab

NOTE:

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

No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1	RJ-45	1	10	No	0	Provided by Lab

3.6 CONFIGURATION OF SYSTEM UNDER TEST





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

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

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS 30	100375	Apr. 29, 2014	Apr. 28, 2015
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 15, 2014	Sep. 14, 2015
Line-Impedance Stabilization Network (for Peripheral) ROHDE & SCHWARZ	ENV216	100071	Nov. 10, 2014	Nov. 09, 2015
RF Cable (JYEBAO)	5DFB	COCCAB-001	Mar. 10, 2014	Mar. 09, 2015
50 ohms Terminator	N/A	EMC-03	Sep. 22, 2014	Sep. 21, 2015
50 ohms Terminator	N/A	EMC-02	Sep. 30, 2014	Sep. 29, 2015
Software ADT	BV ADT_Cond_V7.3.7. 3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3. The VCCI Con C Registration No. is C-3611.
4. Tested Date: Nov. 17, 2014

4.1.3 TEST PROCEDURES

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

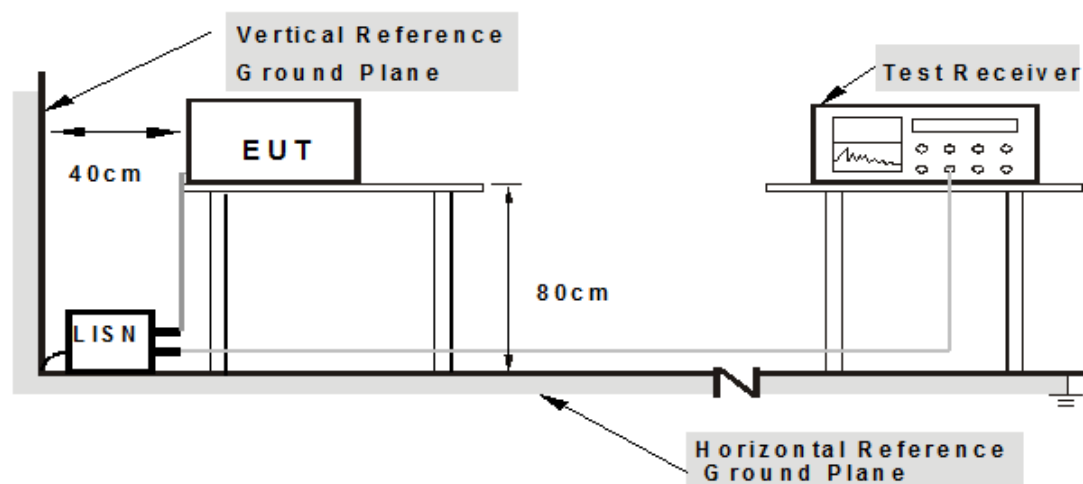
NOTE:

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

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

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



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4.1.6 EUT OPERATING CONDITIONS

1. Placed the EUT on testing table.
2. Prepared computer system (support unit A) to act as communication partner.
3. The communication partner ran test program “(MT76xxE_AP.exe)” to enable EUT under transmission/receiving condition continuously.

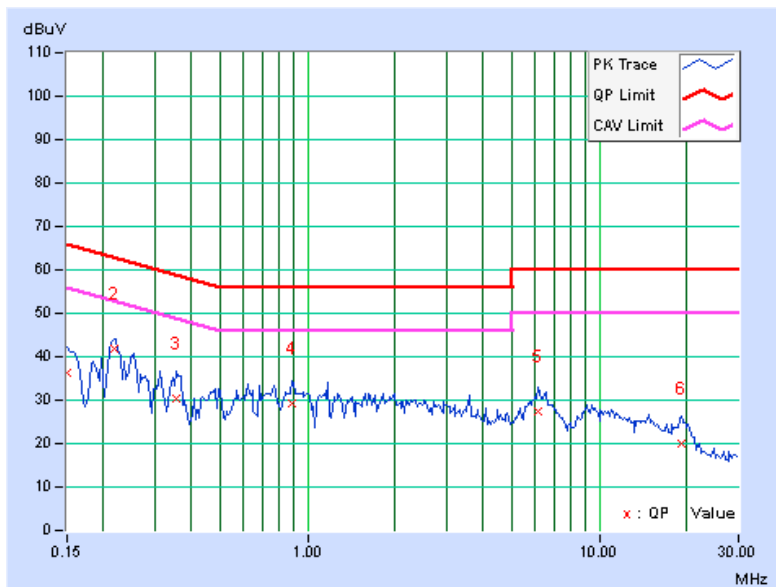
4.1.7 TEST RESULTS

PHASE	Line (L)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor (dB)	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.07	36.09	25.65	36.16	25.72	66.00	56.00	-29.84	-30.28
2	0.21641	0.07	41.64	37.59	41.71	37.66	62.96	52.96	-21.24	-15.29
3	0.35313	0.09	30.12	20.50	30.21	20.59	58.89	48.89	-28.68	-28.30
4	0.88047	0.12	29.30	21.82	29.42	21.94	56.00	46.00	-26.58	-24.06
5	6.20703	0.32	26.93	21.89	27.25	22.21	60.00	50.00	-32.75	-27.79
6	19.10938	0.68	19.40	14.14	20.08	14.82	60.00	50.00	-39.92	-35.18

REMARKS:

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

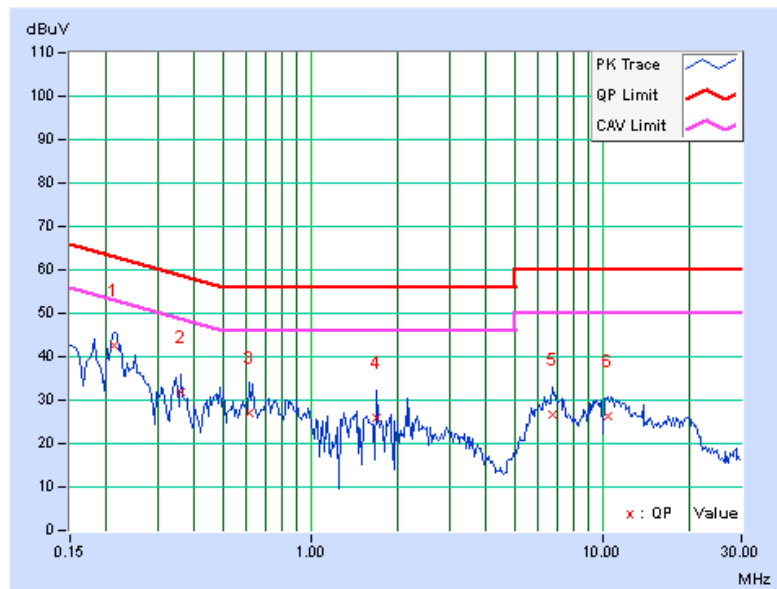


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
--------------	-------------	--------------------------	--------------------------------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.21250	0.06	42.55	32.26	42.61	32.32	63.11	53.11	-20.50	-20.79
2	0.36094	0.08	31.86	15.57	31.94	15.65	58.71	48.71	-26.76	-33.05
3	0.61875	0.10	26.84	20.59	26.94	20.69	56.00	46.00	-29.06	-25.31
4	1.67969	0.16	25.59	15.67	25.75	15.83	56.00	46.00	-30.25	-30.17
5	6.75781	0.35	26.37	20.67	26.72	21.02	60.00	50.00	-33.28	-28.98
6	10.46094	0.47	25.65	20.13	26.12	20.60	60.00	50.00	-33.88	-29.40

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 BANDEGE MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION AND BANDEGE 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 under any condition of modulation.



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4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY51210105	July 21, 2014	July 20, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-03	Nov. 13, 2013	Nov. 12, 2014
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Feb. 26, 2014	Feb. 25, 2015
RF Cable	NA	CHGCAB_001	Oct. 04, 2014	Oct. 03, 2015
Horn_Antenna AISl	AIH.8018	0000320091110	Aug. 27, 2014	Aug. 26, 2015
Pre-Amplifier Agilent	8449B	3008A02578	June 24, 2014	June 23, 2015
RF Cable	NA	131205 131214 SNMY23684/4	Jan. 17, 2014	Jan. 16, 2015
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 13, 2013	Nov. 12, 2014
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Aug. 26, 2014	Aug. 25, 2015
RF Cable	NA	RF104-121 RF104-204	Dec. 12, 2013	Dec. 11, 2014
Antenna Tower & Turn Table CT	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
- 3 The test was performed in 966 Chamber No. G.
4. The FCC Site Registration No. is 966073.
- 5 The VCCI Site Registration No. is G-137.
- 6 The CANADA Site Registration No. is IC 7450H-2.
- 7 Tested Date: Oct. 09 to 31, 2014



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4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

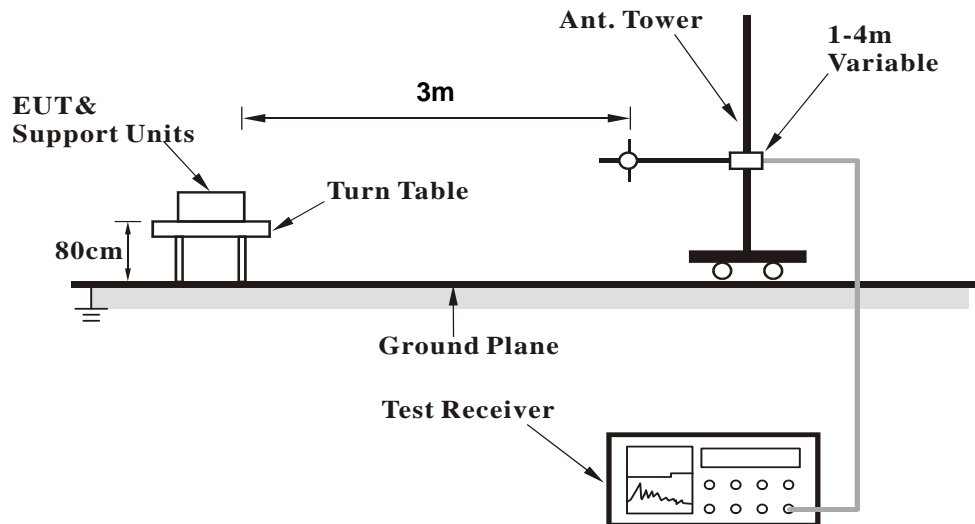
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.2.4 DEVIATION FROM TEST STANDARD

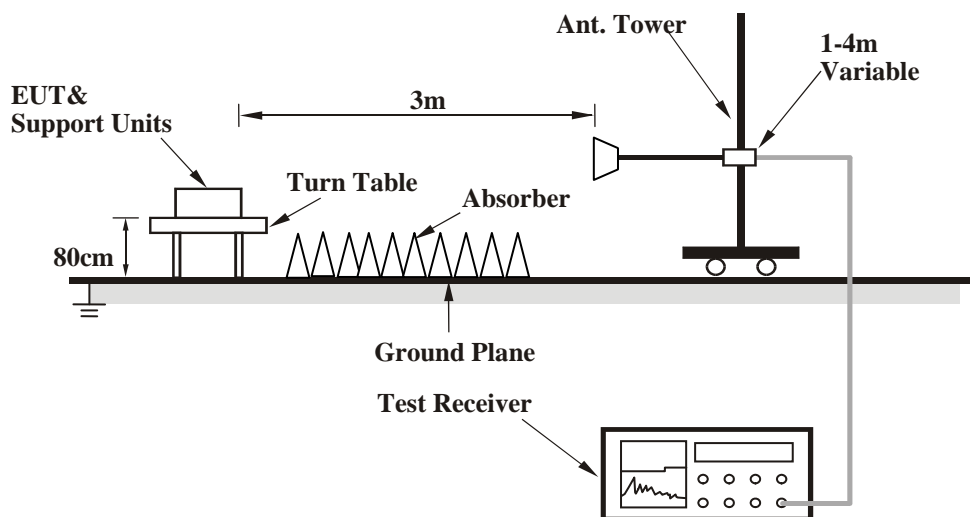
No deviation

4.2.5 TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6



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4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	82.33	27.6 QP	40.0	-12.4	2.00 H	45	46.39	-18.76
2	144.95	27.9 QP	43.5	-15.6	2.00 H	259	41.23	-13.33
3	219.20	27.7 QP	46.0	-18.3	1.50 H	268	43.83	-16.14
4	374.98	26.7 QP	46.0	-19.3	1.00 H	209	36.95	-10.24
5	500.01	32.1 QP	46.0	-13.9	2.00 H	225	39.42	-7.36
6	799.99	26.8 QP	46.0	-19.2	1.00 H	146	28.23	-1.41

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	40.77	36.2 QP	40.0	-3.8	1.00 V	201	49.92	-13.73
2	70.69	34.0 QP	40.0	-6.0	1.00 V	211	49.71	-15.68
3	82.48	30.4 QP	40.0	-9.6	1.50 V	116	49.14	-18.78
4	375.03	30.9 QP	46.0	-15.1	1.00 V	169	41.14	-10.23
5	500.01	34.4 QP	46.0	-11.6	1.00 V	261	41.74	-7.36
6	924.00	31.1 QP	46.0	-14.9	2.00 V	219	30.44	0.65

REMARKS:

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



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ABOVE 1GHz DATA

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.6 PK	74.0	-17.4	1.52 H	147	62.20	-5.60
2	2390.00	47.3 AV	54.0	-6.7	1.52 H	147	52.90	-5.60
3	*2412.00	104.6 PK			1.52 H	147	110.13	-5.53
4	*2412.00	102.4 AV			1.52 H	147	107.93	-5.53
5	4824.00	49.3 PK	74.0	-24.7	1.04 H	75	45.44	3.86
6	4824.00	45.4 AV	54.0	-8.6	1.04 H	75	41.54	3.86

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	67.4 PK	74.0	-6.6	1.08 V	264	73.00	-5.60
2	2390.00	53.7 AV	54.0	-0.3	1.08 V	264	59.30	-5.60
3	*2412.00	113.4 PK			1.08 V	264	118.93	-5.53
4	*2412.00	111.1 AV			1.08 V	264	116.63	-5.53
5	4824.00	54.6 PK	74.0	-19.4	1.16 V	165	50.74	3.86
6	4824.00	51.6 AV	54.0	-2.4	1.16 V	165	47.74	3.86

REMARKS:

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



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	53.8 PK	74.0	-20.2	1.46 H	131	56.27	-2.47
2	2390.00	42.1 AV	54.0	-11.9	1.46 H	131	44.57	-2.47
3	*2437.00	107.8 PK			1.46 H	131	110.05	-2.25
4	*2437.00	105.4 AV			1.46 H	131	107.65	-2.25
5	2483.50	50.7 PK	74.0	-23.3	1.46 H	131	52.73	-2.03
6	2483.50	40.3 AV	54.0	-13.7	1.46 H	131	42.33	-2.03
7	4874.00	55.5 PK	74.0	-18.5	1.09 H	105	49.60	5.90
8	4874.00	51.9 AV	54.0	-2.1	1.09 H	105	46.00	5.90
9	7311.00	55.9 PK	74.0	-18.1	1.05 H	204	42.73	13.17
10	7311.00	48.3 AV	54.0	-5.7	1.05 H	204	35.13	13.17

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	2390.00	58.7 PK	74.0	-15.3	1.11 V	261	61.44	-2.74
2	2390.00	49.9 AV	54.0	-4.1	1.11 V	261	52.64	-2.74
3	*2437.00	117.4 PK			1.11 V	261	119.93	-2.53
4	*2437.00	115.2 AV			1.11 V	261	117.73	-2.53
5	2483.50	55.6 PK	74.0	-18.4	1.11 V	261	57.92	-2.32
6	2483.50	47.8 AV	54.0	-6.2	1.11 V	261	50.12	-2.32
7	4874.00	56.5 PK	74.0	-17.5	1.00 V	192	51.01	5.49
8	4874.00	53.8 AV	54.0	-0.2	1.00 V	192	48.31	5.49
9	7311.00	58.6 PK	74.0	-15.4	1.03 V	217	45.90	12.70
10	7311.00	52.1 AV	54.0	-1.9	1.03 V	217	39.40	12.70

REMARKS:

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



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.1 PK			1.50 H	145	106.24	-2.14
2	*2462.00	101.6 AV			1.50 H	145	103.74	-2.14
3	2483.50	55.4 PK	74.0	-18.6	1.50 H	145	57.43	-2.03
4	2483.50	45.2 AV	54.0	-8.8	1.50 H	145	47.23	-2.03
5	4924.00	51.4 PK	74.0	-22.6	1.06 H	98	45.29	6.11
6	4924.00	47.4 AV	54.0	-6.6	1.06 H	98	41.29	6.11
7	7386.00	54.6 PK	74.0	-19.4	1.20 H	135	41.42	13.18
8	7386.00	41.7 AV	54.0	-12.3	1.20 H	135	28.52	13.18

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	*2462.00	113.6 PK			1.06 V	94	116.02	-2.42
2	*2462.00	110.9 AV			1.06 V	94	113.32	-2.42
3	2483.50	65.2 PK	74.0	-8.8	1.06 V	94	67.52	-2.32
4	2483.50	53.5 AV	54.0	-0.5	1.06 V	94	55.82	-2.32
5	4924.00	55.9 PK	74.0	-18.1	1.00 V	194	50.20	5.70
6	4924.00	52.9 AV	54.0	-1.1	1.00 V	194	47.20	5.70
7	7386.00	58.6 PK	74.0	-15.4	1.11 V	275	45.92	12.68
8	7386.00	49.5 AV	54.0	-4.5	1.11 V	275	36.82	12.68

REMARKS:

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



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802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.7 PK	74.0	-15.3	1.53 H	157	61.17	-2.47
2	2390.00	45.4 AV	54.0	-8.6	1.53 H	157	47.87	-2.47
3	*2412.00	105.2 PK			1.53 H	157	107.57	-2.37
4	*2412.00	95.0 AV			1.53 H	157	97.37	-2.37
5	4824.00	50.2 PK	74.0	-23.8	1.02 H	95	44.49	5.71
6	4824.00	45.3 AV	54.0	-8.7	1.02 H	95	39.59	5.71

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	68.5 PK	74.0	-5.5	1.08 V	264	70.97	-2.47
2	2390.00	53.6 AV	54.0	-0.4	1.08 V	264	56.07	-2.47
3	*2412.00	114.2 PK			1.08 V	264	116.57	-2.37
4	*2412.00	103.9 AV			1.08 V	264	106.27	-2.37
5	4824.00	54.1 PK	74.0	-19.9	1.03 V	180	48.39	5.71
6	4824.00	50.3 AV	54.0	-3.7	1.03 V	180	44.59	5.71

REMARKS:

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



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.6 PK	74.0	-15.4	1.55 H	171	61.07	-2.47
2	2390.00	45.4 AV	54.0	-8.6	1.55 H	171	47.87	-2.47
3	*2437.00	113.8 PK			1.55 H	171	116.05	-2.25
4	*2437.00	104.3 AV			1.55 H	171	106.55	-2.25
5	2483.50	54.1 PK	74.0	-19.9	1.55 H	171	56.13	-2.03
6	2483.50	42.4 AV	54.0	-11.6	1.55 H	171	44.43	-2.03
7	4874.00	49.8 PK	74.0	-24.2	1.01 H	108	43.90	5.90
8	4874.00	44.8 AV	54.0	-9.2	1.01 H	108	38.90	5.90
9	7311.00	53.9 PK	74.0	-20.1	1.17 H	109	40.73	13.17
10	7311.00	41.2 AV	54.0	-12.8	1.17 H	109	28.03	13.17

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	2390.00	69.7 PK	74.0	-4.3	1.03 V	241	72.17	-2.47
2	2390.00	53.6 AV	54.0	-0.4	1.03 V	241	56.07	-2.47
3	*2437.00	122.9 PK			1.03 V	241	125.15	-2.25
4	*2437.00	113.2 AV			1.03 V	241	115.45	-2.25
5	2483.50	63.8 PK	74.0	-10.2	1.03 V	241	65.83	-2.03
6	2483.50	50.6 AV	54.0	-3.4	1.03 V	241	52.63	-2.03
7	4874.00	54.5 PK	74.0	-19.5	1.00 V	174	48.60	5.90
8	4874.00	50.6 AV	54.0	-3.4	1.00 V	174	44.70	5.90
9	7311.00	56.2 PK	74.0	-17.8	1.11 V	279	43.03	13.17
10	7311.00	47.1 AV	54.0	-6.9	1.11 V	279	33.93	13.17

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



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	105.7 PK			1.56 H	171	107.84	-2.14
2	*2462.00	95.6 AV			1.56 H	171	97.74	-2.14
3	2483.50	56.4 PK	74.0	-17.6	1.56 H	171	58.43	-2.03
4	2483.50	45.1 AV	54.0	-8.9	1.56 H	171	47.13	-2.03
5	4924.00	49.5 PK	74.0	-24.5	1.04 H	103	43.39	6.11
6	4924.00	44.3 AV	54.0	-9.7	1.04 H	103	38.19	6.11
7	7386.00	54.2 PK	74.0	-19.8	1.18 H	102	41.02	13.18
8	7386.00	41.4 AV	54.0	-12.6	1.18 H	102	28.22	13.18

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	*2462.00	114.8 PK			1.07 V	95	116.94	-2.14
2	*2462.00	104.5 AV			1.07 V	95	106.64	-2.14
3	2483.50	71.0 PK	74.0	-3.0	1.07 V	95	73.03	-2.03
4	2483.50	53.3 AV	54.0	-0.7	1.07 V	95	55.33	-2.03
5	4924.00	54.3 PK	74.0	-19.7	1.03 V	170	48.19	6.11
6	4924.00	50.4 AV	54.0	-3.6	1.03 V	170	44.29	6.11
7	7386.00	55.6 PK	74.0	-18.4	1.13 V	282	42.42	13.18
8	7386.00	46.6 AV	54.0	-7.4	1.13 V	282	33.42	13.18

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



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802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	53.0 PK	74.0	-21.0	1.55 H	185	55.47	-2.47
2	2390.00	45.2 AV	54.0	-8.8	1.55 H	185	47.67	-2.47
3	*2412.00	103.7 PK			1.55 H	185	106.07	-2.37
4	*2412.00	93.7 AV			1.55 H	185	96.07	-2.37
5	4824.00	49.7 PK	74.0	-24.3	1.05 H	96	43.99	5.71
6	4824.00	44.6 AV	54.0	-9.4	1.05 H	96	38.89	5.71

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	67.6 PK	74.0	-6.4	1.09 V	96	70.07	-2.47
2	2390.00	53.4 AV	54.0	-0.6	1.09 V	96	55.87	-2.47
3	*2412.00	112.8 PK			1.09 V	96	115.17	-2.37
4	*2412.00	102.6 AV			1.09 V	96	104.97	-2.37
5	4824.00	53.6 PK	74.0	-20.4	1.07 V	177	47.89	5.71
6	4824.00	49.9 AV	54.0	-4.1	1.07 V	177	44.19	5.71

REMARKS:

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



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2310.00	53.6 PK	74.0	-20.4	1.50 H	174	56.43	-2.83
2	2310.00	46.0 AV	54.0	-8.0	1.50 H	174	48.83	-2.83
3	2390.00	49.6 PK	74.0	-24.4	1.50 H	174	52.07	-2.47
4	2390.00	42.3 AV	54.0	-11.7	1.50 H	174	44.77	-2.47
5	*2437.00	112.6 PK			1.50 H	174	114.85	-2.25
6	*2437.00	102.9 AV			1.50 H	174	105.15	-2.25
7	4874.00	49.0 PK	74.0	-25.0	1.03 H	114	43.10	5.90
8	4874.00	44.1 AV	54.0	-9.9	1.03 H	114	38.20	5.90
9	7311.00	53.6 PK	74.0	-20.4	1.17 H	111	40.43	13.17
10	7311.00	40.9 AV	54.0	-13.1	1.17 H	111	27.73	13.17

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	2310.00	68.2 PK	74.0	-5.8	1.06 V	242	71.03	-2.83
2	2310.00	53.8 AV	54.0	-0.2	1.06 V	242	56.63	-2.83
3	2390.00	64.2 PK	74.0	-9.8	1.06 V	242	66.67	-2.47
4	2390.00	49.2 AV	54.0	-4.8	1.06 V	242	51.67	-2.47
5	*2437.00	121.7 PK			1.06 V	242	123.95	-2.25
6	*2437.00	111.8 AV			1.06 V	242	114.05	-2.25
7	4874.00	54.5 PK	74.0	-19.5	1.07 V	178	48.60	5.90
8	4874.00	50.6 AV	54.0	-3.4	1.07 V	178	44.70	5.90
9	7311.00	55.6 PK	74.0	-18.4	1.17 V	292	42.43	13.17
10	7311.00	46.8 AV	54.0	-7.2	1.17 V	292	33.63	13.17

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



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.0 PK			1.56 H	175	106.14	-2.14
2	*2462.00	93.6 AV			1.56 H	175	95.74	-2.14
3	2483.50	55.0 PK	74.0	-19.0	1.56 H	175	57.03	-2.03
4	2483.50	45.8 AV	54.0	-8.2	1.56 H	175	47.83	-2.03
5	4924.00	49.5 PK	74.0	-24.5	1.04 H	104	43.39	6.11
6	4924.00	44.6 AV	54.0	-9.4	1.04 H	104	38.49	6.11
7	7386.00	53.6 PK	74.0	-20.4	1.12 H	97	40.42	13.18
8	7386.00	41.1 AV	54.0	-12.9	1.12 H	97	27.92	13.18

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	*2462.00	113.0 PK			1.05 V	94	115.14	-2.14
2	*2462.00	102.5 AV			1.05 V	94	104.64	-2.14
3	2483.50	69.7 PK	74.0	-4.3	1.05 V	94	71.73	-2.03
4	2483.50	53.4 AV	54.0	-0.6	1.05 V	94	55.43	-2.03
5	4924.00	54.0 PK	74.0	-20.0	1.12 V	182	47.89	6.11
6	4924.00	50.3 AV	54.0	-3.7	1.12 V	182	44.19	6.11
7	7386.00	55.3 PK	74.0	-18.7	1.15 V	302	42.12	13.18
8	7386.00	46.5 AV	54.0	-7.5	1.15 V	302	33.32	13.18

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



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802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	53.0 PK	74.0	-21.0	1.58 H	185	55.47	-2.47
2	2390.00	46.5 AV	54.0	-7.5	1.58 H	185	48.97	-2.47
3	*2422.00	99.4 PK			1.58 H	185	101.72	-2.32
4	*2422.00	89.6 AV			1.58 H	185	91.92	-2.32
5	4844.00	49.2 PK	74.0	-24.8	1.00 H	112	43.42	5.78
6	4844.00	44.4 AV	54.0	-9.6	1.00 H	112	38.62	5.78
7	7266.00	54.0 PK	74.0	-20.0	1.09 H	84	40.80	13.20
8	7266.00	41.5 AV	54.0	-12.5	1.09 H	84	28.30	13.20

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.8 PK	74.0	-6.2	1.09 V	93	70.27	-2.47
2	2390.00	53.9 AV	54.0	-0.1	1.09 V	93	56.37	-2.47
3	*2422.00	108.5 PK			1.09 V	93	110.82	-2.32
4	*2422.00	98.5 AV			1.09 V	93	100.82	-2.32
5	4844.00	54.2 PK	74.0	-19.8	1.07 V	194	48.42	5.78
6	4844.00	50.7 AV	54.0	-3.3	1.07 V	194	44.92	5.78
7	7266.00	55.0 PK	74.0	-19.0	1.14 V	314	41.80	13.20
8	7266.00	46.1 AV	54.0	-7.9	1.14 V	314	32.90	13.20

REMARKS:

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



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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	56.2 PK	74.0	-17.8	1.62 H	196	58.67	-2.47
2	2390.00	46.6 AV	54.0	-7.4	1.62 H	196	49.07	-2.47
3	*2437.00	105.4 PK			1.62 H	196	107.65	-2.25
4	*2437.00	94.6 AV			1.62 H	196	96.85	-2.25
5	2483.50	55.6 PK	74.0	-18.4	1.62 H	196	57.63	-2.03
6	2483.50	45.3 AV	54.0	-8.7	1.62 H	196	47.33	-2.03
7	4874.00	48.6 PK	74.0	-25.4	1.03 H	101	42.70	5.90
8	4874.00	44.0 AV	54.0	-10.0	1.03 H	101	38.10	5.90
9	7311.00	54.2 PK	74.0	-19.8	1.05 H	74	41.03	13.17
10	7311.00	41.7 AV	54.0	-12.3	1.05 H	74	28.53	13.17

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	2390.00	70.4 PK	74.0	-3.6	1.07 V	84	72.87	-2.47
2	2390.00	53.9 AV	54.0	-0.1	1.07 V	84	56.37	-2.47
3	*2437.00	114.5 PK			1.07 V	84	116.75	-2.25
4	*2437.00	103.5 AV			1.07 V	84	105.75	-2.25
5	2483.50	69.7 PK	74.0	-4.3	1.07 V	84	71.73	-2.03
6	2483.50	52.6 AV	54.0	-1.4	1.07 V	84	54.63	-2.03
7	4874.00	53.9 PK	74.0	-20.1	1.10 V	208	48.00	5.90
8	4874.00	50.7 AV	54.0	-3.3	1.10 V	208	44.80	5.90
9	7311.00	55.0 PK	74.0	-19.0	1.10 V	326	41.83	13.17
10	7311.00	46.1 AV	54.0	-7.9	1.10 V	326	32.93	13.17

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



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	100.2 PK			1.62 H	193	102.38	-2.18
2	*2452.00	90.3 AV			1.62 H	193	92.48	-2.18
3	2483.50	54.2 PK	74.0	-19.8	1.62 H	193	56.23	-2.03
4	2483.50	46.5 AV	54.0	-7.5	1.62 H	193	48.53	-2.03
5	4904.00	48.2 PK	74.0	-25.8	1.05 H	101	42.18	6.02
6	4904.00	43.7 AV	54.0	-10.3	1.05 H	101	37.68	6.02
7	7356.00	54.2 PK	74.0	-19.8	1.00 H	67	41.02	13.18
8	7356.00	41.6 AV	54.0	-12.4	1.00 H	67	28.42	13.18

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	*2452.00	109.3 PK			1.06 V	95	111.48	-2.18
2	*2452.00	99.2 AV			1.06 V	95	101.38	-2.18
3	2483.50	67.6 PK	74.0	-6.4	1.06 V	95	69.63	-2.03
4	2483.50	53.8 AV	54.0	-0.2	1.06 V	95	55.83	-2.03
5	4904.00	53.8 PK	74.0	-20.2	1.13 V	220	47.78	6.02
6	4904.00	50.4 AV	54.0	-3.6	1.13 V	220	44.38	6.02
7	7356.00	54.8 PK	74.0	-19.2	1.09 V	313	41.62	13.18
8	7356.00	46.0 AV	54.0	-8.0	1.09 V	313	32.82	13.18

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

4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSV 40	100964	July 05, 2014	July 04, 2015

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Dec. 02, 2014

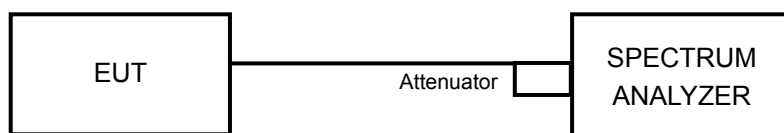
4.3.3 TEST PROCEDURE

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

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

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



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4.3.7 TEST RESULTS

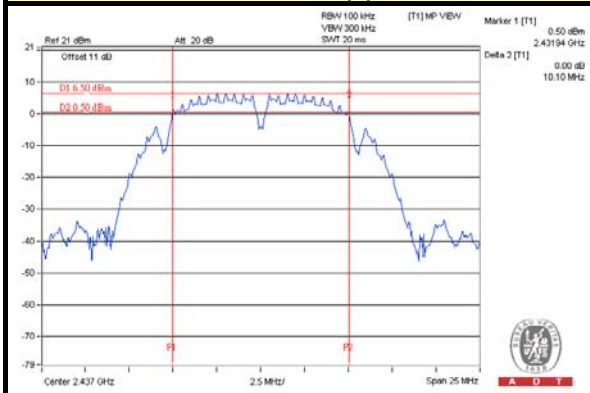
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
802.11b					
1	2412	10.12	10.11	0.5	PASS
6	2437	10.11	10.10	0.5	PASS
11	2462	10.11	10.11	0.5	PASS
802.11g					
1	2412	16.11	15.79	0.5	PASS
6	2437	15.79	15.76	0.5	PASS
11	2462	16.07	16.11	0.5	PASS
802.11n (HT20)					
1	2412	16.41	16.12	0.5	PASS
6	2437	16.10	16.43	0.5	PASS
11	2462	16.46	16.59	0.5	PASS
802.11n (HT40)					
3	2422	35.34	35.33	0.5	PASS
6	2437	35.31	35.47	0.5	PASS
9	2452	35.31	35.32	0.5	PASS



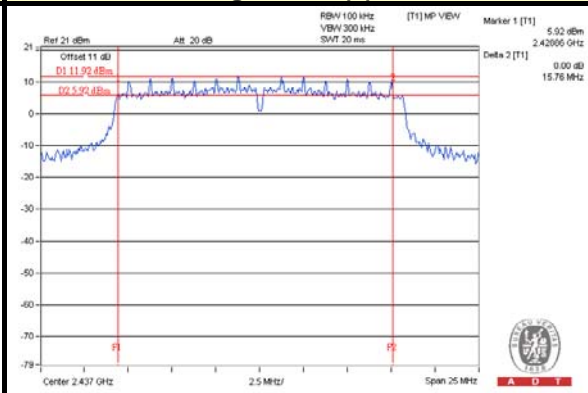
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SPECTRUM PLOT OF WORST VALUE

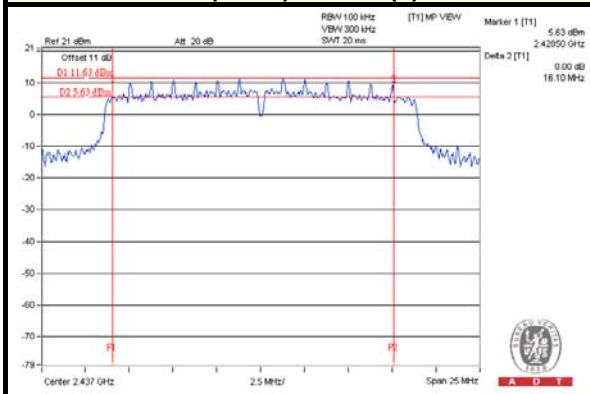
802.11b / Chain(1) : CH6



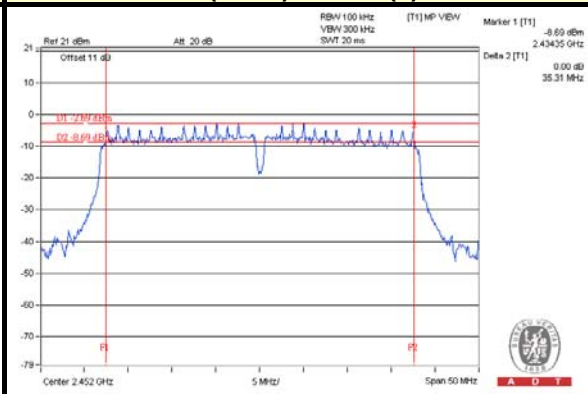
802.11g / Chain(1) : CH6



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



802.11n (HT40) / Chain(0) : CH9





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4.4 CONDUCTED OUTPUT POWER MEASUREMENT

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

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

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

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

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

4.4.2 TEST INSTRUMENTS

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

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Dec. 09, 2014

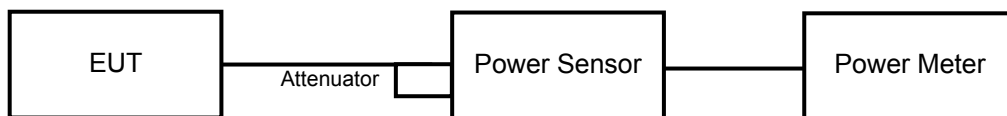
4.4.3 TEST PROCEDURES

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

4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6



4.4.7 TEST RESULTS

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
802.11b							
1	2412	19.33	18.88	162.972	22.12	30	PASS
6	2437	20.31	20.22	212.595	23.28	30	PASS
11	2462	19.36	18.94	164.641	22.17	30	PASS
802.11g							
1	2412	17.50	17.31	110.061	20.42	30	PASS
6	2437	24.79	24.99	616.801	27.90	30	PASS
11	2462	17.22	17.79	112.84	20.52	30	PASS
802.11n (HT20)							
1	2412	16.41	16.19	85.343	19.31	30	PASS
6	2437	23.57	23.87	471.291	26.73	30	PASS
11	2462	15.61	15.22	69.658	18.43	30	PASS
802.11n (HT40)							
3	2422	14.60	14.10	54.544	17.37	30	PASS
6	2437	17.75	18.01	122.807	20.89	30	PASS
9	2452	12.80	12.64	37.42	15.73	30	PASS



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4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSV 40	100964	July 05, 2014	July 04, 2015

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Dec. 09, 2014

4.5.3 TEST PROCEDURE

1. Set the RBW = 10 kHz, VBW = 30 kHz, Detector = power averaging (RMS).
2. Ensure that the number of measurement points in the sweep $\geq 2 \times$ span/RBW
3. Sweep time = auto couple,
4. Employ trace averaging (RMS) mode over a minimum of 100 traces.
5. Use the peak marker function to determine the maximum amplitude level.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6



4.5.7 TEST RESULTS

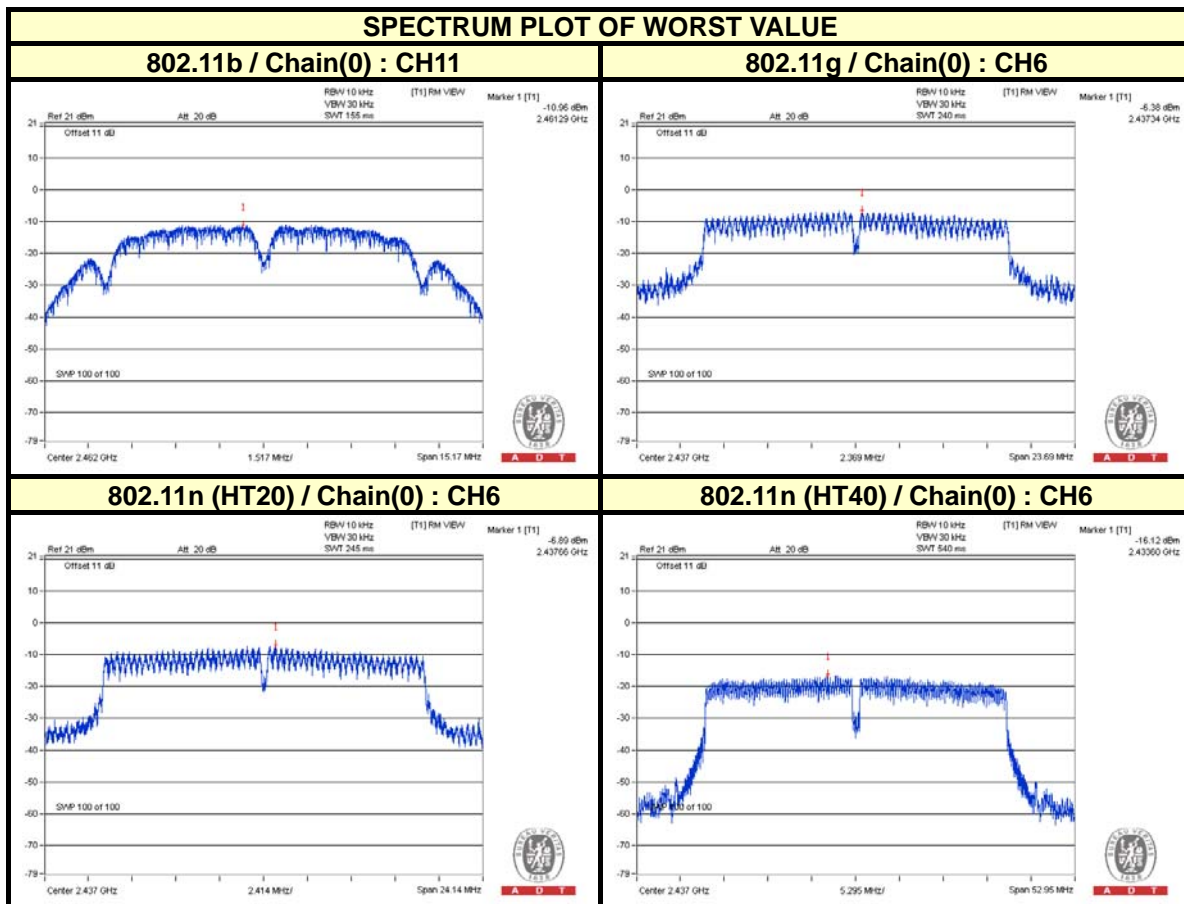
802.11b							
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	1	2412	-11.25	3.01	-8.24	7.89	PASS
	6	2437	-11.55	3.01	-8.54	7.89	PASS
	11	2462	-10.96	3.01	-7.95	7.89	PASS
1	1	2412	-11.15	3.01	-8.14	7.89	PASS
	6	2437	-11.53	3.01	-8.52	7.89	PASS
	11	2462	-11.32	3.01	-8.31	7.89	PASS
802.11g							
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	1	2412	-14.50	3.01	-11.49	7.89	PASS
	6	2437	-6.38	3.01	-3.37	7.89	PASS
	11	2462	-13.71	3.01	-10.70	7.89	PASS
1	1	2412	-12.96	3.01	-9.95	7.89	PASS
	6	2437	-6.86	3.01	-3.85	7.89	PASS
	11	2462	-13.17	3.01	-10.16	7.89	PASS
802.11n (HT20)							
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	1	2412	-14.25	3.01	-11.24	7.89	PASS
	6	2437	-6.89	3.01	-3.88	7.89	PASS
	11	2462	-15.80	3.01	-12.79	7.89	PASS
1	1	2412	-13.80	3.01	-10.79	7.89	PASS
	6	2437	-8.13	3.01	-5.12	7.89	PASS
	11	2462	-15.30	3.01	-12.29	7.89	PASS

Note : 1. Directional gain = 3.1dBi + 10log(2) = 6.11dBi > 6dBi , so the power density limit shall be reduced to 8-(6.11-6) = 7.89dBm.

802.11n (HT40)

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	3	2422	-20.39	3.01	-17.38	7.89	PASS
	6	2437	-16.12	3.01	-13.11	7.89	PASS
	9	2452	-21.34	3.01	-18.33	7.89	PASS
1	3	2422	-19.64	3.01	-16.63	7.89	PASS
	6	2437	-16.65	3.01	-13.64	7.89	PASS
	9	2452	-19.77	3.01	-16.76	7.89	PASS

Note : 1. Directional gain = 3.1dBi + 10log(2) = 6.11dBi > 6dBi , so the power density limit shall be reduced to 8-(6.11-6) = 7.89dBm.





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4.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

Below 30dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSV 40	100964	July 05, 2014	July 04, 2015

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Dec. 02, 2014

4.6.3 TEST PROCEDURE

Measurement Procedure - Reference Level

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

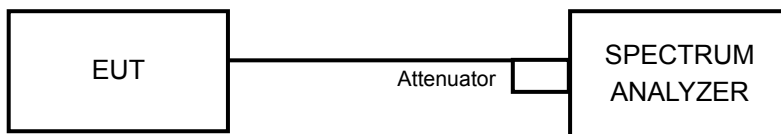
Measurement Procedure –Unwanted Emission Level

1. Set RBW = 100 kHz.
2. Set VBW \geq 300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

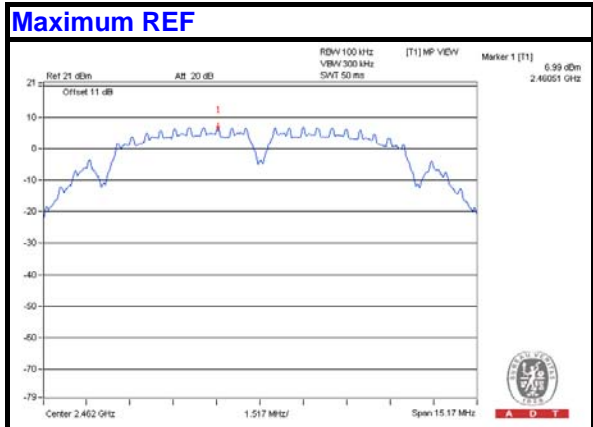
4.6.7 TEST RESULTS

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.



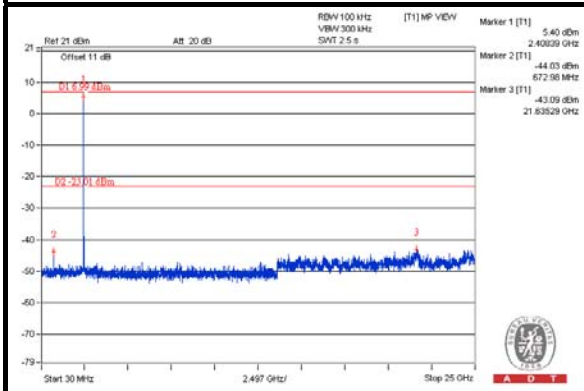
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802.11b

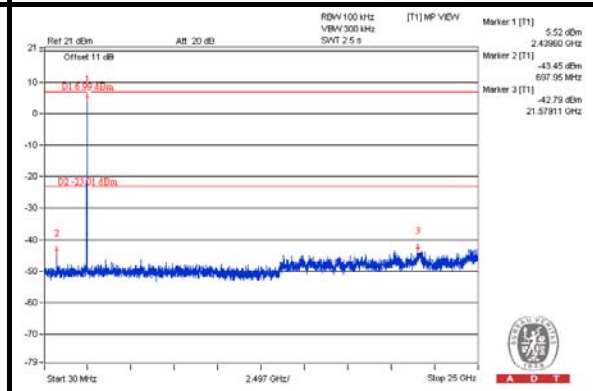


Chain(0)

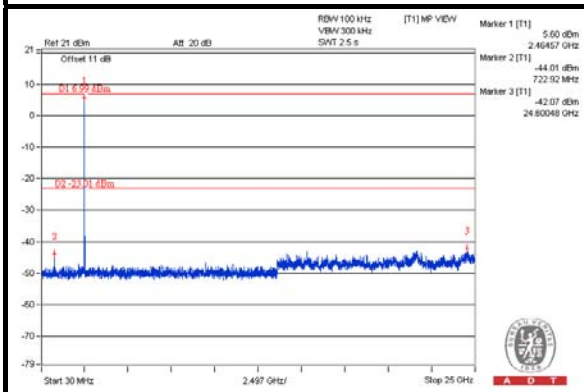
CH 1



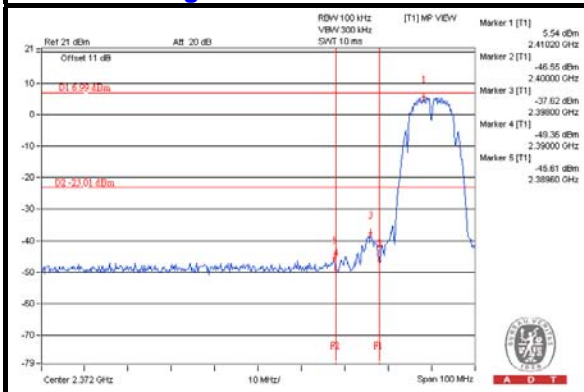
CH 6



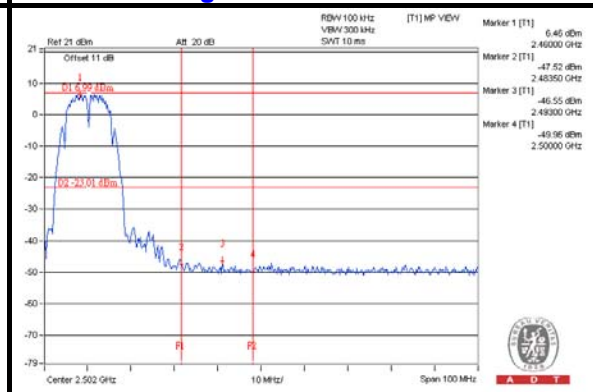
CH 11



CH 1 Band edge



CH 11 Band edge

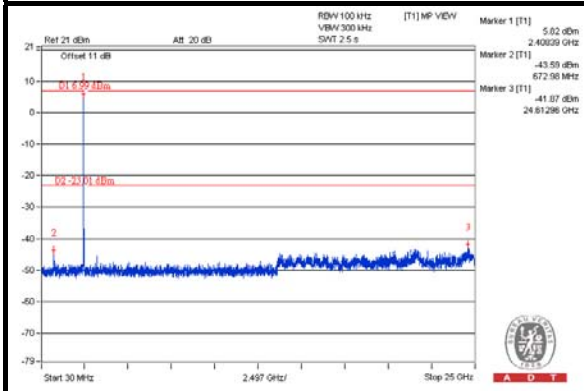




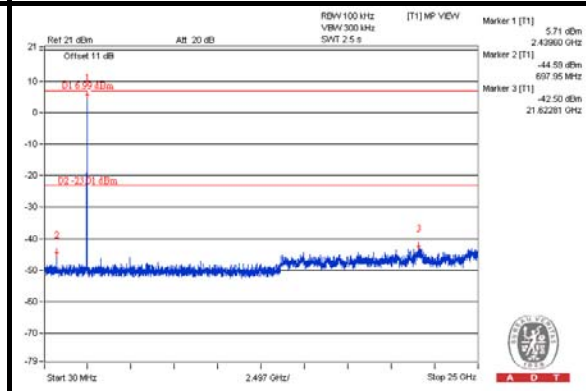
A D T

Chain(1)

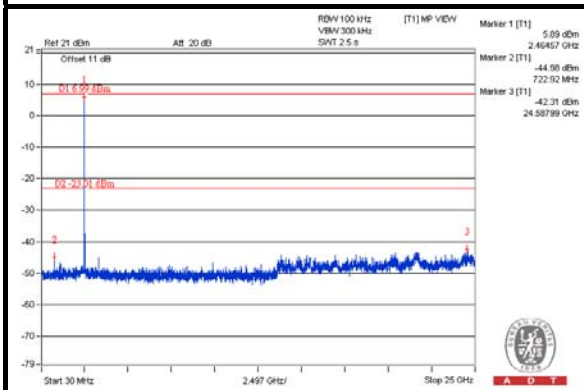
CH 1



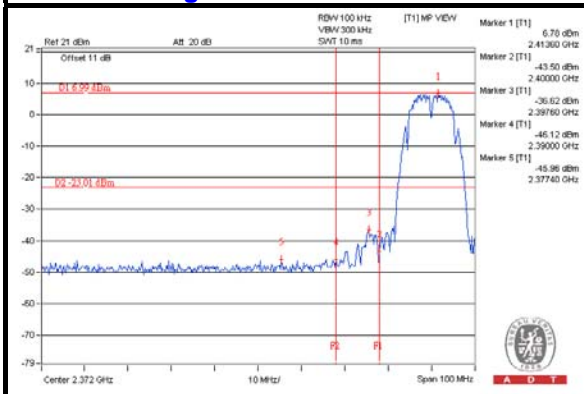
CH 6



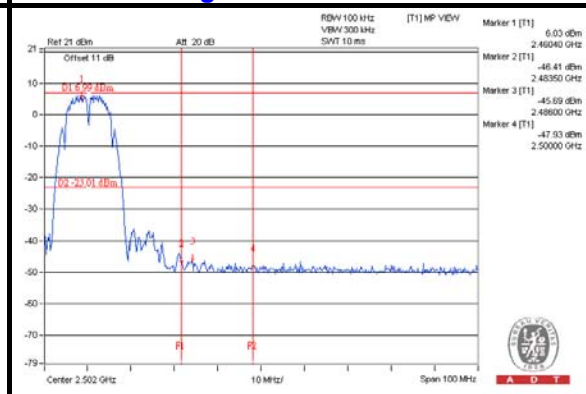
CH 11



CH 1 Band edge



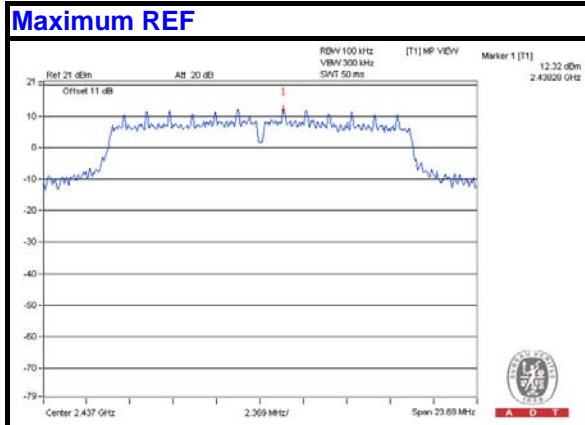
CH 11 Band edge





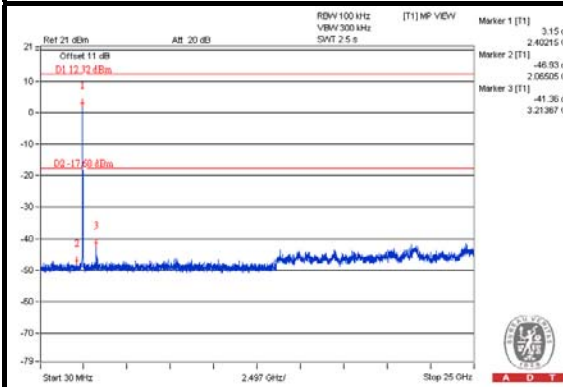
A D T

802.11g

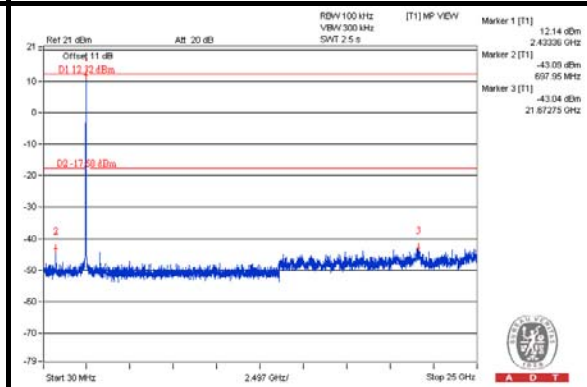


Chain(0)

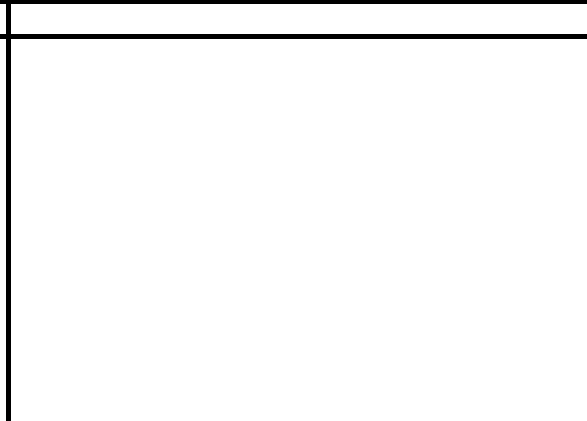
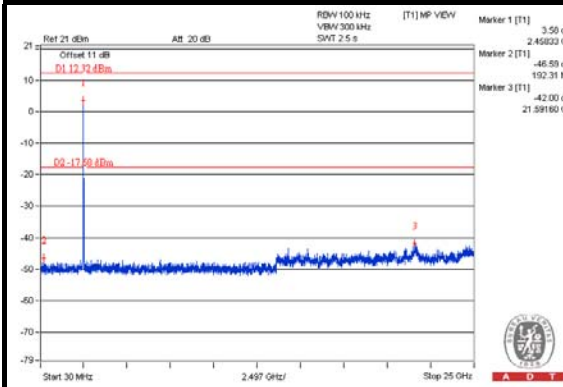
CH 1



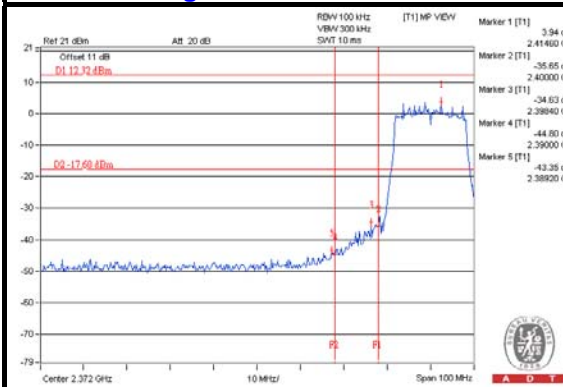
CH 6



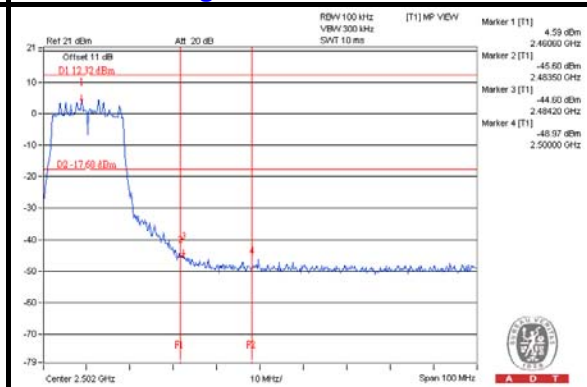
CH 11



CH 1 Band edge



CH 11 Band edge

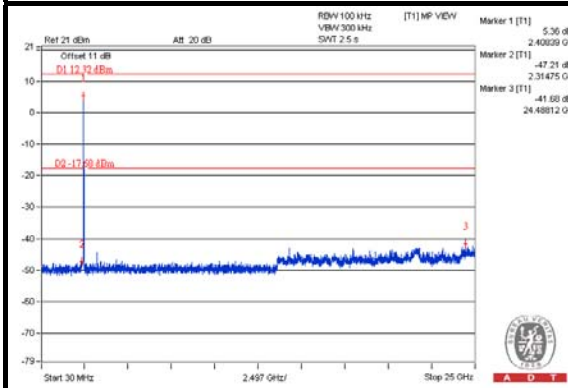




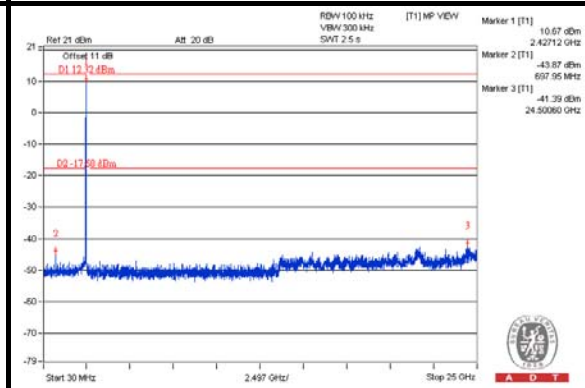
A D T

Chain(1)

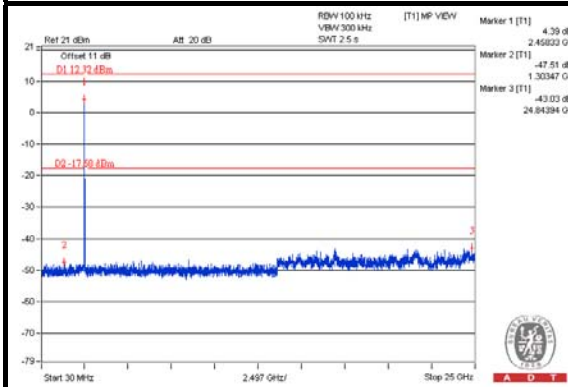
CH 1



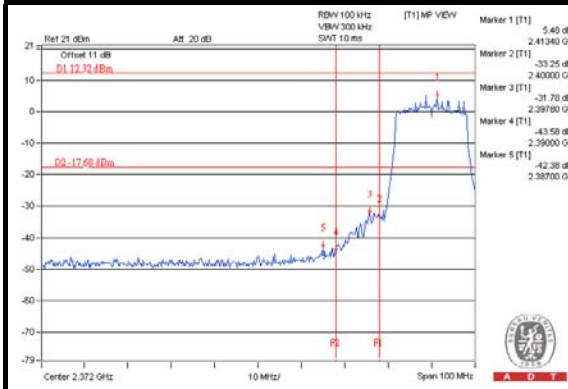
CH 6



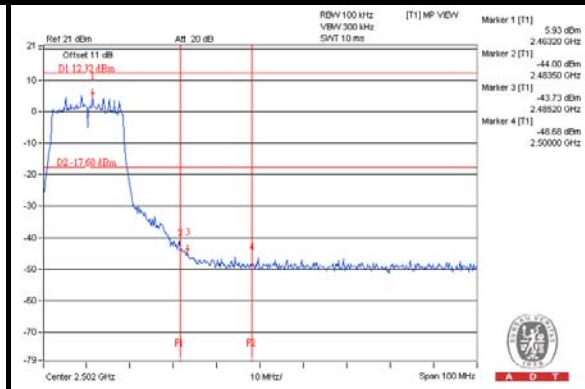
CH 11



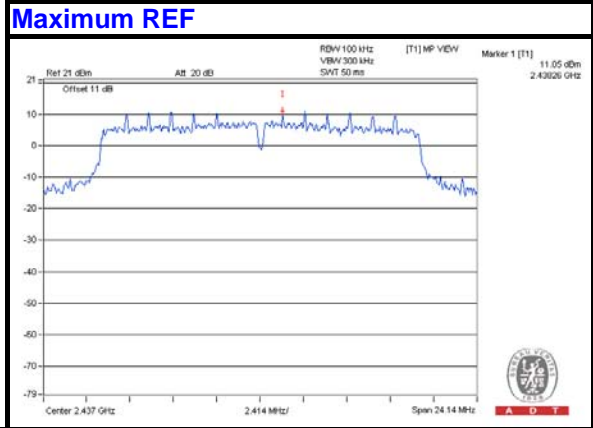
CH 1 Band edge



CH 11 Band edge

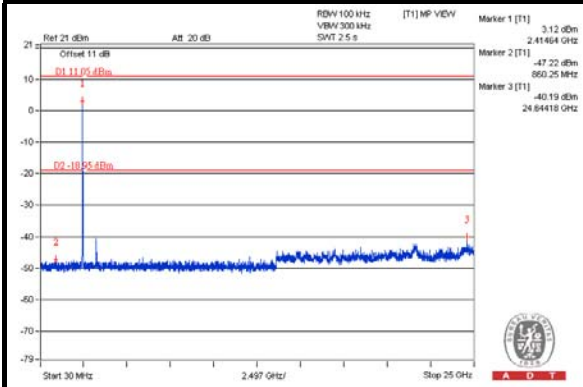


802.11n (HT20)

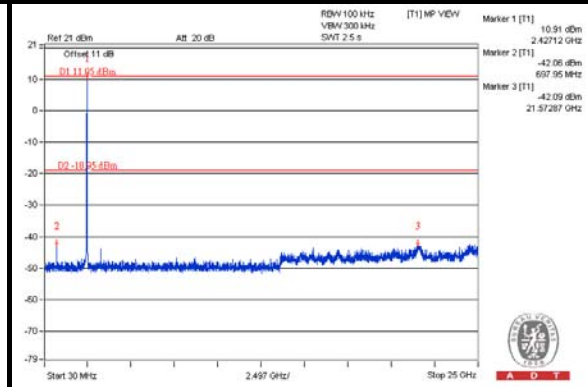


Chain(0)

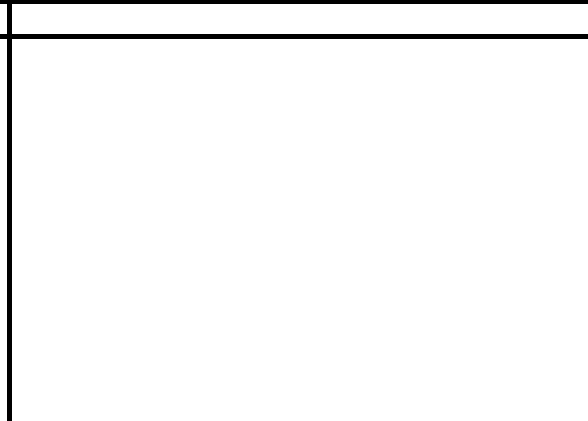
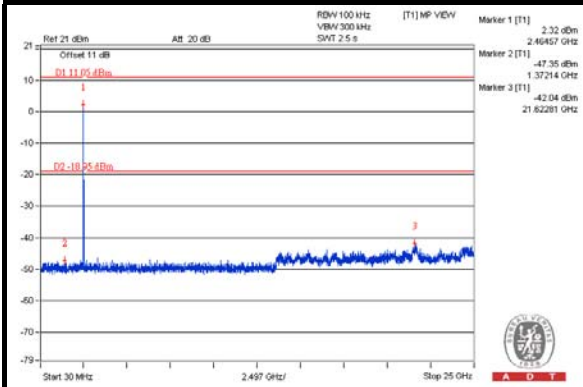
CH 1



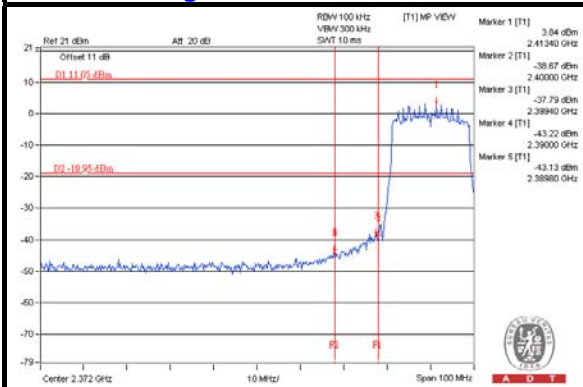
CH 6



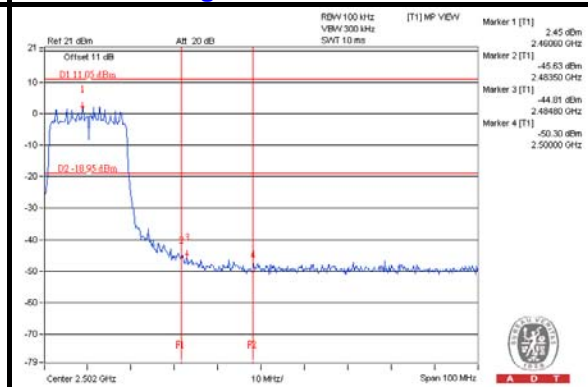
CH 11



CH 1 Band edge



CH 11 Band edge

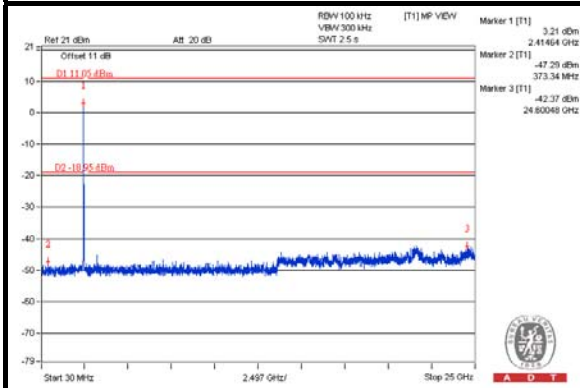




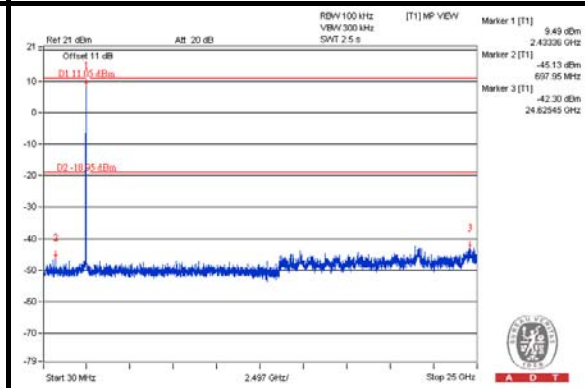
A D T

Chain(1)

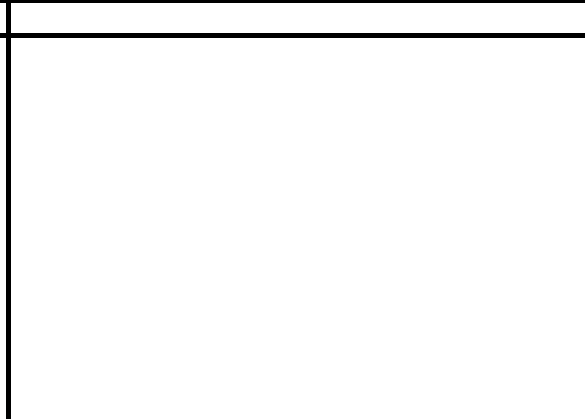
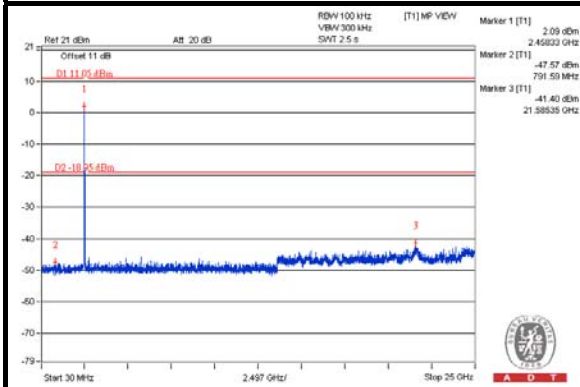
CH 1



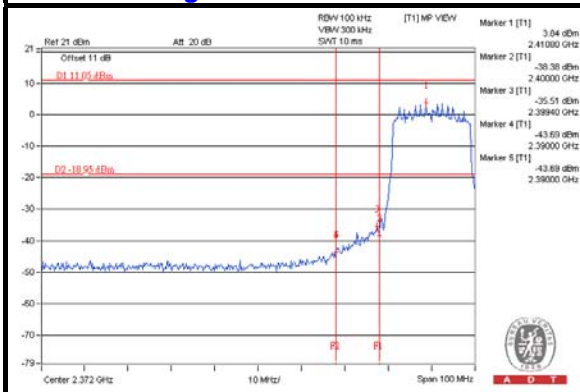
CH 6



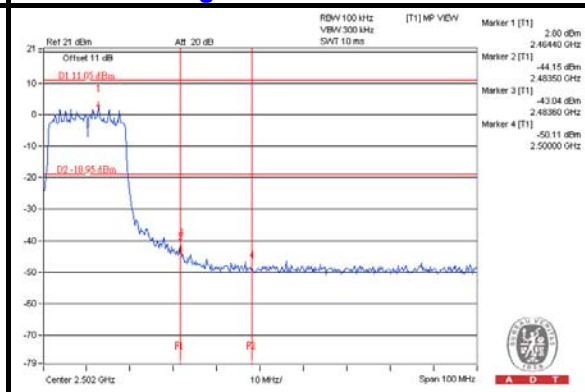
CH 11



CH 1 Band edge



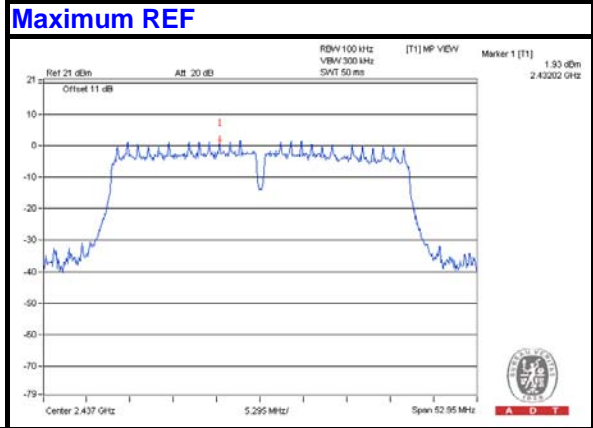
CH 11 Band edge





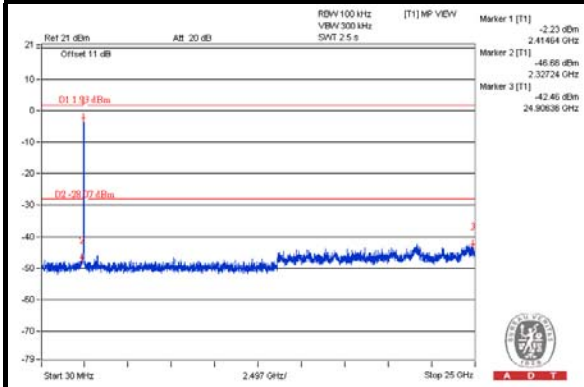
A D T

802.11n (HT40)

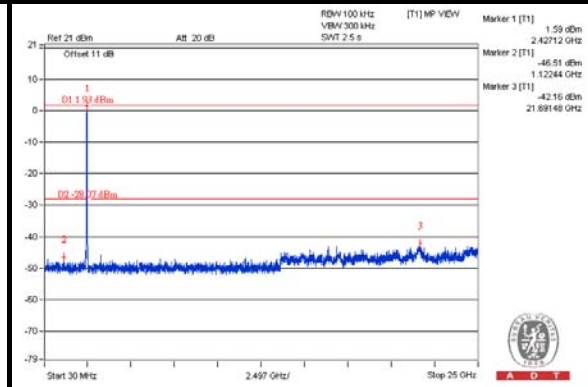


Chain(0)

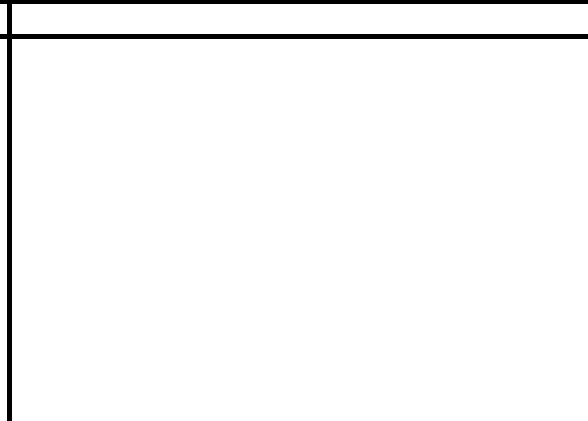
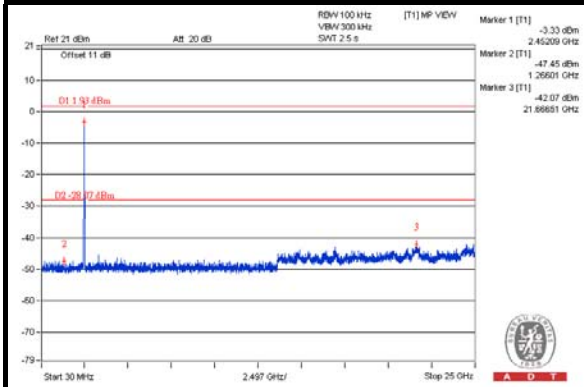
CH 3



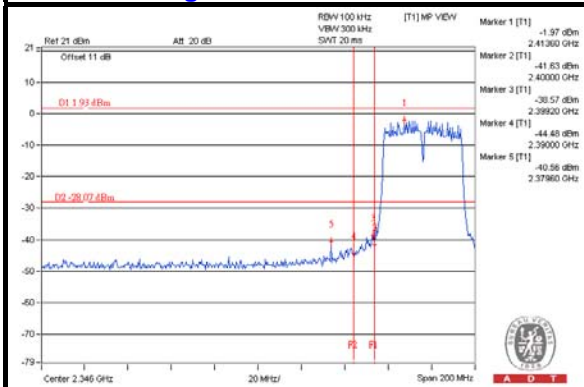
CH 6



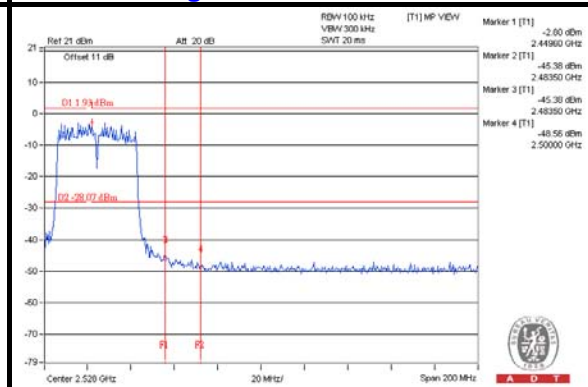
CH 9



CH 3 Band edge



CH 9 Band edge

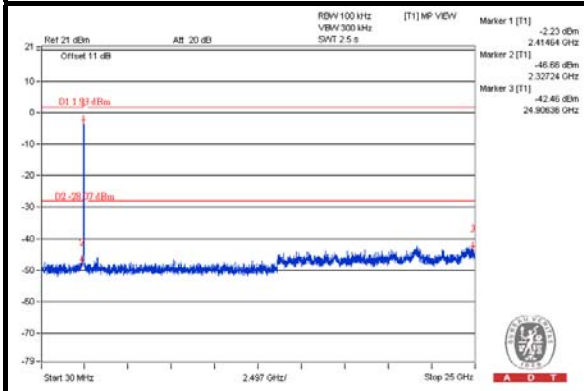




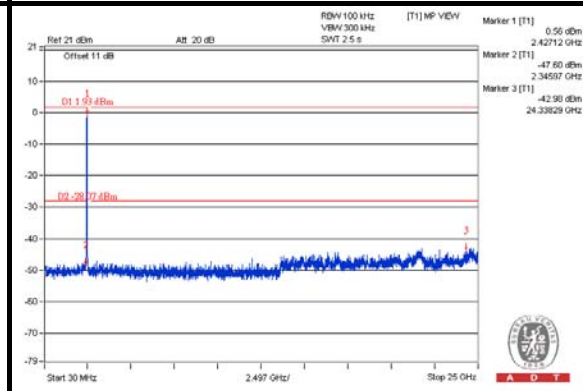
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Chain(1)

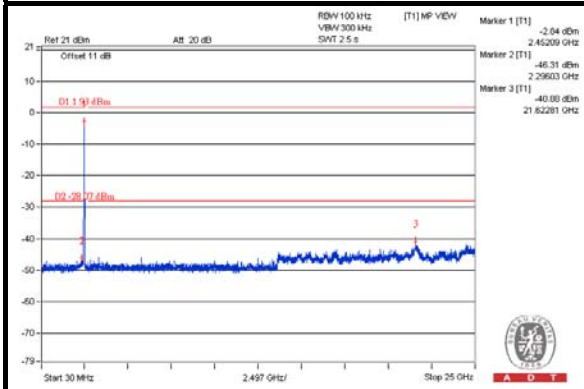
CH 3



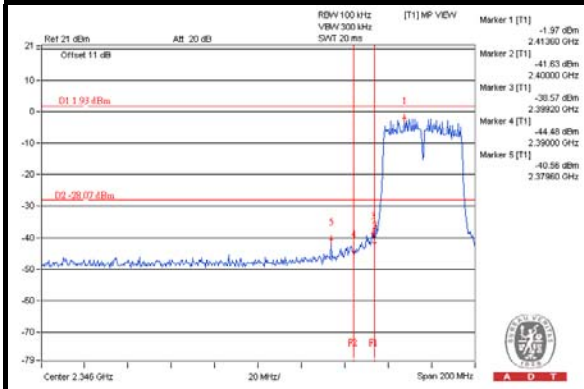
CH 6



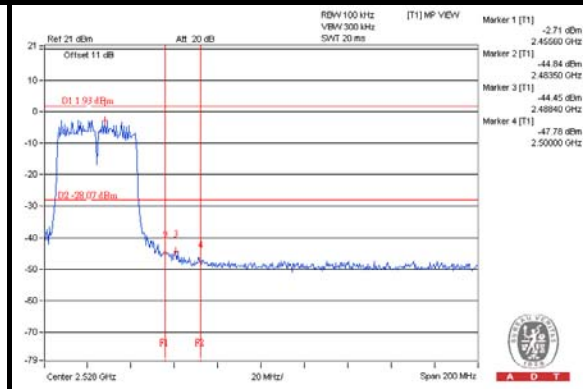
CH 9



CH 3 Band edge



CH 9 Band edge





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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	100375	Apr. 29, 2014	Apr. 28, 2015
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 15, 2014	Sep. 14, 2015
Line-Impedance Stabilization Network (for Peripheral) ROHDE & SCHWARZ	ENV216	100071	Nov. 10, 2014	Nov. 09, 2015
RF Cable (JYEBAO)	5DFB	COCCAB-001	Mar. 10, 2014	Mar. 09, 2015
50 ohms Terminator	N/A	EMC-03	Sep. 22, 2014	Sep. 21, 2015
50 ohms Terminator	N/A	EMC-02	Sep. 30, 2014	Sep. 29, 2015
Software ADT	BV ADT_Cond_V7.3.7. 3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
- 3 The VCCI Con C Registration No. is C-3611.
- 4 Tested Date: Nov. 17, 2014

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.

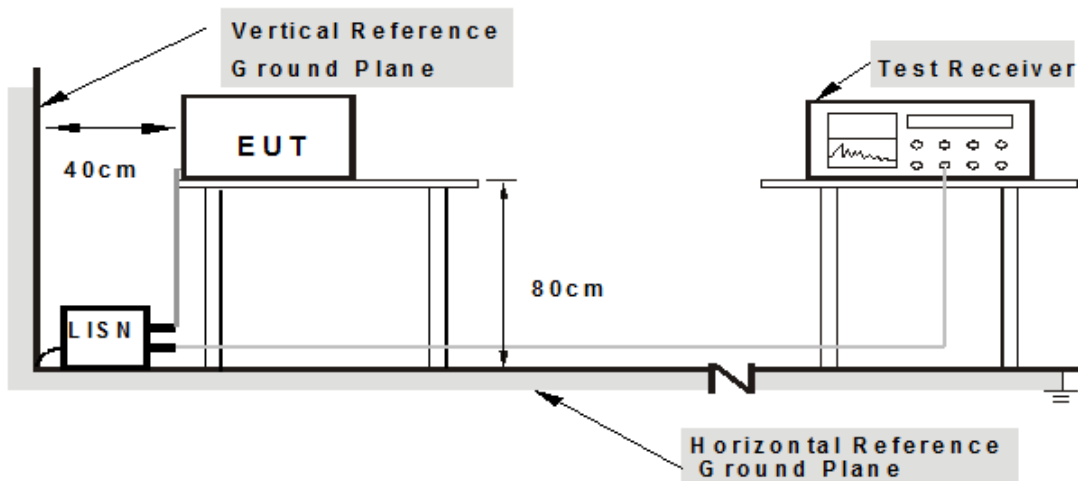
NOTE:

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.



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5.1.6 EUT OPERATING CONDITIONS

Same as the 4.1.6

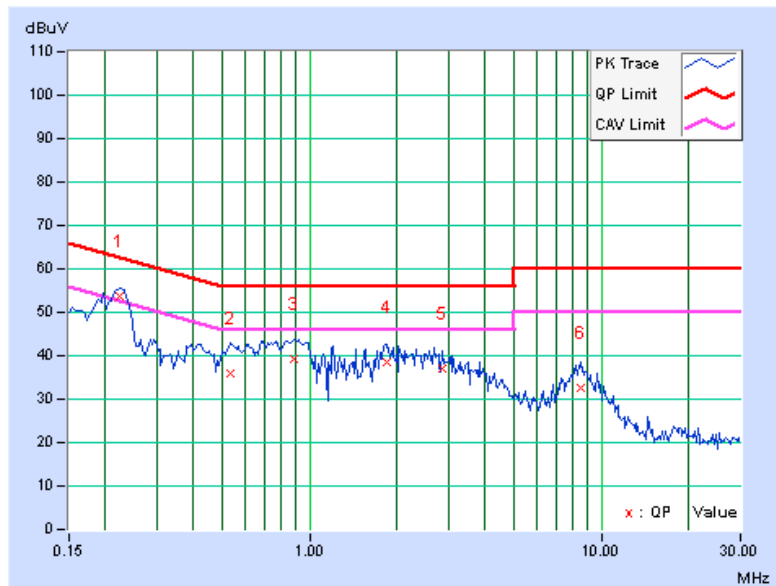
5.1.7 TEST RESULTS

PHASE	Line (L)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor (dB)	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.22422	0.07	53.74	41.91	53.81	41.98	62.66	52.66	-8.85	-10.68
2	0.53281	0.10	35.83	28.03	35.93	28.13	56.00	46.00	-20.07	-17.87
3	0.88438	0.12	39.17	31.37	39.29	31.49	56.00	46.00	-16.71	-14.51
4	1.83203	0.17	38.18	31.59	38.35	31.76	56.00	46.00	-17.65	-14.24
5	2.86328	0.21	36.70	30.59	36.91	30.80	56.00	46.00	-19.09	-15.20
6	8.55859	0.40	32.35	27.02	32.75	27.42	60.00	50.00	-27.25	-22.58

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

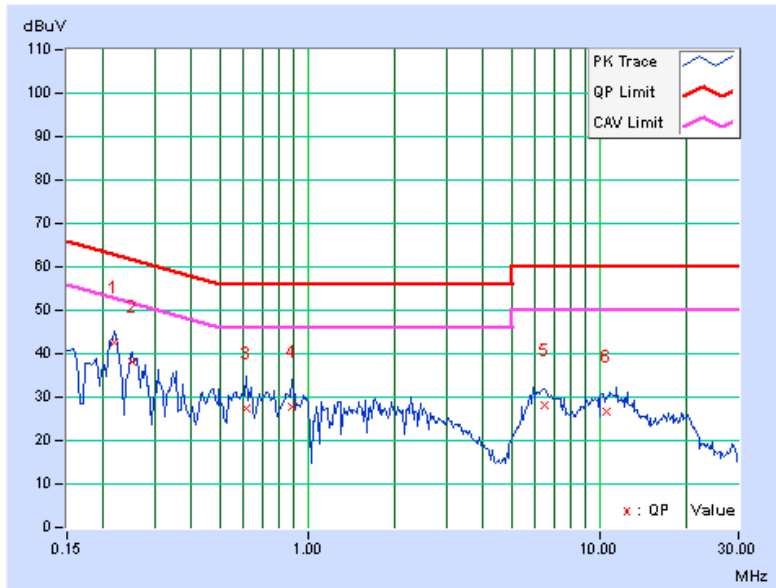


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.21641	0.06	42.57	38.46	42.63	38.52	62.96	52.96	-20.32	-14.43
2	0.25156	0.07	37.94	33.00	38.01	33.07	61.71	51.71	-23.70	-18.64
3	0.61484	0.10	27.23	19.24	27.33	19.34	56.00	46.00	-28.67	-26.66
4	0.88438	0.12	27.66	20.02	27.78	20.14	56.00	46.00	-28.22	-25.86
5	6.49219	0.34	27.79	22.81	28.13	23.15	60.00	50.00	-31.87	-26.85
6	10.60938	0.48	26.15	20.75	26.63	21.23	60.00	50.00	-33.37	-28.77

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
MXE EMI Receiver Agilent	N9038A	MY51210105	July 21, 2014	July 20, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-03	Nov. 13, 2013	Nov. 12, 2014
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Feb. 26, 2014	Feb. 25, 2015
RF Cable	NA	CHGCAB_001	Oct. 04, 2014	Oct. 03, 2015
Horn_Antenna AISl	AIH.8018	0000320091110	Aug. 27, 2014	Aug. 26, 2015
Pre-Amplifier Agilent	8449B	3008A02578	June 24, 2014	June 23, 2015
RF Cable	NA	131205 131214 SNMY23684/4	Jan. 17, 2014	Jan. 16, 2015
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 13, 2013	Nov. 12, 2014
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Aug. 26, 2014	Aug. 25, 2015
RF Cable	NA	RF104-121 RF104-204	Dec. 12, 2013	Dec. 11, 2014
Antenna Tower & Turn Table CT	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
- 3 The test was performed in 966 Chamber No. G.
4. The FCC Site Registration No. is 966073.
- 5 The VCCI Site Registration No. is G-137.
- 6 The CANADA Site Registration No. is IC 7450H-2.
- 7 Tested Date: Oct. 09 to Nov. 01, 2014



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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:

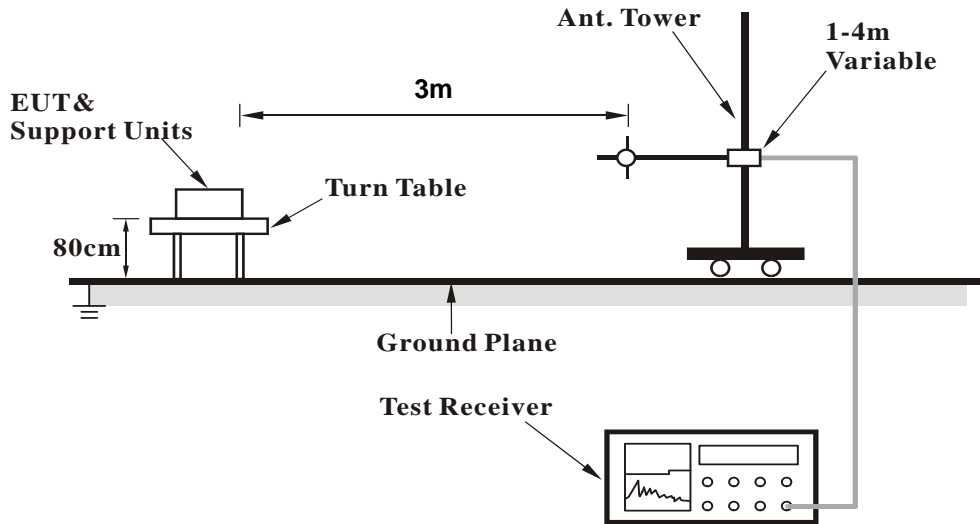
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

5.2.4 DEVIATION FROM TEST STANDARD

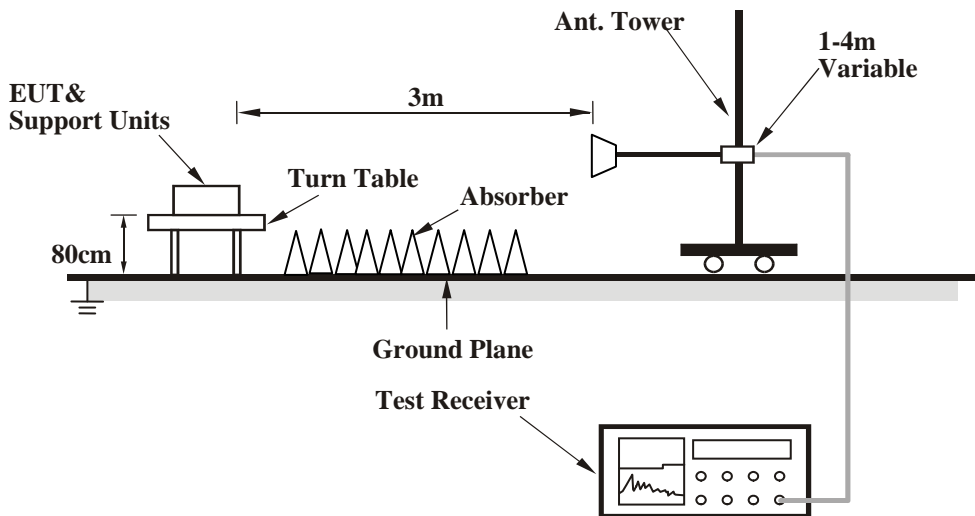
No deviation

5.2.5 TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

5.2.6 EUT OPERATING CONDITIONS

Same as the 4.1.6



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5.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

802.11a

CHANNEL	TX Channel 157	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	82.33	27.5 QP	40.0	-12.5	2.00 H	45	46.28	-18.76
2	144.95	27.8 QP	43.5	-15.7	2.00 H	259	41.13	-13.33
3	219.20	27.6 QP	46.0	-18.4	1.50 H	268	43.71	-16.14
4	374.98	26.6 QP	46.0	-19.4	1.00 H	209	36.86	-10.24
5	500.01	32.0 QP	46.0	-14.0	2.00 H	225	39.36	-7.36
6	799.99	26.7 QP	46.0	-19.3	1.00 H	146	28.11	-1.41

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	40.77	36.1 QP	40.0	-3.9	1.00 V	201	49.85	-13.73
2	70.69	34.0 QP	40.0	-6.1	1.00 V	211	49.63	-15.68
3	82.48	30.3 QP	40.0	-9.7	1.50 V	116	49.07	-18.78
4	375.03	30.8 QP	46.0	-15.2	1.00 V	169	41.06	-10.23
5	500.01	34.3 QP	46.0	-11.7	1.00 V	261	41.62	-7.36
6	924.00	31.0 QP	46.0	-15.0	2.00 V	219	30.39	0.65

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
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	110.2 PK			1.12 H	43	101.78	8.42
2	*5745.00	100.3 AV			1.12 H	43	91.88	8.42
3	11490.00	56.5 PK	74.0	-17.5	1.00 H	301	42.15	14.35
4	11490.00	43.1 AV	54.0	-10.9	1.00 H	301	28.75	14.35

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	*5745.00	119.6 PK			1.10 V	268	111.18	8.42
2	*5745.00	109.5 AV			1.10 V	268	101.08	8.42
3	11490.00	56.3 PK	74.0	-17.7	1.00 V	100	41.95	14.35
4	11490.00	42.9 AV	54.0	-11.1	1.00 V	100	28.55	14.35

REMARKS:

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



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CHANNEL	TX Channel 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	110.5 PK			1.12 H	39	102.01	8.49
2	*5785.00	100.6 AV			1.12 H	39	92.11	8.49
3	11570.00	56.5 PK	74.0	-17.5	1.01 H	305	42.19	14.31
4	11570.00	43.3 AV	54.0	-10.7	1.01 H	305	28.99	14.31

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	119.3 PK			1.04 V	263	110.81	8.49
2	*5785.00	109.1 AV			1.04 V	263	100.61	8.49
3	11570.00	56.7 PK	74.0	-17.3	1.03 V	101	42.39	14.31
4	11570.00	43.1 AV	54.0	-10.9	1.03 V	101	28.79	14.31

REMARKS:

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



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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	110.7 PK			1.07 H	25	102.11	8.59
2	*5825.00	100.7 AV			1.07 H	25	92.11	8.59
3	11650.00	56.0 PK	74.0	-18.0	1.05 H	294	41.62	14.38
4	11650.00	42.9 AV	54.0	-11.1	1.05 H	294	28.52	14.38

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	*5825.00	119.0 PK			1.00 V	253	110.86	8.14
2	*5825.00	109.0 AV			1.00 V	253	100.86	8.14
3	11650.00	57.3 PK	74.0	-16.7	1.07 V	104	43.54	13.76
4	11650.00	42.4 AV	54.0	-11.6	1.07 V	104	28.64	13.76

REMARKS:

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



A D T

802.11ac (VHT20)

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	110.6 PK			1.04 H	37	102.18	8.42
2	*5745.00	100.4 AV			1.04 H	37	91.98	8.42
3	11490.00	56.3 PK	74.0	-17.7	1.00 H	304	41.95	14.35
4	11490.00	43.2 AV	54.0	-10.8	1.00 H	304	28.85	14.35

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	*5745.00	118.9 PK			1.03 V	255	110.91	7.99
2	*5745.00	109.1 AV			1.03 V	255	101.11	7.99
3	11490.00	57.4 PK	74.0	-16.6	1.06 V	116	43.66	13.74
4	11490.00	42.7 AV	54.0	-11.3	1.06 V	116	28.96	13.74

REMARKS:

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



A D T

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	110.9 PK			1.02 H	31	102.41	8.49
2	*5785.00	100.5 AV			1.02 H	31	92.01	8.49
3	11570.00	56.5 PK	74.0	-17.5	1.07 H	288	42.19	14.31
4	11570.00	42.9 AV	54.0	-11.1	1.07 H	288	28.59	14.31

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	119.3 PK			1.04 V	241	111.26	8.04
2	*5785.00	109.3 AV			1.04 V	241	101.26	8.04
3	11570.00	57.9 PK	74.0	-16.1	1.01 V	126	44.19	13.71
4	11570.00	42.0 AV	54.0	-12.0	1.01 V	126	28.29	13.71

REMARKS:

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



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CHANNEL	TX Channel 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	111.1 PK			1.02 H	29	102.51	8.59
2	*5825.00	100.6 AV			1.02 H	29	92.01	8.59
3	11650.00	56.8 PK	74.0	-17.2	1.06 H	287	42.42	14.38
4	11650.00	43.1 AV	54.0	-10.9	1.06 H	287	28.72	14.38

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	*5825.00	119.5 PK			1.02 V	228	111.36	8.14
2	*5825.00	109.7 AV			1.02 V	228	101.56	8.14
3	11650.00	57.1 PK	74.0	-16.9	1.01 V	132	43.34	13.76
4	11650.00	42.5 AV	54.0	-11.5	1.01 V	132	28.74	13.76

REMARKS:

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



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802.11ac (VHT40)

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	111.7 PK			1.00 H	13	103.26	8.44
2	*5755.00	100.9 AV			1.00 H	13	92.46	8.44
3	11510.00	55.8 PK	74.0	-18.2	1.03 H	294	41.46	14.34
4	11510.00	42.7 AV	54.0	-11.3	1.03 H	294	28.36	14.34

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5755.00	118.9 PK			1.03 V	212	110.90	8.00
2	*5755.00	109.3 AV			1.03 V	212	101.30	8.00
3	11510.00	57.1 PK	74.0	-16.9	1.06 V	123	43.37	13.73
4	11510.00	42.4 AV	54.0	-11.6	1.06 V	123	28.67	13.73

REMARKS:

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



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CHANNEL	TX Channel 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	111.5 PK			1.05 H	12	103.00	8.50
2	*5795.00	100.8 AV			1.05 H	12	92.30	8.50
3	11590.00	57.0 PK	74.0	-17.0	1.05 H	289	42.70	14.30
4	11590.00	43.4 AV	54.0	-10.6	1.05 H	289	29.10	14.30

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	119.3 PK			1.03 V	218	111.25	8.05
2	*5795.00	109.6 AV			1.03 V	218	101.55	8.05
3	11590.00	57.0 PK	74.0	-17.0	1.12 V	128	43.30	13.70
4	11590.00	42.5 AV	54.0	-11.5	1.12 V	128	28.80	13.70

REMARKS:

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



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802.11ac (VHT80)

CHANNEL	TX Channel 155	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	*5775.00	110.9 PK			1.11 H	19	102.43	8.47
2	*5775.00	100.3 AV			1.11 H	19	91.83	8.47
3	11550.00	56.7 PK	74.0	-17.3	1.00 H	305	42.38	14.32
4	11550.00	43.0 AV	54.0	-11.0	1.00 H	305	28.68	14.32

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	*5775.00	119.1 PK			1.03 V	205	111.07	8.03
2	*5775.00	109.4 AV			1.03 V	205	101.37	8.03
3	11550.00	56.7 PK	74.0	-17.3	1.11 V	112	42.98	13.72
4	11550.00	42.3 AV	54.0	-11.7	1.11 V	112	28.58	13.72

REMARKS:

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



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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
SPECTRUM ANALYZER R&S	FSV 40	100964	July 05, 2014	July 04, 2015

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Dec. 02, 2014

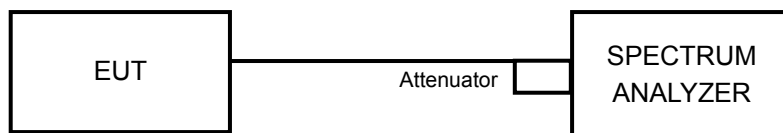
5.3.3 TEST PROCEDURE

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

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP



5.3.6 EUT OPERATING CONDITIONS

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

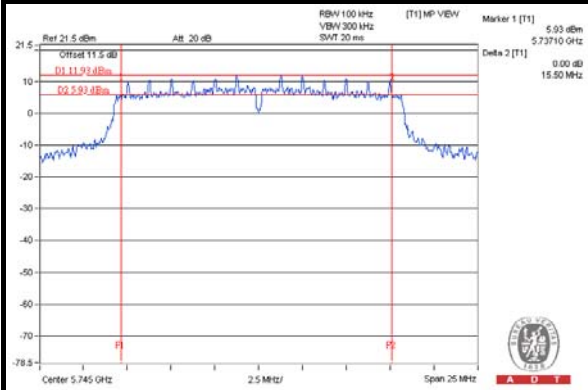


5.3.7 TEST RESULTS

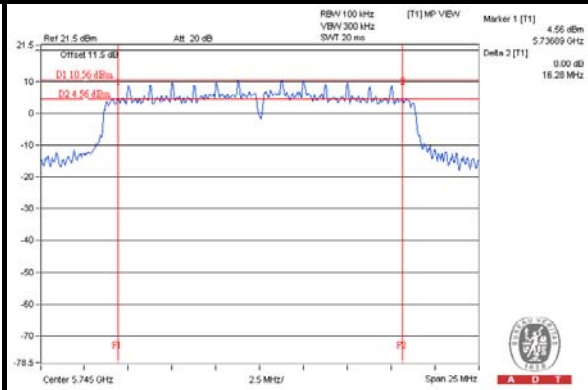
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
802.11a					
149	5745	15.50	15.83	0.5	PASS
157	5785	15.86	15.51	0.5	PASS
165	5825	15.70	16.08	0.5	PASS
802.11ac (VHT20)					
149	5745	16.32	16.28	0.5	PASS
157	5785	16.82	16.41	0.5	PASS
165	5825	16.53	16.51	0.5	PASS
802.11ac (VHT40)					
151	5755	35.30	35.32	0.5	PASS
159	5795	35.34	35.26	0.5	PASS
802.11ac (VHT80)					
155	5775	75.32	75.29	0.5	PASS

SPECTRUM PLOT OF WORST VALUE

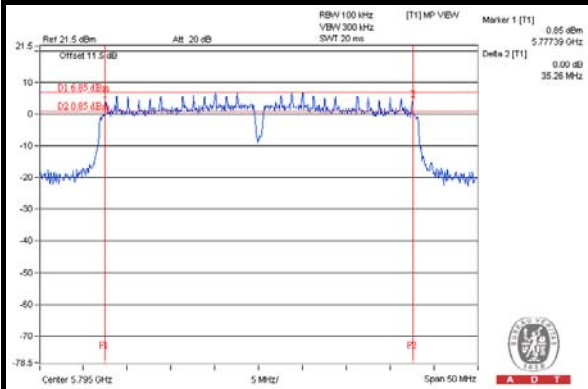
802.11a / Chain(0) : CH149



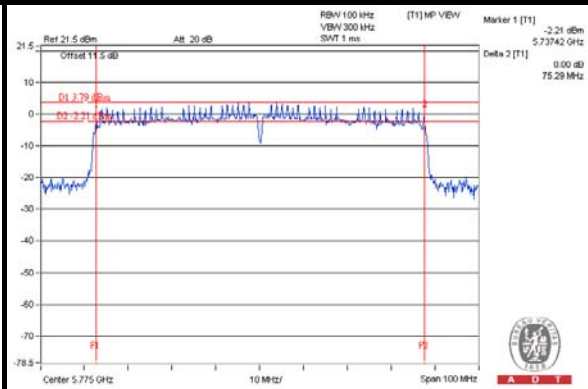
802.11ac (VHT20) / Chain(1) : CH149



802.11ac (VHT40) / Chain(1) : CH159



802.11ac (VHT80) / Chain(1) : CH155





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5.4 CONDUCTED OUTPUT POWER MEASUREMENT

5.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

Per KDB 662911 D01 Multiple Transmitter Output 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.

5.4.2 INSTRUMENTS

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

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Dec. 09, 2014

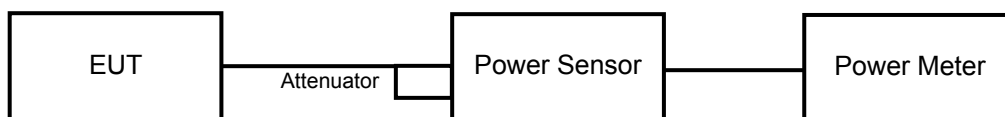
5.4.3 TEST PROCEDURES

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

5.4.4 DEVIATION FROM TEST STANDARD

No deviation.

5.4.5 TEST SETUP



5.4.6 EUT OPERATING CONDITIONS

Same as Item 5.3.6



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5.4.7 TEST RESULTS

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
802.11a							
149	5745	22.16	22.15	328.496	25.17	30	PASS
157	5785	22.24	22.19	333.071	25.23	30	PASS
165	5825	22.18	22.13	328.501	25.17	30	PASS
802.11ac (VHT20)							
149	5745	22.15	22.19	329.636	25.18	30	PASS
157	5785	22.13	22.15	327.364	25.15	30	PASS
165	5825	22.17	22.10	326.997	25.15	30	PASS
802.11ac (VHT40)							
151	5755	22.19	22.14	329.259	25.18	30	PASS
159	5795	22.11	22.17	327.371	25.15	30	PASS
802.11ac (VHT80)							
155	5775	21.41	21.21	270.487	24.32	30	PASS



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5.5 POWER SPECTRAL DENSITY MEASUREMENT

5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSV 40	100964	July 05, 2014	July 04, 2015

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Dec. 09, 2014

5.5.3 TEST PROCEDURE

For 802.11a, 802.11ac (VHT20), 802.11ac (VHT40):

1. Set the RBW = 10 kHz, VBW = 30 kHz, Detector = power averaging (RMS).
2. Ensure that the number of measurement points in the sweep $\geq 2 \times$ span/RBW
3. Sweep time = auto couple,
4. Employ trace averaging (RMS) mode over a minimum of 100 traces.
5. Use the peak marker function to determine the maximum amplitude level.

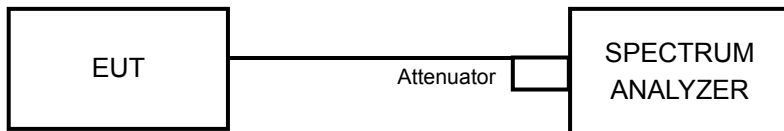
For 802.11ac (VHT80):

1. Set the RBW = 10 kHz, VBW = 30 kHz, Detector = power averaging (RMS).
2. Ensure that the number of measurement points in the sweep $\geq 2 \times$ span/RBW
3. Sweep time = auto couple,
4. Employ trace averaging (RMS) mode over a minimum of 100 traces.
5. Use the peak marker function to determine the maximum amplitude level.
6. Add $10 \log (1/x)$, where x is the duty cycle, to the measured PSD to compute the average PSD during the actual transmission time.

5.5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5.5 TEST SETUP



5.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6



5.5.7 TEST RESULTS

802.11a								
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL	
0	149	5745	-7.40	3.01	-4.39	8	PASS	
	157	5785	-7.76	3.01	-4.75	8	PASS	
	165	5825	-7.35	3.01	-4.34	8	PASS	
1	149	5745	-8.23	3.01	-5.22	8	PASS	
	157	5785	-8.49	3.01	-5.48	8	PASS	
	165	5825	-7.82	3.01	-4.81	8	PASS	
802.11ac (VHT20)								
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL	
0	149	5745	-7.68	3.01	-4.67	8	PASS	
	157	5785	-8.04	3.01	-5.03	8	PASS	
	165	5825	-7.03	3.01	-4.02	8	PASS	
1	149	5745	-8.44	3.01	-5.43	8	PASS	
	157	5785	-8.68	3.01	-5.67	8	PASS	
	165	5825	-7.99	3.01	-4.98	8	PASS	
802.11ac (VHT40)								
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL	
0	151	5755	-9.74	3.01	-6.73	8	PASS	
	159	5795	-11.25	3.01	-8.24	8	PASS	
1	151	5755	-11.99	3.01	-8.98	8	PASS	
	159	5795	-12.47	3.01	-9.46	8	PASS	
802.11ac (VHT80)								
TX CHAIN	CHANNEL	FREQ. (MHz)	PSD W/O DUTY FACTOR (dBm)	10 log (N=2) dB	DUTY FACTOR (dB)	TOTAL PSD WITH DUTY FACTOR (dBm)	LIMIT (dBm)	PASS /FAIL
0	155	5775	-13.78	3.01	0.13	-10.64	8	PASS
1	155	5775	-15.09	3.01	0.13	-11.95	8	PASS

Note : 1. Directional gain = 2.6dBi + 10log(2) = 5.61dBi < 6dBi , so the power density limit shall not be reduced.

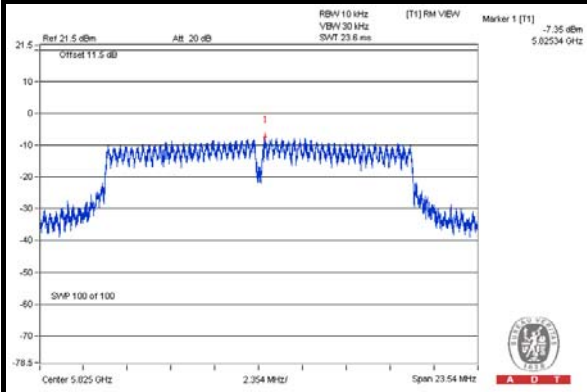
2. Refer to section 3.4 for duty cycle spectrum plot.



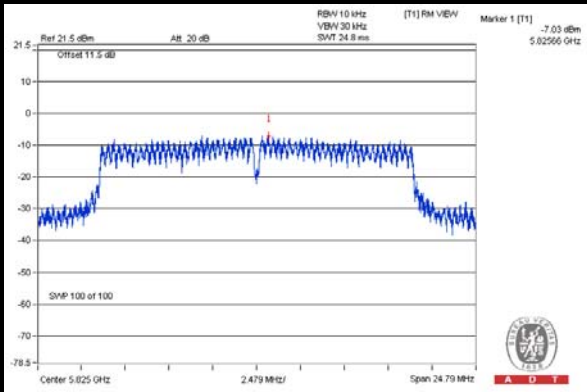
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SPECTRUM PLOT OF WORST VALUE

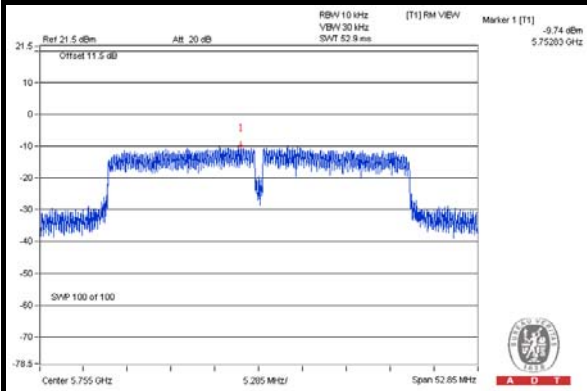
802.11a / Chain(0) : CH165



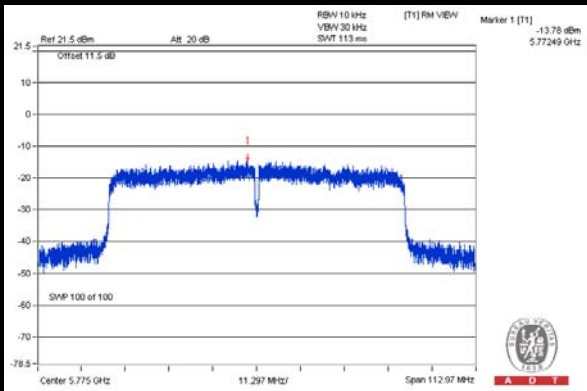
802.11ac (VHT20) / Chain(0) : CH165



802.11ac (VHT40) / Chain(0) : CH151



802.11ac (VHT80) / Chain(0) : CH155





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5.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

5.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

Below 30dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

5.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSV 40	100964	July 05, 2014	July 04, 2015

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Dec. 02, 2014

5.6.3 TEST PROCEDURE

Measurement Procedure - Reference Level

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

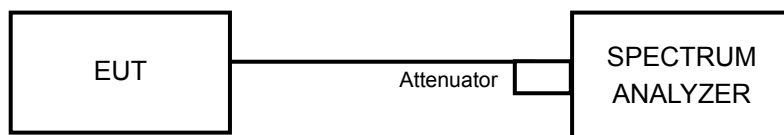
Measurement Procedure –Unwanted Emission Level

1. Set RBW = 100 kHz.
2. Set VBW \geq 300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

5.6.4 DEVIATION FROM TEST STANDARD

No deviation

5.6.5 TEST SETUP



5.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

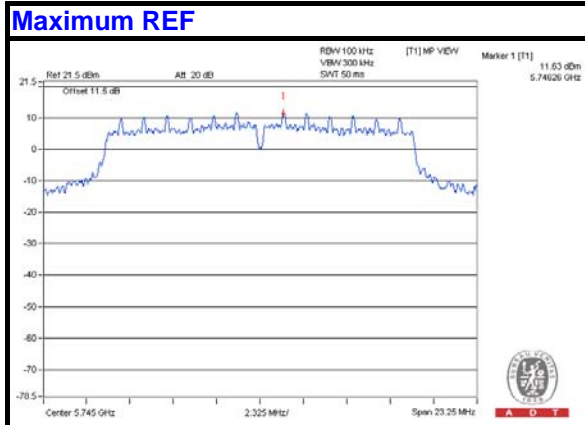
5.6.7 TEST RESULTS

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.



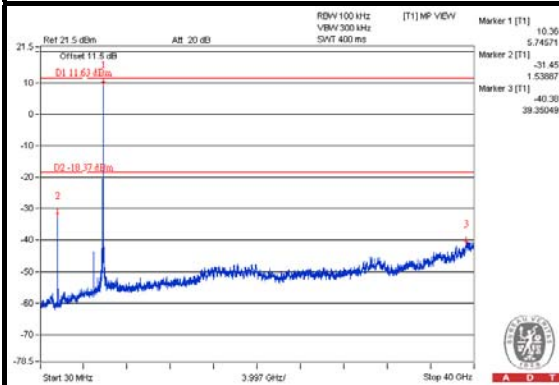
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802.11a

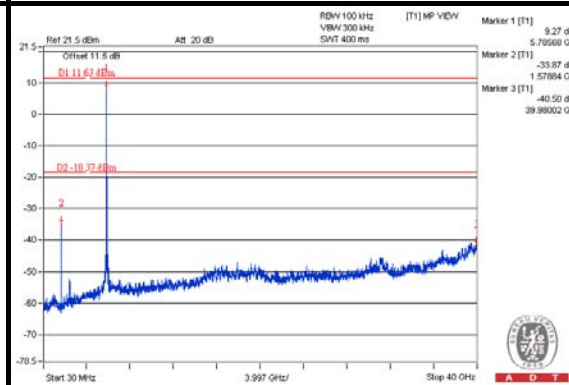


Chain(0)

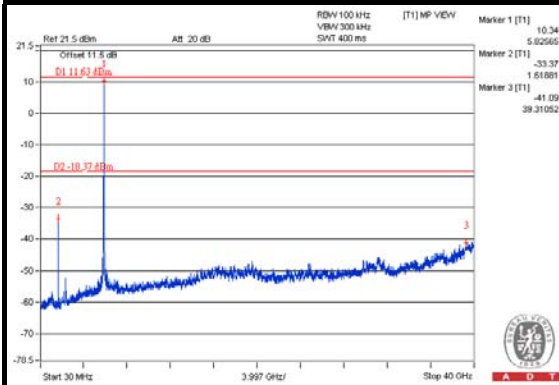
CH 149



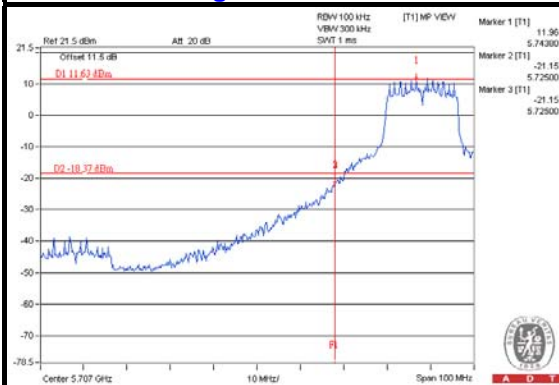
CH 157



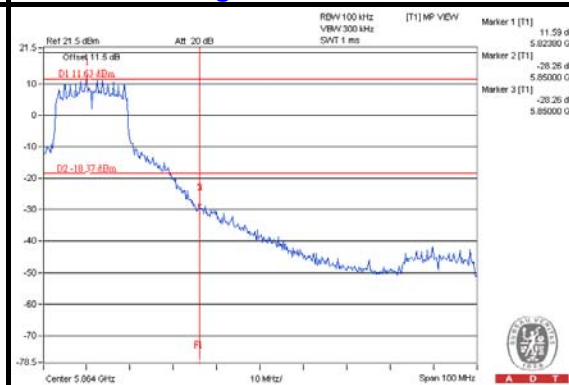
CH 165



CH 149 Band edge



CH 165 Band edge

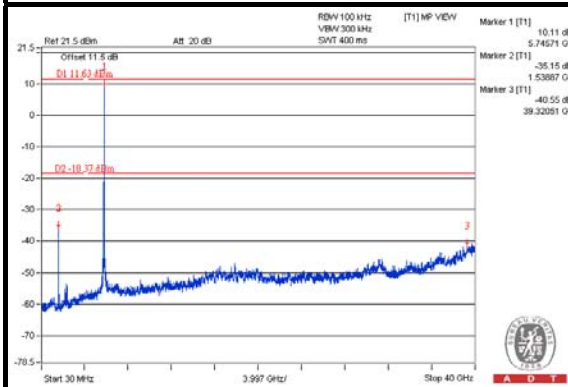




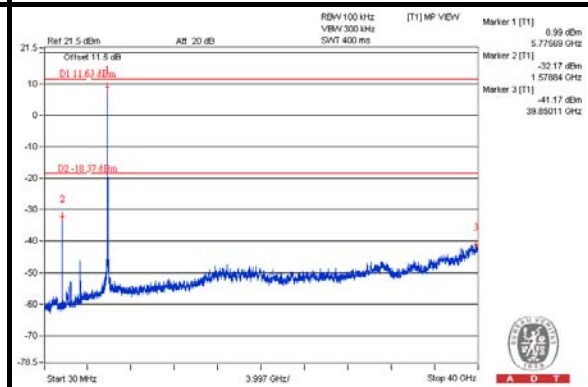
A D T

Chain(1)

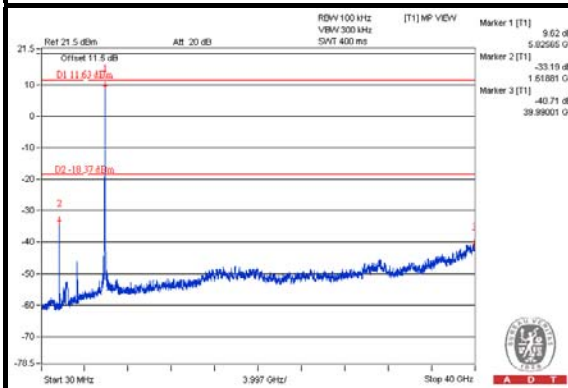
CH 149



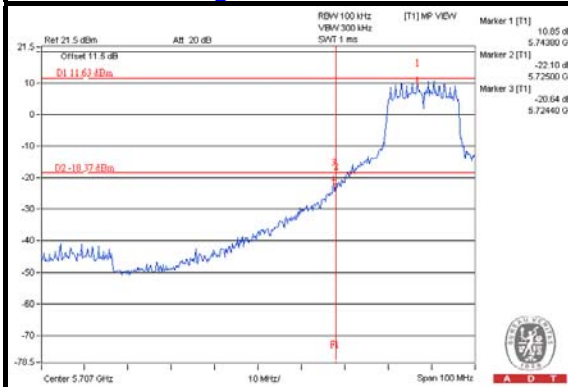
CH 157



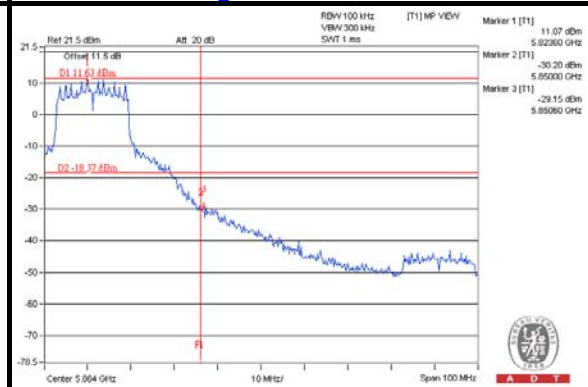
CH 165



CH 149 Band edge

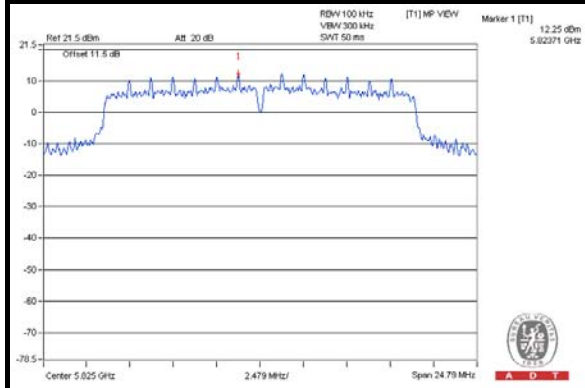


CH 165 Band edge



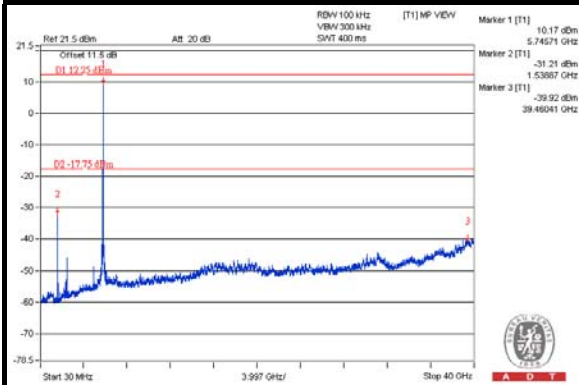
802.11ac (VHT20)

Maximum REF

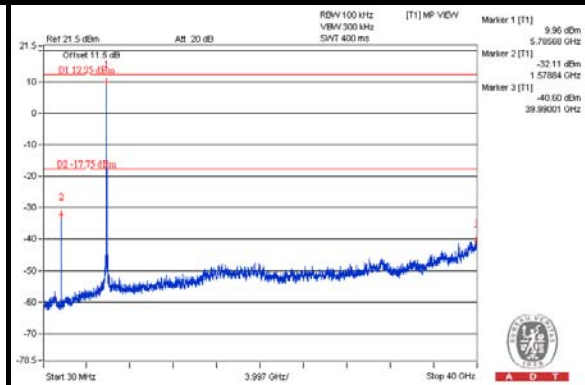


Chain(0)

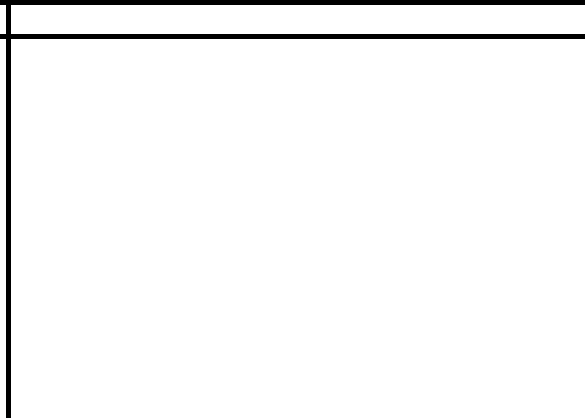
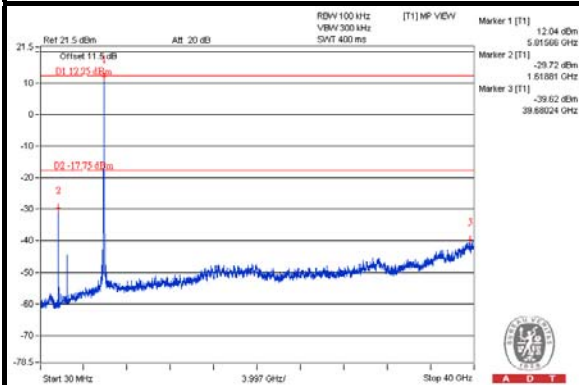
CH 149



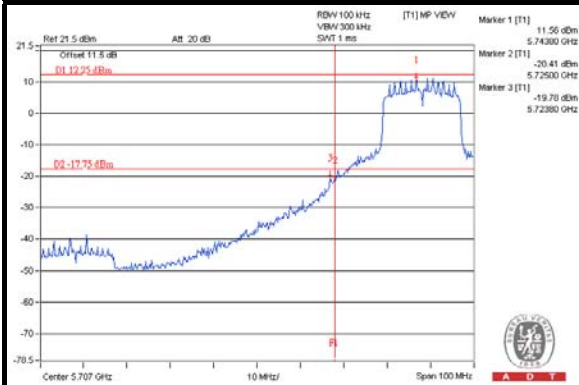
CH 157



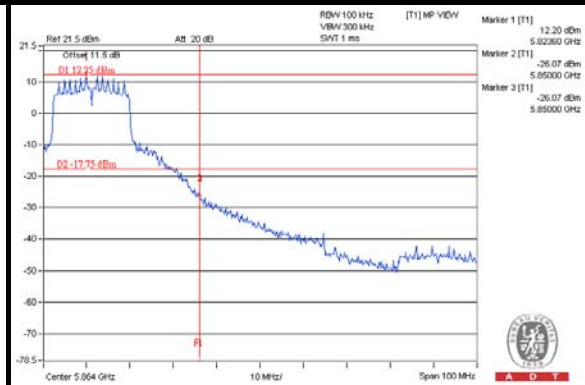
CH 165



CH 149 Band edge



CH 165 Band edge

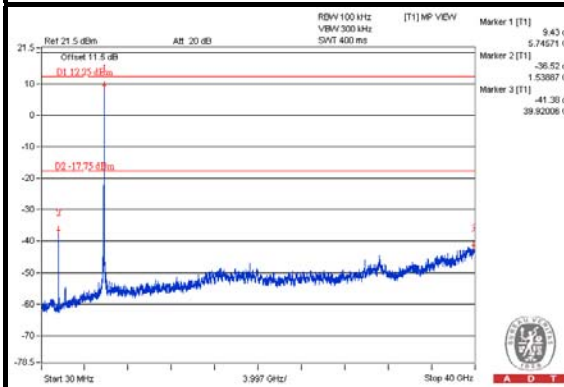




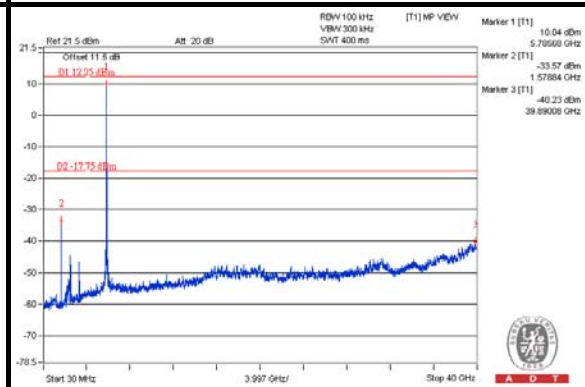
A D T

Chain(1)

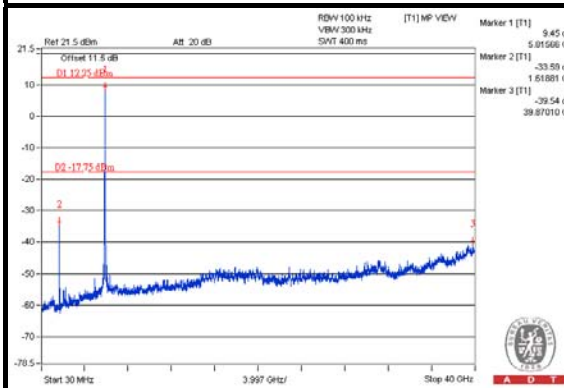
CH 149



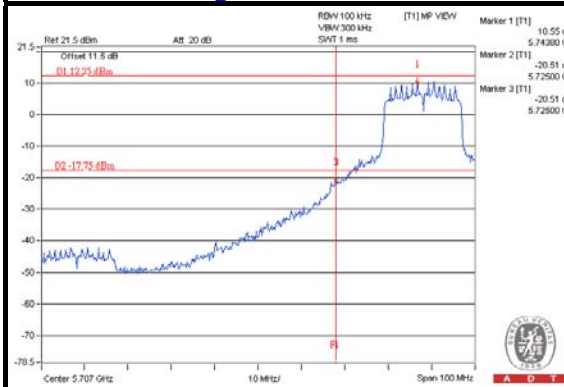
CH 157



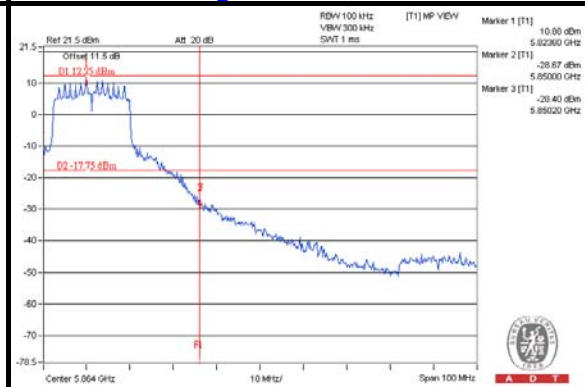
CH 165



CH 149 Band edge



CH 165 Band edge

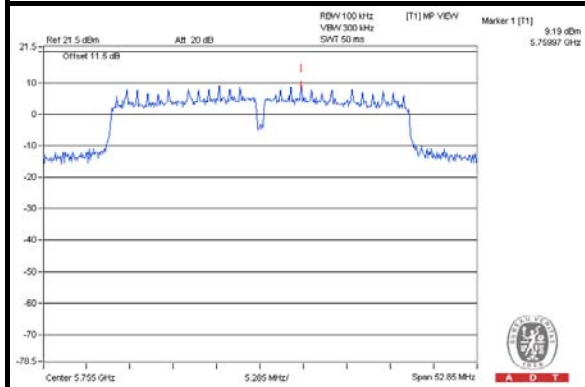




A D T

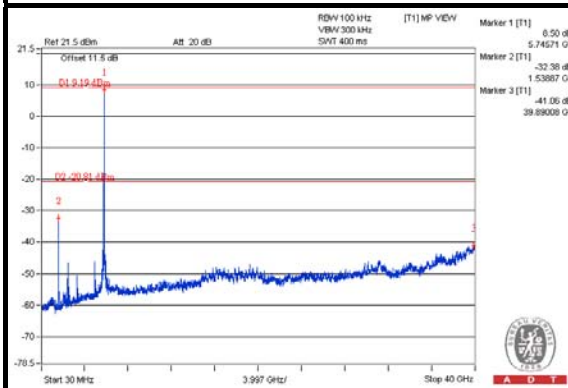
802.11ac (VHT40)

Maximum REF

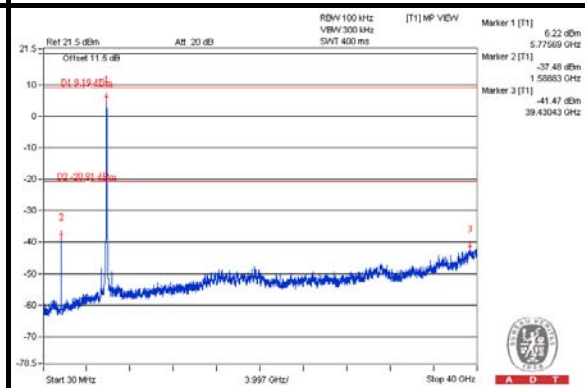


Chain(0)

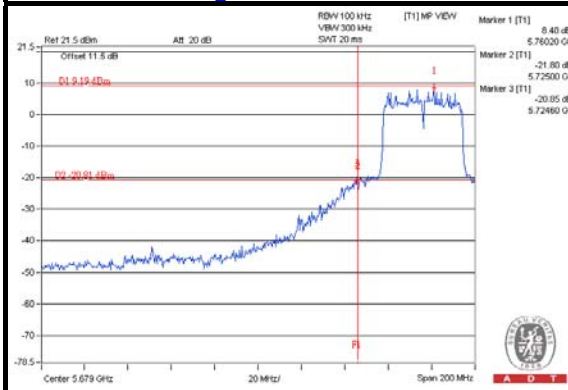
CH 151



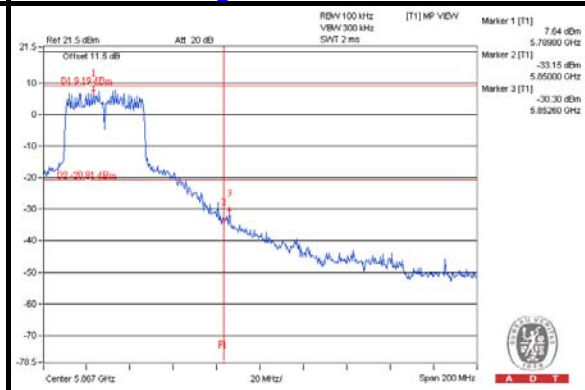
CH 159



CH 151 Band edge



CH 159 Band edge

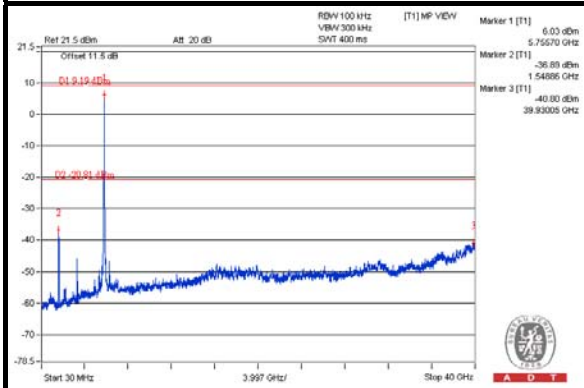




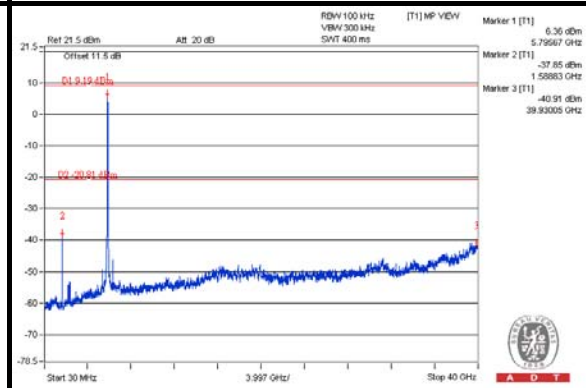
A D T

Chain(1)

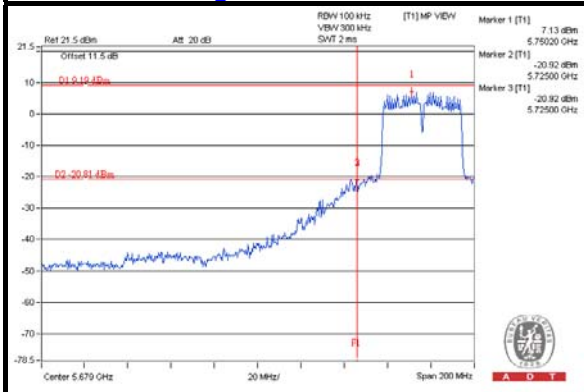
CH 151



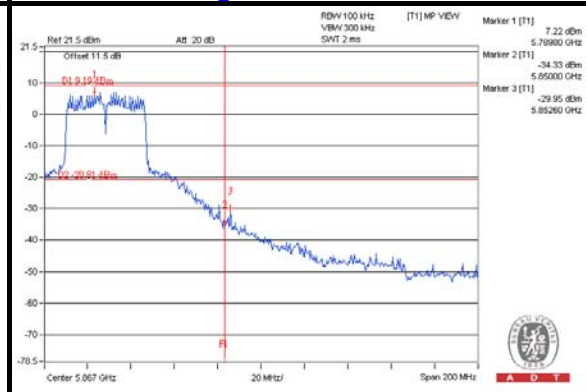
CH 159



CH 151 Band edge



CH 159 Band edge

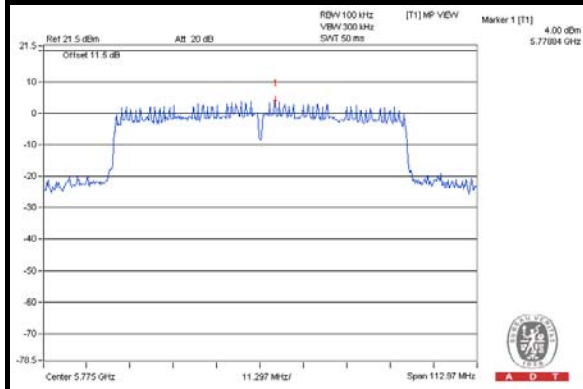




A D T

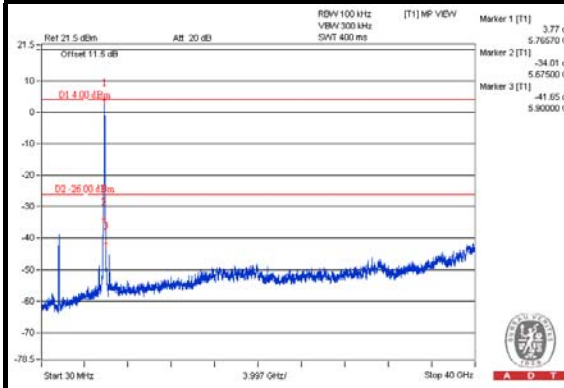
802.11ac (VHT80)

Maximum REF

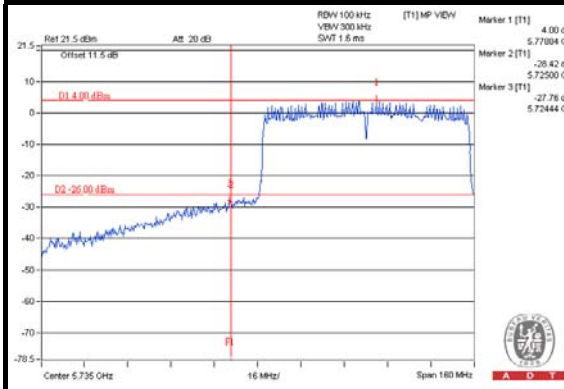


Chain(0)

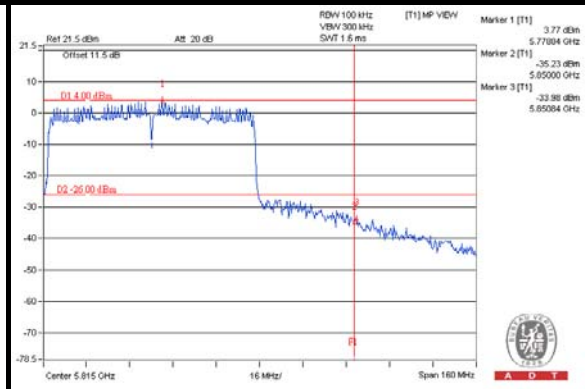
CH 155



CH 155 Band edge (Left)



CH 155 Band edge (Right)

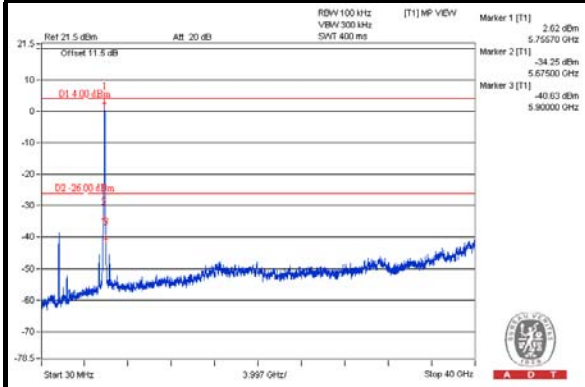




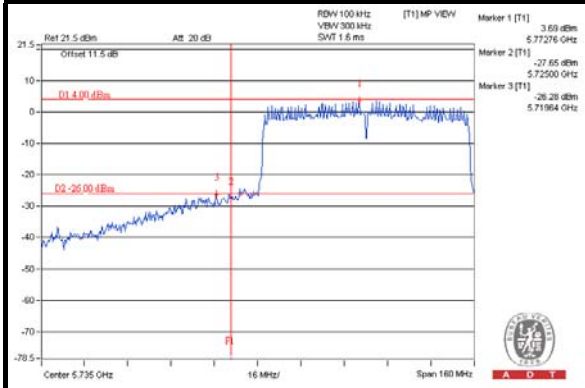
A D T

Chain(1)

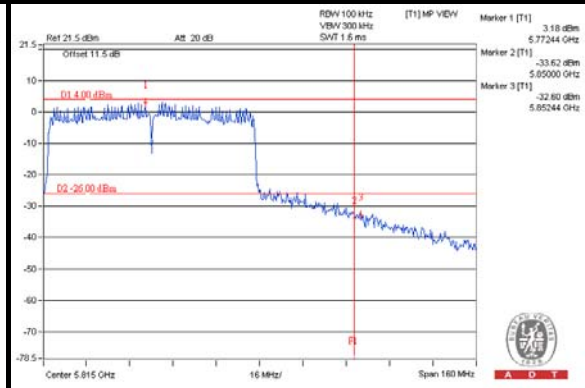
CH 155



CH 155 Band edge (Left)



CH 155 Band edge (Right)





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6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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





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7. INFORMATION ON THE TESTING LABORATORIES

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

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

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26052943

Hsin Chu EMC/RF/Telecom Lab:

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Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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



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

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

--- END ---