FCC TEST REPORT (15.247)

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MODEL NO.: C6250

FCC ID: PY314300292

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APPLICANT: NETGEAR, Inc.

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ISSUED BY: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF141106E03	Original release	Dec. 19, 2014

1. CERTIFICATION

PRODUCT:	Wireless Cable Gateway
BRAND NAME:	NETGEAR
MODEL NO.:	C6250
TEST SAMPLE:	ENGINEERING SAMPLE
APPLICANT:	NETGEAR, Inc.
TESTED:	Nov. 13 to 20, 2014
STANDARDS:	**FCC Part 15, Subpart C (Section 15.247)** ANSI C63.10-2009

The above equipment (Model: C6250) 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:** Dec. 19, 2014
(Claire Kuan, Specialist)

Approved By : _____ , **Date:** Dec. 19, 2014
(May Chen, Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 2.4GHz, 2400~2483.5MHz Band

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -5.22dB at 0.40781MHz.
15.205 15.209 15.247(d)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.2dB at 2483.50MHz.
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(MHF) not a standard connector.

For 5GHz, 5725~5850MHz Band

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -3.77dB at 0.38438MHz.
15.205 15.209 15.247(d)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -3.2dB at 75.32MHz.
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(MHF) 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 5.15~5.25GHzGHz RF parameters was recorded in another test report.

2.1 MEASUREMENT UNCERTAINTY

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

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

Measurement	Value
Conducted emissions	2.86 dB
Radiated emissions (30MHz-1GHz)	5.43 dB
Radiated emissions (1GHz -6GHz)	3.65 dB
Radiated emissions (6GHz -18GHz)	3.88 dB
Radiated emissions (18GHz -40GHz)	4.11 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless Cable Gateway
MODEL NO.	C6250
POWER SUPPLY	DC 12V from adapter power
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 450Mbps 802.11ac: up to 1300Mbps
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** **CDD Mode:** 802.11a: 295.272mW **Beamforming Mode:** 802.11ac (VHT20): 318.911mW 802.11ac (VHT40): 372.052mW 802.11ac (VHT80): 63.742mW **For 15.247 (2.4GHz)** 802.11b: 78.163mW 802.11g: 144.901mW 802.11n (HT20): 120.989mW 802.11n (HT40): 35.396mW **For 15.247 (5GHz)** **CDD Mode:** 802.11a: 594.541mW **Beamforming Mode:** 802.11ac (VHT20): 596.397mW 802.11ac (VHT40): 583.372mW 802.11ac (VHT80): 119.576mW
ANTENNA TYPE	Refer to note as below
DATA CABLE	RJ-45 cable (Unshielded or Shielded, 1.5m)
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	Adapter x 1

Note:

1. 2.4GHz and 5GHz technology can transmit at same time.
2. The emission of the simultaneous operation (2.4GHz & 5GHz) has been evaluated and no non-compliance was found.
3. The EUT must be supplied with a adapter, there are two different models could be chosen as following table:

No	Brand	Model No.	Spec.
1	NETGEAR	P030WF120B	Input: 100-240V, 1.0A, 50-60Hz Output: 12V, 2.5A DC output cable (Unshielded, 1.8m)
2	NETGEAR	SAS030F1 NA	Input: 100-120V, 0.9A, 47-63Hz Output: 12V, 2.5A DC output cable (Unshielded, 1.8m)

For radiated test, the EUT was pre-tested with above adapters, the worse case was found in **adapter 1**. Therefore only the test data of the adapter was recorded in this report.

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

2.4GHz							
PCB Chain No.	Brand	Model	Antenna Gain(dBi) < including cable loss>	Frequency range	Antenna Type	Connecter Type	Cable Length (mm)
Chain 0	Netgear	NA	3.8	2.4~2.4835 GHz	PCB	i-pex(MHF)	125
Chain 1	Netgear	NA	3.3	2.4~2.4835 GHz	PCB	i-pex(MHF)	250
5GHz							
PCB Chain No.	Brand	Model	Antenna Gain(dBi) < including cable loss>	Frequency range	Antenna Type	Connecter Type	Cable Length (mm)
Chain 0	Netgear	NA	3.5	5.15~5.85 GHz	PCB	i-pex(MHF)	113
Chain 1	Netgear	NA	3.6	5.15~5.85 GHz	PCB	i-pex(MHF)	125
Chain 2	Netgear	NA	2.8	5.15~5.85 GHz	PCB	i-pex(MHF)	75

5. The EUT incorporates a MIMO function.

2.4GHz			
MODULATION MODE	**DATA RATE (MCS)**	**TX / RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	1TX (Fixed Chain 1)	1RX
802.11g	6 ~ 54Mbps	2TX	2RX
802.11n (HT20) & 802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
5GHz			
MODULATION MODE	**DATA RATE (MCS)**	**TX / RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	3TX	3RX
802.11n (HT20) & 802.11n (HT40)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11ac (VHT20)	MCS0~8 Nss= 1	3TX	3RX
	MCS0~8 Nss= 2	3TX	3RX
	MCS0~9 Nss= 3	3TX	3RX
802.11ac (VHT40) & 802.11ac (VHT80)	MCS0~9 Nss= 1	3TX	3RX
	MCS0~9 Nss= 2	3TX	3RX
	MCS0~9 Nss= 3	3TX	3RX

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)

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

3.2 DESCRIPTION OF TEST MODES

Operated in 2400 ~ 2483.5MHz band:

11 channels are provided for 802.11b, 802.11g, 802.11n (HT20):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

7 channels are provided for 802.11n (HT40):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

Operated in 5725 ~ 5850MHz band:

5 channels are provided for 802.11a, 802.11n (HT20), 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	
1	√	√	√	√	√	With Adapter 1
2	√	-	-	-	-	With Adapter 2

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

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

OB: Conducted Out-Band Emission Measurement

POWER LINE CONDUCTED EMISSION TEST:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

CDD MODE					
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.

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

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
PLC	26deg. C, 70,%RH	120Vac, 60Hz	Wythe Lin
RE<1G	26deg. C, 70%RH	120Vac, 60Hz	Gary Cheng
RE≥1G	23deg. C, 66%RH	120Vac, 60Hz	Tim Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen
OB	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

For 5GHz:

EUT CONFIGURE MODE	APPLICABLE TO					DESCRIPTION
	PLC	RE < 1G	RE ≥ 1G	APCM	OB	
1	√	√	√	√	√	With Adapter 1
2	√	-	-	-	-	With Adapter 2

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

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

OB: Conducted Out-Band Emission Measurement

POWER LINE CONDUCTED EMISSION TEST:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Beamforming MODE					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11ac (VHT20)	149 to 165	157	OFDM	BPSK	6.5

RADIATED EMISSION TEST (BELOW 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Beamforming MODE					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11ac (VHT20)	149 to 165	157	OFDM	BPSK	6.5

RADIATED EMISSION TEST (ABOVE 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

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

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

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

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
PLC	26deg. C, 70,%RH	120Vac, 60Hz	Wythe Lin
RE<1G	26deg. C, 70%RH	120Vac, 60Hz	Gary Cheng
RE≥1G	23deg. C, 66%RH	120Vac, 60Hz	Tim Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen
OB	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

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

If duty cycle of test signal is ≥ 98 %, duty factor is not required.

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

For 2.4GHz

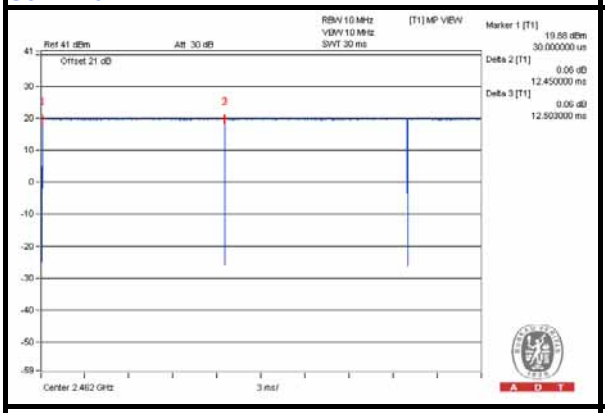
802.11b: Duty cycle = 12.45 ms/12.503 ms = 0.996

802.11g: Duty cycle = 2.065 ms/2.09 ms = 0.988

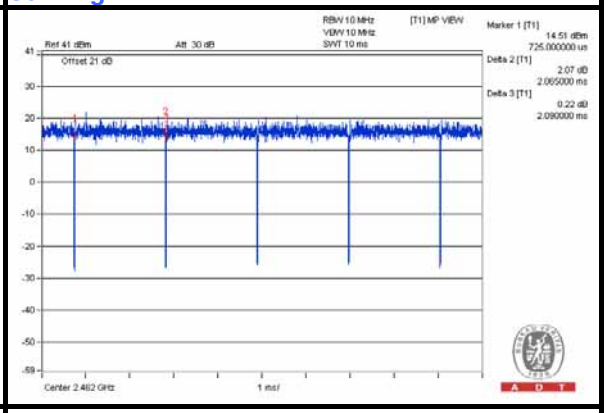
802.11n(HT20): Duty cycle = 1.9 ms/1.928 ms = 0.985

802.11n(HT40): Duty cycle = 0.934 ms/0.959 ms = 0.974, Duty factor = 10 * log(1/0.974) = 0.11

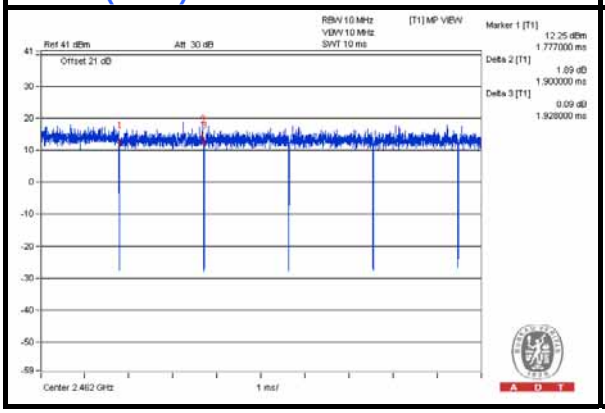
802.11b



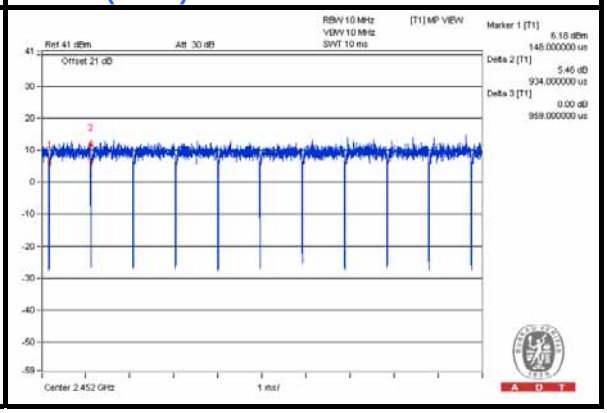
802.11g



802.11n(HT20)



802.11n(HT40)



If duty cycle of test signal is ≥ 98 %, duty factor is not required.

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

For 5GHz

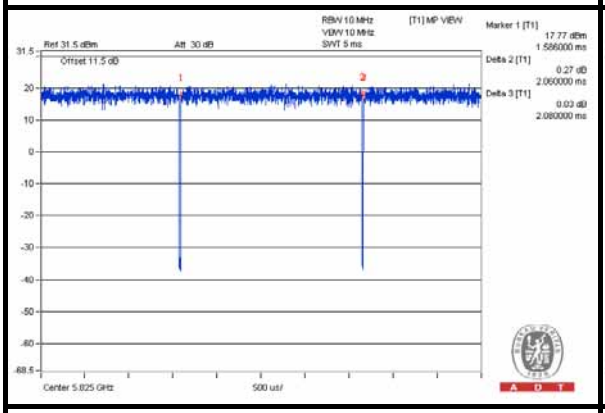
802.11a: Duty cycle = 2.063 ms/2.085 ms = 0.989

802.11ac (VHT20): Duty cycle = 1.917 ms/1.939 ms = 0.989

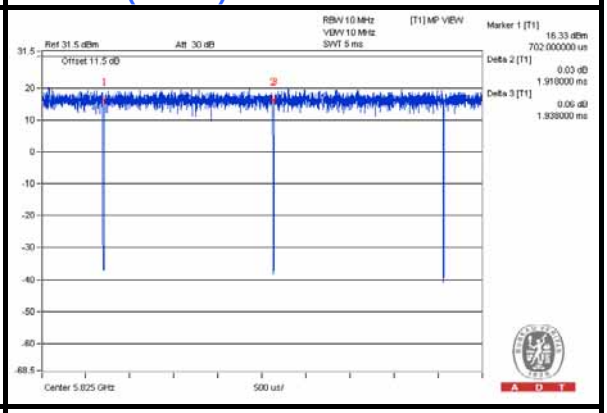
802.11ac (VHT40): Duty cycle = 0.945 ms/0.964 ms = 0.98

802.11ac (VHT80): Duty cycle = 0.459 ms/0.479 ms = 0.958, Duty factor = 10 * log(1/0.958) = 0.19

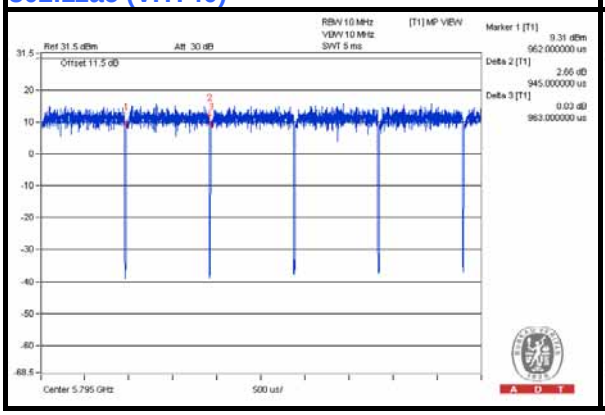
802.11a



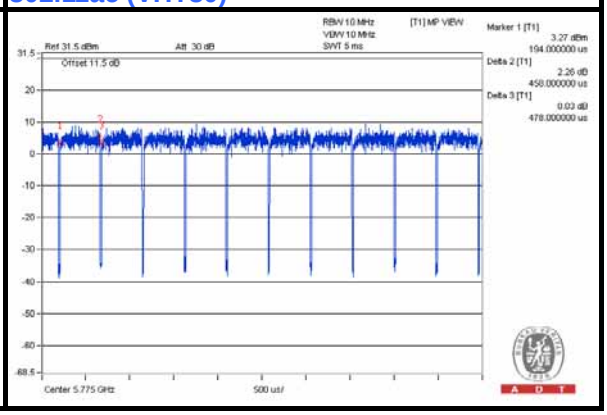
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



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.

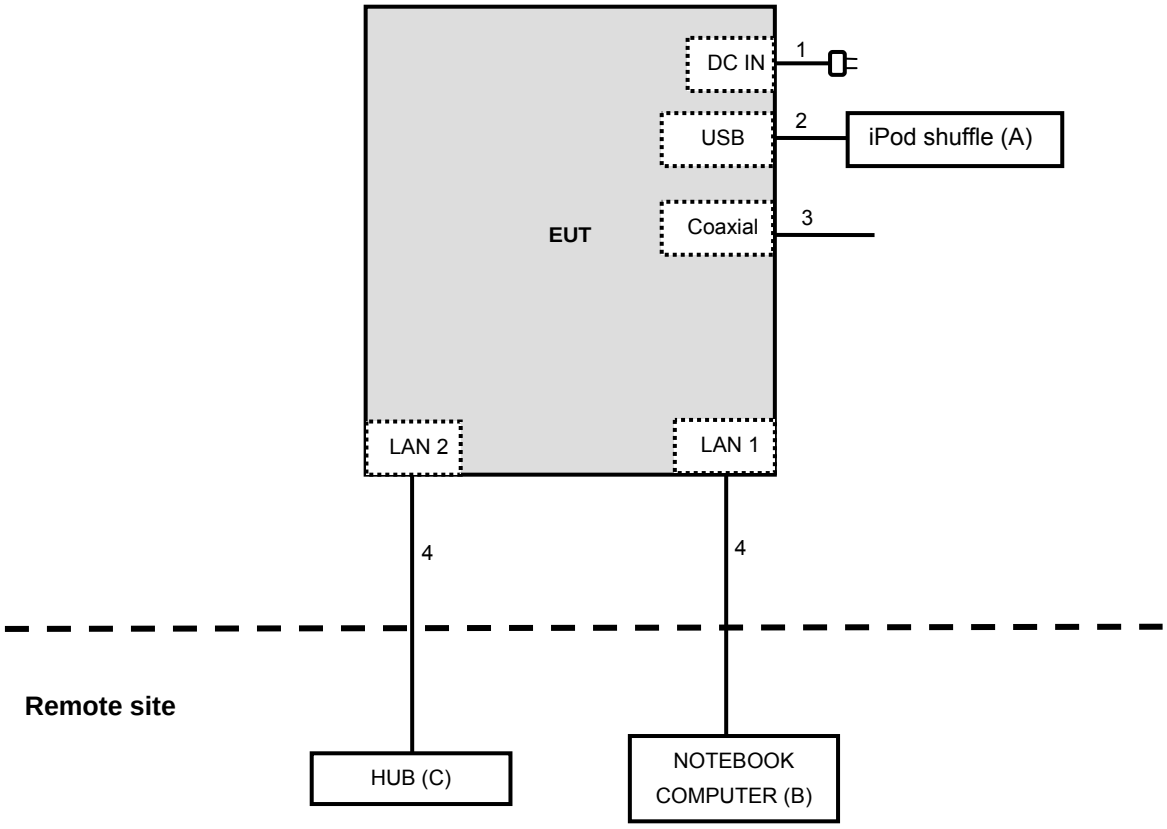
No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	iPod shuffle	Apple	MC749TA/A	CC4DN25WDFDM	NA	Provided by Lab
B	NOTEBOOK COMPUTER	DELL	PP32LA	HSLB32S	FCC DoC	Provided by Lab
C	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab

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	DC	1	1.8	No	0	Supplied by client
2	USB	1	0.1	Yes	0	Provided by Lab
3	Coaxial	1	10	No	0	Provided by Lab
4	RJ-45	1	10	No	0	Provided by Lab

3.6 CONFIGURATION OF SYSTEM UNDER TEST



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

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver 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. 11, 2014	Nov. 10, 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.

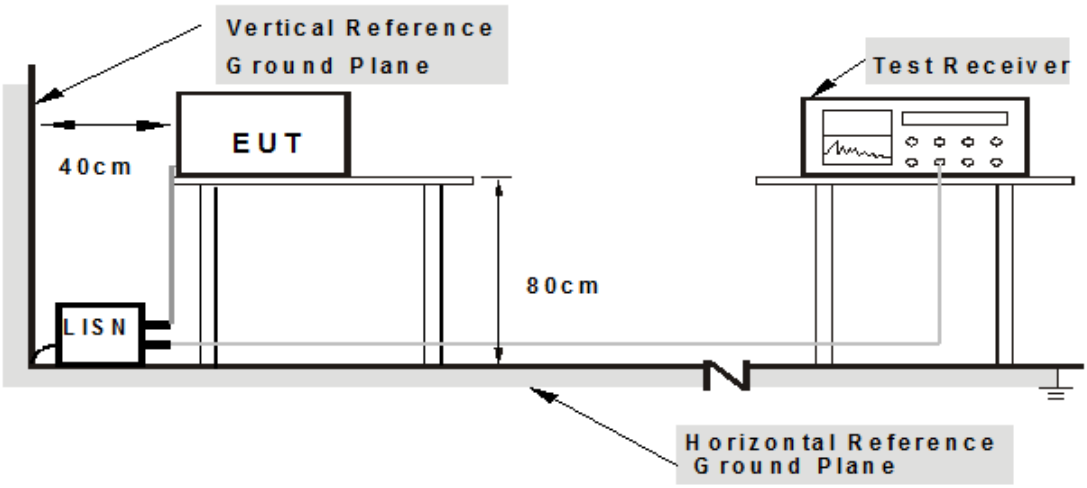
NOTE:

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.

4.1.6 EUT OPERATING CONDITIONS

1. Placed the EUT on testing table.
2. Prepared computer system (support unit B) to act as communication partner.
3. The communication partner ran test program “(MTool.exe [2.0.1.1])” to enable EUT under transmission/receiving condition continuously.

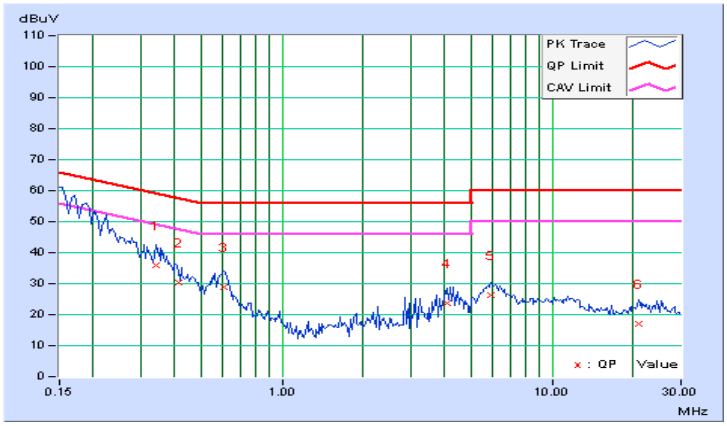
4.1.7 TEST RESULTS (With adapter 1)

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

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.34141	0.08	35.68	25.45	35.76	25.53	59.17	49.17	-23.40	-23.63
2	0.41563	0.09	30.22	17.86	30.31	17.95	57.54	47.54	-27.22	-29.58
3	0.60703	0.10	28.84	21.74	28.94	21.84	56.00	46.00	-27.06	-24.16
4	4.10547	0.25	23.60	12.14	23.85	12.39	56.00	46.00	-32.15	-33.61
5	5.91406	0.31	26.13	21.52	26.44	21.83	60.00	50.00	-33.56	-28.17
6	20.94141	0.72	16.18	10.54	16.90	11.26	60.00	50.00	-43.10	-38.74

REMARKS:

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

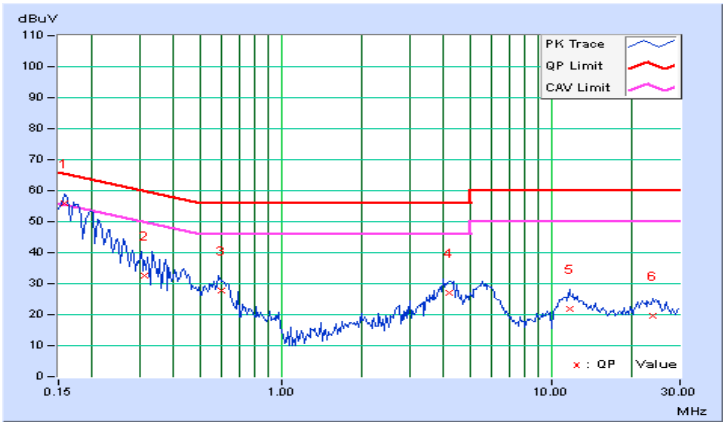


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	0.06	55.70	45.24	55.76	45.30	65.58	55.58	-9.81	-10.27
2	0.31406	0.08	32.53	21.05	32.61	21.13	59.86	49.86	-27.26	-28.74
3	0.59922	0.10	27.59	20.70	27.69	20.80	56.00	46.00	-28.31	-25.20
4	4.17578	0.27	26.95	16.92	27.22	17.19	56.00	46.00	-28.78	-28.81
5	11.70313	0.51	21.50	16.49	22.01	17.00	60.00	50.00	-37.99	-33.00
6	23.75000	0.82	18.76	11.98	19.58	12.80	60.00	50.00	-40.42	-37.20

REMARKS:

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



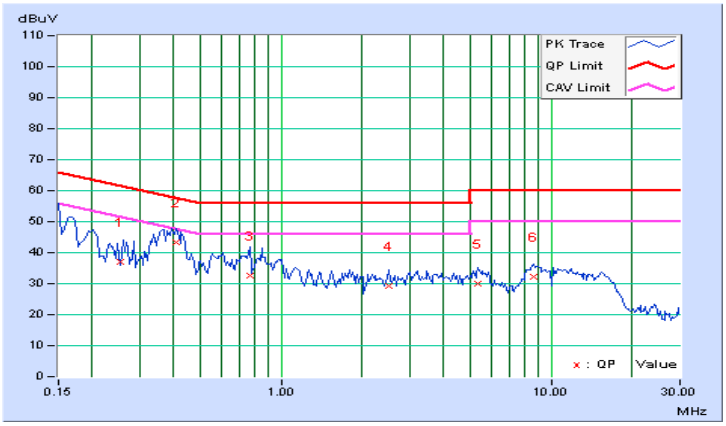
4.1.8 TEST RESULTS (With adapter 2)

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

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.25547	0.08	36.91	25.16	36.99	25.24	61.58	51.58	-24.59	-26.34
2	0.40781	0.09	43.40	37.10	43.49	37.19	57.69	47.69	-14.20	-10.50
3	0.76328	0.11	32.46	26.99	32.57	27.10	56.00	46.00	-23.43	-18.90
4	2.50391	0.20	28.90	23.88	29.10	24.08	56.00	46.00	-26.90	-21.92
5	5.36719	0.30	29.67	23.99	29.97	24.29	60.00	50.00	-30.03	-25.71
6	8.60938	0.40	31.69	27.21	32.09	27.61	60.00	50.00	-27.91	-22.39

REMARKS:

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

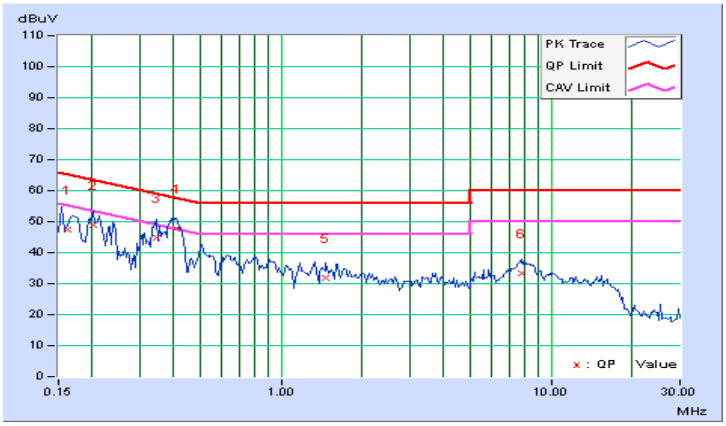


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16191	0.06	47.41	35.90	47.47	35.96	65.37	55.37	-17.89	-19.40
2	0.20078	0.06	48.71	42.77	48.77	42.83	63.58	53.58	-14.81	-10.75
3	0.34531	0.08	44.82	36.22	44.90	36.30	59.07	49.07	-14.17	-12.77
4	**0.40781**	**0.09**	**47.77**	**42.38**	**47.86**	**42.47**	**57.69**	**47.69**	**-9.83**	**-5.22**
5	1.46875	0.15	31.55	26.78	31.70	26.93	56.00	46.00	-24.30	-19.07
6	7.73047	0.38	33.07	28.75	33.45	29.13	60.00	50.00	-26.55	-20.87

REMARKS:

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



4.2 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

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

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

NOTE:

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

4.2.2 TEST INSTRUMENTS

For Below 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY50010156	Aug. 11, 2014	Aug. 10, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-04	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Feb. 27, 2014	Feb. 26, 2015
RF Cable	NA	CHHCAB_001	Oct. 05, 2014	Oct. 04, 2015
Horn_Antenna AISI	AIH.8018	0000220091110	Aug. 26, 2014	Aug. 25, 2015
Pre-Amplifier Agilent	8449B	300801923	Oct. 28, 2014	Oct. 27, 2015
RF Cable	NA	131206 131215 SNMY23685/4	Jan. 17, 2014	Jan. 16, 2015
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Pre-Amplifier EMCI	EMC184045	980143	Jan. 17, 2014	Jan. 16, 2015
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
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
5. The CANADA Site Registration No. is IC 7450H-3.
6. Tested Date: Nov. 14, 2014

For Above 1GHz:

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. 12, 2014	Nov. 11, 2015
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 AISI	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 EMCI	EMC184045	980143	Jan. 17, 2014	Jan. 16, 2015
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: Nov. 13, 2014

4.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

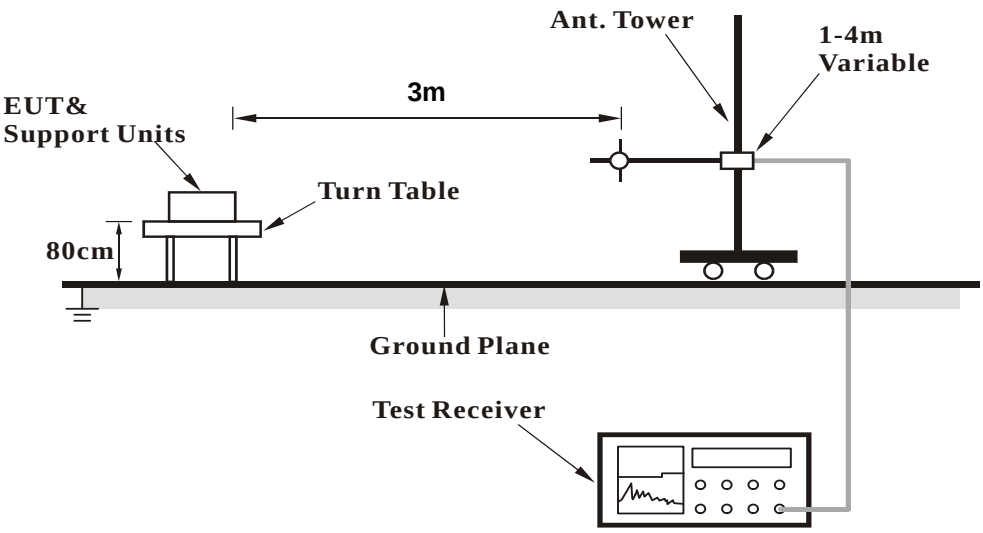
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.2.4 DEVIATION FROM TEST STANDARD

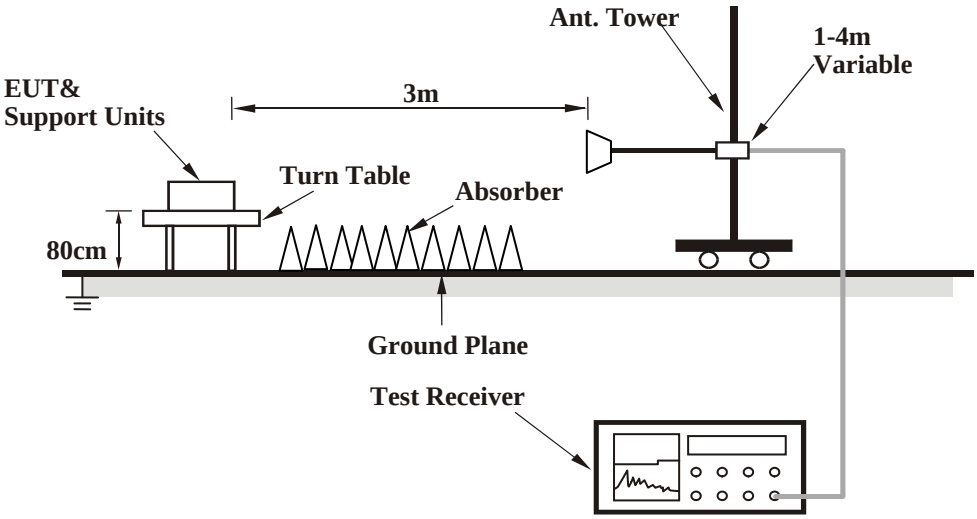
No deviation

4.2.5 TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

CDD MODE

802.11g

CHANNEL	TX Channel 6	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 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	109.15	37.3 QP	43.5	-6.2	1.50 H	93	53.38	-16.08
2	117.59	35.4 QP	43.5	-8.1	2.00 H	115	50.61	-15.18
3	163.28	33.8 QP	43.5	-9.8	1.50 H	84	46.85	-13.10
4	174.20	33.7 QP	43.5	-9.8	1.00 H	110	47.51	-13.77
5	250.00	38.5 QP	46.0	-7.5	1.00 H	281	52.38	-13.91
6	290.54	38.2 QP	46.0	-7.8	1.00 H	44	50.48	-12.28
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	38.44	36.4 QP	40.0	-3.7	1.00 V	227	50.28	-13.93
2	75.28	36.7 QP	40.0	-3.3	1.00 V	145	53.36	-16.63
3	108.38	37.7 QP	43.5	-5.9	1.00 V	94	53.80	-16.15
4	250.00	35.5 QP	46.0	-10.6	1.50 V	336	49.36	-13.91
5	256.54	35.7 QP	46.0	-10.3	2.00 V	0	49.46	-13.73
6	332.06	33.0 QP	46.0	-13.0	1.50 V	333	43.80	-10.80

REMARKS:

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

ABOVE 1GHz DATA

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.3 PK	74.0	-16.7	1.00 H	221	59.77	-2.47
2	2390.00	50.0 AV	54.0	-4.0	1.00 H	221	52.47	-2.47
3	*2412.00	105.3 PK			1.00 H	221	107.67	-2.37
4	*2412.00	102.7 AV			1.00 H	221	105.07	-2.37
5	4824.00	54.6 PK	74.0	-19.4	1.65 H	209	48.89	5.71
6	4824.00	47.6 AV	54.0	-6.4	1.65 H	209	41.89	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	60.4 PK	74.0	-13.6	1.00 V	99	62.87	-2.47
2	2390.00	53.1 AV	54.0	-0.9	1.00 V	99	55.57	-2.47
3	*2412.00	108.2 PK			1.00 V	99	110.57	-2.37
4	*2412.00	105.8 AV			1.00 V	99	108.17	-2.37
5	4824.00	51.7 PK	74.0	-22.3	1.00 V	359	45.99	5.71
6	4824.00	42.9 AV	54.0	-11.1	1.00 V	359	37.19	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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	48.4 PK	74.0	-25.6	1.08 H	218	50.87	-2.47
2	2390.00	35.7 AV	54.0	-18.3	1.08 H	218	38.17	-2.47
3	*2437.00	107.1 PK			1.08 H	218	109.35	-2.25
4	*2437.00	104.2 AV			1.08 H	218	106.45	-2.25
5	2483.50	55.8 PK	74.0	-18.2	1.08 H	218	57.83	-2.03
6	2483.50	42.7 AV	54.0	-11.3	1.08 H	218	44.73	-2.03
7	4874.00	55.7 PK	74.0	-18.3	1.39 H	149	49.80	5.90
8	4874.00	53.1 AV	54.0	-0.9	1.39 H	149	47.20	5.90
9	7311.00	52.2 PK	74.0	-21.8	1.13 H	301	39.03	13.17
10	7311.00	40.1 AV	54.0	-13.9	1.13 H	301	26.93	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	51.4 PK	74.0	-22.6	1.28 V	154	53.87	-2.47
2	2390.00	38.9 AV	54.0	-15.1	1.28 V	154	41.37	-2.47
3	*2437.00	109.6 PK			1.28 V	154	111.85	-2.25
4	*2437.00	107.0 AV			1.28 V	154	109.25	-2.25
5	2483.50	58.3 PK	74.0	-15.7	1.28 V	154	60.33	-2.03
6	2483.50	45.3 AV	54.0	-8.7	1.28 V	154	47.33	-2.03
7	4874.00	51.9 PK	74.0	-22.1	1.00 V	264	46.00	5.90
8	4874.00	43.8 AV	54.0	-10.2	1.00 V	264	37.90	5.90
9	7311.00	52.9 PK	74.0	-21.1	1.00 V	249	39.73	13.17
10	7311.00	40.8 AV	54.0	-13.2	1.00 V	249	27.63	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.

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	105.5 PK			1.09 H	218	107.64	-2.14
2	*2462.00	102.7 AV			1.09 H	218	104.84	-2.14
3	2483.50	56.9 PK	74.0	-17.1	1.09 H	218	58.93	-2.03
4	2483.50	50.3 AV	54.0	-3.7	1.09 H	218	52.33	-2.03
5	4924.00	53.1 PK	74.0	-20.9	1.66 H	152	46.99	6.11
6	4924.00	47.6 AV	54.0	-6.4	1.66 H	152	41.49	6.11
7	7386.00	53.9 PK	74.0	-20.1	1.00 H	310	40.72	13.18
8	7386.00	39.9 AV	54.0	-14.1	1.00 H	310	26.72	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	108.3 PK			1.29 V	156	110.44	-2.14
2	*2462.00	105.7 AV			1.29 V	156	107.84	-2.14
3	2483.50	59.8 PK	74.0	-14.2	1.29 V	156	61.83	-2.03
4	2483.50	53.4 AV	54.0	-0.6	1.29 V	156	55.43	-2.03
5	4924.00	51.8 PK	74.0	-22.2	1.01 V	255	45.69	6.11
6	4924.00	44.0 AV	54.0	-10.0	1.01 V	255	37.89	6.11
7	7386.00	52.8 PK	74.0	-21.2	1.00 V	242	39.62	13.18
8	7386.00	40.7 AV	54.0	-13.3	1.00 V	242	27.52	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.

CDD_MODE

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	69.7 PK	74.0	-4.3	1.07 H	210	72.17	-2.47
2	2390.00	48.7 AV	54.0	-5.3	1.07 H	210	51.17	-2.47
3	*2412.00	105.9 PK			1.07 H	210	108.27	-2.37
4	*2412.00	96.4 AV			1.07 H	210	98.77	-2.37
5	4824.00	52.4 PK	74.0	-21.6	1.65 H	135	46.69	5.71
6	4824.00	44.4 AV	54.0	-9.6	1.65 H	135	38.69	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	73.1 PK	74.0	-0.9	1.00 V	97	75.57	-2.47
2	2390.00	51.9 AV	54.0	-2.1	1.00 V	97	54.37	-2.47
3	*2412.00	109.4 PK			1.00 V	97	111.77	-2.37
4	*2412.00	99.7 AV			1.00 V	97	102.07	-2.37
5	4824.00	51.5 PK	74.0	-22.5	1.01 V	273	45.79	5.71
6	4824.00	43.7 AV	54.0	-10.3	1.01 V	273	37.99	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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.2 PK	74.0	-7.8	1.08 H	220	68.67	-2.47
2	2390.00	44.7 AV	54.0	-9.3	1.08 H	220	47.17	-2.47
3	*2437.00	113.8 PK			1.08 H	220	116.05	-2.25
4	*2437.00	103.6 AV			1.08 H	220	105.85	-2.25
5	2483.50	70.5 PK	74.0	-3.5	1.08 H	220	72.53	-2.03
6	2483.50	47.9 AV	54.0	-6.1	1.08 H	220	49.93	-2.03
7	4874.00	52.0 PK	74.0	-22.0	1.69 H	145	46.10	5.90
8	4874.00	43.9 AV	54.0	-10.1	1.69 H	145	38.00	5.90
9	7311.00	52.2 PK	74.0	-21.8	1.09 H	313	39.03	13.17
10	7311.00	40.3 AV	54.0	-13.7	1.09 H	313	27.13	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	69.3 PK	74.0	-4.7	1.00 V	98	71.77	-2.47
2	2390.00	48.0 AV	54.0	-6.0	1.00 V	98	50.47	-2.47
3	*2437.00	116.8 PK			1.00 V	98	119.05	-2.25
4	*2437.00	106.8 AV			1.00 V	98	109.05	-2.25
5	2483.50	73.3 PK	74.0	-0.7	1.00 V	98	75.33	-2.03
6	2483.50	50.5 AV	54.0	-3.5	1.00 V	98	52.53	-2.03
7	4874.00	51.8 PK	74.0	-22.2	1.05 V	267	45.90	5.90
8	4874.00	44.0 AV	54.0	-10.0	1.05 V	267	38.10	5.90
9	7311.00	53.2 PK	74.0	-20.8	1.10 V	229	40.03	13.17
10	7311.00	41.0 AV	54.0	-13.0	1.10 V	229	27.83	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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	109.0 PK			1.10 H	206	111.14	-2.14
2	*2462.00	98.8 AV			1.10 H	206	100.94	-2.14
3	2483.50	66.7 PK	74.0	-7.3	1.10 H	206	68.73	-2.03
4	2483.50	51.1 AV	54.0	-2.9	1.10 H	206	53.13	-2.03
5	4924.00	52.1 PK	74.0	-21.9	1.66 H	145	45.99	6.11
6	4924.00	44.1 AV	54.0	-9.9	1.66 H	145	37.99	6.11
7	7386.00	51.6 PK	74.0	-22.4	1.08 H	300	38.42	13.18
8	7386.00	39.8 AV	54.0	-14.2	1.08 H	300	26.62	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	112.3 PK			1.00 V	97	114.44	-2.14
2	*2462.00	101.8 AV			1.00 V	97	103.94	-2.14
3	2483.50	69.3 PK	74.0	-4.7	1.00 V	97	71.33	-2.03
4	2483.50	53.6 AV	54.0	-0.4	1.00 V	97	55.63	-2.03
5	4924.00	51.5 PK	74.0	-22.5	1.00 V	271	45.39	6.11
6	4924.00	43.5 AV	54.0	-10.5	1.00 V	271	37.39	6.11
7	7386.00	53.8 PK	74.0	-20.2	1.13 V	226	40.62	13.18
8	7386.00	41.4 AV	54.0	-12.6	1.13 V	226	28.22	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.

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.6 PK	74.0	-5.4	1.13 H	225	71.07	-2.47
2	2390.00	49.9 AV	54.0	-4.1	1.13 H	225	52.37	-2.47
3	*2412.00	105.7 PK			1.13 H	225	108.07	-2.37
4	*2412.00	94.6 AV			1.13 H	225	96.97	-2.37
5	4824.00	51.8 PK	74.0	-22.2	1.75 H	159	46.09	5.71
6	4824.00	43.8 AV	54.0	-10.2	1.75 H	159	38.09	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	71.9 PK	74.0	-2.1	1.00 V	98	74.37	-2.47
2	2390.00	53.1 AV	54.0	-0.9	1.00 V	98	55.57	-2.47
3	*2412.00	108.7 PK			1.00 V	98	111.07	-2.37
4	*2412.00	97.7 AV			1.00 V	98	100.07	-2.37
5	4824.00	51.7 PK	74.0	-22.3	1.00 V	260	45.99	5.71
6	4824.00	43.9 AV	54.0	-10.1	1.00 V	260	38.19	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.

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	66.2 PK	74.0	-7.8	1.13 H	224	68.67	-2.47
2	2390.00	44.4 AV	54.0	-9.6	1.13 H	224	46.87	-2.47
3	*2437.00	112.7 PK			1.13 H	224	114.95	-2.25
4	*2437.00	102.0 AV			1.13 H	224	104.25	-2.25
5	2483.50	70.9 PK	74.0	-3.1	1.13 H	224	72.93	-2.03
6	2483.50	48.1 AV	54.0	-5.9	1.13 H	224	50.13	-2.03
7	4874.00	51.8 PK	74.0	-22.2	1.72 H	154	45.90	5.90
8	4874.00	43.8 AV	54.0	-10.2	1.72 H	154	37.90	5.90
9	7311.00	52.5 PK	74.0	-21.5	1.08 H	311	39.33	13.17
10	7311.00	40.3 AV	54.0	-13.7	1.08 H	311	27.13	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	69.1 PK	74.0	-4.9	1.01 V	97	71.57	-2.47
2	2390.00	47.5 AV	54.0	-6.5	1.01 V	97	49.97	-2.47
3	*2437.00	115.4 PK			1.01 V	97	117.65	-2.25
4	*2437.00	104.9 AV			1.01 V	97	107.15	-2.25
5	**2483.50**	**73.8 PK**	**74.0**	**-0.2**	**1.01 V**	**97**	**75.83**	**-2.03**
6	2483.50	50.7 AV	54.0	-3.3	1.01 V	97	52.73	-2.03
7	4874.00	52.1 PK	74.0	-21.9	1.06 V	259	46.20	5.90
8	4874.00	44.0 AV	54.0	-10.0	1.06 V	259	38.10	5.90
9	7311.00	53.3 PK	74.0	-20.7	1.08 V	226	40.13	13.17
10	7311.00	40.9 AV	54.0	-13.1	1.08 V	226	27.73	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.

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	105.5 PK			1.12 H	214	107.64	-2.14
2	*2462.00	96.7 AV			1.12 H	214	98.84	-2.14
3	2483.50	68.6 PK	74.0	-5.4	1.12 H	214	70.63	-2.03
4	2483.50	50.7 AV	54.0	-3.3	1.12 H	214	52.73	-2.03
5	4924.00	52.1 PK	74.0	-21.9	1.73 H	156	45.99	6.11
6	4924.00	43.9 AV	54.0	-10.1	1.73 H	156	37.79	6.11
7	7386.00	52.0 PK	74.0	-22.0	1.06 H	316	38.82	13.18
8	7386.00	40.1 AV	54.0	-13.9	1.06 H	316	26.92	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	108.4 PK			1.00 V	81	110.54	-2.14
2	*2462.00	99.8 AV			1.00 V	81	101.94	-2.14
3	2483.50	70.9 PK	74.0	-3.1	1.00 V	81	72.93	-2.03
4	2483.50	53.2 AV	54.0	-0.8	1.00 V	81	55.23	-2.03
5	4924.00	51.7 PK	74.0	-22.3	1.11 V	263	45.59	6.11
6	4924.00	44.1 AV	54.0	-9.9	1.11 V	263	37.99	6.11
7	7386.00	52.8 PK	74.0	-21.2	1.15 V	221	39.62	13.18
8	7386.00	40.6 AV	54.0	-13.4	1.15 V	221	27.42	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.

802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.8 PK	74.0	-5.2	1.11 H	231	71.27	-2.47
2	2390.00	50.7 AV	54.0	-3.3	1.11 H	231	53.17	-2.47
3	*2422.00	101.2 PK			1.11 H	231	103.52	-2.32
4	*2422.00	90.4 AV			1.11 H	231	92.72	-2.32
5	4844.00	52.6 PK	74.0	-21.4	1.70 H	157	46.82	5.78
6	4844.00	44.3 AV	54.0	-9.7	1.70 H	157	38.52	5.78
7	7266.00	51.9 PK	74.0	-22.1	1.07 H	321	38.70	13.20
8	7266.00	40.2 AV	54.0	-13.8	1.07 H	321	27.00	13.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.3 PK	74.0	-2.7	1.00 V	98	73.77	-2.47
2	2390.00	53.2 AV	54.0	-0.8	1.00 V	98	55.67	-2.47
3	*2422.00	104.6 PK			1.00 V	99	106.92	-2.32
4	*2422.00	93.6 AV			1.00 V	99	95.92	-2.32
5	4844.00	52.0 PK	74.0	-22.0	1.10 V	266	46.22	5.78
6	4844.00	44.2 AV	54.0	-9.8	1.10 V	266	38.42	5.78
7	7266.00	52.6 PK	74.0	-21.4	1.08 V	235	39.40	13.20
8	7266.00	40.6 AV	54.0	-13.4	1.08 V	235	27.40	13.20

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.7 PK	74.0	-6.3	1.11 H	227	70.17	-2.47
2	2390.00	49.3 AV	54.0	-4.7	1.11 H	227	51.77	-2.47
3	*2437.00	104.2 PK			1.11 H	227	106.45	-2.25
4	*2437.00	93.0 AV			1.11 H	227	95.25	-2.25
5	2483.50	67.9 PK	74.0	-6.1	1.11 H	227	69.93	-2.03
6	2483.50	50.3 AV	54.0	-3.7	1.11 H	227	52.33	-2.03
7	4874.00	52.4 PK	74.0	-21.6	1.69 H	131	46.50	5.90
8	4874.00	44.1 AV	54.0	-9.9	1.69 H	131	38.20	5.90
9	7311.00	52.4 PK	74.0	-21.6	1.05 H	314	39.23	13.17
10	7311.00	40.2 AV	54.0	-13.8	1.05 H	314	27.03	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	70.1 PK	74.0	-3.9	1.00 V	78	72.57	-2.47
2	2390.00	51.9 AV	54.0	-2.1	1.00 V	78	54.37	-2.47
3	*2437.00	107.3 PK			1.00 V	78	109.55	-2.25
4	*2437.00	96.3 AV			1.00 V	78	98.55	-2.25
5	2483.50	70.7 PK	74.0	-3.3	1.00 V	78	72.73	-2.03
6	2483.50	53.4 AV	54.0	-0.6	1.00 V	78	55.43	-2.03
7	4874.00	52.2 PK	74.0	-21.8	1.04 V	282	46.30	5.90
8	4874.00	44.4 AV	54.0	-9.6	1.04 V	282	38.50	5.90
9	7311.00	53.2 PK	74.0	-20.8	1.05 V	224	40.03	13.17
10	7311.00	40.7 AV	54.0	-13.3	1.05 V	224	27.53	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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	101.7 PK			1.04 H	203	103.88	-2.18
2	*2452.00	90.7 AV			1.04 H	203	92.88	-2.18
3	2483.50	65.0 PK	74.0	-9.0	1.04 H	203	67.03	-2.03
4	2483.50	50.2 AV	54.0	-3.8	1.04 H	203	52.23	-2.03
5	4904.00	52.2 PK	74.0	-21.8	1.71 H	149	46.18	6.02
6	4904.00	44.1 AV	54.0	-9.9	1.71 H	149	38.08	6.02
7	7356.00	52.0 PK	74.0	-22.0	1.09 H	308	38.82	13.18
8	7356.00	40.3 AV	54.0	-13.7	1.09 H	308	27.12	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	104.7 PK			1.00 V	98	106.88	-2.18
2	*2452.00	93.5 AV			1.00 V	98	95.68	-2.18
3	2483.50	68.3 PK	74.0	-5.7	1.00 V	98	70.33	-2.03
4	2483.50	53.4 AV	54.0	-0.6	1.00 V	98	55.43	-2.03
5	4904.00	52.1 PK	74.0	-21.9	1.07 V	254	46.08	6.02
6	4904.00	44.1 AV	54.0	-9.9	1.07 V	254	38.08	6.02
7	7356.00	53.4 PK	74.0	-20.6	1.05 V	226	40.22	13.18
8	7356.00	41.5 AV	54.0	-12.5	1.05 V	226	28.32	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.

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 : Nov. 20, 2014

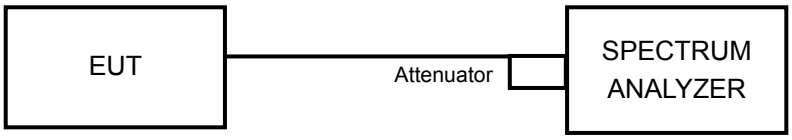
4.3.3 TEST PROCEDURE

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

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP

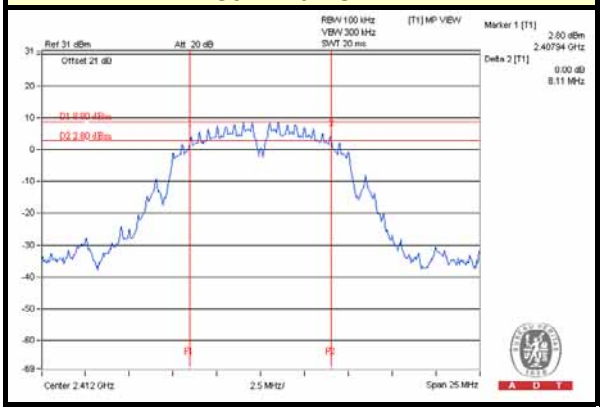


4.3.6 EUT OPERATING CONDITIONS

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

4.3.7 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
802.11b				
1	2412	8.11	0.5	PASS
6	2437	8.13	0.5	PASS
11	2462	8.12	0.5	PASS

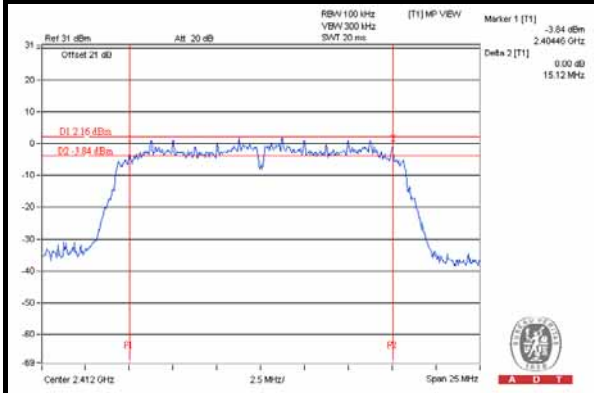
SPECTRUM PLOT OF WORST VALUE	
802.11b : CH1	
	

CDD_MODE					
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
802.11g					
1	2412	15.12	15.14	0.5	PASS
6	2437	14.46	15.15	0.5	PASS
11	2462	15.16	15.15	0.5	PASS
802.11n(HT20)					
1	2412	15.11	15.14	0.5	PASS
6	2437	15.16	15.73	0.5	PASS
11	2462	15.17	16.67	0.5	PASS
802.11n(HT40)					
3	2422	35.32	35.84	0.5	PASS
6	2437	35.44	35.80	0.5	PASS
9	2452	35.30	36.44	0.5	PASS

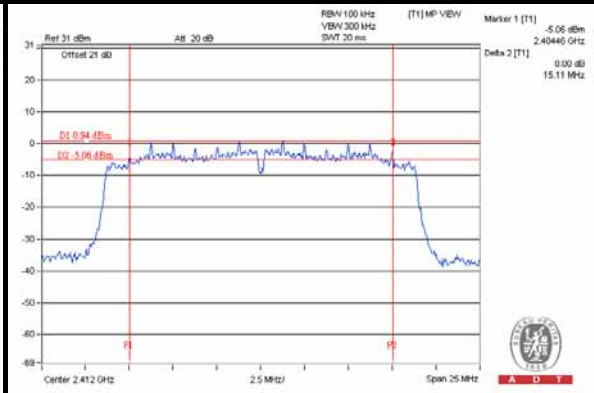
CDD_MODE

SPECTRUM PLOT OF WORST VALUE

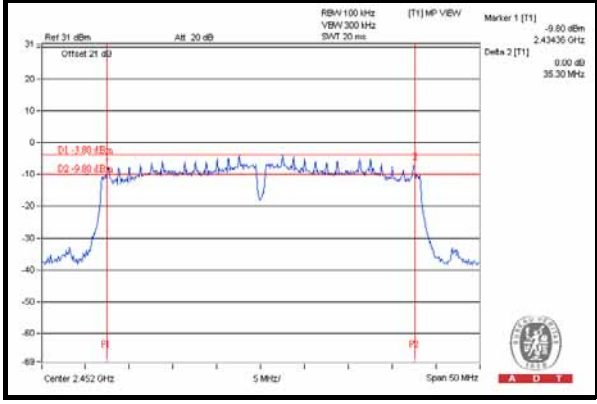
802.11g / Chain(0) : CH1



VHT20 / Chain(0) : CH1



VHT40 / Chain(0) : CH9



4.4 CONDUCTED OUTPUT POWER MEASUREMENT

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

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

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

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

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

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

4.4.2 TEST INSTRUMENTS

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

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Nov. 20, 2014

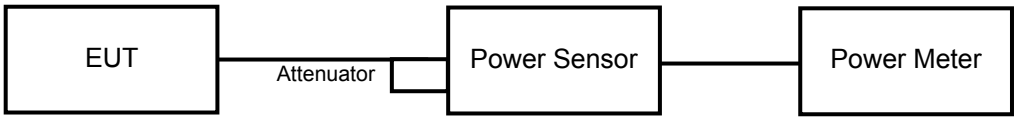
4.4.3 TEST PROCEDURES

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

802.11b					
CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	LIMIT (dBm)	PASS /FAIL
1	2412	52.36	17.19	30	PASS
6	2437	78.163	18.93	30	PASS
11	2462	51.05	17.08	30	PASS

CDD_MODE							
CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS /FAIL
		CHAIN 0	CHAIN 1				
802.11g							
1	2412	12.19	12.47	34.218	15.34	30	PASS
6	2437	18.54	18.66	144.901	21.61	30	PASS
11	2462	12.91	13.65	42.717	16.31	30	PASS
802.11n(HT20)							
1	2412	10.37	11.06	23.653	13.74	30	PASS
6	2437	18.06	17.56	120.989	20.83	30	PASS
11	2462	11.76	11.29	28.456	14.54	30	PASS
802.11n(HT40)							
3	2422	8.19	9.50	15.505	11.90	30	PASS
6	2437	12.05	12.87	35.396	15.49	30	PASS
9	2452	8.65	10.49	18.522	12.68	30	PASS

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
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 : Nov. 20, 2014

4.5.3 TEST PROCEDURE

For 802.11b, 802.11g, VHT20:

1. Set the RBW = 10 kHz, VBW = 30 kHz, Detector = power averaging (RMS).
2. Ensure that the number of measurement points in the sweep ≥ 2 x 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.

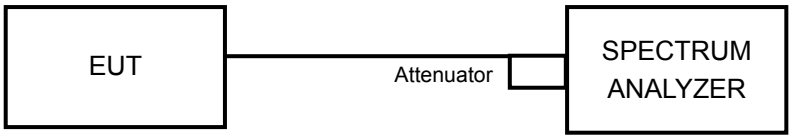
For VHT40:

1. Set the RBW = 10 kHz, VBW = 30 kHz, Detector = power averaging (RMS).
2. Ensure that the number of measurement points in the sweep ≥ 2 x 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.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP

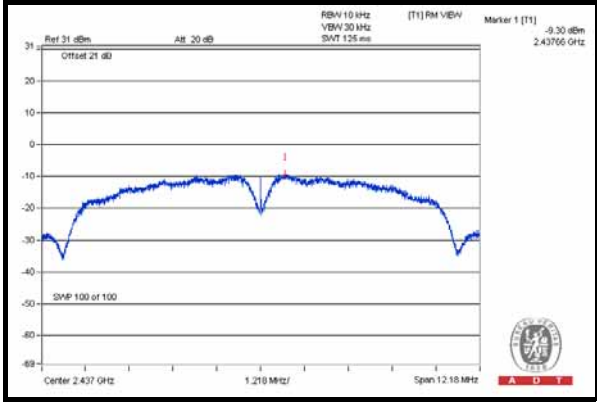


4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.5.7 TEST RESULTS

802.11b				
CHANNEL	FREQUENCY (MHz)	PSD (dBm)	LIMIT (dBm)	PASS /FAIL
1	2412	-10.55	8	PASS
6	2437	-9.30	8	PASS
11	2462	-10.79	8	PASS

SPECTRUM PLOT OF WORST VALUE	
802.11b : CH6	
	

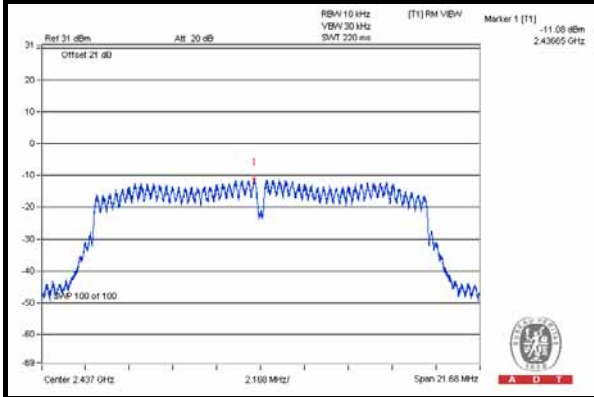
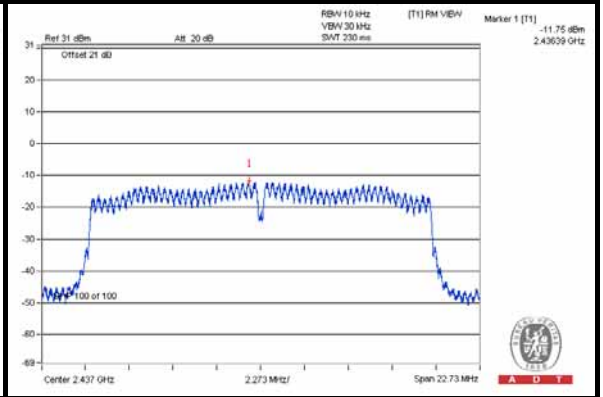
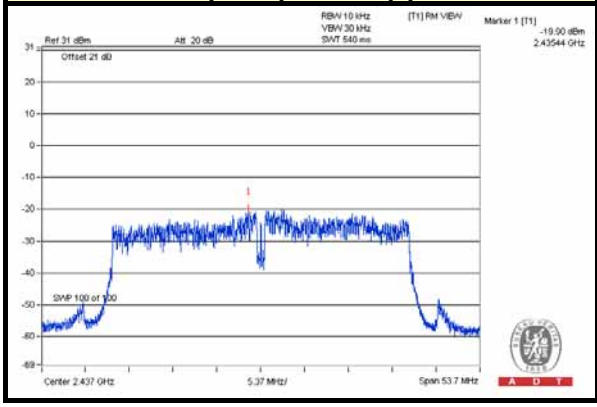
CDD_MODE							
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
802.11g							
0	1	2412	-16.44	3.01	-13.43	7.44	PASS
	6	2437	-11.08	3.01	-8.07	7.44	PASS
	11	2462	-15.70	3.01	-12.69	7.44	PASS
1	1	2412	-17.67	3.01	-14.66	7.44	PASS
	6	2437	-11.90	3.01	-8.89	7.44	PASS
	11	2462	-16.96	3.01	-13.95	7.44	PASS
802.11n(HT20)							
0	1	2412	-18.05	3.01	-15.04	7.44	PASS
	6	2437	-11.75	3.01	-8.74	7.44	PASS
	11	2462	-18.46	3.01	-15.45	7.44	PASS
1	1	2412	-18.13	3.01	-15.12	7.44	PASS
	6	2437	-12.77	3.01	-9.76	7.44	PASS
	11	2462	-18.50	3.01	-15.49	7.44	PASS

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.56dBi > 6dBi , so the power limit shall be reduced to 8-(6.56-6) = 7.44dBm

CDD_MODE								
802.11n(HT40)								
TX CHAIN	CHANNEL	FREQUENCY (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	3	2422	-22.50	3.01	0.11	-19.38	7.44	PASS
	6	2437	-20.05	3.01	0.11	-16.93	7.44	PASS
	9	2452	-22.35	3.01	0.11	-19.23	7.44	PASS
1	3	2422	-20.71	3.01	0.11	-17.59	7.44	PASS
	6	2437	-19.90	3.01	0.11	-16.78	7.44	PASS
	9	2452	-20.78	3.01	0.11	-17.66	7.44	PASS

NOTE: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.56dBi > 6dBi , so the power limit shall be reduced to 8-(6.56-6) = 7.44dBm

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

CDD_MODE	
SPECTRUM PLOT OF WORST VALUE	
802.11g / Chain(0) : CH6	802.11n(HT20) / Chain(0) : CH6
	
802.11n(HT40) / Chain(1) : CH6	
	

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 : Nov. 20, 2014

4.6.3 TEST PROCEDURE

Measurement Procedure - Reference Level

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

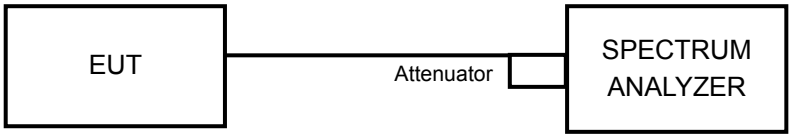
Measurement Procedure –Unwanted Emission Level

1. Set RBW = 100 kHz.
2. Set VBW ≥ 300 kHz.
3. 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

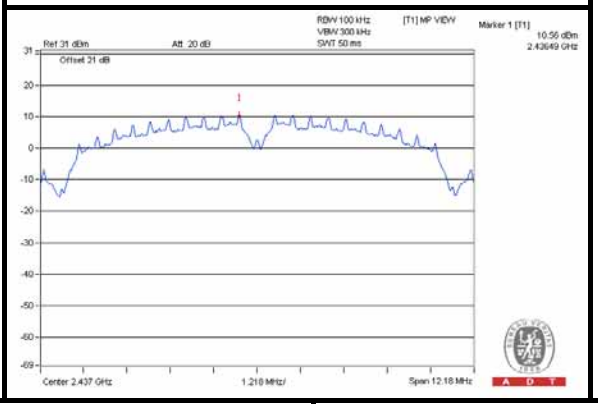
Same as Item 4.3.6

4.6.7 TEST RESULTS

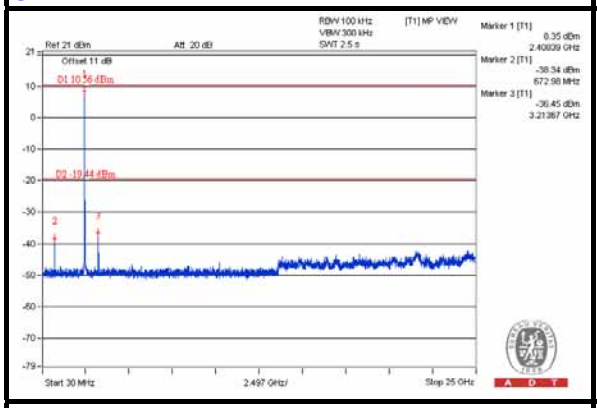
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

802.11b

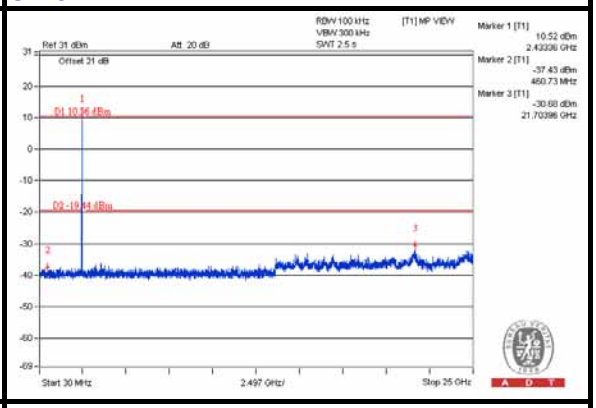
Maximum REF



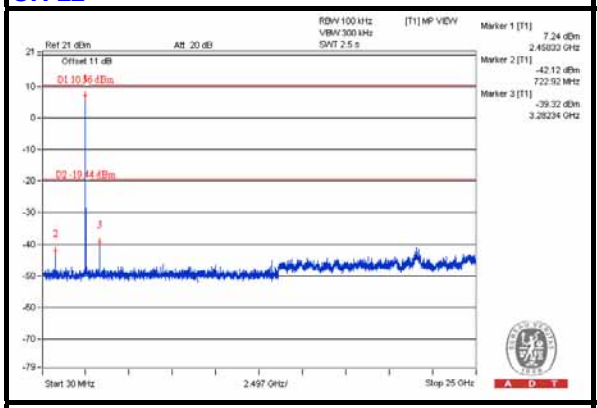
CH 1



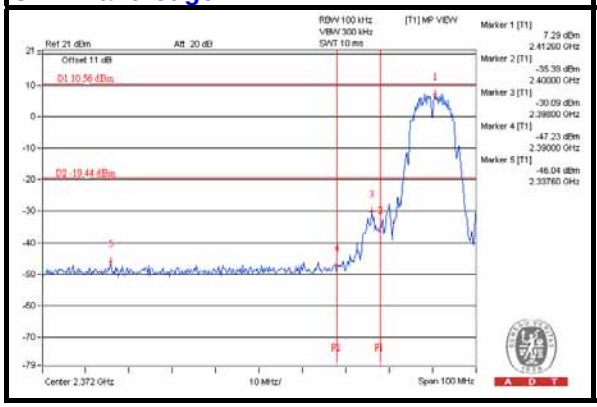
CH 6



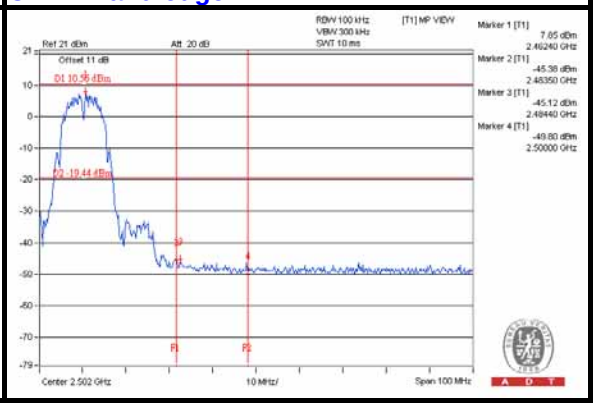
CH 11



CH 1 Band edge

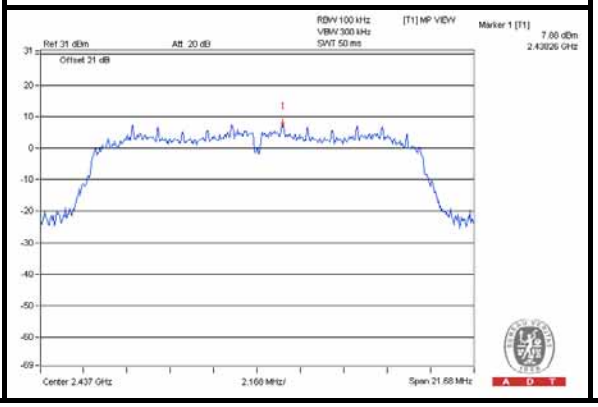


CH 11 Band edge



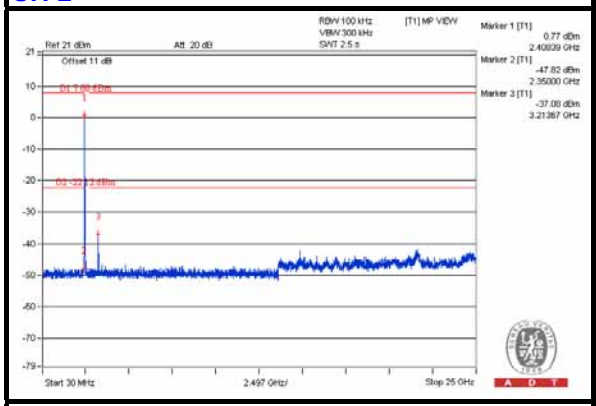
CDD MODE: 802.11g

Maximum REF

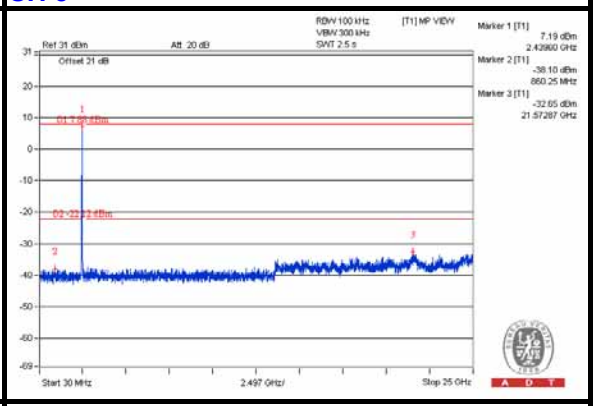


Chain(0)

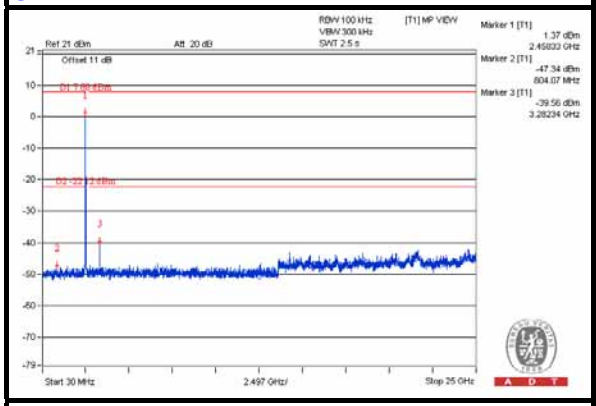
CH 1



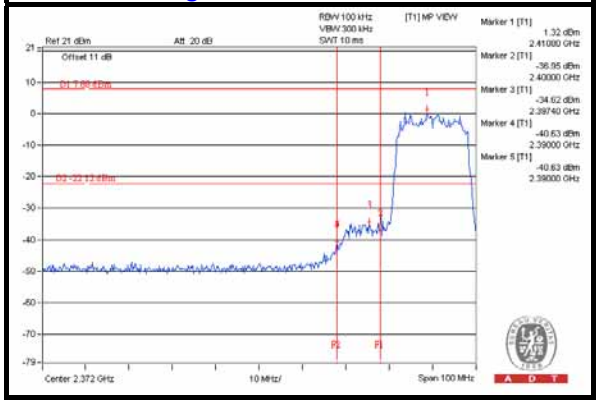
CH 6



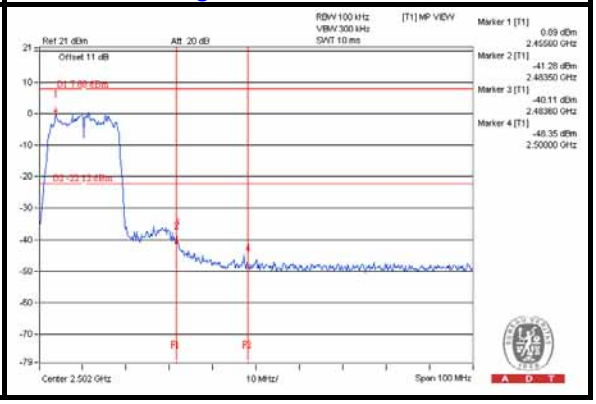
CH 11



CH 1 Band edge

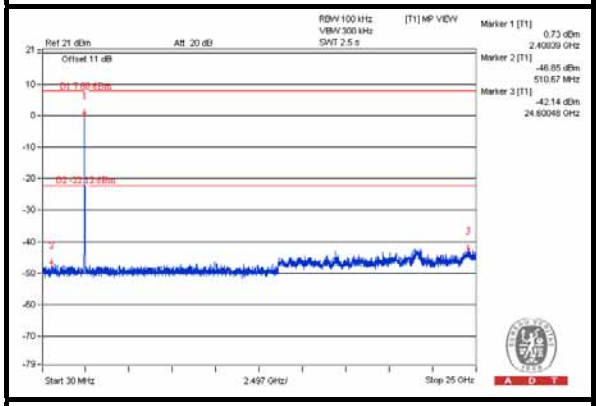


CH 11 Band edge

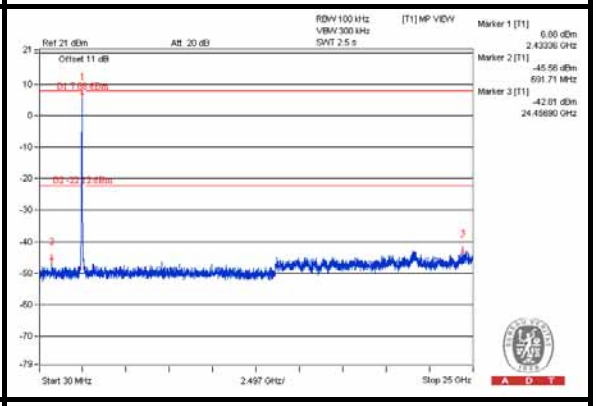


Chain(1)

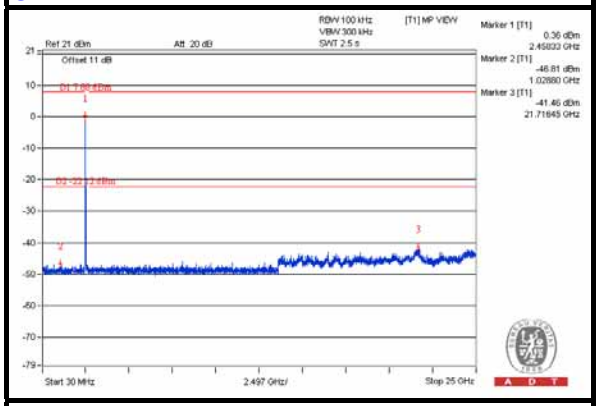
CH 1



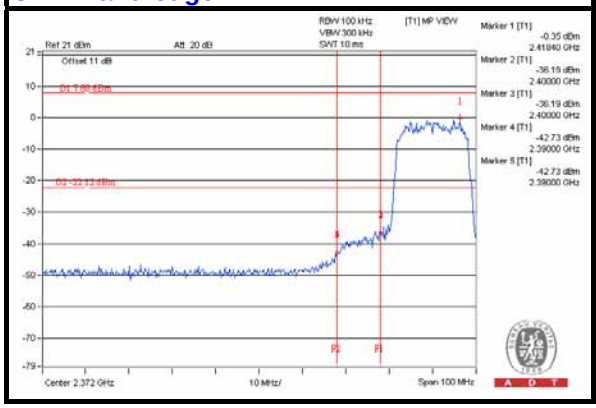
CH 6



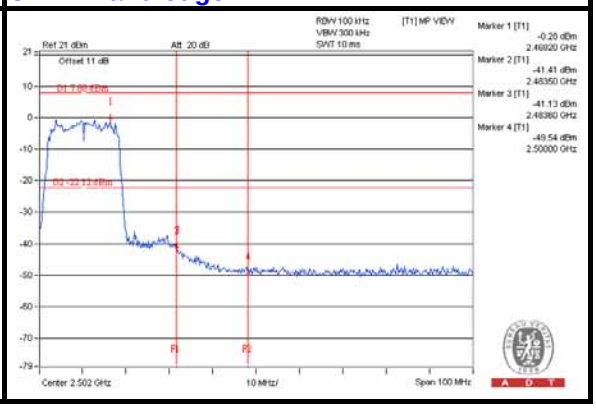
CH 11



CH 1 Band edge

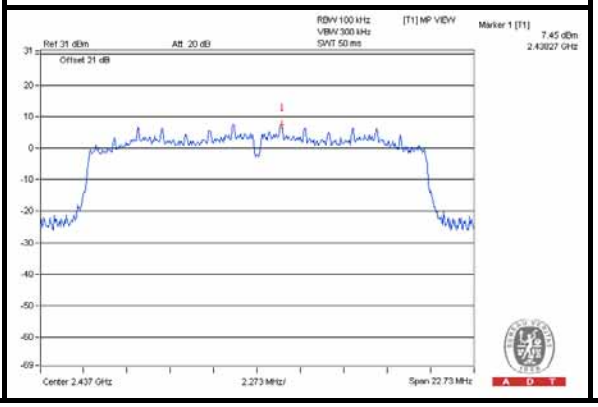


CH 11 Band edge



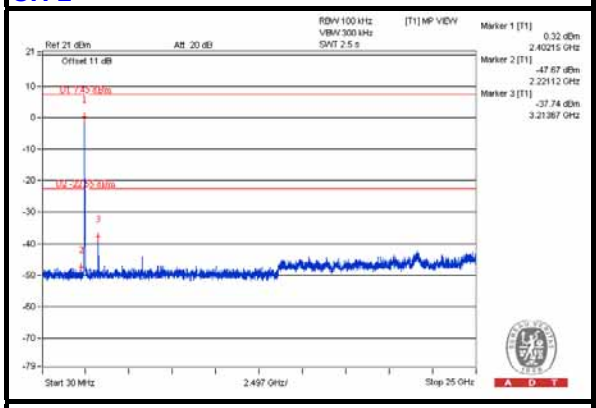
CDD MODE: 802.11n (HT20)

Maximum REF

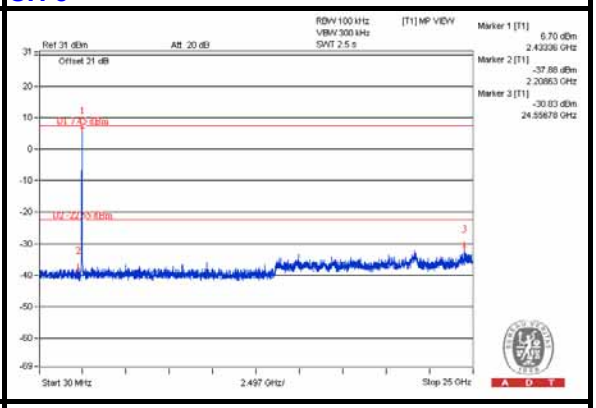


Chain(0)

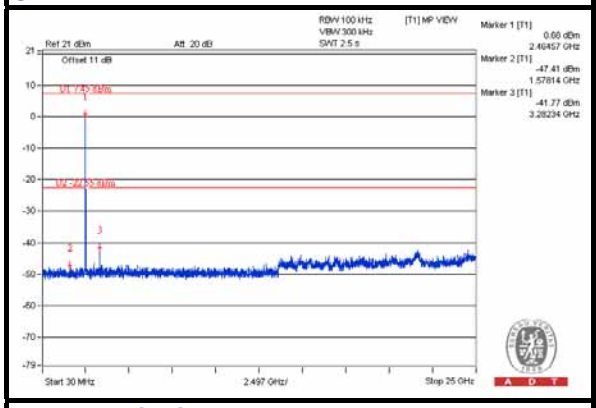
CH 1



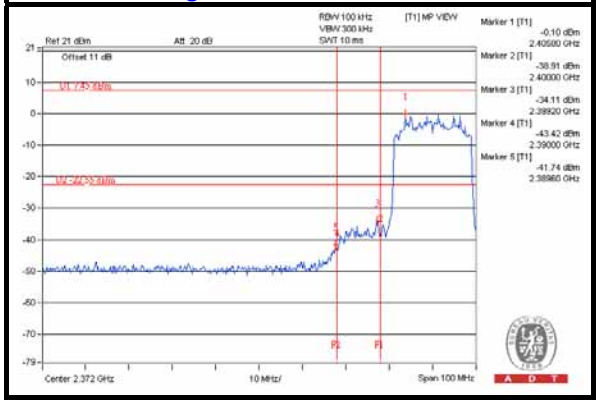
CH 6



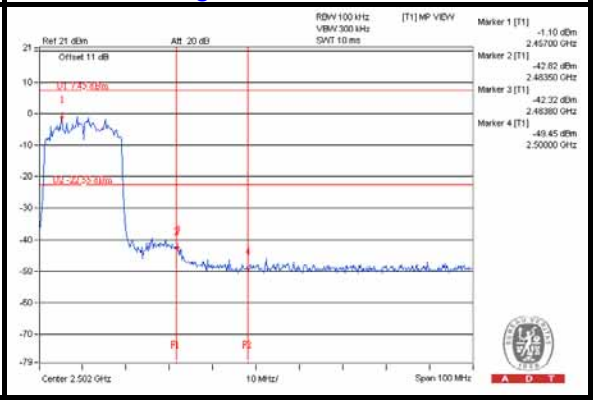
CH 11



CH 1 Band edge

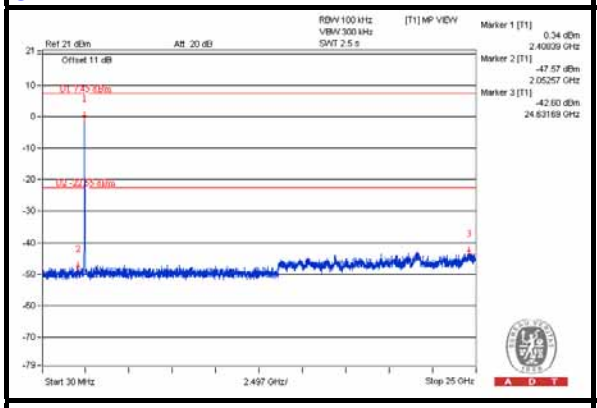


CH 11 Band edge

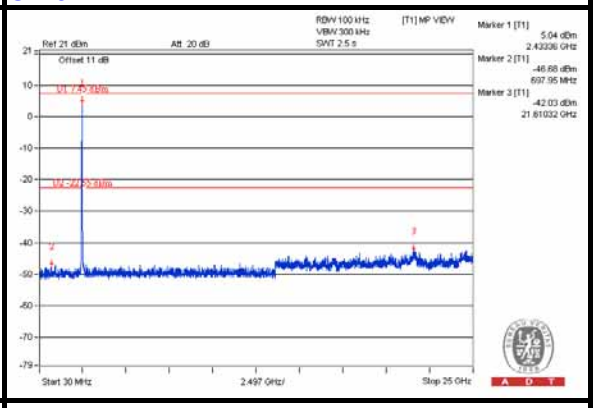


Chain(1)

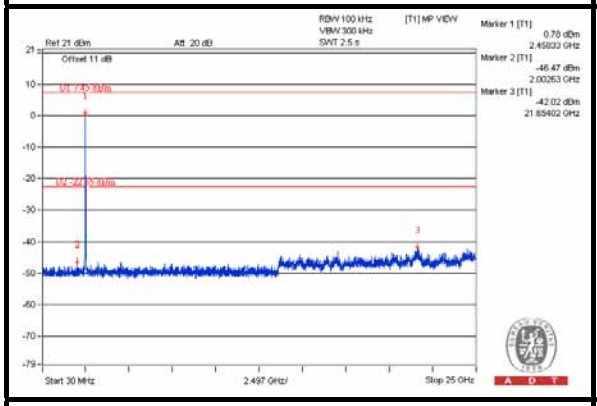
CH 1



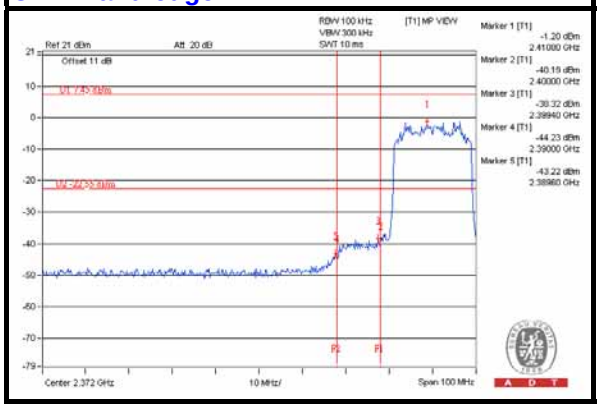
CH 6



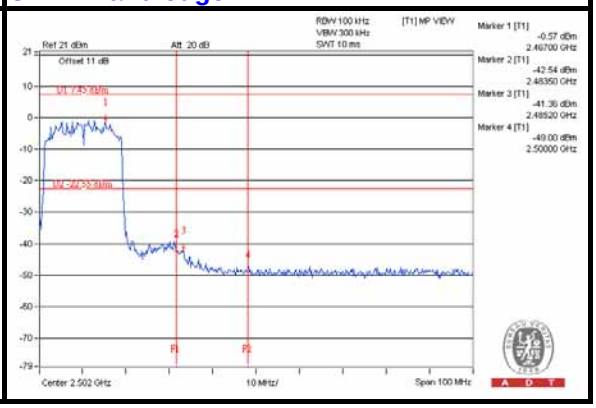
CH 11



CH 1 Band edge

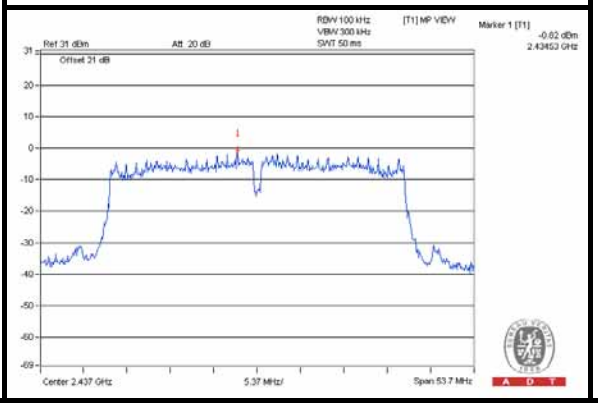


CH 11 Band edge



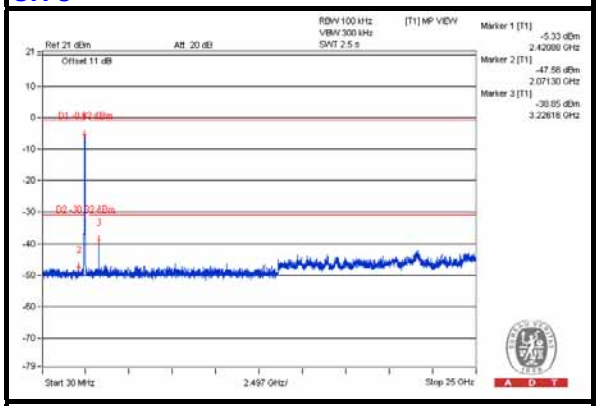
CDD MODE: 802.11n (HT40)

Maximum REF

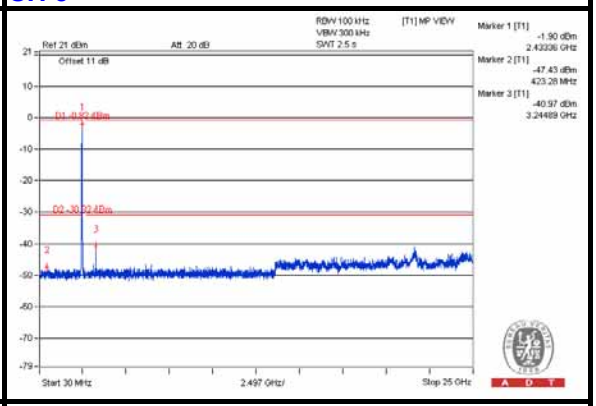


Chain(0)

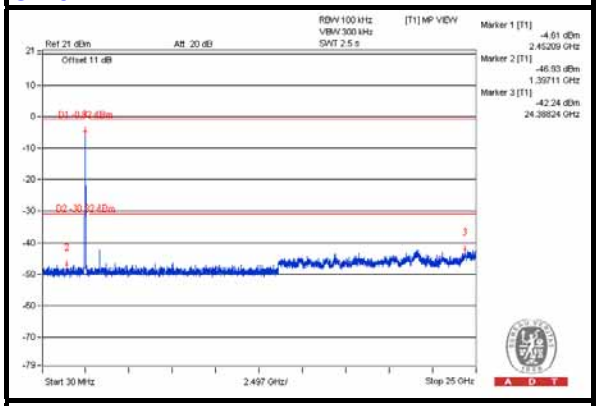
CH 3



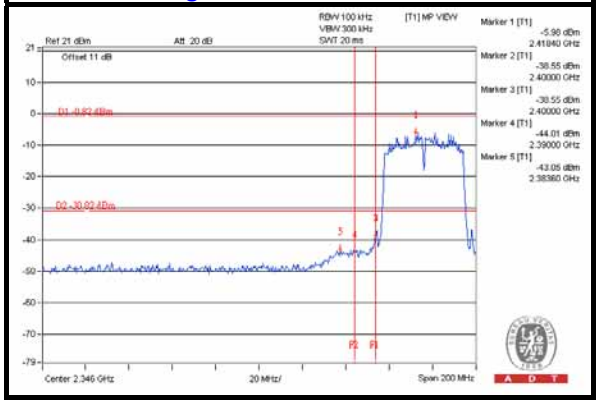
CH 6



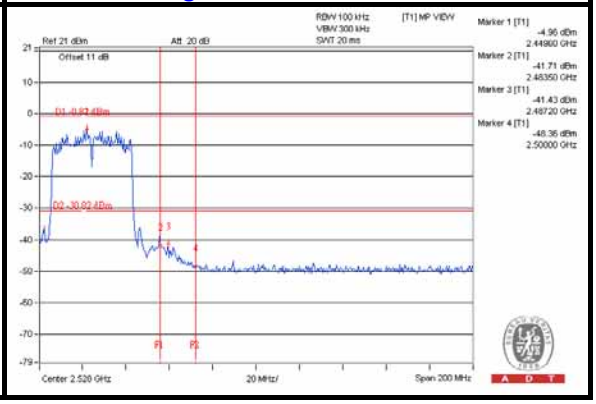
CH 9



CH 3 Band edge

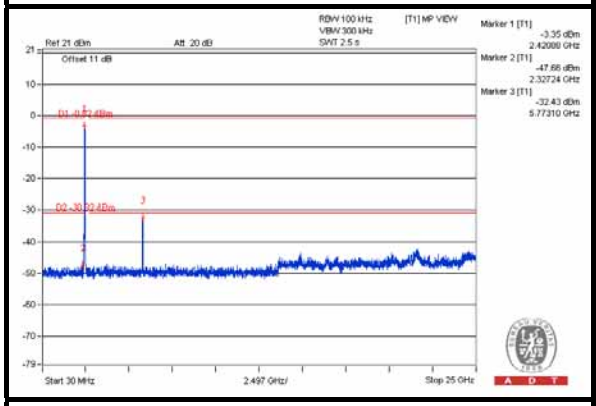


CH 9 Band edge

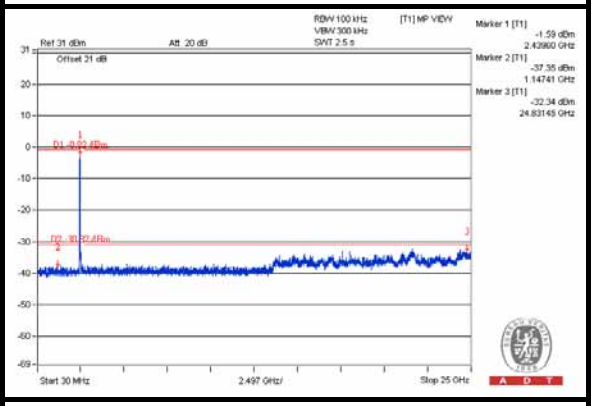


Chain(1)

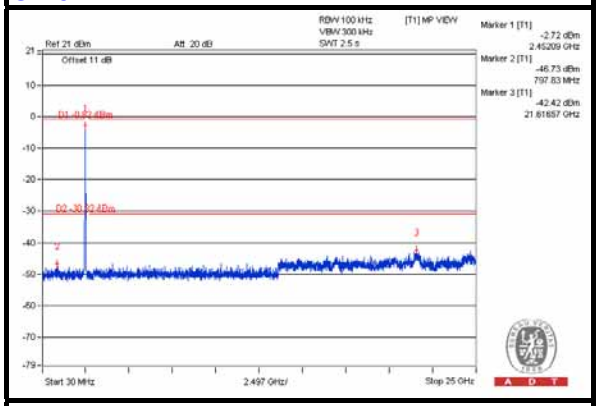
CH 3



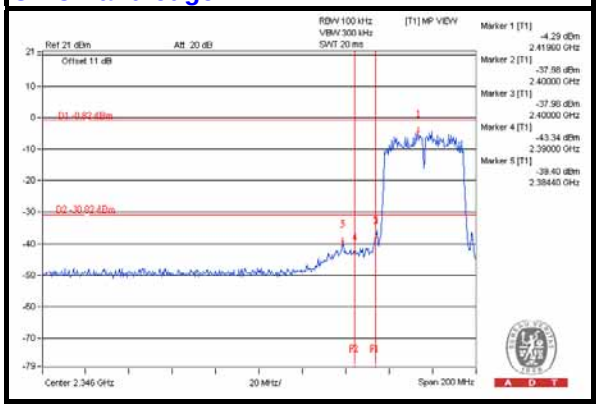
CH 6



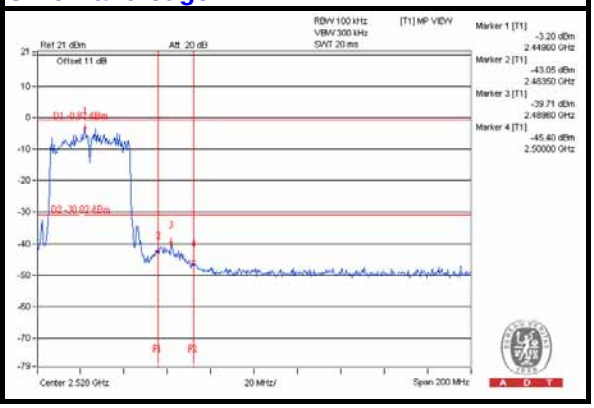
CH 9



CH 3 Band edge



CH 9 Band edge



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

5.1 CONDUCTED EMISSION MEASUREMENT

5.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

5.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver 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. 11, 2014	Nov. 10, 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.

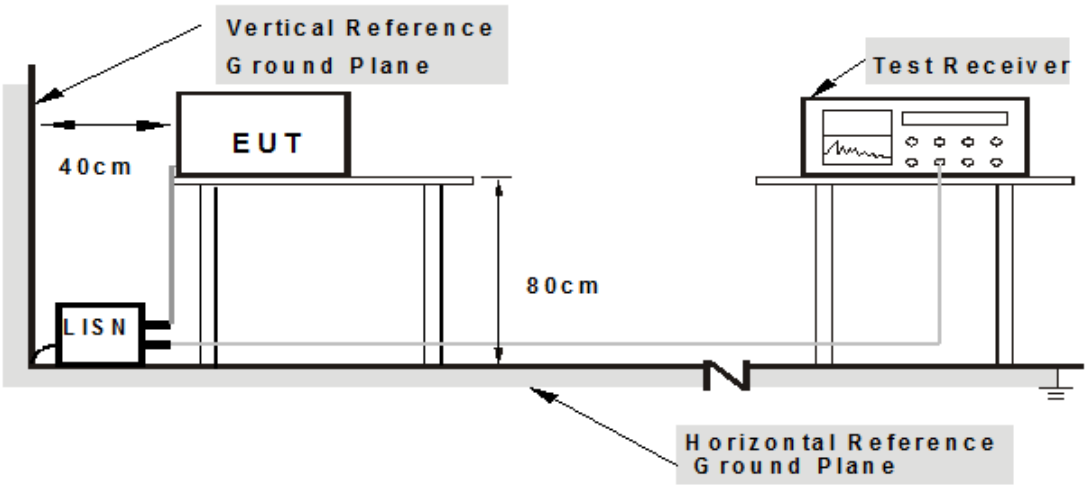
NOTE:

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.

5.1.6 EUT OPERATING CONDITIONS

Same as the 4.1.6

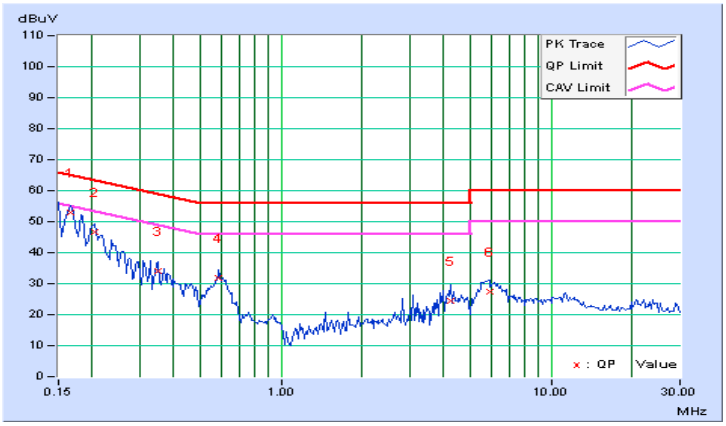
5.1.7 TEST RESULTS (With adapter 1)

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

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	0.07	53.04	43.82	53.11	43.89	65.18	55.18	-12.07	-11.29
2	0.20469	0.07	46.67	36.64	46.74	36.71	63.42	53.42	-16.68	-16.71
3	0.34922	0.08	34.08	24.24	34.16	24.32	58.98	48.98	-24.82	-24.66
4	0.58750	0.10	31.91	26.64	32.01	26.74	56.00	46.00	-23.99	-19.26
5	4.26172	0.26	24.30	13.11	24.56	13.37	56.00	46.00	-31.44	-32.63
6	5.92578	0.31	27.04	21.97	27.35	22.28	60.00	50.00	-32.65	-27.72

REMARKS:

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

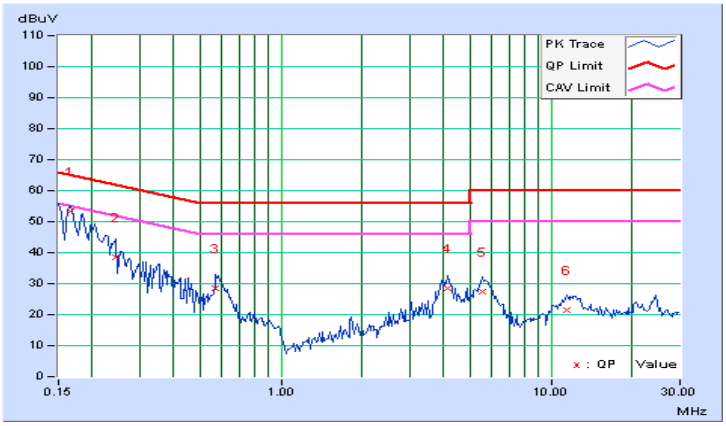


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	0.06	53.10	43.96	53.16	44.02	65.18	55.18	-12.01	-11.15
2	0.24375	0.07	38.49	26.80	38.56	26.87	61.97	51.97	-23.41	-25.10
3	0.57188	0.10	28.47	20.71	28.57	20.81	56.00	46.00	-27.43	-25.19
4	4.14844	0.26	28.15	17.27	28.41	17.53	56.00	46.00	-27.59	-28.47
5	5.53125	0.31	27.08	21.86	27.39	22.17	60.00	50.00	-32.61	-27.83
6	11.37500	0.50	21.13	16.06	21.63	16.56	60.00	50.00	-38.37	-33.44

REMARKS:

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



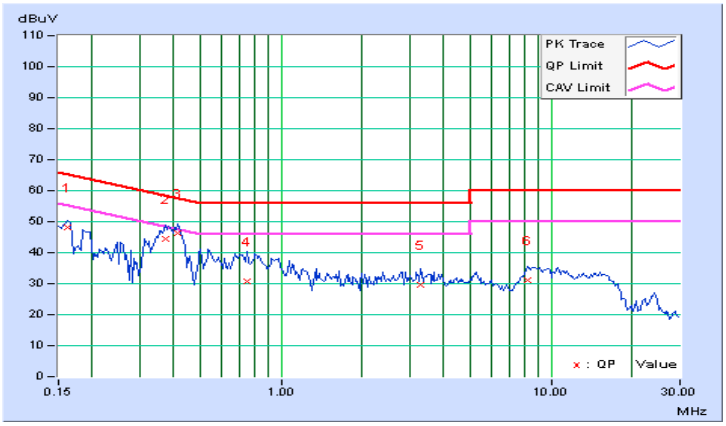
5.1.8 TEST RESULTS (With adapter 2)

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

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	0.07	48.16	39.60	48.23	39.67	65.38	55.38	-17.15	-15.71
2	0.37266	0.09	44.28	37.11	44.37	37.20	58.44	48.44	-14.07	-11.24
3	0.41563	0.09	46.25	41.43	46.34	41.52	57.54	47.54	-11.19	-6.01
4	0.75156	0.11	30.73	25.80	30.84	25.91	56.00	46.00	-25.16	-20.09
5	3.28516	0.22	29.37	24.09	29.59	24.31	56.00	46.00	-26.41	-21.69
6	8.23438	0.39	30.72	26.23	31.11	26.62	60.00	50.00	-28.89	-23.38

REMARKS:

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

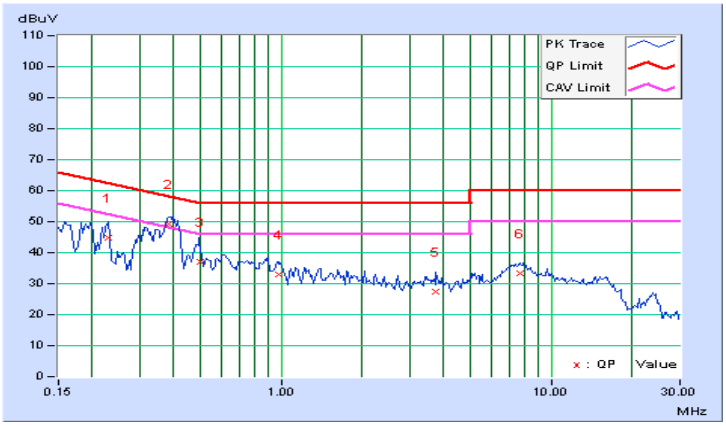


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.22812	0.06	44.70	37.84	44.76	37.90	62.52	52.52	-17.75	-14.61
2	**0.38438**	**0.09**	**49.23**	**44.33**	**49.32**	**44.42**	**58.18**	**48.18**	**-8.87**	**-3.77**
3	0.50000	0.10	36.94	31.78	37.04	31.88	56.00	46.00	-18.96	-14.12
4	0.98203	0.13	32.87	28.71	33.00	28.84	56.00	46.00	-23.00	-17.16
5	3.75000	0.25	27.34	22.02	27.59	22.27	56.00	46.00	-28.41	-23.73
6	7.65625	0.38	32.92	28.68	33.30	29.06	60.00	50.00	-26.70	-20.94

REMARKS:

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



5.2 RADIATED AND BANDEDGE EMISSION MEASUREMENT

5.2.1 LIMITS OF RADIATED AND BANDEDGE EMISSION MEASUREMENT

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

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

NOTE:

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

5.2.2 TEST INSTRUMENTS

For Below 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY50010156	Aug. 11, 2014	Aug. 10, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-04	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Feb. 27, 2014	Feb. 26, 2015
RF Cable	NA	CHHCAB_001	Oct. 05, 2014	Oct. 04, 2015
Horn_Antenna AISI	AIH.8018	0000220091110	Aug. 26, 2014	Aug. 25, 2015
Pre-Amplifier Agilent	8449B	300801923	Oct. 28, 2014	Oct. 27, 2015
RF Cable	NA	131206 131215 SNMY23685/4	Jan. 17, 2014	Jan. 16, 2015
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Pre-Amplifier EMCI	EMC184045	980143	Jan. 17, 2014	Jan. 16, 2015
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
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
5. The CANADA Site Registration No. is IC 7450H-3.
6. Tested Date: Nov. 14, 2014

For Above 1GHz:

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. 12, 2014	Nov. 11, 2015
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 AISI	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 EMCI	EMC184045	980143	Jan. 17, 2014	Jan. 16, 2015
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: Nov. 13, 2014

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:

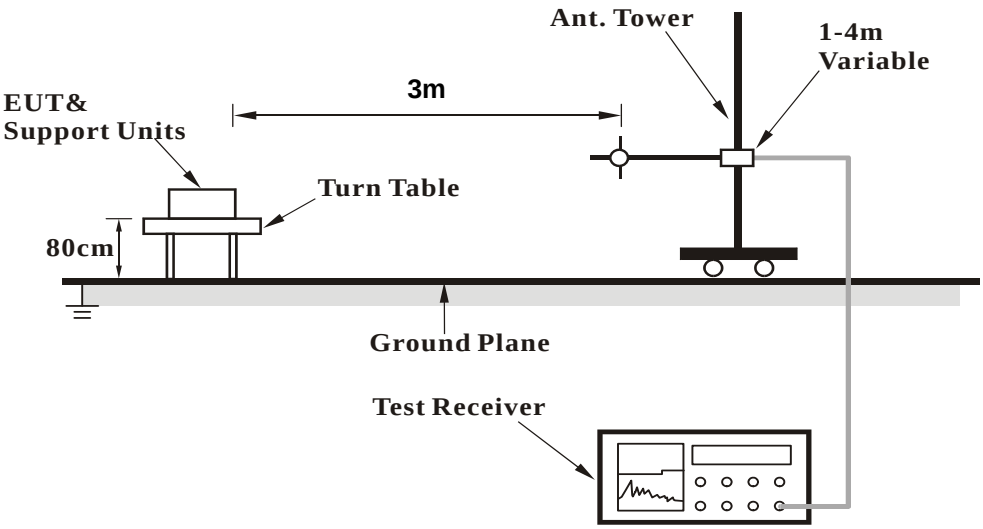
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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/duty cycle)).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

5.2.4 DEVIATION FROM TEST STANDARD

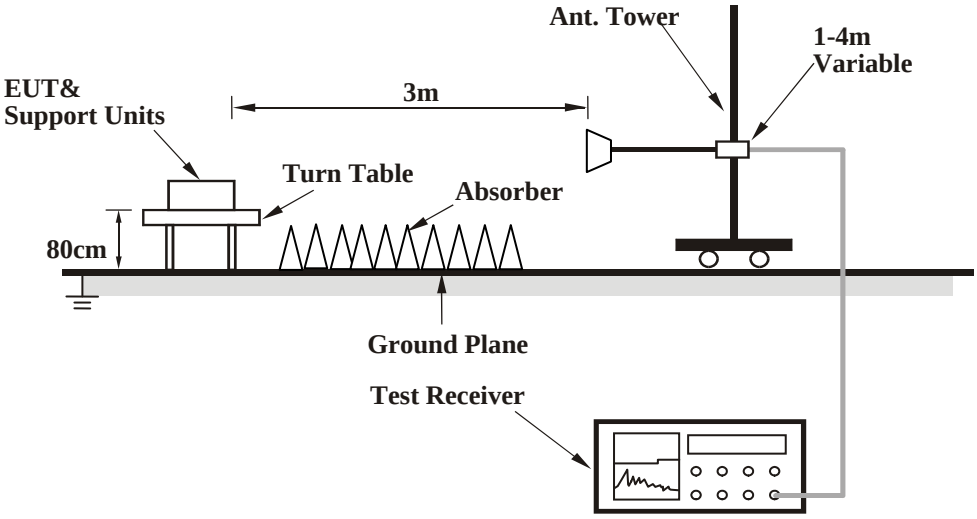
No deviation

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

5.2.7 TEST RESULTS

Beamforming_MODE

BELOW 1GHz WORST-CASE DATA

802.11ac(VHT20)

CHANNEL	TX Channel 157	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 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	109.11	37.3 QP	43.5	-6.2	1.51 H	93	53.38	-16.08
2	117.59	35.1 QP	43.5	-8.4	2.00 H	110	50.28	-15.18
3	163.30	33.7 QP	43.5	-9.8	1.00 H	92	46.80	-13.10
4	174.18	33.7 QP	43.5	-9.8	1.10 H	132	47.49	-13.76
5	250.00	38.5 QP	46.0	-7.5	1.00 H	281	52.38	-13.91
6	290.62	38.3 QP	46.0	-7.7	1.11 H	62	50.58	-12.28
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	38.41	36.4 QP	40.0	-3.6	1.00 V	225	50.34	-13.94
2	**75.32**	**36.8 QP**	**40.0**	**-3.2**	**1.00 V**	**152**	**53.48**	**-16.64**
3	108.35	37.7 QP	43.5	-5.8	1.15 V	121	53.86	-16.16
4	250.00	35.5 QP	46.0	-10.5	1.50 V	332	49.41	-13.91
5	256.53	35.7 QP	46.0	-10.3	1.50 V	112	49.43	-13.73
6	332.10	33.1 QP	46.0	-12.9	1.43 V	320	43.92	-10.80

REMARKS:

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

ABOVE 1GHz DATA

CDD MODE

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	*5745.00	113.2 PK			1.10 H	250	104.78	8.42
2	*5745.00	103.8 AV			1.10 H	250	95.38	8.42
3	11490.00	60.5 PK	74.0	-13.5	1.06 H	33	46.15	14.35
4	11490.00	47.8 AV	54.0	-6.2	1.06 H	33	33.45	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	120.2 PK			1.08 V	94	111.78	8.42
2	*5745.00	110.5 AV			1.08 V	94	102.08	8.42
3	11490.00	58.6 PK	74.0	-15.4	1.00 V	346	44.25	14.35
4	11490.00	45.2 AV	54.0	-8.8	1.00 V	346	30.85	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.
6. The limit value is defined as per 15.247.

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	112.7 PK			1.13 H	248	104.21	8.49
2	*5785.00	103.1 AV			1.13 H	248	94.61	8.49
3	11570.00	59.9 PK	74.0	-14.1	1.01 H	17	45.59	14.31
4	11570.00	47.7 AV	54.0	-6.3	1.01 H	17	33.39	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	119.6 PK			1.09 V	94	111.11	8.49
2	*5785.00	110.2 AV			1.09 V	94	101.71	8.49
3	11570.00	58.7 PK	74.0	-15.3	1.03 V	339	44.39	14.31
4	11570.00	45.5 AV	54.0	-8.5	1.03 V	339	31.19	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.
6. The limit value is defined as per 15.247.

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	111.8 PK			1.12 H	242	103.21	8.59
2	*5825.00	101.7 AV			1.12 H	242	93.11	8.59
3	11650.00	60.1 PK	74.0	-13.9	1.01 H	8	45.72	14.38
4	11650.00	47.6 AV	54.0	-6.4	1.01 H	8	33.22	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	119.1 PK			1.06 V	98	110.51	8.59
2	*5825.00	109.1 AV			1.06 V	98	100.51	8.59
3	11650.00	58.7 PK	74.0	-15.3	1.05 V	326	44.32	14.38
4	11650.00	45.2 AV	54.0	-8.8	1.05 V	326	30.82	14.38

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.
6. The limit value is defined as per 15.247.

Beamforming_MODE

802.11ac (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	*5745.00	110.1 PK			1.06 H	260	101.68	8.42
2	*5745.00	101.2 AV			1.06 H	260	92.78	8.42
3	11490.00	60.3 PK	74.0	-13.7	1.10 H	347	45.95	14.35
4	11490.00	47.8 AV	54.0	-6.2	1.10 H	347	33.45	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	117.3 PK			1.04 V	103	108.88	8.42
2	*5745.00	108.2 AV			1.04 V	103	99.78	8.42
3	11490.00	57.6 PK	74.0	-16.4	1.02 V	356	43.25	14.35
4	11490.00	45.1 AV	54.0	-8.9	1.02 V	356	30.75	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.
6. The limit value is defined as per 15.247.

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	113.3 PK			1.10 H	244	104.81	8.49
2	*5785.00	103.1 AV			1.10 H	244	94.61	8.49
3	11570.00	60.9 PK	74.0	-13.1	1.07 H	343	46.59	14.31
4	11570.00	48.0 AV	54.0	-6.0	1.07 H	343	33.69	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	120.7 PK			1.07 V	90	112.21	8.49
2	*5785.00	110.3 AV			1.07 V	90	101.81	8.49
3	11570.00	58.0 PK	74.0	-16.0	1.00 V	341	43.69	14.31
4	11570.00	45.3 AV	54.0	-8.7	1.00 V	341	30.99	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.
6. The limit value is defined as per 15.247.

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	114.4 PK			1.04 H	243	105.81	8.59
2	*5825.00	104.7 AV			1.04 H	243	96.11	8.59
3	11650.00	61.3 PK	74.0	-12.7	1.02 H	336	46.92	14.38
4	11650.00	48.1 AV	54.0	-5.9	1.02 H	336	33.72	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	121.3 PK			1.05 V	250	112.71	8.59
2	*5825.00	111.4 AV			1.05 V	250	102.81	8.59
3	11650.00	58.6 PK	74.0	-15.4	1.00 V	344	44.22	14.38
4	11650.00	45.8 AV	54.0	-8.2	1.00 V	344	31.42	14.38

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.
6. The limit value is defined as per 15.247.

802.11ac (VHT40)

CHANNEL	TX Channel 151	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	*5755.00	104.2 PK			1.15 H	259	95.76	8.44
2	*5755.00	95.4 AV			1.15 H	259	86.96	8.44
3	11510.00	60.6 PK	74.0	-13.4	1.08 H	22	46.26	14.34
4	11510.00	47.8 AV	54.0	-6.2	1.08 H	22	33.46	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	111.5 PK			1.02 V	223	103.06	8.44
2	*5755.00	102.5 AV			1.02 V	223	94.06	8.44
3	11510.00	58.5 PK	74.0	-15.5	1.00 V	342	44.16	14.34
4	11510.00	45.9 AV	54.0	-8.1	1.00 V	342	31.56	14.34

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.
6. The limit value is defined as per 15.247.

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	112.7 PK			1.06 H	254	104.20	8.50
2	*5795.00	102.0 AV			1.06 H	254	93.50	8.50
3	11590.00	61.0 PK	74.0	-13.0	1.07 H	326	46.70	14.30
4	11590.00	47.6 AV	54.0	-6.4	1.07 H	326	33.30	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	119.4 PK			1.07 V	257	110.90	8.50
2	*5795.00	108.8 AV			1.07 V	257	100.30	8.50
3	11590.00	58.0 PK	74.0	-16.0	1.00 V	343	43.70	14.30
4	11590.00	45.7 AV	54.0	-8.3	1.00 V	343	31.40	14.30

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.

802.11ac (VHT80)

CHANNEL	TX Channel 155	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	*5775.00	104.4 PK			1.12 H	360	95.93	8.47
2	*5775.00	92.2 AV			1.12 H	360	83.73	8.47
3	11550.00	59.8 PK	74.0	-14.2	1.03 H	29	45.48	14.32
4	11550.00	47.4 AV	54.0	-6.6	1.03 H	29	33.08	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	110.9 PK			1.00 V	249	102.43	8.47
2	*5775.00	98.8 AV			1.00 V	249	90.33	8.47
3	11550.00	58.0 PK	74.0	-16.0	1.00 V	340	43.68	14.32
4	11550.00	46.0 AV	54.0	-8.0	1.00 V	340	31.68	14.32

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.
6. The limit value is defined as per 15.247.

5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

5.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
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 : Nov. 14, 2014

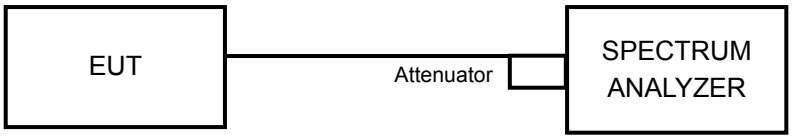
5.3.3 TEST PROCEDURE

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

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP



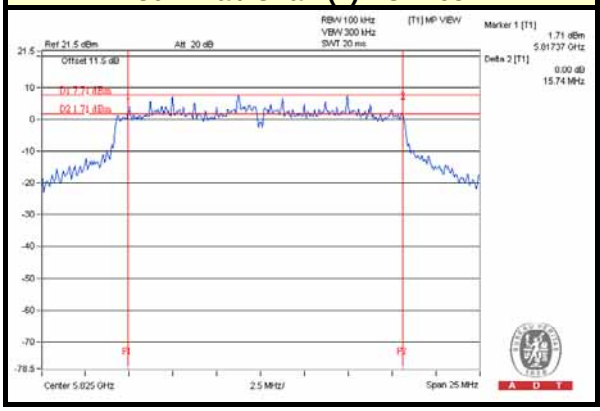
5.3.6 EUT OPERATING CONDITIONS

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

CDD MODE						
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
802.11a						
149	5745	16.39	16.35	15.77	0.5	PASS
157	5785	16.40	16.37	15.75	0.5	PASS
165	5825	16.40	16.35	15.74	0.5	PASS

CDD_MODE	
SPECTRUM PLOT OF WORST VALUE	
802.11a / Chain(1) : CH165	

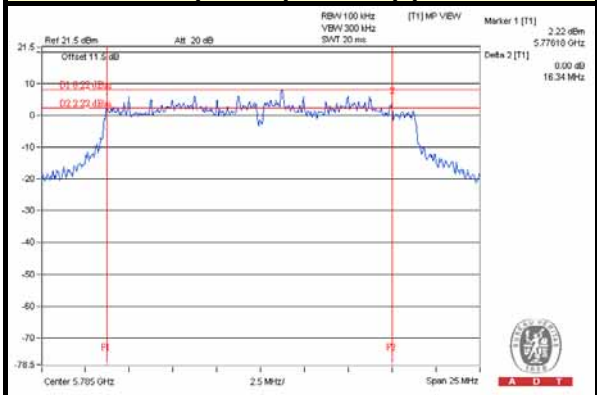


Beamforming MODE						
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
802.11ac (VHT20)						
149	5745	17.66	17.63	17.35	0.5	PASS
157	5785	17.64	17.65	16.34	0.5	PASS
165	5825	17.63	17.64	17.61	0.5	PASS
802.11ac (VHT40)						
151	5755	36.17	36.45	35.75	0.5	PASS
159	5795	36.15	35.89	35.23	0.5	PASS
802.11ac (VHT80)						
155	5775	75.57	76.00	75.43	0.5	PASS

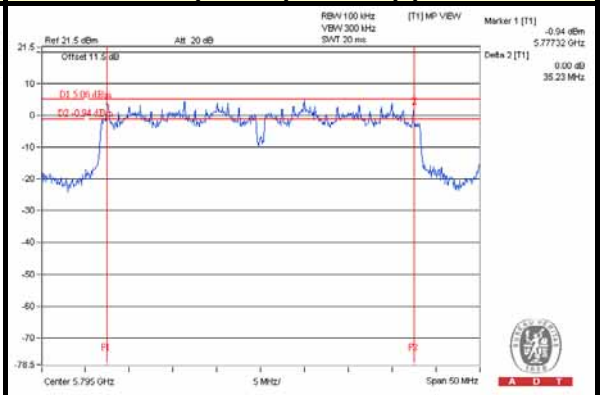
Beamforming_MODE

SPECTRUM PLOT OF WORST VALUE

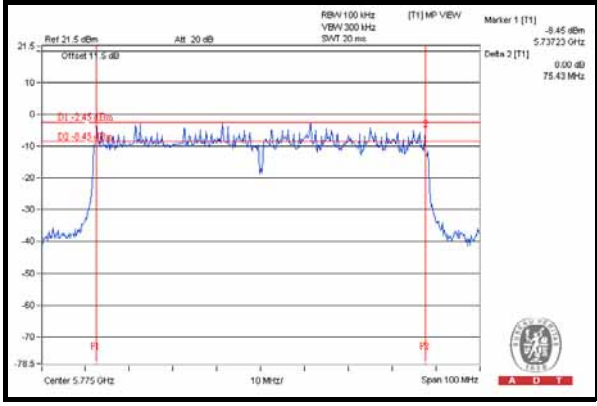
802.11ac (VHT20) / Chain(2) : CH157



802.11ac (VHT40) / Chain(2) : CH159



802.11ac (VHT80) / Chain(2) : CH155



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 ≤ 4;

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

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

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

5.4.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power meter 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 : Nov. 20, 2014

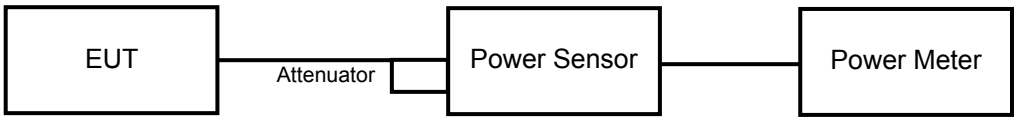
5.4.3 TEST PROCEDURES

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

5.4.7 TEST RESULTS

CDD MODE								
CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
802.11a								
149	5745	23.46	23.57	21.62	594.541	27.74	30	PASS
157	5785	23.11	23.23	21.50	556.276	27.45	30	PASS
165	5825	23.02	22.83	21.47	532.595	27.26	30	PASS

Beamforming MODE								
CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
802.11ac (VHT20)								
149	5745	20.13	20.57	19.49	305.984	24.86	27.92	PASS
157	5785	23.61	23.34	21.79	596.397	27.76	27.92	PASS
165	5825	23.39	22.91	21.35	550.165	27.40	27.92	PASS
802.11ac (VHT40)								
151	5755	17.19	17.66	16.51	155.476	21.92	27.92	PASS
159	5795	23.67	23.16	21.57	583.372	27.66	27.92	PASS
802.11ac (VHT80)								
155	5775	16.21	16.41	15.32	119.576	20.78	27.92	PASS

NOTE: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 3]$ = 8.08dBi > 6dBi , so the power limit shall be reduced to 30-(8.08-6) = 27.92dBm.

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 : Nov. 20, 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 ≥ 2 x 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.

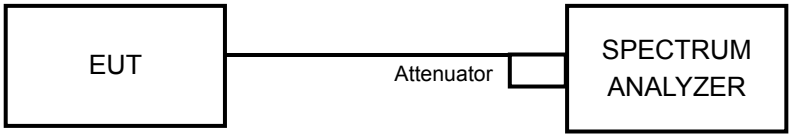
For 802.11ac (VHT80):

1. Set the RBW = 10 kHz, VBW = 30 kHz, Detector = power averaging (RMS).
2. Ensure that the number of measurement points in the sweep ≥ 2 x 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

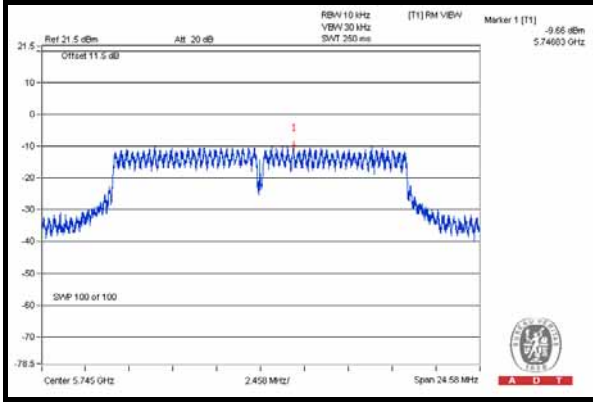
Same as Item 4.3.6

5.5.7 TEST RESULTS

CDD MODE							
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=3) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
802.11a							
0	149	5745	-9.66	4.77	-4.89	5.92	PASS
	157	5785	-9.75	4.77	-4.98	5.92	PASS
	165	5825	-10.43	4.77	-5.66	5.92	PASS
1	149	5745	-10.31	4.77	-5.54	5.92	PASS
	157	5785	-10.22	4.77	-5.45	5.92	PASS
	165	5825	-10.74	4.77	-5.97	5.92	PASS
2	149	5745	-9.68	4.77	-4.91	5.92	PASS
	157	5785	-9.81	4.77	-5.04	5.92	PASS
	165	5825	-10.56	4.77	-5.79	5.92	PASS

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 8.08dBi > 6dBi , so the power limit shall be reduced to 8-(8.08-6) = 5.92dBm.

CDD MODE	
SPECTRUM PLOT OF WORST VALUE	
802.11a / Chain(0) : CH149	

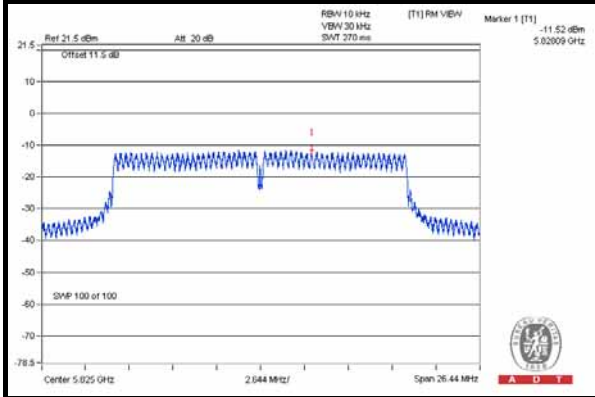
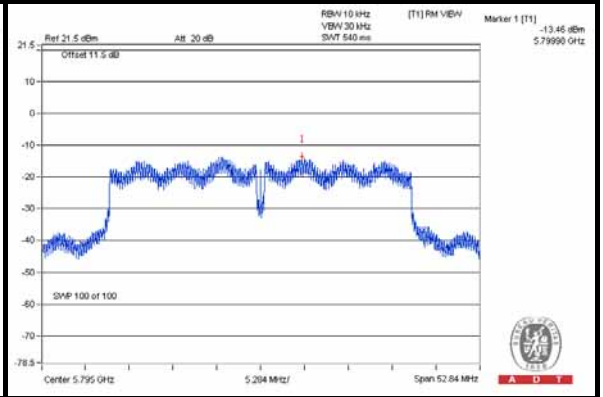
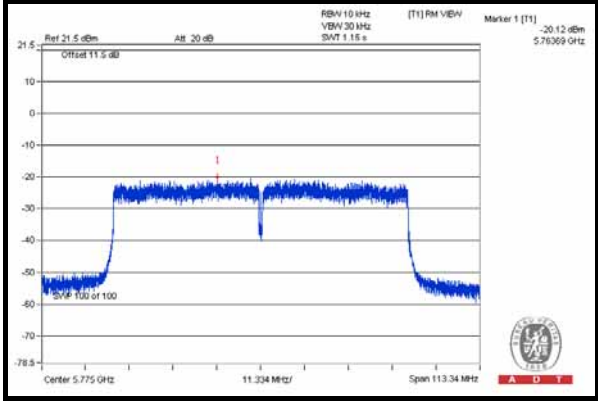


Beamforming MODE							
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=3) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
802.11ac (VHT20)							
0	149	5745	-12.48	4.77	-7.71	5.92	PASS
	157	5785	-11.54	4.77	-6.77	5.92	PASS
	165	5825	-11.52	4.77	-6.75	5.92	PASS
1	149	5745	-12.43	4.77	-7.66	5.92	PASS
	157	5785	-11.64	4.77	-6.87	5.92	PASS
	165	5825	-11.68	4.77	-6.91	5.92	PASS
2	149	5745	-11.89	4.77	-7.12	5.92	PASS
	157	5785	-11.61	4.77	-6.84	5.92	PASS
	165	5825	-11.53	4.77	-6.76	5.92	PASS
802.11ac (VHT40)							
0	151	5755	-17.44	4.77	-12.67	5.92	PASS
	159	5795	-13.84	4.77	-9.07	5.92	PASS
1	151	5755	-17.34	4.77	-12.57	5.92	PASS
	159	5795	-13.82	4.77	-9.05	5.92	PASS
2	151	5755	-17.28	4.77	-12.51	5.92	PASS
	159	5795	-13.46	4.77	-8.69	5.92	PASS

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 8.08dBi > 6dBi , so the power limit shall be reduced to 8-(8.08-6) = 5.92dBm.

Beamforming MODE								
TX CHAIN	CHANNEL	FREQ. (MHz)	PSD W/O DUTY FACTOR (dBm)	10 log (N=3) dB	DUTY FACTOR (dB)	TOTAL PSD WITH DUTY FACTOR (dBm)	LIMIT (dBm)	PASS /FAIL
802.11ac (VHT80)								
0	155	5775	-20.12	4.77	0.19	-15.16	5.92	PASS
1	155	5775	-20.67	4.77	0.19	-15.71	5.92	PASS
2	155	5775	-21.59	4.77	0.19	-16.63	5.92	PASS

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 8.08dBi > 6dBi , so the power limit shall be reduced to 8-(8.08-6) = 5.92dBm.

Beamforming MODE	
SPECTRUM PLOT OF WORST VALUE	
802.11ac (VHT20) / Chain(0) : CH165	802.11ac (VHT40) / Chain(2) : CH159
	
802.11ac (VHT80) / Chain(0) : CH155	
	

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 : Nov. 20, 2014

5.6.3 TEST PROCEDURE

Measurement Procedure - Reference Level

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

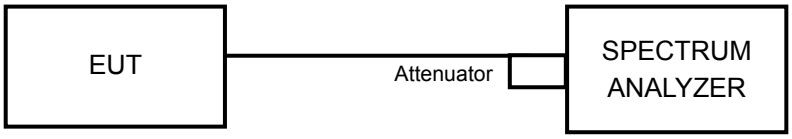
Measurement Procedure –Unwanted Emission Level

1. Set RBW = 100 kHz.
2. Set VBW ≥ 300 kHz.
3. 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

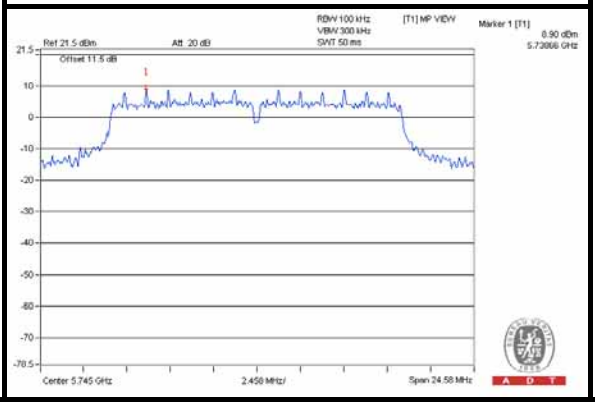
Same as Item 4.3.6

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.

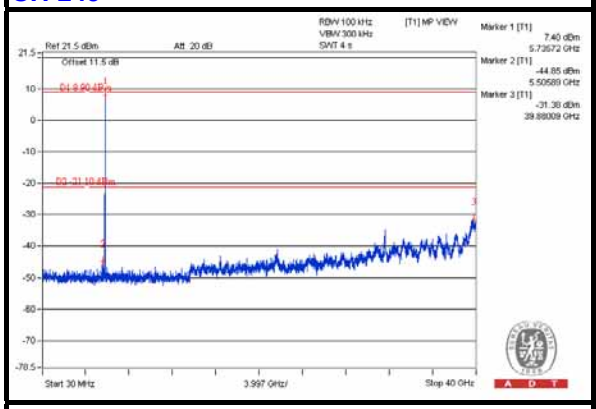
CDD_MODE:_802.11a

Maximum REF

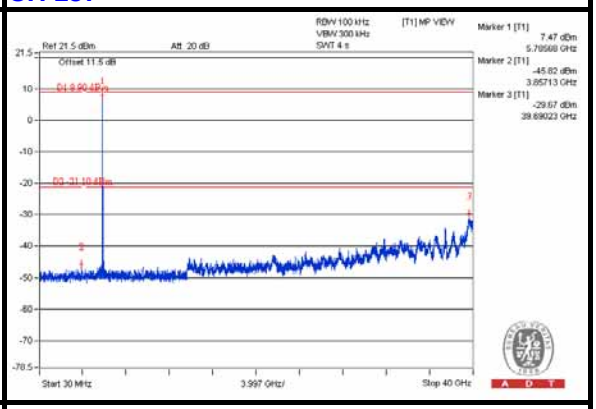


Chain(0)

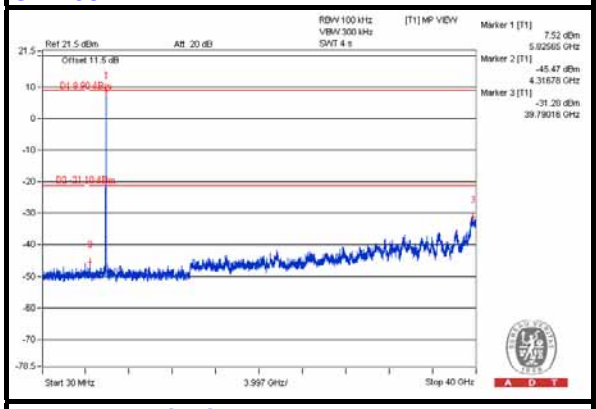
CH 149



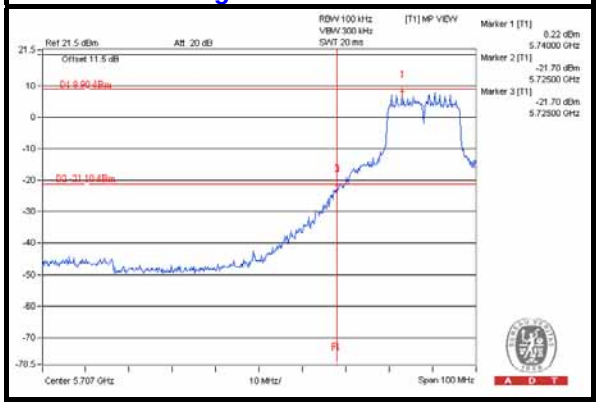
CH 157



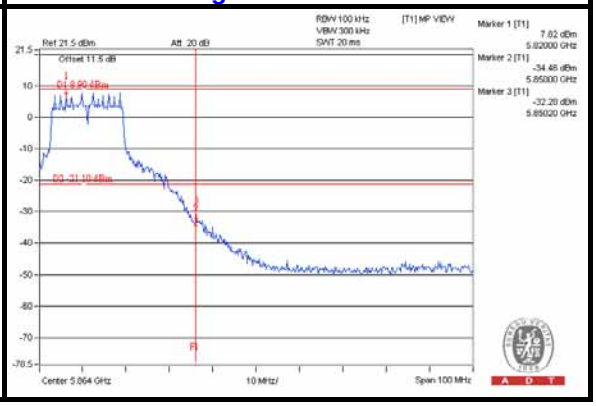
CH 165



CH 149 Band edge

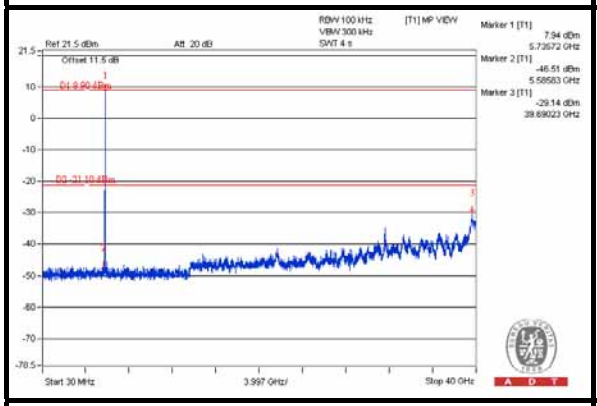


CH 165 Band edge

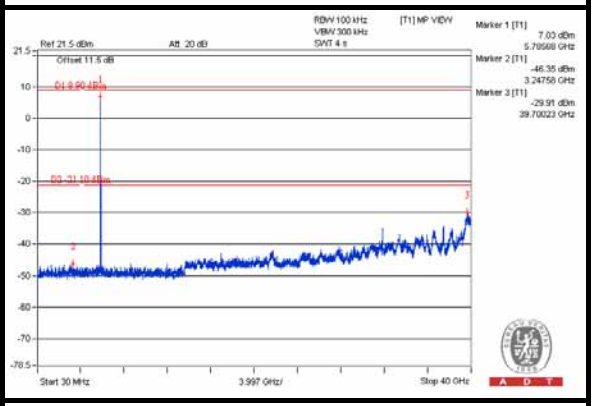


Chain(1)

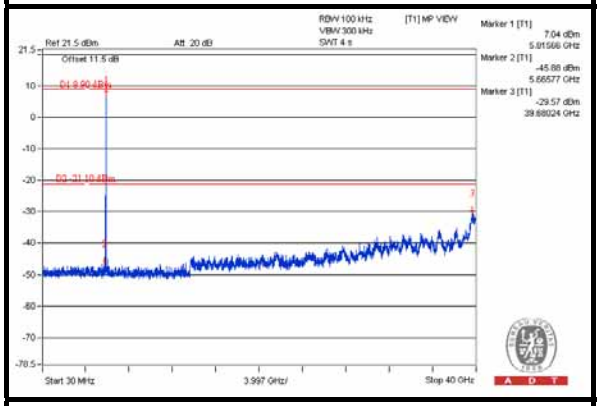
CH 149



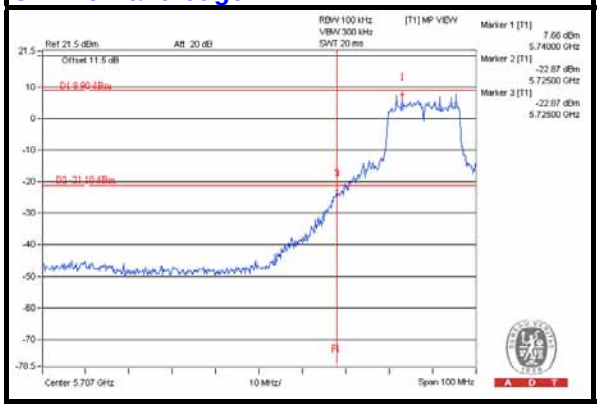
CH 157



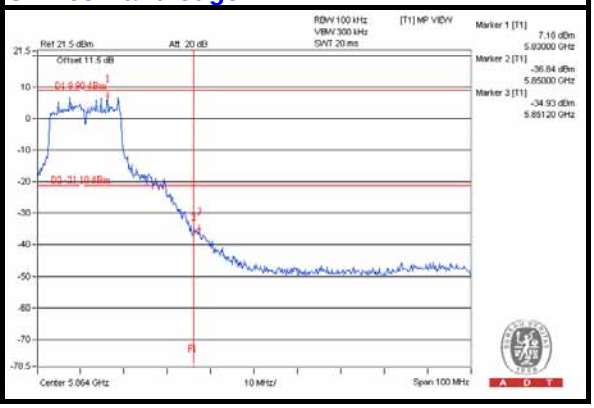
CH 165



CH 149 Band edge

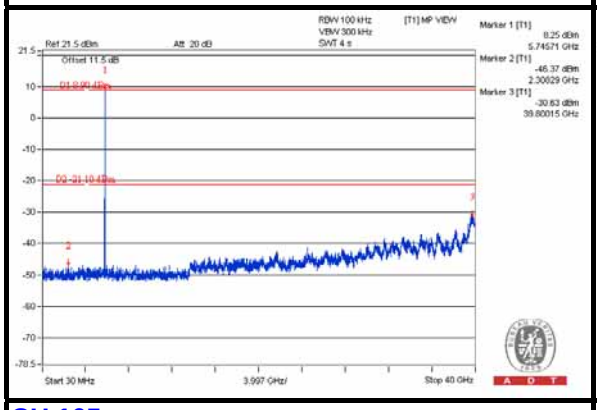


CH 165 Band edge

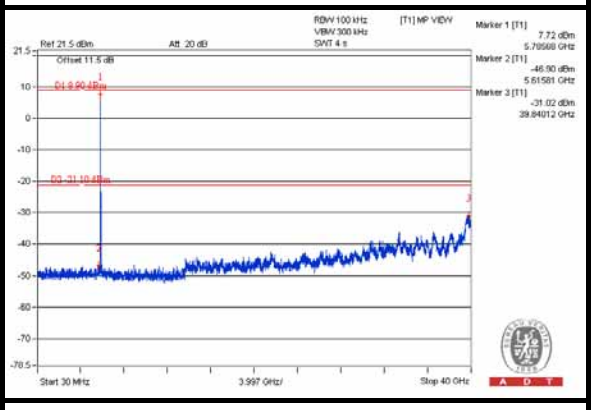


Chain(2)

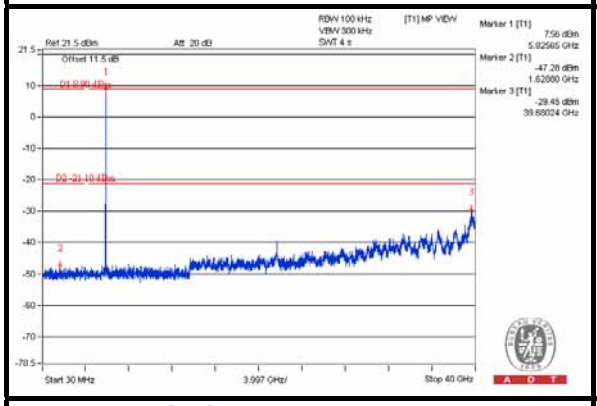
CH 149



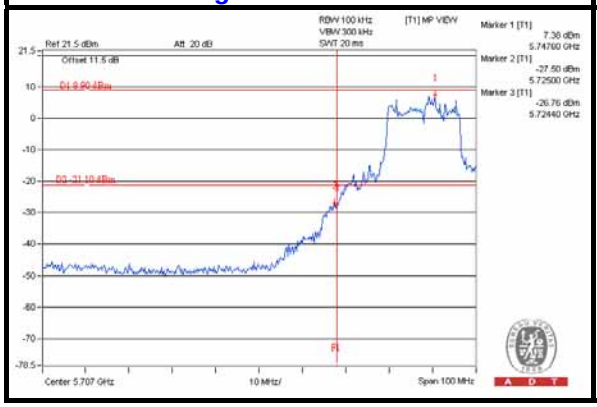
CH 157



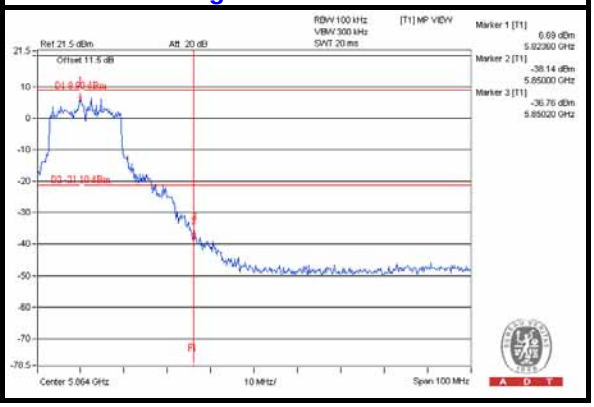
CH 165



CH 149 Band edge

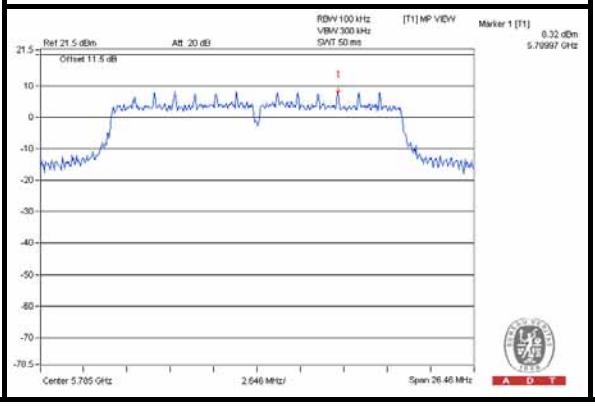


CH 165 Band edge



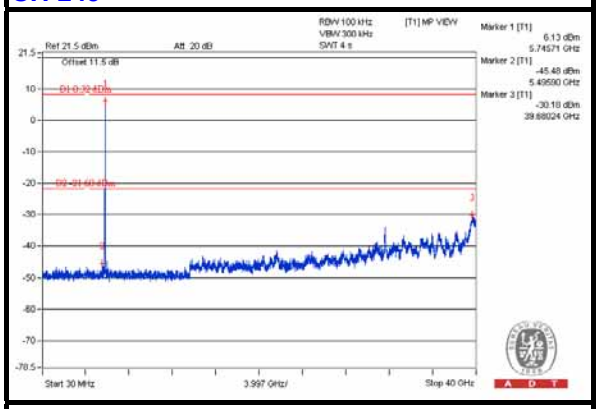
Beamforming MODE: 802.11ac (VHT20)

Maximum REF

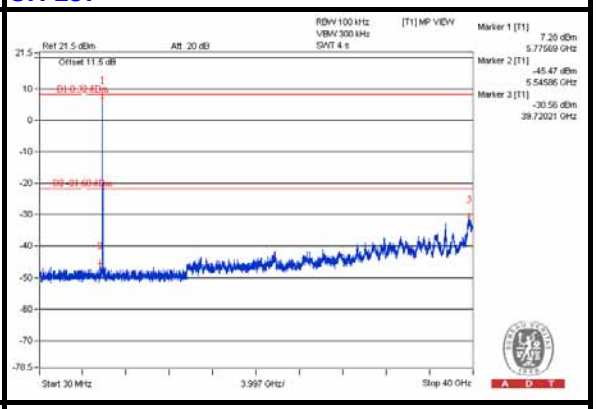


Chain(0)

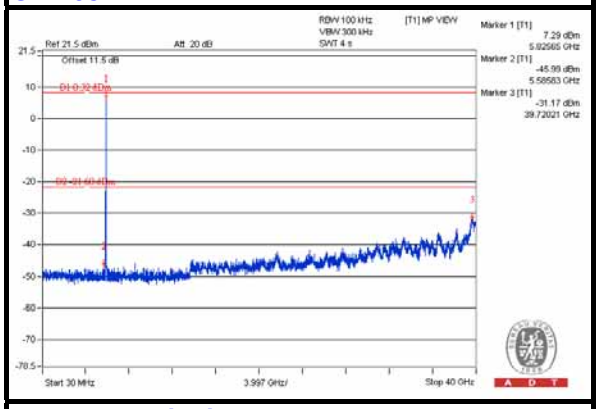
CH 149



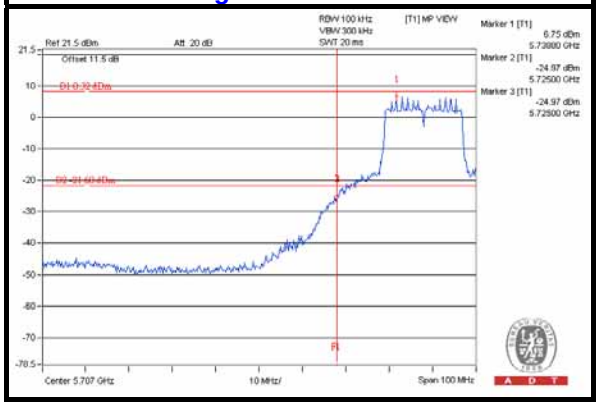
CH 157



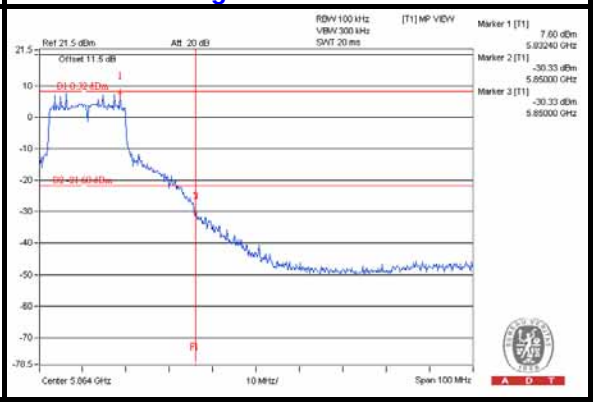
CH 165



CH 149 Band edge

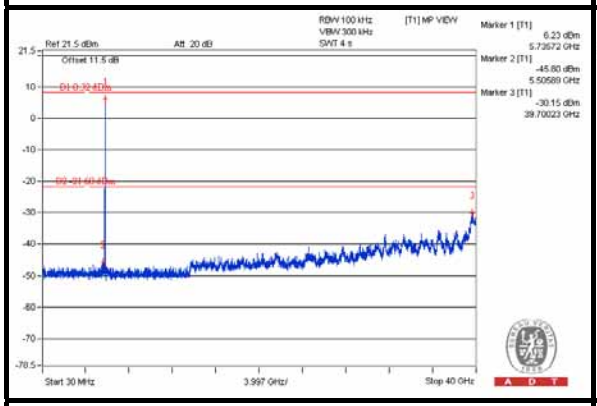


CH 165 Band edge

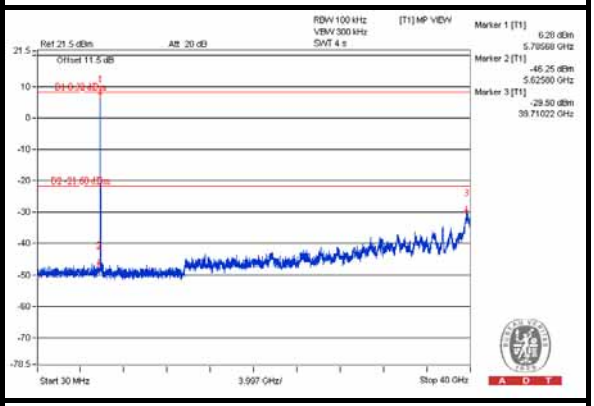


Chain(1)

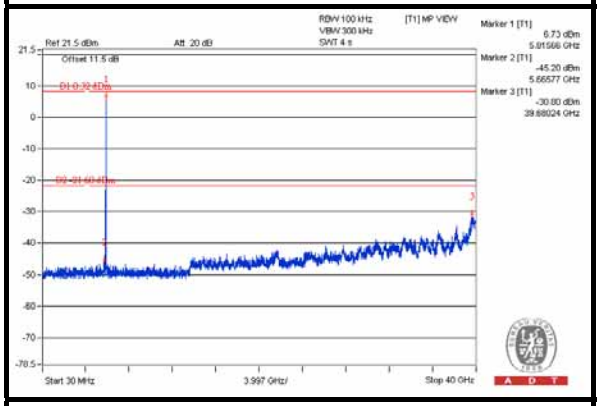
CH 149



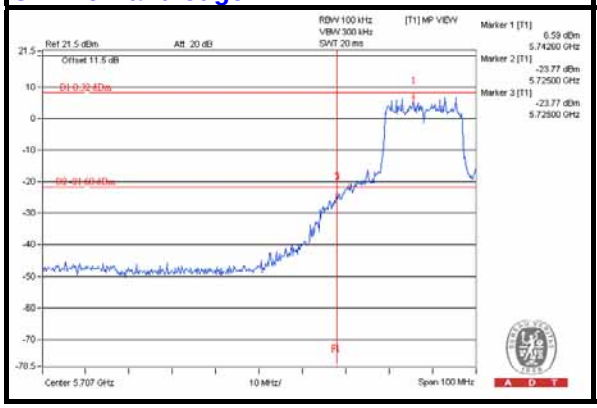
CH 157



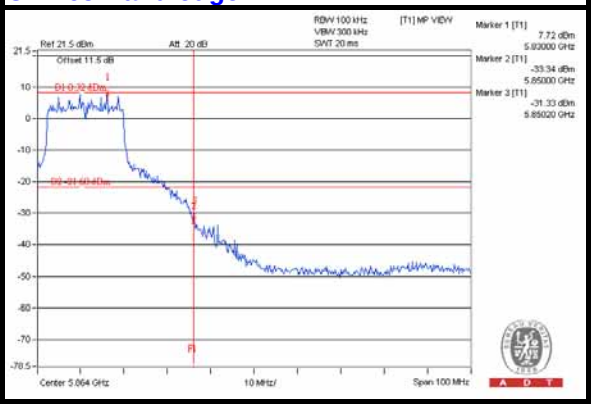
CH 165



CH 149 Band edge

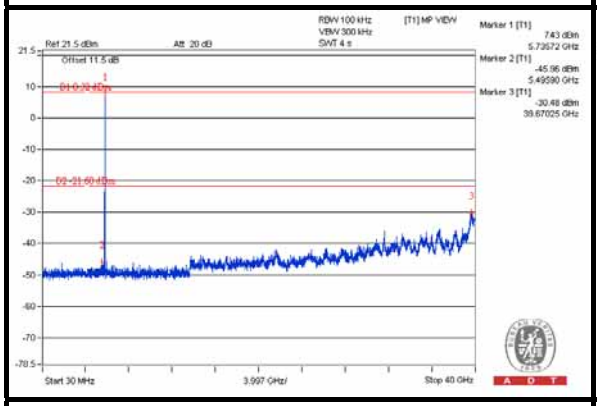


CH 165 Band edge

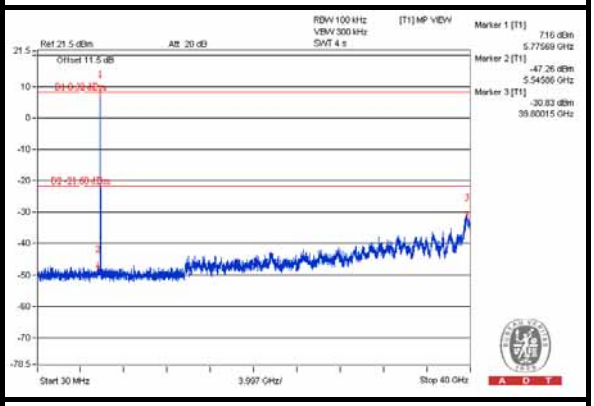


Chain(2)

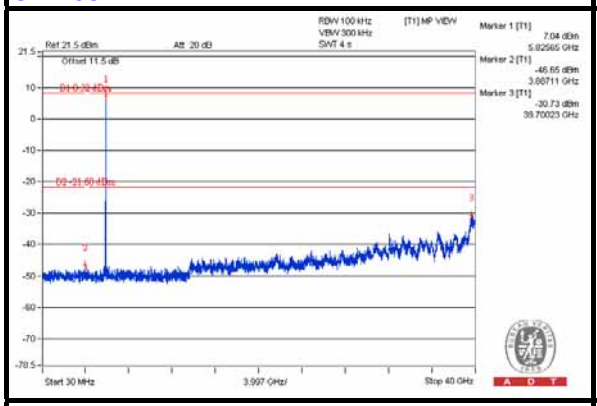
CH 149



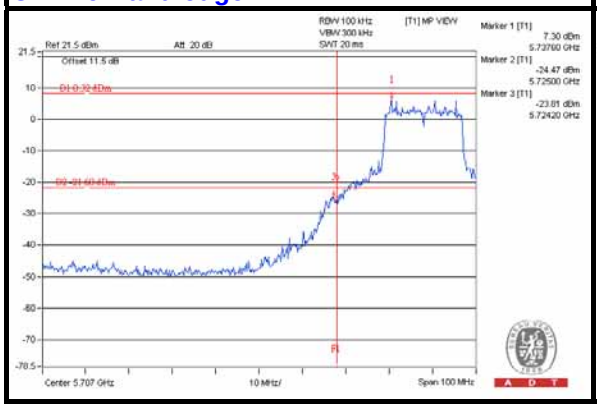
CH 157



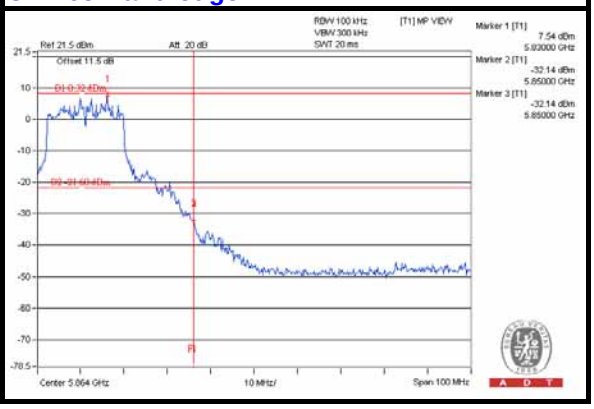
CH 165



CH 149 Band edge

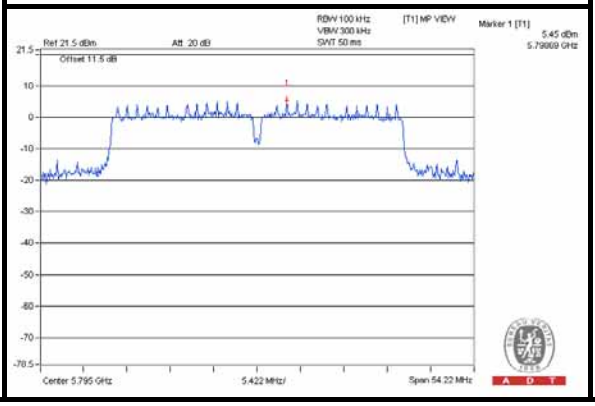


CH 165 Band edge



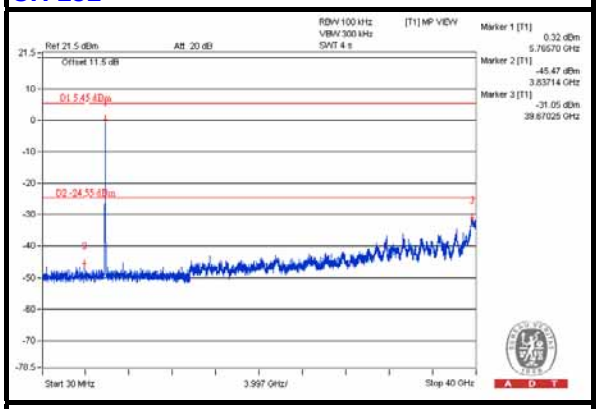
Beamforming MODE: 802.11ac (VHT40)

Maximum REF

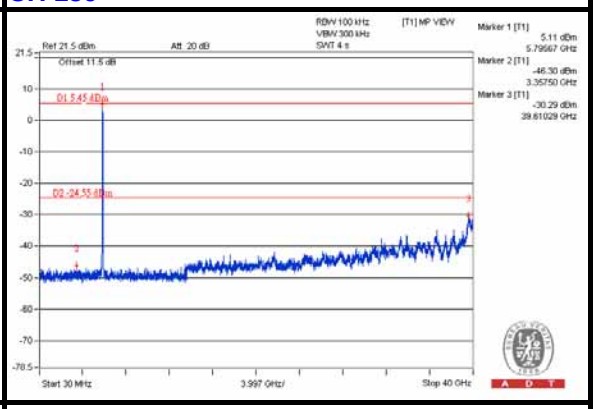


Chain(0)

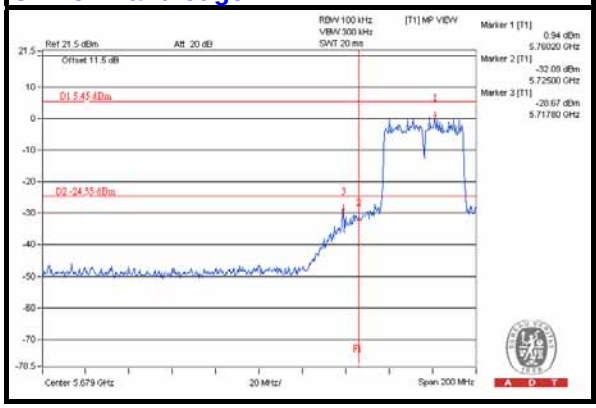
CH 151



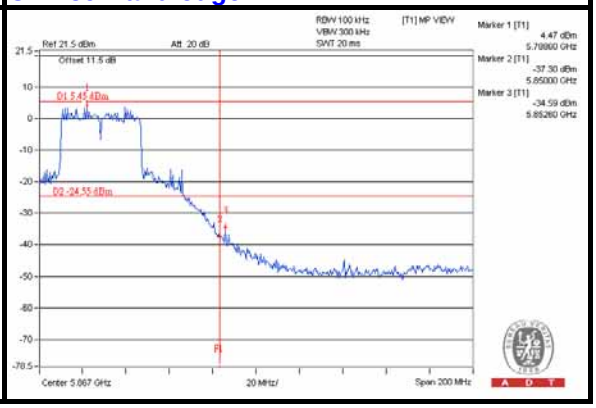
CH 159



CH 151 Band edge

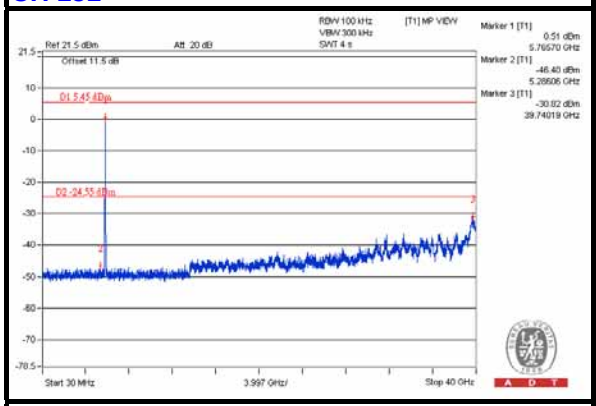


CH 159 Band edge

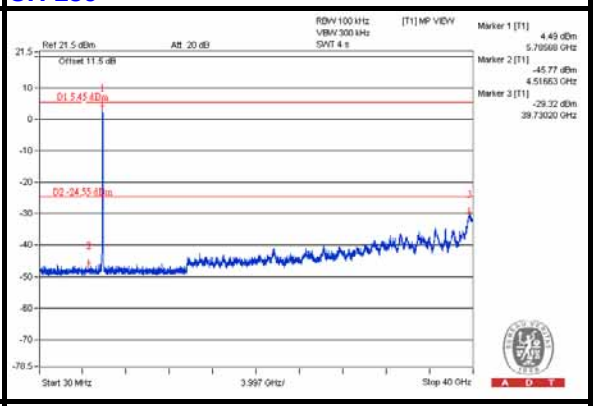


Chain(1)

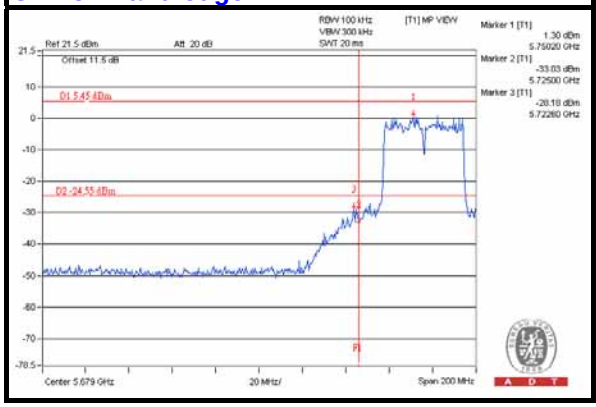
CH 151



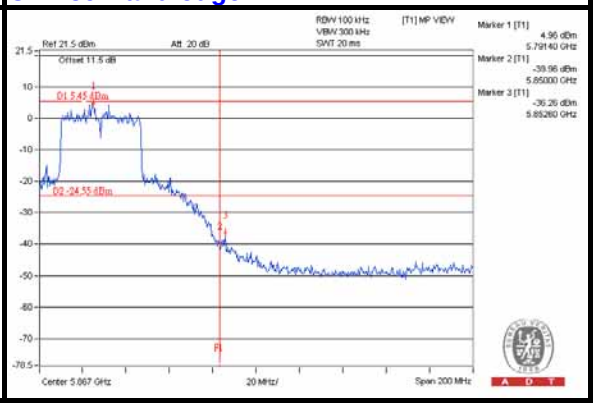
CH 159



CH 151 Band edge

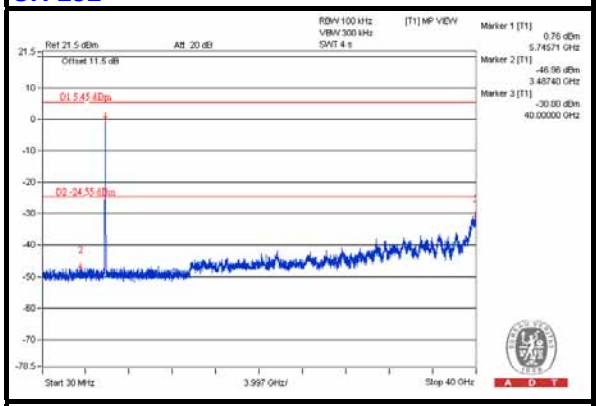


CH 159 Band edge

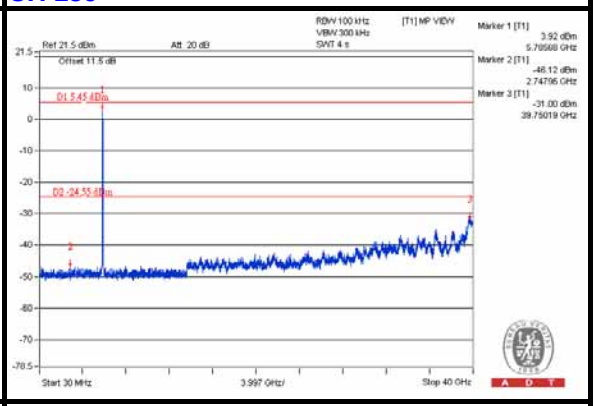


Chain(2)

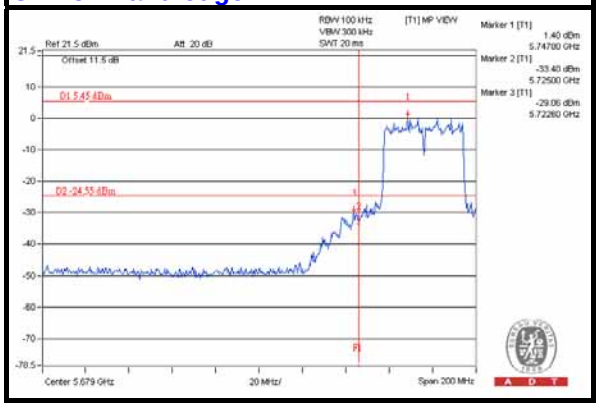
CH 151



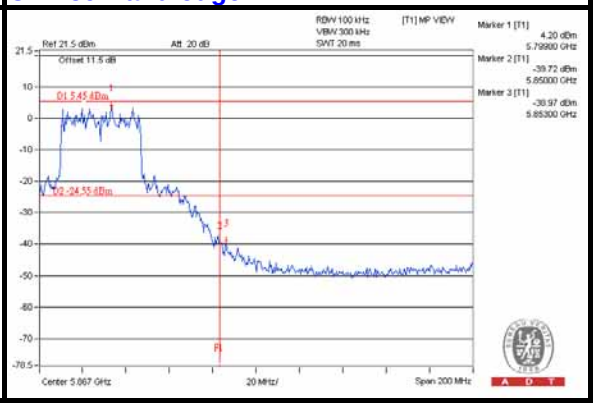
CH 159



CH 151 Band edge

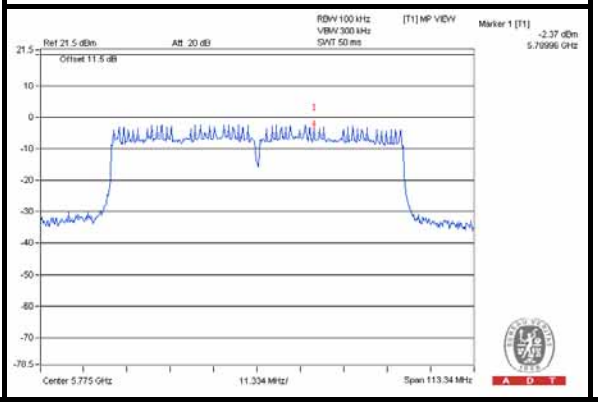


CH 159 Band edge



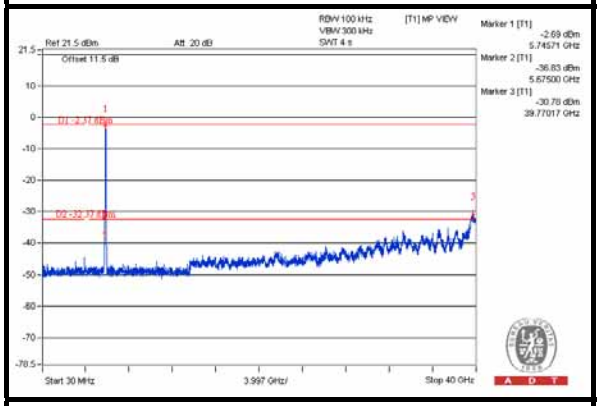
Beamforming MODE: 802.11ac (VHT80)

Maximum REF

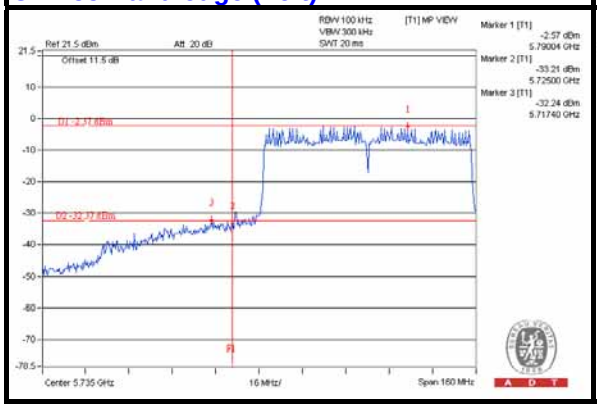


Chain(0)

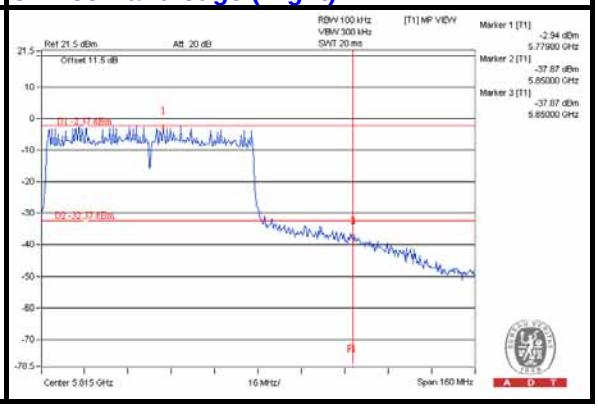
CH 155



CH 155 Band edge (Left)

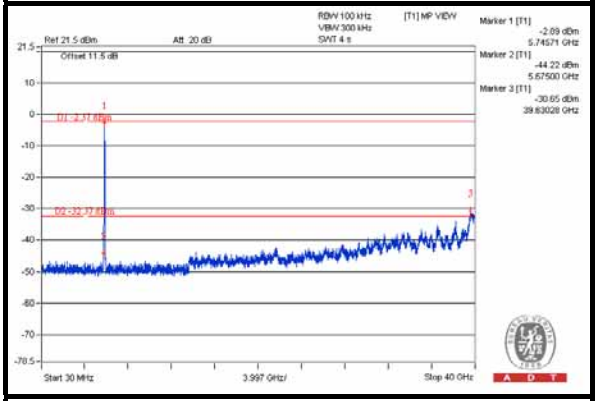


CH 155 Band edge (Right)

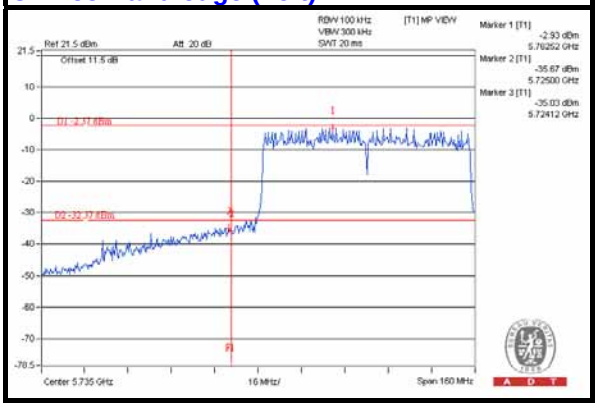


Chain(1)

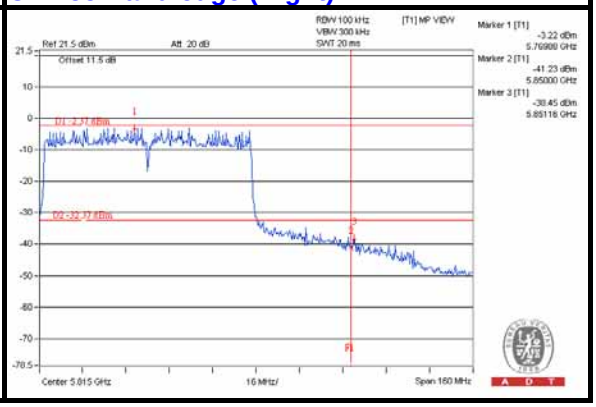
CH 155



CH 155 Band edge (Left)

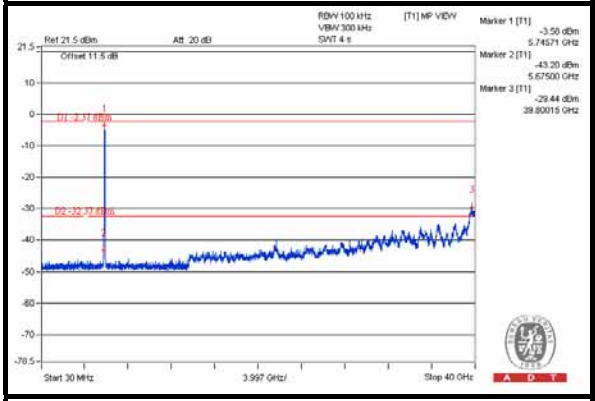


CH 155 Band edge (Right)

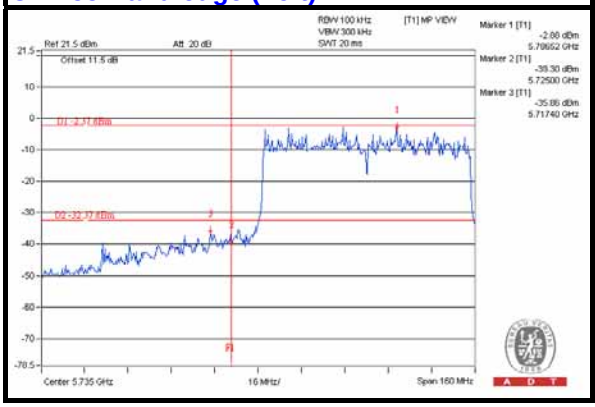


Chain(2)

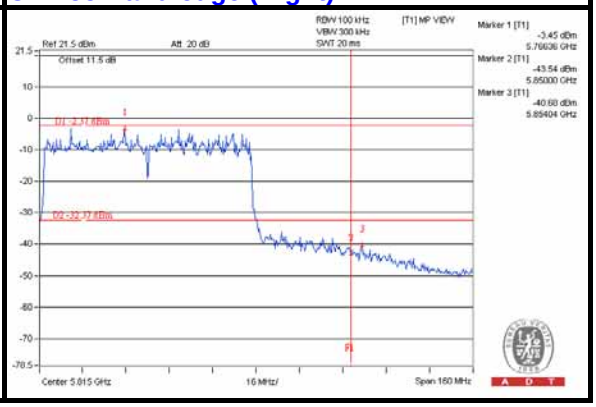
CH 155



CH 155 Band edge (Left)



CH 155 Band edge (Right)



6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

7. INFORMATION ON THE TESTING LABORATORIES

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

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

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

Hsin Chu EMC/RF/Telecom Lab:
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Fax: 886-3-3270892

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

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

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

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

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