FCC TEST REPORT (15.247)

REPORT NO.:	RF140710C17 R1
MODEL NO.:	C6300BD
FCC ID:	PY314200260
RECEIVED:	July 10, 2014
TESTED:	July 22 to 29, 2014
ISSUED:	Oct. 15, 2014

APPLICANT:	Netgear Inc
ADDRESS:	350 E. Plumeria Drive, San Jose CA 95134, USA

ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
LAB ADDRESS :	No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.
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This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

Table of Contents

RELEASE CONTROL RECORD 5
1. CERTIFICATION 6
2. SUMMARY OF TEST RESULTS 7
2.1 MEASUREMENT UNCERTAINTY 8
3. GENERAL INFORMATION 9
3.1 GENERAL DESCRIPTION OF EUT 9
3.2 DESCRIPTION OF TEST MODES 12
3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL 13
3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS 16
3.4 DUTY CYCLE OF TEST SIGNAL 17
3.5 DESCRIPTION OF SUPPORT UNITS 19
3.6 CONFIGURATION OF SYSTEM UNDER TEST 20
4. TEST TYPES AND RESULTS (FOR 2.4GHZ, 2.400 ~ 2.4835GHZ BAND) 21
4.1 CONDUCTED EMISSION MEASUREMENT 21
4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT 21
4.1.2 TEST INSTRUMENTS 21
4.1.3 TEST PROCEDURES 22
4.1.4 DEVIATION FROM TEST STANDARD 22
4.1.5 TEST SETUP 22
4.1.6 EUT OPERATING CONDITIONS 23
4.1.7 TEST RESULTS(MODE 1) 24
4.1.8 TEST RESULTS(MODE 2) 26
4.2 RADIATED EMISSION AND BANDEDGE MEASUREMENT 28
4.2.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT 28
4.2.2 TEST INSTRUMENTS 29
4.2.3 TEST PROCEDURES 30
4.2.4 DEVIATION FROM TEST STANDARD 31
4.2.5 TEST SETUP 31
4.2.6 EUT OPERATING CONDITIONS 31
4.2.7 TEST RESULTS 32
4.3 6DB BANDWIDTH MEASUREMENT 45
4.3.1 LIMITS OF 6DB BANDWIDTH MEASUREMENT 45
4.3.2 TEST INSTRUMENTS 45
4.3.3 TEST PROCEDURE 45
4.3.4 DEVIATION FROM TEST STANDARD 45
4.3.5 TEST SETUP 45
4.3.6 EUT OPERATING CONDITIONS 45
4.3.7 TEST RESULTS 46
4.4 CONDUCTED OUTPUT POWER MEASUREMENT 48
4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT 48
4.4.2 TEST INSTRUMENTS 48
4.4.3 TEST PROCEDURES 48
4.4.4 DEVIATION FROM TEST STANDARD 49
4.4.5 TEST SETUP 49
4.4.6 EUT OPERATING CONDITIONS 49
4.4.7 TEST RESULTS 50
4.5 POWER SPECTRAL DENSITY MEASUREMENT 51
4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT 51
4.5.2 TEST INSTRUMENTS 51
4.5.3 TEST PROCEDURE 51
4.5.4 DEVIATION FROM TEST STANDARD 51

4.5.5 TEST SETUP 52
4.5.6 EUT OPERATING CONDITION 52
4.5.7 TEST RESULTS 53
4.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT 56
4.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT 56
4.6.2 TEST INSTRUMENTS 56
4.6.3 TEST PROCEDURE 56
4.6.4 DEVIATION FROM TEST STANDARD 57
4.6.5 TEST SETUP 57
4.6.6 EUT OPERATING CONDITION 57
4.6.7 TEST RESULTS 57
5. TEST TYPES AND RESULTS (FOR 5GHZ, 5.725~5.850GHZ BAND) 70
5.1 CONDUCTED EMISSION MEASUREMENT 70
5.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT 70
5.1.2 TEST INSTRUMENTS 70
5.1.3 TEST PROCEDURES 71
5.1.4 DEVIATION FROM TEST STANDARD 71
5.1.5 TEST SETUP 71
5.1.6 EUT OPERATING CONDITIONS 72
5.1.7 TEST RESULTS(MODE 1) 73
5.1.8 TEST RESULTS(MODE 2) 75
5.2 RADIATED AND BANDEDGE EMISSION MEASUREMENT 77
5.2.1 LIMITS OF RADIATED AND BANDEDGE EMISSION MEASUREMENT 77
5.2.2 TEST INSTRUMENTS 78
5.2.3 TEST PROCEDURES 79
5.2.4 DEVIATION FROM TEST STANDARD 79
5.2.5 TEST SETUP 80
5.2.6 EUT OPERATING CONDITIONS 80
5.2.7 TEST RESULTS 81
5.3 6DB BANDWIDTH MEASUREMENT 91
5.3.1 LIMITS OF 6DB BANDWIDTH MEASUREMENT 91
5.3.2 TEST INSTRUMENTS 91
5.3.3 TEST PROCEDURE 91
5.3.4 DEVIATION FROM TEST STANDARD 91
5.3.5 TEST SETUP 91
5.3.6 EUT OPERATING CONDITIONS 91
5.3.7 TEST RESULTS 92
5.4 CONDUCTED OUTPUT POWER MEASUREMENT 94
5.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT 94
5.4.2 INSTRUMENTS 94
5.4.3 TEST PROCEDURES 95
5.4.4 DEVIATION FROM TEST STANDARD 95
5.4.5 TEST SETUP 95
5.4.6 EUT OPERATING CONDITIONS 95
5.4.7 TEST RESULTS 96
5.5 POWER SPECTRAL DENSITY MEASUREMENT 97
5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT 97
5.5.2 TEST INSTRUMENTS 97
5.5.3 TEST PROCEDURE 97
5.5.4 DEVIATION FROM TEST STANDARD 97
5.5.5 TEST SETUP 98
5.5.6 EUT OPERATING CONDITION 98
5.5.7 TEST RESULTS 99

5.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT 102
5.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT 102
5.6.2 TEST INSTRUMENTS 102
5.6.3 TEST PROCEDURE 102
5.6.4 DEVIATION FROM TEST STANDARD 103
5.6.5 TEST SETUP 103
5.6.6 EUT OPERATING CONDITION 103
5.6.7 TEST RESULTS 103
6. PHOTOGRAPHS OF THE TEST CONFIGURATION 116
7. INFORMATION ON THE TESTING LABORATORIES 117
8. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB 118

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF140710C17	Original release	Oct. 09, 2014
RF140710C17 R1	Remove the FCC Part 15, Subpart B statement	Oct. 15, 2014

1. CERTIFICATION

PRODUCT:	Wireless Cable Data Gateway
BRAND NAME:	NETGEAR
MODEL NO.:	C6300BD
TEST SAMPLE:	ENGINEERING SAMPLE
APPLICANT:	Netgear Inc
TESTED:	July 22 to 29, 2014
STANDARDS:	**FCC Part 15, Subpart C (Section 15.247)**
	ANSI C63.10-2009

The above equipment (Model: C6300BD) 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:** Oct. 15, 2014

(Claire Kuan, Specialist)

Approved by : _____ , **Date:** Oct. 15, 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 -10.00dB at 0.17179MHz
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 2483.50MHz
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted Output power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is I-PEX not a standard connector.

For 5GHz, 5725~5850MHz Band

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -11.58dB at 0.15912MHz & 0.55625MHz
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -3.0dB at 49.19MHz
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted Output power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is I-PEX not a standard connector.

NOTE: The EUT was operating in 2.400 ~ 2.4835GHz, 5.15~5.25GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 2.400 ~ 2.4835GHz and 5.725~5.850GHz. For the 5.15~5.25GHzGHz 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)	5.37 dB
Radiated emissions (1GHz -6GHz)	3.65 dB
Radiated emissions (6GHz -18GHz)	3.88 dB
Radiated emissions (18GHz -40GHz)	4.11 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless Cable Data Gateway
MODEL NO.	C6300BD
POWER SUPPLY	DC 12V from power adapter
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
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** 5.18 ~ 5.24GHz
	For 15.247 **2.4GHz:** 2412 ~ 2462MHz **5.0GHz:** 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) **For 15.247(5GHz)** 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)

MAXIMUM OUTPUT POWER	**For 15.407** 802.11a: 221.398mW 802.11ac (VHT20): 269.654mW 802.11ac (VHT40): 237.371mW 802.11ac (VHT80): 86.452mW **For 15.247(2.4GHz)** 802.11b: 683.701mW 802.11g: 661.388mW 802.11n (HT20): 476.954mW 802.11n (HT40): 200.838mW **For 15.247(5GHz)** 802.11a: 829.037mW 802.11ac (VHT20): 831.402mW 802.11ac (VHT40): 814.961mW 802.11ac (VHT80): 526.577mW
ANTENNA TYPE	Please see NOTE
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	Adapter x 1

NOTE:

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

For 2.4G used						
Ant. No.	Transmitter Circuit	Brand	Model	Antenna Type	Antenna Gain (dBi)	Connector type
1	Chain (0)	Master Wave	98P92UIPF030	PCB	2	I-PEX
2	Chain (1)		98P92UIPF031		2	
3	Chain (2)		98P92UIPF033		2	
For 5G used						
Ant. No.	Transmitter Circuit	Brand	Model	Antenna Type	Antenna Gain (dBi)	Connector type
4	Chain (0)	Master Wave	98P92UIPF033	PCB	2	I-PEX
5	Chain (1)		98P92UIPF034		2	
6	Chain (2)		98P92UIPF034		2	

2. The EUT could be supplied with a power adapter as the following table:

Adapter No.:	Brand	Model No.	Spec.
1	Netgear	2AAF042F	AC I/P: 100-240V, 1.5A, 50/60Hz DC O/P: 12V, 3.5A DC output cable (Unshielded, 1.8m)
2	Netgear	AD898F20	AC I/P: 100-240V, 1A, 50/60Hz DC O/P: 12V, 3.5A DC output cable (Unshielded, 1.8m)
Note: From the above adapters, the worst radiated test was found in **Adapter 1**. Therefore only the test data of the modes were recorded in this report.			

3. The EUT incorporates a MIMO function with beamforming.

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

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

EUT CONFIGURE MODE	APPLICABLE TO					DESCRIPTION
	PLC	RE < 1G	RE ≥ 1G	APCM	OB	
1	√	√	√	√	√	Adapter No.: 1
2	√	-	-	-	-	Adapter No.: 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

NOTE: 1. The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **Y-plane**.

POWER LINE CONDUCTED EMISSION TEST:

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
For 2.4 GHz 802.11b	1 to 11	6	OFDM	BPSK	1
For 5 GHz 802.11ac (VHT20)	149 to 165	149	OFDM	BPSK	6.5

RADIATED EMISSION TEST (BELOW 1 GHz):

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
For 2.4 GHz 802.11b	1 to 11	6	OFDM	BPSK	1
For 5 GHz 802.11ac (VHT20)	149 to 165	149	OFDM	BPSK	6.5

RADIATED EMISSION TEST (ABOVE 1 GHz):

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
For 2.4 GHz 802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
For 2.4 GHz 802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
For 5 GHz 802.11ac (VHT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
For 5 GHz 802.11ac (VHT40)	151 to 159	151, 159	OFDM	BPSK	13.5
For 5 GHz 802.11ac (VHT80)	155	155	OFDM	BPSK	29.3

ANTENNA PORT CONDUCTED MEASUREMENT:

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
For 2.4 GHz 802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
For 2.4 GHz 802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
For 5 GHz 802.11ac (VHT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
For 5 GHz 802.11ac (VHT40)	151 to 159	151, 159	OFDM	BPSK	13.5
For 5 GHz 802.11ac (VHT80)	155	155	OFDM	BPSK	29.3

CONDUCTED OUT-BAND EMISSION MEASUREMENT:

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
For 2.4 GHz 802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
For 2.4 GHz 802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
For 5 GHz 802.11ac (VHT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
For 5 GHz 802.11ac (VHT40)	151 to 159	151, 159	OFDM	BPSK	13.5
For 5 GHz 802.11ac (VHT80)	155	155	OFDM	BPSK	29.3

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
PLC	30deg. C, 70,%RH	120Vac, 60Hz	Mike Hsieh
RE<1G	25deg. C, 73%RH	120Vac, 60Hz	Gary Cheng
RE≥1G	28deg. C, 76%RH	120Vac, 60Hz	Gary Cheng
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng
OB	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart C (15.247)

558074 D01 DTS Meas Guidance 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

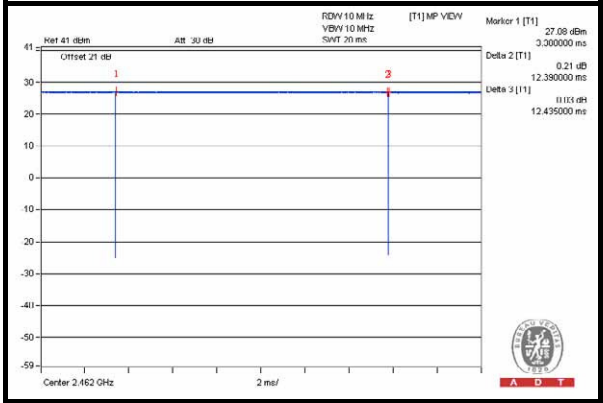
802.11b: Duty cycle = 12.39 ms/12.435 ms = 0.996

802.11g: Duty cycle = 2.063 ms/2.083 ms = 0.99

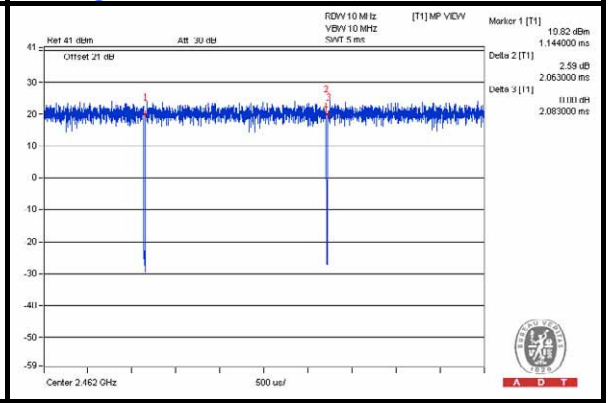
802.11n (HT20): Duty cycle = 1.916 ms/1.938 ms = 0.989

802.11n (HT40): Duty cycle = 0.94 ms/0.961 ms = 0.978, Duty factor = 10 * log(1/0.978) = 0.1

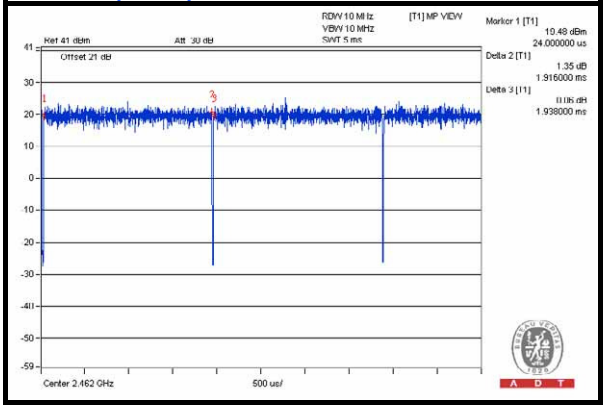
802.11b



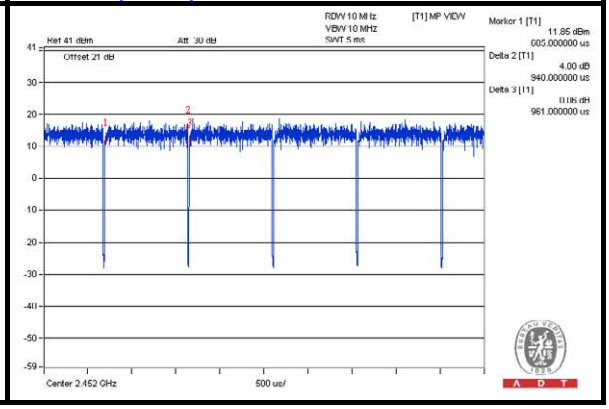
802.11g



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.

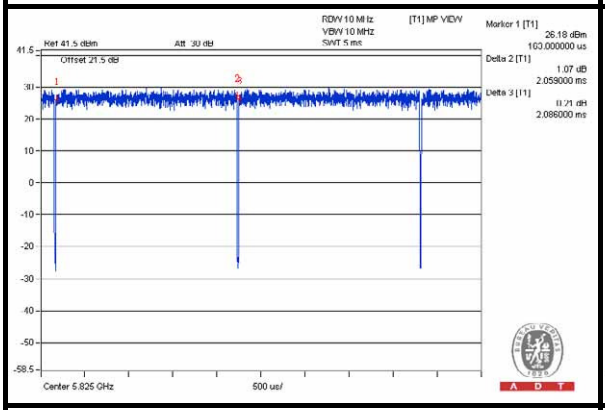
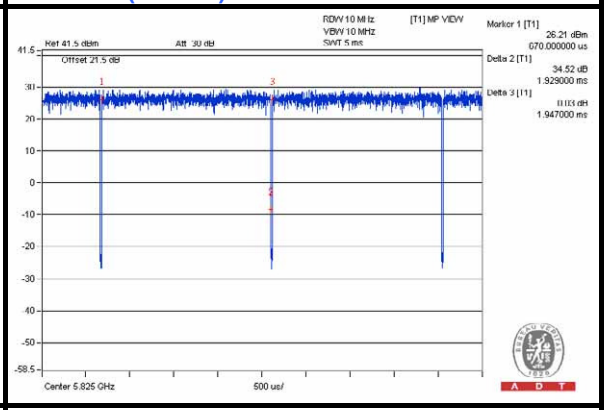
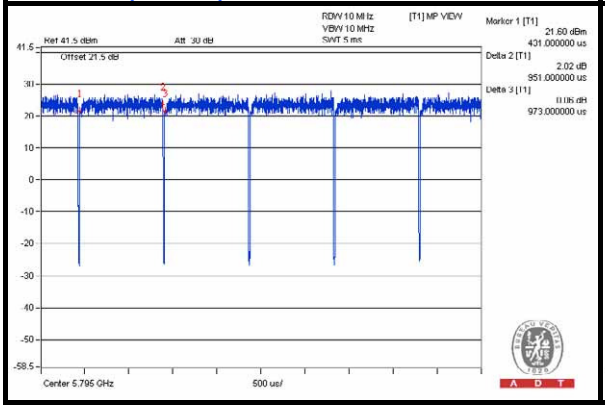
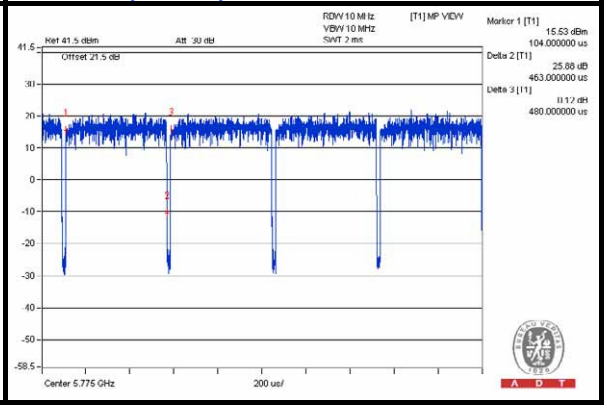
For 5GHz

802.11a: Duty cycle = 2.059 ms/2.086 ms = 0.987

802.11ac (VHT20): Duty cycle = 1.929 ms/1.947 ms = 0.991

802.11ac (VHT40): Duty cycle = 0.951 ms/0.973 ms = 0.977, Duty factor = 10 * log(1/0.977) = 0.1

802.11ac (VHT80): Duty cycle = 0.463 ms/0.48 ms = 0.965, Duty factor = 10 * log(1/0.965) = 0.16

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.

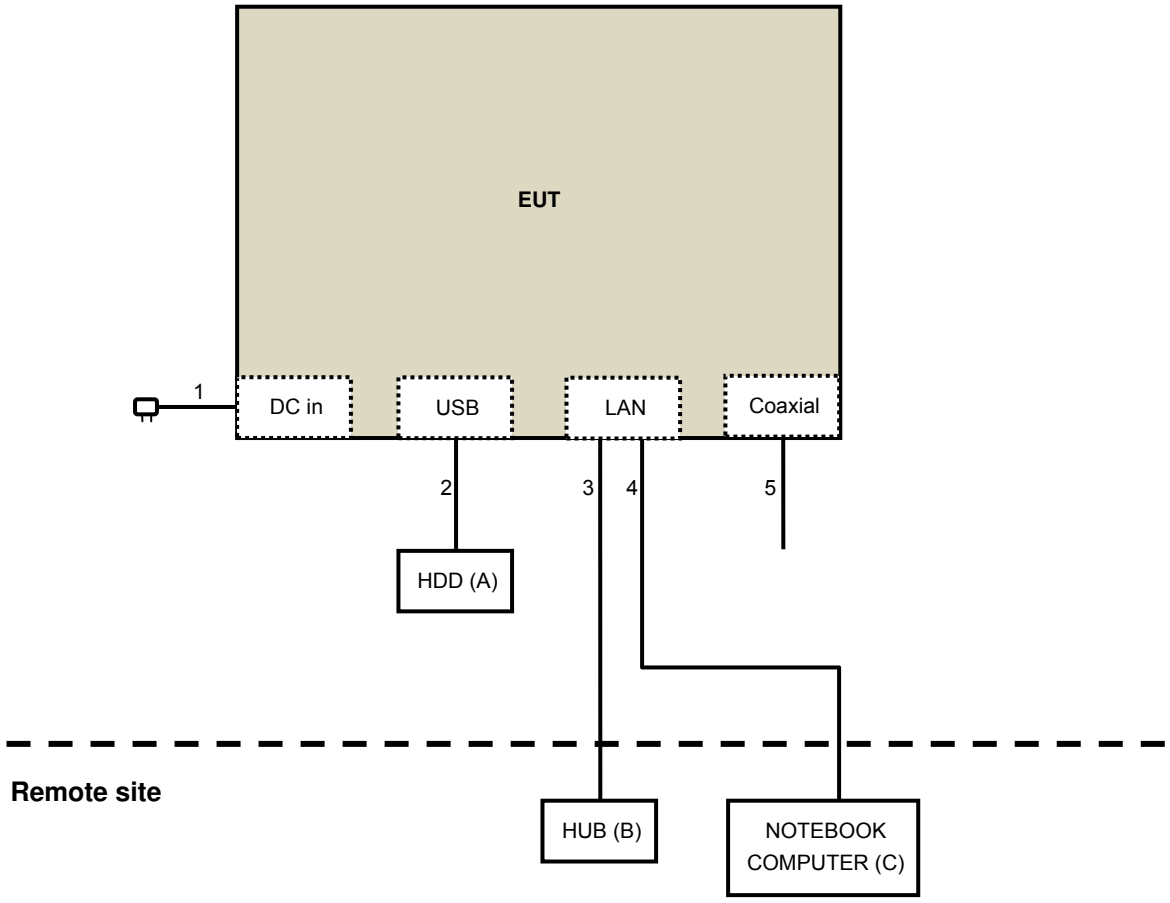
No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	HDD	WD	WDBACW0010 HBK-SESN	WCAZAL625787	FCC DoC	Provided by Lab
B	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab
C	NOTEBOOK COMPUTER	DELL	PP32LA	GSLB32S	FCC DoC	Provided by Lab

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 cable	1	1.8	No	0	Supplied by client
2	USB Cable	1	1.8	Yes	0	Provided by Lab
3	UTP RJ45	3	10	No	0	Provided by Lab
4	UTP RJ45	1	10	No	0	Provided by Lab
5	Coaxial Cable	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	NSLK8127	8127-522	Sep. 12, 2013	Sep. 11, 2014
Line-Impedance Stabilization Network (for Peripheral)	ENV216	100071	Nov. 13, 2013	Nov. 12, 2014
RF Cable (JYEBAO)	5DFB	COCCAB-001	Mar. 10 , 2014	Mar. 09, 2015
50 ohms Terminator	N/A	EMC-03	Sep. 24, 2013	Sep. 23, 2014
50 ohms Terminator	N/A	EMC-02	Oct. 01, 2013	Sep. 30, 2014
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: July 22, 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.

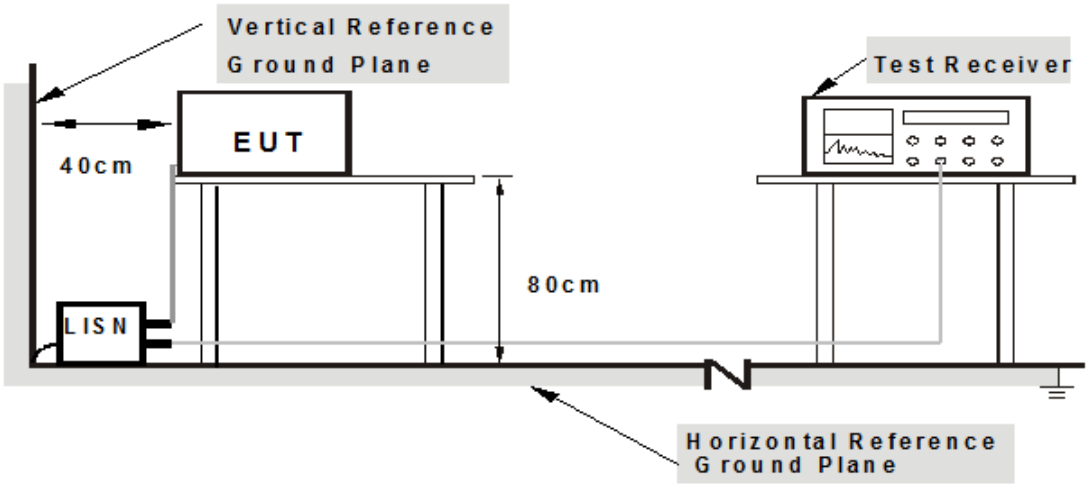
NOTE:

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. Connect the EUT with the support unit C (Notebook Computer) which is placed on table in remote site.
2. The communication partner run test program “Mtool 2.0.1.1” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

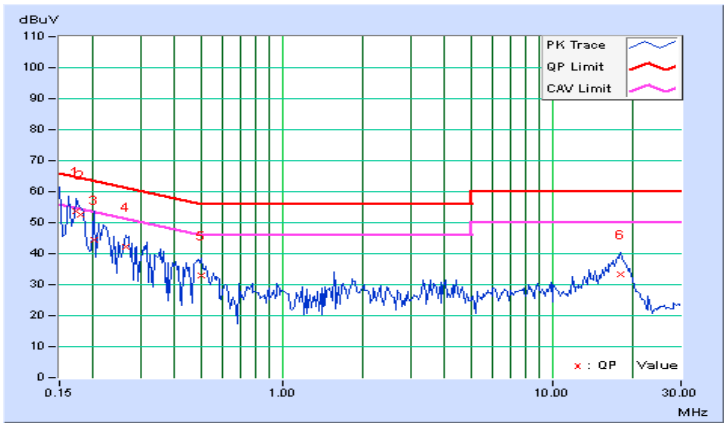
4.1.7 TEST RESULTS(MODE 1)

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	0.17344	0.07	53.77	44.50	53.84	44.57	64.79	54.79	-10.96	-10.23
2	0.18050	0.07	52.49	41.51	52.56	41.58	64.46	54.46	-11.90	-12.88
3	0.20078	0.07	44.26	20.30	44.33	20.37	63.58	53.58	-19.25	-33.21
4	0.26328	0.08	42.18	33.49	42.26	33.57	61.33	51.33	-19.07	-17.76
5	0.50156	0.10	32.82	18.68	32.92	18.78	56.00	46.00	-23.08	-27.22
6	18.00781	0.66	32.66	25.96	33.32	26.62	60.00	50.00	-26.68	-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

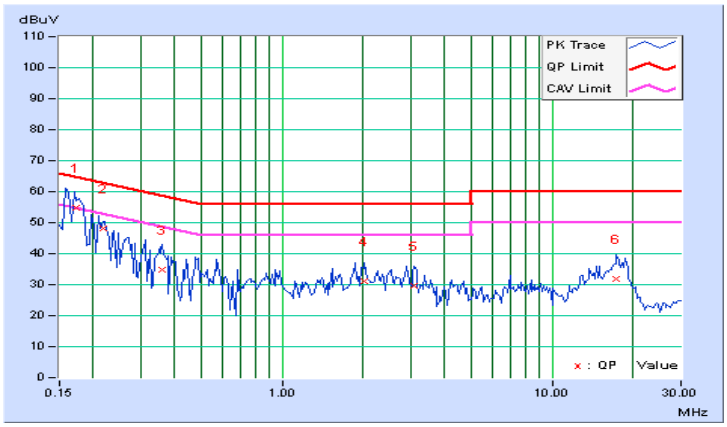


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	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	**0.17179**	**0.07**	**54.80**	**44.28**	**54.87**	**44.35**	**64.87**	**54.87**	**-10.00**	**-10.52**
2	0.21749	0.07	48.04	38.48	48.11	38.55	62.91	52.91	-14.80	-14.36
3	0.36094	0.09	34.59	14.79	34.68	14.88	58.71	48.71	-24.03	-33.83
4	2.02734	0.18	30.83	22.55	31.01	22.73	56.00	46.00	-24.99	-23.27
5	3.08984	0.22	29.32	21.42	29.54	21.64	56.00	46.00	-26.46	-24.36
6	17.31250	0.64	31.21	24.46	31.85	25.10	60.00	50.00	-28.15	-24.90

Remarks:

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



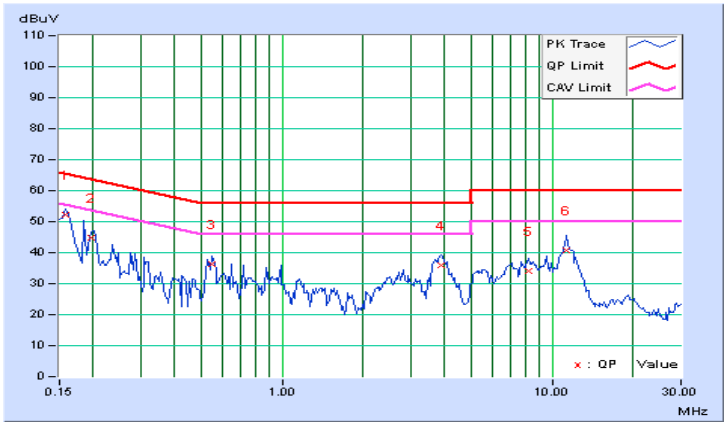
4.1.8 TEST RESULTS(MODE 2)

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	0.15781	0.07	52.09	43.56	52.16	43.63	65.58	55.58	-13.42	-11.95
2	0.19533	0.07	44.58	35.88	44.65	35.95	63.81	53.81	-19.16	-17.86
3	0.54844	0.10	36.08	30.75	36.18	30.85	56.00	46.00	-19.82	-15.15
4	3.89063	0.26	35.49	27.43	35.75	27.69	56.00	46.00	-20.25	-18.31
5	8.18359	0.39	33.61	28.44	34.00	28.83	60.00	50.00	-26.00	-21.17
6	11.28906	0.49	40.35	35.16	40.84	35.65	60.00	50.00	-19.16	-14.35

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

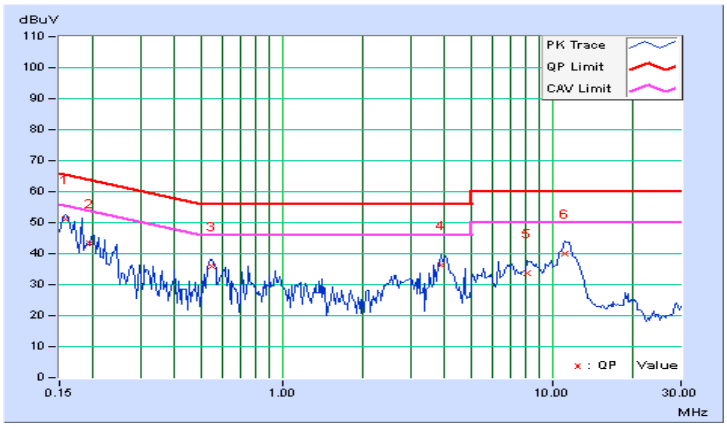


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	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	0.07	51.00	43.24	51.07	43.31	65.58	55.58	-14.50	-12.26
2	0.19523	0.07	43.22	34.98	43.29	35.05	63.81	53.81	-20.52	-18.76
3	0.54844	0.10	35.71	30.42	35.81	30.52	56.00	46.00	-20.19	-15.48
4	3.89063	0.26	36.08	27.39	36.34	27.65	56.00	46.00	-19.66	-18.35
5	8.12500	0.39	33.38	28.43	33.77	28.82	60.00	50.00	-26.23	-21.18
6	11.12109	0.48	39.70	34.77	40.18	35.25	60.00	50.00	-19.82	-14.75

Remarks:

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



4.2 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

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

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

NOTE:

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

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY51210105	July 21, 2014	July 20, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-03	Nov. 13, 2013	Nov. 12, 2014
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Feb. 26, 2014	Feb. 25, 2015
RF Cable	NA	CHGCAB_001	Oct. 05, 2013	Oct. 04, 2014
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Horn_Antenna AISI	AIH.8018	0000320091110	Nov. 18, 2013	Nov. 17, 2014
Pre-Amplifier Agilent	8449B	3008A02578	June 24, 2014	June 23, 2015
RF Cable	NA	RF104-201 RF104-203 RF104-204	Dec. 12, 2013	Dec. 11, 2014
Spectrum Analyzer Agilent	E4446A	MY48250253	Aug. 28, 2013	Aug. 27, 2014
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 13, 2013	Nov. 12, 2014
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 08, 2013	Oct. 07, 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. 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: July 22, 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:

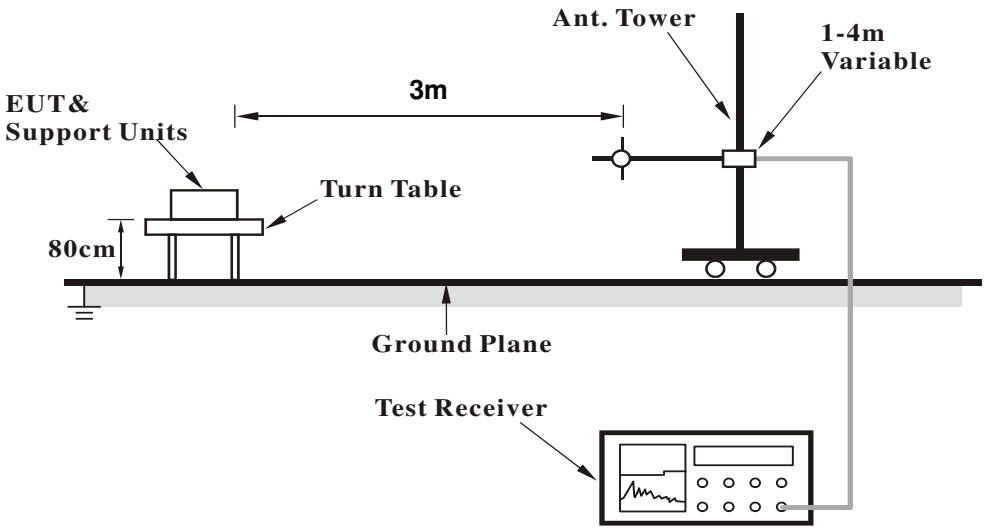
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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

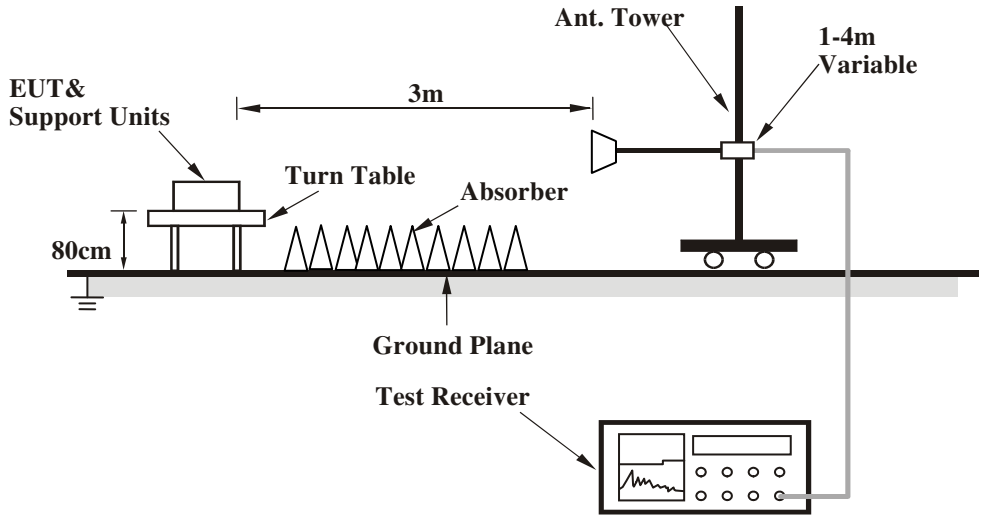
No deviation

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

802.11b

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	60.90	28.9 QP	40.0	-11.1	1.50 H	22	43.17	-14.23
2	125.01	38.8 QP	43.5	-4.7	2.00 H	245	53.75	-14.92
3	250.00	35.5 QP	46.0	-10.5	1.00 H	265	49.84	-14.32
4	375.03	36.6 QP	46.0	-9.4	1.00 H	305	46.86	-10.23
5	500.01	34.7 QP	46.0	-11.3	1.50 H	360	42.09	-7.36
6	749.98	40.8 QP	46.0	-5.2	1.00 H	322	42.77	-1.94
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	49.78	36.4 QP	40.0	-3.6	1.00 V	148	49.92	-13.53
2	59.97	35.8 QP	40.0	-4.2	1.00 V	360	49.94	-14.12
3	125.01	37.3 QP	43.5	-6.2	1.00 V	103	52.21	-14.92
4	374.98	35.0 QP	46.0	-11.0	1.00 V	337	45.23	-10.24
5	500.01	36.9 QP	46.0	-9.2	1.00 V	269	44.21	-7.36
6	749.98	37.3 QP	46.0	-8.7	1.50 V	272	39.26	-1.94

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	2389.10	61.9 PK	74.0	-12.1	1.06 H	134	64.64	-2.74
2	2389.10	52.9 AV	54.0	-1.1	1.06 H	134	55.64	-2.74
3	*2412.00	116.5 PK			1.06 H	134	119.14	-2.64
4	*2412.00	113.7 AV			1.06 H	134	116.34	-2.64
5	4824.00	57.1 PK	74.0	-16.9	1.18 H	304	51.83	5.27
6	4824.00	53.7 AV	54.0	-0.3	1.18 H	304	48.43	5.27
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	2389.10	64.9 PK	74.0	-9.1	1.01 V	68	67.64	-2.74
2	2389.10	53.5 AV	54.0	-0.5	1.01 V	68	56.24	-2.74
3	*2412.00	120.6 PK			1.01 V	68	123.24	-2.64
4	*2412.00	117.8 AV			1.01 V	68	120.44	-2.64
5	4824.00	56.6 PK	74.0	-17.4	1.10 V	97	51.33	5.27
6	4824.00	52.4 AV	54.0	-1.6	1.10 V	97	47.13	5.27

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	116.1 PK			1.04 H	125	118.63	-2.53
2	*2437.00	113.5 AV			1.04 H	125	116.03	-2.53
3	4874.00	57.1 PK	74.0	-16.9	1.23 H	297	51.61	5.49
4	4874.00	53.6 AV	54.0	-0.4	1.23 H	297	48.11	5.49
5	7311.00	56.2 PK	74.0	-17.8	1.00 H	112	43.50	12.70
6	7311.00	43.0 AV	54.0	-11.0	1.00 H	112	30.30	12.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	120.4 PK			1.03 V	65	122.93	-2.53
2	*2437.00	117.4 AV			1.03 V	65	119.93	-2.53
3	4874.00	56.2 PK	74.0	-17.8	1.05 V	82	50.71	5.49
4	4874.00	52.0 AV	54.0	-2.0	1.05 V	82	46.51	5.49
5	7311.00	56.2 PK	74.0	-17.8	1.26 V	360	43.50	12.70
6	7311.00	42.9 AV	54.0	-11.1	1.26 V	360	30.20	12.70

REMARKS:

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

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	117.2 PK			1.10 H	131	119.62	-2.42
2	*2462.00	114.2 AV			1.10 H	131	116.62	-2.42
3	2483.50	64.8 PK	74.0	-9.2	1.10 H	131	67.12	-2.32
4	2483.50	51.8 AV	54.0	-2.2	1.10 H	131	54.12	-2.32
5	4924.00	55.6 PK	74.0	-18.4	1.22 H	286	49.90	5.70
6	4924.00	51.9 AV	54.0	-2.1	1.22 H	286	46.20	5.70
7	7386.00	55.8 PK	74.0	-18.2	1.02 H	104	43.12	12.68
8	7386.00	42.6 AV	54.0	-11.4	1.02 H	104	29.92	12.68
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	120.5 PK			1.00 V	75	122.92	-2.42
2	*2462.00	117.5 AV			1.00 V	75	119.92	-2.42
3	2483.50	63.0 PK	74.0	-11.0	1.00 V	75	65.32	-2.32
4	2483.50	52.6 AV	54.0	-1.4	1.00 V	75	54.92	-2.32
5	4924.00	56.3 PK	74.0	-17.7	1.06 V	84	50.60	5.70
6	4924.00	52.0 AV	54.0	-2.0	1.06 V	84	46.30	5.70
7	7386.00	56.1 PK	74.0	-17.9	1.21 V	360	43.42	12.68
8	7386.00	42.7 AV	54.0	-11.3	1.21 V	360	30.02	12.68

REMARKS:

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

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	66.7 PK	74.0	-7.3	1.25 H	130	69.44	-2.74
2	2390.00	51.1 AV	54.0	-2.9	1.25 H	130	53.84	-2.74
3	*2412.00	113.0 PK			1.25 H	130	115.64	-2.64
4	*2412.00	102.3 AV			1.25 H	130	104.94	-2.64
5	4824.00	55.8 PK	74.0	-18.2	1.00 H	327	50.53	5.27
6	4824.00	43.0 AV	54.0	-11.0	1.00 H	327	37.73	5.27
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.8 PK	74.0	-2.2	1.32 V	86	74.54	-2.74
2	2390.00	53.6 AV	54.0	-0.4	1.32 V	86	56.34	-2.74
3	*2412.00	116.7 PK			1.32 V	86	119.34	-2.64
4	*2412.00	106.2 AV			1.32 V	86	108.84	-2.64
5	4824.00	54.6 PK	74.0	-19.4	1.00 V	176	49.33	5.27
6	4824.00	43.0 AV	54.0	-11.0	1.00 V	176	37.73	5.27

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
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	68.4 PK	74.0	-5.6	1.25 H	121	71.14	-2.74
2	2390.00	43.2 AV	54.0	-10.8	1.25 H	121	45.94	-2.74
3	*2437.00	116.3 PK			1.25 H	121	118.83	-2.53
4	*2437.00	106.2 AV			1.25 H	121	108.73	-2.53
5	2483.50	67.3 PK	74.0	-6.7	1.25 H	121	69.62	-2.32
6	2483.50	45.9 AV	54.0	-8.1	1.25 H	121	48.22	-2.32
7	4874.00	55.4 PK	74.0	-18.6	1.00 H	317	49.91	5.49
8	4874.00	42.7 AV	54.0	-11.3	1.00 H	317	37.21	5.49
9	7311.00	58.9 PK	74.0	-15.1	1.00 H	210	46.20	12.70
10	7311.00	44.4 AV	54.0	-9.6	1.00 H	210	31.70	12.70
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	70.0 PK	74.0	-4.0	1.32 V	62	72.74	-2.74
2	2390.00	45.9 AV	54.0	-8.1	1.32 V	62	48.64	-2.74
3	*2437.00	120.8 PK			1.30 V	85	123.33	-2.53
4	*2437.00	110.4 AV			1.30 V	85	112.93	-2.53
5	2483.50	69.2 PK	74.0	-4.8	1.32 V	62	71.52	-2.32
6	2483.50	53.3 AV	54.0	-0.7	1.32 V	62	55.62	-2.32
7	4874.00	54.2 PK	74.0	-19.8	1.00 V	174	48.71	5.49
8	4874.00	42.6 AV	54.0	-11.4	1.00 V	174	37.11	5.49
9	7311.00	58.1 PK	74.0	-15.9	1.00 V	213	45.40	12.70
10	7311.00	44.6 AV	54.0	-9.4	1.00 V	213	31.90	12.70

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	113.0 PK			1.26 H	126	115.42	-2.42
2	*2462.00	102.1 AV			1.26 H	126	104.52	-2.42
3	2483.50	66.8 PK	74.0	-7.2	1.26 H	126	69.12	-2.32
4	2483.50	51.4 AV	54.0	-2.6	1.26 H	126	53.72	-2.32
5	4924.00	56.0 PK	74.0	-18.0	1.01 H	338	50.30	5.70
6	4924.00	43.1 AV	54.0	-10.9	1.01 H	338	37.40	5.70
7	7386.00	58.9 PK	74.0	-15.1	1.00 H	215	46.22	12.68
8	7386.00	44.5 AV	54.0	-9.5	1.00 H	215	31.82	12.68
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	115.4 PK			1.28 V	85	117.82	-2.42
2	*2462.00	105.8 AV			1.28 V	85	108.22	-2.42
3	2483.50	73.1 PK	74.0	-0.9	1.28 V	85	75.42	-2.32
4	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**1.28 V**	**85**	**56.22**	**-2.32**
5	4924.00	53.9 PK	74.0	-20.1	1.04 V	172	48.20	5.70
6	4924.00	42.4 AV	54.0	-11.6	1.04 V	172	36.70	5.70
7	7386.00	57.9 PK	74.0	-16.1	1.00 V	220	45.22	12.68
8	7386.00	44.6 AV	54.0	-9.4	1.00 V	220	31.92	12.68

REMARKS:

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

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	70.4 PK	74.0	-3.6	1.37 H	61	73.14	-2.74
2	2390.00	48.7 AV	54.0	-5.3	1.37 H	61	51.44	-2.74
3	*2412.00	111.5 PK			1.37 H	61	114.14	-2.64
4	*2412.00	101.3 AV			1.37 H	61	103.94	-2.64
5	4824.00	56.3 PK	74.0	-17.7	1.02 H	316	51.03	5.27
6	4824.00	43.5 AV	54.0	-10.5	1.02 H	316	38.23	5.27
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	73.5 PK	74.0	-0.5	1.33 V	83	76.24	-2.74
2	2390.00	52.5 AV	54.0	-1.5	1.33 V	83	55.24	-2.74
3	*2412.00	116.3 PK			1.33 V	83	118.94	-2.64
4	*2412.00	105.3 AV			1.33 V	83	107.94	-2.64
5	4824.00	55.1 PK	74.0	-18.9	1.03 V	176	49.83	5.27
6	4824.00	43.3 AV	54.0	-10.7	1.03 V	176	38.03	5.27

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
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	68.9 PK	74.0	-5.1	1.29 H	107	71.64	-2.74
2	2390.00	43.5 AV	54.0	-10.5	1.29 H	107	46.24	-2.74
3	*2437.00	116.6 PK			1.26 H	105	119.13	-2.53
4	*2437.00	106.7 AV			1.26 H	105	109.23	-2.53
5	2483.50	68.0 PK	74.0	-6.0	1.21 H	118	70.32	-2.32
6	2483.50	46.4 AV	54.0	-7.6	1.21 H	118	48.72	-2.32
7	4874.00	55.4 PK	74.0	-18.6	1.00 H	308	49.91	5.49
8	4874.00	42.9 AV	54.0	-11.1	1.00 H	308	37.41	5.49
9	7311.00	58.7 PK	74.0	-15.3	1.00 H	196	46.00	12.70
10	7311.00	44.4 AV	54.0	-9.6	1.00 H	196	31.70	12.70
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	72.5 PK	74.0	-1.5	1.31 V	83	75.24	-2.74
2	2390.00	45.6 AV	54.0	-8.4	1.31 V	83	48.34	-2.74
3	*2437.00	121.7 PK			1.31 V	83	124.23	-2.53
4	*2437.00	110.8 AV			1.31 V	83	113.33	-2.53
5	2483.50	72.9 PK	74.0	-1.1	1.31 V	83	75.22	-2.32
6	2483.50	47.7 AV	54.0	-6.3	1.31 V	83	50.02	-2.32
7	4874.00	53.8 PK	74.0	-20.2	1.05 V	171	48.31	5.49
8	4874.00	42.5 AV	54.0	-11.5	1.05 V	171	37.01	5.49
9	7311.00	58.2 PK	74.0	-15.8	1.02 V	228	45.50	12.70
10	7311.00	44.9 AV	54.0	-9.1	1.02 V	228	32.20	12.70

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	112.0 PK			1.32 H	124	114.42	-2.42
2	*2462.00	101.8 AV			1.32 H	124	104.22	-2.42
3	2483.50	66.8 PK	74.0	-7.2	1.31 H	127	69.12	-2.32
4	2483.50	49.3 AV	54.0	-4.7	1.31 H	127	51.62	-2.32
5	4924.00	56.1 PK	74.0	-17.9	1.03 H	345	50.40	5.70
6	4924.00	43.2 AV	54.0	-10.8	1.03 H	345	37.50	5.70
7	7386.00	58.8 PK	74.0	-15.2	1.00 H	217	46.12	12.68
8	7386.00	44.1 AV	54.0	-9.9	1.00 H	217	31.42	12.68
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	116.8 PK			1.28 V	85	119.22	-2.42
2	*2462.00	105.8 AV			1.28 V	85	108.22	-2.42
3	2483.50	73.6 PK	74.0	-0.4	1.28 V	85	75.92	-2.32
4	2483.50	51.1 AV	54.0	-2.9	1.28 V	85	53.42	-2.32
5	4924.00	54.6 PK	74.0	-19.4	1.07 V	167	48.90	5.70
6	4924.00	42.8 AV	54.0	-11.2	1.07 V	167	37.10	5.70
7	7386.00	57.8 PK	74.0	-16.2	1.00 V	230	45.12	12.68
8	7386.00	44.4 AV	54.0	-9.6	1.00 V	230	31.72	12.68

REMARKS:

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

802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.3 PK	74.0	-4.7	1.37 H	70	72.04	-2.74
2	2390.00	51.3 AV	54.0	-2.7	1.37 H	70	54.04	-2.74
3	*2422.00	107.9 PK			1.37 H	70	110.49	-2.59
4	*2422.00	96.6 AV			1.37 H	70	99.19	-2.59
5	4844.00	55.9 PK	74.0	-18.1	1.00 H	340	50.55	5.35
6	4844.00	43.1 AV	54.0	-10.9	1.00 H	340	37.75	5.35
7	7266.00	58.9 PK	74.0	-15.1	1.01 H	231	46.18	12.72
8	7266.00	44.2 AV	54.0	-9.8	1.01 H	231	31.48	12.72
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	71.2 PK	74.0	-2.8	1.35 V	84	73.94	-2.74
2	2390.00	53.4 AV	54.0	-0.6	1.35 V	84	56.14	-2.74
3	*2422.00	111.4 PK			1.35 V	84	113.99	-2.59
4	*2422.00	100.1 AV			1.35 V	84	102.69	-2.59
5	4844.00	53.9 PK	74.0	-20.1	1.00 V	156	48.55	5.35
6	4844.00	42.5 AV	54.0	-11.5	1.00 V	156	37.15	5.35
7	7266.00	57.9 PK	74.0	-16.1	1.06 V	228	45.18	12.72
8	7266.00	44.6 AV	54.0	-9.4	1.06 V	228	31.88	12.72

REMARKS:

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

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	69.3 PK	74.0	-4.7	1.37 H	68	72.04	-2.74
2	2390.00	50.3 AV	54.0	-3.7	1.37 H	68	53.04	-2.74
3	*2437.00	112.0 PK			1.37 H	68	114.53	-2.53
4	*2437.00	101.2 AV			1.37 H	68	103.73	-2.53
5	2483.50	71.3 PK	74.0	-2.7	1.37 H	68	73.62	-2.32
6	2483.50	51.3 AV	54.0	-2.7	1.37 H	68	53.62	-2.32
7	4874.00	55.8 PK	74.0	-18.2	1.00 H	338	50.31	5.49
8	4874.00	43.1 AV	54.0	-10.9	1.00 H	338	37.61	5.49
9	7311.00	58.8 PK	74.0	-15.2	1.00 H	206	46.10	12.70
10	7311.00	44.0 AV	54.0	-10.0	1.00 H	206	31.30	12.70

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	1.27 V	85	74.04	-2.74
2	2390.00	52.7 AV	54.0	-1.3	1.27 V	85	55.44	-2.74
3	*2437.00	115.0 PK			1.27 V	85	117.53	-2.53
4	*2437.00	104.0 AV			1.27 V	85	106.53	-2.53
5	2483.50	73.2 PK	74.0	-0.8	1.27 V	85	75.52	-2.32
6	2483.50	53.2 AV	54.0	-0.8	1.27 V	85	55.52	-2.32
7	4874.00	53.3 PK	74.0	-20.7	1.09 V	156	47.81	5.49
8	4874.00	42.1 AV	54.0	-11.9	1.09 V	156	36.61	5.49
9	7311.00	57.5 PK	74.0	-16.5	1.03 V	232	44.80	12.70
10	7311.00	44.5 AV	54.0	-9.5	1.03 V	232	31.80	12.70

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	108.2 PK			1.39 H	63	110.66	-2.46
2	*2452.00	97.0 AV			1.39 H	63	99.46	-2.46
3	2483.50	69.5 PK	74.0	-4.5	1.39 H	63	71.82	-2.32
4	2483.50	53.0 AV	54.0	-1.0	1.39 H	63	55.32	-2.32
5	4904.00	55.9 PK	74.0	-18.1	1.02 H	341	50.28	5.62
6	4904.00	42.8 AV	54.0	-11.2	1.02 H	341	37.18	5.62
7	7356.00	58.6 PK	74.0	-15.4	1.00 H	222	45.91	12.69
8	7356.00	43.7 AV	54.0	-10.3	1.00 H	222	31.01	12.69
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	110.7 PK			1.27 V	83	113.16	-2.46
2	*2452.00	99.9 AV			1.27 V	83	102.36	-2.46
3	2483.50	73.1 PK	74.0	-0.9	1.27 V	83	75.42	-2.32
4	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**1.27 V**	**83**	**56.22**	**-2.32**
5	4904.00	54.3 PK	74.0	-19.7	1.09 V	164	48.68	5.62
6	4904.00	42.8 AV	54.0	-11.2	1.09 V	164	37.18	5.62
7	7356.00	57.8 PK	74.0	-16.2	1.02 V	223	45.11	12.69
8	7356.00	44.6 AV	54.0	-9.4	1.02 V	223	31.91	12.69

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 : July 29, 2014

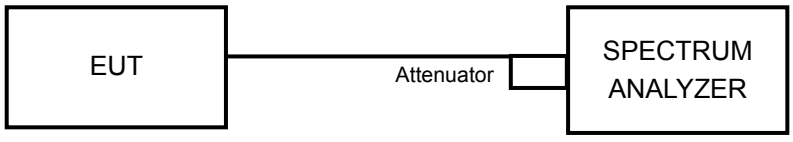
4.3.3 TEST PROCEDURE

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

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	9.03	9.10	9.06	0.5	PASS
6	2437	9.10	8.58	9.10	0.5	PASS
11	2462	9.06	8.61	9.09	0.5	PASS

802.11g

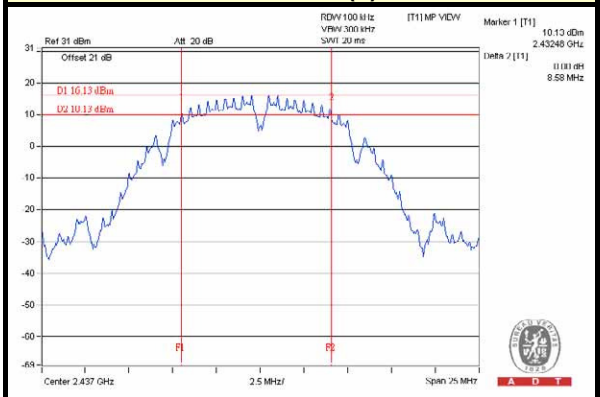
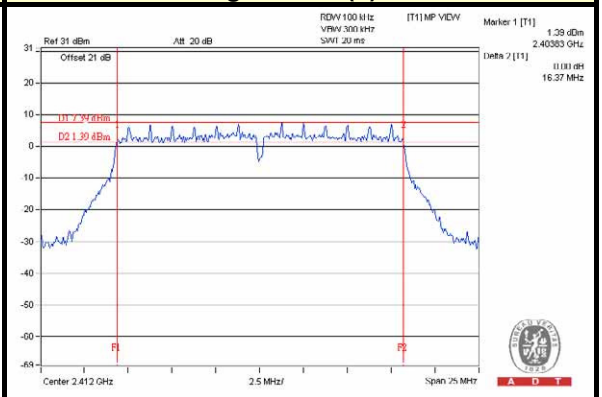
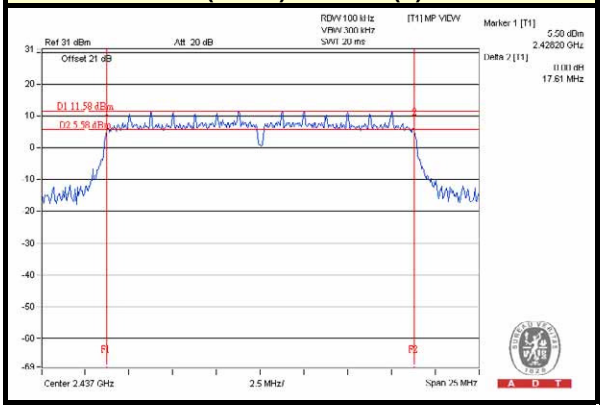
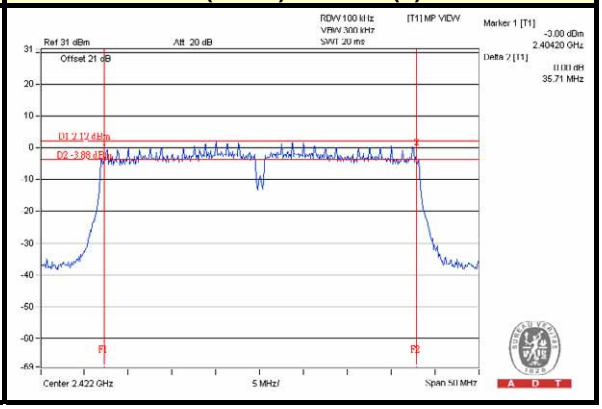
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	16.37	16.40	16.43	0.5	PASS
6	2437	16.39	16.40	16.41	0.5	PASS
11	2462	16.42	16.42	16.43	0.5	PASS

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	17.62	17.64	17.65	0.5	PASS
6	2437	17.61	17.65	17.64	0.5	PASS
11	2462	17.64	17.63	17.64	0.5	PASS

802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
3	2422	36.21	35.71	36.43	0.5	PASS
6	2437	35.88	36.47	36.45	0.5	PASS
9	2452	36.42	36.44	36.45	0.5	PASS

SPECTRUM PLOT OF WORST VALUE	
802.11b / Chain (1) : CH6	**802.11g / Chain (0) : CH1**
	
802.11n (HT20) / Chain (0) : CH6	**802.11n (HT40) / Chain (1) : CH3**
	

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 : July 29, 2014

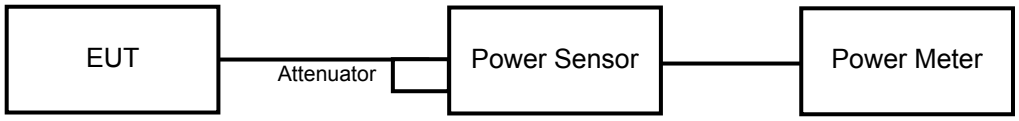
4.4.3 TEST PROCEDURES

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 (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	23.29	24.12	23.04	672.902	28.28	29.23	PASS
6	2437	23.34	24.31	22.97	683.701	28.35	29.23	PASS
11	2462	23.50	24.11	23.04	682.876	28.34	29.23	PASS

NOTE: Directional gain = 2dBi + 10log(3) = 6.77dBi > 6dBi , so the power limit shall be reduced to 30-(6.77-6) = 29.23dBm.

802.11g

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	17.82	17.27	17.19	166.227	22.21	29.23	PASS
6	2437	23.29	23.83	23.15	661.388	28.20	29.23	PASS
11	2462	17.64	16.91	17.04	157.749	21.98	29.23	PASS

NOTE: Directional gain = 2dBi + 10log(3) = 6.77dBi > 6dBi , so the power limit shall be reduced to 30-(6.77-6) = 29.23dBm.

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	16.47	16.00	16.12	125.098	20.97	29.23	PASS
6	2437	22.00	22.37	21.64	476.954	26.78	29.23	PASS
11	2462	17.02	16.47	16.54	139.793	21.45	29.23	PASS

NOTE: Directional gain = 2dBi + 10log(3) = 6.77dBi > 6dBi , so the power limit shall be reduced to 30-(6.77-6) = 29.23dBm.

802.11n (HT40)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
3	2422	14.54	14.11	14.08	79.794	19.02	29.23	PASS
6	2437	18.60	18.11	18.04	200.838	23.03	29.23	PASS
9	2452	14.36	14.12	14.04	78.464	18.95	29.23	PASS

NOTE: Directional gain = 2dBi + 10log(3) = 6.77dBi > 6dBi , so the power limit shall be reduced to 30-(6.77-6) = 29.23dBm.

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 : July 29, 2014

4.5.3 TEST PROCEDURE

Duty cycle of test signal is ≥ 98 %

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.

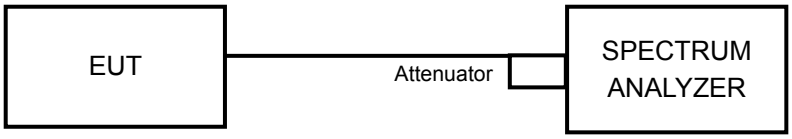
Duty cycle of test signal is < 98%

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

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=3) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	1	2412	-4.02	4.77	0.75	7.23	PASS
	6	2437	-4.55	4.77	0.22	7.23	PASS
	11	2462	-3.99	4.77	0.78	7.23	PASS
1	1	2412	-3.84	4.77	0.93	7.23	PASS
	6	2437	-4.38	4.77	0.39	7.23	PASS
	11	2462	-3.87	4.77	0.90	7.23	PASS
2	1	2412	-3.37	4.77	1.40	7.23	PASS
	6	2437	-3.98	4.77	0.79	7.23	PASS
	11	2462	-3.80	4.77	0.97	7.23	PASS

NOTE: Directional gain = 2dBi + 10log(3) =6.77dBi > 6dBi , so the power limit shall be reduced to 8-(6.77-6) = 7.23dBm.

802.11g

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=3) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	1	2412	-12.18	4.77	-7.41	7.23	PASS
	6	2437	-7.76	4.77	-2.99	7.23	PASS
	11	2462	-12.07	4.77	-7.30	7.23	PASS
1	1	2412	-12.35	4.77	-7.58	7.23	PASS
	6	2437	-8.04	4.77	-3.27	7.23	PASS
	11	2462	-12.63	4.77	-7.86	7.23	PASS
2	1	2412	-11.87	4.77	-7.10	7.23	PASS
	6	2437	-8.08	4.77	-3.31	7.23	PASS
	11	2462	-12.07	4.77	-7.30	7.23	PASS

NOTE: Directional gain = 2dBi + 10log(3) =6.77dBi > 6dBi , so the power limit shall be reduced to 8-(6.77-6) = 7.23dBm.

802.11n (HT20)

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=3) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	1	2412	-13.77	4.77	-9.00	7.23	PASS
	6	2437	-9.02	4.77	-4.25	7.23	PASS
	11	2462	-13.45	4.77	-8.68	7.23	PASS
1	1	2412	-13.19	4.77	-8.42	7.23	PASS
	6	2437	-9.01	4.77	-4.24	7.23	PASS
	11	2462	-13.42	4.77	-8.65	7.23	PASS
2	1	2412	-14.11	4.77	-9.34	7.23	PASS
	6	2437	-8.66	4.77	-3.89	7.23	PASS
	11	2462	-13.57	4.77	-8.80	7.23	PASS

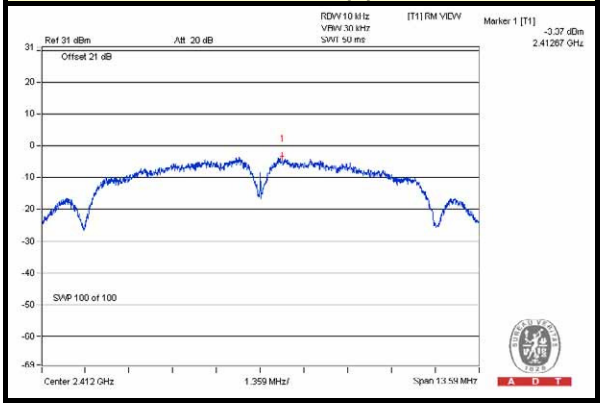
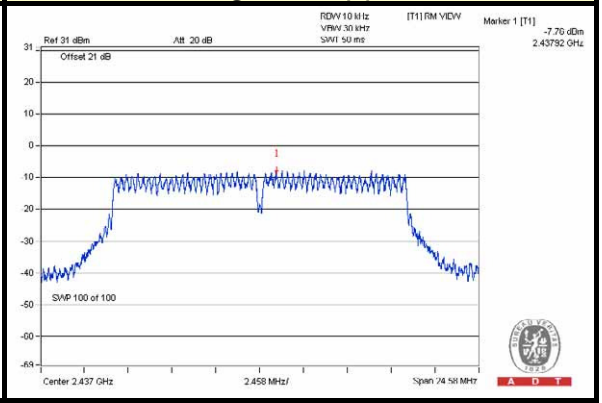
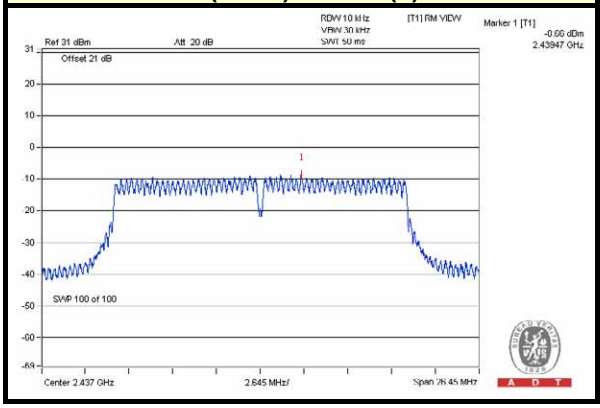
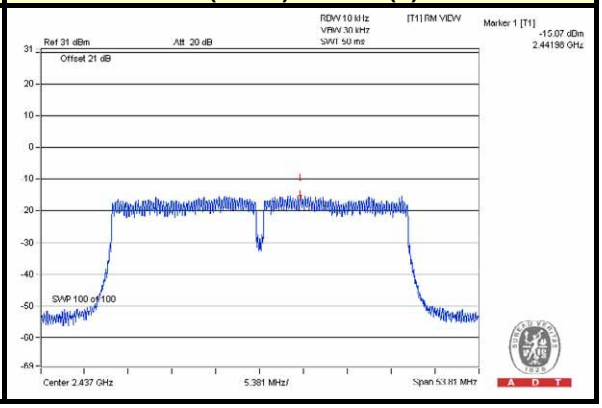
NOTE: Directional gain = 2dBi + 10log(3) =6.77dBi > 6dBi , so the power limit shall be reduced to 8-(6.77-6) = 7.23dBm.

802.11n (HT40)

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
0	3	2422	-18.72	4.77	0.1	-13.85	7.23	PASS
	6	2437	-15.07	4.77	0.1	-10.20	7.23	PASS
	9	2452	-19.44	4.77	0.1	-14.57	7.23	PASS
1	3	2422	-19.05	4.77	0.1	-14.18	7.23	PASS
	6	2437	-15.27	4.77	0.1	-10.40	7.23	PASS
	9	2452	-19.60	4.77	0.1	-14.73	7.23	PASS
2	3	2422	-18.73	4.77	0.1	-13.86	7.23	PASS
	6	2437	-15.18	4.77	0.1	-10.31	7.23	PASS
	9	2452	-19.03	4.77	0.1	-14.16	7.23	PASS

NOTE: Directional gain = 2dBi + 10log(3) =6.77dBi > 6dBi , so the power limit shall be reduced to 8-(6.77-6) = 7.23dBm.

NOTE: 1. Refer to section 3.4 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE	
802.11b / Chain(2) : CH1	**802.11g / Chain(0) : CH6**
	
802.11n (HT20) / Chain(2) : CH6	**802.11n (HT40) / Chain(0) : 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 : July 29, 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.

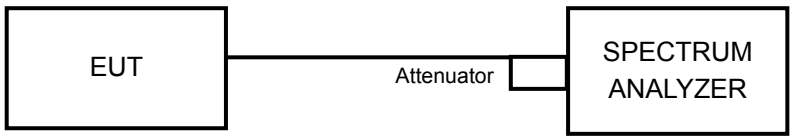
Measurement Procedure –Unwanted Emission Level

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

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITION

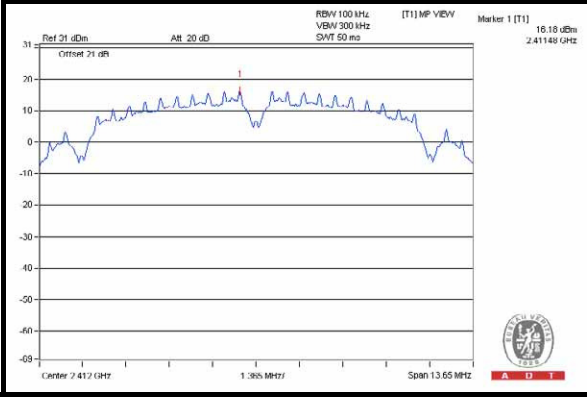
Same as Item 4.3.6

4.6.7 TEST RESULTS

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

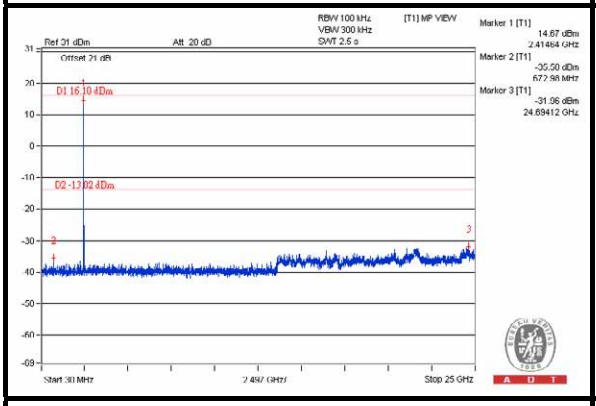
802.11b

Maximum REF

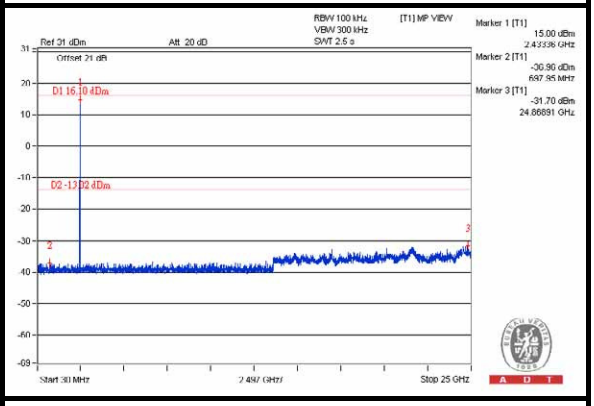


For Chain (0)

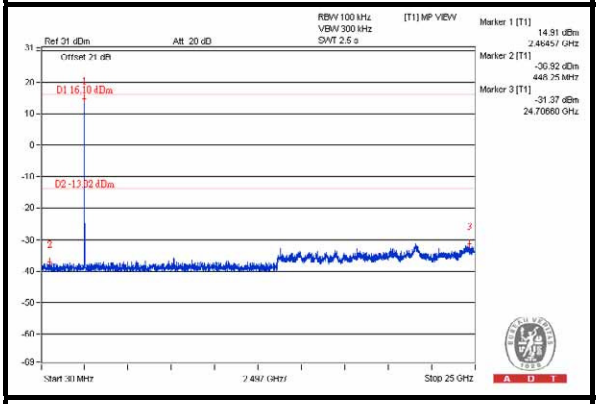
CH 1



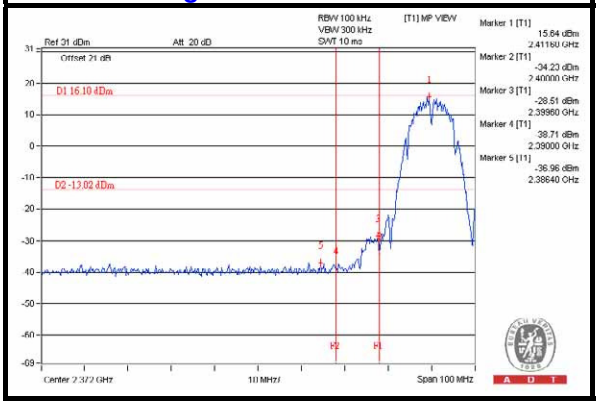
CH 6



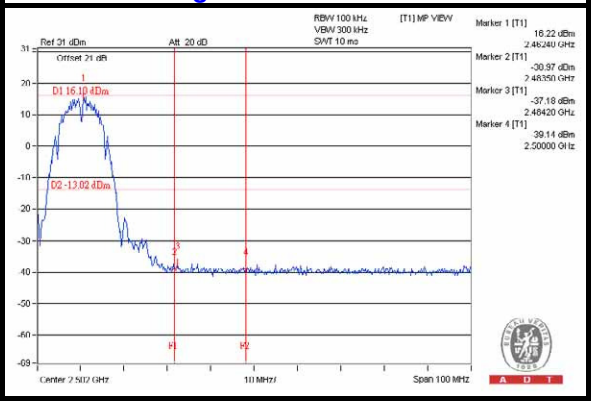
CH 11



CH 1 Band edge

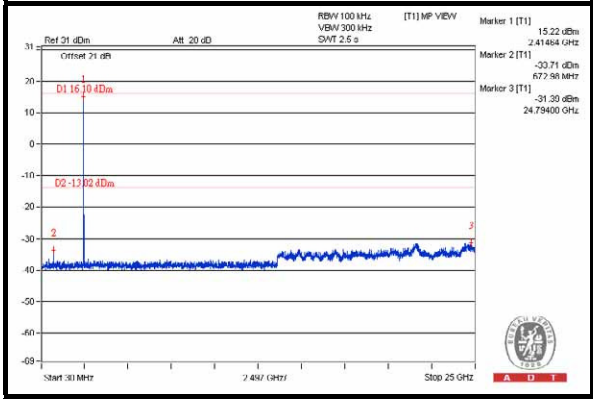


CH 11 Band edge

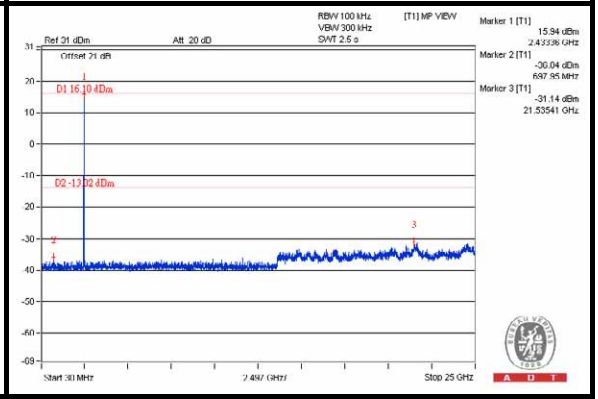


For Chain (1)

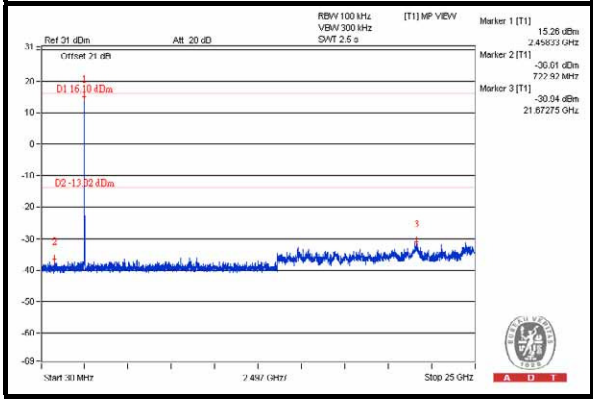
CH 1



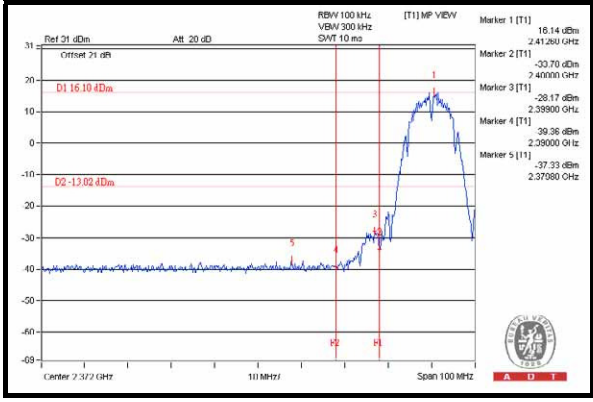
CH 6



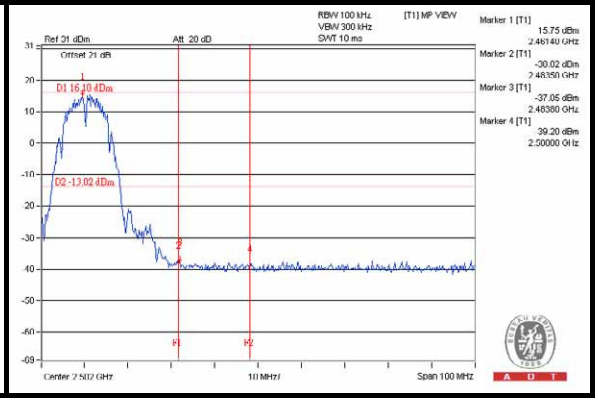
CH 11



CH 1 Band edge

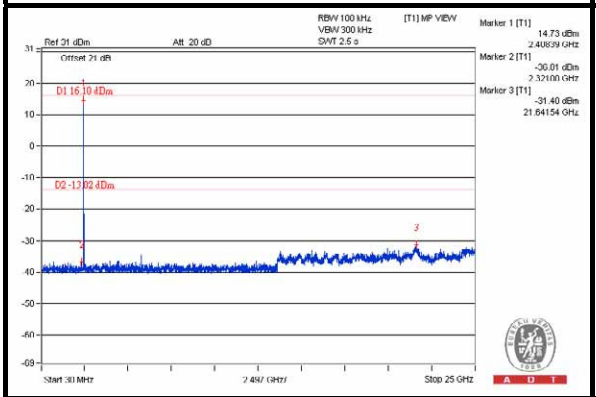


CH 11 Band edge

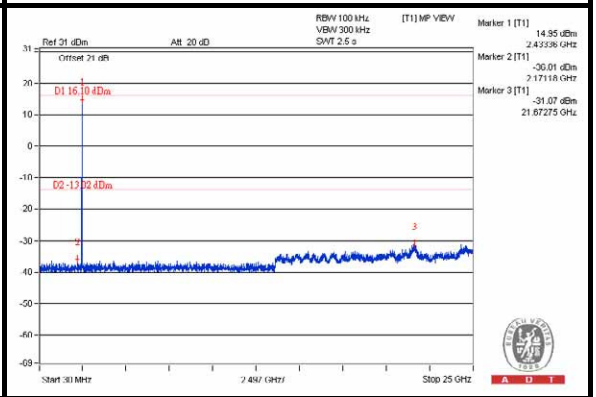


For Chain (2)

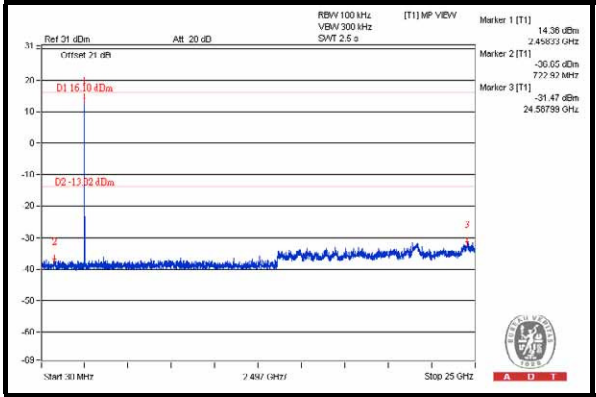
CH 1



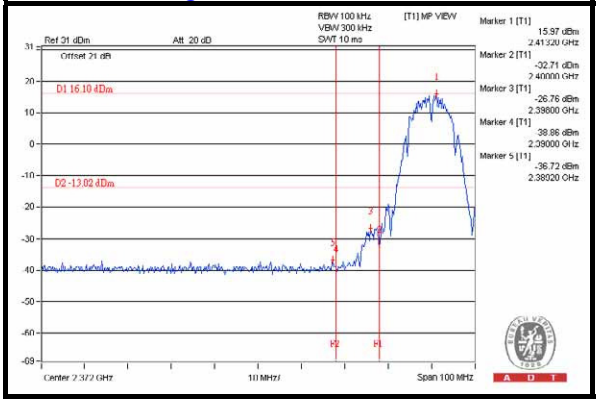
CH 6



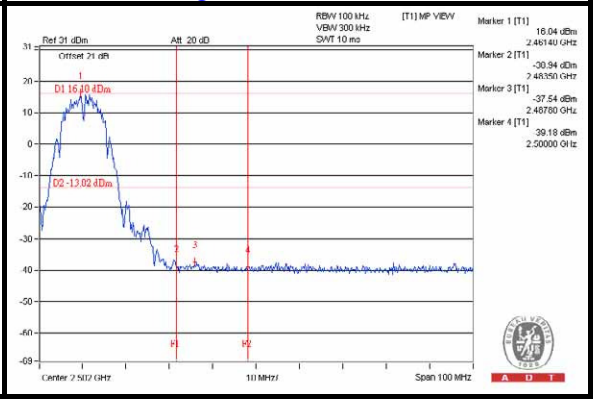
CH 11



CH 1 Band edge

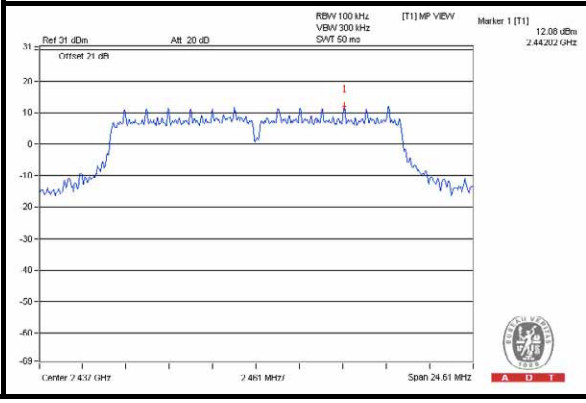


CH 11 Band edge



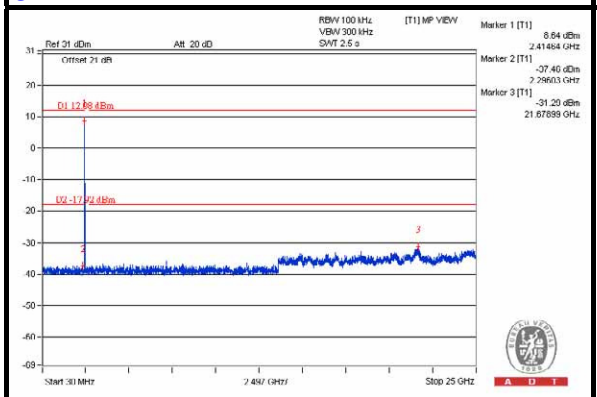
802.11g

Maximum REF

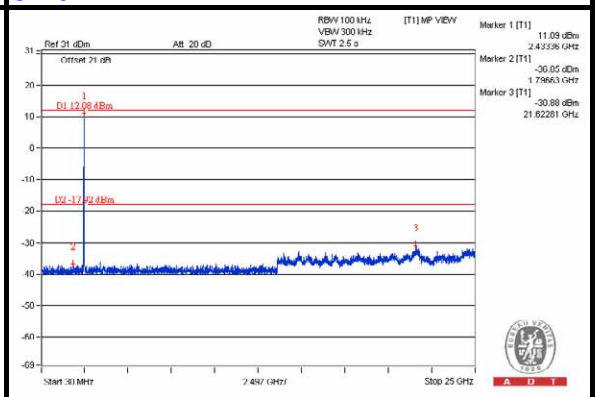


For Chain (0)

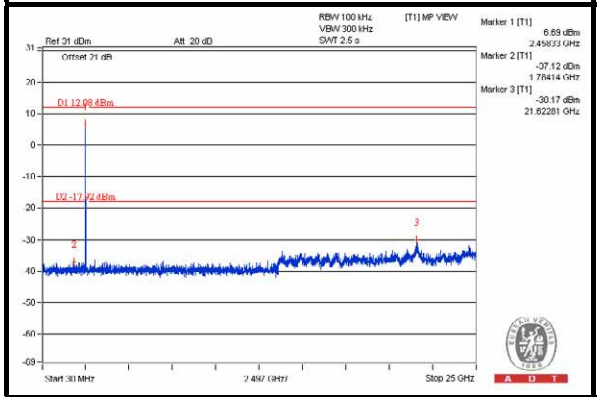
CH 1



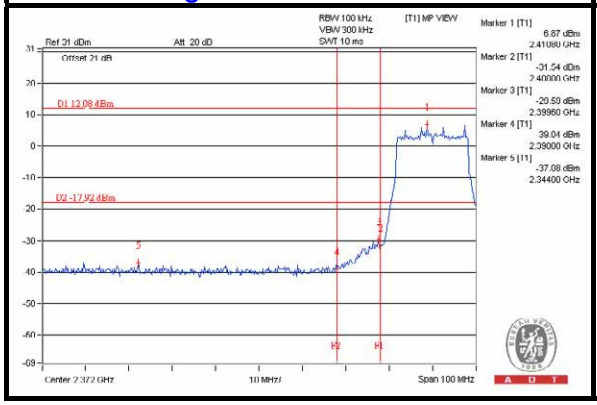
CH 6



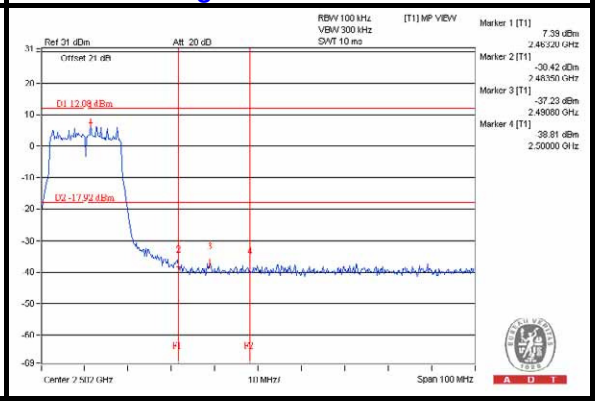
CH 11



CH 1 Band edge

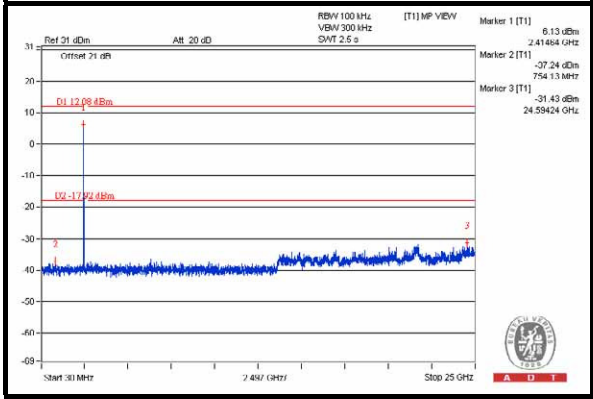


CH 11 Band edge

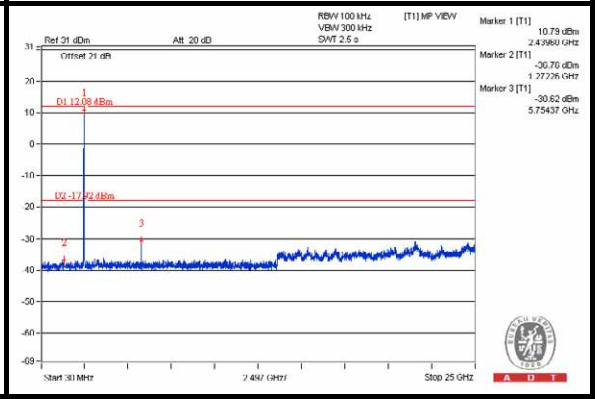


For Chain (1)

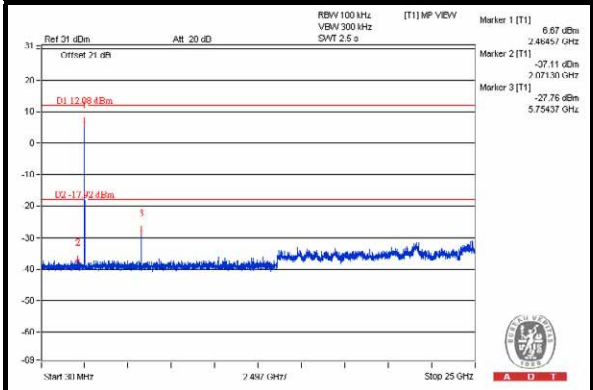
CH 1



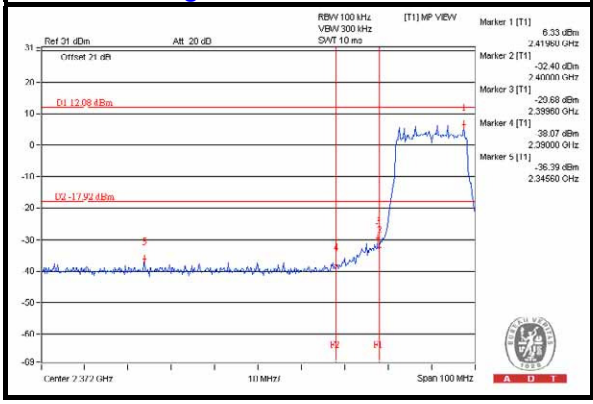
CH 6



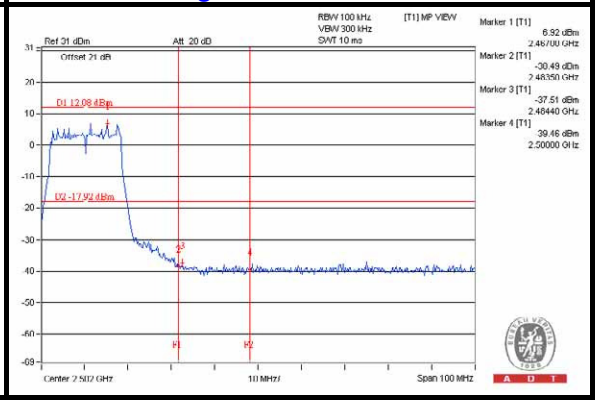
CH 11



CH 1 Band edge

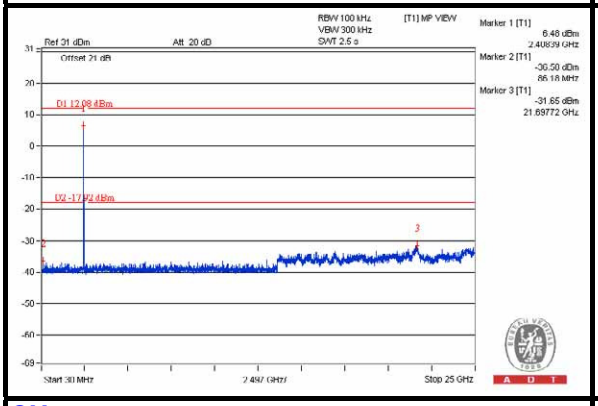


CH 11 Band edge

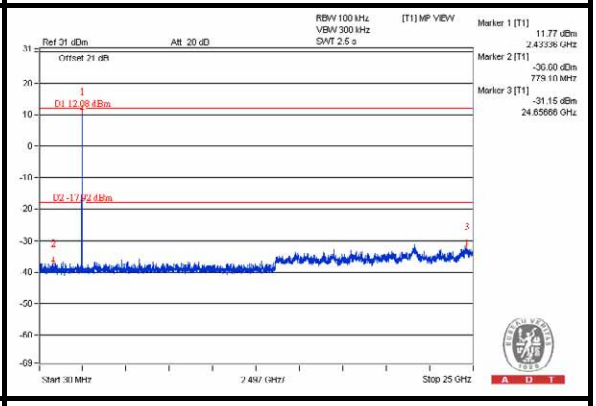


For Chain (2)

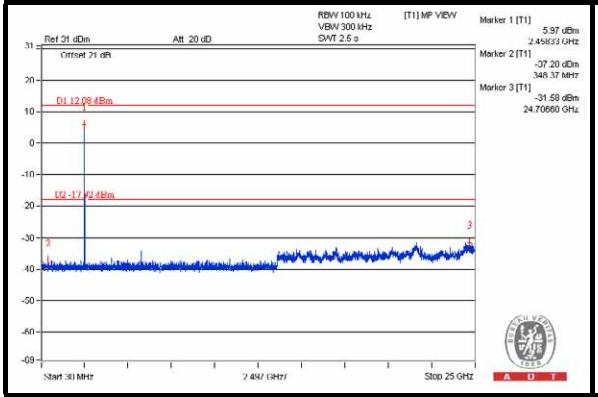
CH 1



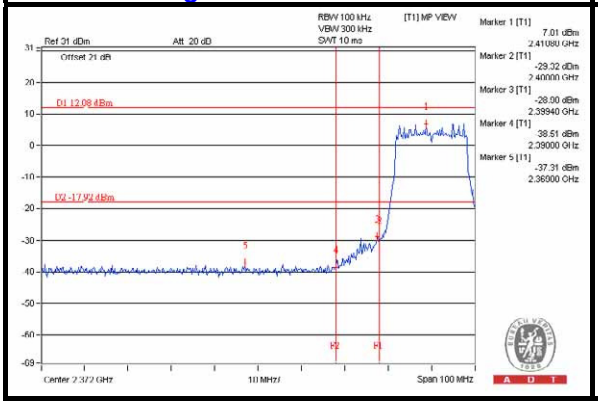
CH 6



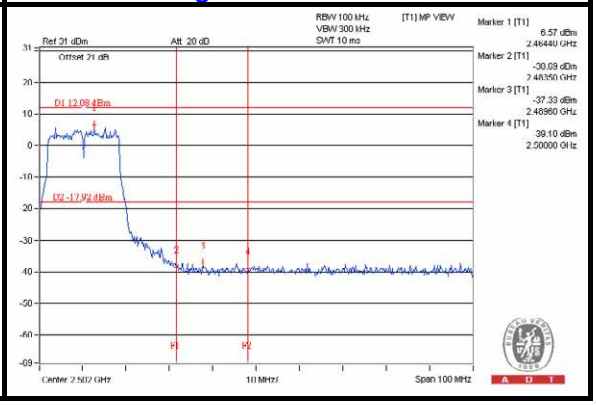
CH 11



CH 1 Band edge

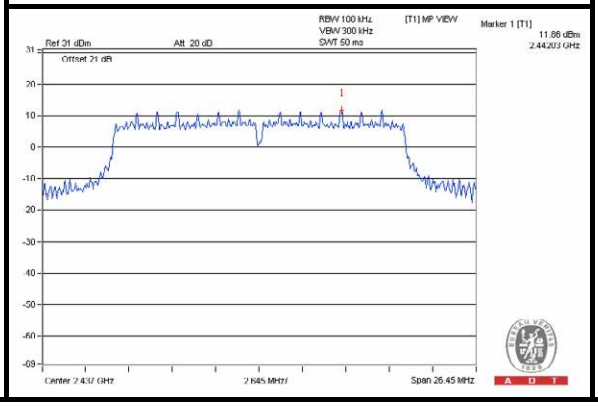


CH 11 Band edge



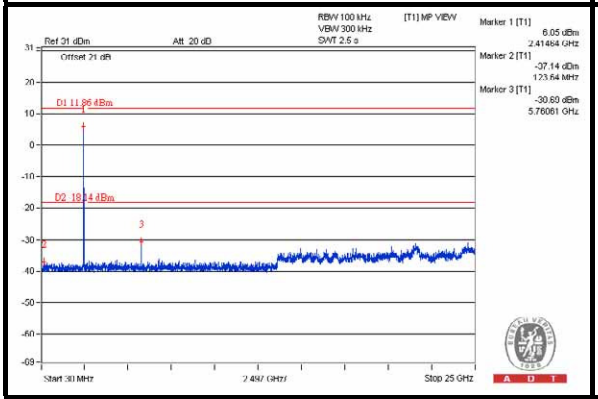
802.11n (HT20)

Maximum REF

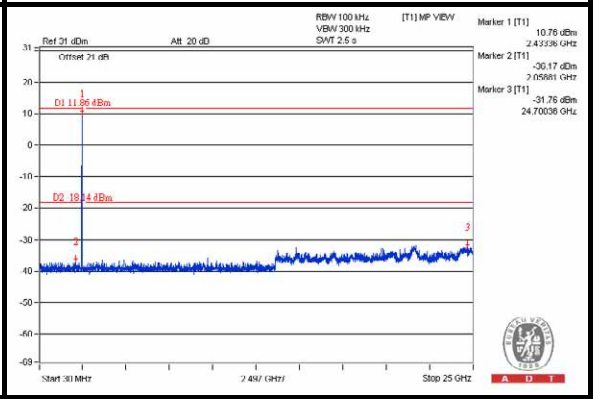


For Chain (0)

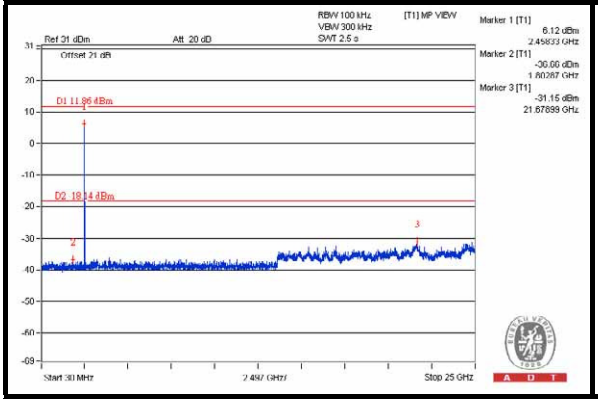
CH 1



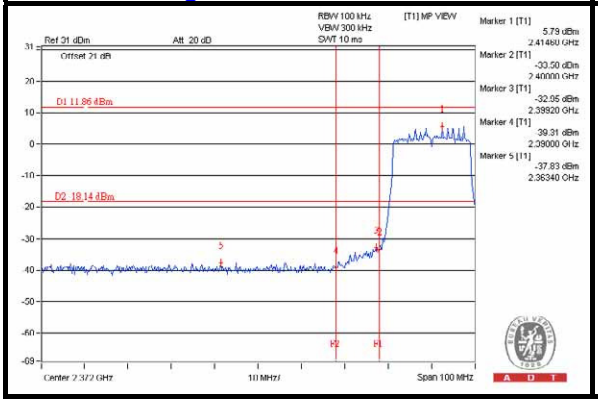
CH 6



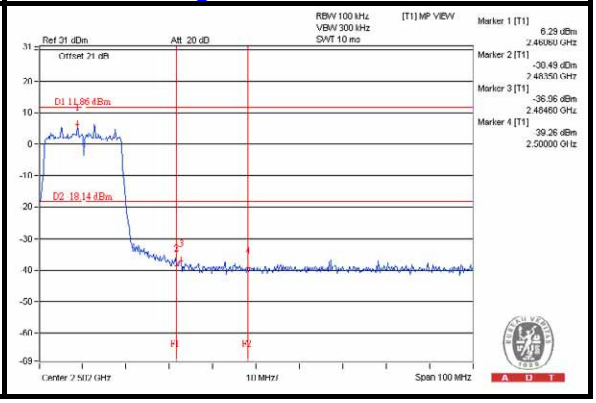
CH 11



CH 1 Band edge

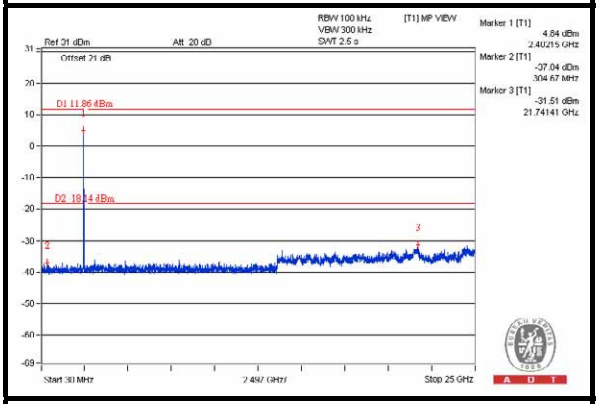


CH 11 Band edge

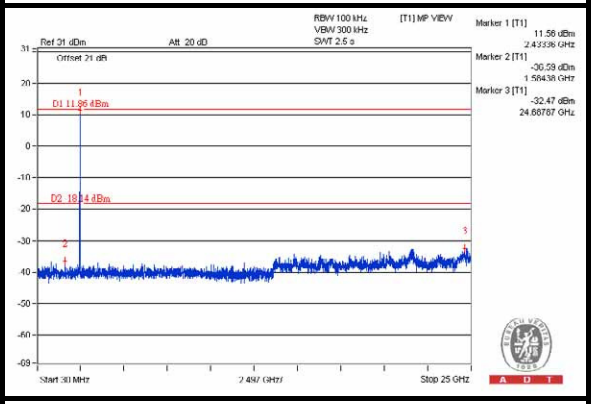


For Chain (1)

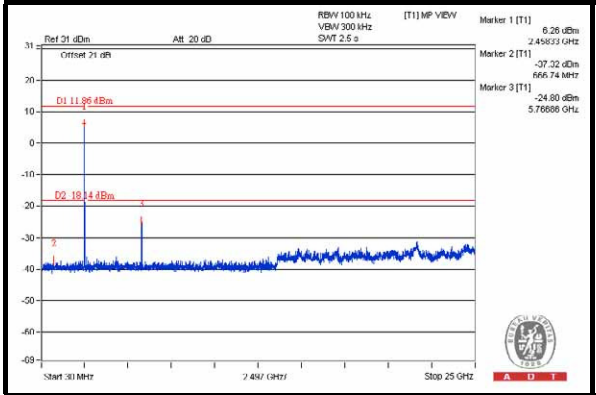
CH 1



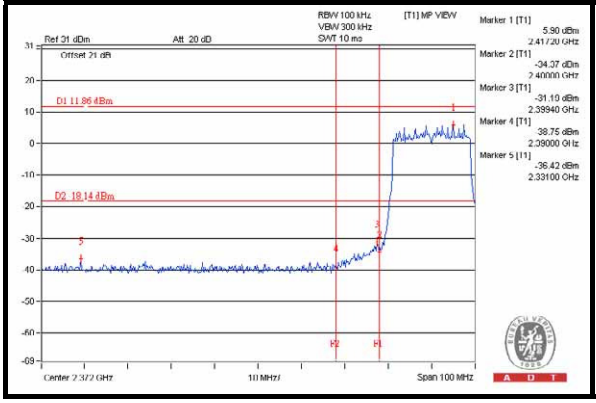
CH 6



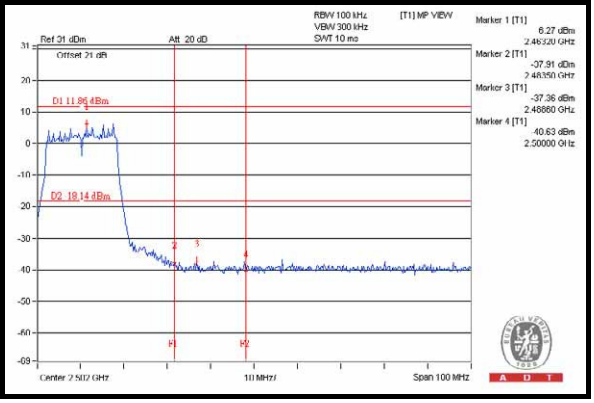
CH 11



CH 1 Band edge

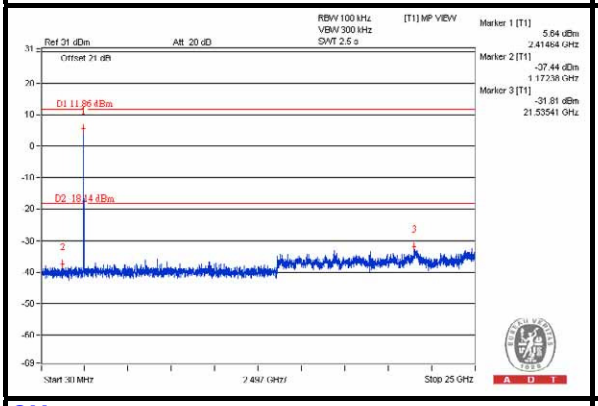


CH 11 Band edge

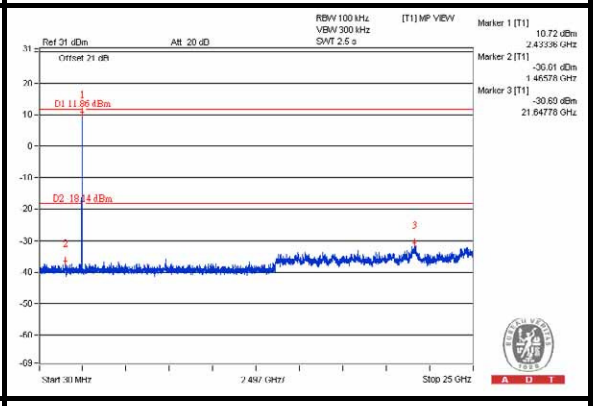


For Chain (2)

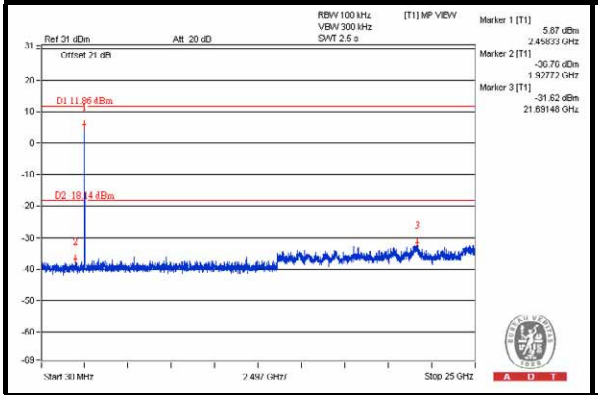
CH 1



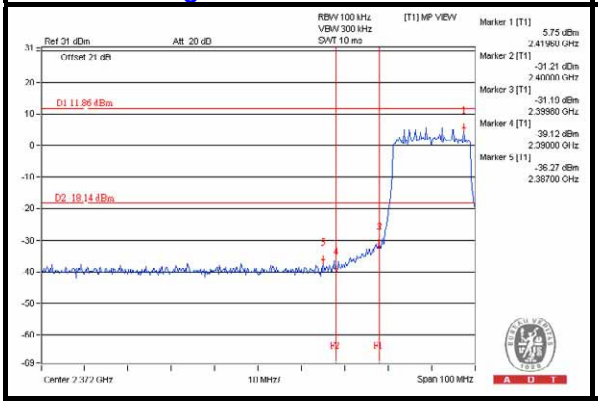
CH 6



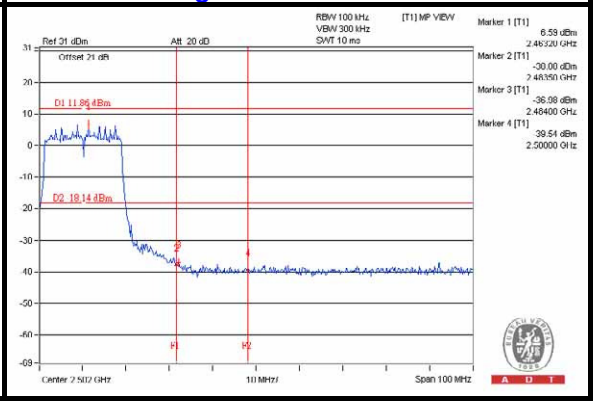
CH 11



CH 1 Band edge

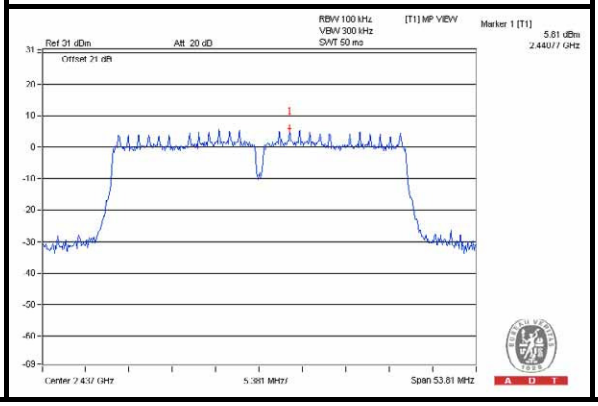


CH 11 Band edge



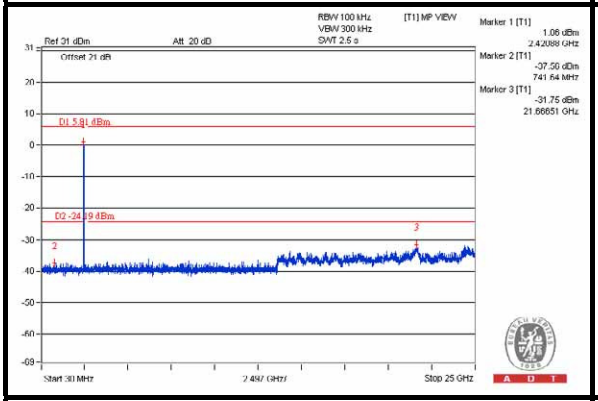
802.11n (HT40)

Maximum REF

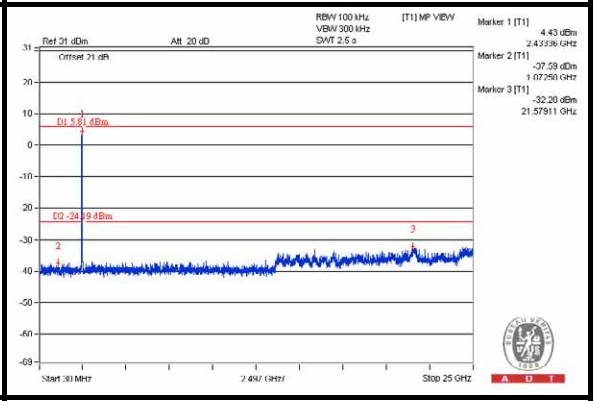


For Chain (0)

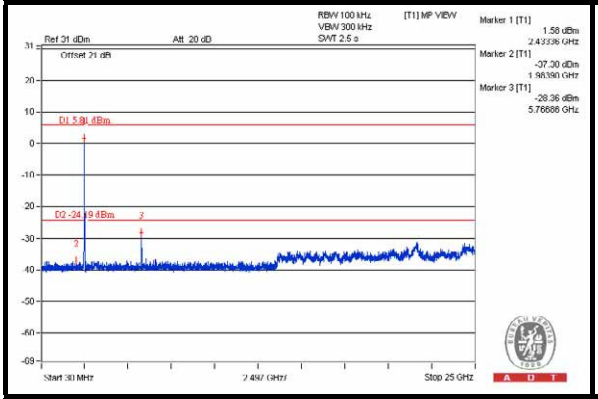
CH 3



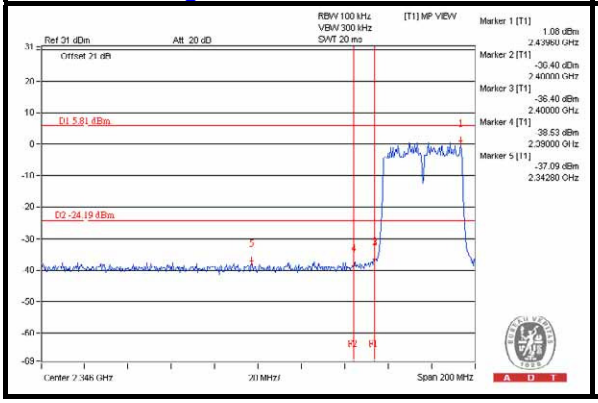
CH 6



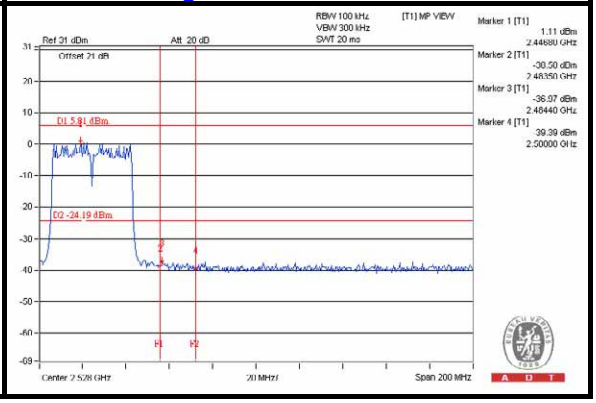
CH 9



CH 3 Band edge

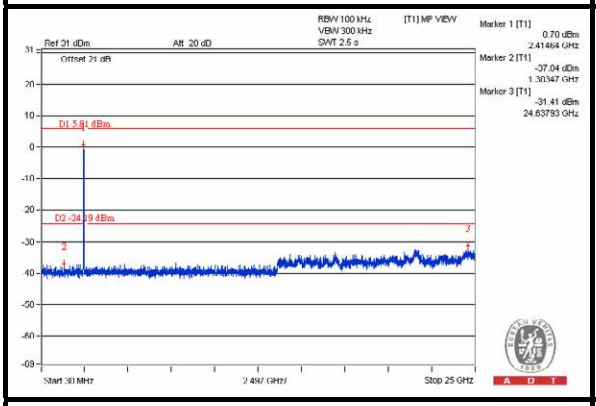


CH 9 Band edge

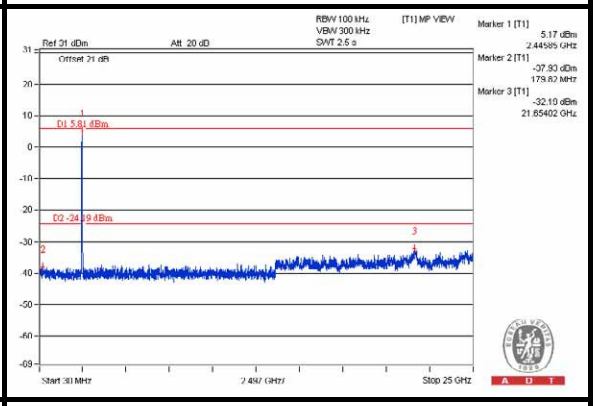


For Chain (1)

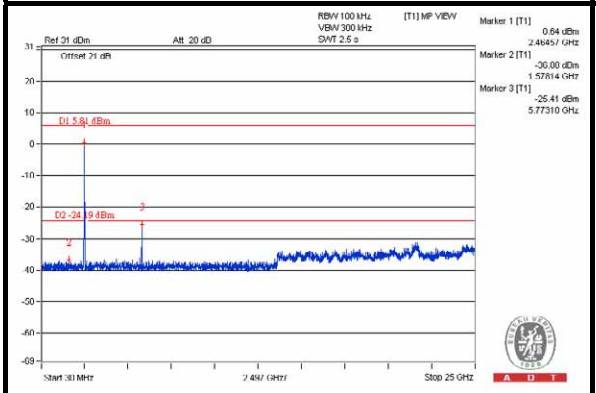
CH 3



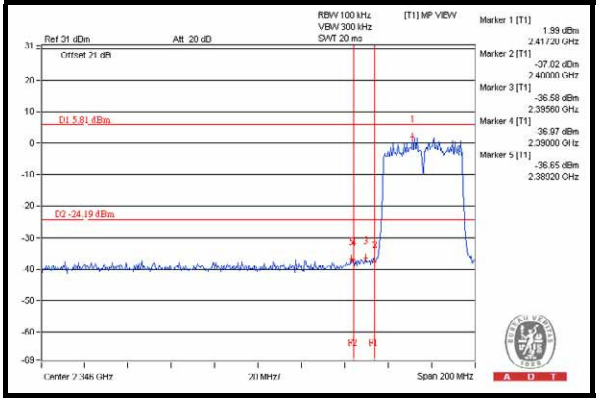
CH 6



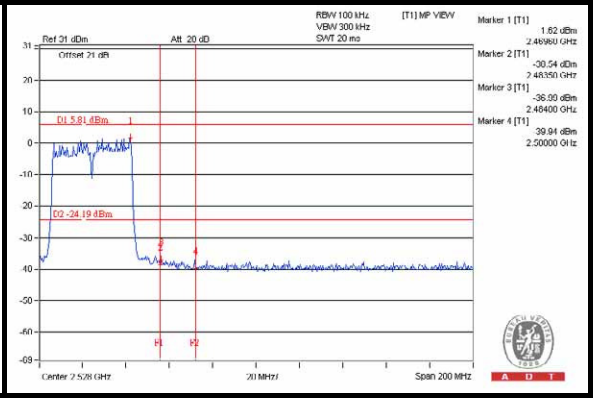
CH 9



CH 3 Band edge

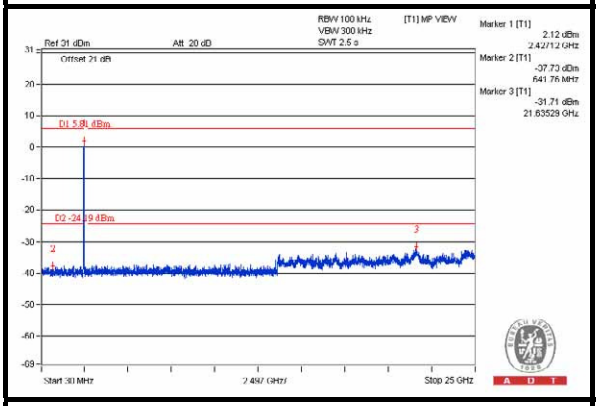


CH 9 Band edge

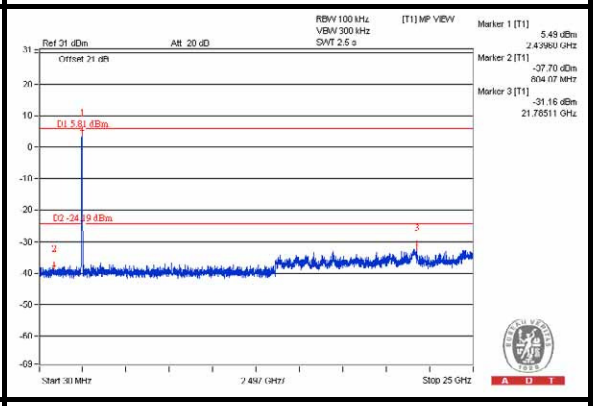


For Chain (2)

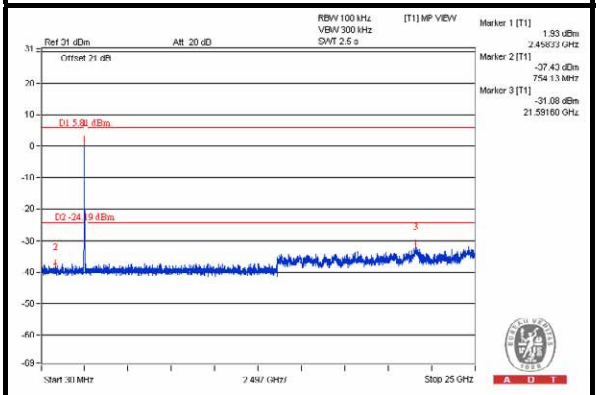
CH 3



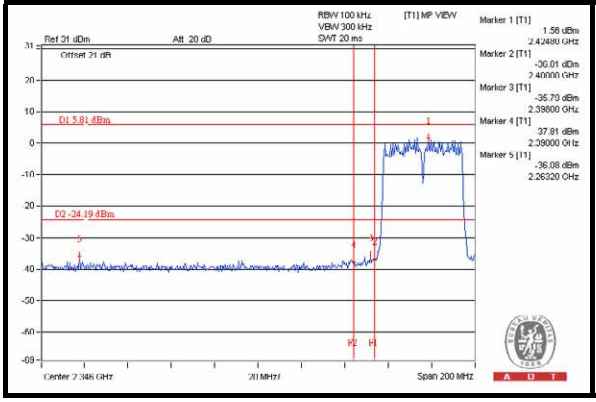
CH 6



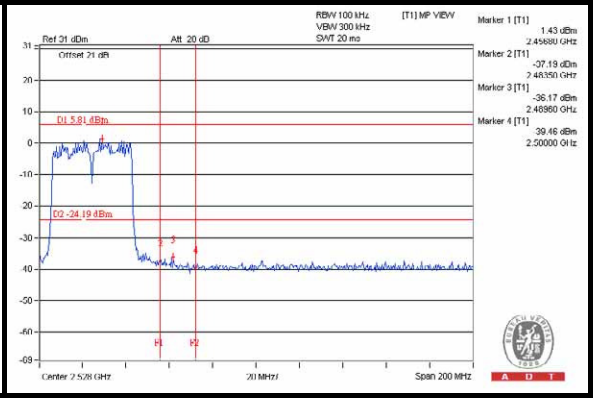
CH 9



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	NSLK8127	8127-522	Sep. 12, 2013	Sep. 11, 2014
Line-Impedance Stabilization Network (for Peripheral)	ENV216	100071	Nov. 13, 2013	Nov. 12, 2014
RF Cable (JYEBAO)	5DFB	COCCAB-001	Mar. 10 , 2014	Mar. 09, 2015
50 ohms Terminator	N/A	EMC-03	Sep. 24, 2013	Sep. 23, 2014
50 ohms Terminator	N/A	EMC-02	Oct. 01, 2013	Sep. 30, 2014
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: July 22, 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.

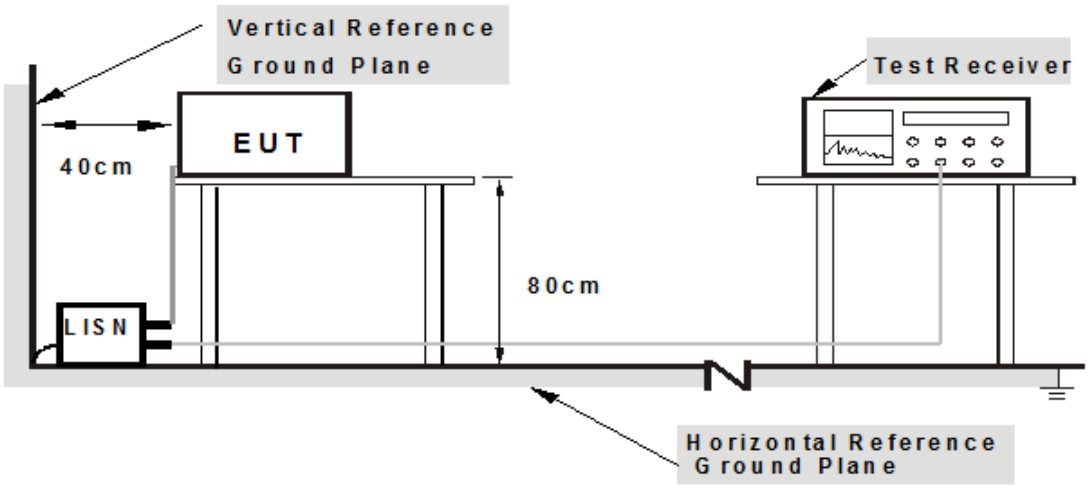
NOTE:

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

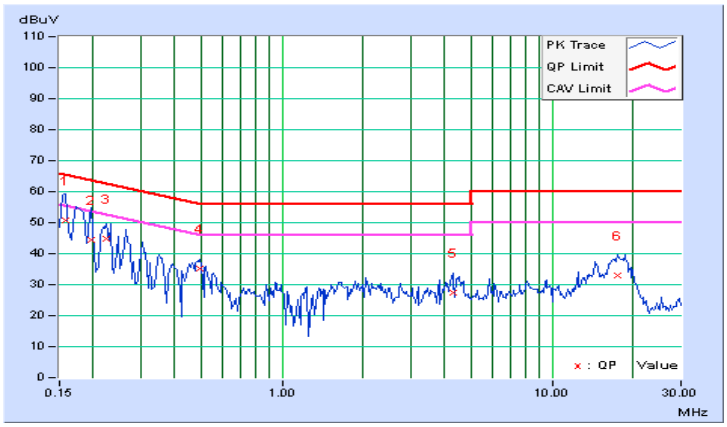
5.1.7 TEST RESULTS(MODE 1)

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	0.15781	0.07	50.74	20.91	50.81	20.98	65.58	55.58	-14.77	-34.60
2	0.19687	0.07	44.54	18.61	44.61	18.68	63.74	53.74	-19.13	-35.06
3	0.22422	0.07	44.89	33.15	44.96	33.22	62.66	52.66	-17.70	-19.44
4	0.49766	0.10	34.93	20.99	35.03	21.09	56.04	46.04	-21.01	-24.95
5	4.27734	0.27	27.14	15.11	27.41	15.38	56.00	46.00	-28.59	-30.62
6	17.49609	0.65	32.43	25.83	33.08	26.48	60.00	50.00	-26.92	-23.52

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

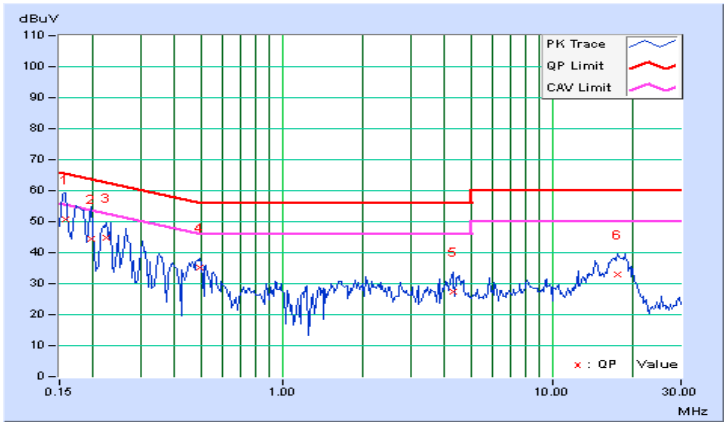


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	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	0.07	50.74	20.91	50.81	20.98	65.58	55.58	-14.76	-34.59
2	0.19687	0.07	44.54	18.61	44.61	18.68	63.74	53.74	-19.13	-35.06
3	0.22422	0.07	44.89	33.15	44.96	33.22	62.66	52.66	-17.70	-19.44
4	0.49766	0.10	34.93	20.99	35.03	21.09	56.04	46.04	-21.01	-24.95
5	4.27734	0.27	27.14	15.11	27.41	15.38	56.00	46.00	-28.59	-30.62
6	17.49609	0.64	32.43	25.83	33.07	26.47	60.00	50.00	-26.93	-23.53

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



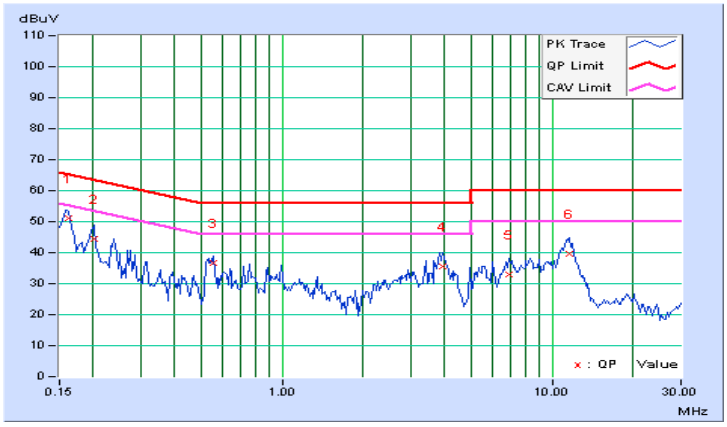
5.1.8 TEST RESULTS(MODE 2)

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	50.90	41.82	50.97	41.89	65.38	55.38	-14.41	-13.49
2	0.20078	0.07	44.54	35.54	44.61	35.61	63.58	53.58	-18.97	-17.97
3	**0.55625**	**0.10**	**36.54**	**34.32**	**36.64**	**34.42**	**56.00**	**46.00**	**-19.36**	**-11.58**
4	3.95703	0.26	35.40	27.58	35.66	27.84	56.00	46.00	-20.34	-18.16
5	6.92578	0.35	32.73	28.19	33.08	28.54	60.00	50.00	-26.92	-21.46
6	11.64063	0.50	39.13	34.47	39.63	34.97	60.00	50.00	-20.37	-15.03

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

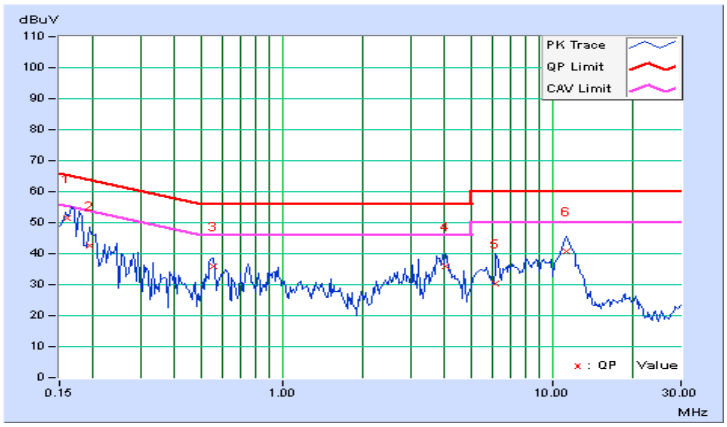


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	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	**0.15912**	**0.07**	**51.52**	**43.86**	**51.59**	**43.93**	**65.51**	**55.51**	**-13.92**	**-11.58**
2	0.19297	0.07	42.38	32.62	42.45	32.69	63.91	53.91	-21.46	-21.22
3	0.55625	0.10	35.89	33.47	35.99	33.57	56.00	46.00	-20.01	-12.43
4	4.01563	0.26	35.60	27.26	35.86	27.52	56.00	46.00	-20.14	-18.48
5	6.20313	0.33	30.09	22.95	30.42	23.28	60.00	50.00	-29.58	-26.72
6	11.26563	0.48	40.43	35.42	40.91	35.90	60.00	50.00	-19.09	-14.10

Remarks:

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



5.2 RADIATED AND BANDEDGE EMISSION MEASUREMENT

5.2.1 LIMITS OF RADIATED AND BANDEDGE EMISSION MEASUREMENT

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

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

NOTE:

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

5.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY51210105	July 21, 2014	July 20, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-03	Nov. 13, 2013	Nov. 12, 2014
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Feb. 26, 2014	Feb. 25, 2015
RF Cable	NA	CHGCAB_001	Oct. 05, 2013	Oct. 04, 2014
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Horn_Antenna AISI	AIH.8018	0000320091110	Nov. 18, 2013	Nov. 17, 2014
Pre-Amplifier Agilent	8449B	3008A02578	June 24, 2014	June 23, 2015
RF Cable	NA	RF104-201 RF104-203 RF104-204	Dec. 12, 2013	Dec. 11, 2014
Spectrum Analyzer Agilent	E4446A	MY48250253	Aug. 28, 2013	Aug. 27, 2014
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 13, 2013	Nov. 12, 2014
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 08, 2013	Oct. 07, 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. 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: July 22, 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:

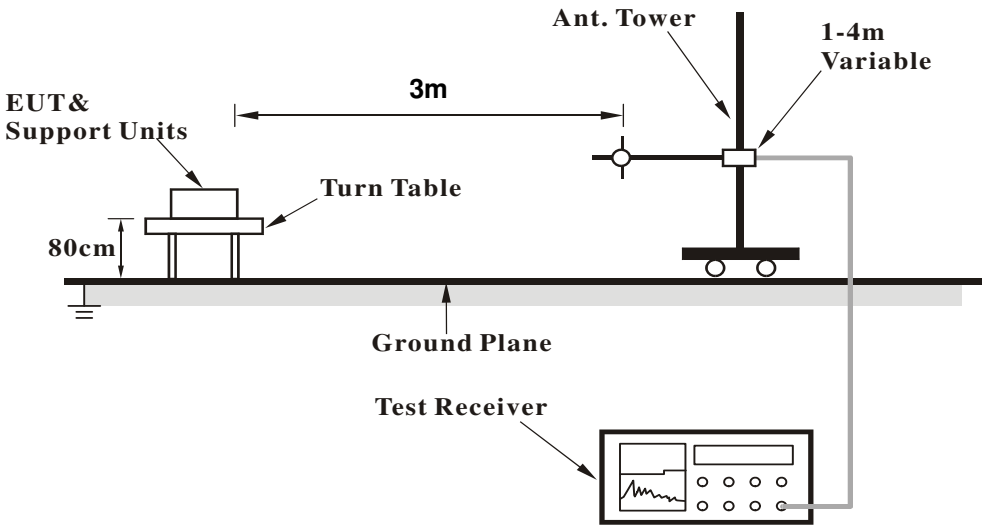
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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

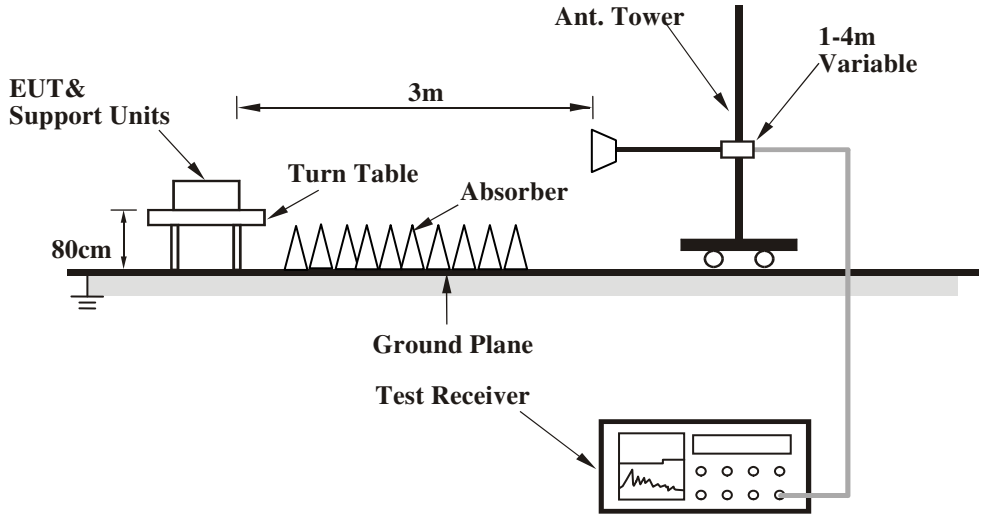
No deviation

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

BELOW 1GHz WORST-CASE DATA

802.11ac VHT20

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	125.12	38.5 QP	43.5	-5.0	2.00 H	226	53.45	-14.92
2	250.00	35.1 QP	46.0	-10.9	1.00 H	314	49.42	-14.32
3	258.92	39.4 QP	46.0	-6.7	1.50 H	21	53.32	-13.97
4	375.03	37.3 QP	46.0	-8.7	1.00 H	310	47.55	-10.23
5	749.98	40.2 QP	46.0	-5.8	1.50 H	249	42.13	-1.94
6	875.02	38.9 QP	46.0	-7.1	1.50 H	228	39.37	-0.45
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	**49.19**	**37.0 QP**	**40.0**	**-3.0**	**1.00 V**	**98**	**50.49**	**-13.51**
2	57.55	36.4 QP	40.0	-3.6	1.00 V	360	50.24	-13.81
3	125.01	37.1 QP	43.5	-6.4	1.00 V	96	52.02	-14.92
4	374.98	34.2 QP	46.0	-11.8	1.50 V	257	44.44	-10.24
5	500.02	36.9 QP	46.0	-9.1	1.00 V	266	44.26	-7.36
6	624.98	36.6 QP	46.0	-9.4	1.50 V	237	41.01	-4.41

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

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	*5745.00	123.0 PK			1.30 H	94	115.01	7.99
2	*5745.00	111.3 AV			1.30 H	94	103.31	7.99
3	11490.00	58.6 PK	74.0	-15.4	1.20 H	84	44.86	13.74
4	11490.00	45.6 AV	54.0	-8.4	1.20 H	84	31.86	13.74
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	126.1 PK			1.02 V	102	118.11	7.99
2	*5745.00	115.0 AV			1.02 V	102	107.01	7.99
3	11490.00	60.6 PK	74.0	-13.4	1.00 V	35	46.86	13.74
4	11490.00	49.6 AV	54.0	-4.4	1.00 V	35	35.86	13.74

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
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	123.2 PK			1.34 H	96	115.16	8.04
2	*5785.00	111.3 AV			1.34 H	96	103.26	8.04
3	11570.00	58.8 PK	74.0	-15.2	1.20 H	84	45.09	13.71
4	11570.00	45.8 AV	54.0	-8.2	1.20 H	84	32.09	13.71
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	*5785.00	125.9 PK			1.04 V	114	117.86	8.04
2	*5785.00	114.6 AV			1.04 V	114	106.56	8.04
3	11570.00	60.4 PK	74.0	-13.6	1.01 V	49	46.69	13.71
4	11570.00	49.2 AV	54.0	-4.8	1.01 V	49	35.49	13.71

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
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	122.8 PK			1.35 H	79	114.66	8.14
2	*5825.00	111.4 AV			1.35 H	79	103.26	8.14
3	11650.00	58.7 PK	74.0	-15.3	1.20 H	89	44.94	13.76
4	11650.00	45.7 AV	54.0	-8.3	1.20 H	89	31.94	13.76
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	126.0 PK			1.00 V	105	117.86	8.14
2	*5825.00	114.7 AV			1.00 V	105	106.56	8.14
3	11650.00	60.5 PK	74.0	-13.5	1.03 V	43	46.74	13.76
4	11650.00	49.4 AV	54.0	-4.6	1.03 V	43	35.64	13.76

REMARKS:

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

802.11ac VHT20

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	*5745.00	122.5 PK			1.31 H	83	114.51	7.99
2	*5745.00	110.9 AV			1.31 H	83	102.86	7.99
3	11490.00	58.4 PK	74.0	-15.6	1.25 H	85	44.66	13.74
4	11490.00	45.3 AV	54.0	-8.7	1.25 H	85	31.56	13.74
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	126.1 PK			1.00 V	118	118.11	7.99
2	*5745.00	114.7 AV			1.00 V	118	106.71	7.99
3	11490.00	60.2 PK	74.0	-13.8	1.00 V	23	46.46	13.74
4	11490.00	49.2 AV	54.0	-4.8	1.00 V	23	35.46	13.74

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
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	123.5 PK			1.30 H	89	115.01	8.49
2	*5785.00	111.8 AV			1.30 H	89	103.31	8.49
3	11570.00	58.5 PK	74.0	-15.5	1.27 H	79	44.19	14.31
4	11570.00	45.4 AV	54.0	-8.6	1.27 H	79	31.09	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	126.5 PK			1.00 V	106	118.46	8.04
2	*5785.00	115.1 AV			1.00 V	106	107.06	8.04
3	11570.00	61.0 PK	74.0	-13.0	1.00 V	30	47.29	13.71
4	11570.00	49.9 AV	54.0	-4.1	1.00 V	30	36.19	13.71

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
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	123.6 PK			1.28 H	84	115.01	8.59
2	*5825.00	111.8 AV			1.28 H	84	103.21	8.59
3	11650.00	58.6 PK	74.0	-15.4	1.23 H	95	44.22	14.38
4	11650.00	45.7 AV	54.0	-8.3	1.23 H	95	31.32	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	126.5 PK			1.00 V	114	118.36	8.14
2	*5825.00	115.4 AV			1.00 V	114	107.26	8.14
3	11650.00	60.0 PK	74.0	-14.0	1.00 V	24	46.24	13.76
4	11650.00	49.1 AV	54.0	-4.9	1.00 V	24	35.34	13.76

REMARKS:

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

802.11ac VHT40

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5755.00	115.7 PK			1.36 H	75	107.26	8.44
2	*5755.00	106.5 AV			1.36 H	75	98.06	8.44
3	11510.00	55.8 PK	74.0	-18.2	1.07 H	26	41.46	14.34
4	11510.00	44.9 AV	54.0	-9.1	1.07 H	26	30.56	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	121.7 PK			1.00 V	118	113.70	8.00
2	*5755.00	110.2 AV			1.00 V	118	102.20	8.00
3	11510.00	59.3 PK	74.0	-14.7	1.02 V	22	45.57	13.73
4	11510.00	48.4 AV	54.0	-5.6	1.02 V	22	34.67	13.73

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
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	118.2 PK			1.36 H	88	109.70	8.50
2	*5795.00	109.2 AV			1.36 H	88	100.70	8.50
3	11590.00	55.8 PK	74.0	-18.2	1.10 H	33	41.50	14.30
4	11590.00	44.9 AV	54.0	-9.1	1.10 H	33	30.60	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	123.7 PK			1.05 V	111	115.65	8.05
2	*5795.00	112.9 AV			1.05 V	111	104.85	8.05
3	11590.00	59.1 PK	74.0	-14.9	1.00 V	46	45.40	13.70
4	11590.00	49.2 AV	54.0	-4.8	1.00 V	46	35.50	13.70

REMARKS:

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

802.11ac VHT80

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	*5775.00	113.6 PK			1.33 H	82	105.57	8.03
2	*5775.00	102.6 AV			1.33 H	82	94.57	8.03
3	11550.00	53.8 PK	74.0	-20.2	1.14 H	42	40.08	13.72
4	11550.00	44.6 AV	54.0	-9.4	1.14 H	42	30.88	13.72
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	117.4 PK			1.00 V	118	109.37	8.03
2	*5775.00	106.4 AV			1.00 V	118	98.37	8.03
3	11550.00	57.3 PK	74.0	-16.7	1.00 V	29	43.58	13.72
4	11550.00	48.1 AV	54.0	-5.9	1.00 V	29	34.38	13.72

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
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 : July 29, 2014

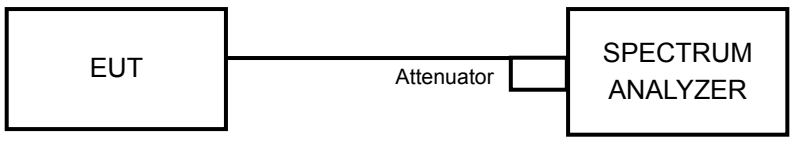
5.3.3 TEST PROCEDURE

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

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	16.40	16.41	16.43	0.5	PASS
157	5785	16.39	16.40	16.40	0.5	PASS
165	5825	16.37	16.39	16.40	0.5	PASS

802.11ac (VHT20)

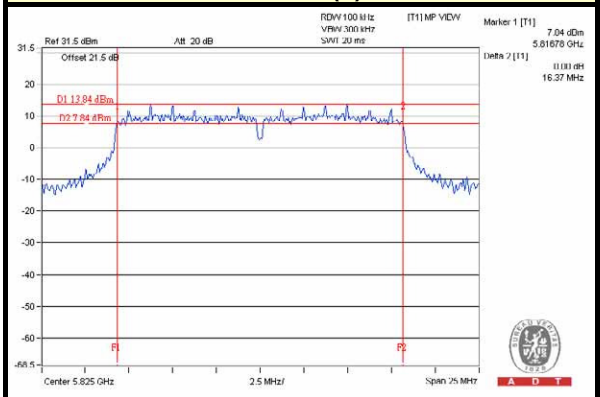
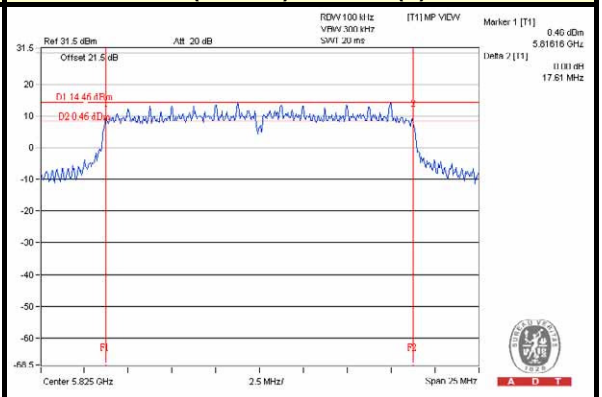
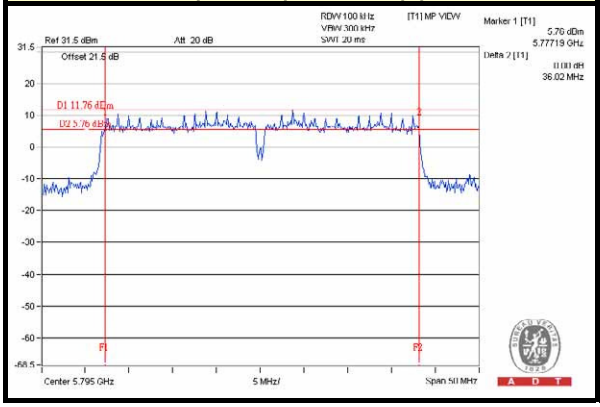
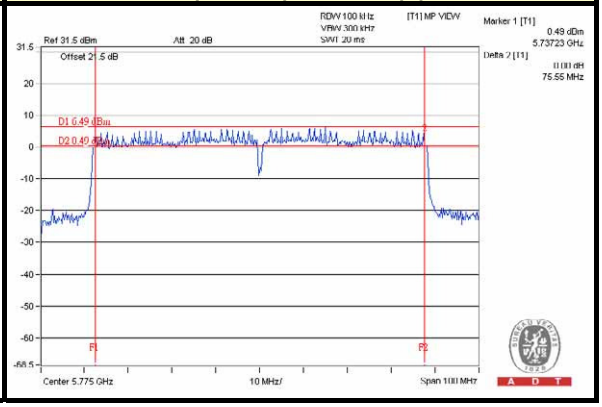
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	17.66	17.68	17.66	0.5	PASS
157	5785	17.63	17.63	17.64	0.5	PASS
165	5825	17.63	17.61	17.62	0.5	PASS

802.11ac (VHT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
151	5755	36.23	36.48	36.46	0.5	PASS
159	5795	36.02	36.42	36.43	0.5	PASS

802.11ac (VHT80)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
155	5775	75.58	76.44	75.55	0.5	PASS

SPECTRUM PLOT OF WORST VALUE	
802.11a / Chain (0) : CH165	**802.11ac (VHT20) / Chain (1): CH165**
	
802.11ac (VHT40) / Chain (0): 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 : July 29, 2014

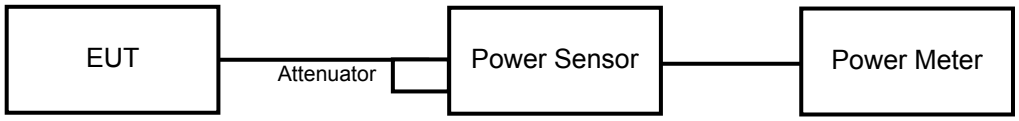
5.4.3 TEST PROCEDURES

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

802.11a

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
149	5745	24.31	24.21	24.53	817.199	29.12	29.23	PASS
157	5785	24.33	24.35	24.46	822.543	29.15	29.23	PASS
165	5825	24.47	24.27	24.50	829.037	29.19	29.23	PASS

NOTE: Directional gain = 2dBi + 10log(3) = 6.77dBi > 6dBi , so the power limit shall be reduced to 30-(6.77-6) = 29.23dBm.

802.11ac (VHT20)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
149	5745	24.37	24.43	24.48	831.402	29.20	29.23	PASS
157	5785	24.37	24.29	24.51	824.549	29.16	29.23	PASS
165	5825	24.26	24.38	24.40	816.266	29.12	29.23	PASS

NOTE: Directional gain = 2dBi + 10log(3) = 6.77dBi > 6dBi , so the power limit shall be reduced to 30-(6.77-6) = 29.23dBm.

802.11ac (VHT40)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
151	5755	22.86	22.85	22.98	584.558	27.67	29.23	PASS
159	5795	24.30	24.33	24.39	814.961	29.11	29.23	PASS

NOTE: Directional gain = 2dBi + 10log(3) = 6.77dBi > 6dBi , so the power limit shall be reduced to 30-(6.77-6) = 29.23dBm.

802.11ac (VHT80)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
155	5775	22.46	22.46	22.41	526.577	27.21	29.23	PASS

NOTE: Directional gain = 2dBi + 10log(3) = 6.77dBi > 6dBi , so the power limit shall be reduced to 30-(6.77-6) = 29.23dBm.

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 : July 29, 2014

5.5.3 TEST PROCEDURE

Duty cycle of test signal is ≥ 98 %

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.

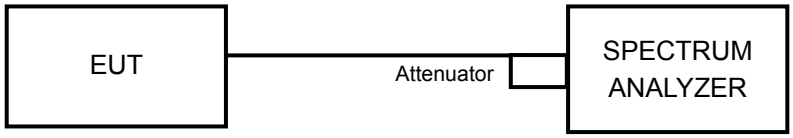
Duty cycle of test signal is < 98%

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

802.11a

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=3) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	149	5745	-5.73	4.77	-0.96	7.23	PASS
	157	5785	-5.48	4.77	-0.71	7.23	PASS
	165	5825	-5.90	4.77	-1.13	7.23	PASS
1	149	5745	-6.09	4.77	-1.32	7.23	PASS
	157	5785	-5.31	4.77	-0.54	7.23	PASS
	165	5825	-5.19	4.77	-0.42	7.23	PASS
2	149	5745	-5.49	4.77	-0.72	7.23	PASS
	157	5785	-5.34	4.77	-0.57	7.23	PASS
	165	5825	-5.21	4.77	-0.44	7.23	PASS
NOTE: Directional gain = 2dBi + 10log(3) = 6.77dBi > 6dBi , so the power limit shall be reduced to 8-(6.77-6) = 7.23dBm.							

802.11ac (VHT20)

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=3) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	149	5745	-6.21	4.77	-1.44	7.23	PASS
	157	5785	-6.31	4.77	-1.54	7.23	PASS
	165	5825	-5.38	4.77	-0.61	7.23	PASS
1	149	5745	-6.60	4.77	-1.83	7.23	PASS
	157	5785	-6.47	4.77	-1.70	7.23	PASS
	165	5825	-6.31	4.77	-1.54	7.23	PASS
2	149	5745	-6.08	4.77	-1.31	7.23	PASS
	157	5785	-5.99	4.77	-1.22	7.23	PASS
	165	5825	-6.04	4.77	-1.27	7.23	PASS
NOTE: Directional gain = 2dBi + 10log(3) = 6.77dBi > 6dBi , so the power limit shall be reduced to 8-(6.77-6) = 7.23dBm.							

802.11ac (VHT40)

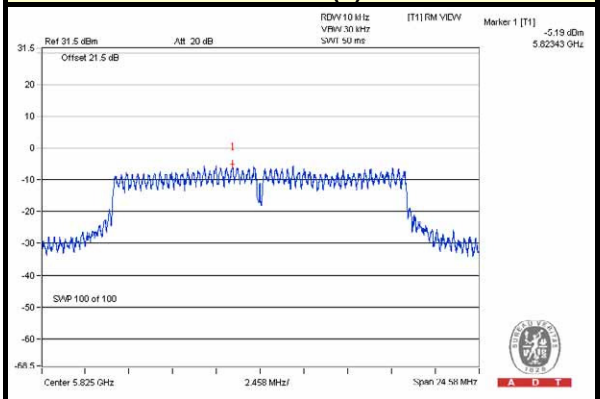
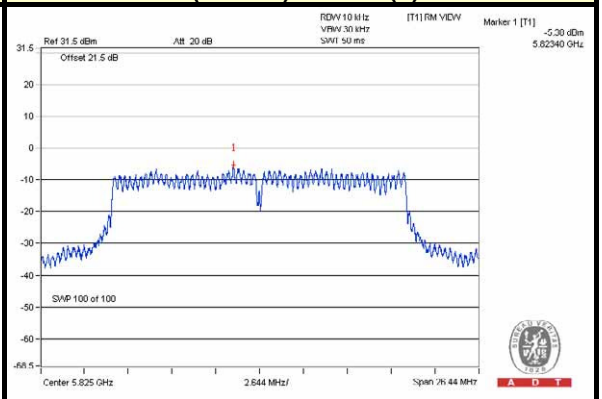
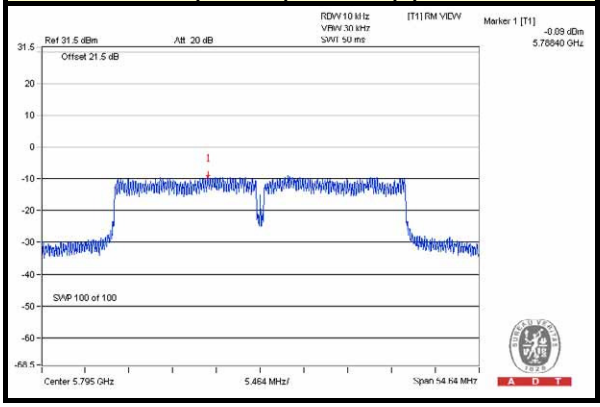
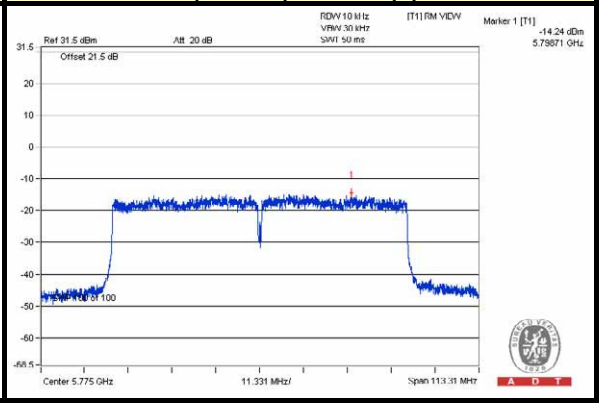
TX CHAIN	CHANNEL	FREQ. (MHz)	PSD W/O DUTY FACTOR (dBm/)	10 log (N=3) dB	DUTY FACTOR (dB)	TOTAL PSD WITH DUTY FACTOR (dBm/)	LIMIT (dBm/)	PASS /FAIL
0	1	151	-11.04	4.77	0.1	-6.17	7.23	PASS
	6	159	-8.92	4.77	0.1	-4.05	7.23	PASS
1	1	151	-10.79	4.77	0.1	-5.92	7.23	PASS
	6	159	-9.22	4.77	0.1	-4.35	7.23	PASS
2	1	149	-10.82	4.77	0.1	-5.95	7.23	PASS
	6	157	-8.89	4.77	0.1	-4.02	7.23	PASS
NOTE: Directional gain = 2dBi + 10log(3) = 6.77dBi > 6dBi , so the power limit shall be reduced to 8-(6.77-6) = 7.23dBm.								

NOTE: 1. Refer to section 3.4 for duty cycle spectrum plot.

802.11ac (VHT80)

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
0	155	5775	-15.29	4.77	0.16	-10.36	7.23	PASS
1	155	5775	-14.58	4.77	0.16	-9.65	7.23	PASS
2	155	5775	-14.24	4.77	0.16	-9.31	7.23	PASS
NOTE: Directional gain = 2dBi + 10log(3) = 6.77dBi > 6dBi , so the power limit shall be reduced to 8-(6.77-6) = 7.23dBm.								

NOTE: 1. Refer to section 3.4 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE	
802.11a / Chain (1) : CH165	**802.11ac (VHT20) / Chain(0) : CH165**
	
802.11ac (VHT40) / Chain(2) : CH159	**802.11ac (VHT80) / Chain(2) : 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
SPECTRUM ANALYZER R&S	FSP 40	100060	May 08, 2014	May 07, 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 : July 29, 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.

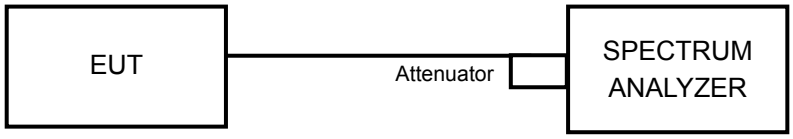
Measurement Procedure –Unwanted Emission Level

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

5.6.4 DEVIATION FROM TEST STANDARD

No deviation

5.6.5 TEST SETUP



5.6.6 EUT OPERATING CONDITION

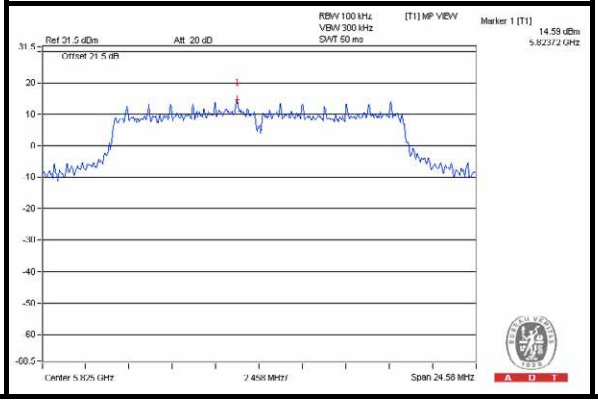
Same as Item 4.3.6

5.6.7 TEST RESULTS

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

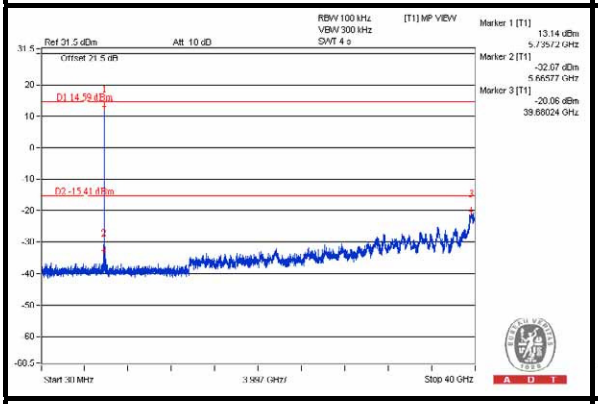
802.11a

Maximum REF

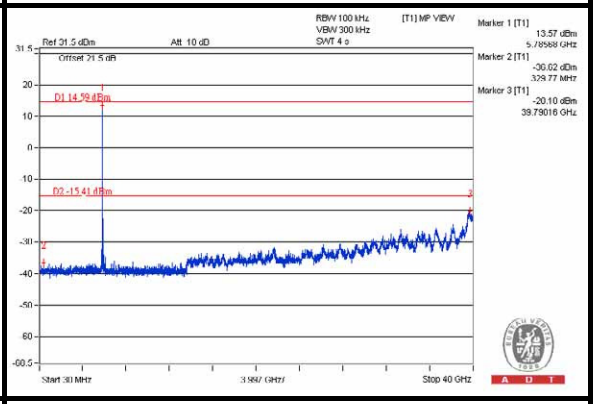


For Chain (0)

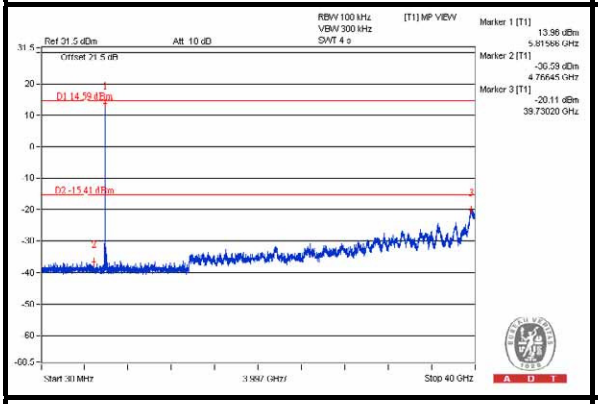
CH 149



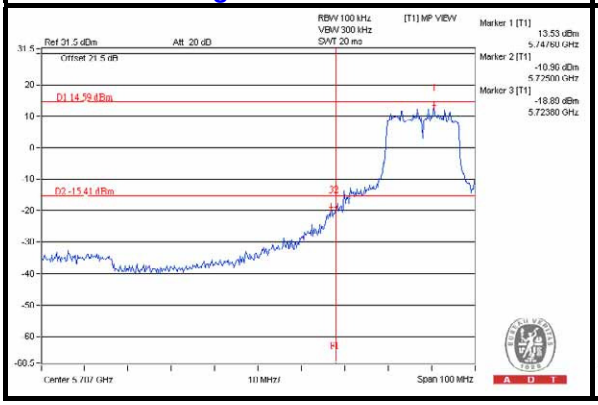
CH 157



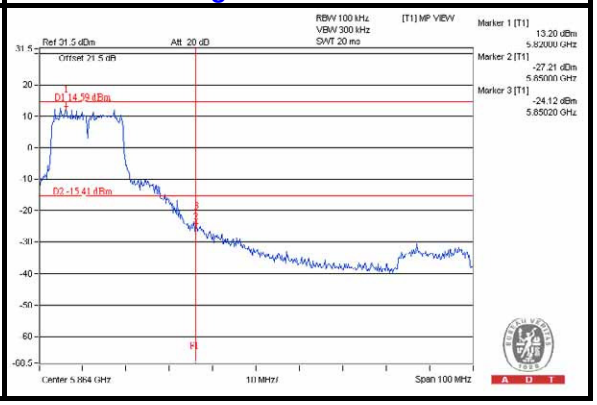
CH 165



CH 149 Band edge

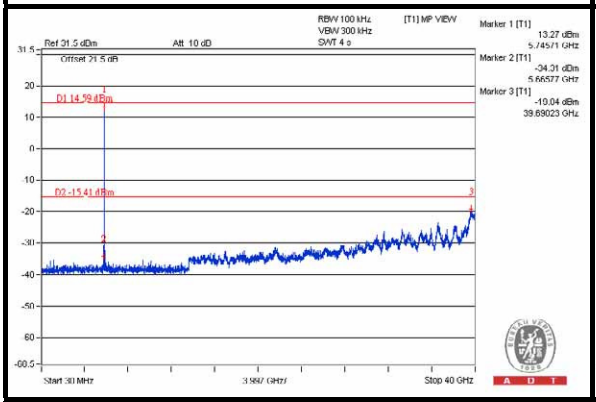


CH 165 Band edge

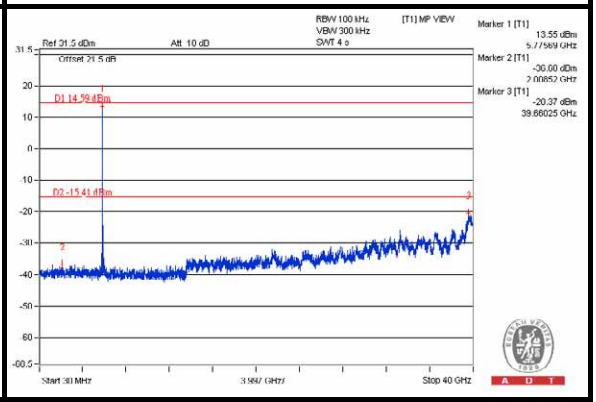


For Chain (1)

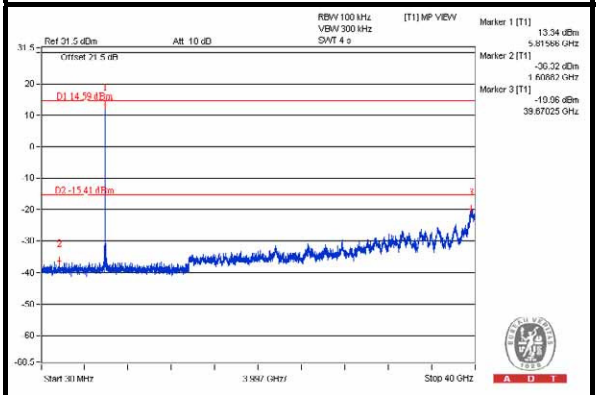
CH 149



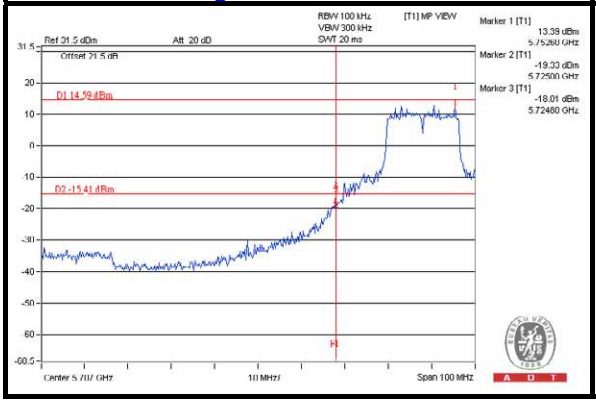
CH 157



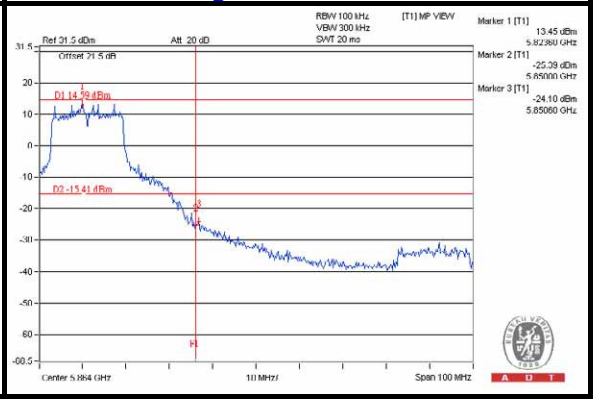
CH 165



CH 149 Band edge

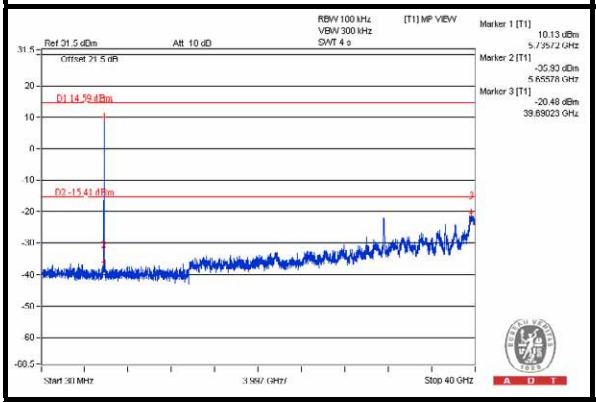


CH 165 Band edge

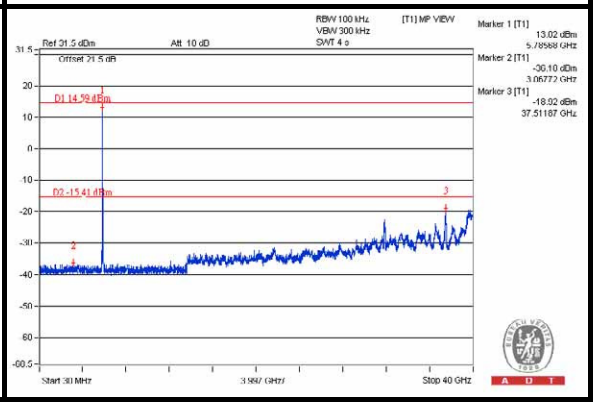


For Chain (2)

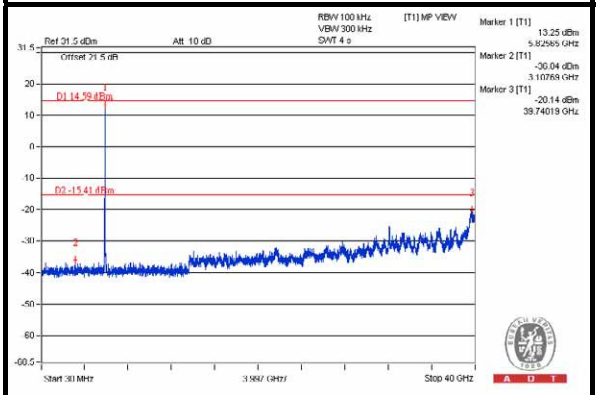
CH 149



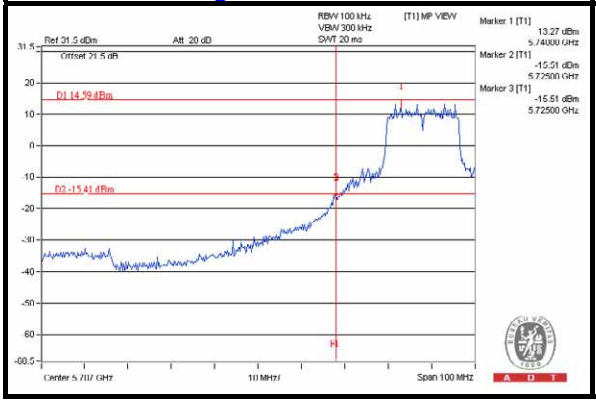
CH 157



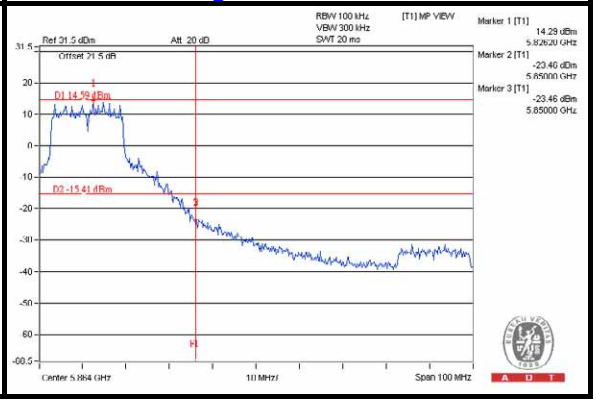
CH 165



CH 149 Band edge

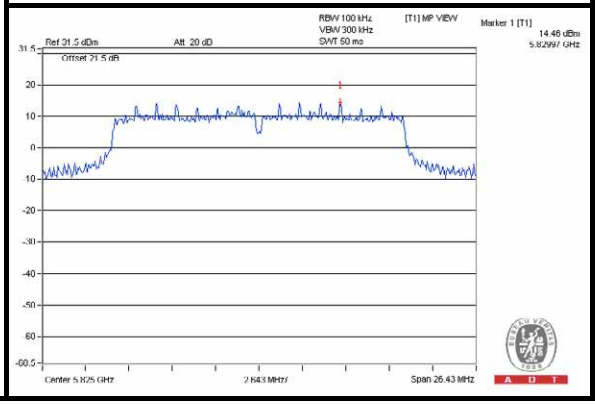


CH 165 Band edge



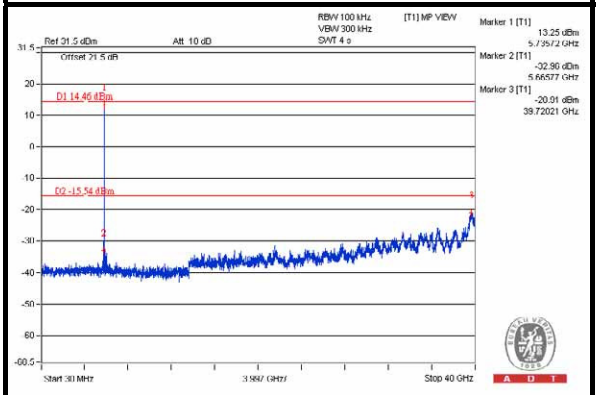
802.11ac (VHT20)

Maximum REF

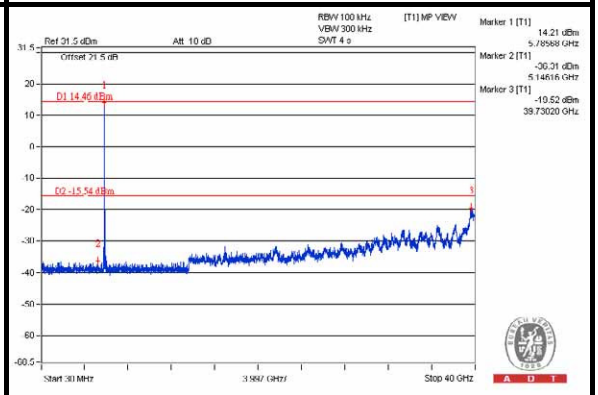


For Chain (0)

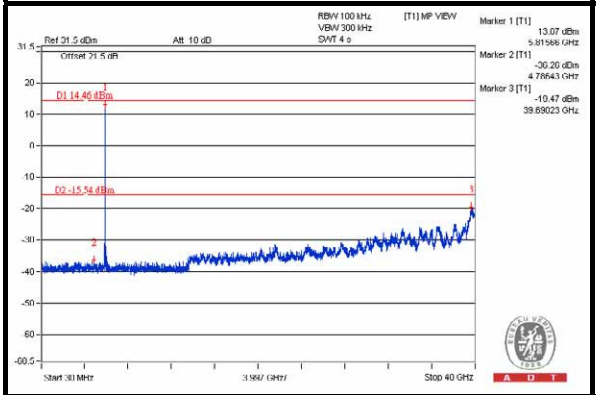
CH 149



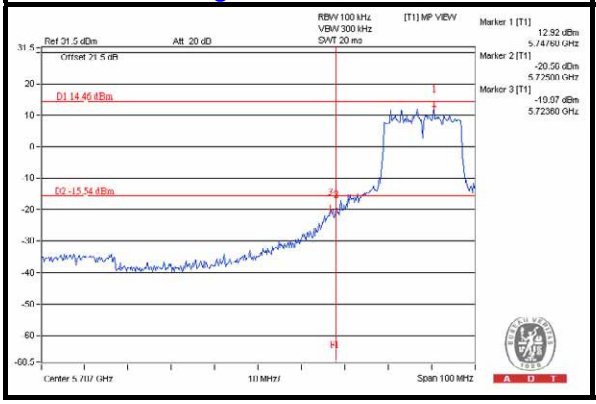
CH 157



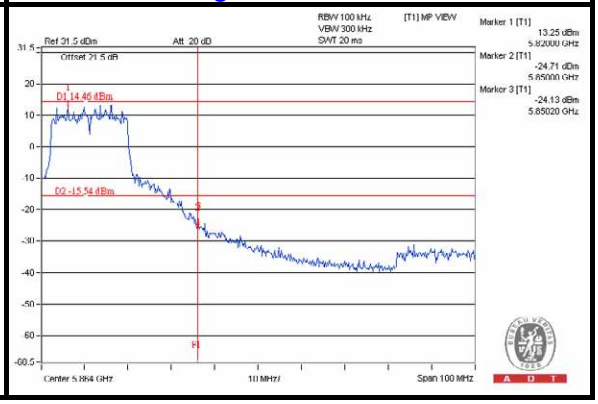
CH 165



CH 149 Band edge

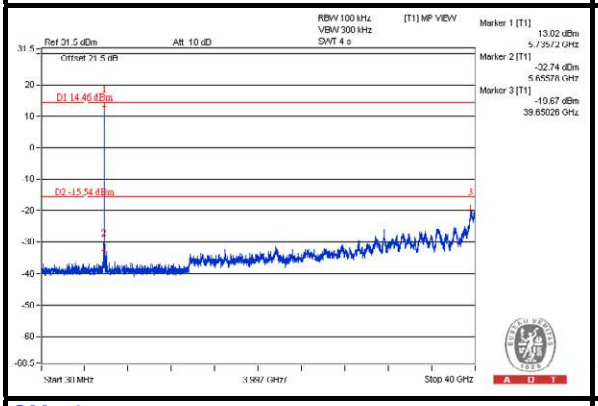


CH 165 Band edge

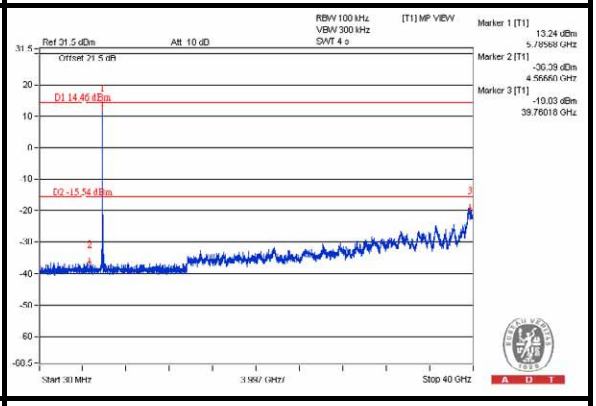


For Chain (1)

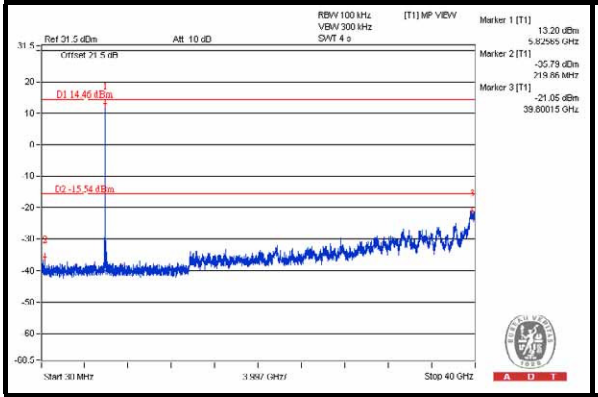
CH 149



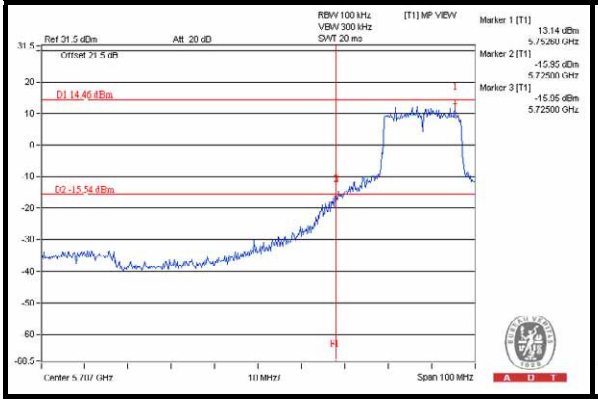
CH 157



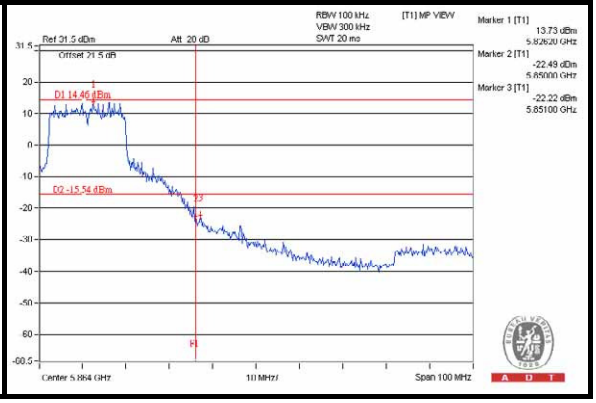
CH 165



CH 149 Band edge



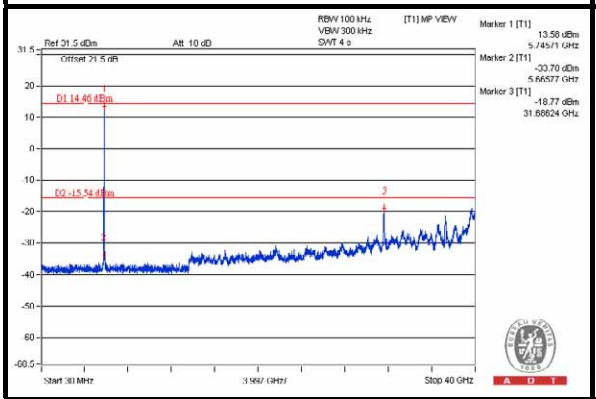
CH 165 Band edge



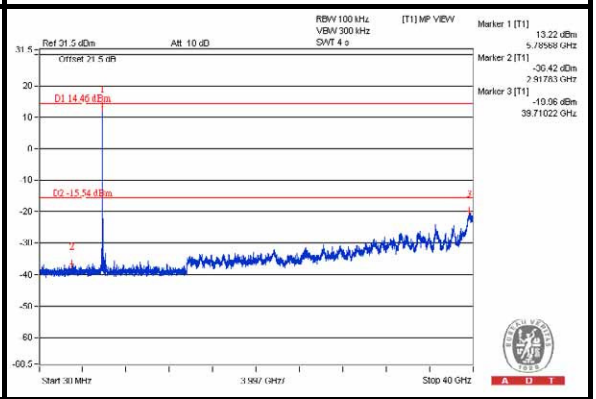
802.11ac (VHT20)

For Chain (2)

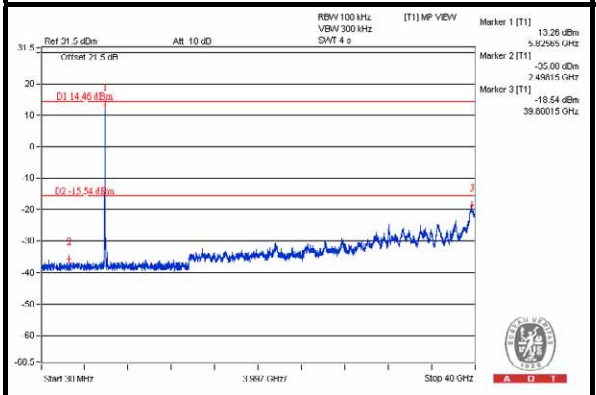
CH 149



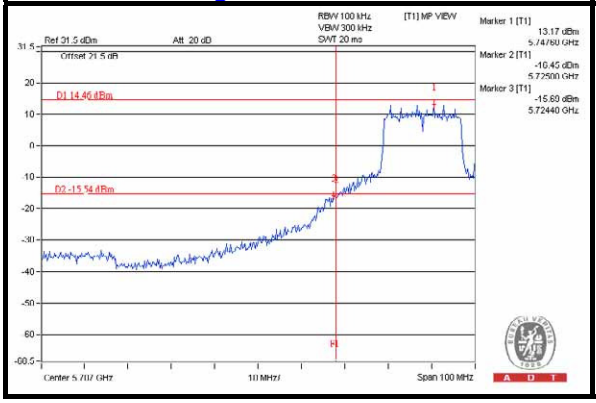
CH 157



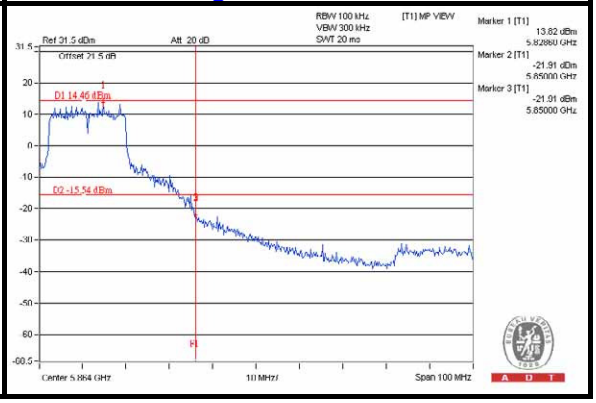
CH 165



CH 149 Band edge

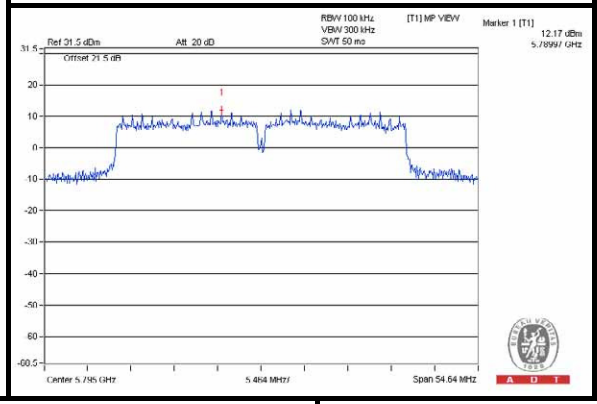


CH 165 Band edge



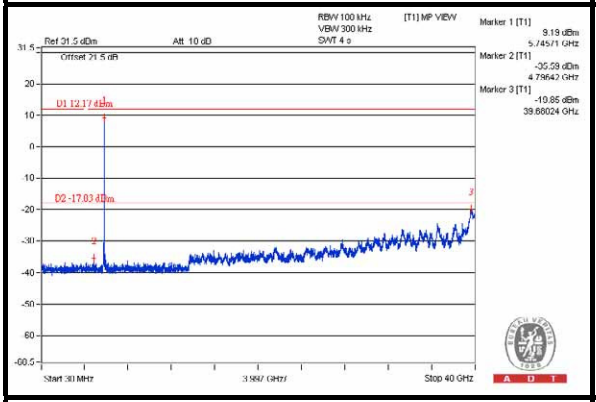
802.11ac (VHT40)

Maximum REF

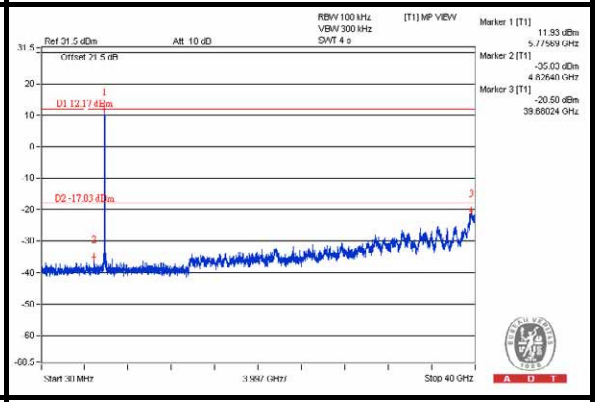


For Chain (0)

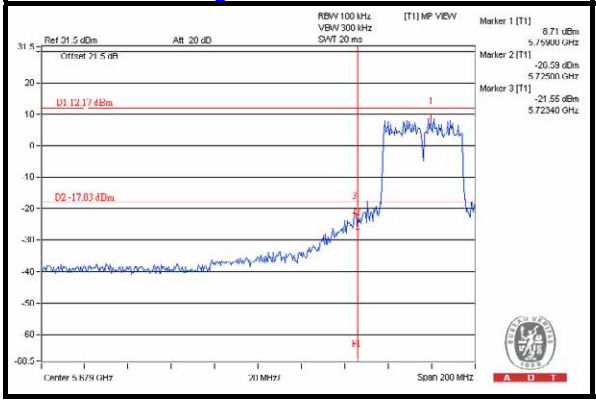
CH 151



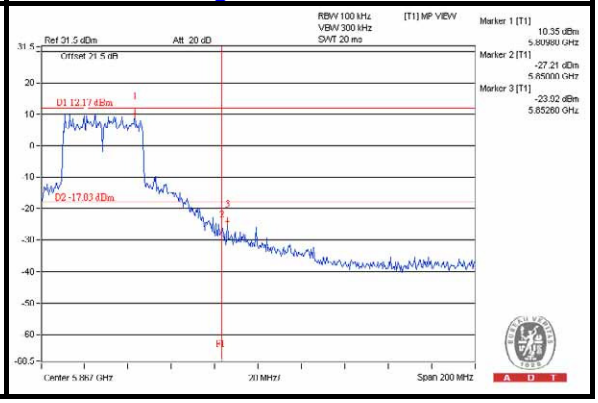
CH 159

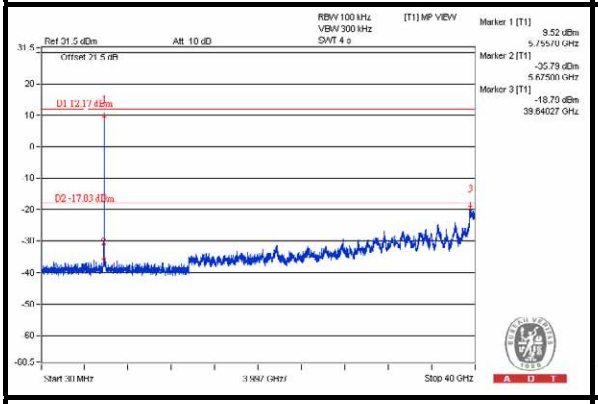
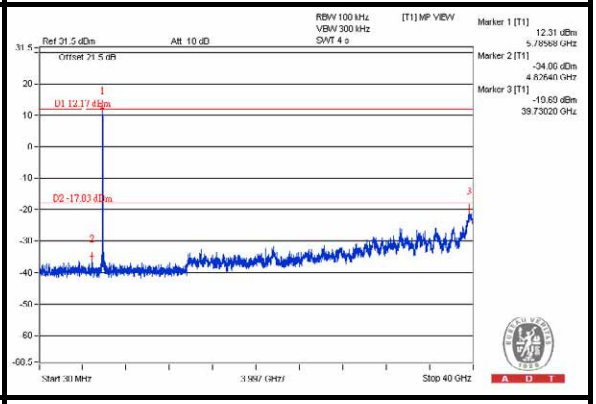
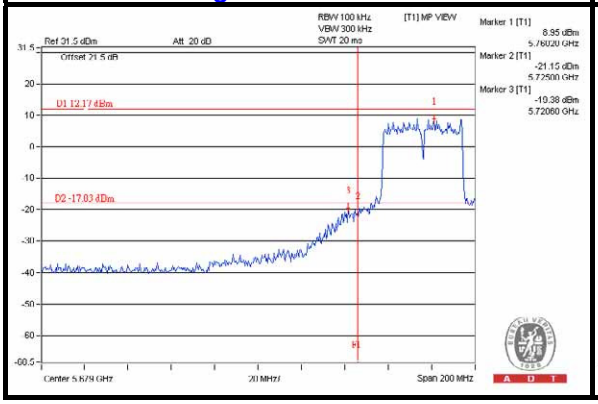
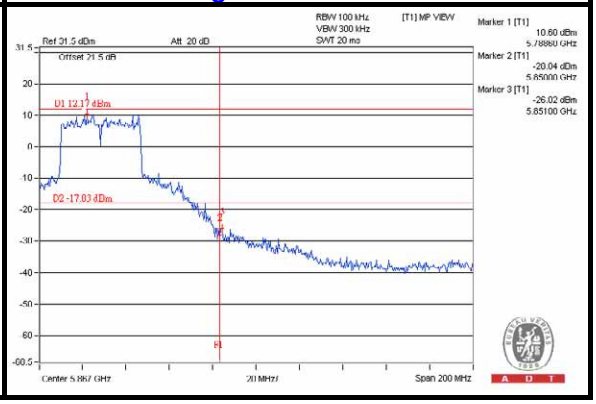


CH 151 Band edge



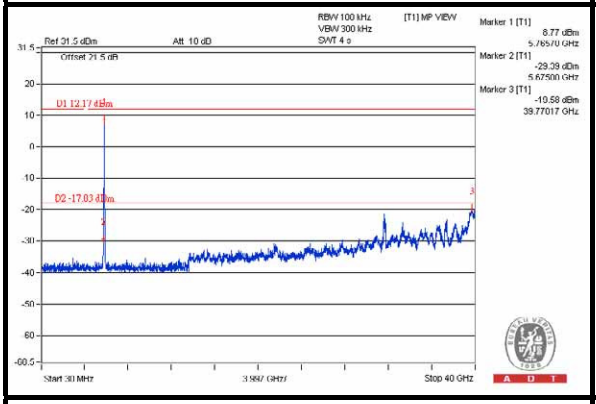
CH 159 Band edge



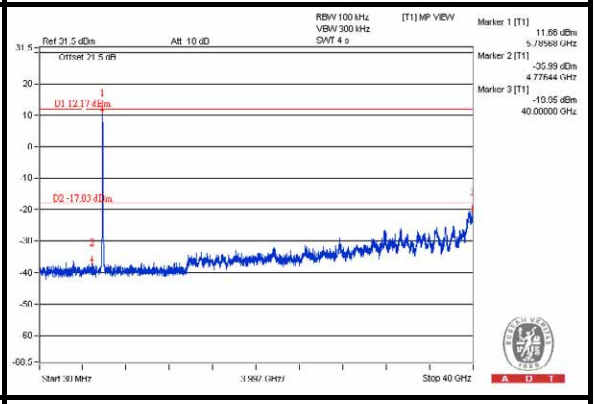
For Chain (1)	
CH 151	**CH 159**
	
CH 151 Band edge	**CH 159 Band edge**
	

For Chain (2)

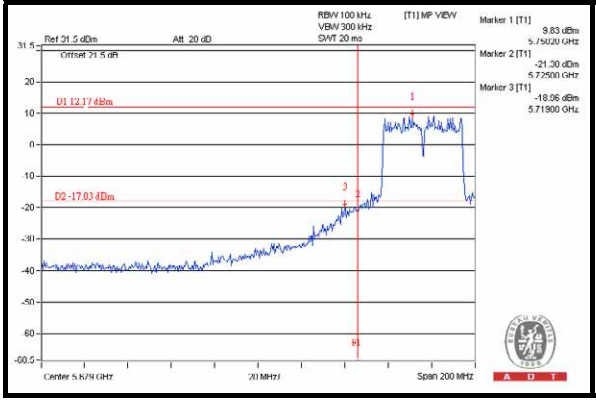
CH 151



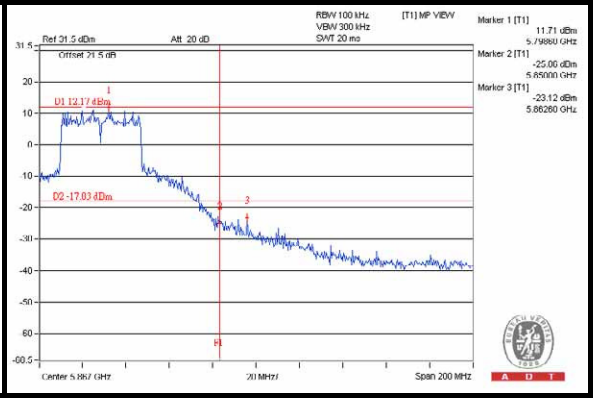
CH 159



CH 151 Band edge

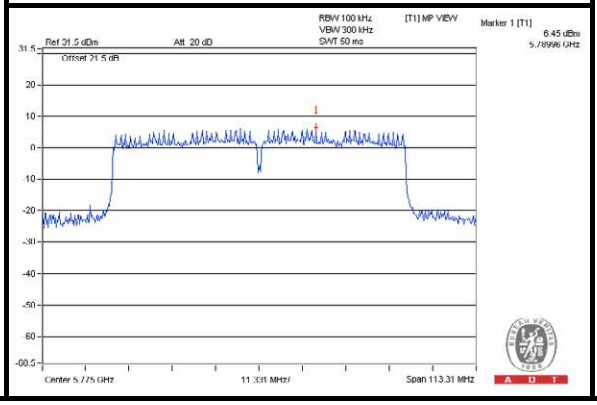


CH 159 Band edge



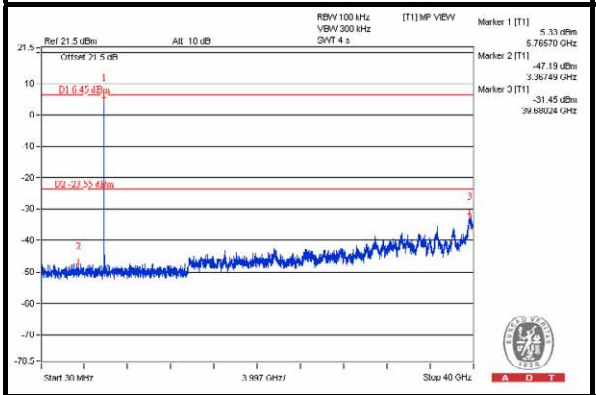
802.11ac (VHT80)

Maximum REF

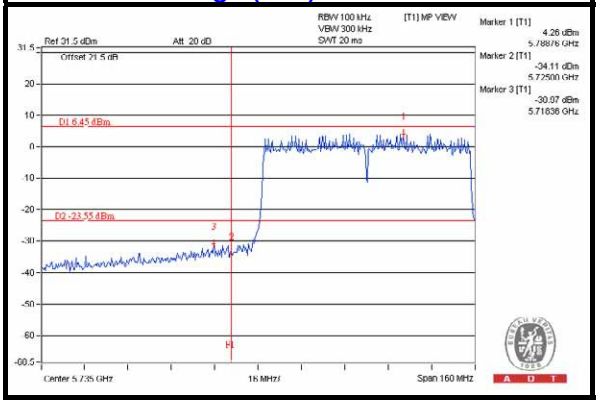


For Chain (0)

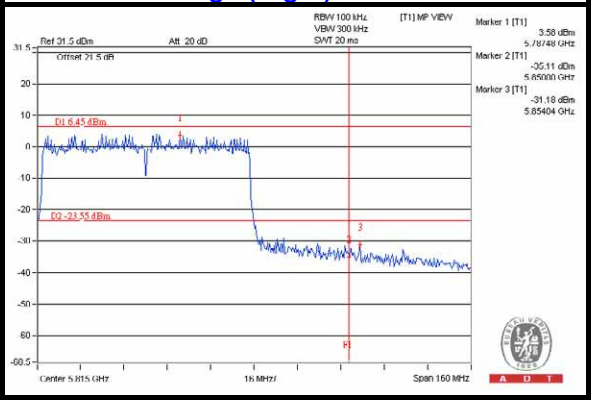
CH 155



CH 155 Band edge (Left)

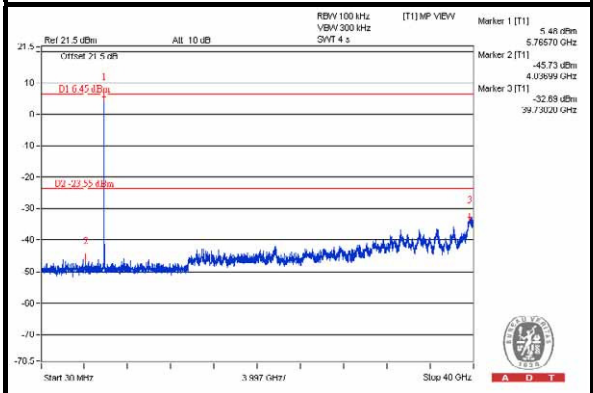


CH 155 Band edge (Right)

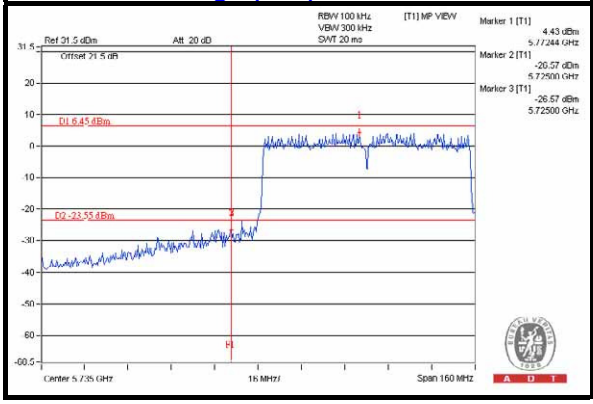


For Chain (1)

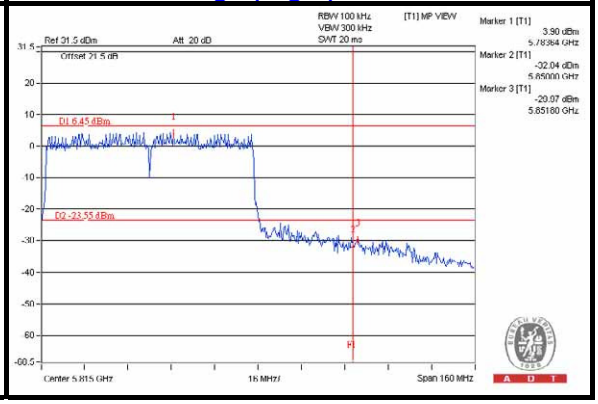
CH 155



CH 155 Band edge (Left)

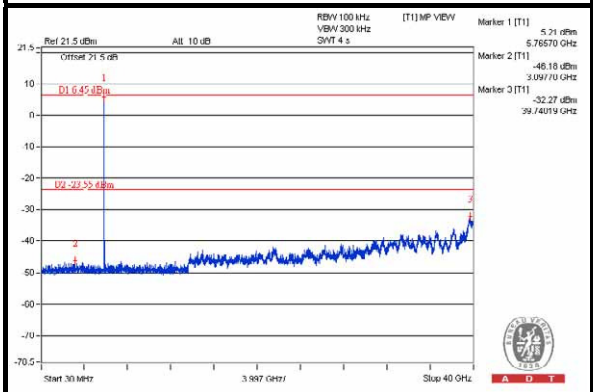


CH 155 Band edge (Right)

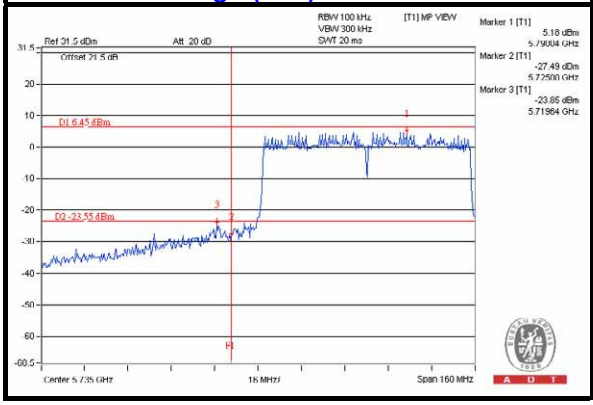


For Chain (2)

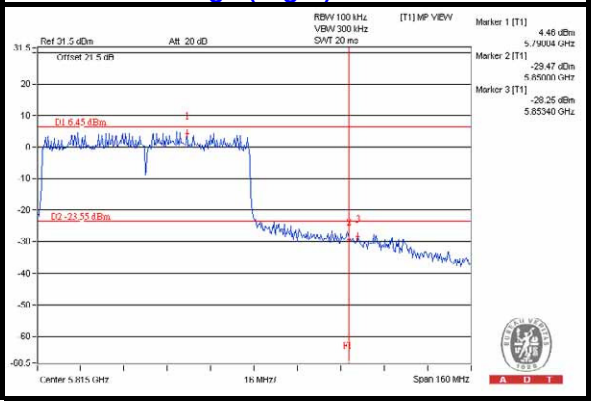
CH 155



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

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

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

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

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