

FCC Test Report

Report No.: RF150708E07

FCC ID: PY315200307

Test Model: R7300

Received Date: July 08, 2015

Test Date: July 15 to 31, 2015

Issued Date: Aug. 11, 2015

Applicant: NETGEAR, Inc.

Address: 350 East Plumeria Drive San Jose, CA 95134

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

Lab Address: No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

Test Location (1): No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

Test Location (2): No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

Test Location (3): E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City, Taiwan R.O.C.



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must 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 Certificate of Conformity	6
2 Summary of Test Results	7
2.1 Measurement Uncertainty	7
2.2 Modification Record	7
3 General Information	8
3.1 General Description of EUT	8
3.2 Description of Test Modes	11
3.2.1 Test Mode Applicability and Tested Channel Detail	12
3.3 Duty Cycle of Test Signal	16
3.4 Description of Support Units	18
3.4.1 Configuration of System under Test	19
3.5 General Description of Applied Standards	20
4 Test Types and Results (For 2.4GHz Band)	21
4.1 Radiated Emission and Bandedge Measurement	21
4.1.1 Limits of Radiated Emission and Bandedge Measurement	21
4.1.2 Test Instruments	22
4.1.3 Test Procedures	23
4.1.4 Deviation from Test Standard	23
4.1.5 Test Set Up	24
4.1.6 EUT Operating Conditions	24
4.1.7 Test Results	25
4.2 Conducted Emission Measurement	38
4.2.1 Limits of Conducted Emission Measurement	38
4.2.2 Test Instruments	38
4.2.3 Test Procedures	39
4.2.4 Deviation from Test Standard	39
4.2.5 Test Setup	39
4.2.6 EUT Operating Conditions	39
4.2.7 Test Results	40
4.3 6dB Bandwidth Measurement	42
4.3.1 Limits of 6dB Bandwidth Measurement	42
4.3.2 Test Setup	42
4.3.3 Test Instruments	42
4.3.4 Test Procedure	42
4.3.5 Deviation from Test Standard	42
4.3.6 EUT Operating Conditions	42
4.3.7 Test Result	43
4.4 Conducted Output Power Measurement	45
4.4.1 Limits of Conducted Output Power Measurement	45
4.4.2 Test Setup	45
4.4.3 Test Instruments	45
4.4.4 Test Procedures	45
4.4.5 Deviation from Test Standard	45
4.4.6 EUT Operating Conditions	45
4.4.7 Test Results	46
4.5 Power Spectral Density Measurement	47
4.5.1 Limits of Power Spectral Density Measurement	47
4.5.2 Test Setup	47
4.5.3 Test Instruments	47
4.5.4 Test Procedure	47
4.5.5 Deviation from Test Standard	47
4.5.6 EUT Operating Condition	47

4.5.7	Test Results	48
4.6	Conducted Out of Band Emission Measurement	51
4.6.1	Limits of Conducted Out of Band Emission Measurement	51
4.6.2	Test Setup	51
4.6.3	Test Instruments	51
4.6.4	Test Procedure	51
4.6.5	Deviation from Test Standard	51
4.6.6	EUT Operating Condition	51
4.6.7	Test Results	51
5	Test Types and Results (For 5GHz Band).....	64
5.1	Radiated Emission and Bandedge Measurement.....	64
5.1.1	Limits of Radiated Emission and Bandedge Measurement	64
5.1.2	Test Instruments	64
5.1.3	Test Procedures.....	64
5.1.4	Deviation from Test Standard	64
5.1.5	Test Setup.....	64
5.1.6	EUT Operating Conditions.....	65
5.1.7	Test Results	66
5.2	Conducted Emission Measurement	76
5.2.1	Limits of Conducted Emission Measurement	76
5.2.2	Test Instruments	76
5.2.3	Test Procedures.....	76
5.2.4	Deviation from Test Standard	76
5.2.5	Test Setup.....	76
5.2.6	EUT operating conditions	76
5.2.7	Test Results	77
5.3	6dB Bandwidth Measurement.....	79
5.3.1	Limits of 6dB Bandwidth Measurement.....	79
5.3.2	Test Setup.....	79
5.3.3	Test Instruments	79
5.3.4	Test Procedure	79
5.3.5	Deviation from Test Standard	79
5.3.6	EUT Operating Conditions.....	79
5.3.7	Test Result.....	80
5.4	Conducted Output Power	82
5.4.1	Limits OF Conducted Output Power Measurement	82
5.4.2	Test Setup.....	82
5.4.3	Test Instruments	82
5.4.4	Test Procedures.....	82
5.4.5	Deviation from Test Standard	82
5.4.6	EUT Operating Conditions.....	82
5.4.7	Test Results	83
5.5	Power Spectral Density Measurement.....	84
5.5.1	Limits of Power Spectral Density Measurement	84
5.5.2	Test Setup.....	84
5.5.3	Test Instruments	84
5.5.4	Test Procedure	84
5.5.5	Deviation from Test Standard	84
5.5.6	EUT Operating Condition	84
5.5.7	Test Results	85
5.6	Conducted Out of Band Emission Measurement.....	88
5.6.1	Limits of Conducted Out of Band Emission Measurement	88
5.6.2	Test Setup.....	88
5.6.3	Test Instruments	88
5.6.4	Test Procedure	88
5.6.5	Deviation from Test Standard	88
5.6.6	EUT Operating Condition	88



5.6.7 Test Results	88
6 Pictures of Test Arrangements	101
Appendix – Information on the Testing Laboratories	102



A D T

Release Control Record

Issue No.	Description	Date Issued
RF150708E07	Original release.	Aug. 11, 2015

1 Certificate of Conformity

Product: Nighthawk AC1900 DST Router

Brand: NETGEAR

Test Model: R7300

Sample Status: ENGINEERING SAMPLE

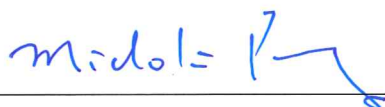
Applicant: NETGEAR, Inc.

Test Date: July 15 to 31, 2015

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10: 2013

The above equipment 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:

Aug. 11, 2015

Midoli Peng / Specialist

Approved by :



Date:

Aug. 11, 2015

May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (SECTION 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -7.05dB at 0.33359MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.2dB at 2483.50MHz & 2390.00MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted 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 Re-SMA not a standard connector.

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:

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.86 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.37 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.65 dB
	6GHz ~ 18GHz	3.88 dB
	18GHz ~ 40GHz	4.11 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Nighthawk AC1900 DST Router
Brand	NETGEAR
Test Model	R7300
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	AC 100-240V, 1.3A, 50/60Hz
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT (20/40) mode in 2.4GHz
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a: 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: 2.412 ~ 2.462GHz
	5GHz: 5.745 ~ 5.825GHz
Number of Channel	For 15.407 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)
	For 15.247 (2.4GHz) 11 for 802.11b, 802.11g, 802.11n (HT20), VHT20 7 for 802.11n (HT40), VHT40
	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)

Output Power	For 15.407 CDD Mode: 802.11a: 436.228mW 802.11ac (VHT20): 436.723mW 802.11ac (VHT40): 888.181mW 802.11ac (VHT80): 293.206mW Beamforming Mode: 802.11ac (VHT20): 393.736mW 802.11ac (VHT40): 674.757mW 802.11ac (VHT80): 219.7mW
	For 15.247(5GHz) CDD Mode: 802.11a: 932.093mW Beamforming Mode: 802.11ac (VHT20): 931.687mW 802.11ac (VHT40): 916.556mW 802.11ac (VHT80): 539.77mW
	For 15.247(2.4GHz) CDD Mode: 802.11b: 983.43mW 802.11g: 922.959mW 802.11n(HT20): 917.129mW 802.11n(HT40): 252.703mW Beamforming Mode: VHT20: 917.129mW VHT40: 225.567mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

- The EUT must be supplied with internal power supply as following spec:
◆ AC 100-240V, 1.3A, 50/60Hz
- The antennas provided to the EUT, please refer to the following table:

Antenna No.	Ant. Gain(dBi)	Frequency range (GHz to GHz)	Antenna Type	Connector Type
1	0.5	2.4~2.4835	Dipole	Re-SMA
	0.9	5.15~5.25	Dipole	Re-SMA
	0.4	5.725~5.85	Dipole	Re-SMA
2	0.5	2.4~2.4835	Dipole	Re-SMA
	0.9	5.15~5.25	Dipole	Re-SMA
	0.4	5.725~5.85	Dipole	Re-SMA
3	0.5	2.4~2.4835	Dipole	Re-SMA
	0.9	5.15~5.25	Dipole	Re-SMA
	0.4	5.725~5.85	Dipole	Re-SMA

3. The EUT incorporates a MIMO function with beamforming.(Except for 802.11a/b/g)

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

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

- The emission of the simultaneous operation (2.4GHz & 5GHz) has been evaluated and no non-compliance was found.
- The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

FOR 2.4GHz:

11 channels are provided for 802.11b, 802.11g, 802.11n (HT20), VHT20:

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), VHT40:

Channel	Frequency	Channel	Frequency
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

FOR 5GHz (5745 ~ 5825MHz):

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

For 2.4GHz:

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE $\geq$ 1G**: Radiated Emission above 1GHz

RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

Radiated Emission Test (Above 1GHz):

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

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

Radiated Emission Test (Below 1GHz):

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

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	6	DSSS	DBPSK	1

Power Line Conducted Emission Test:

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

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	6	DSSS	DBPSK	1

Antenna Port Conducted Measurement:

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

CDD Mode					
For Conducted Output Power / Power Spectral Density / 6dB Bandwidth Measurement					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n(HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n(HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
Beamforming Mode					
For Conducted Output Power Measurement					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
VHT40	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	21deg. C, 68%RH	120Vac, 60Hz	Andy Ho
RE<1G	20deg. C, 66%RH	120Vac, 60Hz	Weiwei Lo
PLC	30deg. C, 65%RH	120Vac, 60Hz	Jyunchun Lin
APCM	25deg. C, 60%RH	120Vac, 60Hz	Gary Cheng

For 5GHz (5745 ~ 5825MHz):

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	APCM	
-	√	√	-	√	-

Where **RE $\geq$ 1G**: Radiated Emission above 1GHz & Bandedge Measurement
RE<1G: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission
APCM: Antenna Port Conducted Measurement

Radiated Emission Test (Above 1GHz):

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

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

Radiated Emission Test (Below 1GHz):

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

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

Power Line Conducted Emission Test:

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

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

Antenna Port Conducted Measurement:

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

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

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	23deg. C, 66%RH	120Vac, 60Hz	Tim Ho
RE<1G	20deg. C, 66%RH	120Vac, 60Hz	Weiwei Lo
PLC	30deg. C, 65%RH	120Vac, 60Hz	Jyunchun Lin
APCM	25deg. C, 60%RH	120Vac, 60Hz	Gary Cheng

3.3 Duty Cycle of Test Signal

2.4GHz Band:

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

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

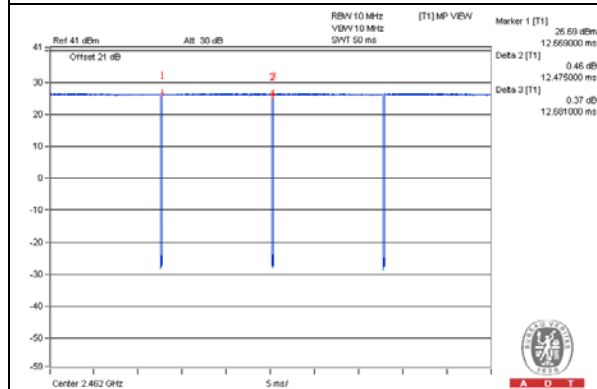
802.11b: Duty cycle = 12.475 ms/12.681 ms = 0.984

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

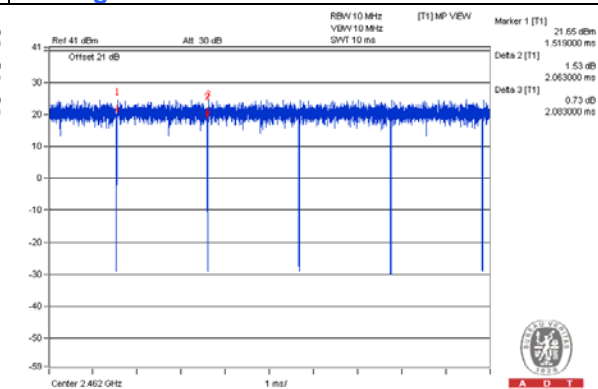
802.11n (HT20): Duty cycle = 1.92 ms/1.954 ms = 0.983

802.11n (HT40): Duty cycle = 0.942 ms/0.98 ms = 0.961, Duty factor = $10 * \log(1/0.961) = 0.17$

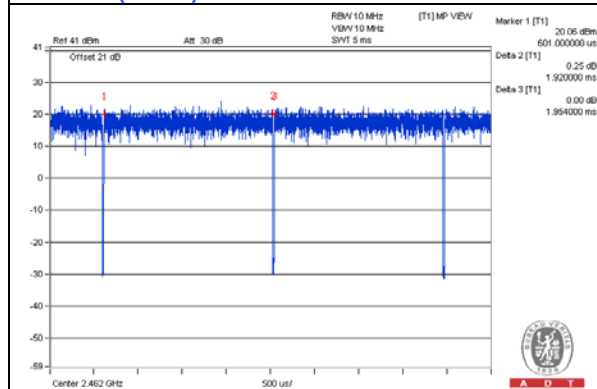
802.11b



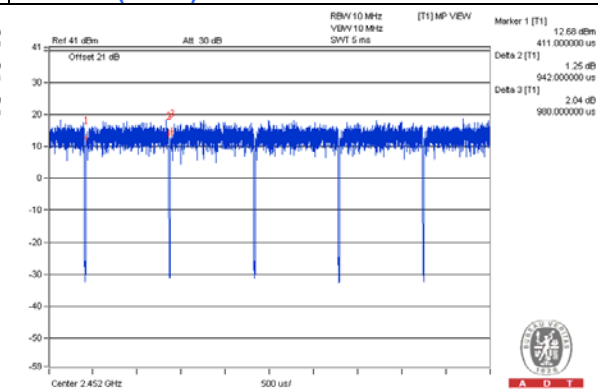
802.11g



802.11n (HT20)



802.11n (HT40)



For 5GHz (5745 ~ 5825MHz):

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

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

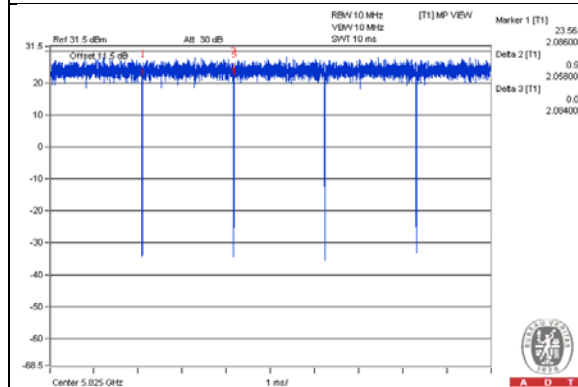
802.11a: Duty cycle = 2.058 ms/2.084 ms = 0.988

802.11ac (VHT20): Duty cycle = 1.926 ms/1.948 ms = 0.989

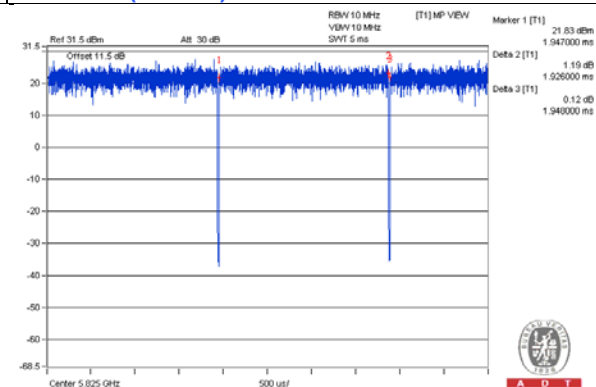
802.11ac (VHT40): Duty cycle = 0.953 ms/0.970 ms = 0.982

802.11ac (VHT80): Duty cycle = 0.457 ms/0.48 ms = 0.952, Duty factor = $10 * \log(1/0.952) = 0.21$

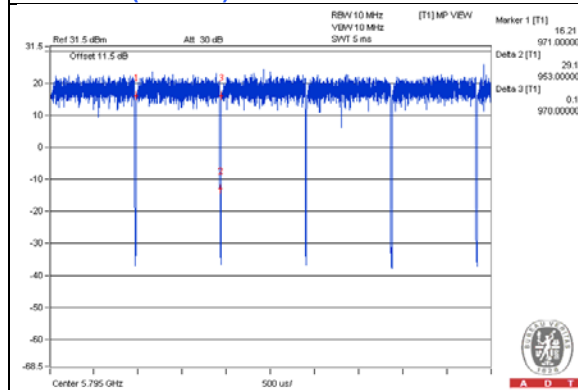
802.11a



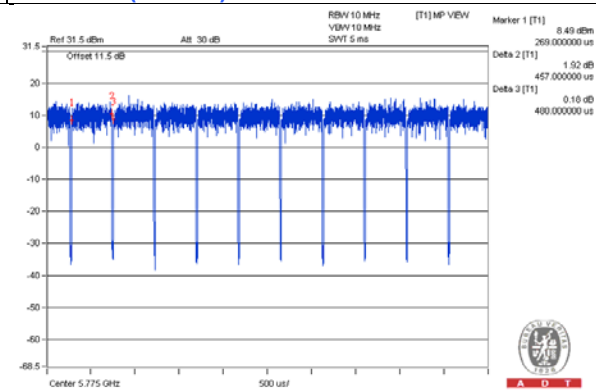
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 Description of Support Units

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

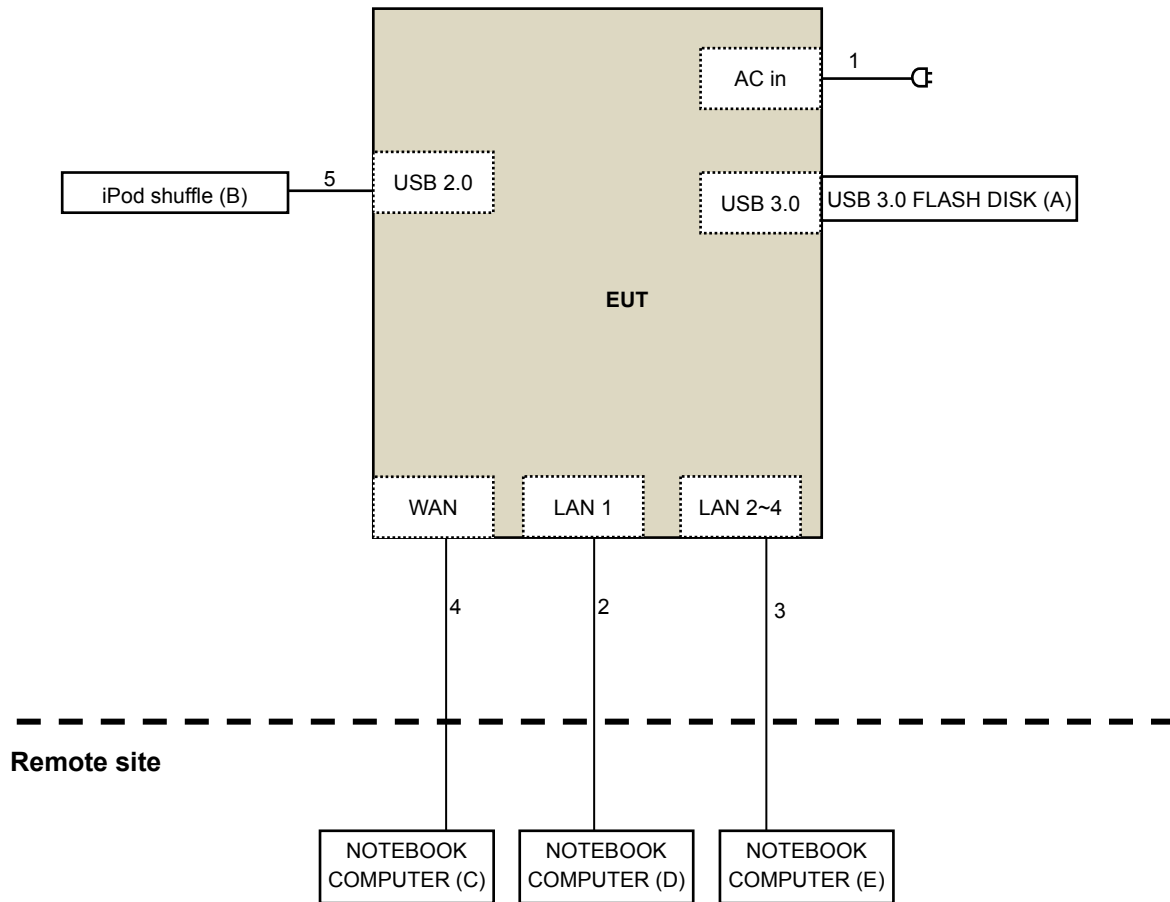
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	USB 3.0 FLASH DISK	Transcend	NA	NA	NA	Provided by Lab
B.	iPod shuffle	Apple	MC749TA/A	CC4DMFJUDFDM	NA	Provided by Lab
C.	NOTEBOOK COMPUTER	DELL	PP27L	6YLB32S	FCC DoC	Provided by Lab
D.	NOTEBOOK COMPUTER	DELL	PP27L	7YLB32S	FCC DoC	Provided by Lab
E.	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	AC	1	1.8	No	0	Supplied by Client
2.	RJ-45	1	1	No	0	Provided by Lab
3.	RJ-45	3	10	No	0	Provided by Lab
4.	RJ-45	1	10	No	0	Provided by Lab
5.	USB	1	0.1	Yes	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 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 v03r03

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

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

4 Test Types and Results (For 2.4GHz Band)

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210202	Dec. 12, 2014	Dec. 11, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-03	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Feb. 06, 2015	Feb. 05, 2016
RF Cable	8D-FB	CHGCAB-001 -1 CHGCAB-001 -2	Oct. 04, 2014	Oct. 03, 2015
	RF-141	CHGCAB-004	Oct. 04, 2014	Oct. 03, 2015
Horn_Antenna AISI	AIH.8018	000032009111 0	Feb. 09, 2015	Feb. 08, 2016
Pre-Amplifier Agilent	8449B	3008A02578	June 23, 2015	June 22, 2016
RF Cable	NA	131205 131216 131217 SNMY23684/ 4	Jan. 16, 2015	Jan. 15, 2016
Spectrum Analyzer R&S	FSV40	100964	June 26, 2015	June 25, 2016
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Dec. 12, 2014	Dec. 11, 2015
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Feb. 05, 2015	Feb. 04, 2016
RF Cable	NA	329751/4 RF104-204	Dec. 11, 2014	Dec. 10, 2015
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA
SPECTRUM ANALYZER R&S	FSV 40	100964	June 26, 2015	June 25, 2016
Power Meter Anritsu	ML2495A	1014008	Apr. 28, 2015	Apr. 27, 2016
Power Sensor Anritsu	MA2411B	0917122	Apr. 28, 2015	Apr. 27, 2016

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 966 Chamber No. G.
3. The FCC Site Registration No. is 966073.
4. The VCCI Site Registration No. is G-137.
5. The CANADA Site Registration No. is IC 7450H-2.
6. Tested Date: July 21 to 31, 2015

4.1.3 Test Procedures

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

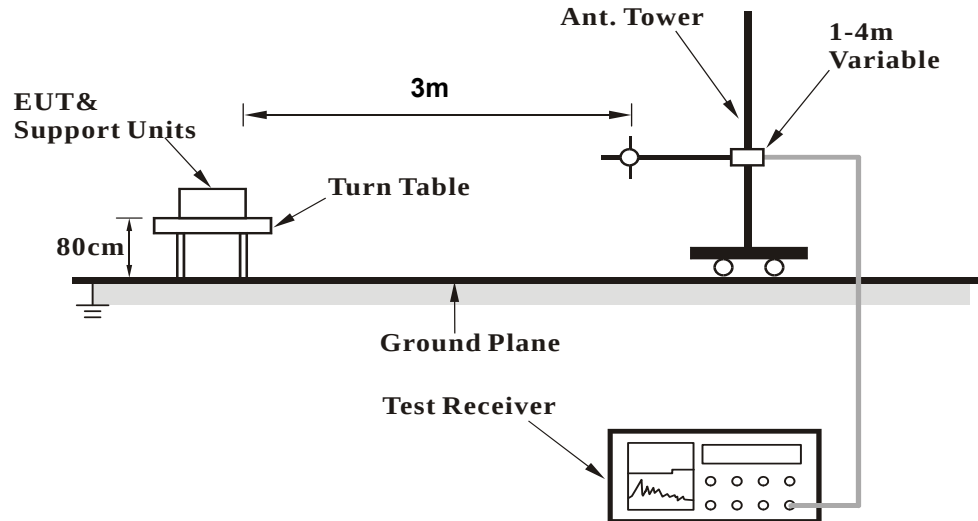
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

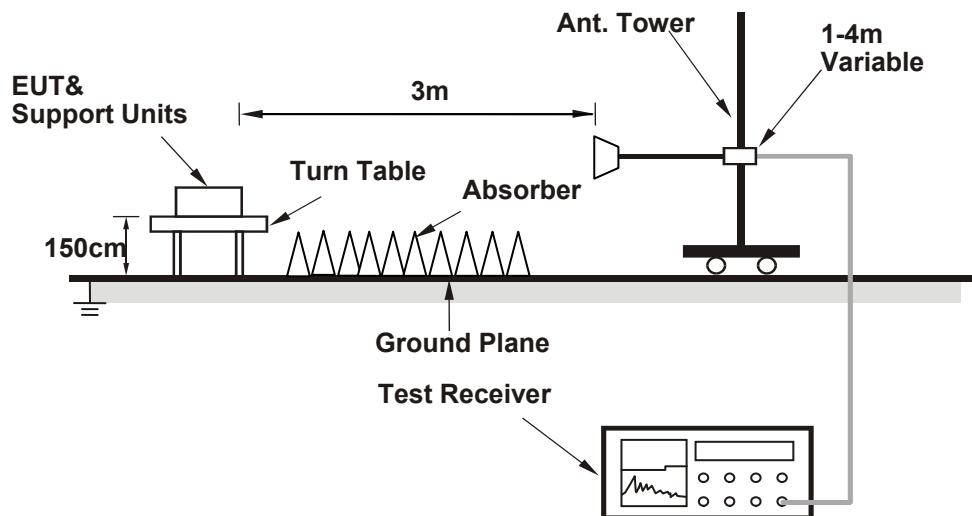
No deviation.

4.1.5 Test Set Up

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

1. Connect the EUT with the support units C-E (NOTEBOOK COMPUTER) which is placed on remote site.
2. Controlling software (Mtool 2.0.1.8.msi) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data

CDD Mode

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	51.4 PK	74.0	-22.6	1.19 H	174	56.63	-5.23
2	2390.00	40.9 AV	54.0	-13.1	1.19 H	174	46.13	-5.23
3	*2412.00	107.6 PK			1.19 H	174	112.75	-5.15
4	*2412.00	105.1 AV			1.19 H	174	110.25	-5.15
5	4824.00	50.0 PK	74.0	-24.0	1.51 H	194	48.87	1.13
6	4824.00	48.1 AV	54.0	-5.9	1.51 H	194	46.97	1.13
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.3 PK	74.0	-10.7	2.46 V	53	68.53	-5.23
2	2390.00	53.4 AV	54.0	-0.6	2.46 V	53	58.63	-5.23
3	*2412.00	119.7 PK			2.46 V	53	124.85	-5.15
4	*2412.00	115.7 AV			2.46 V	53	120.88	-5.15
5	4824.00	54.5 PK	74.0	-19.5	1.50 V	216	53.37	1.13
6	4824.00	52.9 AV	54.0	-1.1	1.50 V	216	51.77	1.13

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	107.8 PK			1.23 H	181	112.88	-5.08
2	*2437.00	105.0 AV			1.23 H	181	110.08	-5.08
3	4874.00	50.2 PK	74.0	-23.8	1.56 H	181	48.83	1.37
4	4874.00	48.3 AV	54.0	-5.7	1.56 H	181	46.93	1.37
5	7311.00	40.1 PK	74.0	-33.9	1.57 H	203	31.98	8.12
6	7311.00	33.2 AV	54.0	-20.8	1.57 H	203	25.08	8.12
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	119.9 PK			2.08 V	55	124.98	-5.08
2	*2437.00	115.8 AV			2.08 V	55	120.88	-5.08
3	4874.00	54.7 PK	74.0	-19.3	1.48 V	232	53.33	1.37
4	4874.00	53.0 AV	54.0	-1.0	1.48 V	232	51.63	1.37
5	7311.00	44.6 PK	74.0	-29.4	1.22 V	218	36.48	8.12
6	7311.00	34.1 AV	54.0	-19.9	1.22 V	218	25.98	8.12

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	107.4 PK			1.22 H	171	112.40	-5.00
2	*2462.00	104.7 AV			1.22 H	171	109.70	-5.00
3	2483.50	50.0 PK	74.0	-24.0	1.22 H	171	54.92	-4.92
4	2483.50	41.3 AV	54.0	-12.7	1.22 H	171	46.22	-4.92
5	4924.00	49.8 PK	74.0	-24.2	1.53 H	167	48.27	1.53
6	4924.00	48.0 AV	54.0	-6.0	1.53 H	167	46.47	1.53
7	7386.00	40.2 PK	74.0	-33.8	1.59 H	192	31.98	8.22
8	7386.00	33.4 AV	54.0	-20.6	1.59 H	192	25.18	8.22
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	119.5 PK			2.06 V	334	124.50	-5.00
2	*2462.00	115.5 AV			2.06 V	334	120.50	-5.00
3	2483.50	61.9 PK	74.0	-12.1	2.06 V	334	66.82	-4.92
4	2483.50	53.8 AV	54.0	-0.2	2.06 V	334	58.72	-4.92
5	4924.00	54.6 PK	74.0	-19.4	1.45 V	205	53.07	1.53
6	4924.00	52.8 AV	54.0	-1.2	1.45 V	205	51.27	1.53
7	7386.00	44.5 PK	74.0	-29.5	1.23 V	207	36.28	8.22
8	7386.00	34.1 AV	54.0	-19.9	1.23 V	207	25.88	8.22

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	2388.00	61.7 PK	74.0	-12.3	1.22 H	184	66.93	-5.23
2	2388.00	38.4 AV	54.0	-15.6	1.22 H	184	43.63	-5.23
3	*2412.00	109.1 PK			1.22 H	184	114.25	-5.15
4	*2412.00	98.3 AV			1.22 H	184	103.45	-5.15
5	4824.00	49.6 PK	74.0	-24.4	1.48 H	161	48.47	1.13
6	4824.00	47.8 AV	54.0	-6.2	1.48 H	161	46.67	1.13
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	2388.00	73.7 PK	74.0	-0.3	2.06 V	360	78.93	-5.23
2	2388.00	50.9 AV	54.0	-3.1	2.06 V	360	56.13	-5.23
3	*2412.00	119.9 PK			2.06 V	360	125.05	-5.15
4	*2412.00	109.1 AV			2.06 V	360	114.25	-5.15
5	4824.00	53.0 PK	74.0	-21.0	1.62 V	244	51.87	1.13
6	4824.00	40.9 AV	54.0	-13.1	1.62 V	244	39.77	1.13

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	59.6 PK	74.0	-14.4	1.21 H	179	64.83	-5.23
2	2390.00	41.1 AV	54.0	-12.9	1.21 H	179	46.33	-5.23
3	*2437.00	113.3 PK			1.21 H	179	118.38	-5.08
4	*2437.00	102.4 AV			1.21 H	179	107.48	-5.08
5	2483.50	58.0 PK	74.0	-16.0	1.21 H	179	62.92	-4.92
6	2483.50	38.7 AV	54.0	-15.3	1.21 H	179	43.62	-4.92
7	4874.00	45.6 PK	74.0	-28.4	1.45 H	158	44.23	1.37
8	4874.00	37.2 AV	54.0	-16.8	1.45 H	158	35.83	1.37
9	7311.00	40.5 PK	74.0	-33.5	1.38 H	267	32.38	8.12
10	7311.00	33.2 AV	54.0	-20.8	1.38 H	267	25.08	8.12

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	72.1 PK	74.0	-1.9	2.04 V	360	77.33	-5.23
2	2390.00	53.6 AV	54.0	-0.4	2.04 V	360	58.83	-5.23
3	*2437.00	124.1 PK			2.04 V	360	129.18	-5.08
4	*2437.00	113.2 AV			2.04 V	360	118.28	-5.08
5	2483.50	70.5 PK	74.0	-3.5	2.04 V	360	75.42	-4.92
6	2483.50	51.2 AV	54.0	-2.8	2.04 V	360	56.12	-4.92
7	4874.00	52.4 PK	74.0	-21.6	1.58 V	231	51.03	1.37
8	4874.00	40.4 AV	54.0	-13.6	1.58 V	231	39.03	1.37
9	7311.00	44.4 PK	74.0	-29.6	1.26 V	200	36.28	8.12
10	7311.00	33.7 AV	54.0	-20.3	1.26 V	200	25.58	8.12

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	2390.00	44.2 PK	74.0	-29.8	1.24 H	172	49.43	-5.23
2	2390.00	33.6 AV	54.0	-20.4	1.24 H	172	38.83	-5.23
3	*2462.00	107.2 PK			1.24 H	172	112.20	-5.00
4	*2462.00	95.8 AV			1.24 H	172	100.80	-5.00
5	2483.50	61.2 PK	74.0	-12.8	1.24 H	172	66.12	-4.92
6	2483.50	36.0 AV	54.0	-18.0	1.24 H	172	40.92	-4.92
7	4924.00	45.8 PK	74.0	-28.2	1.47 H	154	44.27	1.53
8	4924.00	37.1 AV	54.0	-16.9	1.47 H	154	35.57	1.53
9	7386.00	40.7 PK	74.0	-33.3	1.41 H	257	32.48	8.22
10	7386.00	33.5 AV	54.0	-20.5	1.41 H	257	25.28	8.22

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	56.7 PK	74.0	-17.3	2.00 V	263	61.93	-5.23
2	2390.00	44.5 AV	54.0	-9.5	2.00 V	263	49.73	-5.23
3	*2462.00	118.0 PK			2.00 V	360	123.00	-5.00
4	*2462.00	106.6 AV			2.00 V	360	111.60	-5.00
5	2483.50	73.7 PK	74.0	-0.3	2.00 V	263	78.62	-4.92
6	2483.50	48.5 AV	54.0	-5.5	2.00 V	263	53.42	-4.92
7	4924.00	52.0 PK	74.0	-22.0	1.61 V	216	50.47	1.53
8	4924.00	40.3 AV	54.0	-13.7	1.61 V	216	38.77	1.53
9	7386.00	44.4 PK	74.0	-29.6	1.22 V	202	36.18	8.22
10	7386.00	33.5 AV	54.0	-20.5	1.22 V	202	25.28	8.22

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	60.7 PK	74.0	-13.3	1.27 H	166	65.93	-5.23
2	2390.00	39.6 AV	54.0	-14.4	1.27 H	166	44.83	-5.23
3	*2412.00	105.9 PK			1.27 H	166	111.05	-5.15
4	*2412.00	94.8 AV			1.27 H	166	99.95	-5.15
5	4824.00	45.6 PK	74.0	-28.4	1.45 H	225	44.47	1.13
6	4824.00	36.8 AV	54.0	-17.2	1.45 H	225	35.67	1.13

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	73.2 PK	74.0	-0.8	2.07 V	360	78.43	-5.23
2	2390.00	52.1 AV	54.0	-1.9	2.07 V	360	57.33	-5.23
3	*2412.00	116.7 PK			2.07 V	360	121.85	-5.15
4	*2412.00	105.6 AV			2.07 V	360	110.75	-5.15
5	4824.00	52.3 PK	74.0	-21.7	1.58 V	206	51.17	1.13
6	4824.00	40.5 AV	54.0	-13.5	1.58 V	206	39.37	1.13

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	59.8 PK	74.0	-14.2	1.26 H	180	65.03	-5.23
2	2390.00	41.2 AV	54.0	-12.8	1.26 H	180	46.43	-5.23
3	*2437.00	112.9 PK			1.26 H	180	117.98	-5.08
4	*2437.00	101.4 AV			1.26 H	180	106.48	-5.08
5	2483.50	58.1 PK	74.0	-15.9	1.26 H	180	63.02	-4.92
6	2483.50	39.1 AV	54.0	-14.9	1.26 H	180	44.02	-4.92
7	4874.00	46.0 PK	74.0	-28.0	1.44 H	142	44.63	1.37
8	4874.00	37.5 AV	54.0	-16.5	1.44 H	142	36.13	1.37
9	7311.00	40.6 PK	74.0	-33.4	1.45 H	261	32.48	8.12
10	7311.00	33.6 AV	54.0	-20.4	1.45 H	261	25.48	8.12

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	72.3 PK	74.0	-1.7	2.04 V	360	77.53	-5.23
2	2390.00	53.7 AV	54.0	-0.3	2.04 V	360	58.93	-5.23
3	*2437.00	123.7 PK			2.04 V	360	128.78	-5.08
4	*2437.00	112.2 AV			2.04 V	360	117.28	-5.08
5	2483.50	70.6 PK	74.0	-3.4	2.04 V	360	75.52	-4.92
6	2483.50	51.6 AV	54.0	-2.4	2.04 V	360	56.52	-4.92
7	4874.00	52.2 PK	74.0	-21.8	1.60 V	230	50.83	1.37
8	4874.00	40.3 AV	54.0	-13.7	1.60 V	230	38.93	1.37
9	7311.00	43.8 PK	74.0	-30.2	1.21 V	194	35.68	8.12
10	7311.00	33.1 AV	54.0	-20.9	1.21 V	194	24.98	8.12

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	104.8 PK			1.21 H	190	109.80	-5.00
2	*2462.00	93.7 AV			1.21 H	190	98.70	-5.00
3	2483.50	60.9 PK	74.0	-13.1	1.21 H	190	65.82	-4.92
4	2483.50	33.7 AV	54.0	-20.3	1.21 H	190	38.62	-4.92
5	4924.00	46.0 PK	74.0	-28.0	1.41 H	139	44.47	1.53
6	4924.00	37.8 AV	54.0	-16.2	1.41 H	139	36.27	1.53
7	7386.00	40.5 PK	74.0	-33.5	1.43 H	245	32.28	8.22
8	7386.00	33.7 AV	54.0	-20.3	1.43 H	245	25.48	8.22
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	115.6 PK			2.01 V	360	120.60	-5.00
2	*2462.00	104.5 AV			2.01 V	360	109.50	-5.00
3	2483.50	73.4 PK	74.0	-0.6	2.01 V	360	78.32	-4.92
4	2483.50	46.2 AV	54.0	-7.8	2.01 V	360	51.12	-4.92
5	4924.00	51.5 PK	74.0	-22.5	1.56 V	237	49.97	1.53
6	4924.00	39.8 AV	54.0	-14.2	1.56 V	237	38.27	1.53
7	7386.00	43.8 PK	74.0	-30.2	1.21 V	205	35.58	8.22
8	7386.00	33.3 AV	54.0	-20.7	1.21 V	205	25.08	8.22

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	63.2 PK	74.0	-10.8	1.25 H	175	68.43	-5.23
2	2390.00	41.3 AV	54.0	-12.7	1.25 H	175	46.53	-5.23
3	*2422.00	102.8 PK			1.25 H	175	107.92	-5.12
4	*2422.00	90.9 AV			1.25 H	175	96.02	-5.12
5	4844.00	46.3 PK	74.0	-27.7	1.43 H	141	45.08	1.22
6	4844.00	37.9 AV	54.0	-16.1	1.43 H	141	36.68	1.22
7	7266.00	41.0 PK	74.0	-33.0	1.46 H	259	32.95	8.05
8	7266.00	34.0 AV	54.0	-20.0	1.46 H	259	25.95	8.05
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	73.7 PK	74.0	-0.3	1.69 V	360	78.93	-5.23
2	2390.00	53.8 AV	54.0	-0.2	1.69 V	360	59.03	-5.23
3	*2422.00	113.6 PK			1.69 V	360	118.72	-5.12
4	*2422.00	101.7 AV			1.69 V	360	106.82	-5.12
5	4844.00	51.9 PK	74.0	-22.1	1.52 V	249	50.68	1.22
6	4844.00	40.2 AV	54.0	-13.8	1.52 V	249	38.98	1.22
7	7266.00	44.5 PK	74.0	-29.5	1.16 V	203	36.45	8.05
8	7266.00	33.8 AV	54.0	-20.2	1.16 V	203	25.75	8.05

REMARKS:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Emission Level – Limit value
- " * ": 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	58.4 PK	74.0	-15.6	1.19 H	163	63.63	-5.23
2	2390.00	38.6 AV	54.0	-15.4	1.19 H	163	43.83	-5.23
3	*2437.00	104.2 PK			1.19 H	163	109.28	-5.08
4	*2437.00	92.8 AV			1.19 H	163	97.88	-5.08
5	2483.50	60.9 PK	74.0	-13.1	1.19 H	163	65.82	-4.92
6	2483.50	38.1 AV	54.0	-15.9	1.19 H	163	43.02	-4.92
7	4874.00	45.7 PK	74.0	-28.3	1.40 H	136	44.33	1.37
8	4874.00	37.6 AV	54.0	-16.4	1.40 H	136	36.23	1.37
9	7311.00	40.3 PK	74.0	-33.7	1.45 H	263	32.18	8.12
10	7311.00	33.5 AV	54.0	-20.5	1.45 H	263	25.38	8.12

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	70.9 PK	74.0	-3.1	1.67 V	360	76.13	-5.23
2	2390.00	51.1 AV	54.0	-2.9	1.67 V	360	56.33	-5.23
3	*2437.00	115.0 PK			1.67 V	360	120.08	-5.08
4	*2437.00	103.7 AV			1.67 V	360	108.78	-5.08
5	2483.50	73.4 PK	74.0	-0.6	1.67 V	360	78.32	-4.92
6	2483.50	50.6 AV	54.0	-3.4	1.67 V	360	55.52	-4.92
7	4874.00	52.1 PK	74.0	-21.9	1.50 V	264	50.73	1.37
8	4874.00	40.4 AV	54.0	-13.6	1.50 V	264	39.03	1.37
9	7311.00	44.8 PK	74.0	-29.2	1.16 V	188	36.68	8.12
10	7311.00	33.9 AV	54.0	-20.1	1.16 V	188	25.78	8.12

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	100.6 PK			1.24 H	155	105.63	-5.03
2	*2452.00	89.8 AV			1.24 H	155	94.83	-5.03
3	2483.50	63.3 PK	74.0	-10.7	1.24 H	155	68.22	-4.92
4	2483.50	39.9 AV	54.0	-14.1	1.24 H	155	44.82	-4.92
5	4904.00	45.4 PK	74.0	-28.6	1.44 H	147	43.91	1.49
6	4904.00	37.3 AV	54.0	-16.7	1.44 H	147	35.81	1.49
7	7356.00	40.1 PK	74.0	-33.9	1.49 H	248	31.92	8.18
8	7356.00	33.2 AV	54.0	-20.8	1.49 H	248	25.02	8.18
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	111.4 PK			1.68 V	360	116.43	-5.03
2	*2452.00	100.6 AV			1.68 V	360	105.63	-5.03
3	2483.50	73.8 PK	74.0	-0.2	1.68 V	360	78.72	-4.92
4	2483.50	50.4 AV	54.0	-3.6	1.68 V	360	55.32	-4.92
5	4904.00	51.9 PK	74.0	-22.1	1.54 V	263	50.41	1.49
6	4904.00	40.1 AV	54.0	-13.9	1.54 V	263	38.61	1.49
7	7356.00	44.5 PK	74.0	-29.5	1.13 V	195	36.32	8.18
8	7356.00	33.6 AV	54.0	-20.4	1.13 V	195	25.42	8.18

REMARKS:

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

Below 1GHz Data

CDD Mode

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	131.22	32.8 QP	43.5	-10.7	2.00 H	291	46.94	-14.10
2	179.67	36.0 QP	43.5	-7.5	2.00 H	36	50.39	-14.41
3	210.71	34.7 QP	43.5	-8.9	1.00 H	246	50.67	-16.02
4	479.98	30.1 QP	46.0	-15.9	2.00 H	103	37.42	-7.28
5	625.00	33.2 QP	46.0	-12.8	1.00 H	0	36.92	-3.74
6	750.03	36.5 QP	46.0	-9.5	1.00 H	360	37.73	-1.21
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	167.21	32.3 QP	43.5	-11.2	1.00 V	317	45.64	-13.36
2	210.27	31.0 QP	43.5	-12.5	1.00 V	249	47.03	-16.02
3	375.03	25.9 QP	46.0	-20.1	1.50 V	0	35.88	-9.97
4	500.01	28.3 QP	46.0	-17.7	1.00 V	51	35.15	-6.83
5	749.98	34.1 QP	46.0	-11.9	1.50 V	0	35.31	-1.21
6	874.97	33.8 QP	46.0	-12.3	1.00 V	48	33.50	0.25

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	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 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100375	May 06, 2015	May 05, 2016
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 15, 2014	Sep. 14, 2015
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 11, 2015	June 10, 2016
RF Cable	5D-FB	COCCAB-001	Mar. 09, 2015	Mar. 08, 2016
50 ohms Terminator	N/A	EMC-03	Sep. 22, 2014	Sep. 21, 2015
50 ohms Terminator	N/A	EMC-02	Sep. 30, 2014	Sep. 29, 2015
Software BVADT	BVADT_Cond_ V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 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 15, 2015

4.2.3 Test Procedures

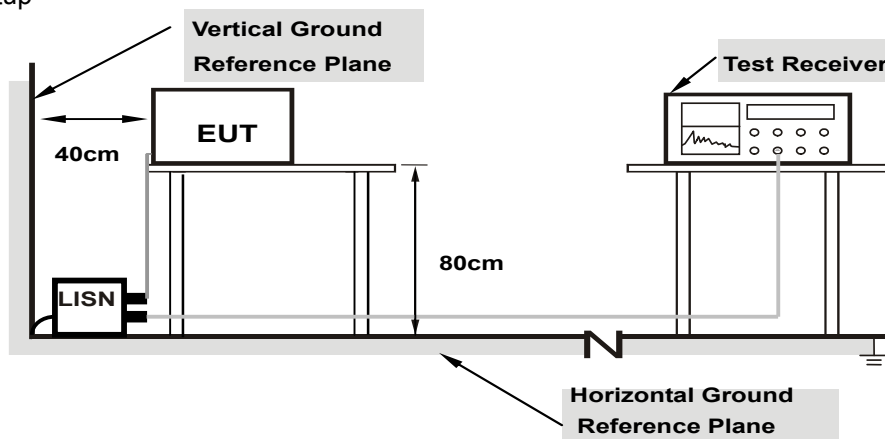
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Conditions

Same as 4.1.6.

4.2.7 Test Results

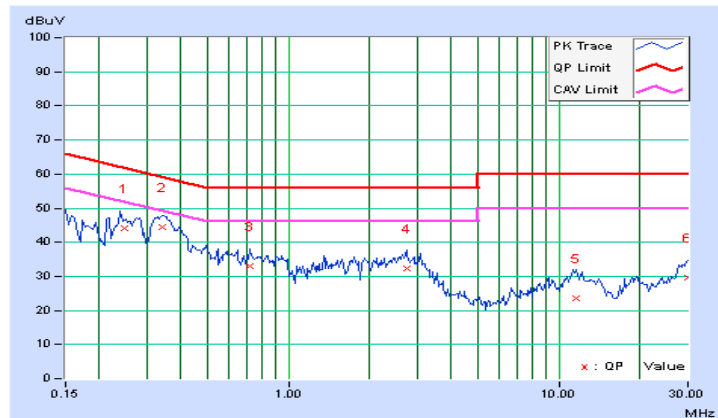
CDD Mode

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	----------	-------------------	--------------------------------

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.24872	0.09	43.91	37.01	44.00	37.10	61.80	51.80	-17.80	-14.70
2	0.34141	0.10	44.49	34.82	44.59	34.92	59.17	49.17	-14.58	-14.25
3	0.71641	0.12	32.99	24.58	33.11	24.70	56.00	46.00	-22.89	-21.30
4	2.72656	0.19	32.24	26.26	32.43	26.45	56.00	46.00	-23.57	-19.55
5	11.64453	0.49	23.15	17.01	23.64	17.50	60.00	50.00	-36.36	-32.50
6	29.84766	0.92	28.72	23.70	29.64	24.62	60.00	50.00	-30.36	-25.38

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

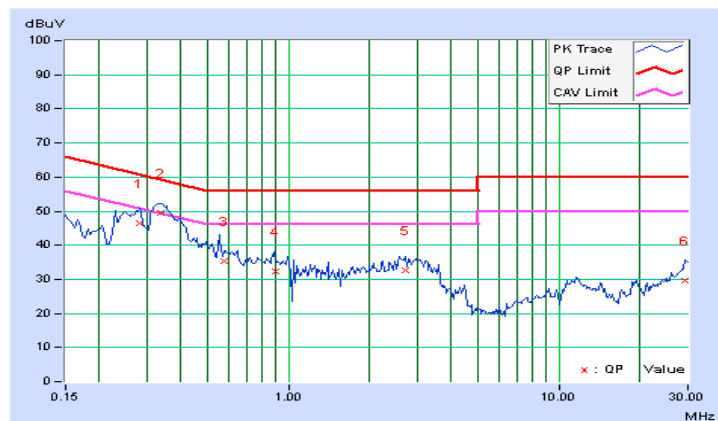


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	--------------------------------

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.28281	0.09	46.40	36.30	46.49	36.39	60.73	50.73	-14.24	-14.34
2	0.33750	0.09	49.43	41.15	49.52	41.24	59.26	49.26	-9.74	-8.02
3	0.57512	0.11	35.22	27.50	35.33	27.61	56.00	46.00	-20.67	-18.39
4	0.89425	0.12	32.25	23.73	32.37	23.85	56.00	46.00	-23.63	-22.15
5	2.71875	0.19	32.48	26.34	32.67	26.53	56.00	46.00	-23.33	-19.47
6	29.30859	0.96	28.69	23.54	29.65	24.50	60.00	50.00	-30.35	-25.50

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

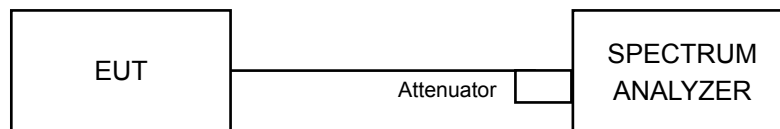


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- 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

4.3.5 Deviation from Test Standard

No deviation.

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.

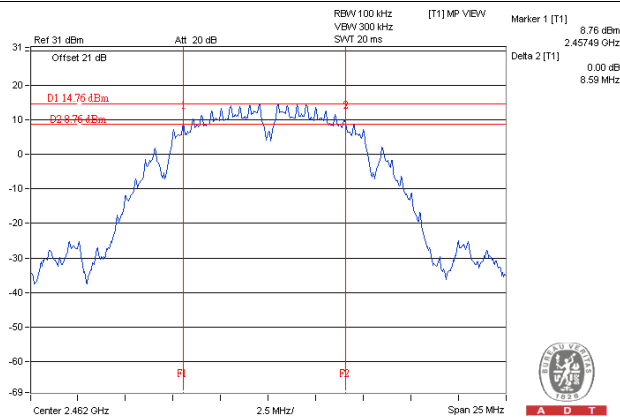
4.3.7 Test Result

CDD Mode

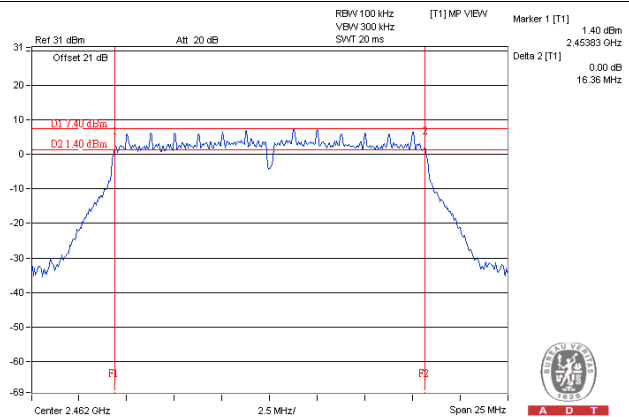
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
802.11b						
1	2412	9.08	9.07	9.06	0.5	Pass
6	2437	9.13	8.62	9.10	0.5	Pass
11	2462	8.61	9.05	8.59	0.5	Pass
802.11g						
1	2412	16.43	16.41	16.40	0.5	Pass
6	2437	16.39	16.38	16.40	0.5	Pass
11	2462	16.42	16.41	16.36	0.5	Pass
802.11n (HT20)						
1	2412	17.66	17.68	17.63	0.5	Pass
6	2437	17.64	17.64	17.62	0.5	Pass
11	2462	17.63	17.64	17.59	0.5	Pass
802.11n (HT40)						
3	2422	35.84	36.48	36.46	0.5	Pass
6	2437	36.43	36.41	36.45	0.5	Pass
9	2452	36.40	36.38	36.11	0.5	Pass

Spectrum Plot of Worst Value

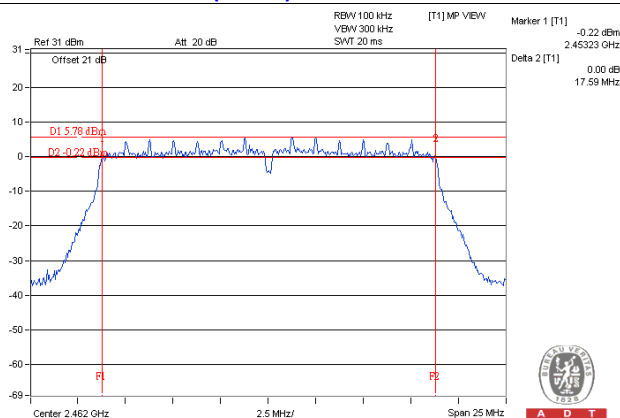
802.11b – Chain 2: CH 11



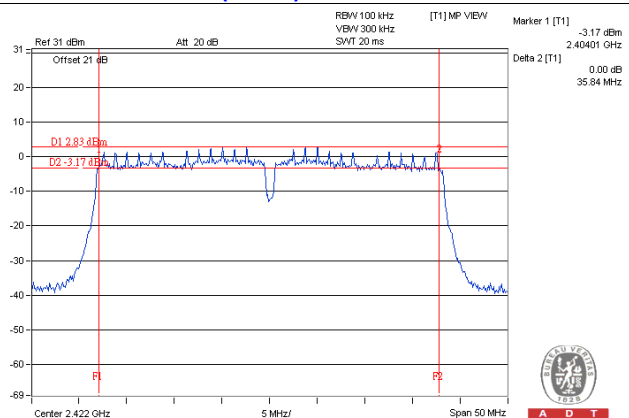
802.11g – Chain 2: CH 11



802.11n (HT20) – Chain 2: CH 11



802.11n (HT40) – Chain 0: CH 3



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,

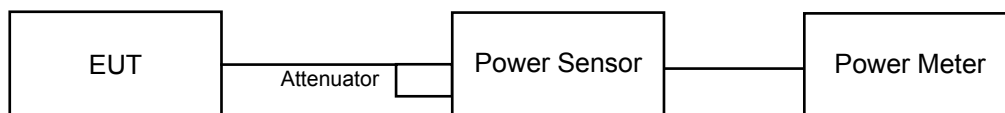
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

An 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 power level.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

CDD Mode

Channel	Frequency (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
802.11b								
1	2412	24.44	24.80	25.25	914.931	29.61	30	Pass
6	2437	25.70	25.31	24.35	983.43	29.93	30	Pass
11	2462	24.01	24.19	24.79	815.491	29.11	30	Pass
802.11g								
1	2412	19.49	20.25	20.72	312.877	24.95	30	Pass
6	2437	25.44	24.80	24.33	922.959	29.65	30	Pass
11	2462	18.83	19.49	20.08	267.163	24.27	30	Pass
802.11n (HT20)								
1	2412	17.22	17.60	18.41	179.61	22.54	30	Pass
6	2437	25.36	24.79	24.35	917.129	29.62	30	Pass
11	2462	17.49	17.70	18.67	188.61	22.76	30	Pass
802.11n (HT40)								
3	2422	16.57	16.95	17.93	157.026	21.96	30	Pass
6	2437	18.66	19.23	19.80	252.703	24.03	30	Pass
9	2452	16.10	16.53	17.04	136.298	21.34	30	Pass

Beamforming Mode

Channel	Frequency (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
VHT20								
1	2412	16.75	17.15	17.96	161.712	22.09	30	Pass
6	2437	25.36	24.79	24.35	917.129	29.62	30	Pass
11	2462	17.04	17.24	18.26	170.536	22.32	30	Pass
VHT40								
3	2422	16.07	16.45	17.45	140.205	21.47	30	Pass
6	2437	18.16	18.75	19.30	225.567	23.53	30	Pass
9	2452	15.60	16.07	16.54	121.848	20.86	30	Pass

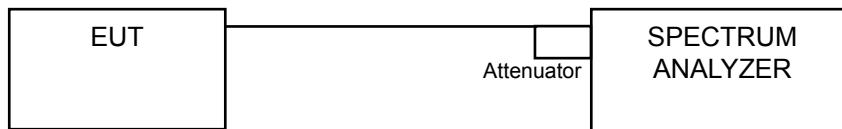
NOTE: Directional gain = $0.5\text{dBi} + 10\log(3) = 5.27\text{dBi} < 6\text{dBi}$, so the power limit shall not be reduced.

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 Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

For AVG. power (duty cycle $\geq 98\%$)

- Set instrument center frequency to DTS channel center frequency.
- Set span to at least 1.5 times the OBW.
- Set RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set VBW $\geq 3 \times \text{RBW}$.
- Detector = power averaging (RMS) or sample detector (when RMS not available).
- Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span}/\text{RBW}$.
- Sweep time = auto couple.
- Employ trace averaging (RMS) mode over a minimum of 100 traces.
- Use the peak marker function to determine the maximum amplitude level.

For AVG. power (duty cycle $< 98\%$)

- Measure the duty cycle (x).
- Set instrument center frequency to DTS channel center frequency.
- Set span to at least 1.5 times the OBW.
- Set RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set VBW $\geq 3 \times \text{RBW}$.
- Detector = power averaging (RMS) or sample detector (when RMS not available).
- Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span}/\text{RBW}$.
- Sweep time = auto couple.
- Do not use sweep triggering. Allow sweep to "free run".
- Employ trace averaging (RMS) mode over a minimum of 100 traces.
- Use the peak marker function to determine the maximum amplitude level.
- Add $10 \log(1/x)$, where x is the duty cycle measured in step (a), to the measured PSD to compute the average PSD during the actual transmission time.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

CDD Mode

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
802.11b							
0	1	2412	-3.54	4.77	1.23	8	Pass
	6	2437	-3.04	4.77	1.73	8	Pass
	11	2462	-4.18	4.77	0.59	8	Pass
1	1	2412	-4.13	4.77	0.64	8	Pass
	6	2437	-3.02	4.77	1.75	8	Pass
	11	2462	-4.58	4.77	0.19	8	Pass
2	1	2412	-4.16	4.77	0.61	8	Pass
	6	2437	-2.93	4.77	1.84	8	Pass
	11	2462	-4.69	4.77	0.08	8	Pass
802.11g							
0	1	2412	-9.54	4.77	-4.77	8	Pass
	6	2437	-3.44	4.77	1.33	8	Pass
	11	2462	-9.70	4.77	-4.93	8	Pass
1	1	2412	-9.39	4.77	-4.62	8	Pass
	6	2437	-4.47	4.77	0.30	8	Pass
	11	2462	-10.30	4.77	-5.53	8	Pass
2	1	2412	-10.43	4.77	-5.66	8	Pass
	6	2437	-4.80	4.77	-0.03	8	Pass
	11	2462	-10.91	4.77	-6.14	8	Pass
802.11n (HT20)							
0	1	2412	-12.73	4.77	-7.96	8	Pass
	6	2437	-5.31	4.77	-0.54	8	Pass
	11	2462	-12.51	4.77	-7.74	8	Pass
1	1	2412	-13.30	4.77	-8.53	8	Pass
	6	2437	-6.23	4.77	-1.46	8	Pass
	11	2462	-13.08	4.77	-8.31	8	Pass
2	1	2412	-13.32	4.77	-8.55	8	Pass
	6	2437	-6.03	4.77	-1.26	8	Pass
	11	2462	-13.68	4.77	-8.91	8	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

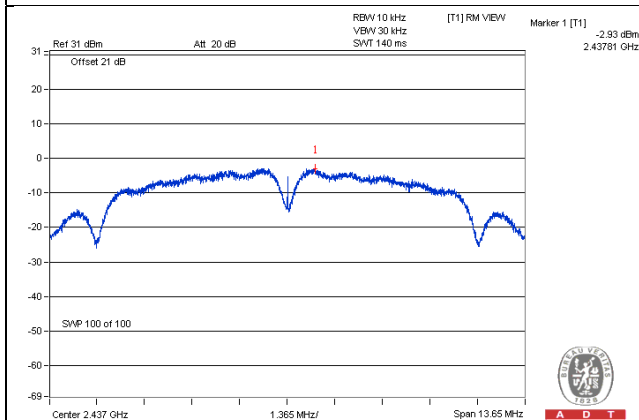
2. Directional gain = 0.5dBi + 10log(3) = 5.27dBi < 6dBi , so the power density limit shall not be reduced.

TX chain	Channel	Freq. (MHz)	PSD w/o Duty Factor (dBm)	10 log (N=3) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm)	Limit (dBm)	Pass /Fail
802.11n (HT40)								
0	3	2422	-16.12	4.77	0.17	-11.18	8	Pass
	6	2437	-14.31	4.77	0.17	-9.37	8	Pass
	9	2452	-16.81	4.77	0.17	-11.87	8	Pass
1	3	2422	-16.01	4.77	0.17	-11.07	8	Pass
	6	2437	-14.08	4.77	0.17	-9.14	8	Pass
	9	2452	-16.73	4.77	0.17	-11.79	8	Pass
2	3	2422	-14.98	4.77	0.17	-10.04	8	Pass
	6	2437	-14.56	4.77	0.17	-9.62	8	Pass
	9	2452	-15.81	4.77	0.17	-10.87	8	Pass

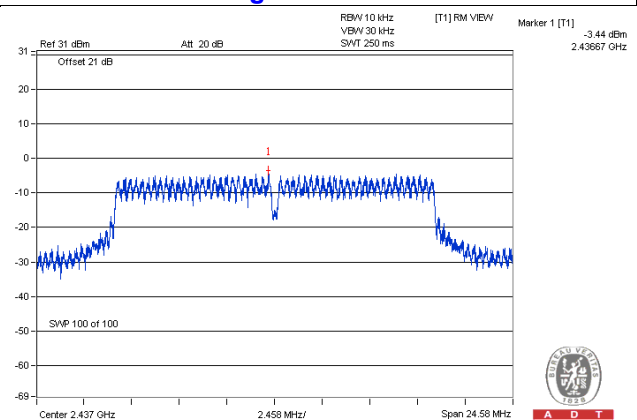
- Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $0.5\text{dBi} + 10\log(3) = 5.27\text{dBi} < 6\text{dBi}$, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

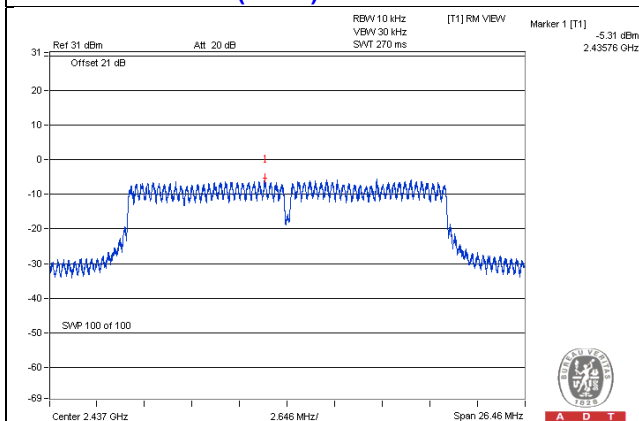
802.11b – Chain 2: CH 6



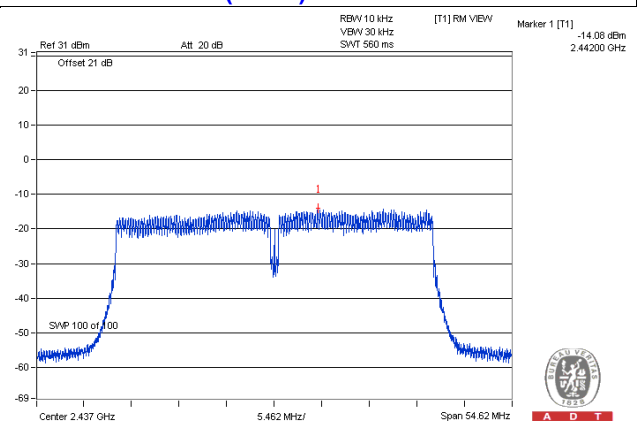
802.11g – Chain 0: CH 6



802.11n (HT20) – Chain 0: CH 6



802.11n (HT40) – Chain 1: CH 6

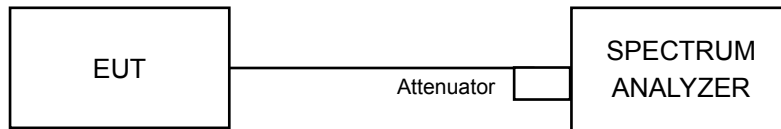


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOB

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

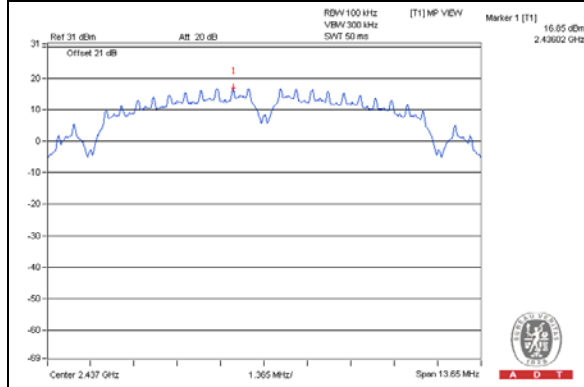
Same as Item 4.3.6

4.6.7 Test Results

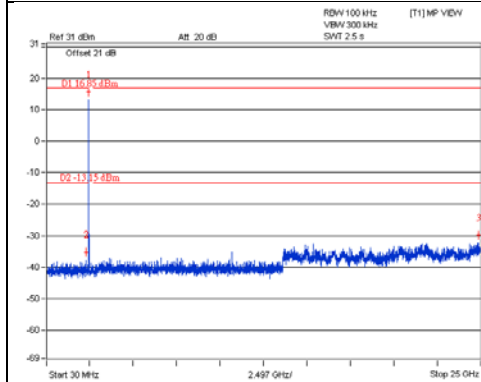
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

CDD Mode 802.11b

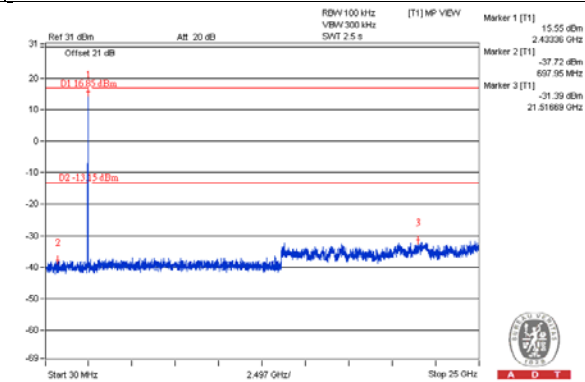
Maximum REF



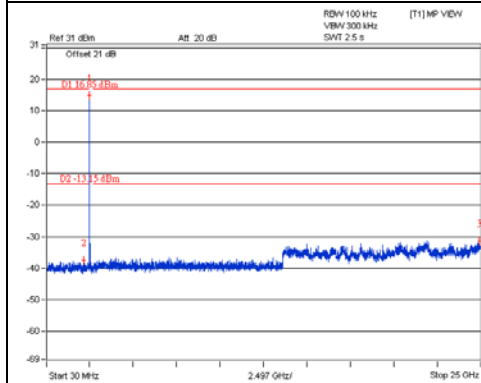
Chain 0 CH 1



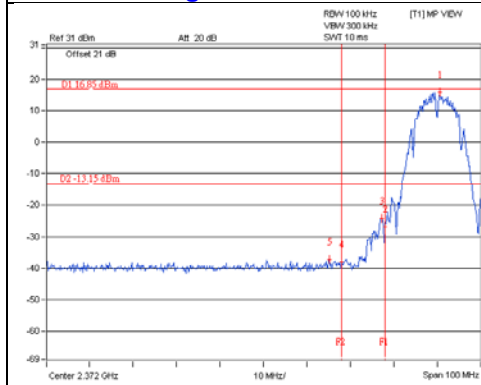
CH 6



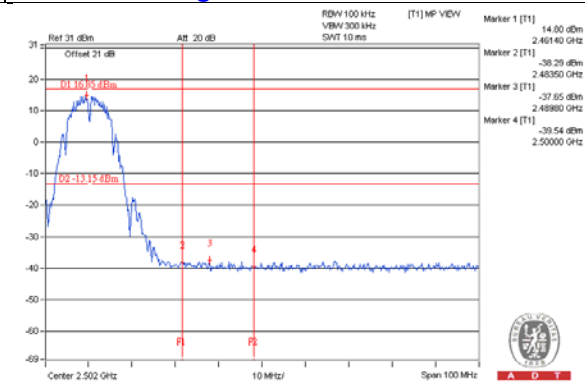
CH 11



CH 1 Band edge

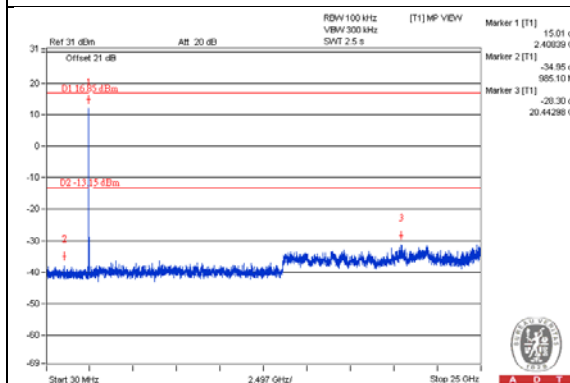


CH 11 Band edge

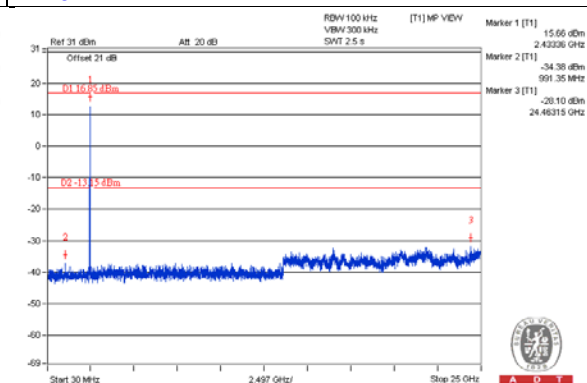


Chain 1

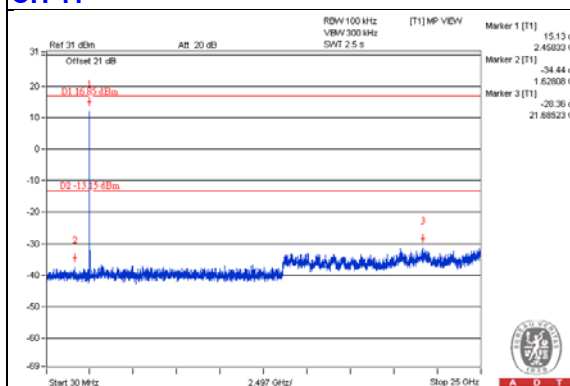
CH 1



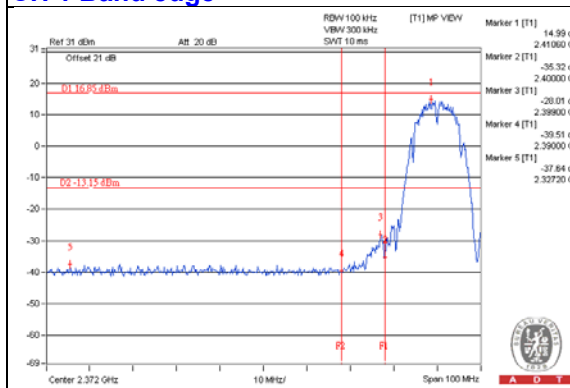
CH 6



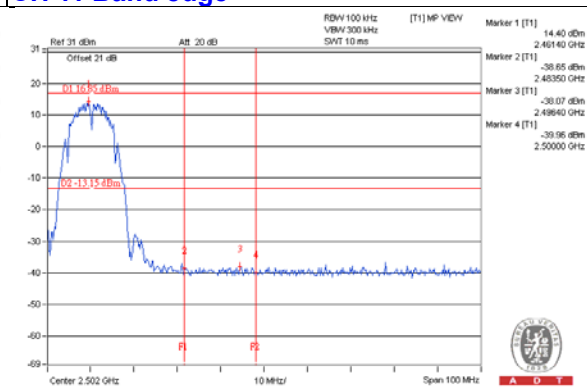
CH 11



CH 1 Band edge

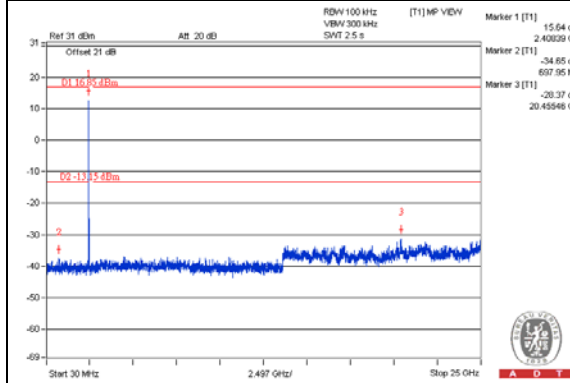


CH 11 Band edge

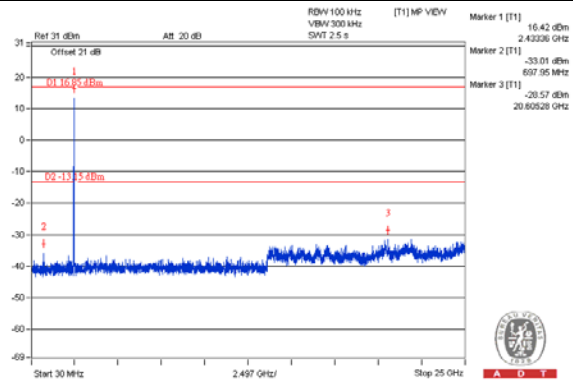


Chain 2

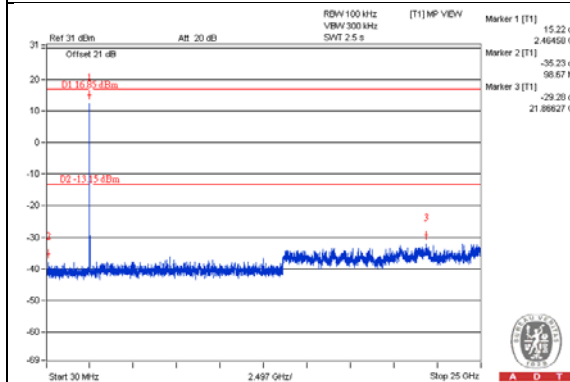
CH 1



CH 6

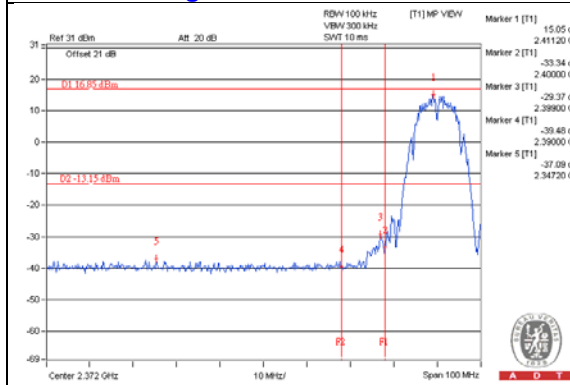


CH 11

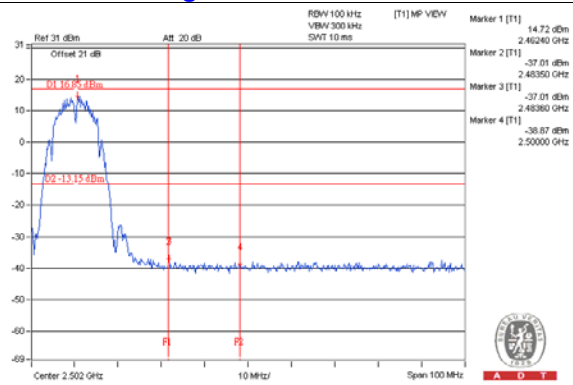


CH 11 Band edge

CH 1 Band edge

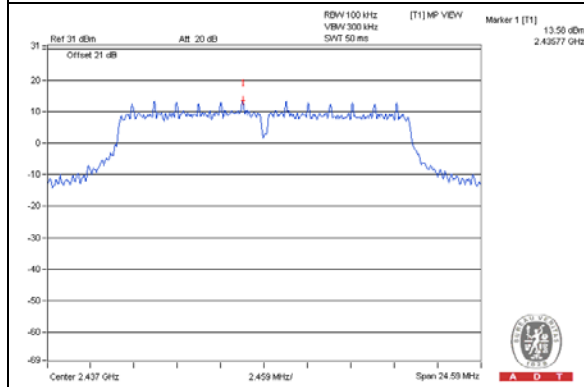


CH 11 Band edge



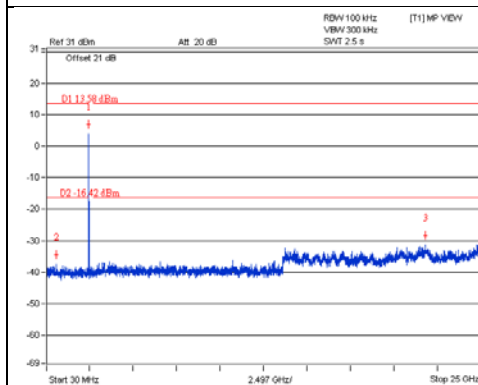
802.11g

Maximum REF

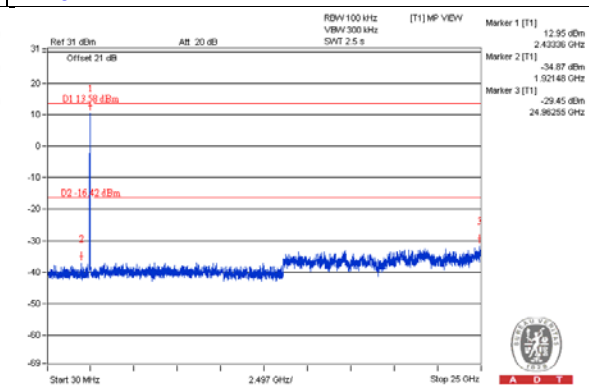


Chain 0

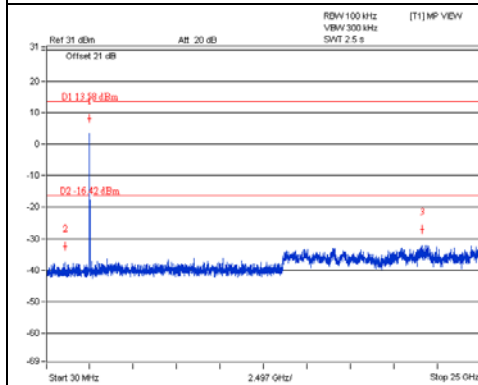
CH 1



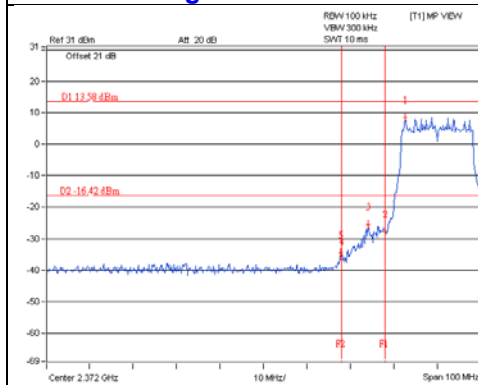
CH 6



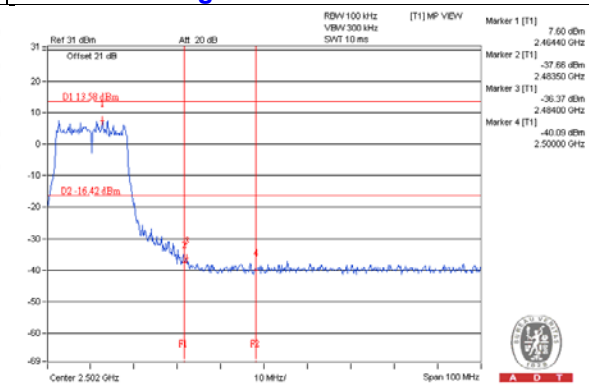
CH 11



CH 1 Band edge

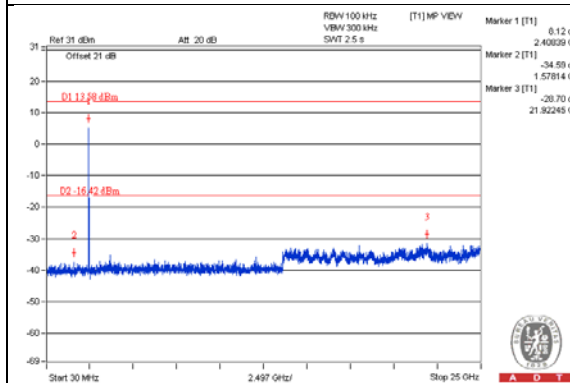


CH 11 Band edge

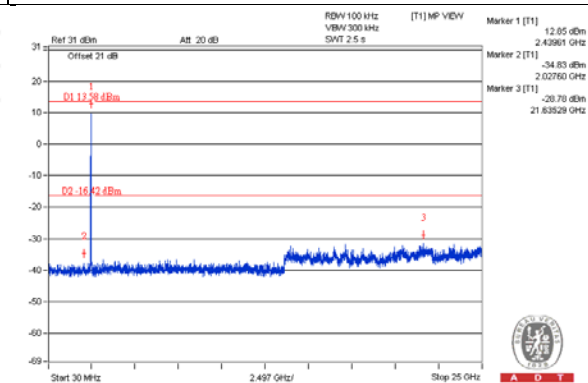


Chain 1

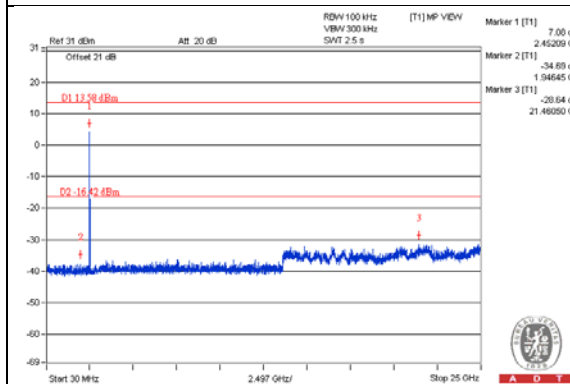
CH 1



CH 6

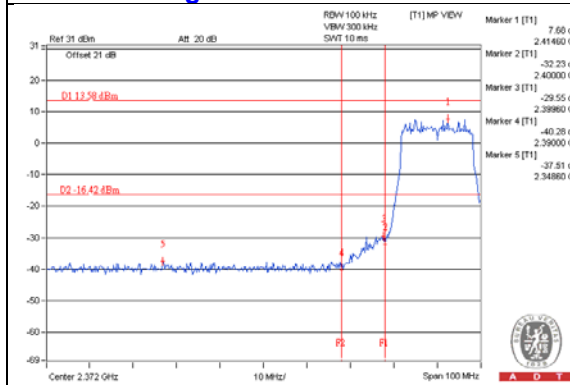


CH 11

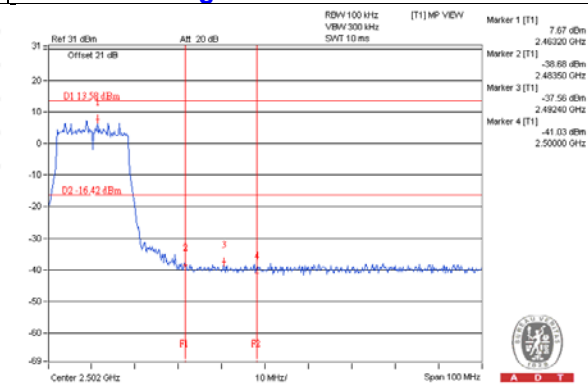


CH 11 Band edge

CH 1 Band edge

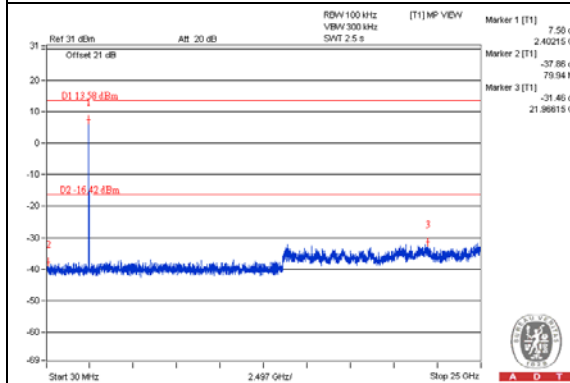


CH 11 Band edge

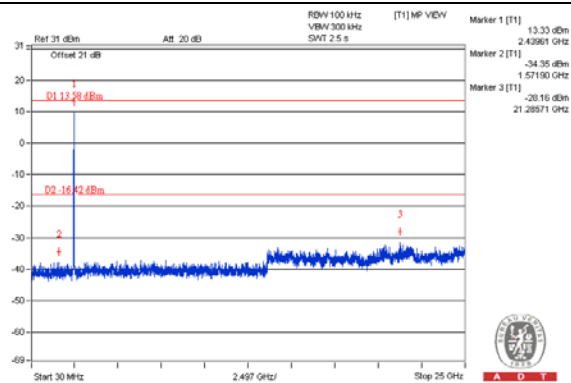


Chain 2

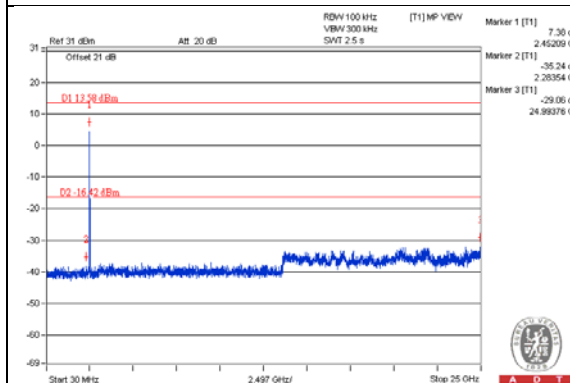
CH 1



CH 6

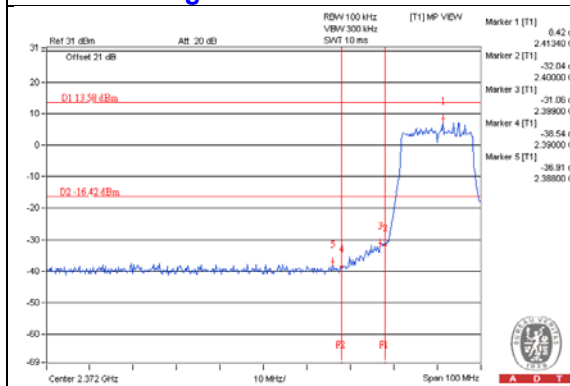


CH 11

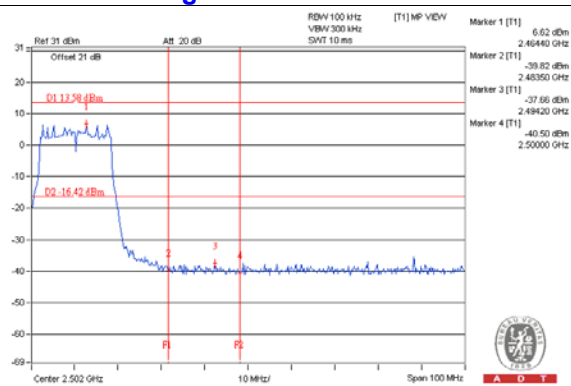


CH 11 Band edge

CH 1 Band edge

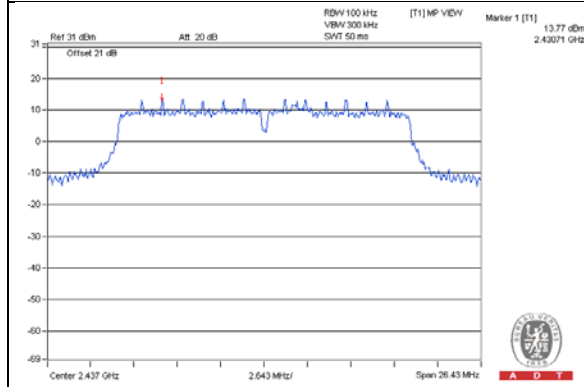


CH 11 Band edge



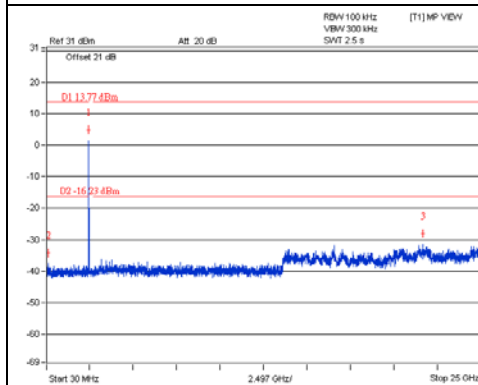
802.11n (HT20)

Maximum REF

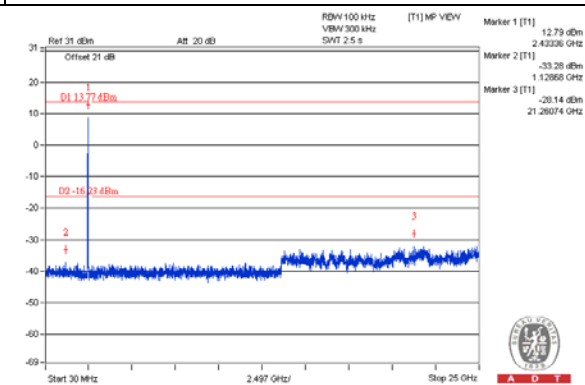


Chain 0

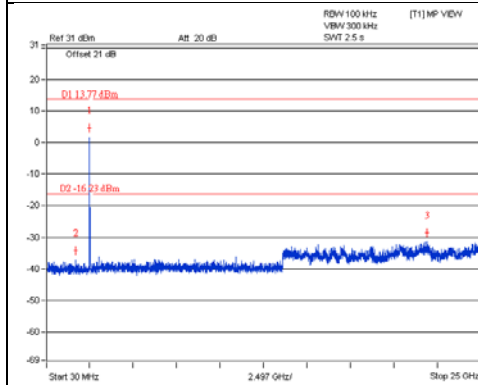
CH 1



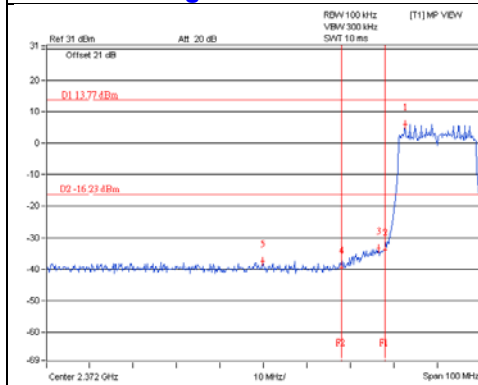
CH 6



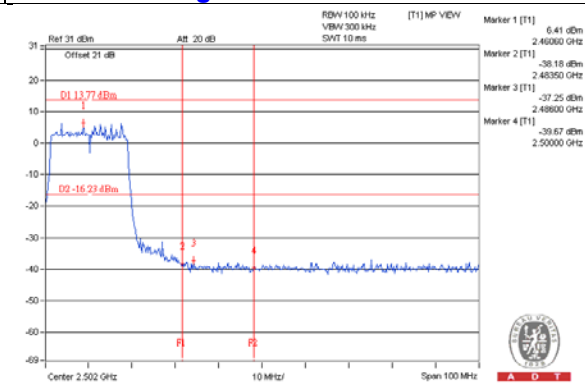
CH 11



CH 1 Band edge

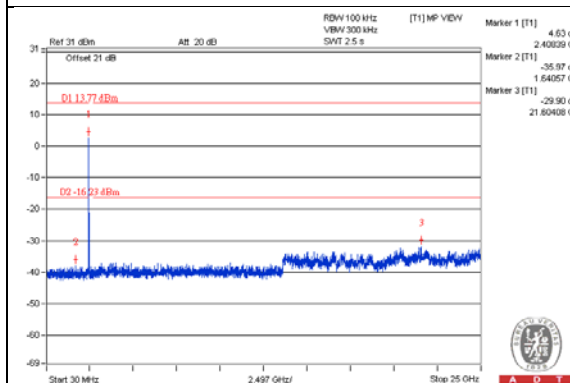


CH 11 Band edge

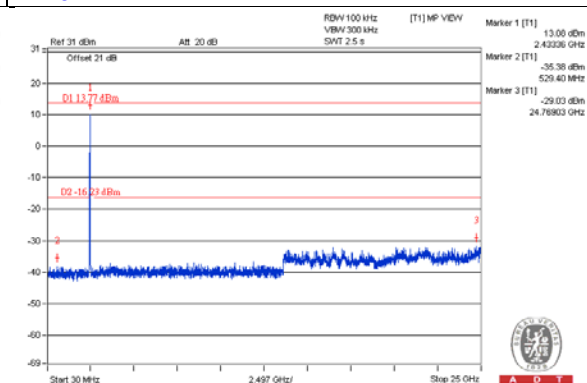


Chain 1

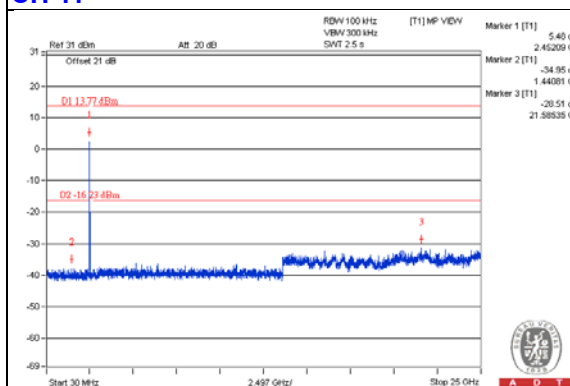
CH 1



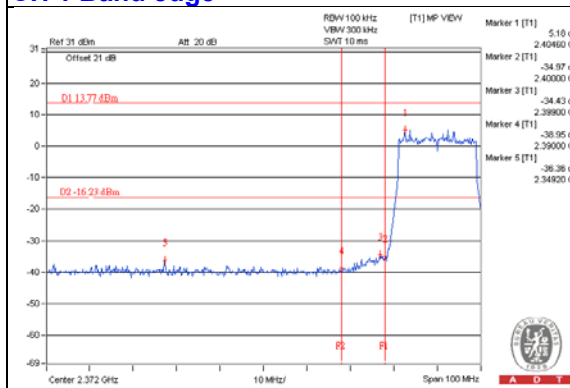
CH 6



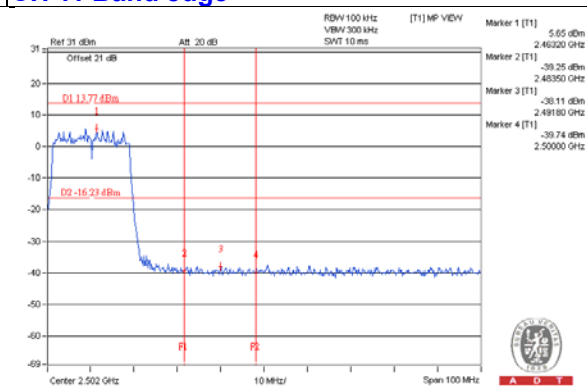
CH 11



CH 1 Band edge

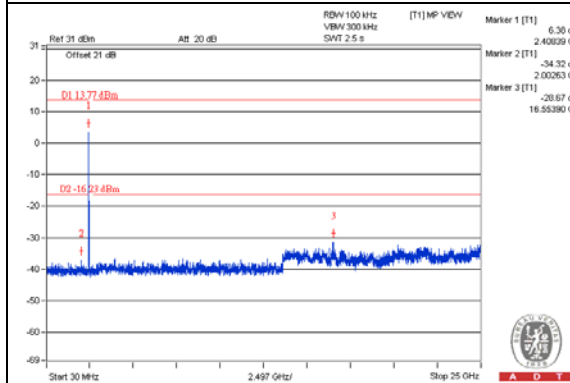


CH 11 Band edge

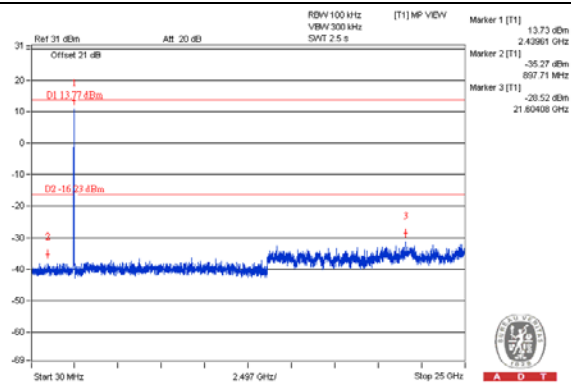


Chain 2

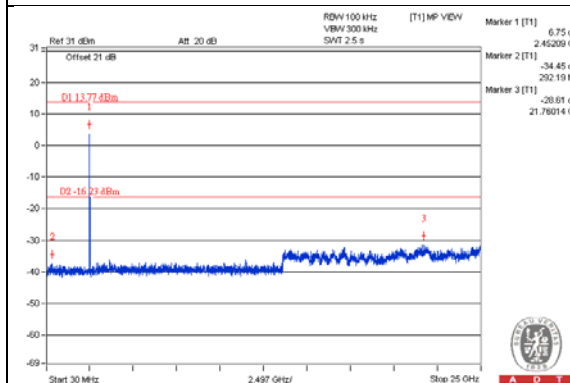
CH 1



CH 6

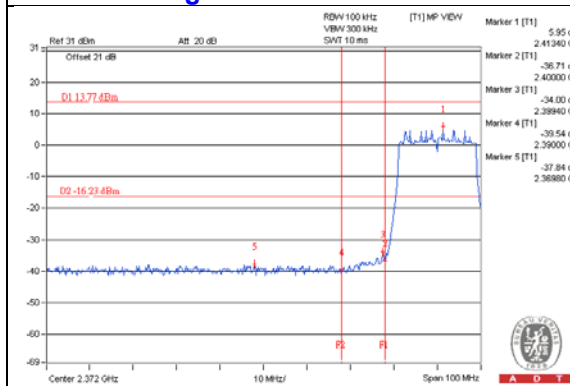


CH 11

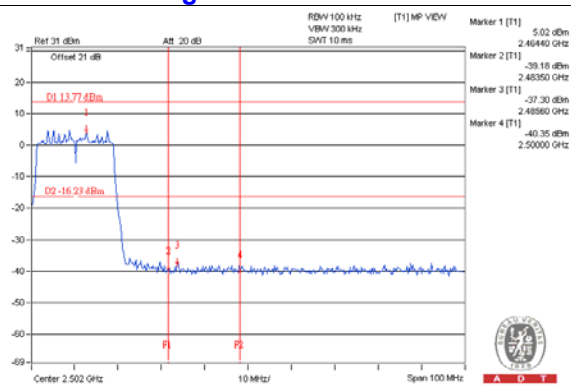


CH 11 Band edge

CH 1 Band edge

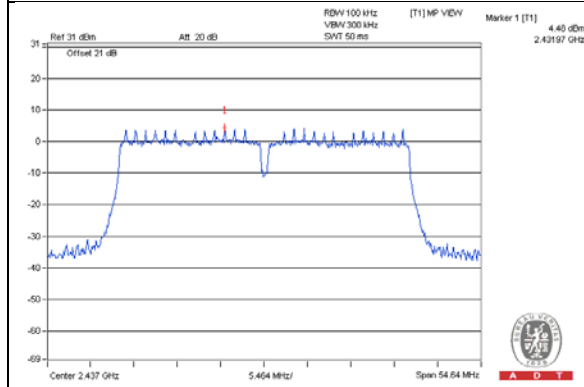


CH 11 Band edge



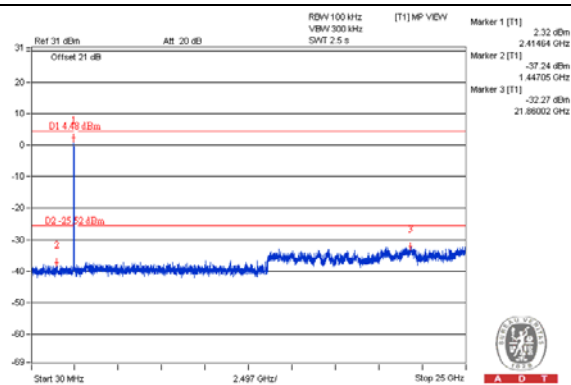
802.11n (HT40)

Maximum REF

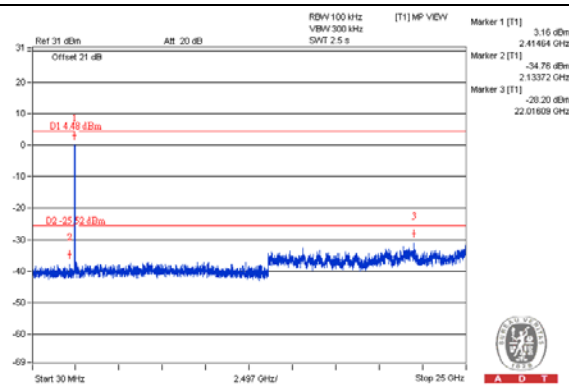


Chain 0

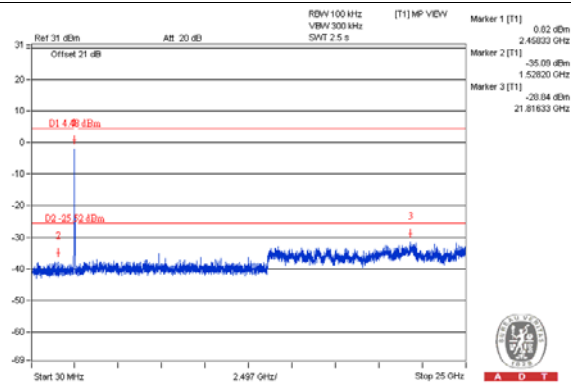
CH 3



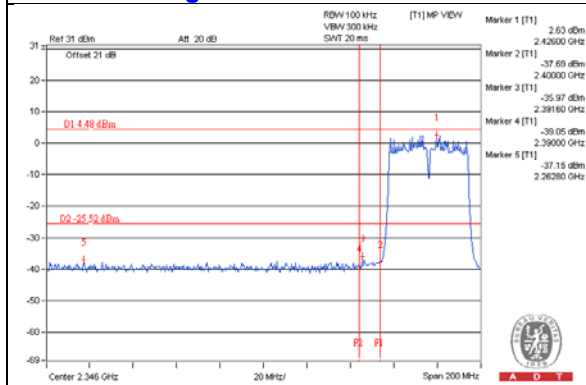
CH 6



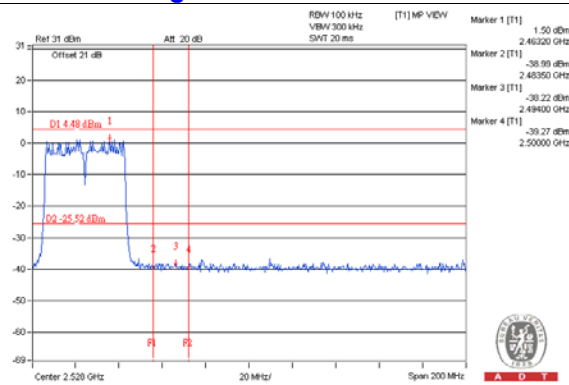
CH 9



CH 3 Band edge



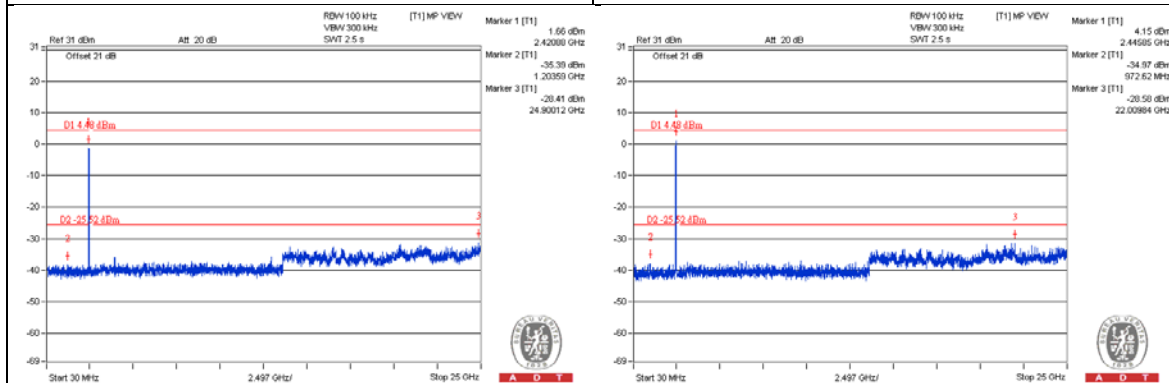
CH 9 Band edge



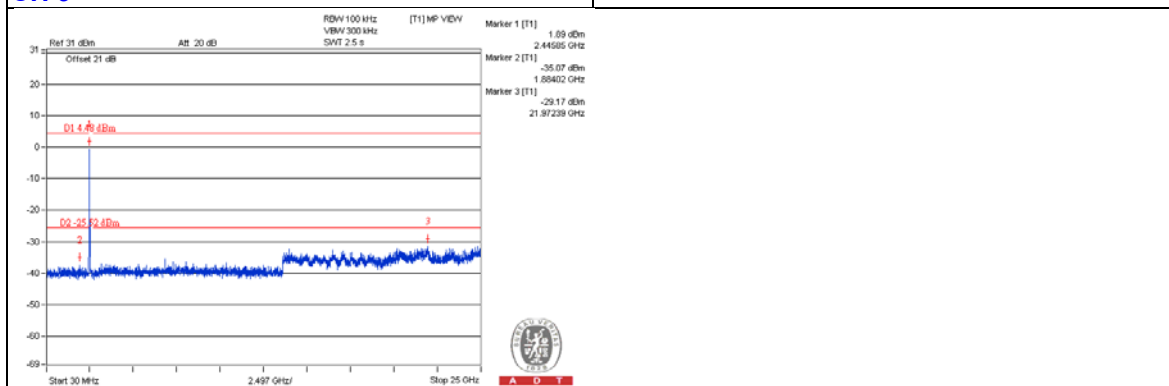
Chain 1

CH 3

CH 6

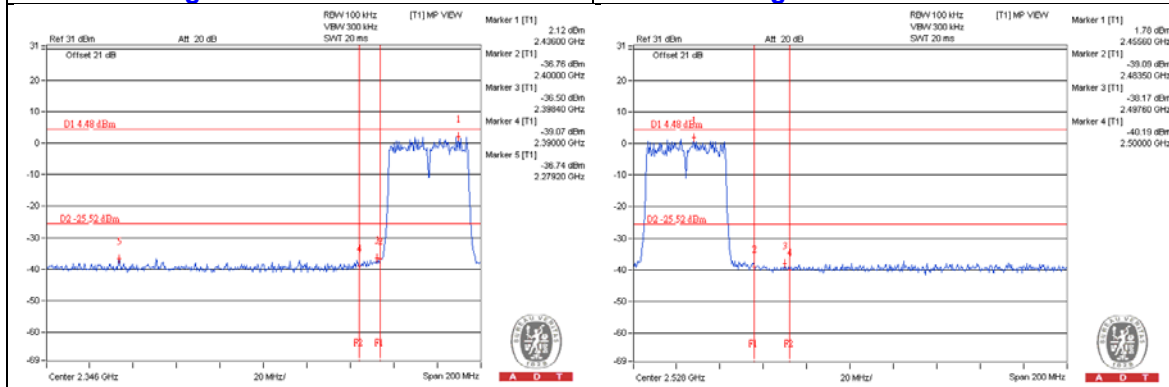


CH 9



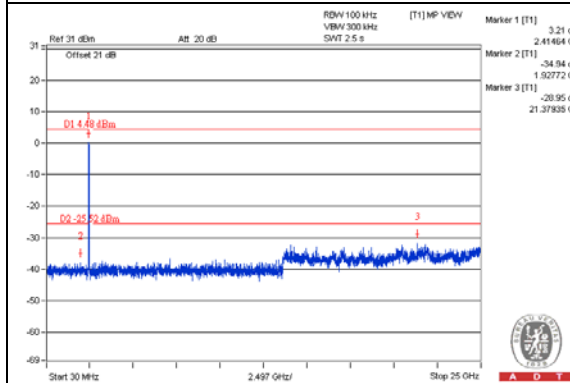
CH 3 Band edge

CH 9 Band edge

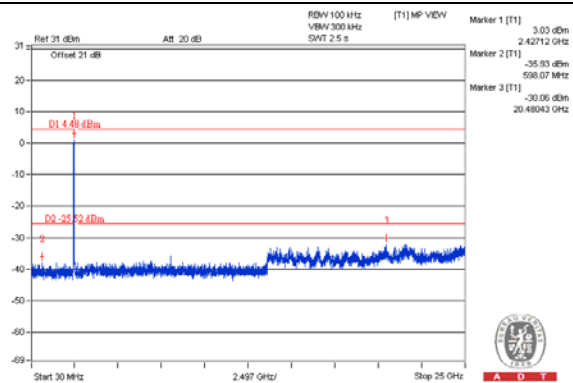


Chain 2

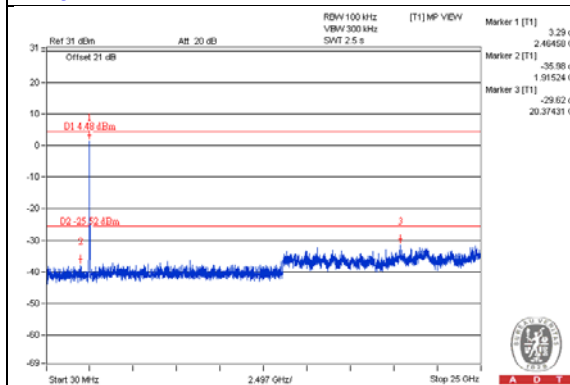
CH 3



CH 6

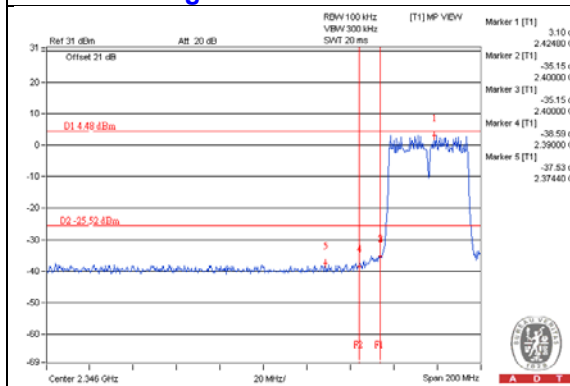


CH 9

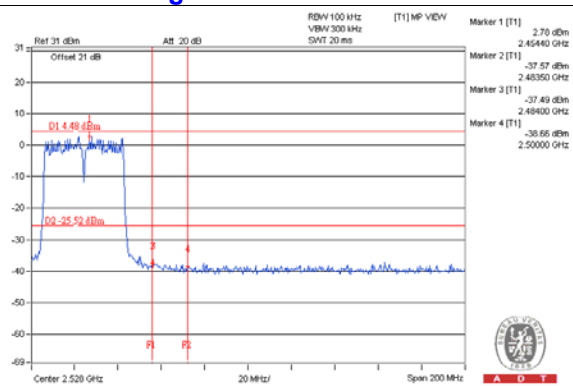


CH 9 Band edge

CH 3 Band edge



CH 9 Band edge



5 Test Types and Results (For 5GHz Band)

5.1 Radiated Emission and Bandedge Measurement

5.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

5.1.2 Test Instruments

Same as item 4.1.2.

5.1.3 Test Procedures

Same as item 4.1.3.

5.1.4 Deviation from Test Standard

No deviation.

5.1.5 Test Setup

Same as item 4.1.5.

5.1.6 EUT Operating Conditions

Same as item 4.1.6.

5.1.7 Test Results

Above 1GHz Data

CDD Mode

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	5423.00	55.6 PK	74.0	-18.4	2.25 H	319	52.94	2.66
2	5423.00	43.8 AV	54.0	-10.2	2.25 H	319	41.14	2.66
3	*5745.00	123.5 PK			2.08 H	322	120.27	3.23
4	*5745.00	113.1 AV			2.08 H	322	109.87	3.23
5	11490.00	47.4 PK	74.0	-26.6	1.52 H	220	32.61	14.79
6	11490.00	35.5 AV	54.0	-18.5	1.52 H	220	20.71	14.79
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	5423.00	59.2 PK	74.0	-14.8	2.25 V	181	56.54	2.66
2	5423.00	46.2 AV	54.0	-7.8	2.25 V	181	43.54	2.66
3	*5745.00	125.5 PK			1.80 V	15	122.27	3.23
4	*5745.00	115.5 AV			1.80 V	15	112.27	3.23
5	11490.00	46.1 PK	74.0	-27.9	1.59 V	211	31.31	14.79
6	11490.00	33.9 AV	54.0	-20.1	1.59 V	211	19.11	14.79

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 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	124.0 PK			2.05 H	310	120.77	3.23
2	*5785.00	113.7 AV			2.05 H	310	110.47	3.23
3	11570.00	47.2 PK	74.0	-26.8	1.58 H	213	32.71	14.49
4	11570.00	35.0 AV	54.0	-19.0	1.58 H	213	20.51	14.49
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	126.0 PK			1.81 V	0	122.77	3.23
2	*5785.00	115.9 AV			1.81 V	0	112.67	3.23
3	11570.00	46.6 PK	74.0	-27.4	1.59 V	205	32.11	14.49
4	11570.00	34.2 AV	54.0	-19.8	1.59 V	205	19.71	14.49

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 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	123.5 PK			2.08 H	296	120.27	3.23
2	*5825.00	112.9 AV			2.08 H	296	109.67	3.23
3	11650.00	47.7 PK	74.0	-26.3	1.61 H	215	33.41	14.29
4	11650.00	35.4 AV	54.0	-18.6	1.61 H	215	21.11	14.29
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	125.6 PK			1.70 V	10	122.37	3.23
2	*5825.00	115.2 AV			1.70 V	10	111.97	3.23
3	11650.00	46.8 PK	74.0	-27.2	1.60 V	219	32.51	14.29
4	11650.00	34.2 AV	54.0	-19.8	1.60 V	219	19.91	14.29

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.

Beamforming Mode

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	122.1 PK			2.10 H	298	118.87	3.23
2	*5745.00	110.6 AV			2.10 H	298	107.37	3.23
3	11490.00	47.5 PK	74.0	-26.5	1.59 H	216	32.71	14.79
4	11490.00	35.1 AV	54.0	-18.9	1.59 H	216	20.31	14.79
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	124.4 PK			1.72 V	4	121.17	3.23
2	*5745.00	112.9 AV			1.72 V	4	109.67	3.23
3	11490.00	47.4 PK	74.0	-26.6	1.64 V	219	32.61	14.79
4	11490.00	34.5 AV	54.0	-19.5	1.64 V	219	19.71	14.79

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 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	122.7 PK			2.04 H	313	119.47	3.23
2	*5785.00	111.3 AV			2.04 H	313	108.07	3.23
3	11570.00	47.9 PK	74.0	-26.1	1.63 H	201	33.41	14.49
4	11570.00	35.4 AV	54.0	-18.6	1.63 H	201	20.91	14.49
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	125.1 PK			1.70 V	2	121.87	3.23
2	*5785.00	113.6 AV			1.70 V	2	110.37	3.23
3	11570.00	47.6 PK	74.0	-26.4	1.59 V	210	33.11	14.49
4	11570.00	35.0 AV	54.0	-19.0	1.59 V	210	20.51	14.49

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 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	122.6 PK			2.09 H	302	119.37	3.23
2	*5825.00	111.4 AV			2.09 H	302	108.17	3.23
3	11650.00	48.0 PK	74.0	-26.0	1.69 H	196	33.71	14.29
4	11650.00	35.8 AV	54.0	-18.2	1.69 H	196	21.51	14.29
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	125.1 PK			1.72 V	9	121.87	3.23
2	*5825.00	113.7 AV			1.72 V	9	110.47	3.23
3	11650.00	47.3 PK	74.0	-26.7	1.53 V	201	33.01	14.29
4	11650.00	34.9 AV	54.0	-19.1	1.53 V	201	20.61	14.29

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.

802.11ac (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	119.7 PK			2.14 H	310	116.48	3.22
2	*5755.00	107.9 AV			2.14 H	310	104.68	3.22
3	11510.00	47.6 PK	74.0	-26.4	1.74 H	205	32.87	14.73
4	11510.00	35.4 AV	54.0	-18.6	1.74 H	205	20.67	14.73
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	122.1 PK			1.73 V	360	118.88	3.22
2	*5755.00	110.2 AV			1.73 V	360	106.98	3.22
3	11510.00	46.9 PK	74.0	-27.1	1.58 V	207	32.17	14.73
4	11510.00	34.4 AV	54.0	-19.6	1.58 V	207	19.67	14.73

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.

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	120.0 PK			2.13 H	308	116.77	3.23
2	*5795.00	108.2 AV			2.13 H	308	104.97	3.23
3	11590.00	47.2 PK	74.0	-26.8	1.75 H	210	32.81	14.39
4	11590.00	34.9 AV	54.0	-19.1	1.75 H	210	20.51	14.39
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	122.6 PK			1.74 V	360	119.37	3.23
2	*5795.00	110.4 AV			1.74 V	360	107.17	3.23
3	11590.00	47.2 PK	74.0	-26.8	1.54 V	216	32.81	14.39
4	11590.00	34.6 AV	54.0	-19.4	1.54 V	216	20.21	14.39

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.

802.11ac (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	114.0 PK			2.08 H	306	110.77	3.23
2	*5775.00	101.7 AV			2.08 H	306	98.47	3.23
3	11550.00	47.7 PK	74.0	-26.3	1.70 H	224	33.14	14.56
4	11550.00	35.1 AV	54.0	-18.9	1.70 H	224	20.54	14.56
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	116.3 PK			1.75 V	353	113.07	3.23
2	*5775.00	104.1 AV			1.75 V	353	100.87	3.23
3	11550.00	46.8 PK	74.0	-27.2	1.58 V	221	32.24	14.56
4	11550.00	34.4 AV	54.0	-19.6	1.58 V	221	19.84	14.56

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.

Below 1GHz Data

CDD Mode

802.11a

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	132.77	33.7 QP	43.5	-9.8	2.00 H	267	47.56	-13.87
2	162.89	35.2 QP	43.5	-8.3	1.50 H	104	48.27	-13.04
3	211.15	34.8 QP	43.5	-8.7	1.50 H	245	50.78	-16.01
4	374.98	28.9 QP	46.0	-17.1	1.00 H	167	38.86	-9.98
5	500.01	31.0 QP	46.0	-15.0	2.00 H	330	37.81	-6.83
6	625.00	32.9 QP	46.0	-13.1	1.50 H	51	36.68	-3.74
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	164.88	30.6 QP	43.5	-12.9	1.50 V	321	43.74	-13.17
2	200.04	30.1 QP	43.5	-13.4	1.00 V	332	46.12	-16.01
3	500.01	28.2 QP	46.0	-17.8	1.00 V	46	35.03	-6.83
4	625.00	29.5 QP	46.0	-16.5	1.50 V	69	33.22	-3.74
5	749.98	32.4 QP	46.0	-13.6	1.00 V	0	33.62	-1.21
6	874.97	33.3 QP	46.0	-12.7	1.00 V	56	33.02	0.25

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

5.2 Conducted Emission Measurement

5.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	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 0.50MHz.

5.2.2 Test Instruments

Same as item 4.2.2.

5.2.3 Test Procedures

Same as item 4.2.3.

5.2.4 Deviation from Test Standard

No deviation.

5.2.5 Test Setup

Same as item 4.2.5.

5.2.6 EUT operating conditions

Same as item 4.1.6.

5.2.7 Test Results

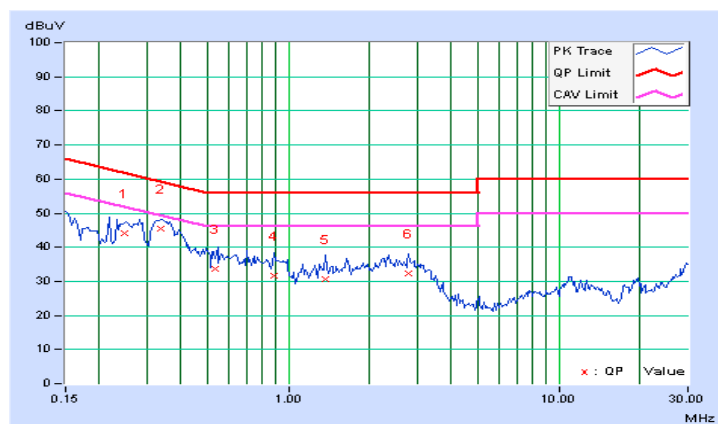
CDD Mode

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	----------	-------------------	--------------------------------

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.24831	0.09	44.13	36.50	44.22	36.59	61.81	51.81	-17.59	-15.22
2	0.33750	0.10	45.24	36.76	45.34	36.86	59.26	49.26	-13.93	-12.41
3	0.53556	0.11	33.52	24.64	33.63	24.75	56.00	46.00	-22.37	-21.25
4	0.88828	0.12	31.57	22.82	31.69	22.94	56.00	46.00	-24.31	-23.06
5	1.36328	0.14	30.41	23.46	30.55	23.60	56.00	46.00	-25.45	-22.40
6	2.77344	0.19	32.12	26.12	32.31	26.31	56.00	46.00	-23.69	-19.69

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

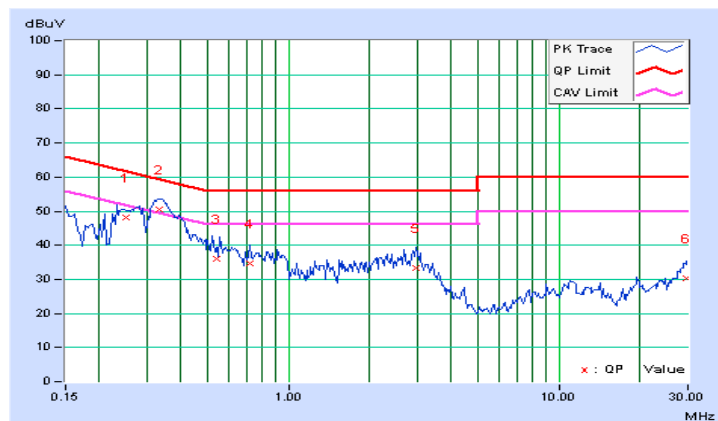


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	--------------------------------

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.25122	0.09	47.98	42.30	48.07	42.39	61.72	51.72	-13.65	-9.33
2	0.33359	0.09	50.41	42.22	50.50	42.31	59.36	49.36	-8.86	-7.05
3	0.53959	0.11	35.83	28.03	35.94	28.14	56.00	46.00	-20.06	-17.86
4	0.71641	0.12	34.42	25.94	34.54	26.06	56.00	46.00	-21.46	-19.94
5	2.96875	0.20	33.09	26.97	33.29	27.17	56.00	46.00	-22.71	-18.83
6	29.67578	0.97	29.25	24.10	30.22	25.07	60.00	50.00	-29.78	-24.93

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



5.3 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 Setup

Same as item 4.3.2.

5.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

5.3.4 Test Procedure

Same as item 4.3.4.

5.3.5 Deviation from Test Standard

No deviation.

5.3.6 EUT Operating Conditions

Same as item 4.3.6.

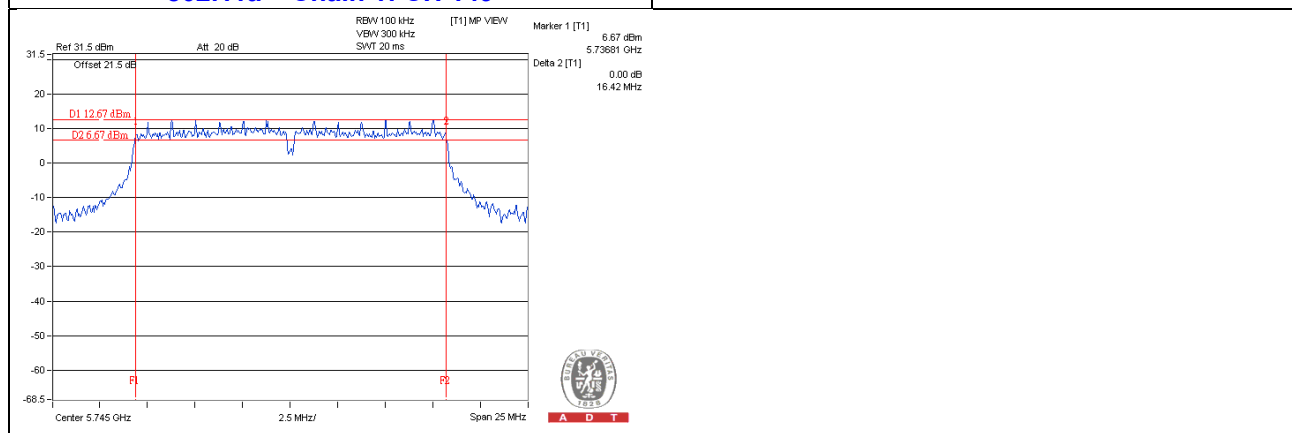
5.3.7 Test Result

CDD Mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
802.11a						
149	5745	16.46	16.42	16.45	0.5	Pass
157	5785	16.43	16.43	16.46	0.5	Pass
165	5825	16.45	16.42	16.46	0.5	Pass

Spectrum Plot of Worst Value

802.11a – Chain 1: CH 149

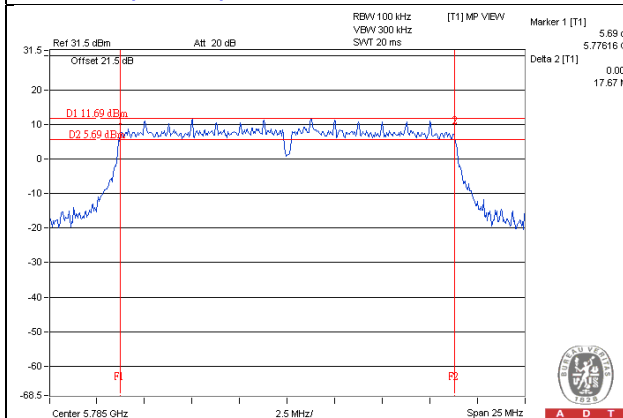


CDD Mode

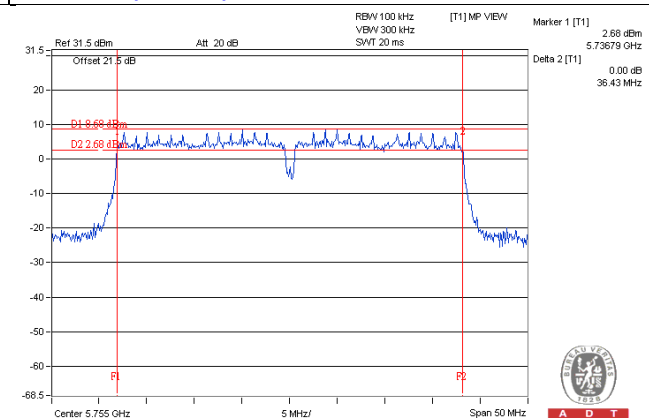
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
802.11ac (VHT20)						
149	5745	17.70	17.70	17.70	0.5	Pass
157	5785	17.67	17.71	17.70	0.5	Pass
165	5825	17.68	17.69	17.68	0.5	Pass
802.11ac (VHT40)						
151	5755	36.43	36.46	36.44	0.5	Pass
159	5795	36.45	36.49	36.47	0.5	Pass
802.11ac (VHT80)						
155	5775	75.84	76.15	76.41	0.5	Pass

SPECTRUM PLOT OF WORST VALUE

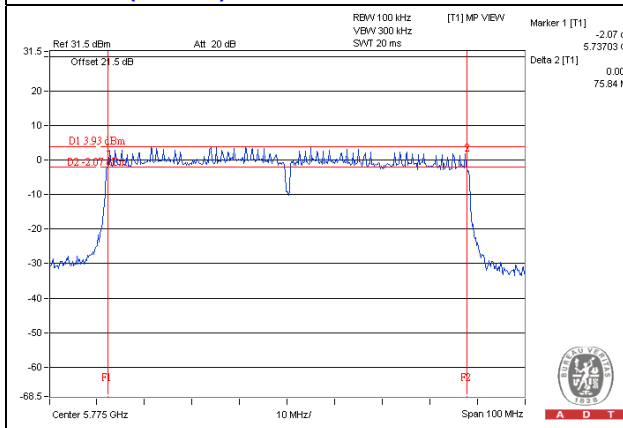
802.11ac (VHT20) – Chain 0: CH157



802.11ac (VHT40) – Chain 0: CH151



802.11ac (VHT80) – Chain 0: CH155



5.4 Conducted Output Power

5.4.1 Limits OF Conducted Output Power Measurement

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

Per KDB 662911 D01 Multiple Transmitter Output v02r01 Method of conducted output power measurement on IEEE 802.11 devices,

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

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

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

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

5.4.2 Test Setup

Same as Item 4.5.2.

5.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

5.4.4 Test Procedures

Same as Item 4.5.4.

5.4.5 Deviation from Test Standard

No deviation.

5.4.6 EUT Operating Conditions

Same as Item 4.5.6.

5.4.7 Test Results

CDD Mode

Channel	Frequency (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
802.11a								
149	5745	23.71	25.27	24.92	881.931	29.45	30	Pass
157	5785	24.00	25.25	25.39	932.093	29.69	30	Pass
165	5825	23.72	25.33	24.90	885.728	29.47	30	Pass

Beamforming Mode

Channel	Frequency (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
802.11ac (VHT20)								
149	5745	24.17	24.25	24.63	817.691	29.13	30	Pass
157	5785	24.02	25.24	25.38	931.687	29.69	30	Pass
165	5825	23.63	25.51	25.03	904.726	29.57	30	Pass
802.11ac (VHT40)								
151	5755	23.72	25.19	25.05	885.765	29.47	30	Pass
159	5795	23.56	25.44	25.31	916.556	29.62	30	Pass
802.11ac (VHT80)								
155	5775	21.68	22.75	23.10	539.77	27.32	30	Pass

NOTE: Directional gain = $0.4\text{dBi} + 10\log(3) = 5.17\text{dBi} < 6\text{dBi}$, so the power limit shall not be reduced.

5.5 Power Spectral Density Measurement

5.5.1 Limits of Power Spectral Density Measurement

Same as item 4.6.1.

5.5.2 Test Setup

Same as item 4.6.2.

5.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

5.5.4 Test Procedure

Same as item 4.6.4.

5.5.5 Deviation from Test Standard

No deviation.

5.5.6 EUT Operating Condition

Same as Item 4.3.6

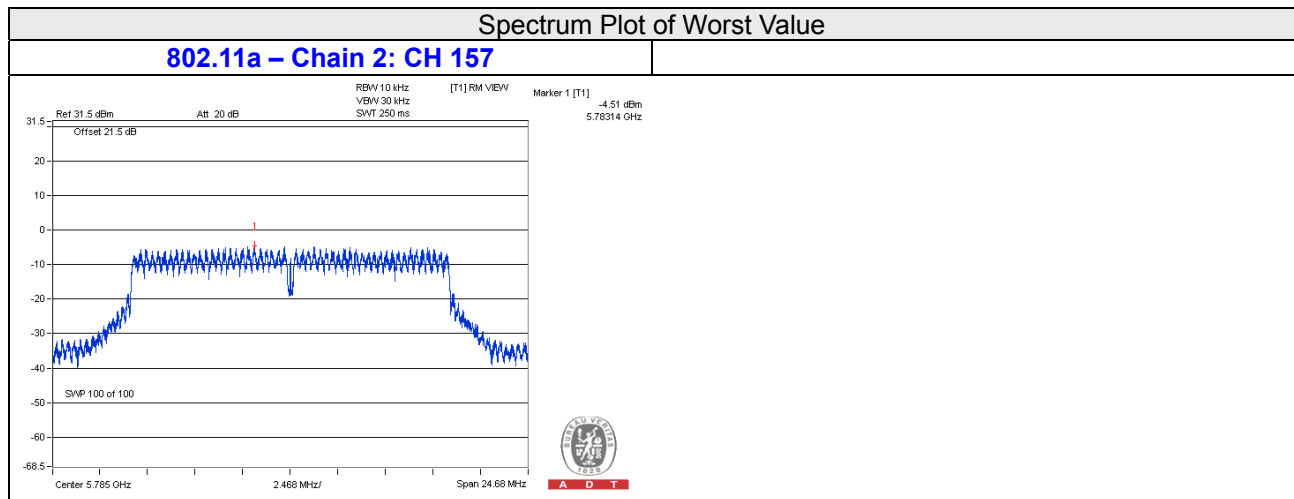
5.5.7 Test Results

CDD Mode

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
802.11a							
0	149	5745	-6.38	4.77	-1.61	8	Pass
	157	5785	-6.42	4.77	-1.65	8	Pass
	165	5825	-6.54	4.77	-1.77	8	Pass
1	149	5745	-4.63	4.77	0.14	8	Pass
	157	5785	-5.07	4.77	-0.30	8	Pass
	165	5825	-4.92	4.77	-0.15	8	Pass
2	149	5745	-5.27	4.77	-0.50	8	Pass
	157	5785	-4.51	4.77	0.26	8	Pass
	165	5825	-5.12	4.77	-0.35	8	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. Directional gain = $0.4\text{dBi} + 10\log(3) = 5.17\text{dBi} < 6\text{dBi}$, so the power density limit shall be not reduced.



Beamforming Mode

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
802.11ac (VHT20)							
0	149	5745	-6.64	4.77	-1.87	8	Pass
	157	5785	-7.14	4.77	-2.37	8	Pass
	165	5825	-6.90	4.77	-2.13	8	Pass
1	149	5745	-6.82	4.77	-2.05	8	Pass
	157	5785	-5.65	4.77	-0.88	8	Pass
	165	5825	-6.42	4.77	-1.65	8	Pass
2	149	5745	-5.94	4.77	-1.17	8	Pass
	157	5785	-5.39	4.77	-0.62	8	Pass
	165	5825	-6.52	4.77	-1.75	8	Pass
802.11ac (VHT40)							
0	151	5755	-9.60	4.77	-4.83	8	Pass
	159	5795	-9.23	4.77	-4.46	8	Pass
1	151	5755	-8.28	4.77	-3.51	8	Pass
	159	5795	-8.33	4.77	-3.56	8	Pass
2	151	5755	-8.45	4.77	-3.68	8	Pass
	159	5795	-8.44	4.77	-3.67	8	Pass

TX chain	Channel	Freq. (MHz)	PSD w/o Duty Factor (dBm)	10 log (N=3) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm)	Limit (dBm)	Pass /Fail
802.11ac (VHT80)								
0	155	5775	-14.21	4.77	0.21	-9.23	8	Pass
1	155	5775	-12.41	4.77	0.21	-7.43	8	Pass
2	155	5775	-13.20	4.77	0.21	-8.22	8	Pass

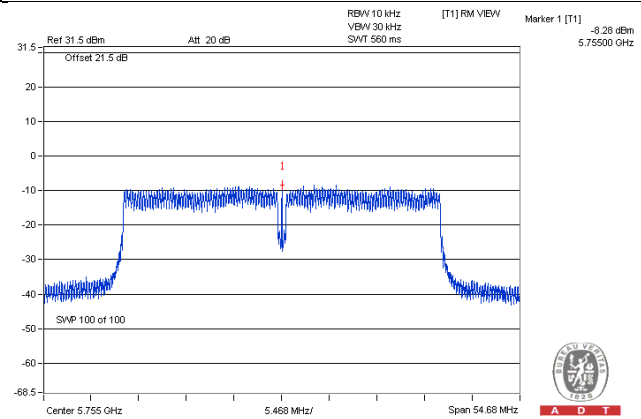
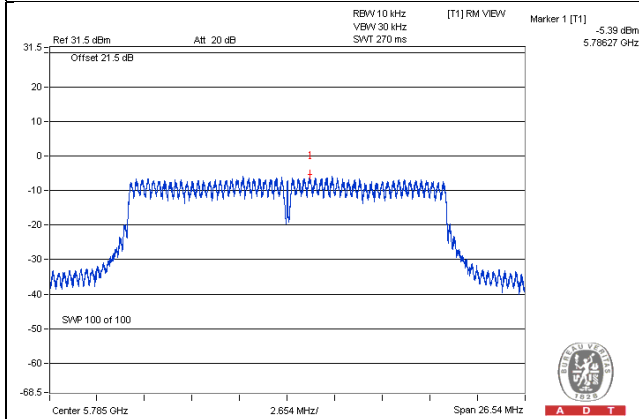
Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. Directional gain = $0.4\text{dBi} + 10\log(3) = 5.17\text{dBi} < 6\text{dBi}$, so the power density limit shall be not reduced.

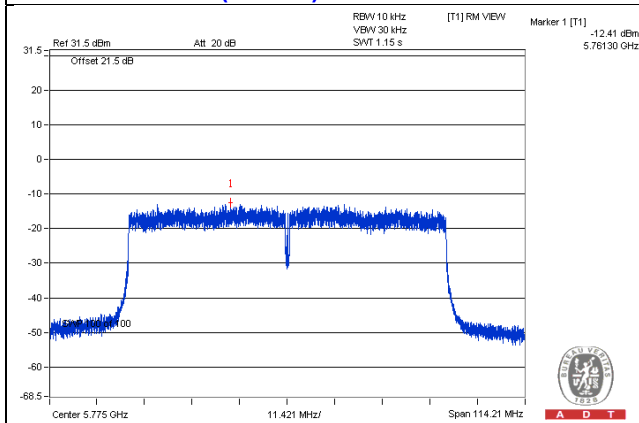
Spectrum Plot of Worst Value

802.11ac (VHT20) – Chain 2: CH 157

802.11ac (VHT40) – Chain 1: CH 151



802.11ac (VHT80) – Chain 1: CH 155



5.6 Conducted Out of Band Emission Measurement

5.6.1 Limits of Conducted Out of Band Emission Measurement

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

5.6.2 Test Setup

Same as Item 4.7.2

5.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

5.6.4 Test Procedure

Same as Item 4.7.4

5.6.5 Deviation from Test Standard

No deviation.

5.6.6 EUT Operating Condition

Same as Item 4.3.6

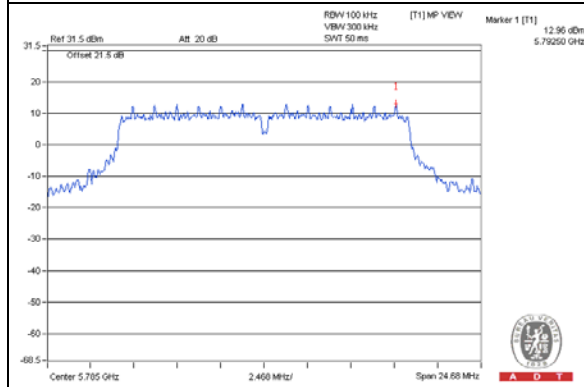
5.6.7 Test Results

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

CDD Mode

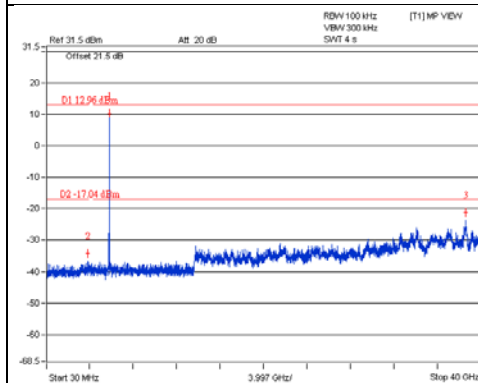
802.11a

Maximum REF

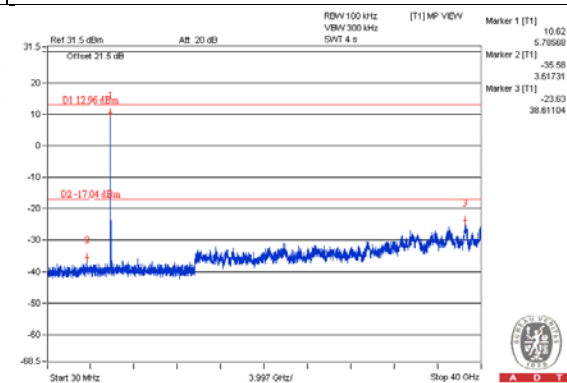


Chain 0

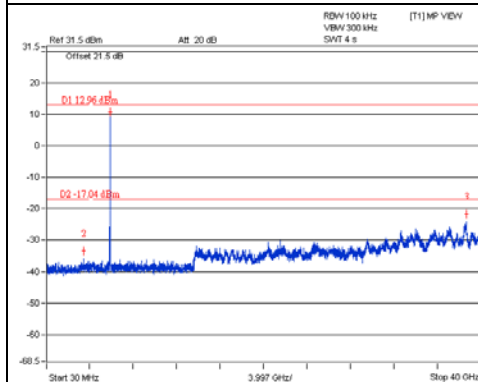
CH 149



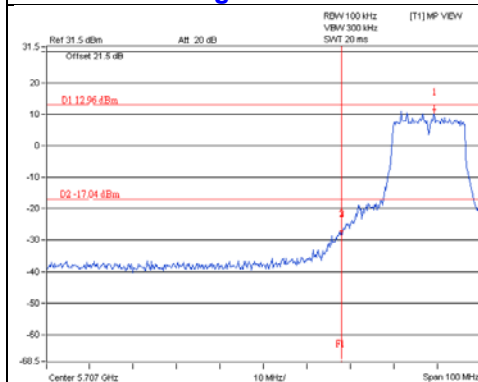
CH 157



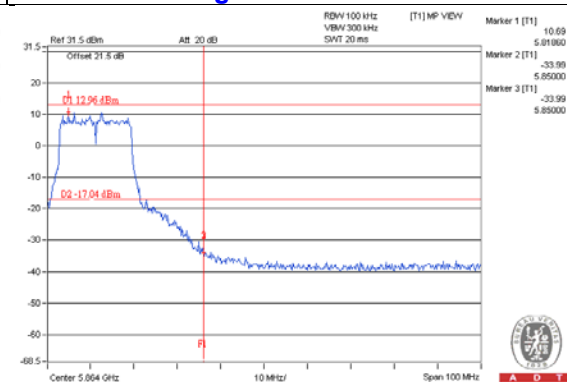
CH 165



CH 149 Band edge



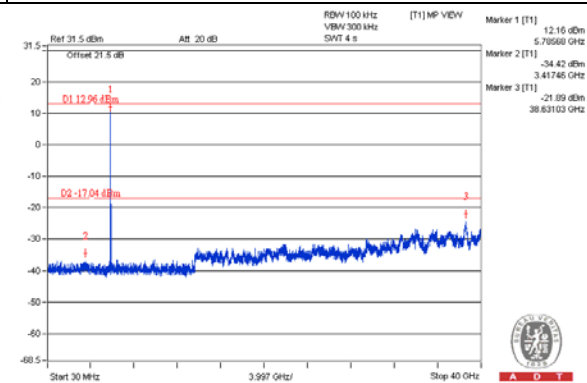
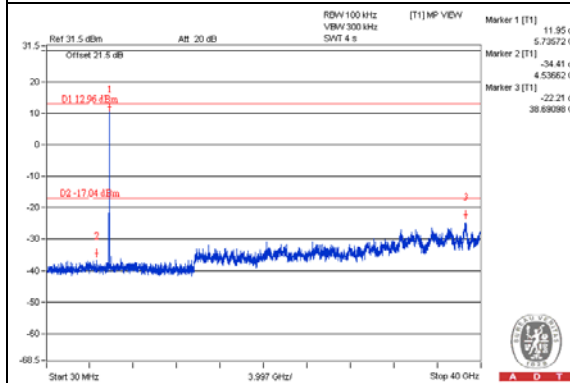
CH 165 Band edge



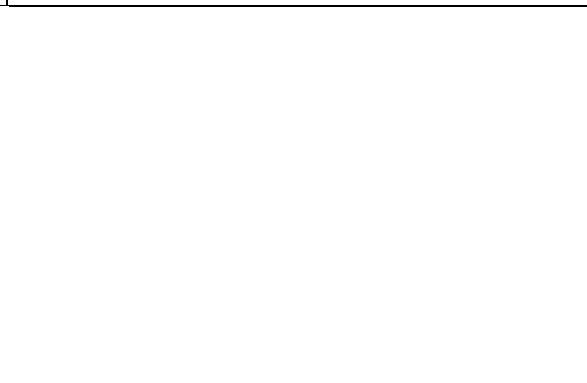
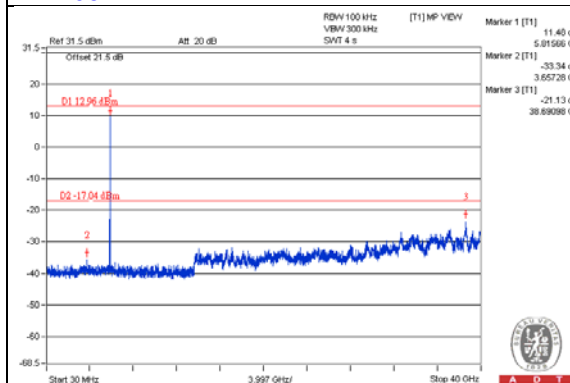
Chain 1

CH 149

CH 157

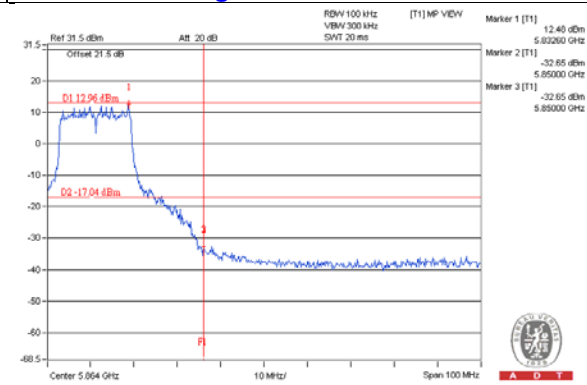
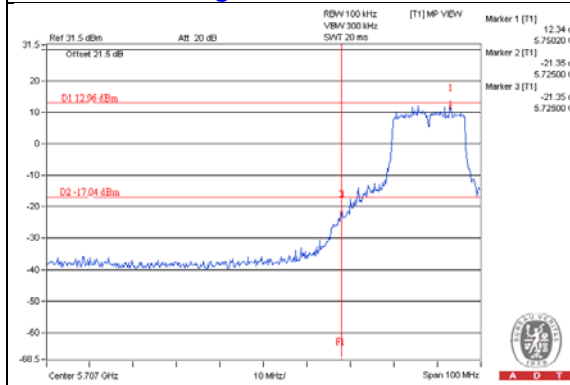


CH 165



CH 149 Band edge

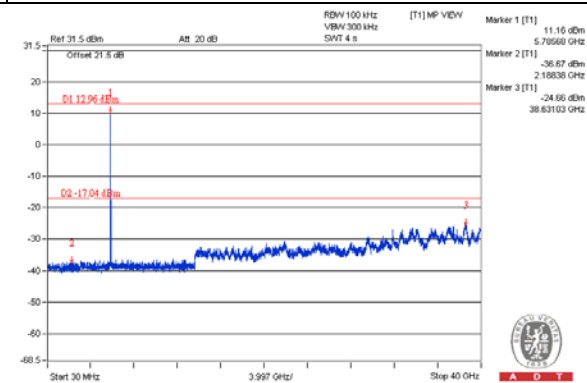
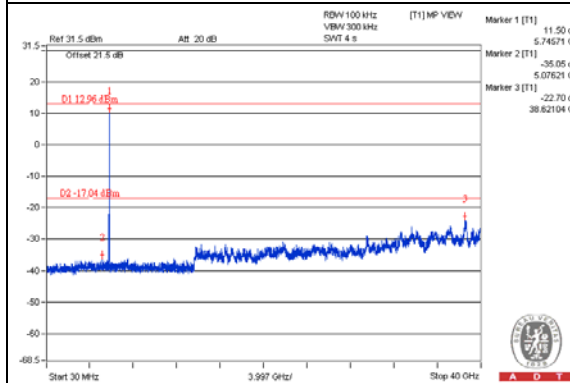
CH 165 Band edge



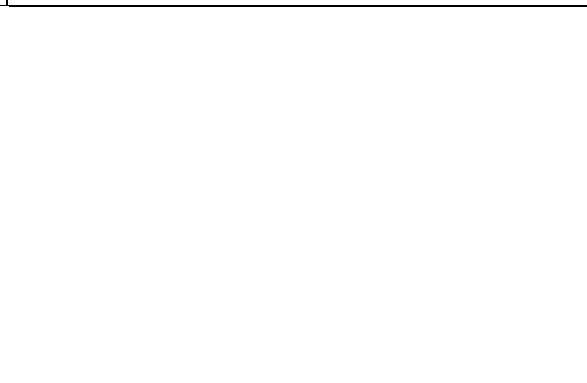
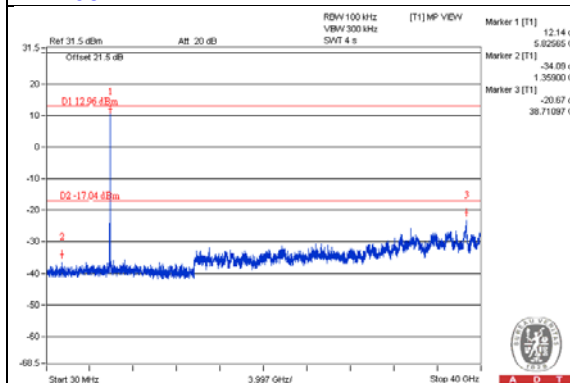
Chain 2

CH 149

CH 157

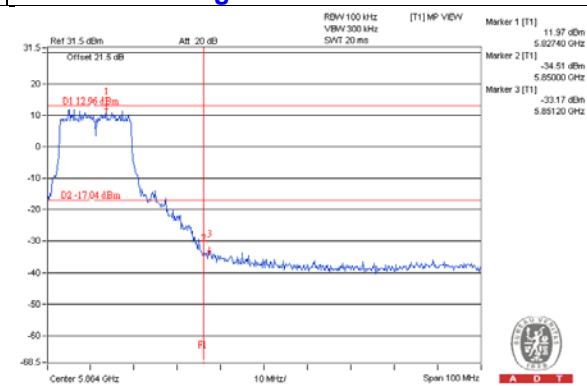
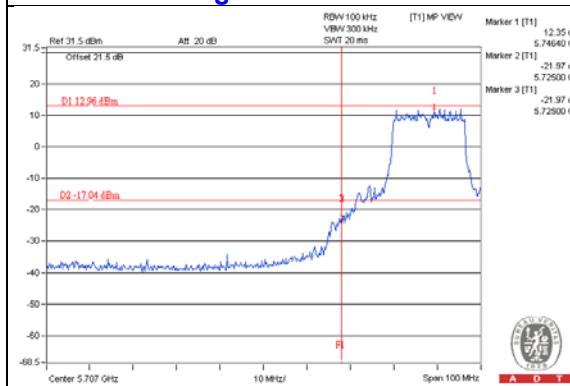


CH 165



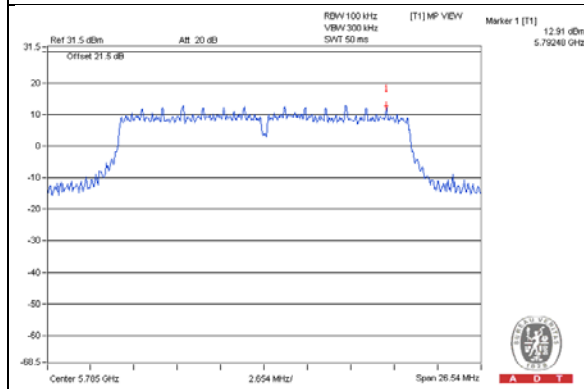
CH 149 Band edge

CH 165 Band edge

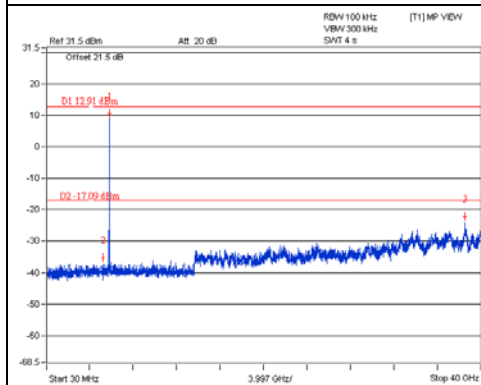


Beamforming Mode 802.11ac (VHT20)

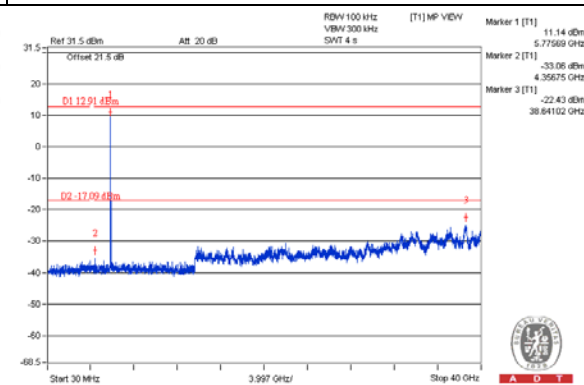
Maximum REF



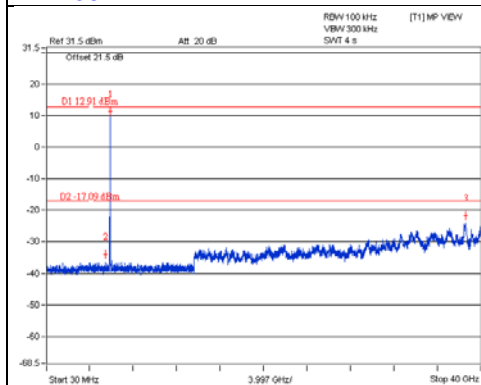
Chain 0 CH 149



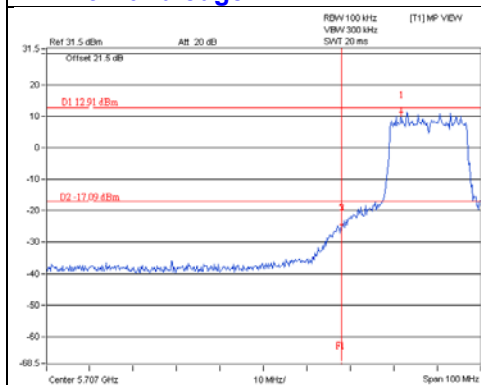
CH 157



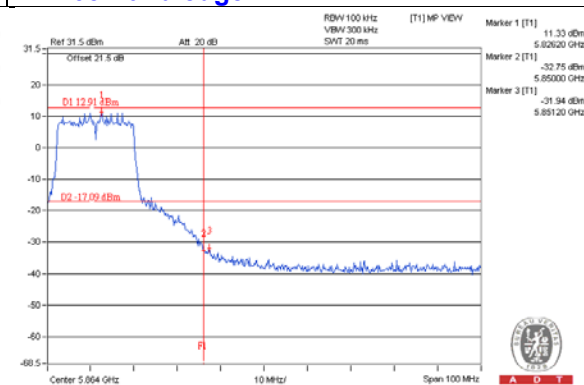
CH 165



CH 149 Band edge



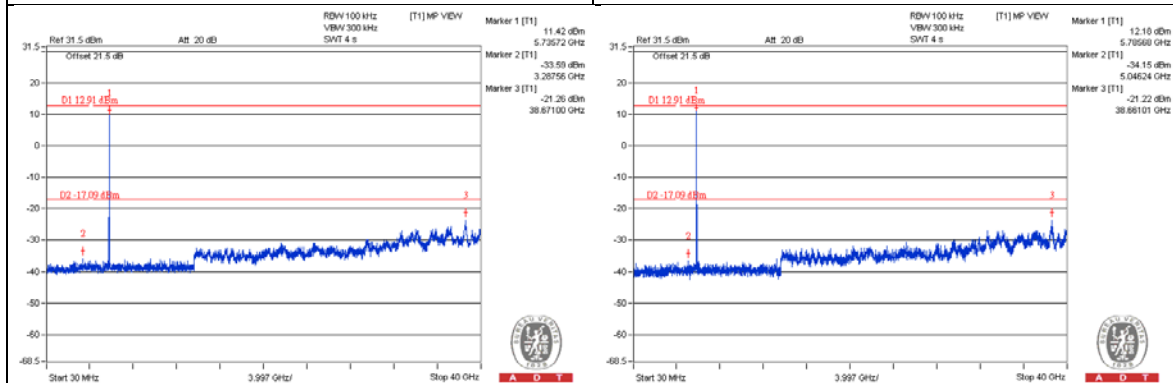
CH 165 Band edge



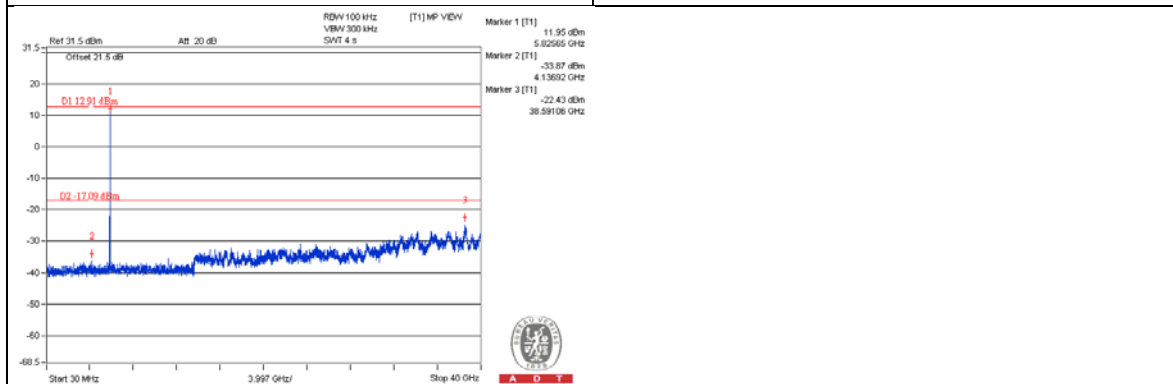
Chain 1

CH 149

CH 157

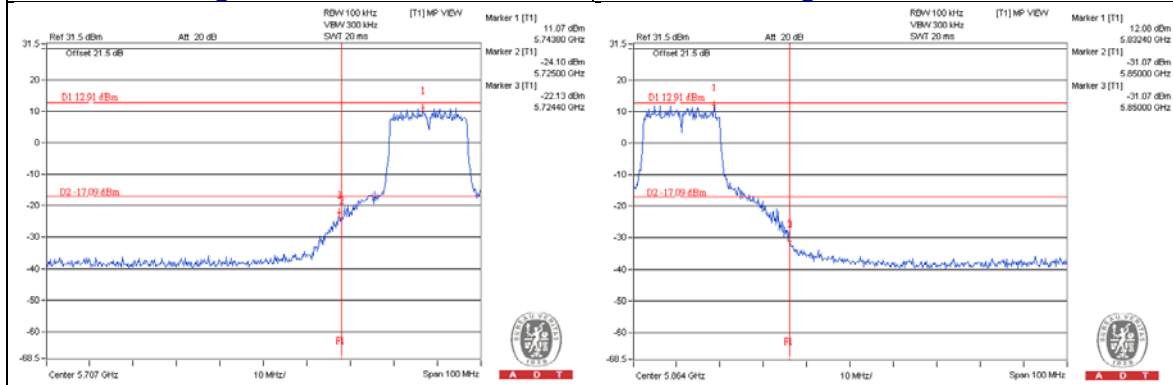


CH 165



CH 149 Band edge

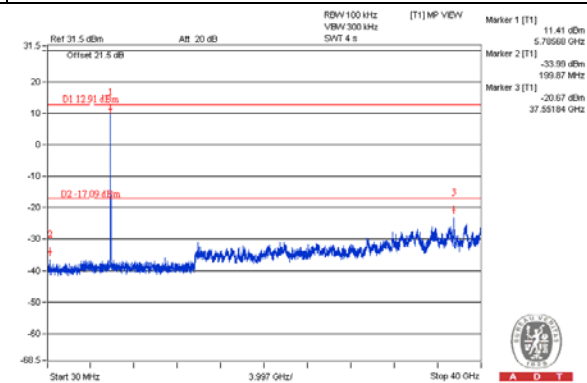
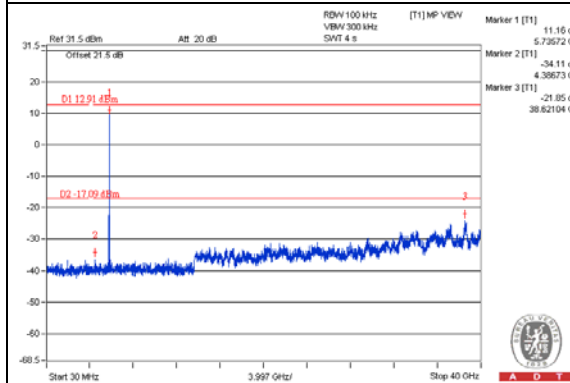
CH 165 Band edge



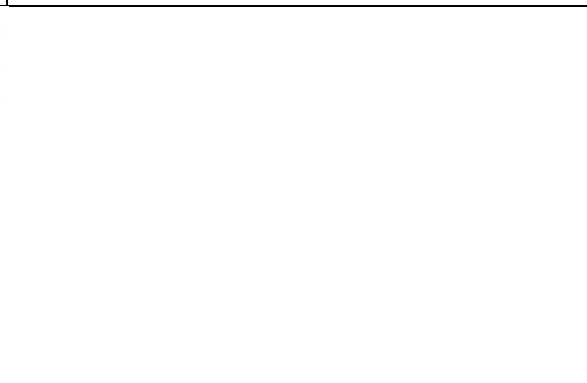
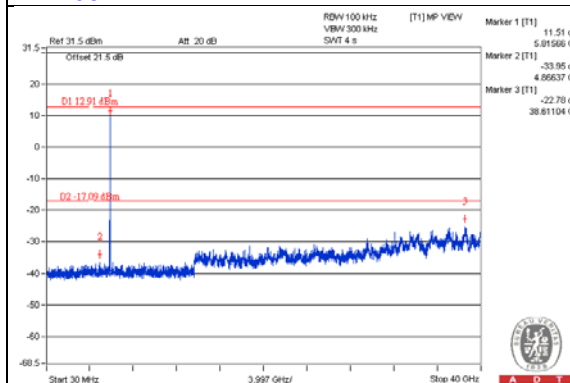
Chain 2

CH 149

CH 157

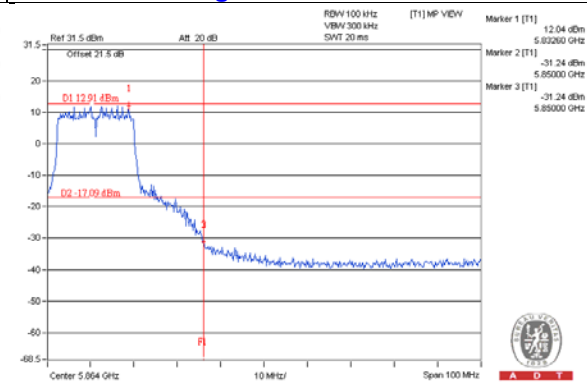
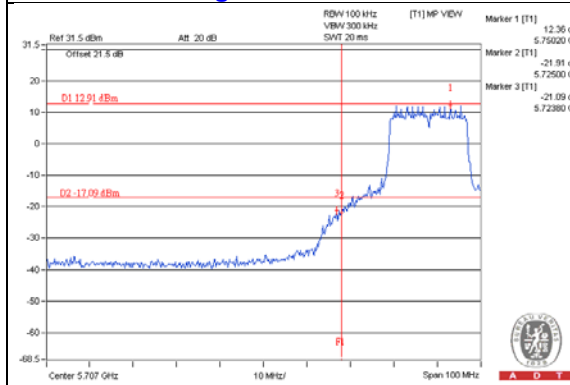


CH 165



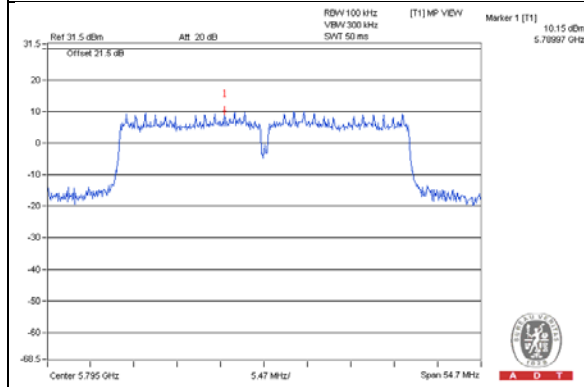
CH 149 Band edge

CH 165 Band edge

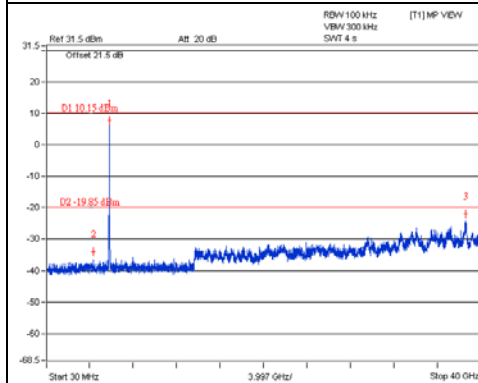


802.11ac (VHT40)

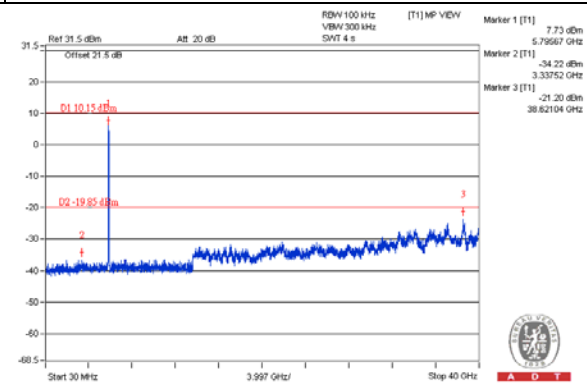
Maximum REF



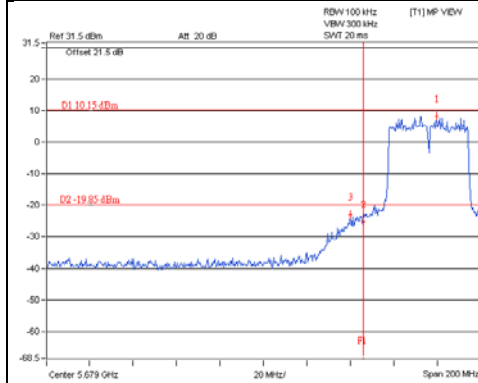
Chain 0 CH 151



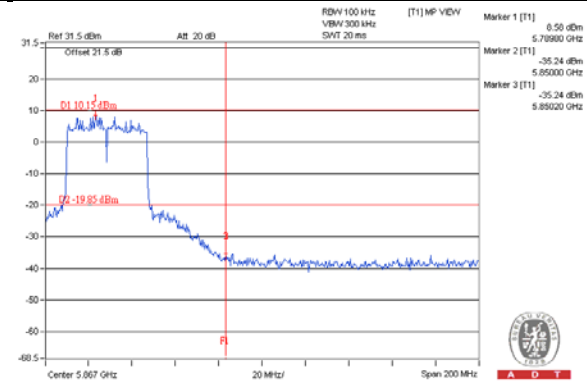
CH 159



CH 151 Band edge



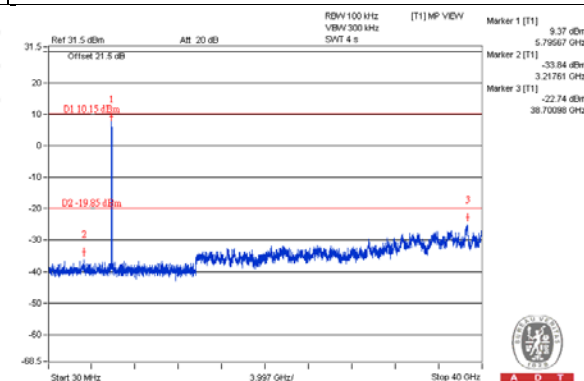
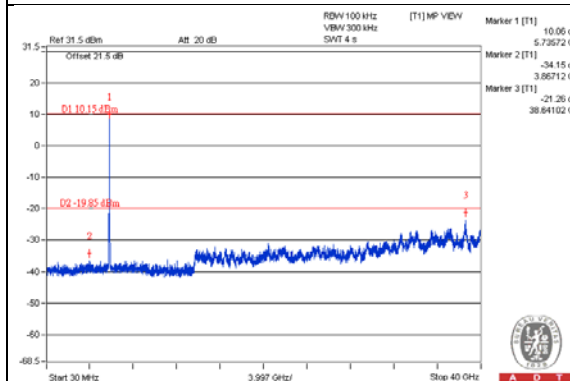
CH 159 Band edge



Chain 1

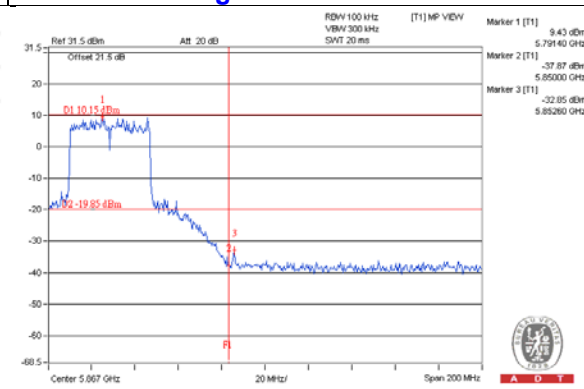
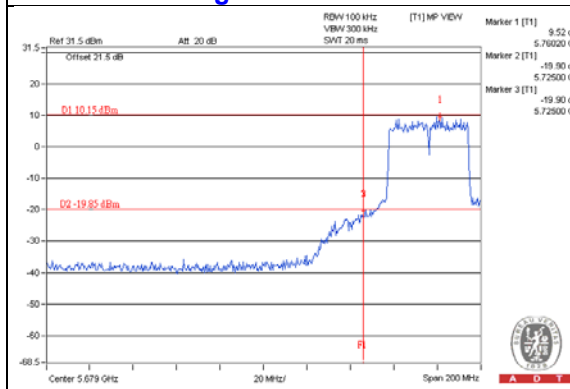
CH 151

CH 159



CH 151 Band edge

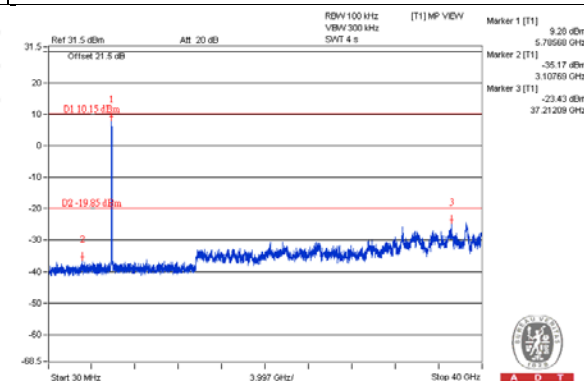
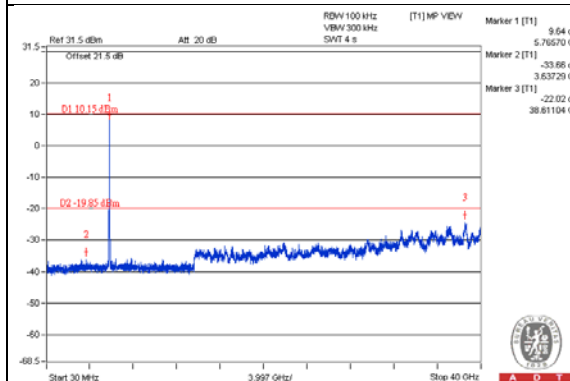
CH 159 Band edge



Chain 2

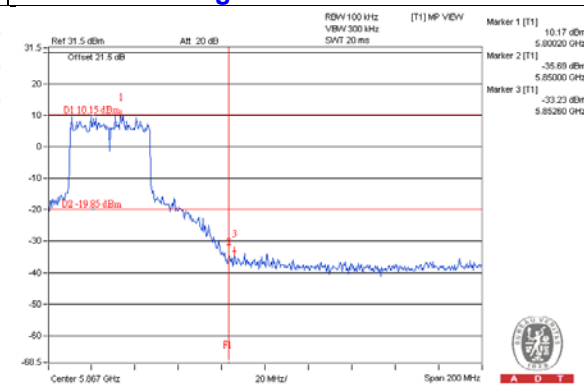
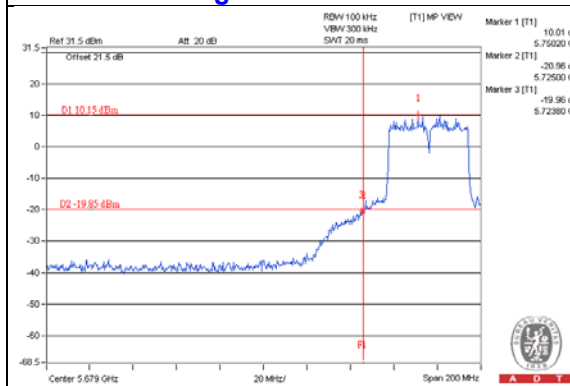
CH 151

CH 159



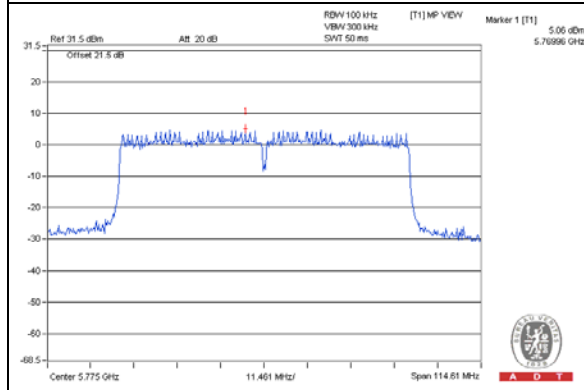
CH 151 Band edge

CH 159 Band edge

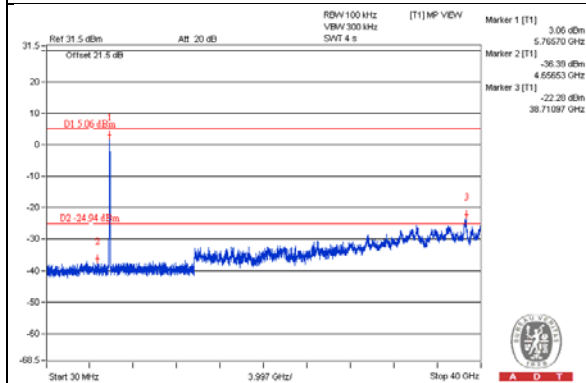


802.11ac (VHT80)

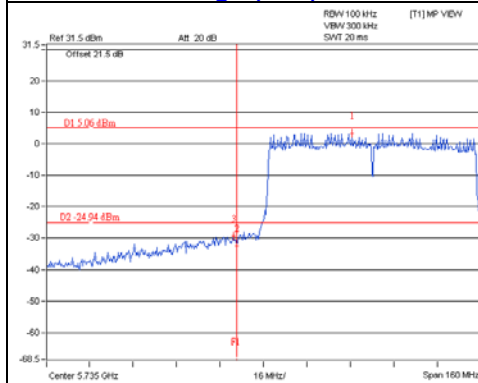
Maximum REF



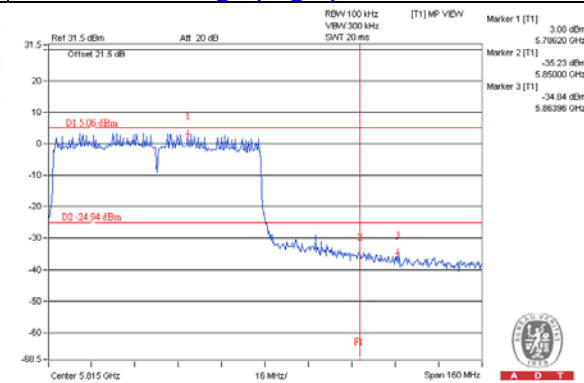
Chain 0 CH 155



CH 155 Band edge (Left)

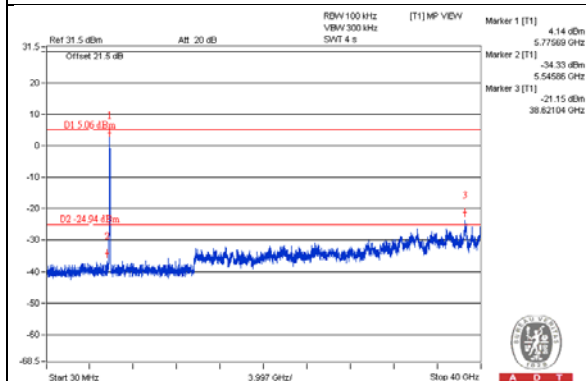


CH 155 Band edge (Right)

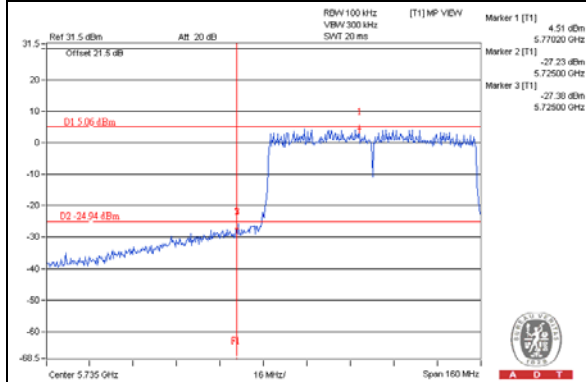


Chain 1

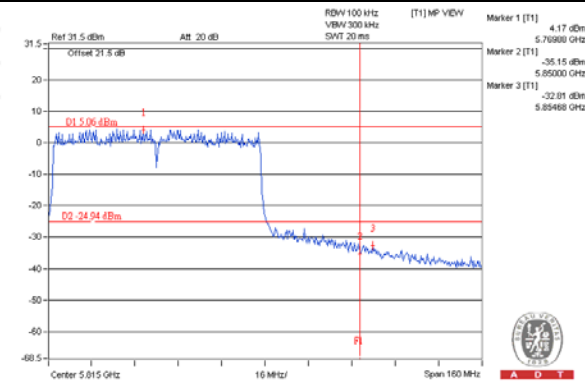
CH 155



CH 155 Band edge (Left)

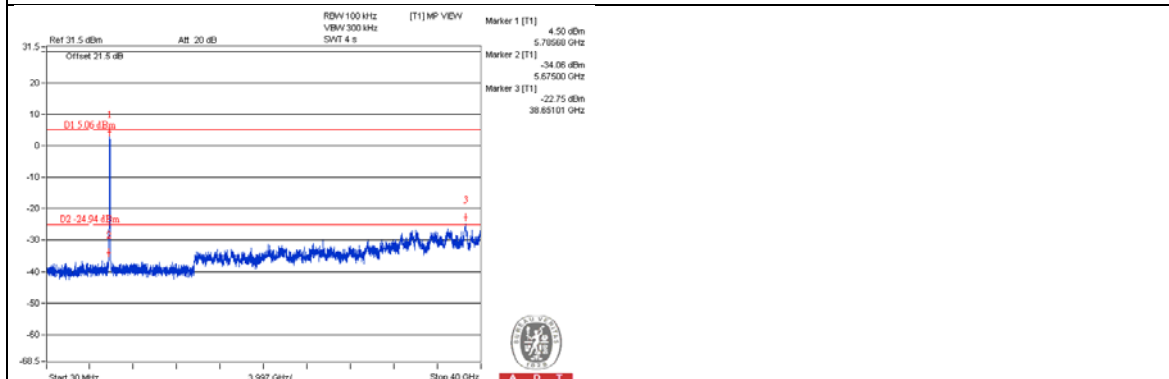


CH 155 Band edge (Right)

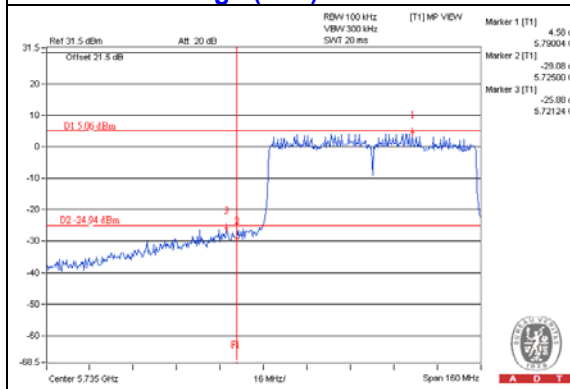


Chain 2

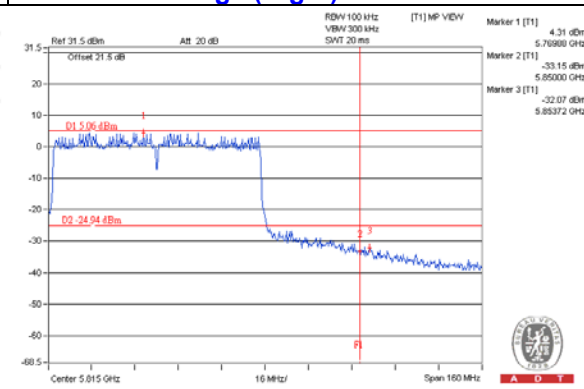
CH 155



CH 155 Band edge (Left)



CH 155 Band edge (Right)



6 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

--- END ---