FCC Test Report (15.247)

Report No.:	RF150430E02A
FCC ID:	PY315200309
Test Model:	R8500
Received Date:	June 29, 2015
Test Date:	July 03 to 28, 2015
Issued Date:	July 31, 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 Lab (A):	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
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 Lab (B):	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Test Location (1):	No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

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Release Control Record

Issue No.	Description	Date Issued
RF150430E02A	Original release.	July 31, 2015

1 Certificate of Conformity

Product:	Nighthawk X8 Tri Band WiFi Router
Brand:	NETGEAR
Test Model:	R8500
Sample Status:	ENGINEERING SAMPLE
Applicant:	NETGEAR, Inc.
Test Date:	July 03 to 28, 2015
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10:2009

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. This report contains Radiated Emissions & Band Edge Measurement (above 1GHz) test data that were produced under subcontract by Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories.

Prepared by : _____ , **Date:** July 31, 2015

(Midoli Peng, Specialist)

Approved by : _____ , **Date:** July 31, 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 -13.22dB at 0.50156MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 2483.50MHz and 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 i-pex(MHF) not a standard connector.

NOTE: 1 The EUT was operating in 2.400 ~ 2.4835GHz, 5.15~5.25GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 2.400 ~ 2.4835GHz and 5.725~5.850GHz. For the 5.15~5.25GHz RF parameters was recorded in another test report.

2 This report is prepared for FCC Class II change.

- **For 2.4GHz - 802.11b:** Only Conducted Emission / radiated emissions / conducted power were presented in this test report
- **For 2.4GHz - 802.11g, VHT20, VHT40:** All test Measurement were presented in this test report.
- **For 5GHz (5.745~5.825GHz):** Only Conducted Emission / radiated emissions / conducted power were presented in this test report).

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.86 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.43 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Nighthawk X8 Tri Band WiFi Router
Brand	NETGEAR
Test Model	R8500
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	19Vdc from power adapter
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 802.11g/a: up to 54Mbps 802.11n: up to 600Mbps 802.11ac: up to 1733.3Mbps
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: 980.686mW **Beamforming Mode:** 802.11ac (VHT20): 985.604mW 802.11ac (VHT40): 748.957mW 802.11ac (VHT80): 345.908mW
	For 15.247(5GHz) **CDD Mode:** 802.11a: 955.654mW 802.11ac (VHT20): 944.894mW 802.11ac (VHT40): 929.906mW 802.11ac (VHT80): 806.468mW **Beamforming Mode:** 802.11ac (VHT20): 388.161mW 802.11ac (VHT40): 388.868mW 802.11ac (VHT80): 388.815mW
	For 15.247(2.4GHz) **CDD Mode:** 802.11b: 858.125mW 802.11g: 929.401mW **Beamforming Mode:** VHT20: 848.386mW VHT40: 434.55mW

Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	Ethernet cable (shielded, 1.5m)

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the Report No.: RF150430E02 design is as the following information:
   - Add 2.4GHz (802.11g, 802.11n (HT20), 802.11n (HT40), VHT20 & VHT40 modulation type.
   - Change components.
   - Change internal antenna location
   - Add one new adapter (Model : 2ABS060K 1 NA)
2. According to above conditions, the EUT was tested for below informaion:
   - **For 2.4GHz - 802.11b:** Only Conducted Emission / radiated emissions / conducted power were presented in this test report.
   - **For 2.4GHz - 802.11g, VHT20, VHT40:** All test Measurement were presented in this test report.
   - **For 5GHz (5.745~5.825GHz):** Only Conducted Emission / radiated emissions / conducted power were presented in this test report.
3. The EUT's appearance has two different colors (black and Gray), and gray was selected as representative color for the test and its data was recorded in this report.
4. The EUT must be supplied with a power adapter as following table:

No	Brand Name	Model No.	P/N	Spec.
1	NETGEAR	AD2003F10	332-10631-01	Input: 100-120Vac, 50/60Hz, 1.5A Output: 19Vdc, 3.16A DC output cable: 1.8m, unshielded
2	NETGEAR	2ABS060K 1 NA	332-10788-01	Input: 100-120Vac, 50/60Hz, 1.0A Output: 19Vdc, 3.16A DC output cable: 1.8m, unshielded
From the above adapters, the worst radiated emission was found in Adapter 1. Therefore only the test data of the modes were recorded in this report.				

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

Antenna No.	Ant. Gain(dBi)	Frequency range (GHz to GHz)	Antenna Type	Connecter Type
Internal (1)	3.99	5.15~5.25GHz	Dipole	i-pex(MHF)
Internal (2)	3.71	5.25~5.35GHz	Dipole	i-pex(MHF)
Internal (3)	3.71	5.47~5.725GHz	Dipole	i-pex(MHF)
Internal (4)	3.98	5.725~5.85GHz	Dipole	i-pex(MHF)
External (1)	0.67	2.4~2.4835GHz	Dipole	i-pex(MHF)
	-0.84	5.15~5.25GHz	Dipole	i-pex(MHF)
	-1.38	5.25~5.35GHz	Dipole	i-pex(MHF)
	-1.6	5.47~5.725GHz	Dipole	i-pex(MHF)
	-1.79	5.725~5.85GHz	Dipole	i-pex(MHF)
External (2)	0.67	2.4~2.4835GHz	Dipole	i-pex(MHF)
	-0.84	5.15~5.25GHz	Dipole	i-pex(MHF)
	-1.38	5.25~5.35GHz	Dipole	i-pex(MHF)
	-1.6	5.47~5.725GHz	Dipole	i-pex(MHF)
	-1.79	5.725~5.85GHz	Dipole	i-pex(MHF)
External (3)	0.67	2.4~2.4835GHz	Dipole	i-pex(MHF)
	-0.84	5.15~5.25GHz	Dipole	i-pex(MHF)
	-1.38	5.25~5.35GHz	Dipole	i-pex(MHF)
	-1.6	5.47~5.725GHz	Dipole	i-pex(MHF)
	-1.79	5.725~5.85GHz	Dipole	i-pex(MHF)
External (4)	0.67	2.4~2.4835GHz	Dipole	i-pex(MHF)
	-0.84	5.15~5.25GHz	Dipole	i-pex(MHF)
	-1.38	5.25~5.35GHz	Dipole	i-pex(MHF)
	-1.6	5.47~5.725GHz	Dipole	i-pex(MHF)
	-1.79	5.725~5.85GHz	Dipole	i-pex(MHF)

6. The coexistence mode:

Technology		
WLAN(2.4GHz) - External Antenna	WLAN(5GHz <5150~5250MHz>) - External Antenna	WLAN(5GHz <5725~5850MHz>) - Internal Antenna
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.		

7. 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	4TX	4RX
802.11g	1 ~ 11Mbps	4TX	4RX
802.11n (HT20)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
802.11n (HT40)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
VHT20	MCS0~8 Nss=1	4TX	4RX
	MCS0~8 Nss=2	4TX	4RX
	MCS0~9 Nss=3	4TX	4RX
	MCS0~8 Nss=4	4TX	4RX
VHT40	MCS0~9 Nss=1	4TX	4RX
	MCS0~9 Nss=2	4TX	4RX
	MCS0~9 Nss=3	4TX	4RX
	MCS0~9 Nss=4	4TX	4RX
For 5GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	4TX	4RX
802.11n (HT20)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
802.11n (HT40)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
802.11ac (VHT20)	MCS 0~8, Nss=1	4TX	4RX
	MCS 0~8, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS 0~9, Nss=4	4TX	4RX
802.11ac (VHT40)	MCS 0~9, Nss=1	4TX	4RX
	MCS 0~9, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS 0~9, Nss=4	4TX	4RX
802.11ac (VHT80)	MCS 0~9, Nss=1	4TX	4RX
	MCS 0~9, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS 0~9, Nss=4	4TX	4RX

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)

8. 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, and 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≥1G	RE<1G	PLC	APCM	
1	√	√	√	√	With adapter 1
2	-	-	√	-	With adapter 2

Where **RE≥1G:** Radiated Emission above 1GHz & Bandedge Measurement **RE<1G:** Radiated Emission below 1GHz

PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

NOTE:

1. The test mode was reference to the worst case in the original test report.
2. "-" means no effect.

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
Beamforming Mode					
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

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)
802.11g	1 to 11	6	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)
802.11g	1 to 11	6	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.

For Conducted Output Power Measurement					
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
For Conducted Output Power Measurement					
Beamforming Mode					
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
For Power Spectral Density Measurement / 6dB Bandwidth Measurement					
CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
For Power Spectral Density Measurement / 6dB Bandwidth Measurement					
Beamforming Mode					
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≥1G	22deg. C, 66%RH	120Vac, 60Hz	Andy Ho
RE<1G	19deg. C, 65%RH	120Vac, 60Hz	Andy Ho
PLC	25deg. C, 68%RH 25deg. C, 65%RH	120Vac, 60Hz	Jyunchun Lin
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

For 5GHz (5745 ~ 5825MHz):

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

Where **RE≥1G:** Radiated Emission above 1GHz & Bandedge Measurement **RE<1G:** Radiated Emission below 1GHz

PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

NOTE:

1. The test mode was reference to the worst case in the original test report.
2. "-" means no effect.

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
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	149	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	149	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.

For Conducted Output Power Measurement					
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
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
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≥1G	22deg. C, 66%RH	120Vac, 60Hz	Andy Ho
RE<1G	19deg. C, 65%RH	120Vac, 60Hz	Andy Ho
PLC	25deg. C, 68%RH 25deg. C, 65%RH	120Vac, 60Hz	Jyunchun Lin
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

2.4GHz Band:

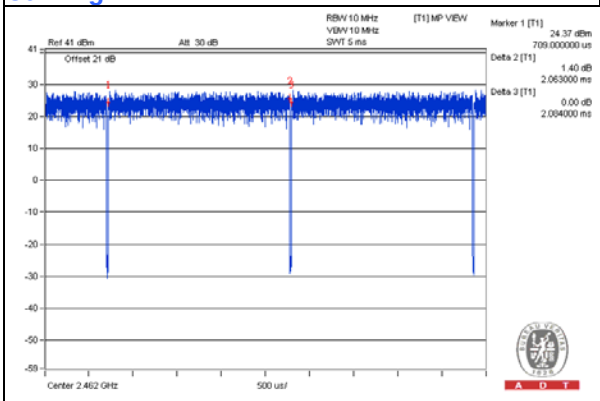
Duty cycle of test signal is ≥ 98 %, duty factor is not required.

802.11g: Duty cycle = 2.063ms/2.084 ms = 0.99

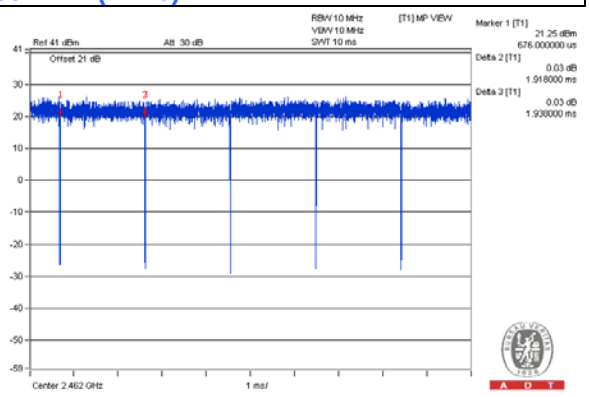
VHT20: Duty cycle = 1.918 ms/1.938 ms = 0.99

VHT40: Duty cycle = 0.945 ms/0.964 ms = 0.98

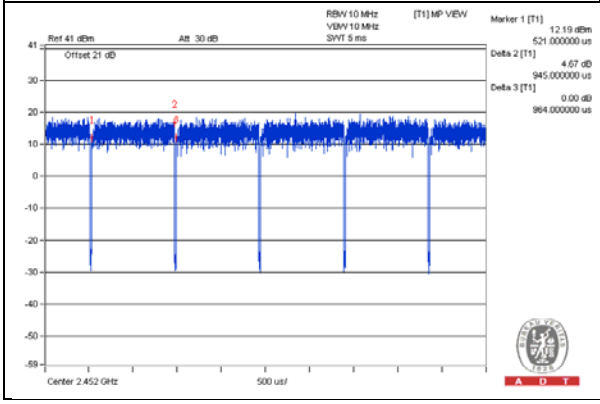
802.11g



802.11n (HT20)



VHT40



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.

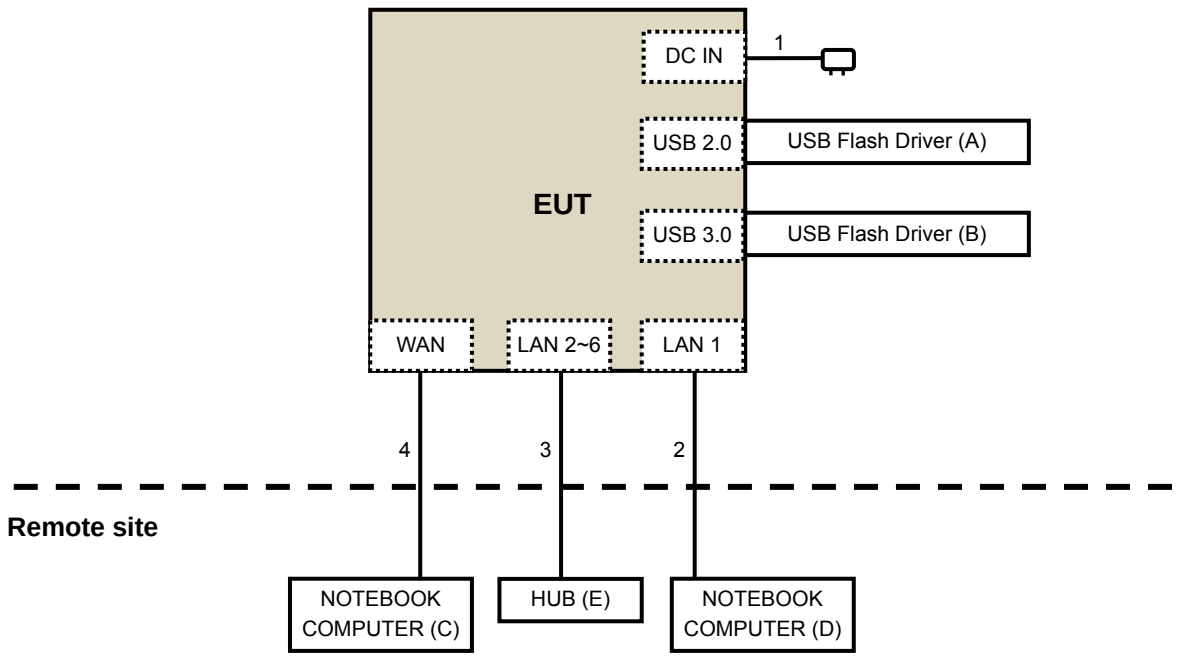
No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	USB Flash Driver	Transcend	JetFlash 790	NA	NA	Provided by Lab
B	USB Flash Driver	Transcend	JetFlash 790	NA	NA	Provided by Lab
C	NOTEBOOK COMPUTER	DELL	PP32LA	HSLB32S	FCC DoC	Provided by Lab
D	NOTEBOOK COMPUTER	DELL	E5430	4YV4VY1	FCC DoC	Provided 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 (1.8 m).

No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1	DC	1	1.8	No	0	Supplied by Client
2	RJ45	1	10	No	0	Provided by Lab
3	RJ45	5	10	No	0	Provided by Lab
4	RJ45	1	10	No	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 v03r02
662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2009

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

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

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

For above 1GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	July 25, 2014	July 24, 2015
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Feb. 05, 2015	Feb. 04, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 09, 2015	Feb. 08, 2016
Preamplifier Agilent	8449B	3008A01961	Oct. 18, 2014	Oct. 17, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309220/4	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250724/4	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Aug. 09, 2014	Aug. 08, 2015
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA	NA
Turn Table BV ADT	TT100	TT93021704	NA	NA
Turn Table Controller BV ADT	SC100	SC93021704	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2014	Oct. 17, 2015

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Chamber 4.

3. The FCC Site Registration No. is 460141.

4. The IC Site Registration No. is IC7450F-4.

5. Tested Date: July 03, 2015

For below 1GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	Aug. 11, 2014	Aug. 10, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-04	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Feb. 09, 2015	Feb. 08, 2016
RF Cable	8D-FB	CHHCAB-001-1 CHHCAB-001-2	Oct. 05, 2014	Oct. 04, 2015
	RF-141	CHHCAB-004	Oct. 05, 2014	Oct. 04, 2015
Software	ADT_Radiated_V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. H.
3. The FCC Site Registration No. is 797305.
4. The CANADA Site Registration No. is IC 7450H-3.
5. Tested Date: July 09, 2015

4.1.3 Test Procedures

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

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

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

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

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

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

Note:

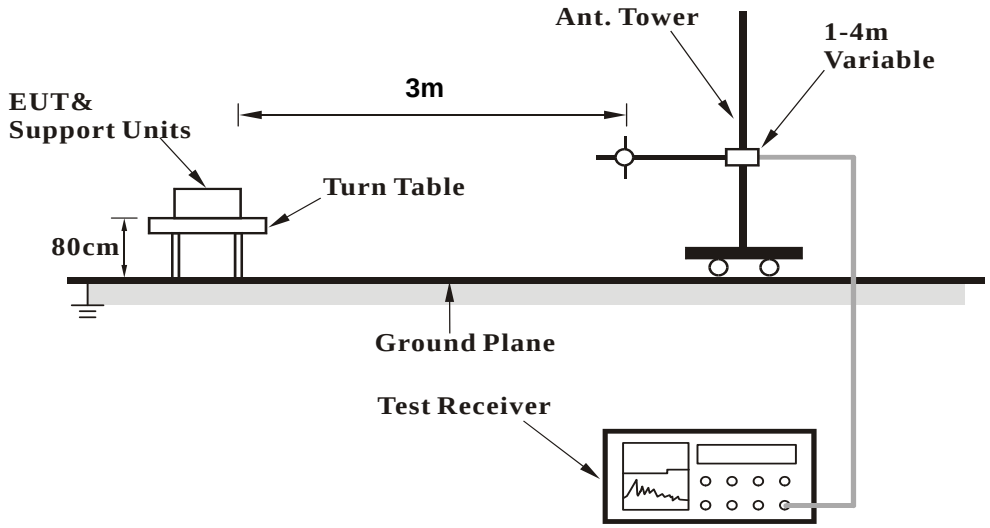
1. For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the ground at 3 meter chamber room for test
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (10 log(1/duty cycle)).
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
6. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

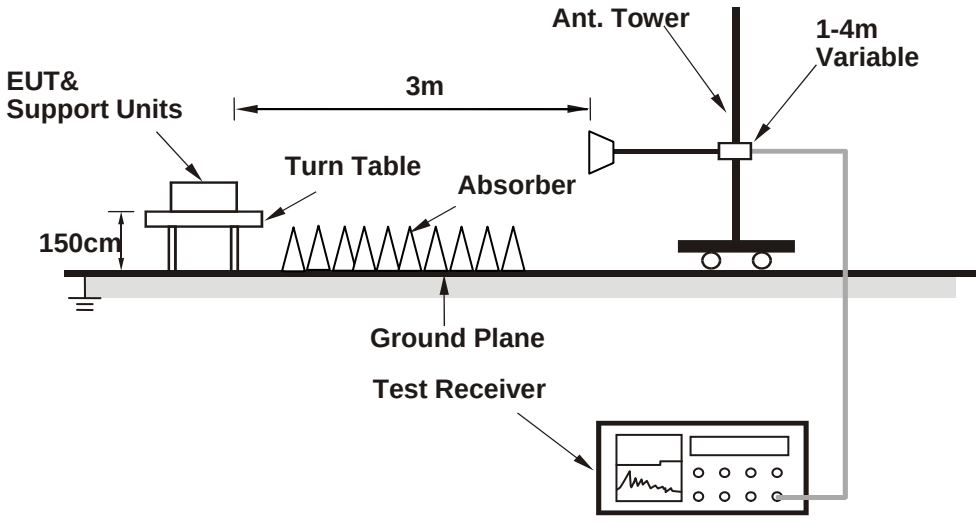
No deviation.

4.1.5 Test Setup

<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-D (NOTEBOOK COMPUTER) which is placed on remote site.
2. Controlling software (Mtool.exe_2_0_2_7) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data (Subcontract Item)

CDD Mode

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	2390.00	58.9 PK	74.0	-15.1	1.37 H	278	27.28	31.62
2	2390.00	44.4 AV	54.0	-9.6	1.37 H	278	12.78	31.62
3	*2412.00	103.8 PK			1.37 H	278	72.08	31.72
4	*2412.00	100.2 AV			1.37 H	278	68.48	31.72
5	4824.00	48.2 PK	74.0	-25.8	1.73 H	296	10.62	37.58
6	4824.00	44.9 AV	54.0	-9.1	1.73 H	296	7.32	37.58
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	2390.00	58.2 PK	74.0	-15.8	2.16 V	205	26.58	31.62
2	2390.00	45.6 AV	54.0	-8.4	2.16 V	205	13.98	31.62
3	*2412.00	117.8 PK			2.16 V	205	86.08	31.72
4	*2412.00	115.2 AV			2.16 V	205	83.48	31.72
5	4824.00	56.0 PK	74.0	-18.0	1.88 V	196	18.42	37.58
6	4824.00	53.8 AV	54.0	-0.2	1.88 V	196	16.22	37.58

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	104.6 PK			1.37 H	271	72.78	31.82
2	*2437.00	101.0 AV			1.37 H	271	69.18	31.82
3	4874.00	48.2 PK	74.0	-25.8	1.68 H	295	10.43	37.77
4	4874.00	44.6 AV	54.0	-9.4	1.68 H	295	6.83	37.77
5	7311.00	50.1 PK	74.0	-23.9	1.00 H	330	5.62	44.48
6	7311.00	40.3 AV	54.0	-13.7	1.00 H	330	-4.18	44.48
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	118.6 PK			2.66 V	207	86.78	31.82
2	*2437.00	116.0 AV			2.66 V	207	84.18	31.82
3	4874.00	55.6 PK	74.0	-18.4	1.82 V	164	17.83	37.77
4	4874.00	53.7 AV	54.0	-0.3	1.82 V	164	15.93	37.77
5	7311.00	50.9 PK	74.0	-23.1	1.62 V	236	6.42	44.48
6	7311.00	40.1 AV	54.0	-13.9	1.62 V	236	-4.38	44.48

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	105.1 PK			1.42 H	258	73.18	31.92
2	*2462.00	101.3 AV			1.42 H	258	69.38	31.92
3	2483.50	58.9 PK	74.0	-15.1	1.42 H	258	26.88	32.02
4	2483.50	44.1 AV	54.0	-9.9	1.42 H	258	12.08	32.02
5	4924.00	48.2 PK	74.0	-25.8	1.67 H	295	10.31	37.89
6	4924.00	44.7 AV	54.0	-9.3	1.67 H	295	6.81	37.89
7	7386.00	50.1 PK	74.0	-23.9	1.05 H	324	5.42	44.68
8	7386.00	40.0 AV	54.0	-14.0	1.05 H	324	-4.68	44.68
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	119.1 PK			2.41 V	207	87.18	31.92
2	*2462.00	116.3 AV			2.41 V	207	84.38	31.92
3	2483.50	59.5 PK	74.0	-14.5	2.41 V	207	27.48	32.02
4	2483.50	45.9 AV	54.0	-8.1	2.41 V	207	13.88	32.02
5	4924.00	55.4 PK	74.0	-18.6	1.78 V	163	17.51	37.89
6	4924.00	53.5 AV	54.0	-0.5	1.78 V	163	15.61	37.89
7	7386.00	49.6 PK	74.0	-24.4	1.89 V	228	4.92	44.68
8	7386.00	39.9 AV	54.0	-14.1	1.89 V	228	-4.78	44.68

REMARKS:

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

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.6 PK	74.0	-16.4	1.36 H	261	25.98	31.62
2	2390.00	45.2 AV	54.0	-8.8	1.36 H	261	13.58	31.62
3	*2412.00	106.2 PK			1.36 H	261	74.48	31.72
4	*2412.00	95.2 AV			1.36 H	261	63.48	31.72
5	4824.00	55.6 PK	74.0	-18.4	1.69 H	291	18.02	37.58
6	4824.00	42.1 AV	54.0	-11.9	1.69 H	291	4.52	37.58
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	73.1 PK	74.0	-0.9	2.28 V	196	41.48	31.62
2	2390.00	53.7 AV	54.0	-0.3	2.28 V	196	22.08	31.62
3	*2412.00	120.8 PK			2.28 V	196	89.08	31.72
4	*2412.00	110.4 AV			2.28 V	196	78.68	31.72
5	4824.00	56.0 PK	74.0	-18.0	1.57 V	44	18.42	37.58
6	4824.00	42.9 AV	54.0	-11.1	1.57 V	44	5.32	37.58

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.5 PK	74.0	-15.5	1.34 H	262	26.88	31.62
2	2390.00	44.7 AV	54.0	-9.3	1.34 H	262	13.08	31.62
3	*2437.00	110.2 PK			1.34 H	262	78.38	31.82
4	*2437.00	99.4 AV			1.34 H	262	67.58	31.82
5	2483.50	56.9 PK	74.0	-17.1	1.34 H	262	24.88	32.02
6	2483.50	42.1 AV	54.0	-11.9	1.34 H	262	10.08	32.02
7	4874.00	56.0 PK	74.0	-18.0	1.64 H	283	18.23	37.77
8	4874.00	42.6 AV	54.0	-11.4	1.64 H	283	4.83	37.77
9	7311.00	54.0 PK	74.0	-20.0	1.05 H	339	9.52	44.48
10	7311.00	39.5 AV	54.0	-14.5	1.05 H	339	-4.98	44.48
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	2.46 V	195	41.58	31.62
2	2390.00	52.4 AV	54.0	-1.6	2.46 V	195	20.78	31.62
3	*2437.00	125.1 PK			2.46 V	195	93.28	31.82
4	*2437.00	114.3 AV			2.46 V	195	82.48	31.82
5	2483.50	72.2 PK	74.0	-1.8	2.46 V	195	40.18	32.02
6	2483.50	50.2 AV	54.0	-3.8	2.46 V	195	18.18	32.02
7	4874.00	55.8 PK	74.0	-18.2	1.60 V	39	18.03	37.77
8	4874.00	42.6 AV	54.0	-11.4	1.60 V	39	4.83	37.77
9	7311.00	53.4 PK	74.0	-20.6	1.51 V	46	8.92	44.48
10	7311.00	39.0 AV	54.0	-15.0	1.51 V	46	-5.48	44.48

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.4 PK			1.41 H	262	72.48	31.92
2	*2462.00	93.8 AV			1.41 H	262	61.88	31.92
3	2483.50	58.3 PK	74.0	-15.7	1.41 H	262	26.28	32.02
4	2483.50	45.5 AV	54.0	-8.5	1.41 H	262	13.48	32.02
5	4924.00	55.9 PK	74.0	-18.1	1.60 H	267	18.01	37.89
6	4924.00	42.4 AV	54.0	-11.6	1.60 H	267	4.51	37.89
7	7386.00	54.3 PK	74.0	-19.7	1.05 H	332	9.62	44.68
8	7386.00	39.9 AV	54.0	-14.1	1.05 H	332	-4.78	44.68
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	119.8 PK			2.20 V	197	87.88	31.92
2	*2462.00	109.1 AV			2.20 V	197	77.18	31.92
3	2483.50	73.8 PK	74.0	-0.2	2.20 V	197	41.78	32.02
4	2483.50	53.8 AV	54.0	-0.2	2.20 V	197	21.78	32.02
5	4924.00	56.1 PK	74.0	-17.9	1.64 V	34	18.21	37.89
6	4924.00	43.0 AV	54.0	-11.0	1.64 V	34	5.11	37.89
7	7386.00	53.5 PK	74.0	-20.5	1.56 V	44	8.82	44.68
8	7386.00	38.9 AV	54.0	-15.1	1.56 V	44	-5.78	44.68

REMARKS:

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

Beamforming Mode

VHT20

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.9 PK	74.0	-15.1	1.30 H	262	27.28	31.62
2	2390.00	44.3 AV	54.0	-9.7	1.30 H	262	12.68	31.62
3	*2412.00	102.7 PK			1.30 H	262	70.98	31.72
4	*2412.00	91.5 AV			1.30 H	262	59.78	31.72
5	4824.00	55.7 PK	74.0	-18.3	1.68 H	285	18.12	37.58
6	4824.00	42.1 AV	54.0	-11.9	1.68 H	285	4.52	37.58
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	2.02 V	176	42.08	31.62
2	2390.00	52.3 AV	54.0	-1.7	2.02 V	176	20.68	31.62
3	*2412.00	118.2 PK			2.02 V	176	86.48	31.72
4	*2412.00	106.9 AV			2.02 V	176	75.18	31.72
5	4824.00	56.4 PK	74.0	-17.6	1.60 V	43	18.82	37.58
6	4824.00	43.2 AV	54.0	-10.8	1.60 V	43	5.62	37.58

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.9 PK	74.0	-17.1	1.35 H	276	25.28	31.62
2	2390.00	46.0 AV	54.0	-8.0	1.35 H	276	14.38	31.62
3	*2437.00	110.3 PK			1.35 H	276	78.48	31.82
4	*2437.00	99.2 AV			1.35 H	276	67.38	31.82
5	2483.50	58.0 PK	74.0	-16.0	1.35 H	276	25.98	32.02
6	2483.50	46.1 AV	54.0	-7.9	1.35 H	276	14.08	32.02
7	4874.00	55.9 PK	74.0	-18.1	1.60 H	286	18.13	37.77
8	4874.00	42.5 AV	54.0	-11.5	1.60 H	286	4.73	37.77
9	7311.00	54.6 PK	74.0	-19.4	1.01 H	326	10.12	44.48
10	7311.00	40.0 AV	54.0	-14.0	1.01 H	326	-4.48	44.48
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.7 PK	74.0	-2.3	2.34 V	175	40.08	31.62
2	2390.00	53.8 AV	54.0	-0.2	2.34 V	175	22.18	31.62
3	*2437.00	125.3 PK			2.34 V	175	93.48	31.82
4	*2437.00	114.2 AV			2.34 V	175	82.38	31.82
5	2483.50	73.0 PK	74.0	-1.0	2.34 V	175	40.98	32.02
6	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**2.34 V**	**175**	**21.88**	**32.02**
7	4874.00	55.8 PK	74.0	-18.2	1.57 V	42	18.03	37.77
8	4874.00	42.9 AV	54.0	-11.1	1.57 V	42	5.13	37.77
9	7311.00	54.0 PK	74.0	-20.0	1.47 V	36	9.52	44.48
10	7311.00	39.5 AV	54.0	-14.5	1.47 V	36	-4.98	44.48

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	105.1 PK			1.39 H	266	73.18	31.92
2	*2462.00	93.6 AV			1.39 H	266	61.68	31.92
3	2483.50	59.3 PK	74.0	-14.7	1.39 H	266	27.28	32.02
4	2483.50	46.1 AV	54.0	-7.9	1.39 H	266	14.08	32.02
5	4924.00	55.4 PK	74.0	-18.6	1.64 H	285	17.51	37.89
6	4924.00	42.2 AV	54.0	-11.8	1.64 H	285	4.31	37.89
7	7386.00	54.3 PK	74.0	-19.7	1.04 H	336	9.62	44.68
8	7386.00	39.6 AV	54.0	-14.4	1.04 H	336	-5.08	44.68
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	120.0 PK			2.29 V	180	88.08	31.92
2	*2462.00	108.3 AV			2.29 V	180	76.38	31.92
3	**2483.50**	**73.9 PK**	**74.0**	**-0.1**	**2.29 V**	**180**	**41.88**	**32.02**
4	2483.50	53.8 AV	54.0	-0.2	2.29 V	180	21.78	32.02
5	4924.00	55.3 PK	74.0	-18.7	1.54 V	27	17.41	37.89
6	4924.00	42.4 AV	54.0	-11.6	1.54 V	27	4.51	37.89
7	7386.00	54.3 PK	74.0	-19.7	1.46 V	35	9.62	44.68
8	7386.00	39.8 AV	54.0	-14.2	1.46 V	35	-4.88	44.68

REMARKS:

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

VHT40

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.2 PK	74.0	-16.8	1.39 H	268	25.58	31.62
2	2390.00	46.0 AV	54.0	-8.0	1.39 H	268	14.38	31.62
3	*2422.00	97.4 PK			1.39 H	268	65.64	31.76
4	*2422.00	85.8 AV			1.39 H	268	54.04	31.76
5	4844.00	56.4 PK	74.0	-17.6	1.64 H	290	18.75	37.65
6	4844.00	42.9 AV	54.0	-11.1	1.64 H	290	5.25	37.65
7	7266.00	54.2 PK	74.0	-19.8	1.07 H	345	9.80	44.40
8	7266.00	39.4 AV	54.0	-14.6	1.07 H	345	-5.00	44.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.9 PK	74.0	-2.1	2.00 V	176	40.28	31.62
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**2.00 V**	**176**	**22.28**	**31.62**
3	*2422.00	112.6 PK			2.00 V	176	80.84	31.76
4	*2422.00	100.9 AV			2.00 V	176	69.14	31.76
5	4844.00	55.8 PK	74.0	-18.2	1.58 V	44	18.15	37.65
6	4844.00	42.8 AV	54.0	-11.2	1.58 V	44	5.15	37.65
7	7266.00	54.0 PK	74.0	-20.0	1.48 V	48	9.60	44.40
8	7266.00	39.2 AV	54.0	-14.8	1.48 V	48	-5.20	44.40

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	54.7 PK	74.0	-19.3	1.30 H	248	23.08	31.62
2	2390.00	45.3 AV	54.0	-8.7	1.30 H	248	13.68	31.62
3	*2437.00	101.1 PK			1.30 H	248	69.28	31.82
4	*2437.00	88.9 AV			1.30 H	248	57.08	31.82
5	2483.50	54.1 PK	74.0	-19.9	1.30 H	248	22.08	32.02
6	2483.50	41.9 AV	54.0	-12.1	1.30 H	248	9.88	32.02
7	4874.00	55.9 PK	74.0	-18.1	1.61 H	272	18.13	37.77
8	4874.00	42.4 AV	54.0	-11.6	1.61 H	272	4.63	37.77
9	7311.00	53.8 PK	74.0	-20.2	1.04 H	350	9.32	44.48
10	7311.00	39.5 AV	54.0	-14.5	1.04 H	350	-4.98	44.48
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.8 PK	74.0	-4.2	2.36 V	205	38.18	31.62
2	2390.00	53.5 AV	54.0	-0.5	2.36 V	205	21.88	31.62
3	*2437.00	115.9 PK			2.36 V	205	84.08	31.82
4	*2437.00	104.0 AV			2.36 V	205	72.18	31.82
5	2483.50	69.2 PK	74.0	-4.8	2.36 V	205	37.18	32.02
6	2483.50	50.0 AV	54.0	-4.0	2.36 V	205	17.98	32.02
7	4874.00	56.5 PK	74.0	-17.5	1.59 V	42	18.73	37.77
8	4874.00	43.2 AV	54.0	-10.8	1.59 V	42	5.43	37.77
9	7311.00	53.7 PK	74.0	-20.3	1.44 V	33	9.22	44.48
10	7311.00	39.0 AV	54.0	-15.0	1.44 V	33	-5.48	44.48

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	98.0 PK			1.35 H	274	66.12	31.88
2	*2452.00	86.5 AV			1.35 H	274	54.62	31.88
3	2483.50	57.5 PK	74.0	-16.5	1.35 H	274	25.48	32.02
4	2483.50	46.3 AV	54.0	-7.7	1.35 H	274	14.28	32.02
5	4904.00	56.1 PK	74.0	-17.9	1.60 H	291	18.23	37.87
6	4904.00	42.5 AV	54.0	-11.5	1.60 H	291	4.63	37.87
7	7356.00	54.7 PK	74.0	-19.3	1.09 H	349	10.10	44.60
8	7356.00	39.9 AV	54.0	-14.1	1.09 H	349	-4.70	44.60
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	112.9 PK			2.19 V	182	81.02	31.88
2	*2452.00	101.4 AV			2.19 V	182	69.52	31.88
3	2483.50	72.3 PK	74.0	-1.7	2.19 V	182	40.28	32.02
4	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**2.19 V**	**182**	**21.88**	**32.02**
5	4904.00	56.4 PK	74.0	-17.6	1.60 V	36	18.53	37.87
6	4904.00	43.2 AV	54.0	-10.8	1.60 V	36	5.33	37.87
7	7356.00	53.7 PK	74.0	-20.3	1.48 V	29	9.10	44.60
8	7356.00	39.3 AV	54.0	-14.7	1.48 V	29	-5.30	44.60

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

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	36.96	29.8 QP	40.0	-10.2	1.50 H	118	51.03	-21.21
2	247.31	40.1 QP	46.0	-5.9	1.00 H	235	61.30	-21.22
3	259.16	40.7 QP	46.0	-5.3	1.00 H	13	61.54	-20.86
4	350.49	42.0 QP	46.0	-4.0	2.50 H	173	60.18	-18.16
5	387.78	40.8 QP	46.0	-5.2	1.00 H	180	57.86	-17.04
6	500.01	36.8 QP	46.0	-9.2	1.00 H	342	51.04	-14.25
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	62.49	35.8 QP	40.0	-4.2	1.00 V	225	57.14	-21.33
2	320.71	41.5 QP	46.0	-4.5	1.50 V	271	60.01	-18.55
3	326.41	40.4 QP	46.0	-5.6	1.00 V	158	58.88	-18.45
4	394.04	41.0 QP	46.0	-5.0	1.00 V	148	57.97	-16.94
5	500.01	39.6 QP	46.0	-6.4	1.00 V	226	53.83	-14.25
6	750.00	37.1 QP	46.0	-9.0	1.00 V	143	46.26	-9.21

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 14 to 28, 2015

4.2.3 Test Procedures

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

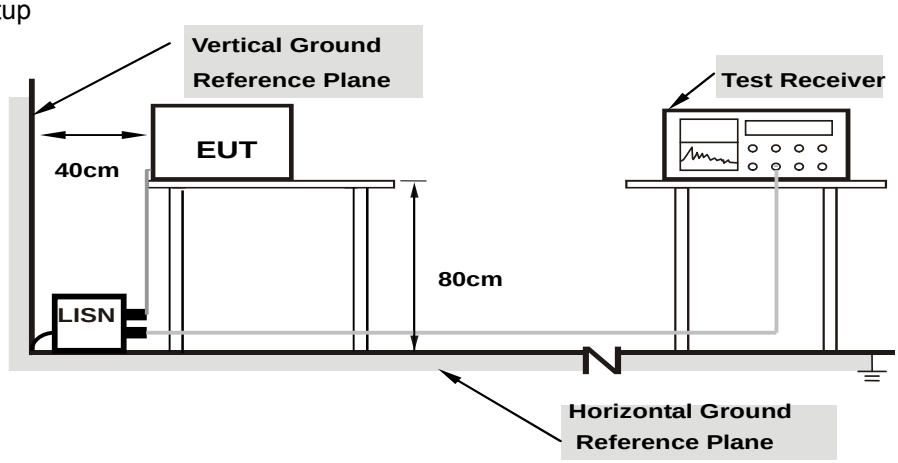
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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 (Mode 1)

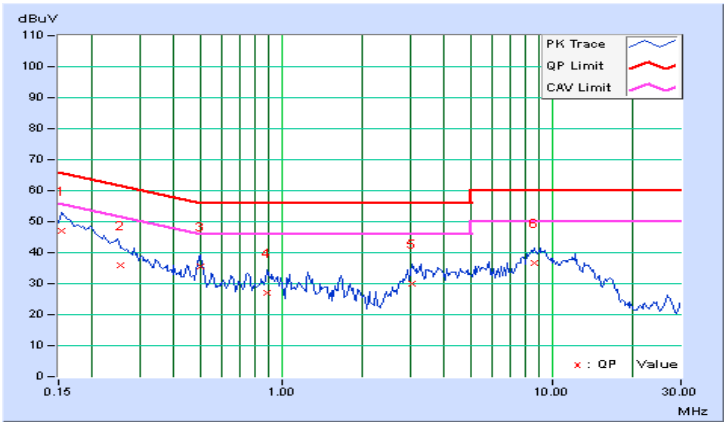
CDD Mode

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	0.15391	0.14	46.74	38.22	46.88	38.36	65.79	55.79	-18.91	-17.43
2	0.25328	0.16	35.80	29.78	35.96	29.94	61.65	51.65	-25.69	-21.71
3	0.50156	0.18	35.32	31.98	35.50	32.16	56.00	46.00	-20.50	-13.84
4	0.88828	0.19	26.78	19.82	26.97	20.01	56.00	46.00	-29.03	-25.99
5	3.05859	0.32	29.82	23.14	30.14	23.46	56.00	46.00	-25.86	-22.54
6	8.62500	0.66	36.08	30.70	36.74	31.36	60.00	50.00	-23.26	-18.64

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

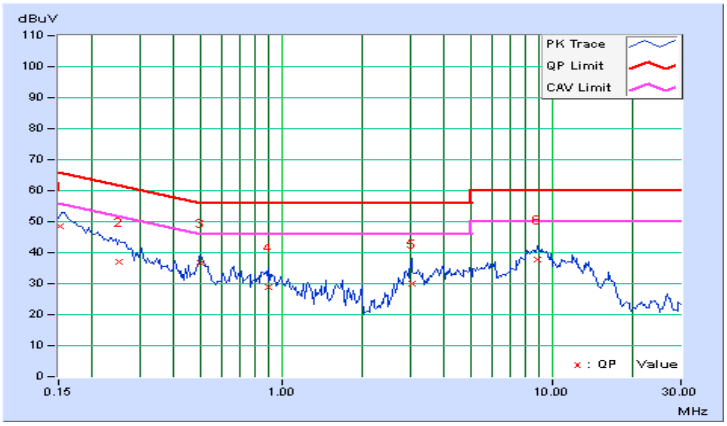


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.15103	0.14	48.22	39.96	48.36	40.10	65.94	55.94	-17.58	-15.84
2	0.25094	0.16	36.88	29.80	37.04	29.96	61.73	51.73	-24.69	-21.77
3	**0.50156**	**0.20**	**36.62**	**32.58**	**36.82**	**32.78**	**56.00**	**46.00**	**-19.18**	**-13.22**
4	0.90000	0.23	28.72	21.06	28.95	21.29	56.00	46.00	-27.05	-24.71
5	3.02734	0.36	29.72	23.54	30.08	23.90	56.00	46.00	-25.92	-22.10
6	8.87891	0.72	36.94	31.22	37.66	31.94	60.00	50.00	-22.34	-18.06

Remarks:

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



4.2.8 Test Results (Mode 2)

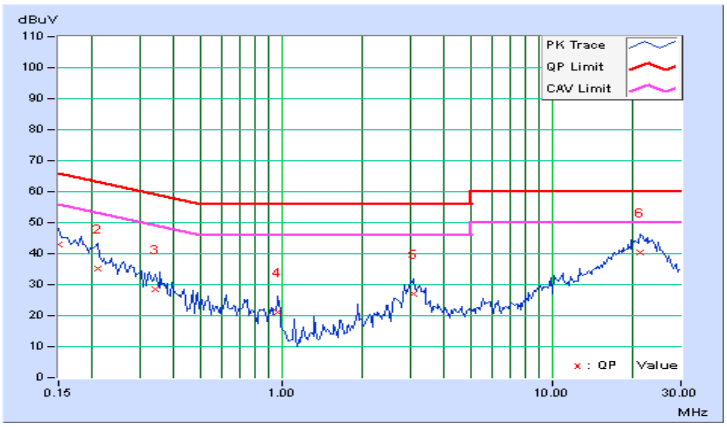
CDD Mode

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	0.15000	0.14	42.76	30.39	42.90	30.53	66.00	56.00	-23.10	-25.47
2	0.20859	0.15	34.96	22.95	35.11	23.10	63.26	53.26	-28.15	-30.16
3	0.34141	0.16	28.32	23.36	28.48	23.52	59.17	49.17	-30.68	-25.64
4	0.97422	0.20	20.78	20.47	20.98	20.67	56.00	46.00	-35.02	-25.33
5	3.08594	0.33	26.84	20.51	27.17	20.84	56.00	46.00	-28.83	-25.16
6	21.19141	1.15	39.12	34.21	40.27	35.36	60.00	50.00	-19.73	-14.64

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

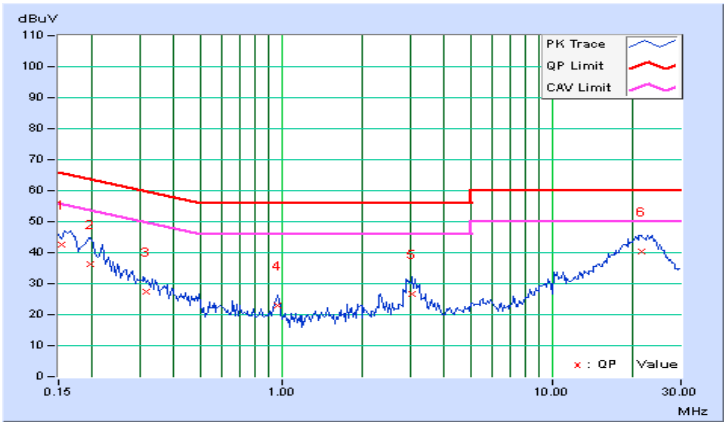


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.15463	0.14	42.28	31.06	42.42	31.20	65.75	55.75	-23.33	-24.55
2	0.19687	0.15	35.98	22.56	36.13	22.71	63.74	53.74	-27.61	-31.03
3	0.31634	0.17	27.14	19.52	27.31	19.69	59.80	49.80	-32.49	-30.11
4	0.97422	0.24	22.62	20.82	22.86	21.06	56.00	46.00	-33.14	-24.94
5	3.03516	0.36	26.19	19.84	26.55	20.20	56.00	46.00	-29.45	-25.80
6	21.39063	1.27	39.00	34.00	40.27	35.27	60.00	50.00	-19.73	-14.73

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

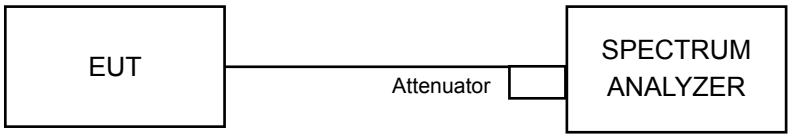


4.3 6dB Bandwidth Measurement

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSV 40	100964	June 26, 2015	June 25, 2016

NOTE: 1. The test was performed in Oven room B.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: July 06, 2015

4.3.4 Test Procedure

a. Set resolution bandwidth (RBW) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. 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 fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

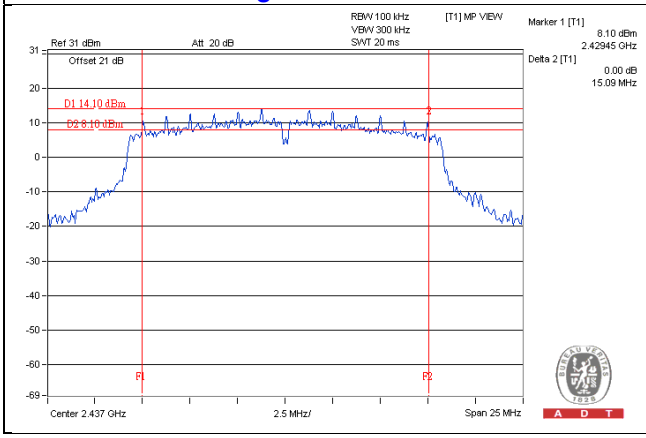
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 Test Result

CDD Mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
802.11g							
1	2412	15.15	15.16	15.13	15.16	0.5	PASS
6	2437	15.18	15.09	15.15	15.16	0.5	PASS
11	2462	15.18	15.16	15.15	15.15	0.5	PASS

Spectrum Plot of Worst Value	
802.11g – Chain 1: CH 6	

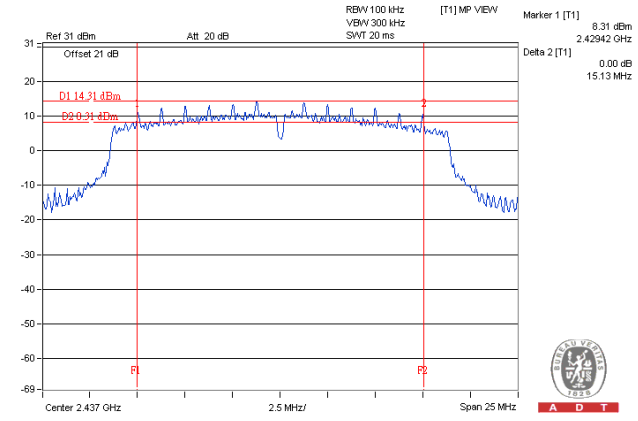


Beamforming Mode

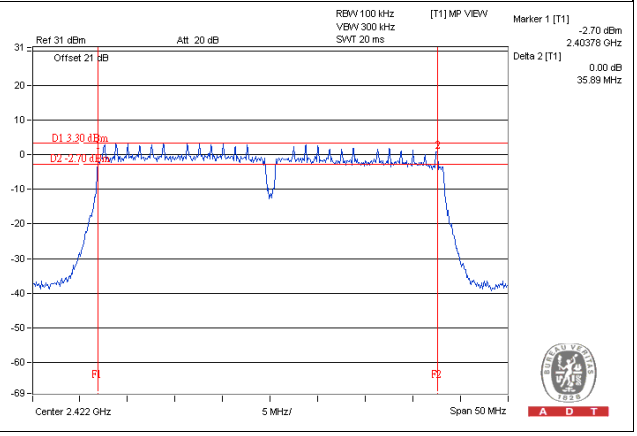
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
VHT20							
1	2412	15.14	15.16	15.16	15.14	0.5	PASS
6	2437	15.17	15.17	15.13	15.14	0.5	PASS
11	2462	15.17	15.76	15.14	15.17	0.5	PASS
VHT40							
3	2422	35.89	36.46	35.92	35.89	0.5	PASS
6	2437	36.46	36.46	35.89	36.47	0.5	PASS
9	2452	36.47	36.48	36.49	36.48	0.5	PASS

Spectrum Plot of Worst Value

VHT20 – Chain 2: CH 6



VHT40 – Chain 0: CH 3



4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

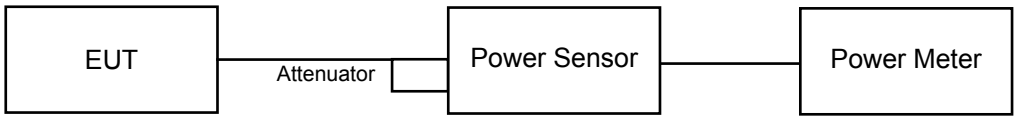
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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 NANT ≤ 4;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;
Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less for 20-MHz channel widths with NANT ≥ 5.

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

4.4.2 Test Setup



4.4.3 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
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 test was performed in Oven room B.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: July 06, 2015

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	Chain 3				
802.11b									
1	2412	20.80	21.30	21.38	21.17	523.444	27.19	30	Pass
6	2437	22.54	23.33	23.36	23.92	858.125	29.34	30	Pass
11	2462	21.85	23.10	22.58	22.54	717.89	28.56	30	Pass
802.11g									
1	2412	21.85	22.22	22.33	22.04	650.792	28.13	30	Pass
6	2437	23.36	23.75	23.86	23.66	929.401	29.68	30	Pass
11	2462	21.03	21.58	21.51	21.15	542.541	27.34	30	Pass

Beamforming Mode

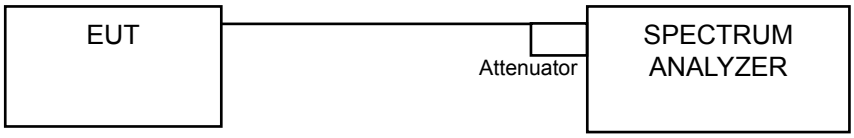
Channel	Frequency (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
VHT20									
1	2412	20.26	20.50	20.19	20.43	433.252	26.37	30	Pass
6	2437	22.96	23.15	23.75	23.16	848.386	29.29	30	Pass
11	2462	19.28	20.25	19.81	19.33	372.071	25.71	30	Pass
VHT40									
3	2422	16.85	17.37	17.58	17.11	211.677	23.26	30	Pass
6	2437	20.10	20.41	20.80	20.09	434.55	26.38	30	Pass
9	2452	16.69	17.38	17.19	16.73	200.826	23.03	30	Pass

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 Test Setup



4.5.3 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSV 40	100964	June 26, 2015	June 25, 2016

NOTE: 1. The test was performed in Oven room B.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: July 06, 2015

4.5.4 Test Procedure

a) Set instrument center frequency to DTS channel center frequency.
b) Set span to at least 1.5 times the OBW.
c) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz. .
d) Set VBW ≥3 x RBW.
e) Detector = power averaging (RMS) or sample detector (when RMS not available).
f) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g) Sweep time = auto couple.
h) Employ trace averaging (RMS) mode over a minimum of 100 traces.
i) Use the peak marker function to determine the maximum amplitude level.

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

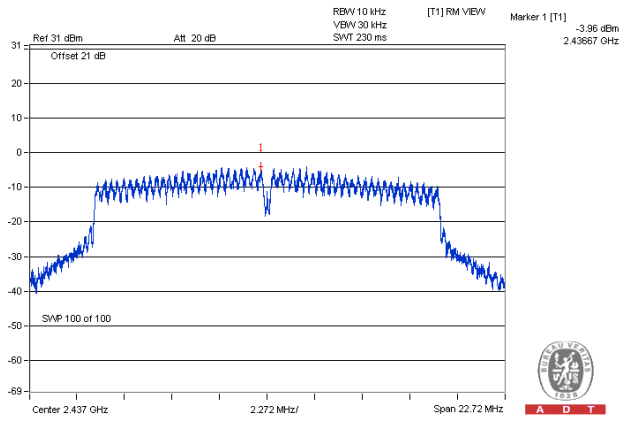
TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
802.11g							
0	1	2412	-6.31	6.02	-0.29	7.31	Pass
	6	2437	-4.12	6.02	1.90	7.31	Pass
	11	2462	-7.13	6.02	-1.11	7.31	Pass
1	1	2412	-6.45	6.02	-0.43	7.31	Pass
	6	2437	-4.19	6.02	1.83	7.31	Pass
	11	2462	-6.71	6.02	-0.69	7.31	Pass
2	1	2412	-5.43	6.02	0.59	7.31	Pass
	6	2437	-3.96	6.02	2.06	7.31	Pass
	11	2462	-6.67	6.02	-0.65	7.31	Pass
3	1	2412	-5.70	6.02	0.32	7.31	Pass
	6	2437	-4.53	6.02	1.49	7.31	Pass
	11	2462	-5.67	6.02	0.35	7.31	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 = 0.67dBi + 10log(4) = 6.69dBi > 6dBi , so the power density limit shall be reduced to 8-(6.69-6) = 7.31dBm.

Spectrum Plot of Worst Value

802.11g– Chain 2: CH 6

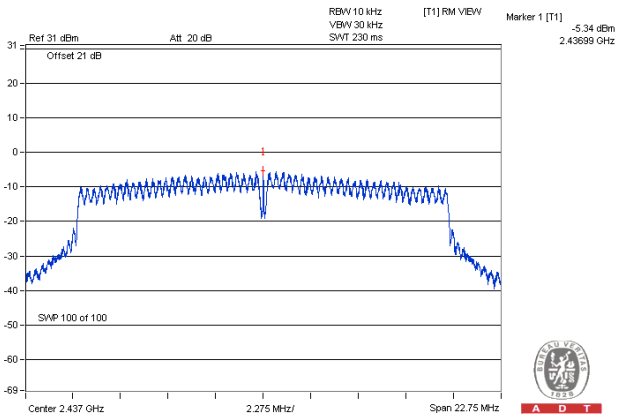
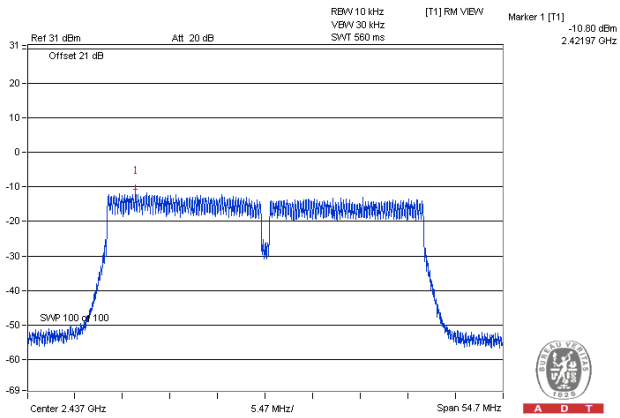


Beamforming Mode

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
VHT20							
0	1	2412	-9.00	6.02	-2.98	7.31	Pass
	6	2437	-5.34	6.02	0.68	7.31	Pass
	11	2462	-9.68	6.02	-3.66	7.31	Pass
1	1	2412	-8.97	6.02	-2.95	7.31	Pass
	6	2437	-5.71	6.02	0.31	7.31	Pass
	11	2462	-9.89	6.02	-3.87	7.31	Pass
2	1	2412	-8.98	6.02	-2.96	7.31	Pass
	6	2437	-5.54	6.02	0.48	7.31	Pass
	11	2462	-9.35	6.02	-3.33	7.31	Pass
3	1	2412	-8.87	6.02	-2.85	7.31	Pass
	6	2437	-5.35	6.02	0.67	7.31	Pass
	11	2462	-8.64	6.02	-2.62	7.31	Pass
VHT40							
0	3	2422	-15.21	6.02	-9.19	7.31	Pass
	6	2437	-12.63	6.02	-6.61	7.31	Pass
	9	2452	-16.00	6.02	-9.98	7.31	Pass
1	3	2422	-14.99	6.02	-8.97	7.31	Pass
	6	2437	-11.93	6.02	-5.91	7.31	Pass
	9	2452	-15.11	6.02	-9.09	7.31	Pass
2	3	2422	-15.03	6.02	-9.01	7.31	Pass
	6	2437	-11.59	6.02	-5.57	7.31	Pass
	9	2452	-14.66	6.02	-8.64	7.31	Pass
3	3	2422	-14.73	6.02	-8.71	7.31	Pass
	6	2437	-10.80	6.02	-4.78	7.31	Pass
	9	2452	-14.80	6.02	-8.78	7.31	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 = 0.67dBi + 10log(4) = 6.69dBi > 6dBi , so the power density limit shall be reduced to 8-(6.69-6) = 7.31dBm.

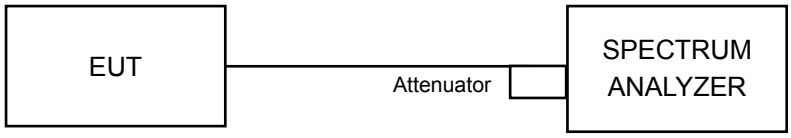
Spectrum Plot of Worst Value	
VHT20 – Chain 0: CH 6	**VHT40 – Chain 3: CH 6**
	

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSV 40	100964	June 26, 2015	June 25, 2016

NOTE: 1. The test was performed in Oven room B.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: July 06, 2015

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOBE

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

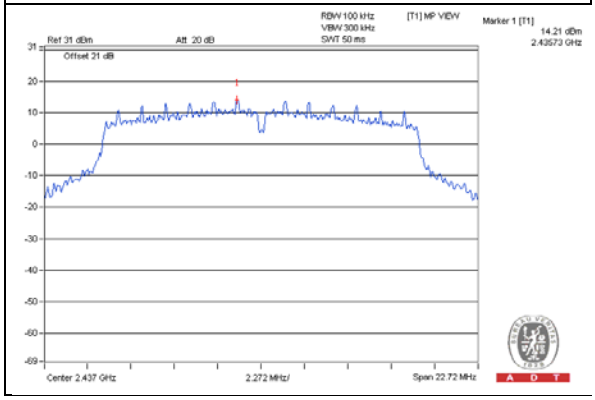
Same as Item 4.3.6

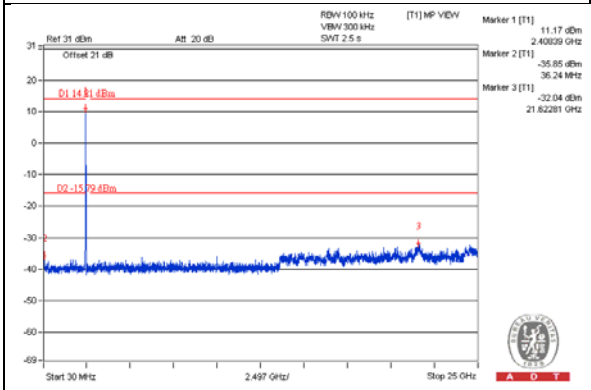
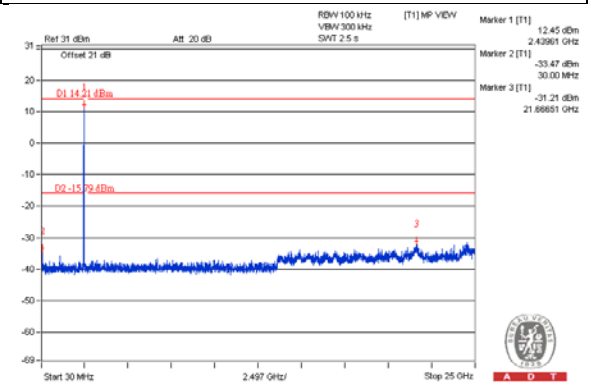
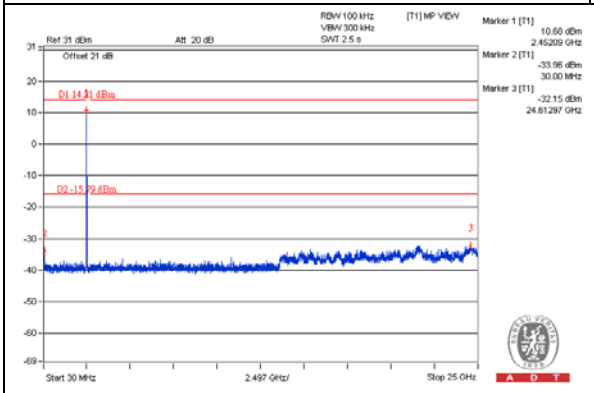
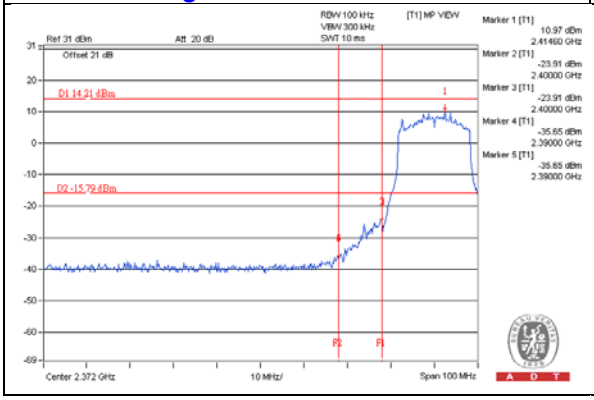
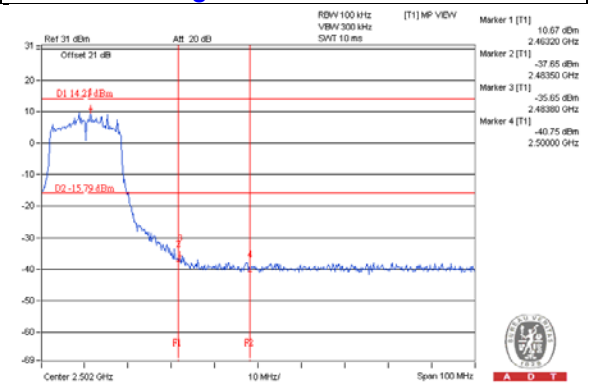
4.6.7 Test Results

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

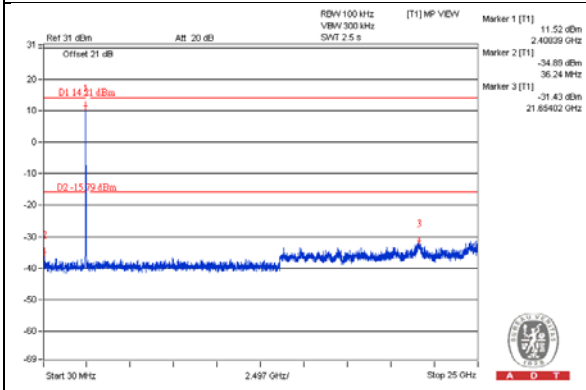
802.11g

Maximum REF


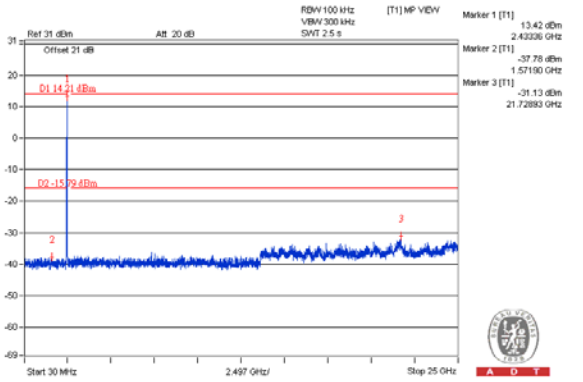
Chain 0	
CH 1	CH 6
	
CH 11	
	
CH 1 Band edge	CH 11 Band edge
	

Chain 1

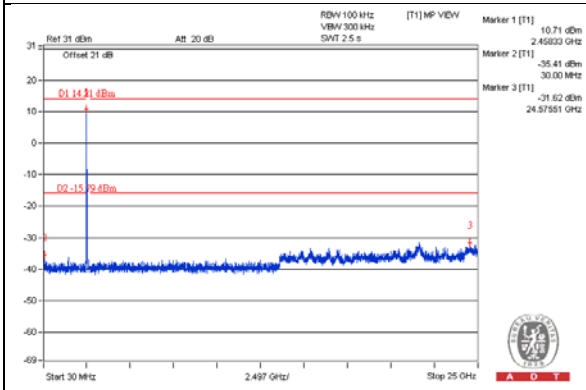
CH 1



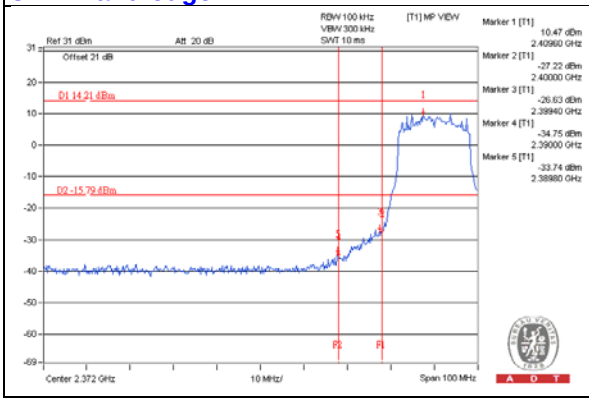
CH 6



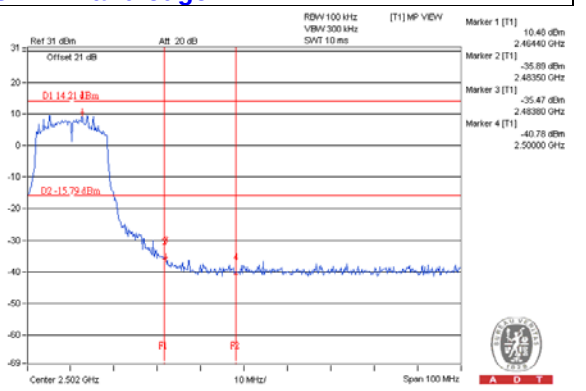
CH 11



CH 1 Band edge

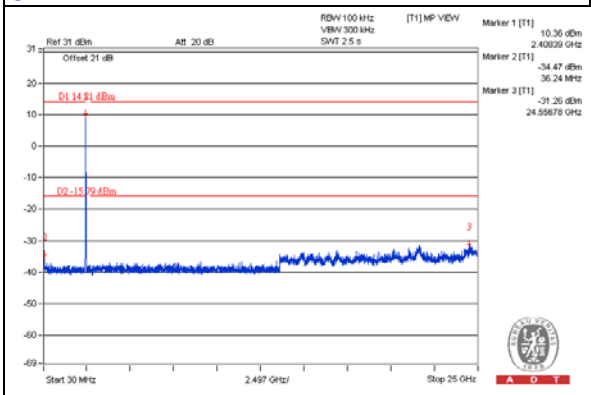


CH 11 Band edge

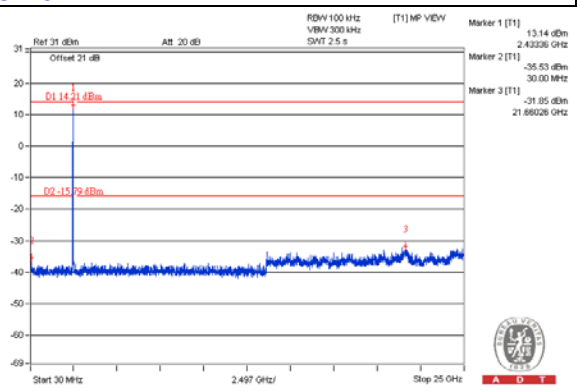


Chain 2

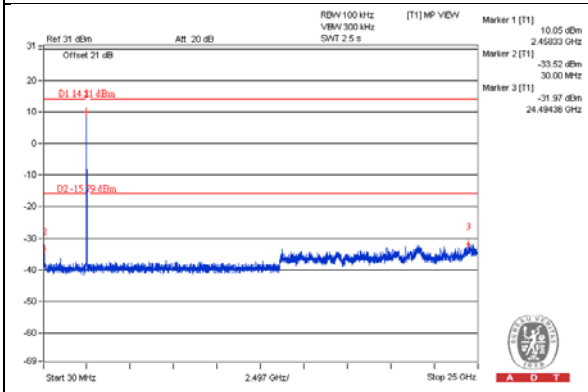
CH 1



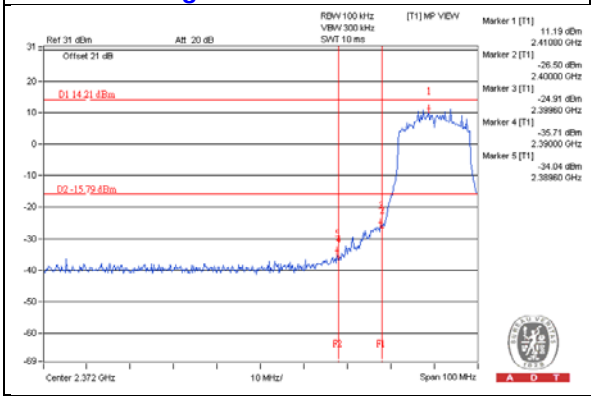
CH 6



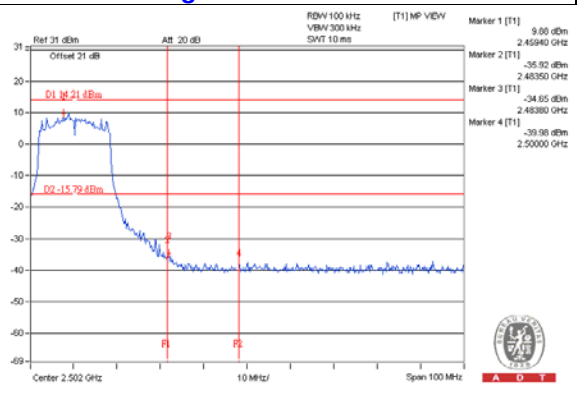
CH 11



CH 1 Band edge

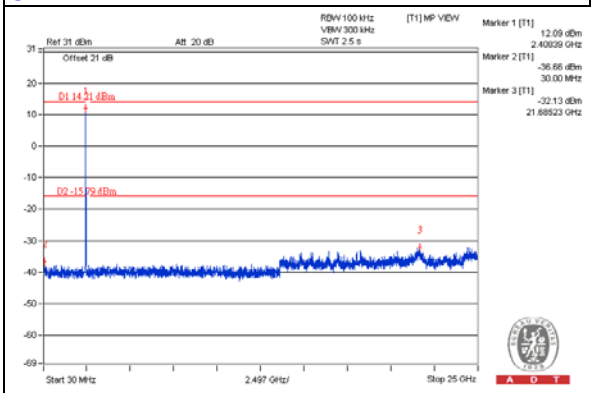


CH 11 Band edge

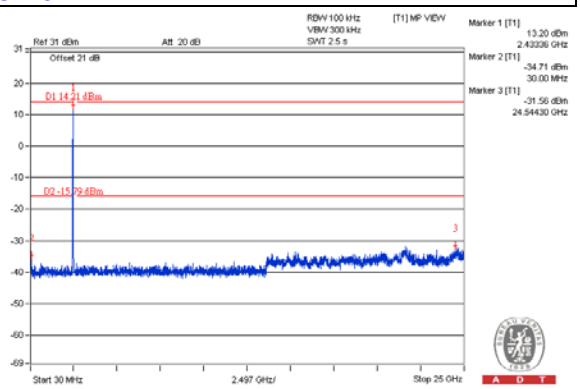


Chain 3

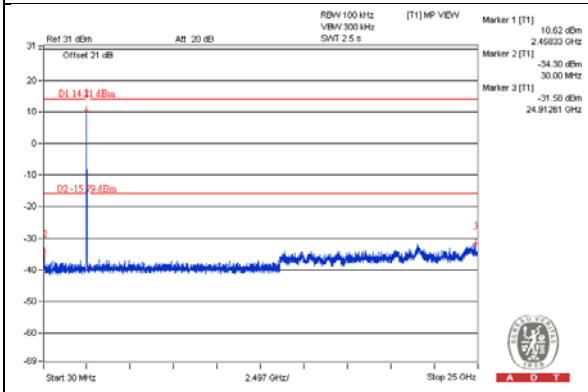
CH 1



CH 6



CH 11



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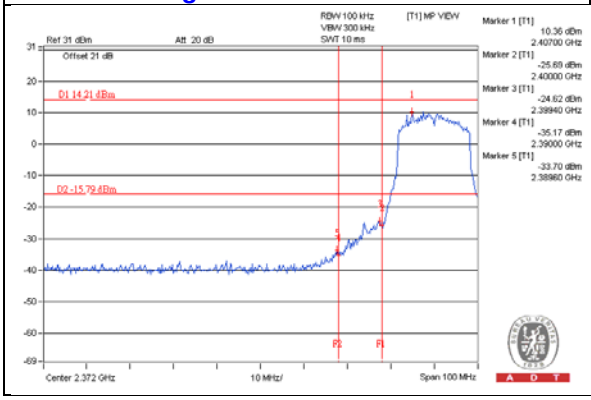
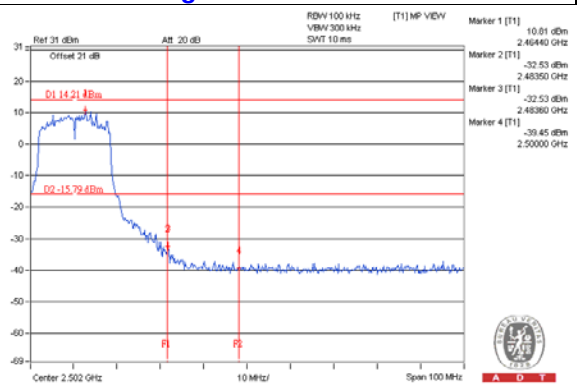


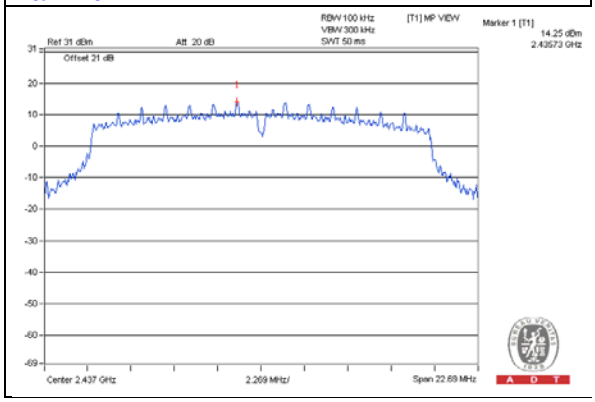
CH 11 Band edge



Beamforming Mode

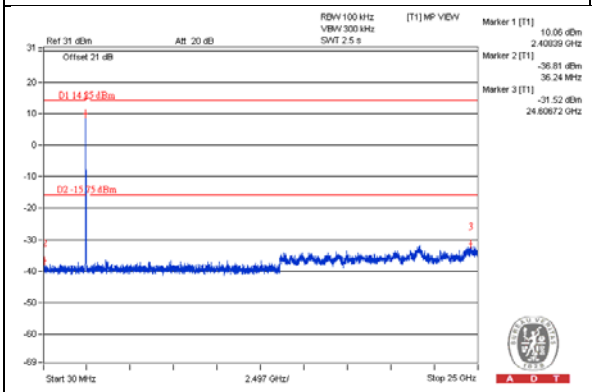
VHT20

Maximum REF

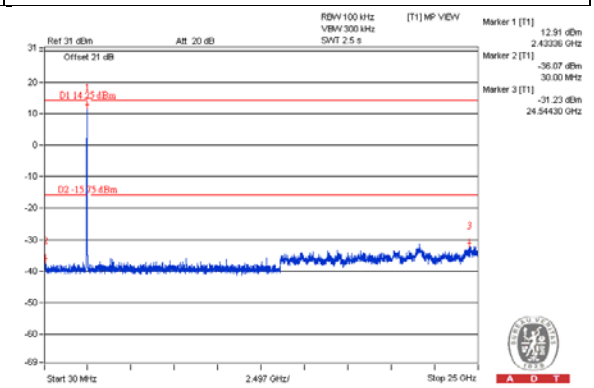


Chain 0

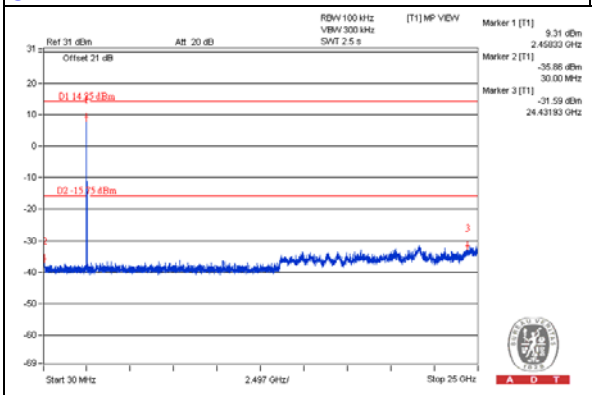
CH 1



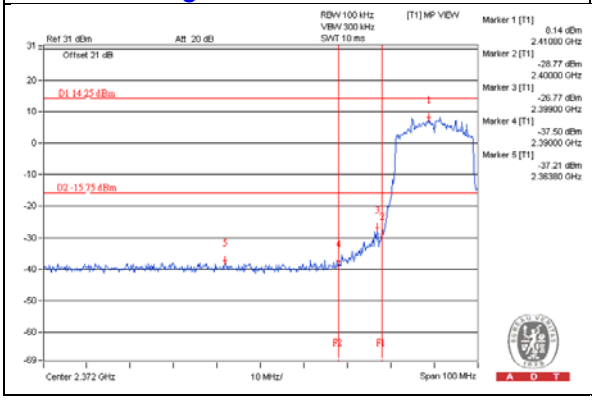
CH 6



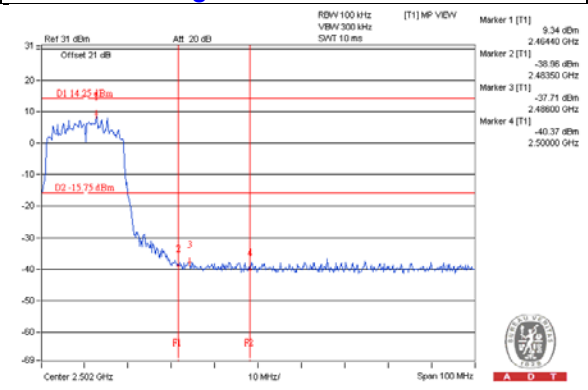
CH 11



CH 1 Band edge

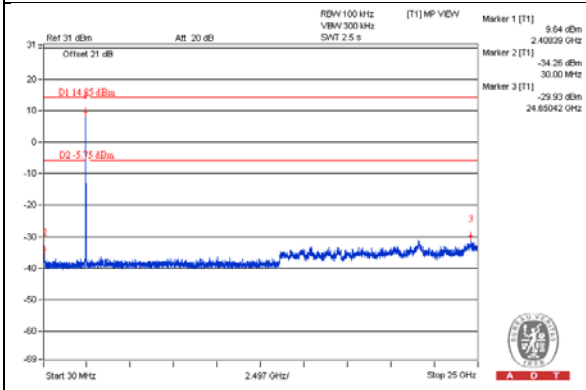


CH 11 Band edge

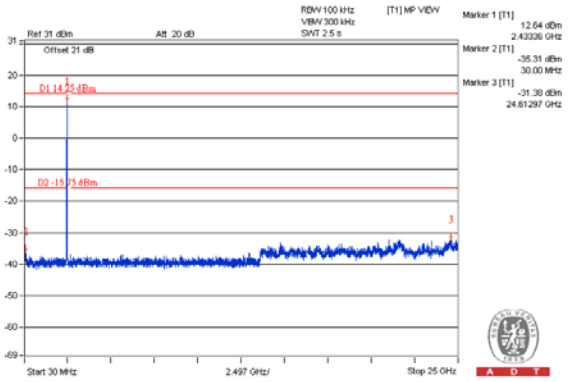


Chain 1

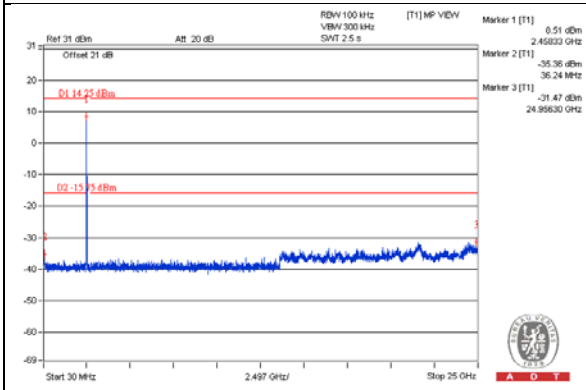
CH 1



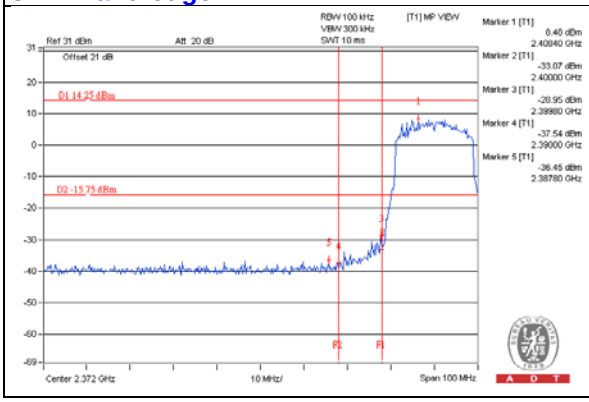
CH 6



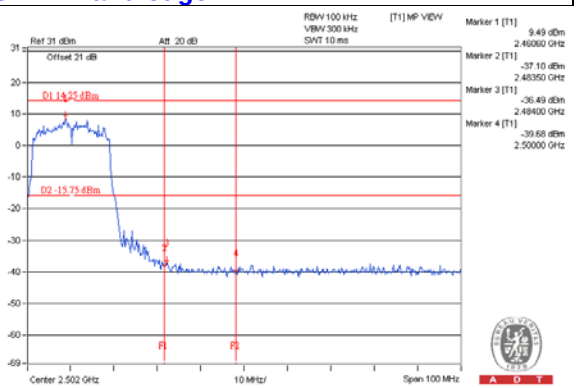
CH 11



CH 1 Band edge

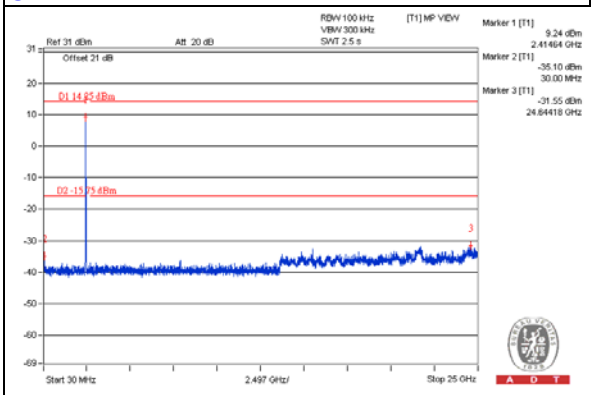


CH 11 Band edge

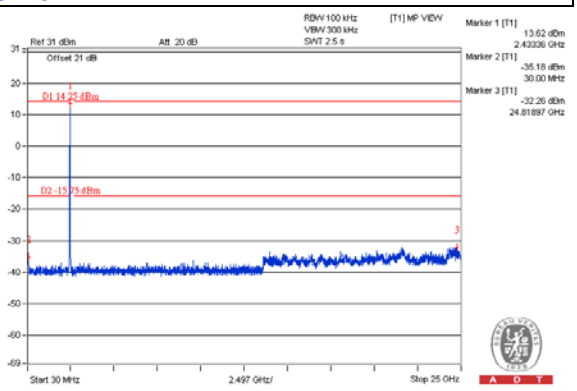


Chain 2

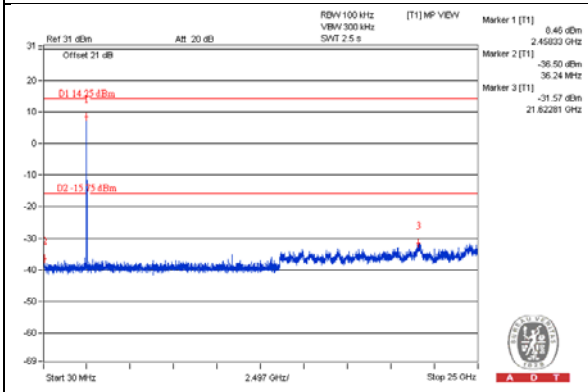
CH 1



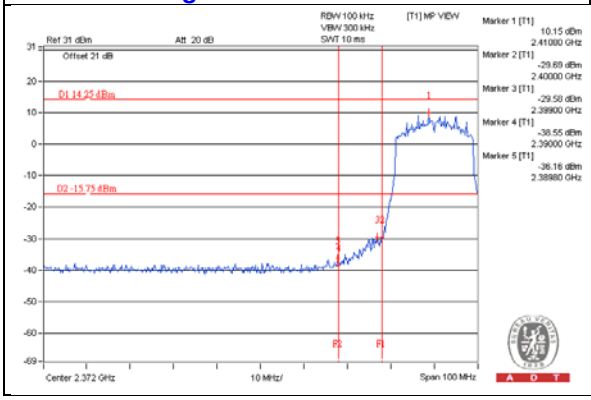
CH 6



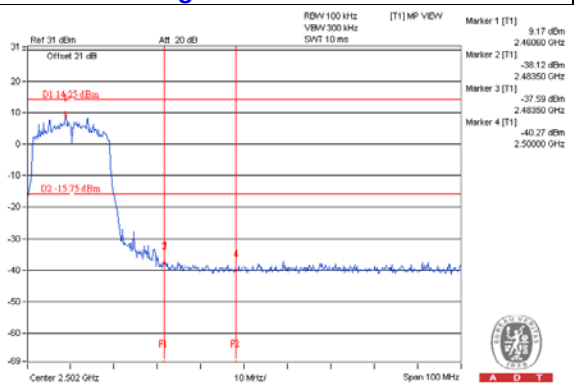
CH 11



CH 1 Band edge

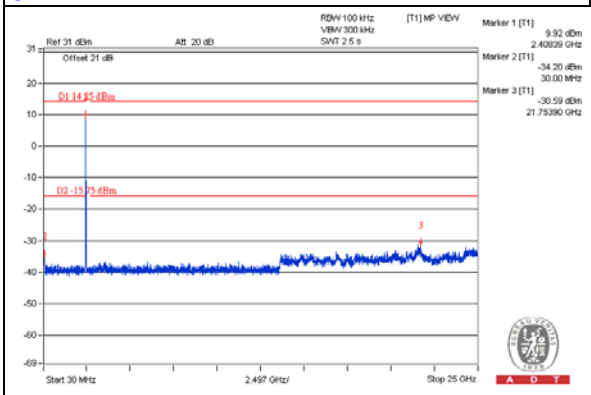


CH 11 Band edge

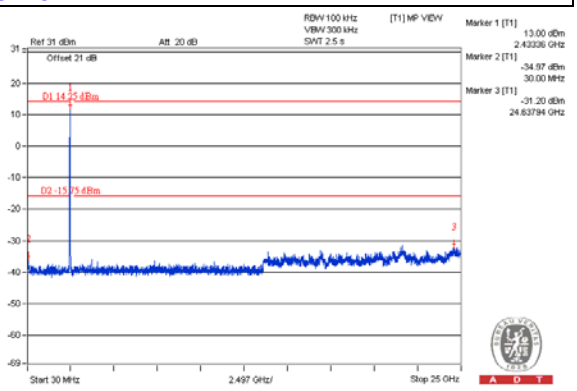


Chain 3

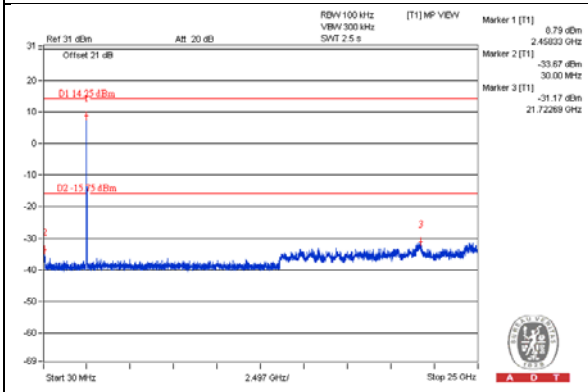
CH 1



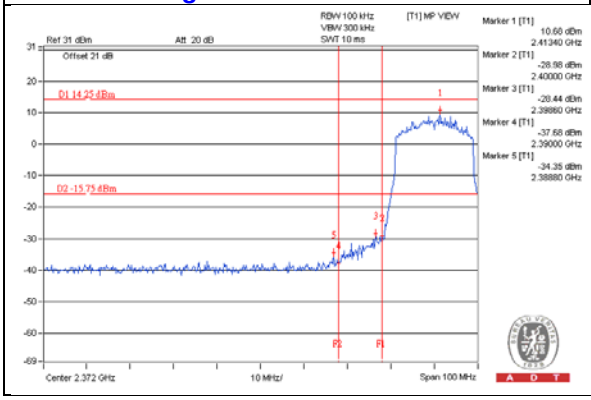
CH 6



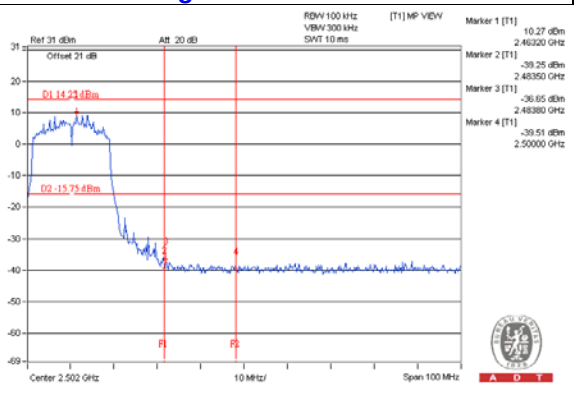
CH 11



CH 1 Band edge

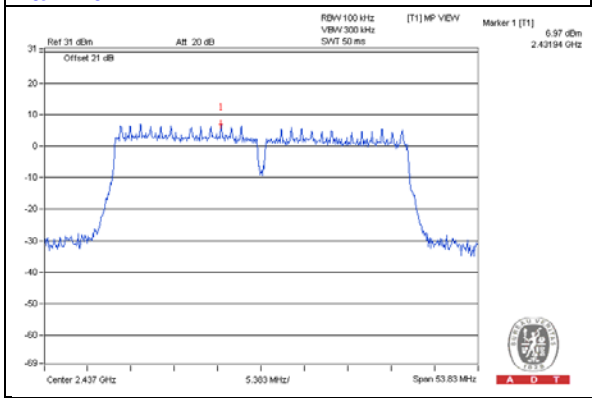


CH 11 Band edge



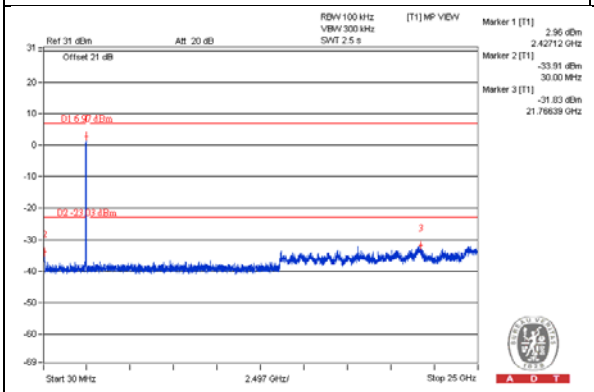
VHT40

Maximum REF

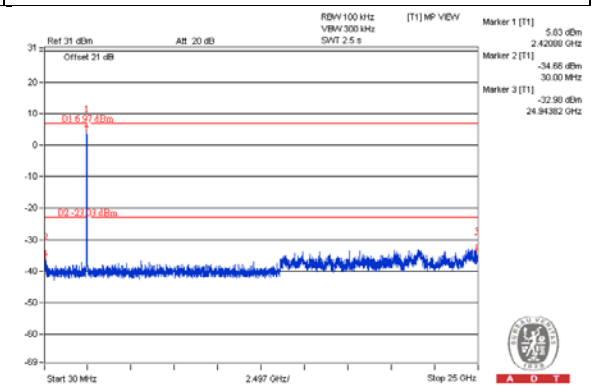


Chain 0

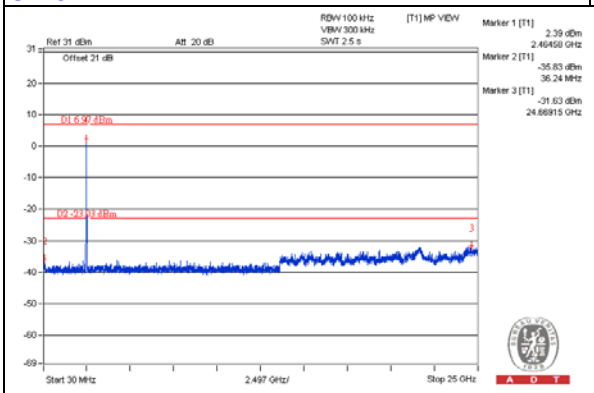
CH 3



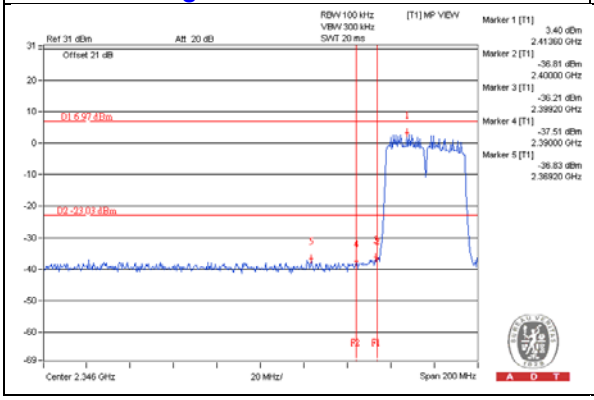
CH 6



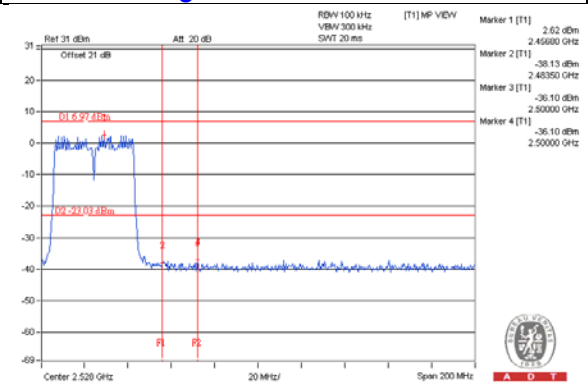
CH 9



CH 3 Band edge

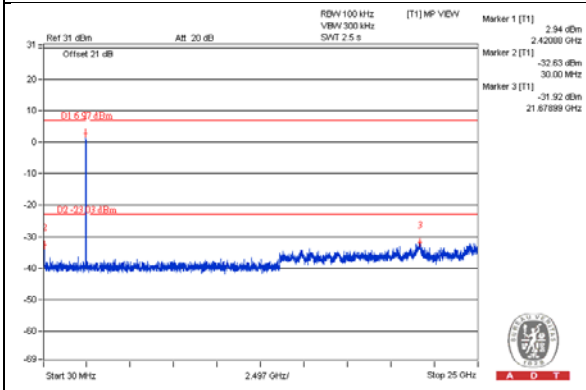


CH 9 Band edge

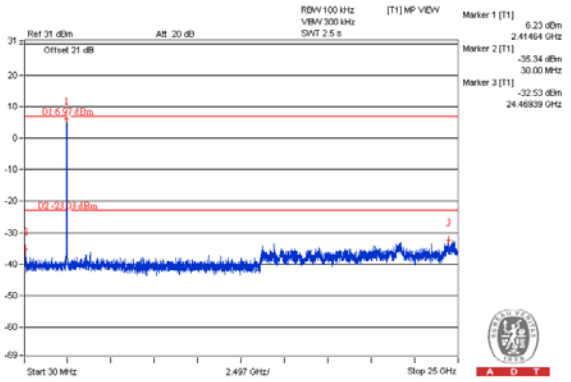


Chain 1

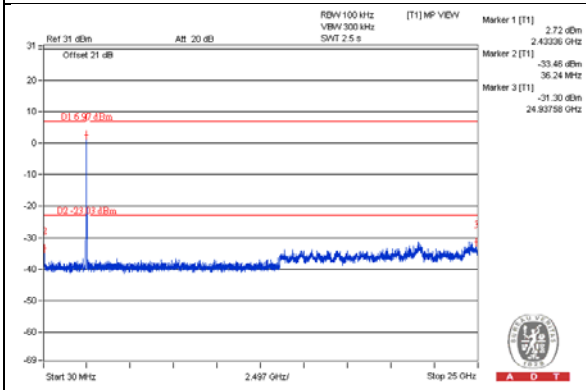
CH 3



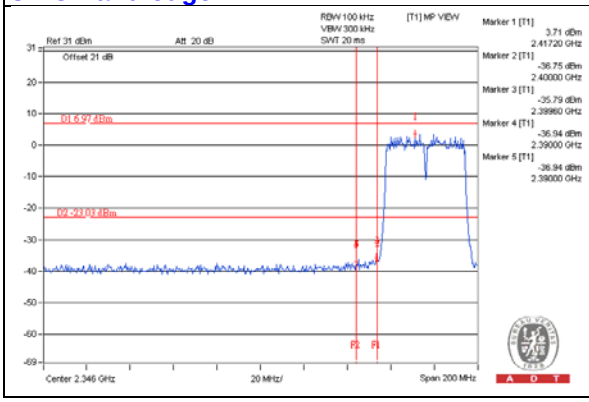
CH 6



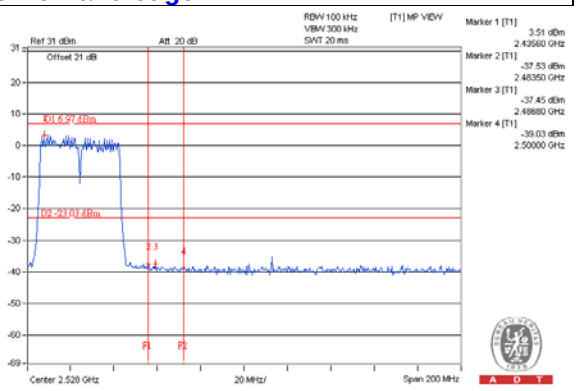
CH 9



CH 3 Band edge

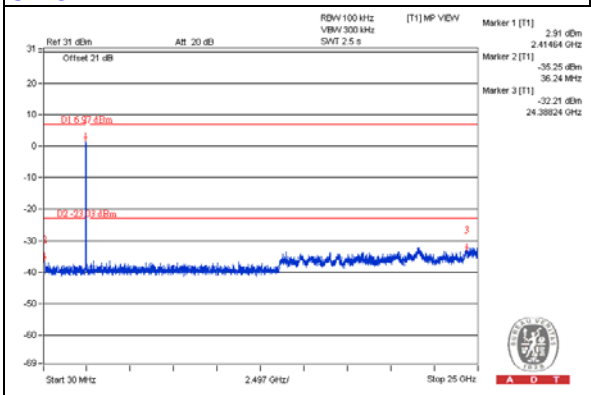


CH 9 Band edge

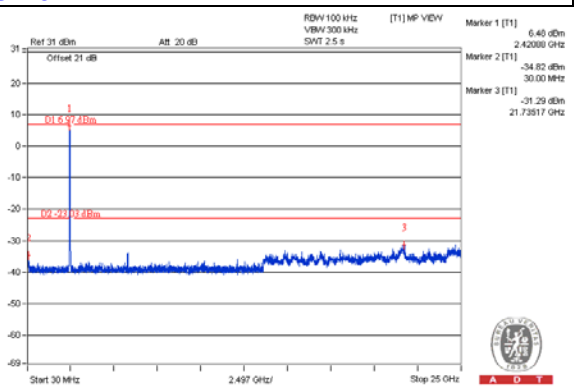


Chain 2

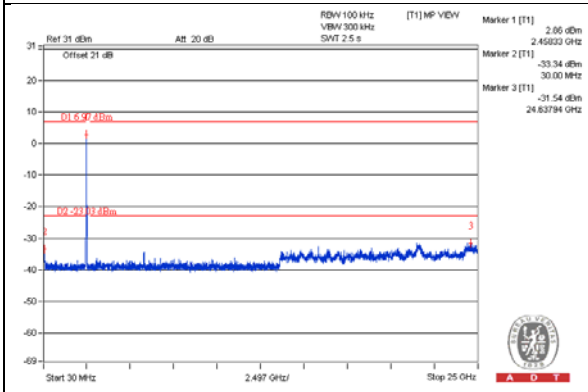
CH 3



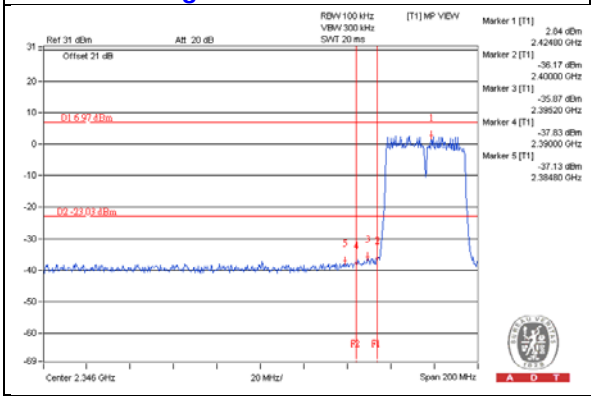
CH 6



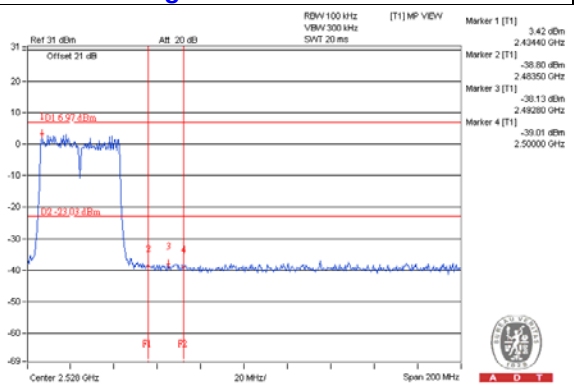
CH 9



CH 3 Band edge

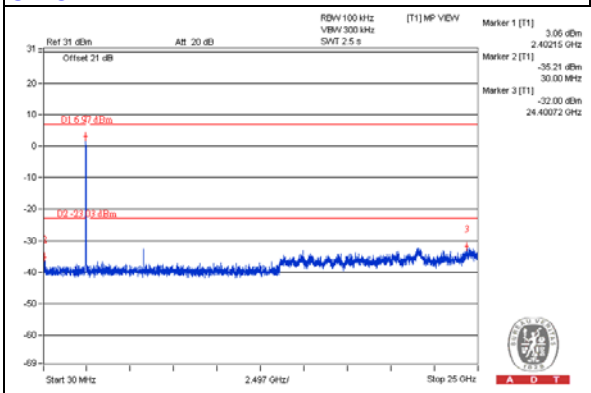


CH 9 Band edge

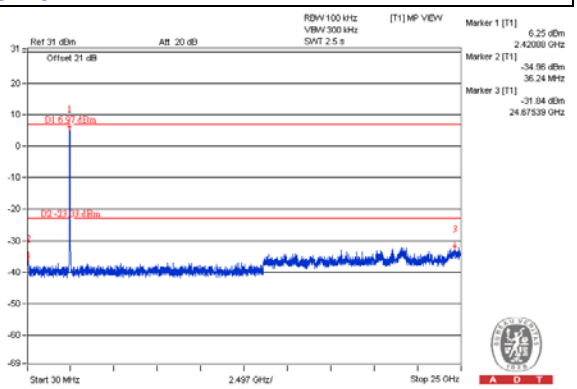


Chain 3

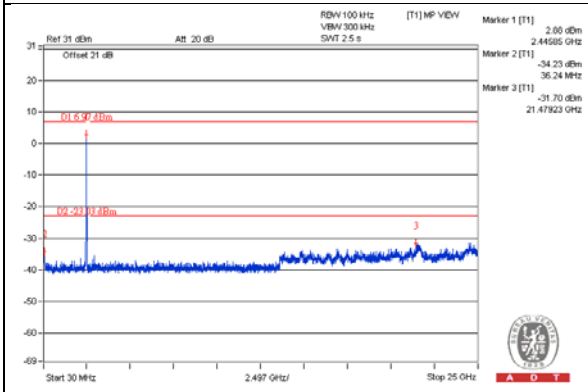
CH 3



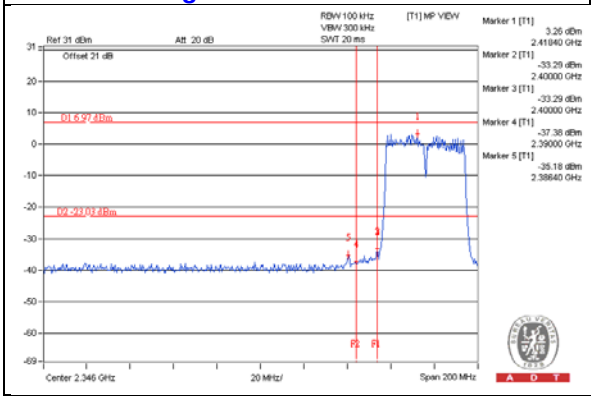
CH 6



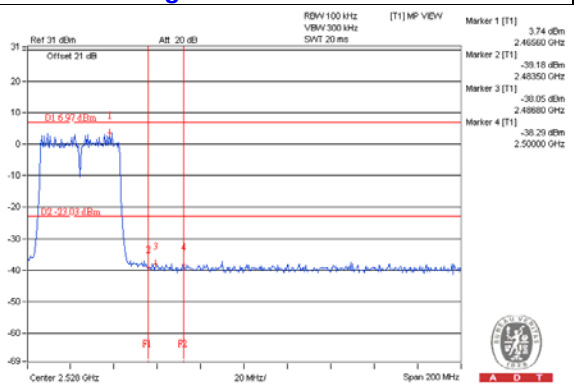
CH 9



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

For above 1GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 06, 2014	Oct. 05, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	July 25, 2014	July 24, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Feb. 06, 2015	Feb. 05, 2016
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Feb. 05, 2015	Feb. 04, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 09, 2015	Feb. 08, 2016
Preamplifier Agilent	8449B	3008A01961	Oct. 18, 2014	Oct. 17, 2015
Preamplifier Agilent	8447D	2944A10738	Oct. 18, 2014	Oct. 17, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309220/4	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250724/4	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Aug. 09, 2014	Aug. 08, 2015
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA	NA
Turn Table BV ADT	TT100	TT93021704	NA	NA
Turn Table Controller BV ADT	SC100	SC93021704	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2014	Oct. 17, 2015

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Chamber 4.

3. The FCC Site Registration No. is 460141.

4. The IC Site Registration No. is IC7450F-4.

5. Tested Date: July 03, 2015

For below 1GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	Aug. 11, 2014	Aug. 10, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-04	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Feb. 09, 2015	Feb. 08, 2016
RF Cable	8D-FB	CHHCAB-001-1 CHHCAB-001-2	Oct. 05, 2014	Oct. 04, 2015
	RF-141	CHHCAB-004	Oct. 05, 2014	Oct. 04, 2015
Software	ADT_Radiated_V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. H.
3. The FCC Site Registration No. is 797305.
4. The CANADA Site Registration No. is IC 7450H-3.
5. Tested Date: July 09, 2015

5.1.3 Test Procedures

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

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

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

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

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

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

Note:

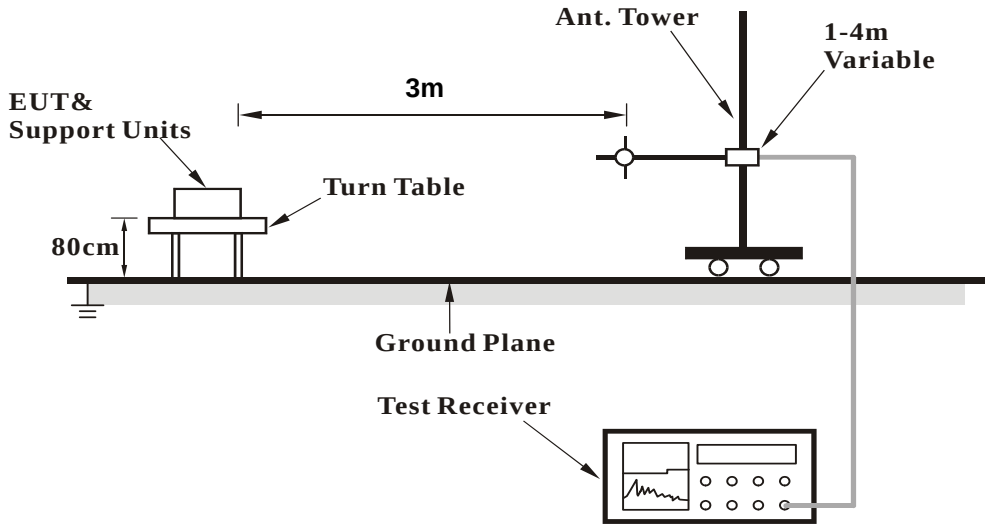
1. For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the ground at 3 meter chamber room for test
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (10 log(1/duty cycle)).
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
6. All modes of operation were investigated and the worst-case emissions are reported.

5.1.4 Deviation from Test Standard

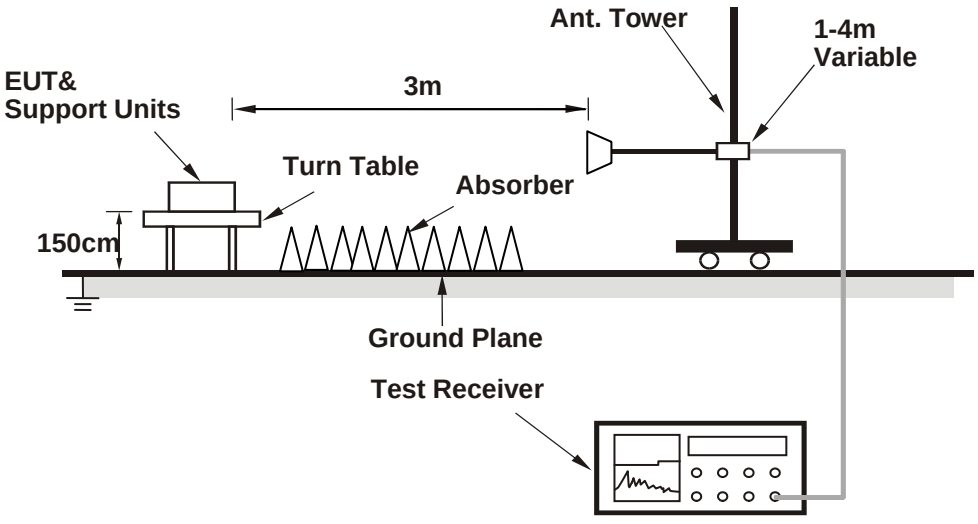
No deviation.

5.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

5.1.6 EUT Operating Conditions

1. Connect the EUT with the support units C-D (NOTEBOOK COMPUTER) which is placed on remote site.
2. Controlling software (Mtool.exe_2_0_2_7) has been activated to set the EUT on specific status.

5.1.7 Test Results

Above 1GHz Data (Subcontract Item)

CDD Mode

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	*5745.00	119.9 PK			1.87 H	292	80.38	39.52
2	*5745.00	108.1 AV			1.87 H	292	68.58	39.52
3	11490.00	60.3 PK	74.0	-13.7	1.04 H	139	9.71	50.59
4	11490.00	45.7 AV	54.0	-8.3	1.04 H	139	-4.89	50.59
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	124.7 PK			1.56 V	291	85.18	39.52
2	*5745.00	112.6 AV			1.56 V	291	73.08	39.52
3	11490.00	63.4 PK	74.0	-10.6	2.27 V	245	12.81	50.59
4	11490.00	49.2 AV	54.0	-4.8	2.27 V	245	-1.39	50.59

REMARKS:

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

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	120.5 PK			1.81 H	287	80.94	39.56
2	*5785.00	108.9 AV			1.81 H	287	69.34	39.56
3	11570.00	60.1 PK	74.0	-13.9	1.09 H	133	9.70	50.40
4	11570.00	46.1 AV	54.0	-7.9	1.09 H	133	-4.30	50.40
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	124.8 PK			1.51 V	281	85.24	39.56
2	*5785.00	112.7 AV			1.51 V	281	73.14	39.56
3	11570.00	63.2 PK	74.0	-10.8	2.26 V	244	12.80	50.40
4	11570.00	48.8 AV	54.0	-5.2	2.26 V	244	-1.60	50.40

REMARKS:

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

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	120.8 PK			1.87 H	271	81.22	39.58
2	*5825.00	108.8 AV			1.87 H	271	69.22	39.58
3	11650.00	60.5 PK	74.0	-13.5	1.05 H	134	10.22	50.28
4	11650.00	46.2 AV	54.0	-7.8	1.05 H	134	-4.08	50.28
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	124.7 PK			1.53 V	270	85.12	39.58
2	*5825.00	112.8 AV			1.53 V	270	73.22	39.58
3	11650.00	62.9 PK	74.0	-11.1	2.21 V	234	12.62	50.28
4	11650.00	48.8 AV	54.0	-5.2	2.21 V	234	-1.48	50.28

REMARKS:

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

802.11ac (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5745.00	119.8 PK			1.85 H	285	80.28	39.52
2	*5745.00	108.1 AV			1.85 H	285	68.58	39.52
3	11490.00	59.8 PK	74.0	-14.2	1.11 H	139	9.21	50.59
4	11490.00	45.6 AV	54.0	-8.4	1.11 H	139	-4.99	50.59
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	124.9 PK			1.41 V	277	85.38	39.52
2	*5745.00	112.7 AV			1.41 V	277	73.18	39.52
3	11490.00	63.1 PK	74.0	-10.9	2.17 V	245	12.51	50.59
4	11490.00	48.8 AV	54.0	-5.2	2.17 V	245	-1.79	50.59

REMARKS:

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

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	120.2 PK			1.83 H	276	80.64	39.56
2	*5785.00	108.4 AV			1.83 H	276	68.84	39.56
3	11570.00	60.0 PK	74.0	-14.0	1.06 H	134	9.60	50.40
4	11570.00	45.7 AV	54.0	-8.3	1.06 H	134	-4.70	50.40
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	124.8 PK			1.54 V	270	85.24	39.56
2	*5785.00	112.8 AV			1.54 V	270	73.24	39.56
3	11570.00	62.6 PK	74.0	-11.4	2.20 V	241	12.20	50.40
4	11570.00	48.5 AV	54.0	-5.5	2.20 V	241	-1.90	50.40

REMARKS:

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

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	119.9 PK			1.86 H	286	80.32	39.58
2	*5825.00	108.3 AV			1.86 H	286	68.72	39.58
3	11650.00	59.8 PK	74.0	-14.2	1.09 H	141	9.52	50.28
4	11650.00	45.6 AV	54.0	-8.4	1.09 H	141	-4.68	50.28
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	124.8 PK			1.36 V	275	85.22	39.58
2	*5825.00	112.2 AV			1.36 V	275	72.62	39.58
3	11650.00	62.2 PK	74.0	-11.8	2.18 V	248	11.92	50.28
4	11650.00	48.1 AV	54.0	-5.9	2.18 V	248	-2.18	50.28

REMARKS:

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

802.11ac (VHT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5755.00	120.8 PK			1.78 H	280	81.28	39.52
2	*5755.00	108.9 AV			1.78 H	280	69.38	39.52
3	11510.00	60.2 PK	74.0	-13.8	1.11 H	132	9.64	50.56
4	11510.00	45.8 AV	54.0	-8.2	1.11 H	132	-4.76	50.56
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	*5755.00	107.7 PK			1.38 V	273	68.18	39.52
2	*5755.00	102.3 AV			1.38 V	273	62.78	39.52
3	11510.00	62.4 PK	74.0	-11.6	2.24 V	260	11.84	50.56
4	11510.00	48.3 AV	54.0	-5.7	2.24 V	260	-2.26	50.56

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

CHANNEL	TX Channel 159	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	120.0 PK			1.80 H	267	80.43	39.57
2	*5795.00	108.1 AV			1.80 H	267	68.53	39.57
3	11590.00	60.5 PK	74.0	-13.5	1.12 H	141	10.16	50.34
4	11590.00	46.1 AV	54.0	-7.9	1.12 H	141	-4.24	50.34
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	121.5 PK			1.48 V	282	81.93	39.57
2	*5795.00	109.0 AV			1.48 V	282	69.43	39.57
3	11590.00	62.9 PK	74.0	-11.1	2.22 V	259	12.56	50.34
4	11590.00	48.5 AV	54.0	-5.5	2.22 V	259	-1.84	50.34

REMARKS:

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

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5775.00	119.8 PK			1.77 H	264	80.25	39.55
2	*5775.00	108.3 AV			1.77 H	264	68.75	39.55
3	11550.00	59.9 PK	74.0	-14.1	1.08 H	134	9.45	50.45
4	11550.00	45.7 AV	54.0	-8.3	1.08 H	134	-4.75	50.45
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5775.00	116.8 PK			1.42 V	272	77.25	39.55
2	*5775.00	103.2 AV			1.42 V	272	63.65	39.55
3	11550.00	63.0 PK	74.0	-11.0	2.20 V	249	12.55	50.45
4	11550.00	48.4 AV	54.0	-5.6	2.20 V	249	-2.05	50.45

REMARKS:

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

Below 1GHz Worst-Case Data

CDD Mode

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	36.96	29.7 QP	40.0	-10.3	2.50 H	187	50.94	-21.21
2	247.28	40.1 QP	46.0	-5.9	1.00 H	360	61.33	-21.23
3	259.16	40.7 QP	46.0	-5.3	1.00 H	13	61.59	-20.86
4	350.49	42.4 QP	46.0	-3.6	2.50 H	173	60.59	-18.16
5	387.78	41.0 QP	46.0	-5.0	1.00 H	180	58.00	-17.04
6	500.01	36.9 QP	46.0	-9.2	1.00 H	342	51.10	-14.25
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	62.49	35.9 QP	40.0	-4.1	2.50 V	212	57.26	-21.33
2	320.71	41.8 QP	46.0	-4.2	1.00 V	0	60.31	-18.55
3	326.41	40.6 QP	46.0	-5.4	1.00 V	353	59.01	-18.45
4	394.04	41.4 QP	46.0	-4.6	1.00 V	226	58.38	-16.94
5	500.01	39.6 QP	46.0	-6.4	1.00 V	124	53.86	-14.25
6	750.03	37.1 QP	46.0	-8.9	1.00 V	322	46.31	-9.21

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

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 14 to 28, 2015

5.2.3 Test Procedures

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

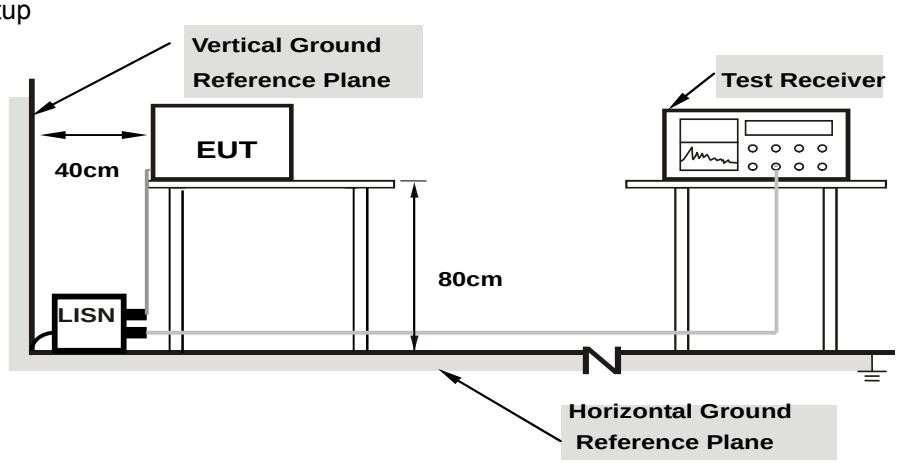
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

5.2.4 Deviation from Test Standard

No deviation.

5.2.5 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).

5.2.6 EUT Operating Conditions

Same as 4.1.6.

5.2.7 Test Results (Mode 1)

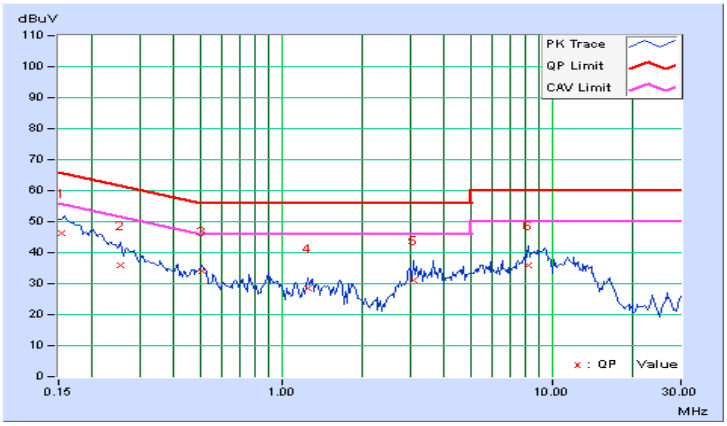
CDD Mode

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	0.15481	0.14	46.32	38.12	46.46	38.26	65.74	55.74	-19.28	-17.48
2	0.25547	0.16	35.80	28.80	35.96	28.96	61.58	51.58	-25.62	-22.62
3	0.50938	0.18	33.90	28.82	34.08	29.00	56.00	46.00	-21.92	-17.00
4	1.25781	0.22	28.34	23.26	28.56	23.48	56.00	46.00	-27.44	-22.52
5	3.09766	0.33	30.68	24.28	31.01	24.61	56.00	46.00	-24.99	-21.39
6	8.16797	0.63	35.48	30.06	36.11	30.69	60.00	50.00	-23.89	-19.31

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

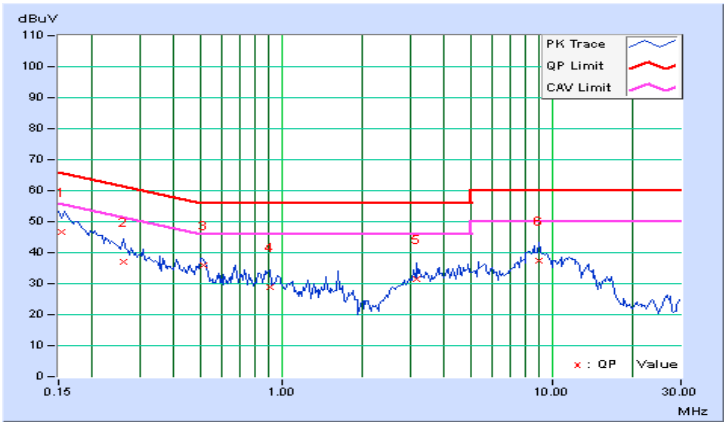


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.15469	0.14	46.54	38.66	46.68	38.80	65.74	55.74	-19.06	-16.94
2	0.25938	0.16	36.78	30.66	36.94	30.82	61.45	51.45	-24.51	-20.63
3	0.51647	0.20	35.72	29.88	35.92	30.08	56.00	46.00	-20.08	-15.92
4	0.90781	0.23	28.74	20.54	28.97	20.77	56.00	46.00	-27.03	-25.23
5	3.17969	0.37	31.20	24.46	31.57	24.83	56.00	46.00	-24.43	-21.17
6	8.92188	0.72	36.54	31.10	37.26	31.82	60.00	50.00	-22.74	-18.18

Remarks:

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



5.2.8 Test Results (Mode 2)

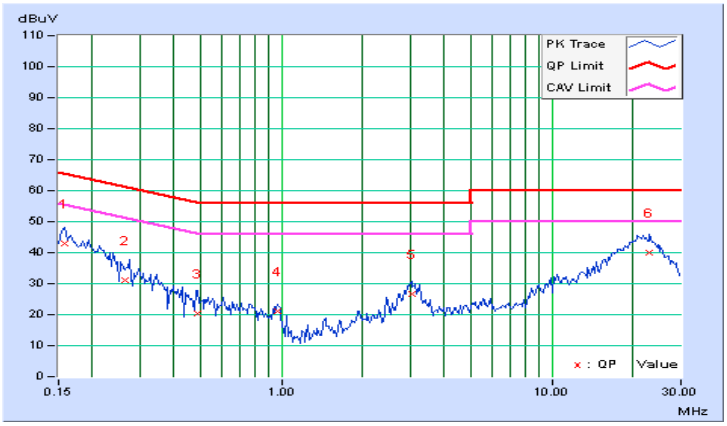
CDD Mode

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	0.15781	0.14	42.72	29.85	42.86	29.99	65.58	55.58	-22.72	-25.59
2	0.26288	0.16	30.93	21.77	31.09	21.93	61.34	51.34	-30.25	-29.41
3	0.48984	0.17	20.31	17.63	20.48	17.80	56.17	46.17	-35.69	-28.37
4	0.97406	0.20	20.78	20.45	20.98	20.65	56.00	46.00	-35.02	-25.35
5	3.02344	0.32	26.20	19.79	26.52	20.11	56.00	46.00	-29.48	-25.89
6	23.02734	1.22	38.62	33.68	39.84	34.90	60.00	50.00	-20.16	-15.10

Remarks:

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

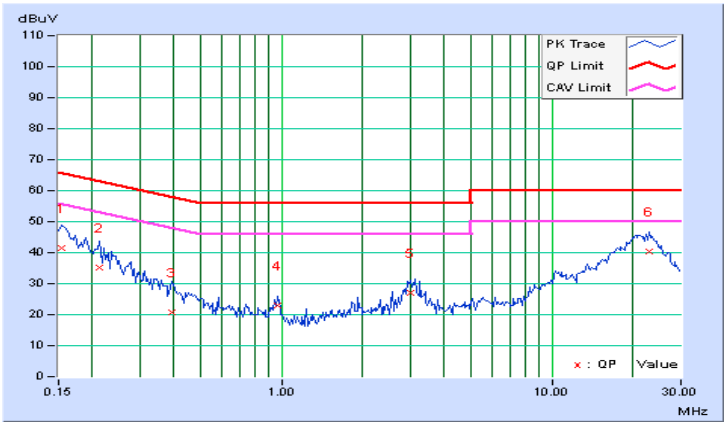


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.15391	0.14	41.41	30.63	41.55	30.77	65.79	55.79	-24.24	-25.02
2	0.21250	0.15	35.00	24.54	35.15	24.69	63.11	53.11	-27.95	-28.41
3	0.39219	0.19	20.47	13.86	20.66	14.05	58.02	48.02	-37.36	-33.97
4	0.97422	0.24	22.60	20.67	22.84	20.91	56.00	46.00	-33.16	-25.09
5	2.99609	0.36	26.78	21.05	27.14	21.41	56.00	46.00	-28.86	-24.59
6	23.00781	1.32	38.90	34.11	40.22	35.43	60.00	50.00	-19.78	-14.57

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 Conducted Output Power Measurement

5.3.1 Limits of Conducted Output Power Measurement

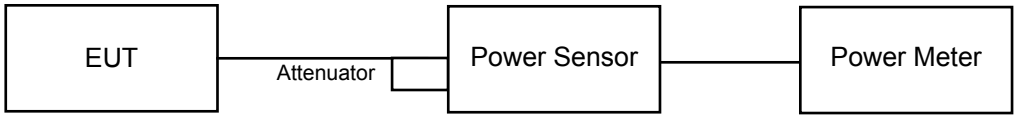
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;
Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less for 20-MHz channel widths with NANT ≥ 5.

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

5.3.2 Test Setup



5.3.3 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
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 test was performed in Oven room B.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: July 06, 2015

5.3.4 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.

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 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	Chain 3				
802.11a									
149	5745	23.07	23.75	24.45	23.75	955.654	29.80	30	Pass
157	5785	23.38	23.55	24.53	23.54	953.971	29.80	30	Pass
165	5825	23.16	23.29	24.58	23.58	935.43	29.71	30	Pass
802.11ac (VHT20)									
149	5745	23.09	23.85	24.33	23.57	944.894	29.75	30	Pass
157	5785	23.42	23.32	24.41	23.65	942.366	29.74	30	Pass
165	5825	23.42	23.43	24.35	23.50	936.221	29.71	30	Pass
802.11ac (VHT40)									
151	5755	22.47	23.16	24.15	23.33	858.912	29.34	30	Pass
159	5795	23.12	22.57	24.45	24.24	929.906	29.68	30	Pass
802.11ac (VHT80)									
155	5775	22.60	22.87	23.96	22.60	806.468	29.07	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	Chain 3				
802.11ac (VHT20)									
149	5745	19.25	20.02	20.44	19.68	388.161	25.89	26	Pass
157	5785	19.54	19.45	20.54	19.81	387.014	25.88	26	Pass
165	5825	19.38	19.35	20.78	19.68	385.366	25.86	26	Pass
802.11ac (VHT40)									
151	5755	19.06	19.65	20.63	20.02	388.868	25.90	26	Pass
159	5795	19.22	18.72	20.79	20.38	387.127	25.88	26	Pass
802.11ac (VHT80)									
155	5775	19.48	19.84	20.63	19.45	388.815	25.90	26	Pass

NOTE: Directional gain = 3.98dBi + 10log(4) = 10dBi > 6dBi , so the power limit shall be reduced to 30-(10-6) = 26dBm.

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:

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Fax: 886-2-26051924

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Web Site: www.bureauveritas-adt.com

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

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