FCC TEST REPORT (15.247)

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MODEL NO.: C7000

FCC ID: PY314300285

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APPLICANT: NETGEAR, Inc.

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

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF141013E03	Original release	Dec. 12, 2014

1. CERTIFICATION

PRODUCT:	AC1900 WiFi Cable Modem Router
BRAND NAME:	NETGEAR
MODEL NO.:	C7000
TEST SAMPLE:	ENGINEERING SAMPLE
APPLICANT:	NETGEAR, Inc.
TESTED:	Oct. 21 to Nov. 13, 2014
STANDARDS:	**FCC Part 15, Subpart C (Section 15.247)** ANSI C63.10-2009

The above equipment (Model: C7000) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared By : Midoli P, **Date:** Dec. 12, 2014

(Midoli Peng, Specialist)

Approved By : , **Date:** Dec. 12, 2014

(May Chen, Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 2.4GHz, 2400~2483.5MHz Band

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -5.55dB at 0.15781MHz.
15.205 15.209 15.247(d)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.2dB at 4874.00MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted Output power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is i-Pex not a standard connector.

For 5GHz, 5725~5850MHz Band

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -8.41dB at 0.15781MHz.
15.205 15.209 15.247(d)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5133.00MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted Output Power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is i-Pex not a standard connector.

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

2.1 MEASUREMENT UNCERTAINTY

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

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

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

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	AC1900 WiFi Cable Modem Router
MODEL NO.	C7000
POWER SUPPLY	DC 12V from adapter power
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT (20/40) mode in 2.4GHz
MODULATION TECHNOLOGY	DSSS,OFDM
TRANSFER RATE	802.11b: up to 11Mbps 802.11a / g: up to 54Mbps 802.11n: up to 450Mbps 802.11ac: up to 1300Mbps
OPERATING FREQUENCY	**For 15.407** **5GHz:** 5.18 ~ 5.24GHz
	For 15.247 **2.4GHz:** 2.412 ~ 2.462GHz **5GHz:** 5.745 ~ 5.825GHz
NUMBER OF CHANNEL	**For 15.407** 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)
	For 15.247 **2.4GHz:** 11 for 802.11b, 802.11g, 802.11n (HT20). VHT20 7 for 802.11n (HT40), VHT40 **5GHz:** 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)

MAXIMUM OUTPUT POWER	**For 15.407** **CDD Mode:** 802.11a: 326.992mW 802.11ac (VHT20): 345.639mW 802.11ac (VHT40): 276.987mW 802.11ac (VHT80): 93.76mW **Beamforming Mode:** 802.11ac (VHT20): 345.639mW 802.11ac (VHT40): 276.987mW 802.11ac (VHT80): 93.76mW **For 15.247 (2.4GHz)** **CDD Mode:** 802.11b: 736.543mW 802.11g: 987.667mW VHT20: 996.326mW VHT40: 224.324mW **Beamforming Mode:** VHT20: 786.891mW VHT40: 224.324mW **For 15.247 (5GHz)** **CDD Mode:** 802.11a: 970.815mW 802.11ac (VHT20): 959.983mW 802.11ac (VHT40): 887.886mW 802.11ac (VHT80): 353.759mW **Beamforming Mode:** 802.11ac (VHT20): 687.638mW 802.11ac (VHT40): 665.617mW 802.11ac (VHT80): 353.759mW
ANTENNA TYPE	Refer to note as below
DATA CABLE	RJ-45 cable (Unshielded or Shielded, 1.5m) Coaxial cable (Shielded, 3m)
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	Adapter x 1

Note:

1. 2.4GHz and 5GHz technology can transmit at same time.
2. The EUT must be supplied with a adapter, there are two different models could be chosen as following table:

No	Brand	Model No.	Spec.
1	NETGEAR	AD898F20	Input: 100-240V, 1.0A, 50-60Hz Output: 12V, 3.5A DC output cable (Unshielded, 1.8m)
2	NETGEAR	2AAF042F NA	Input: 100-240V, 1.5A, 50-60Hz Output: 12V, 3.5A DC output cable (Unshielded, 1.8m)

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

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

PCB Chain No.	Brand	Model	Antenna Gain(dBi) < including cable loss>	Frequency range (MHz ~ MHz)	Antenna Type	Connecter Type
Chain 0	Netgear	NA	2.0 2.8	2400~2483.5 5150~5850	Dipole	i-Pex
Chain 1	Netgear	NA	2.0 2.8	2400~2483.5 5150~5850	Dipole	i-Pex
Chain 2	Netgear	NA	2.0 2.8	2400~2483.5 5150~5850	Dipole	i-Pex

4. The EUT incorporates a MIMO function.

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

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

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

3.2 DESCRIPTION OF TEST MODES

Operated in 2400 ~ 2483.5MHz band:

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

Operated in 5725 ~ 5850MHz band:

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
149	5745 MHz	161	5805 MHz
153	5765 MHz	165	5825 MHz
157	5785 MHz		

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

CHANNEL	FREQUENCY
151	5755 MHz
159	5795 MHz

1 channel is provided for 802.11ac (VHT80):

CHANNEL	FREQUENCY
155	5775 MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

For 2.4GHz:

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

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

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

OB: Conducted Out-Band Emission Measurement

POWER LINE CONDUCTED EMISSION TEST:

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

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

CDD MODE					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
VHT20	1 to 11	6	OFDM	BPSK	6.5

RADIATED EMISSION TEST (BELOW 1 GHz):

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

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

CDD MODE					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
VHT20	1 to 11	6	OFDM	BPSK	6.5

RADIATED EMISSION TEST (ABOVE 1 GHz):

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

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

CDD MODE					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
VHT40	3 to 9	3, 6, 9	OFDM	BPSK	13.5

ANTENNA PORT CONDUCTED MEASUREMENT:

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

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

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
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
For 2.4 GHz VHT40	3 to 9	3, 6, 9	OFDM	BPSK	13.5
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
For 2.4 GHz VHT40	3 to 9	3, 6, 9	OFDM	BPSK	13.5

CONDUCTED OUT-BAND EMISSION MEASUREMENT:

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

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

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
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
VHT40	3 to 9	3, 6, 9	OFDM	BPSK	13.5
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
PLC	30deg. C, 70,%RH	120Vac, 60Hz	Mike Hsieh
RE<1G	23deg. C, 68%RH	120Vac, 60Hz	Tim Ho
RE≥1G	25deg. C, 70%RH	120Vac, 60Hz	Gary Cheng
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen
OB	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

For 5GHz:

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

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

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

OB: Conducted Out-Band Emission Measurement

POWER LINE CONDUCTED EMISSION TEST:

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

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

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

RADIATED EMISSION TEST (BELOW 1 GHz):

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

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

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

RADIATED EMISSION TEST (ABOVE 1 GHz):

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

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

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

ANTENNA PORT CONDUCTED MEASUREMENT:

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

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

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

CONDUCTED OUT-BAND EMISSION MEASUREMENT:

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

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

CDD MODE					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
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
PLC	30deg. C, 70,%RH	120Vac, 60Hz	Mike Hsieh
RE<1G	23deg. C, 68%RH	120Vac, 60Hz	Tim Ho
RE≥1G	25deg. C, 70%RH	120Vac, 60Hz	Gary Cheng
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen
OB	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart C (15.247)
558074 D01 DTS Meas Guidance v03r02
662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2009

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

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.

3.4 DUTY CYCLE OF TEST SIGNAL

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

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

For 2.4GHz

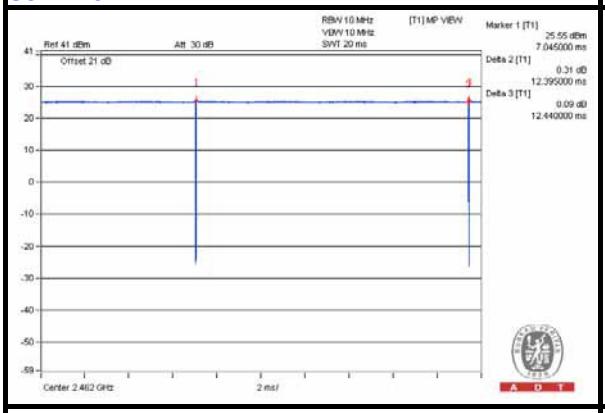
802.11b: Duty cycle = 12.395 ms/12.44 ms = 0.996

802.11g: Duty cycle = 2.06 ms/2.08 ms = 0.99

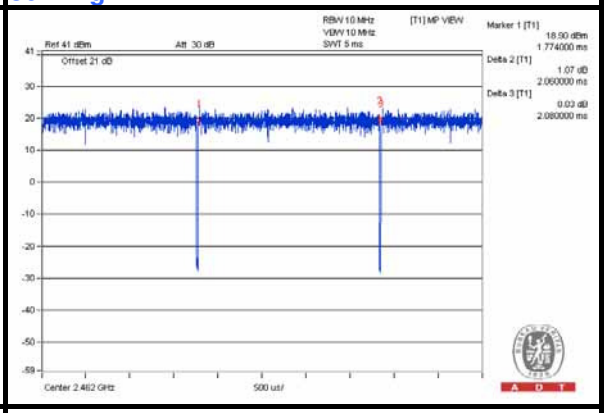
VHT20: Duty cycle = 1.915 ms/1.936 ms = 0.989

VHT40: Duty cycle = 0.942 ms/0.967 ms = 0.974, Duty factor = 10 * log(1/0.974) = 0.11

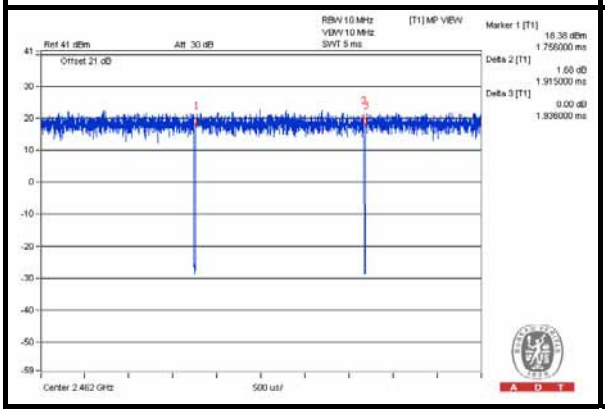
802.11b



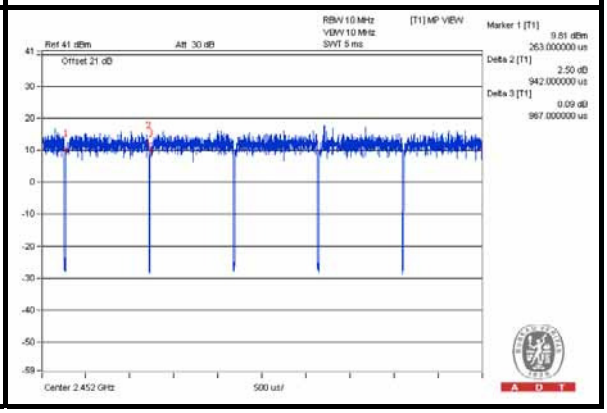
802.11g



VHT20



VHT40



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

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

For 5GHz

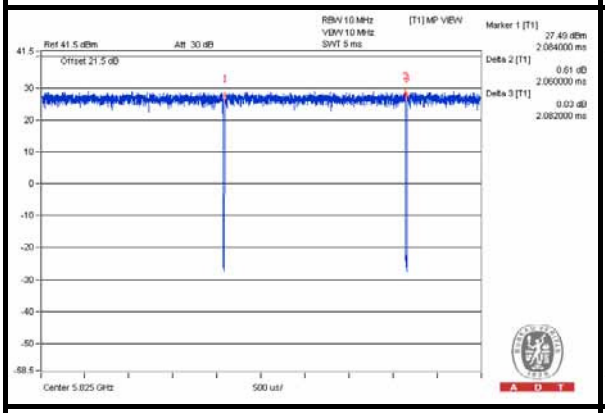
802.11a: Duty cycle = 2.06 ms/2.082 ms = 0.989

802.11ac (VHT20): Duty cycle = 1.912 ms/1.937 ms = 0.987

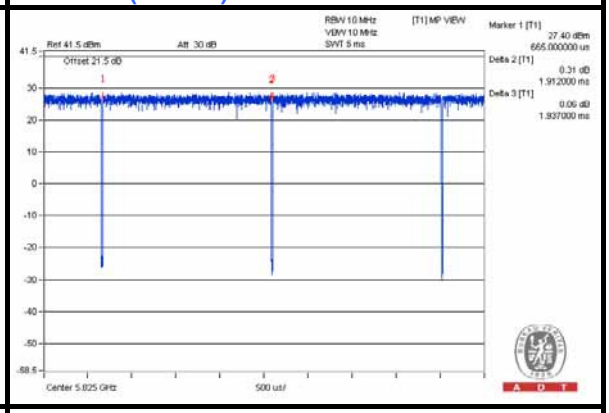
802.11ac (VHT40): Duty cycle = 0.937 ms/0.96 ms = 0.976, Duty factor = 10 * log(1/0.976) = 0.11

802.11ac (VHT80): Duty cycle = 0.456 ms/0.477 ms = 0.956, Duty factor = 10 * log(1/0.956) = 0.20

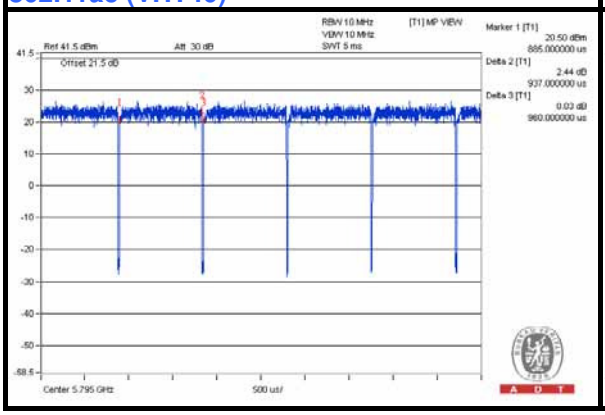
802.11a



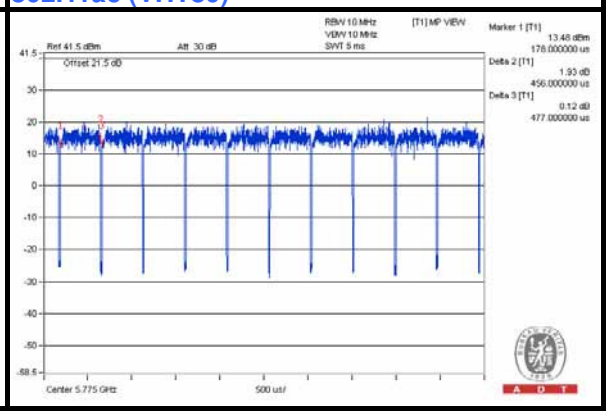
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.5 DESCRIPTION OF SUPPORT UNITS

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

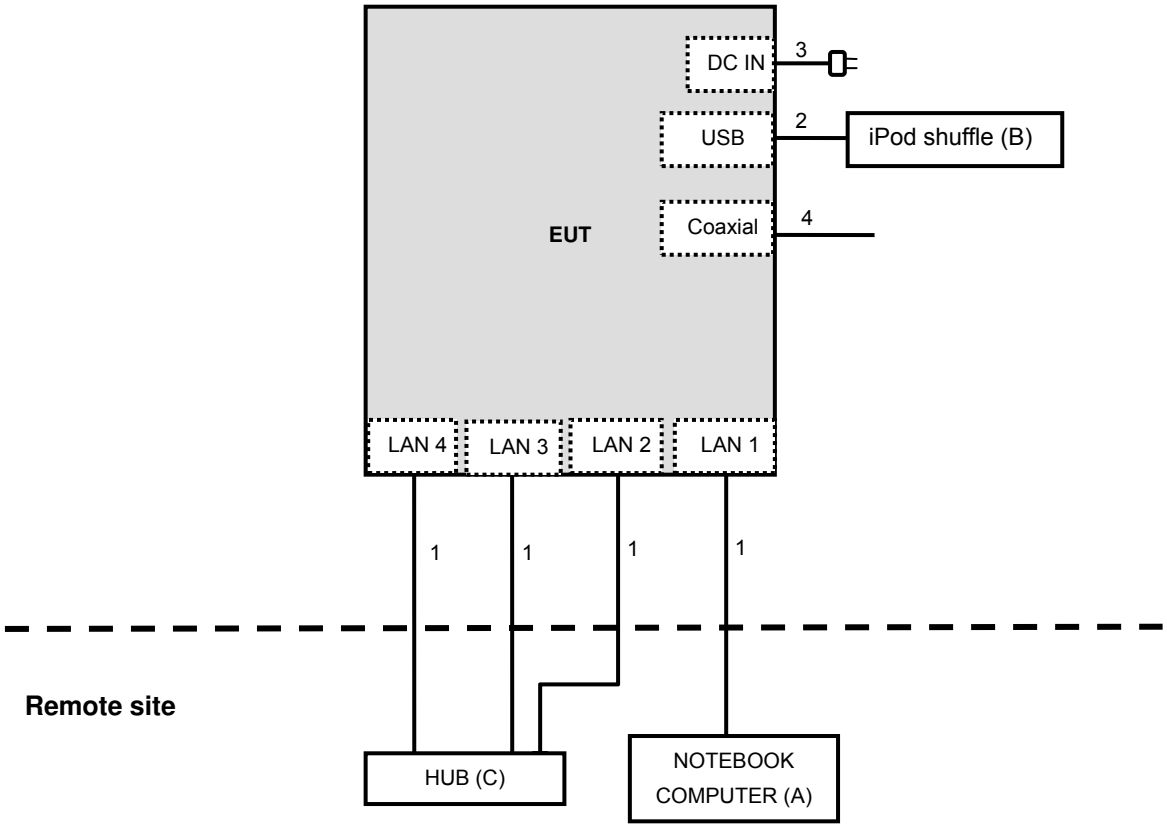
No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	NOTEBOOK COMPUTER	DELL	E6400	D814C A00 APCC	NA	Provided by Lab
B	iPod shuffle	Apple	MD778TA/A	CC4JMCMXF4T1	NA	Provided by Lab
C	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab

NOTE:

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

No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1	RJ-45	1	10	No	0	Provided by Lab
2	USB	1	0.1	No	0	Provided by Lab
3	DC	1	1.8	No	0	Supplied by client
4	Coaxial	1	10	No	0	Provided by Lab

3.6 CONFIGURATION OF SYSTEM UNDER TEST



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

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

4.1.2 TEST INSTRUMENTS

For mode 1 test

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS 30	100375	Apr. 29, 2014	Apr. 28, 2015
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 15, 2014	Sep. 14, 2015
Line-Impedance Stabilization Network (for Peripheral) ROHDE & SCHWARZ	ENV216	100071	Nov. 13, 2013	Nov. 12, 2014
RF Cable (JYEBAO)	5DFB	COCCAB-001	Mar. 10 , 2014	Mar. 09, 2015
50 ohms Terminator	N/A	EMC-03	Sep. 22, 2014	Sep. 21, 2015
50 ohms Terminator	N/A	EMC-02	Sep. 30, 2014	Sep. 29, 2015
Software ADT	BV ADT_Cond_V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3 The VCCI Con C Registration No. is C-3611.
4 Tested Date: Oct. 21, 2014

For mode 2 test

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS 30	100375	Apr. 29, 2014	Apr. 28, 2015
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 15, 2014	Sep. 14, 2015
Line-Impedance Stabilization Network (for Peripheral) ROHDE & SCHWARZ	ENV216	100071	Nov. 11, 2014	Nov. 10, 2015
RF Cable (JYEBAO)	5DFB	COCCAB-001	Mar. 10 , 2014	Mar. 09, 2015
50 ohms Terminator	N/A	EMC-03	Sep. 22, 2014	Sep. 21, 2015
50 ohms Terminator	N/A	EMC-02	Sep. 30, 2014	Sep. 29, 2015
Software ADT	BV ADT_Cond_V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3 The VCCI Con C Registration No. is C-3611.
4 Tested Date: Nov. 14, 2014

4.1.3 TEST PROCEDURES

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

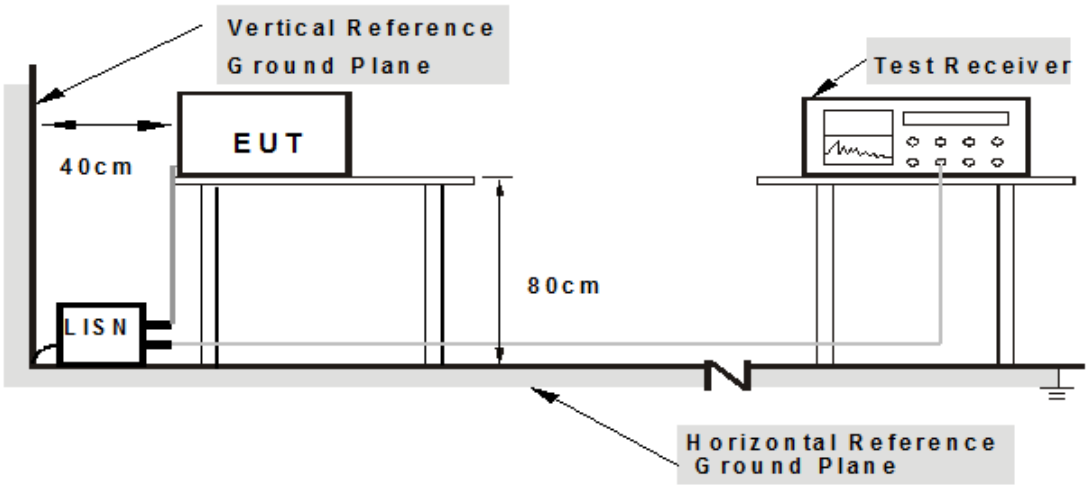
NOTE:

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

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

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

4.1.6 EUT OPERATING CONDITIONS

1. Placed the EUT on testing table.
2. Prepared computer system (support unit A) to act as communication partner.
3. The communication partner ran test program “(MTool.exe [2.0.1.0])” to enable EUT under transmission/receiving condition continuously.

4.1.7 TEST RESULTS (MODE 1)

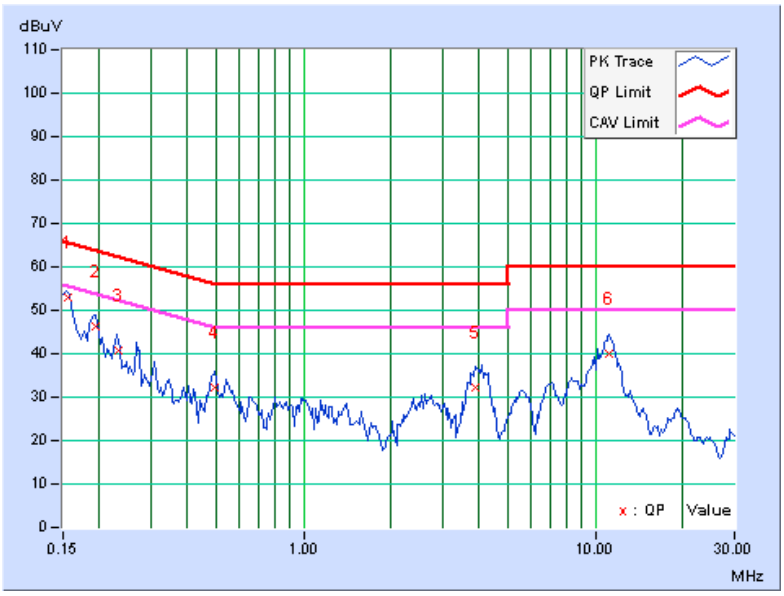
CDD MODE

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

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15556	0.07	52.71	46.53	52.78	46.60	65.70	55.70	-12.92	-9.10
2	0.19297	0.07	46.09	39.79	46.16	39.86	63.91	53.91	-17.75	-14.05
3	0.23325	0.07	40.61	34.41	40.68	34.48	62.33	52.33	-21.65	-17.85
4	0.49766	0.10	31.96	27.41	32.06	27.51	56.04	46.04	-23.98	-18.53
5	3.89453	0.25	32.01	24.93	32.26	25.18	56.00	46.00	-23.74	-20.82
6	11.21484	0.48	39.64	34.50	40.12	34.98	60.00	50.00	-19.88	-15.02

REMARKS:

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

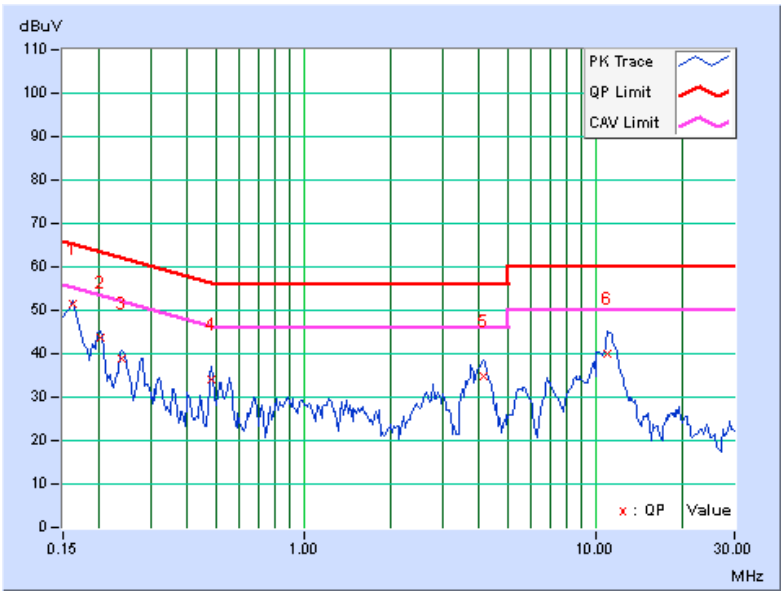


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	0.06	51.27	44.74	51.33	44.80	65.38	55.38	-14.04	-10.57
2	0.20078	0.06	43.72	37.90	43.78	37.96	63.58	53.58	-19.80	-15.62
3	0.23984	0.07	38.76	33.27	38.83	33.34	62.10	52.10	-23.28	-18.77
4	0.48594	0.10	33.95	29.62	34.05	29.72	56.24	46.24	-22.19	-16.52
5	4.12500	0.26	34.54	26.05	34.80	26.31	56.00	46.00	-21.20	-19.69
6	11.00000	0.49	39.53	34.35	40.02	34.84	60.00	50.00	-19.98	-15.16

REMARKS:

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



4.1.8 TEST RESULTS (MODE 2)

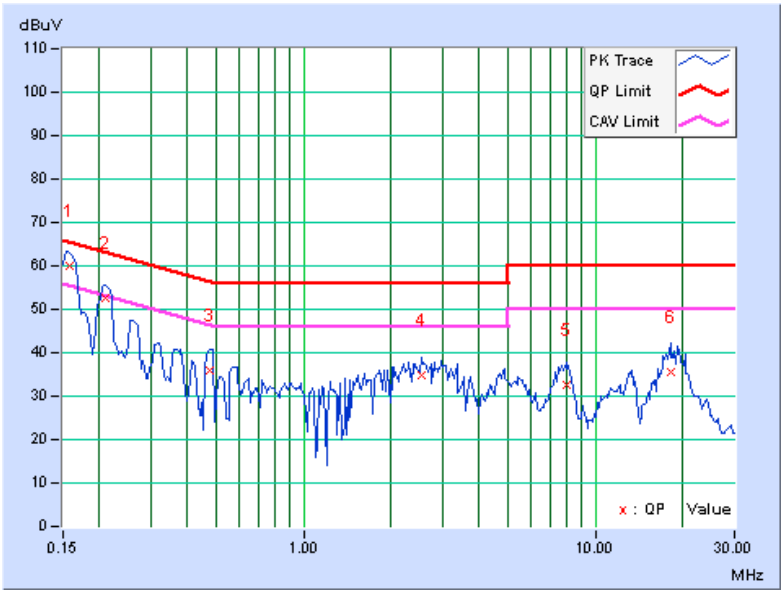
CDD MODE

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

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.15781**	**0.07**	**59.96**	**48.03**	**60.03**	**48.10**	**65.58**	**55.58**	**-5.55**	**-7.48**
2	0.20859	0.07	52.37	39.82	52.44	39.89	63.26	53.26	-10.82	-13.37
3	0.47422	0.09	35.90	25.89	35.99	25.98	56.44	46.44	-20.44	-20.45
4	2.52734	0.20	34.68	25.07	34.88	25.27	56.00	46.00	-21.12	-20.73
5	7.94141	0.38	32.33	24.98	32.71	25.36	60.00	50.00	-27.29	-24.64
6	18.08594	0.66	34.90	26.72	35.56	27.38	60.00	50.00	-24.44	-22.62

REMARKS:

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

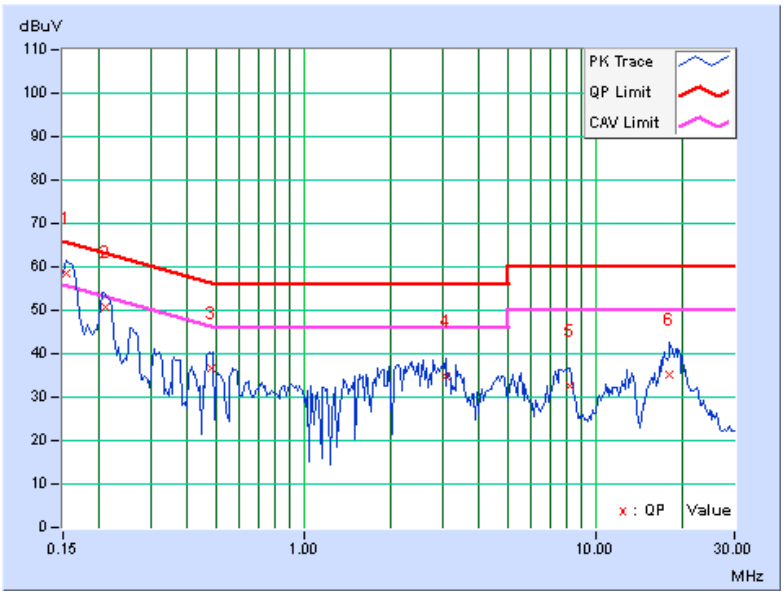


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	0.06	58.46	43.66	58.52	43.72	65.79	55.79	-7.26	-12.06
2	0.20869	0.06	50.55	39.84	50.61	39.90	63.26	53.26	-12.65	-13.36
3	0.48347	0.10	36.59	27.91	36.69	28.01	56.28	46.28	-19.59	-18.27
4	3.06250	0.22	34.70	24.39	34.92	24.61	56.00	46.00	-21.08	-21.39
5	8.15234	0.40	32.22	24.85	32.62	25.25	60.00	50.00	-27.38	-24.75
6	18.01953	0.69	34.57	26.34	35.26	27.03	60.00	50.00	-24.74	-22.97

REMARKS:

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



4.2 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

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

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

NOTE:

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

4.2.2 TEST INSTRUMENTS

For Below 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY50010156	Aug. 11, 2014	Aug. 10, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-04	Nov. 13, 2013	Nov. 12, 2014
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Feb. 27, 2014	Feb. 26, 2015
RF Cable	NA	CHHCAB_001	Oct. 05, 2014	Oct. 04, 2015
Horn_Antenna AISI	AIH.8018	0000220091110	Aug. 26, 2014	Aug. 25, 2015
Pre-Amplifier Agilent	8449B	300801923	Oct. 29, 2013	Oct. 28, 2014
RF Cable	NA	131206 131215 SNMY23685/4	Jan. 17, 2014	Jan. 16, 2015
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 13, 2013	Nov. 12, 2014
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Aug. 26, 2014	Aug. 25, 2015
RF Cable	NA	RF104-121 RF104-204	Dec. 12, 2013	Dec. 11, 2014
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3 The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
5 The CANADA Site Registration No. is IC 7450H-3.
6 Tested Date: Oct. 22, 2014

For Above 1GHz:

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

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3 The test was performed in 966 Chamber No. G.
4. The FCC Site Registration No. is 966073.
5 The VCCI Site Registration No. is G-137.
6 The CANADA Site Registration No. is IC 7450H-2.
7 Tested Date: Nov. 03, 2014

4.2.3 TEST PROCEDURES

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

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

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

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

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

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

Note:

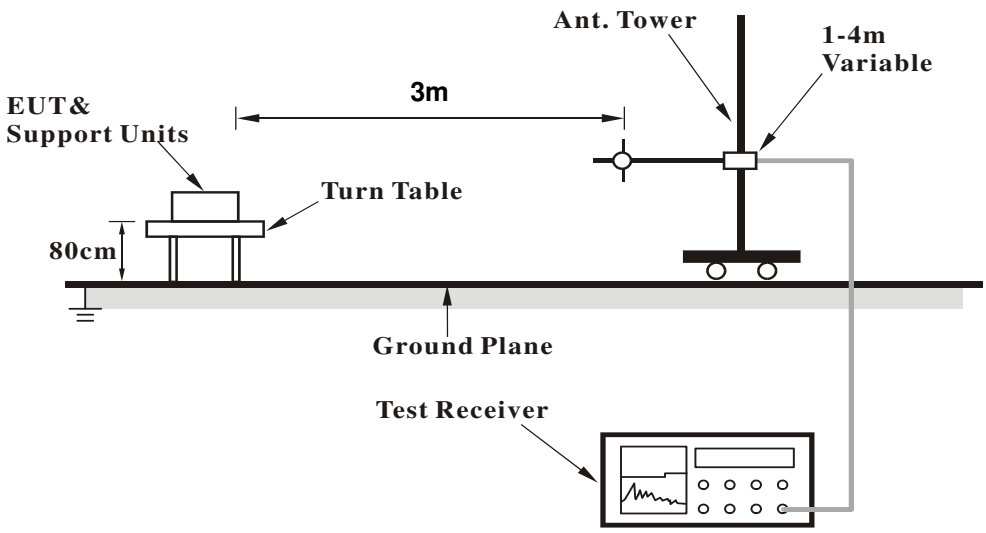
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.2.4 DEVIATION FROM TEST STANDARD

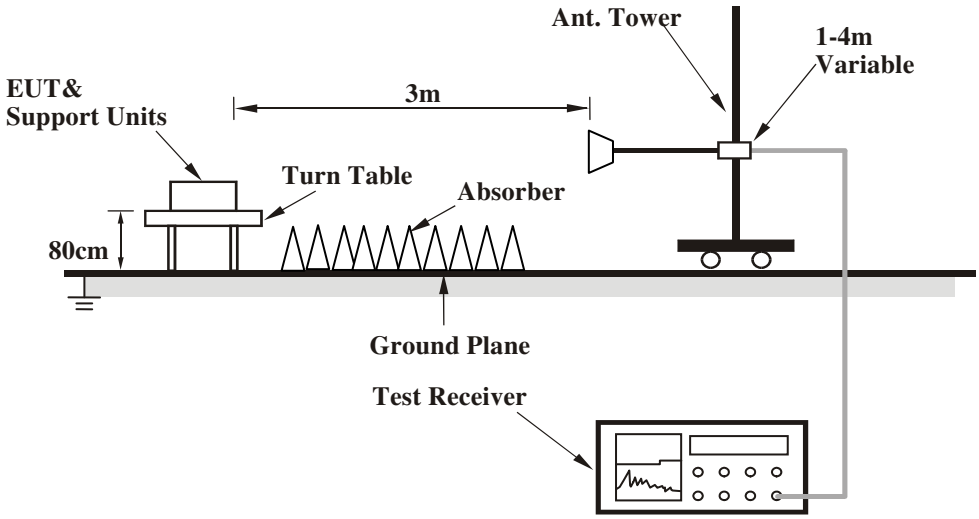
No deviation

4.2.5 TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

4.2.7 TEST RESULTS

CDD MODE

BELOW 1GHz WORST-CASE DATA

VHT20

CHANNEL	TX Channel 6	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	374.98	36.5 QP	46.0	-9.5	1.00 H	29	46.62	-10.15
2	500.01	36.4 QP	46.0	-9.6	2.00 H	345	43.58	-7.19
3	625.00	41.6 QP	46.0	-4.4	1.00 H	104	45.88	-4.30
4	749.98	39.8 QP	46.0	-6.2	1.00 H	102	41.76	-1.97
5	875.02	41.5 QP	46.0	-4.5	1.50 H	342	41.86	-0.36
6	1000.00	40.8 QP	54.0	-13.2	1.50 H	360	39.17	1.65
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	33.98	33.2 QP	40.0	-6.9	1.00 V	360	47.40	-14.25
2	51.17	32.6 QP	40.0	-7.4	1.50 V	0	45.99	-13.42
3	375.03	37.2 QP	46.0	-8.8	1.50 V	13	47.39	-10.15
4	500.01	37.6 QP	46.0	-8.4	1.00 V	210	44.82	-7.19
5	625.00	39.3 QP	46.0	-6.7	1.00 V	111	43.60	-4.30
6	875.02	40.7 QP	46.0	-5.3	1.00 V	74	41.07	-0.36

REMARKS:

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

ABOVE 1GHz DATA

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.7 PK	74.0	-12.3	1.33 H	57	67.30	-5.60
2	2390.00	52.0 AV	54.0	-2.0	1.33 H	57	57.60	-5.60
3	*2412.00	119.2 PK			1.33 H	57	124.73	-5.53
4	*2412.00	116.8 AV			1.33 H	57	122.33	-5.53
5	2491.30	58.7 PK	74.0	-15.3	1.33 H	57	63.88	-5.18
6	2491.30	48.6 AV	54.0	-5.4	1.33 H	57	53.78	-5.18
7	4824.00	53.5 PK	74.0	-20.5	1.29 H	269	49.64	3.86
8	4824.00	49.9 AV	54.0	-4.1	1.29 H	269	46.04	3.86

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.9 PK	74.0	-15.1	1.00 V	81	64.50	-5.60
2	2390.00	50.2 AV	54.0	-3.8	1.00 V	81	55.80	-5.60
3	*2412.00	117.9 PK			1.00 V	81	123.43	-5.53
4	*2412.00	115.4 AV			1.00 V	81	120.93	-5.53
5	2491.30	59.4 PK	74.0	-14.6	1.00 V	81	64.58	-5.18
6	2491.30	50.6 AV	54.0	-3.4	1.00 V	81	55.78	-5.18
7	4824.00	55.6 PK	74.0	-18.4	1.31 V	259	51.74	3.86
8	4824.00	53.7 AV	54.0	-0.3	1.31 V	259	49.84	3.86

REMARKS:

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

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	119.7 PK			1.30 H	52	125.12	-5.42
2	*2437.00	117.3 AV			1.30 H	52	122.72	-5.42
3	4874.00	52.4 PK	74.0	-21.6	1.26 H	270	48.59	3.81
4	4874.00	48.7 AV	54.0	-5.3	1.26 H	270	44.89	3.81
5	7311.00	50.4 PK	74.0	-23.6	1.12 H	132	42.17	8.23
6	7311.00	39.4 AV	54.0	-14.6	1.12 H	132	31.17	8.23
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	118.1 PK			1.00 V	80	123.52	-5.42
2	*2437.00	115.7 AV			1.00 V	80	121.12	-5.42
3	4874.00	56.1 PK	74.0	-17.9	1.02 V	251	52.29	3.81
4	**4874.00**	**53.8 AV**	**54.0**	**-0.2**	**1.02 V**	**251**	**49.99**	**3.81**
5	7311.00	52.7 PK	74.0	-21.3	1.13 V	280	44.47	8.23
6	7311.00	41.1 AV	54.0	-12.9	1.13 V	280	32.87	8.23

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	118.9 PK			1.30 H	52	124.21	-5.31
2	*2462.00	116.6 AV			1.30 H	52	121.91	-5.31
3	2483.50	59.4 PK	74.0	-14.6	1.30 H	52	64.60	-5.20
4	2483.50	52.9 AV	54.0	-1.1	1.30 H	52	58.10	-5.20
5	4924.00	50.4 PK	74.0	-23.6	1.25 H	272	46.60	3.80
6	4924.00	44.3 AV	54.0	-9.7	1.25 H	272	40.50	3.80
7	7386.00	50.4 PK	74.0	-23.6	1.14 H	133	41.85	8.55
8	7386.00	39.4 AV	54.0	-14.6	1.14 H	133	30.85	8.55
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	117.4 PK			1.00 V	82	122.71	-5.31
2	*2462.00	115.2 AV			1.00 V	82	120.51	-5.31
3	4924.00	53.2 PK	74.0	-20.8	1.00 V	252	49.40	3.80
4	4924.00	49.6 AV	54.0	-4.4	1.00 V	252	45.80	3.80
5	7386.00	52.5 PK	74.0	-21.5	1.14 V	287	43.95	8.55
6	7386.00	40.8 AV	54.0	-13.2	1.14 V	287	32.25	8.55

REMARKS:

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

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	70.6 PK	74.0	-3.4	1.00 H	183	76.20	-5.60
2	2390.00	53.7 AV	54.0	-0.3	1.00 H	183	59.30	-5.60
3	*2412.00	116.6 PK			1.32 H	68	122.13	-5.53
4	*2412.00	106.7 AV			1.32 H	68	112.23	-5.53
5	4824.00	49.3 PK	74.0	-24.7	1.28 H	280	45.44	3.86
6	4824.00	46.5 AV	54.0	-7.5	1.28 H	280	42.64	3.86
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.2 PK	74.0	-5.8	1.32 V	68	73.80	-5.60
2	2390.00	51.2 AV	54.0	-2.8	1.32 V	68	56.80	-5.60
3	*2412.00	115.3 PK			1.00 V	183	120.83	-5.53
4	*2412.00	105.8 AV			1.00 V	183	111.33	-5.53
5	4824.00	52.4 PK	74.0	-21.6	1.33 V	244	48.54	3.86
6	4824.00	50.0 AV	54.0	-4.0	1.33 V	244	46.14	3.86

REMARKS:

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

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	67.8 PK	74.0	-6.2	1.30 H	67	73.40	-5.60
2	2390.00	50.8 AV	54.0	-3.2	1.30 H	67	56.40	-5.60
3	*2437.00	123.3 PK			1.30 H	67	128.72	-5.42
4	*2437.00	113.6 AV			1.30 H	67	119.02	-5.42
5	2483.50	65.4 PK	74.0	-8.6	1.30 H	67	70.60	-5.20
6	2483.50	50.2 AV	54.0	-3.8	1.30 H	67	55.40	-5.20
7	4874.00	47.2 PK	74.0	-26.8	1.28 H	257	43.39	3.81
8	4874.00	41.1 AV	54.0	-12.9	1.28 H	257	37.29	3.81
9	7311.00	48.6 PK	74.0	-25.4	1.12 H	118	40.37	8.23
10	7311.00	37.1 AV	54.0	-16.9	1.12 H	118	28.87	8.23
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	65.3 PK	74.0	-8.7	1.00 V	194	70.90	-5.60
2	2390.00	48.5 AV	54.0	-5.5	1.00 V	194	54.10	-5.60
3	*2437.00	122.2 PK			1.00 V	194	127.62	-5.42
4	*2437.00	112.5 AV			1.00 V	194	117.92	-5.42
5	2483.50	63.2 PK	74.0	-10.8	1.00 V	194	68.40	-5.20
6	2483.50	48.3 AV	54.0	-5.7	1.00 V	194	53.50	-5.20
7	4874.00	51.4 PK	74.0	-22.6	1.02 V	259	47.59	3.81
8	4874.00	47.6 AV	54.0	-6.4	1.02 V	259	43.79	3.81
9	7311.00	50.4 PK	74.0	-23.6	1.19 V	273	42.17	8.23
10	7311.00	38.6 AV	54.0	-15.4	1.19 V	273	30.37	8.23

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	116.8 PK			1.29 H	66	122.11	-5.31
2	*2462.00	107.0 AV			1.29 H	66	112.31	-5.31
3	2483.50	71.2 PK	74.0	-2.8	1.29 H	66	76.40	-5.20
4	2483.50	53.7 AV	54.0	-0.3	1.29 H	66	58.90	-5.20
5	4924.00	47.2 PK	74.0	-26.8	1.27 H	261	43.40	3.80
6	4924.00	41.2 AV	54.0	-12.8	1.27 H	261	37.40	3.80
7	7386.00	48.6 PK	74.0	-25.4	1.13 H	135	40.05	8.55
8	7386.00	37.2 AV	54.0	-16.8	1.13 H	135	28.65	8.55
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	115.9 PK			1.00 V	198	121.21	-5.31
2	*2462.00	105.8 AV			1.00 V	198	111.11	-5.31
3	2483.50	70.6 PK	74.0	-3.4	1.00 V	198	75.80	-5.20
4	2483.50	51.8 AV	54.0	-2.2	1.00 V	198	57.00	-5.20
5	4924.00	51.8 PK	74.0	-22.2	1.00 V	245	48.00	3.80
6	4924.00	47.7 AV	54.0	-6.3	1.00 V	245	43.90	3.80
7	7386.00	49.8 PK	74.0	-24.2	1.15 V	265	41.25	8.55
8	7386.00	38.2 AV	54.0	-15.8	1.15 V	265	29.65	8.55

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.

VHT20

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	73.2 PK	74.0	-0.8	1.36 H	303	78.80	-5.60
2	2390.00	53.2 AV	54.0	-0.8	1.36 H	303	58.80	-5.60
3	*2412.00	115.3 PK			1.36 H	303	120.83	-5.53
4	*2412.00	105.1 AV			1.36 H	303	110.63	-5.53
5	4824.00	49.2 PK	74.0	-24.8	1.22 H	285	45.34	3.86
6	4824.00	46.3 AV	54.0	-7.7	1.22 H	285	42.44	3.86
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.1 PK	74.0	-1.9	1.00 V	285	77.70	-5.60
2	2390.00	51.0 AV	54.0	-3.0	1.00 V	285	56.60	-5.60
3	*2412.00	114.3 PK			1.00 V	285	119.83	-5.53
4	*2412.00	104.2 AV			1.00 V	285	109.73	-5.53
5	4824.00	52.3 PK	74.0	-21.7	1.32 V	249	48.44	3.86
6	4824.00	49.6 AV	54.0	-4.4	1.32 V	249	45.74	3.86

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.2 PK	74.0	-4.8	1.00 H	257	74.80	-5.60
2	2390.00	51.9 AV	54.0	-2.1	1.00 H	257	57.50	-5.60
3	*2437.00	122.3 PK			1.36 H	309	127.72	-5.42
4	*2437.00	111.5 AV			1.36 H	309	116.92	-5.42
5	2483.50	67.3 PK	74.0	-6.7	1.00 H	257	72.50	-5.20
6	2483.50	51.2 AV	54.0	-2.8	1.00 H	257	56.40	-5.20
7	4874.00	47.5 PK	74.0	-26.5	1.28 H	261	43.69	3.81
8	4874.00	41.3 AV	54.0	-12.7	1.28 H	261	37.49	3.81
9	7311.00	49.1 PK	74.0	-24.9	1.13 H	128	40.87	8.23
10	7311.00	37.7 AV	54.0	-16.3	1.13 H	128	29.47	8.23

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	64.8 PK	74.0	-9.2	1.36 V	309	70.40	-5.60
2	2390.00	48.0 AV	54.0	-6.0	1.36 V	309	53.60	-5.60
3	*2437.00	121.4 PK			1.00 V	257	126.82	-5.42
4	*2437.00	110.3 AV			1.00 V	257	115.72	-5.42
5	2483.50	64.2 PK	74.0	-9.8	1.36 V	309	69.40	-5.20
6	2483.50	48.9 AV	54.0	-5.1	1.36 V	309	54.10	-5.20
7	4874.00	51.3 PK	74.0	-22.7	1.00 V	257	47.49	3.81
8	4874.00	47.3 AV	54.0	-6.7	1.00 V	257	43.49	3.81
9	7311.00	50.4 PK	74.0	-23.6	1.23 V	271	42.17	8.23
10	7311.00	38.6 AV	54.0	-15.4	1.23 V	271	30.37	8.23

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	115.1 PK			1.34 H	309	120.41	-5.31
2	*2462.00	104.7 AV			1.34 H	309	110.01	-5.31
3	2483.50	73.3 PK	74.0	-0.7	1.34 H	309	78.50	-5.20
4	2483.50	53.5 AV	54.0	-0.5	1.34 H	309	58.70	-5.20
5	4924.00	47.5 PK	74.0	-26.5	1.28 H	261	43.70	3.80
6	4924.00	41.3 AV	54.0	-12.7	1.28 H	261	37.50	3.80
7	7386.00	48.4 PK	74.0	-25.6	1.11 H	149	39.85	8.55
8	7386.00	37.3 AV	54.0	-16.7	1.11 H	149	28.75	8.55
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	114.3 PK			1.36 V	255	119.61	-5.31
2	*2462.00	103.2 AV			1.36 V	255	108.51	-5.31
3	2483.50	70.0 PK	74.0	-4.0	1.36 V	255	75.20	-5.20
4	2483.50	50.2 AV	54.0	-3.8	1.36 V	255	55.40	-5.20
5	4924.00	51.9 PK	74.0	-22.1	1.02 V	251	48.10	3.80
6	4924.00	47.8 AV	54.0	-6.2	1.02 V	251	44.00	3.80
7	7386.00	50.4 PK	74.0	-23.6	1.24 V	260	41.85	8.55
8	7386.00	38.6 AV	54.0	-15.4	1.24 V	260	30.05	8.55

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.9 PK	74.0	-5.1	1.00 H	258	74.50	-5.60
2	2390.00	53.7 AV	54.0	-0.3	1.00 H	258	59.30	-5.60
3	*2422.00	109.9 PK			1.00 H	258	115.39	-5.49
4	*2422.00	99.7 AV			1.00 H	258	105.19	-5.49
5	2500.00	53.7 PK	74.0	-20.3	1.38 H	80	58.84	-5.14
6	2500.00	44.9 AV	54.0	-9.1	1.38 H	80	50.04	-5.14
7	4844.00	50.3 PK	74.0	-23.7	1.06 H	249	46.46	3.84
8	4844.00	46.4 AV	54.0	-7.6	1.06 H	249	42.56	3.84
9	7266.00	49.4 PK	74.0	-24.6	1.28 H	255	41.34	8.06
10	7266.00	37.6 AV	54.0	-16.4	1.28 H	255	29.54	8.06
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	65.1 PK	74.0	-8.9	1.36 V	313	70.70	-5.60
2	2390.00	50.4 AV	54.0	-3.6	1.36 V	313	56.00	-5.60
3	*2422.00	109.8 PK			1.36 V	313	115.29	-5.49
4	*2422.00	98.7 AV			1.36 V	313	104.19	-5.49
5	2500.00	50.1 PK	74.0	-23.9	1.36 V	313	55.24	-5.14
6	2500.00	40.2 AV	54.0	-13.8	1.36 V	313	45.34	-5.14
7	4844.00	47.5 PK	74.0	-26.5	1.26 V	246	43.66	3.84
8	4844.00	41.2 AV	54.0	-12.8	1.26 V	246	37.36	3.84
9	7266.00	48.2 PK	74.0	-25.8	1.11 V	155	40.14	8.06
10	7266.00	37.4 AV	54.0	-16.6	1.11 V	155	29.34	8.06

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	69.8 PK	74.0	-4.2	1.00 H	259	75.40	-5.60
2	2390.00	52.8 AV	54.0	-1.2	1.00 H	259	58.40	-5.60
3	*2437.00	113.8 PK			1.00 H	259	119.22	-5.42
4	*2437.00	103.3 AV			1.00 H	259	108.72	-5.42
5	2483.50	73.3 PK	74.0	-0.7	1.00 H	259	78.50	-5.20
6	2483.50	53.4 AV	54.0	-0.6	1.00 H	259	58.60	-5.20
7	4874.00	50.1 PK	74.0	-23.9	1.11 H	264	46.29	3.81
8	4874.00	45.9 AV	54.0	-8.1	1.11 H	264	42.09	3.81
9	7311.00	49.5 PK	74.0	-24.5	1.28 H	269	41.27	8.23
10	7311.00	37.4 AV	54.0	-16.6	1.28 H	269	29.17	8.23
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	66.3 PK	74.0	-7.7	1.40 V	329	71.90	-5.60
2	2390.00	48.3 AV	54.0	-5.7	1.40 V	329	53.90	-5.60
3	*2437.00	112.1 PK			1.40 V	329	117.52	-5.42
4	*2437.00	102.0 AV			1.40 V	329	107.42	-5.42
5	2483.50	69.9 PK	74.0	-4.1	1.40 V	329	75.10	-5.20
6	2483.50	49.4 AV	54.0	-4.6	1.40 V	329	54.60	-5.20
7	4874.00	46.9 PK	74.0	-27.1	1.30 V	256	43.09	3.81
8	4874.00	40.8 AV	54.0	-13.2	1.30 V	256	36.99	3.81
9	7311.00	48.6 PK	74.0	-25.4	1.14 V	145	40.37	8.23
10	7311.00	37.6 AV	54.0	-16.4	1.14 V	145	29.37	8.23

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	109.7 PK			1.00 H	257	115.06	-5.36
2	*2452.00	99.3 AV			1.00 H	257	104.66	-5.36
3	2483.50	70.7 PK	74.0	-3.3	1.00 H	257	75.90	-5.20
4	2483.50	53.6 AV	54.0	-0.4	1.00 H	257	58.80	-5.20
5	4904.00	50.2 PK	74.0	-23.8	1.07 H	262	46.41	3.79
6	4904.00	46.4 AV	54.0	-7.6	1.07 H	262	42.61	3.79
7	7356.00	49.3 PK	74.0	-24.7	1.28 H	253	40.87	8.43
8	7356.00	37.7 AV	54.0	-16.3	1.28 H	253	29.27	8.43
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	110.1 PK			1.41 V	325	115.46	-5.36
2	*2452.00	98.9 AV			1.41 V	325	104.26	-5.36
3	2483.50	65.2 PK	74.0	-8.8	1.39 V	307	70.40	-5.20
4	2483.50	50.2 AV	54.0	-3.8	1.39 V	307	55.40	-5.20
5	4904.00	47.2 PK	74.0	-26.8	1.29 V	240	43.41	3.79
6	4904.00	40.9 AV	54.0	-13.1	1.29 V	240	37.11	3.79
7	7356.00	47.9 PK	74.0	-26.1	1.13 V	152	39.47	8.43
8	7356.00	37.0 AV	54.0	-17.0	1.13 V	152	28.57	8.43

REMARKS:

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

4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

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

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Nov. 12 to 13, 2014

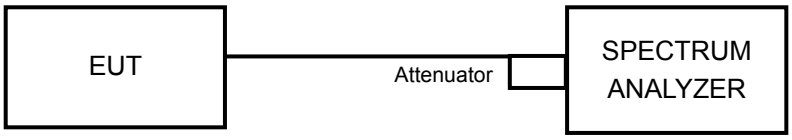
4.3.3 TEST PROCEDURE

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

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP

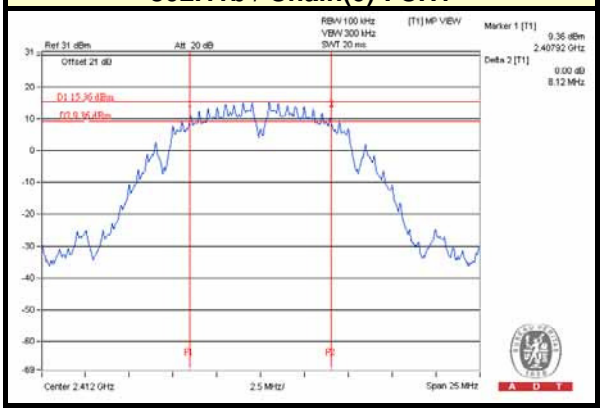
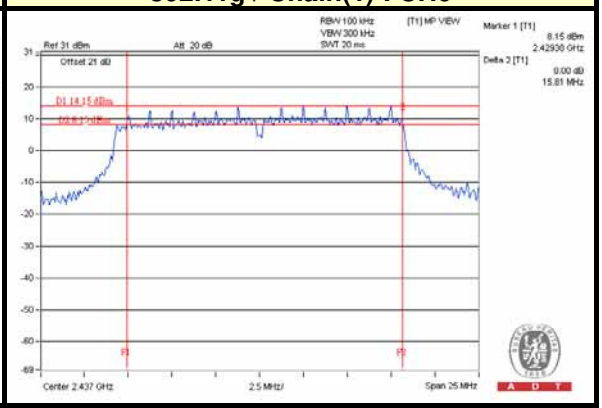
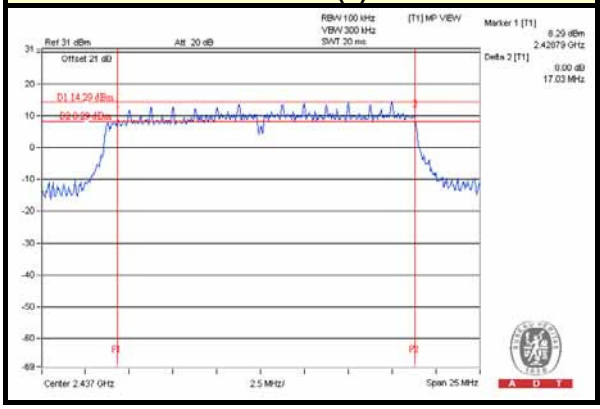
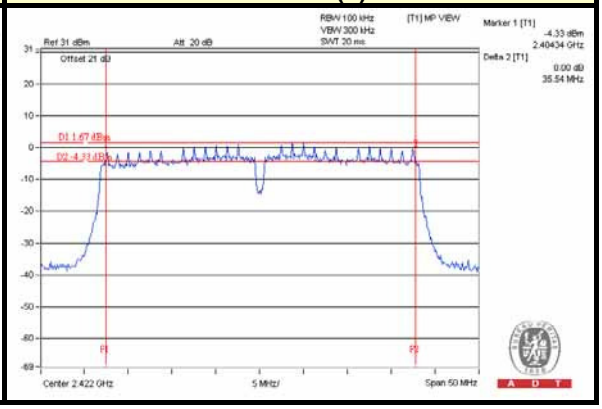


4.3.6 EUT OPERATING CONDITIONS

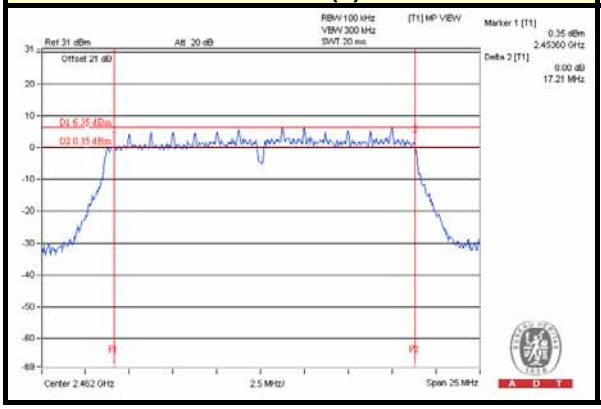
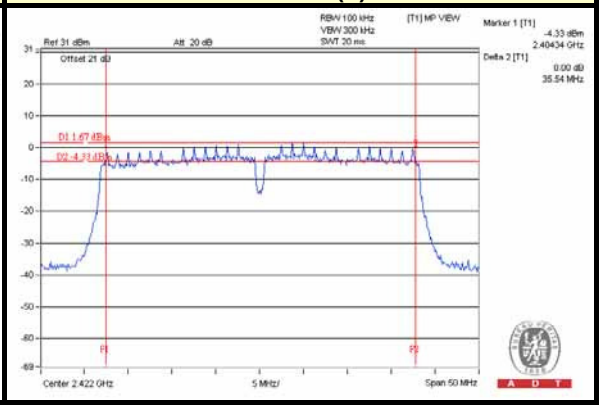
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS

CDD MODE						
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
802.11b						
1	2412	8.12	9.06	8.59	0.5	PASS
6	2437	9.08	9.11	9.07	0.5	PASS
11	2462	8.58	8.61	9.04	0.5	PASS
802.11g						
1	2412	16.40	16.40	16.36	0.5	PASS
6	2437	16.39	15.81	16.37	0.5	PASS
11	2462	16.39	16.40	16.10	0.5	PASS
VHT20						
1	2412	17.65	17.66	17.36	0.5	PASS
6	2437	17.62	17.03	17.57	0.5	PASS
11	2462	17.56	17.66	17.21	0.5	PASS
VHT40						
3	2422	36.37	36.46	35.54	0.5	PASS
6	2437	36.44	35.87	36.34	0.5	PASS
9	2452	35.87	35.95	36.15	0.5	PASS

CDD MODE	
SPECTRUM PLOT OF WORST VALUE	
802.11b / Chain(0) : CH1	802.11g / Chain(1) : CH6
	
VHT20 / Chain(1) : CH6	VHT40 / Chain(2) : CH3
	

Beamforming MODE						
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
VHT20						
1	2412	17.65	17.66	17.36	0.5	PASS
6	2437	17.64	17.63	17.59	0.5	PASS
11	2462	17.56	17.66	17.21	0.5	PASS
VHT40						
3	2422	36.37	36.46	35.54	0.5	PASS
6	2437	36.44	35.87	36.34	0.5	PASS
9	2452	35.87	35.95	36.15	0.5	PASS

Beamforming MODE	
SPECTRUM PLOT OF WORST VALUE	
VHT20 / Chain(2) : CH11	VHT40 / Chain(2) : CH3
	

4.4 CONDUCTED OUTPUT POWER MEASUREMENT

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

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

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

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

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

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

4.4.2 TEST INSTRUMENTS

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

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Nov. 12 to 13, 2014

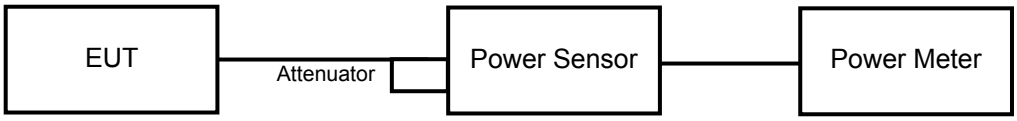
4.4.3 TEST PROCEDURES

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

4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.7 TEST RESULTS

CDD MODE								
CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
802.11b								
1	2412	23.26	23.17	23.08	622.563	27.94	30	PASS
6	2437	23.90	23.80	24.00	736.543	28.67	30	PASS
11	2462	23.15	22.45	22.62	565.14	27.52	30	PASS
802.11g								
1	2412	18.17	17.77	18.07	189.577	22.78	30	PASS
6	2437	25.46	25.02	25.03	987.667	29.95	30	PASS
11	2462	18.15	17.72	17.88	185.845	22.69	30	PASS
VHT20								
1	2412	18.39	18.26	18.02	199.399	23.00	30	PASS
6	2437	25.53	25.02	25.07	996.326	29.98	30	PASS
11	2462	17.66	17.44	17.44	169.271	22.29	30	PASS
VHT40								
3	2422	14.73	13.95	14.15	80.55	19.06	30	PASS
6	2437	18.86	18.67	18.68	224.324	23.51	30	PASS
9	2452	15.11	14.25	14.30	85.956	19.34	30	PASS

Beamforming MODE								
CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
VHT20								
1	2412	18.39	18.26	18.02	199.399	23.00	29.23	PASS
6	2437	24.46	24.00	24.09	786.891	28.96	29.23	PASS
11	2462	17.66	17.44	17.44	169.271	22.29	29.23	PASS
VHT40								
3	2422	14.73	13.95	14.15	80.55	19.06	29.23	PASS
6	2437	18.86	18.67	18.68	224.324	23.51	29.23	PASS
9	2452	15.11	14.25	14.30	85.956	19.34	29.23	PASS

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

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

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

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Nov. 12 to 13, 2014

4.5.3 TEST PROCEDURE

For 802.11b, 802.11g, VHT20:

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

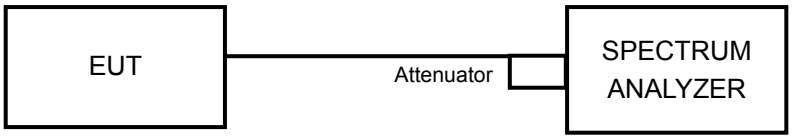
For VHT40:

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

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.5.7 TEST RESULTS

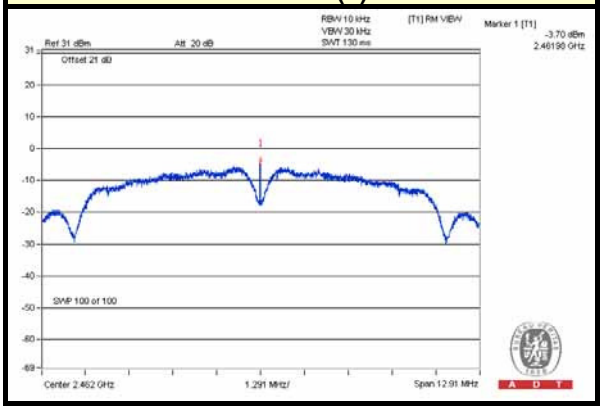
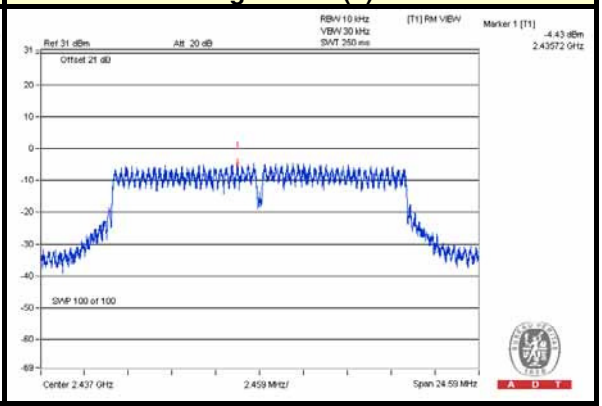
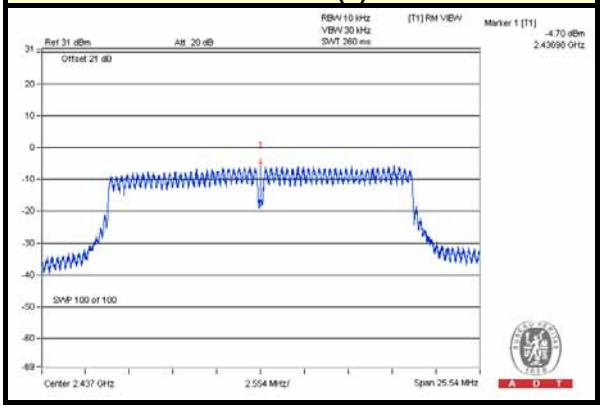
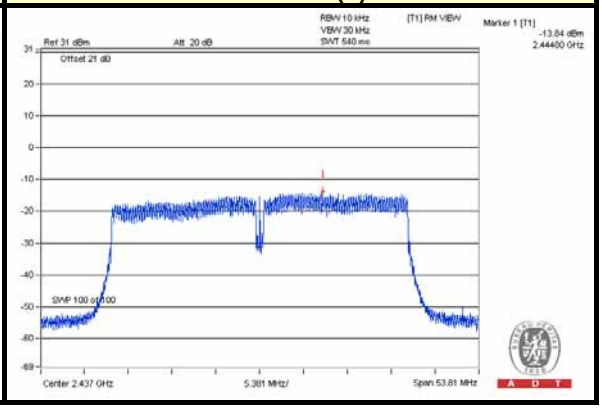
CDD MODE							
802.11b							
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=3) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	1	2412	-4.51	4.77	0.26	7.23	PASS
	6	2437	-4.46	4.77	0.31	7.23	PASS
	11	2462	-4.80	4.77	-0.03	7.23	PASS
1	1	2412	-4.26	4.77	0.51	7.23	PASS
	6	2437	-4.90	4.77	-0.13	7.23	PASS
	11	2462	-3.70	4.77	1.07	7.23	PASS
2	1	2412	-5.15	4.77	-0.38	7.23	PASS
	6	2437	-4.61	4.77	0.16	7.23	PASS
	11	2462	-5.10	4.77	-0.33	7.23	PASS
802.11g							
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=3) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	1	2412	-11.06	4.77	-6.29	7.23	PASS
	6	2437	-4.43	4.77	0.34	7.23	PASS
	11	2462	-11.07	4.77	-6.30	7.23	PASS
1	1	2412	-8.15	4.77	-3.38	7.23	PASS
	6	2437	-4.77	4.77	0.00	7.23	PASS
	11	2462	-9.81	4.77	-5.04	7.23	PASS
2	1	2412	-10.63	4.77	-5.86	7.23	PASS
	6	2437	-5.19	4.77	-0.42	7.23	PASS
	11	2462	-11.55	4.77	-6.78	7.23	PASS

CDD MODE							
VHT20							
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=3) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	1	2412	-12.20	4.77	-7.43	7.23	PASS
	6	2437	-5.28	4.77	-0.51	7.23	PASS
	11	2462	-13.18	4.77	-8.41	7.23	PASS
1	1	2412	-8.14	4.77	-3.37	7.23	PASS
	6	2437	-4.70	4.77	0.07	7.23	PASS
	11	2462	-10.54	4.77	-5.77	7.23	PASS
2	1	2412	-12.19	4.77	-7.42	7.23	PASS
	6	2437	-6.47	4.77	-1.70	7.23	PASS
	11	2462	-13.32	4.77	-8.55	7.23	PASS

VHT40								
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD W/O DUTY FACTOR (dBm)	10 log (N=3) dB	DUTY FACTOR (dB)	TOTAL PSD WITH DUTY FACTOR (dBm)	LIMIT (dBm)	PASS /FAIL
0	3	2422	-18.53	4.77	0.11	-13.65	7.23	PASS
	6	2437	-13.92	4.77	0.11	-9.04	7.23	PASS
	9	2452	-17.64	4.77	0.11	-12.76	7.23	PASS
1	3	2422	-17.13	4.77	0.11	-12.25	7.23	PASS
	6	2437	-13.84	4.77	0.11	-8.96	7.23	PASS
	9	2452	-17.95	4.77	0.11	-13.07	7.23	PASS
2	3	2422	-16.96	4.77	0.11	-12.08	7.23	PASS
	6	2437	-13.84	4.77	0.11	-8.96	7.23	PASS
	9	2452	-17.88	4.77	0.11	-13.00	7.23	PASS

Note : 1. Directional gain = 2dBi + 10log(3) = 6.77dBi > 6dBi , so the power density limit shall be reduced to 8-(6.77-6) = 7.23dBm.

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

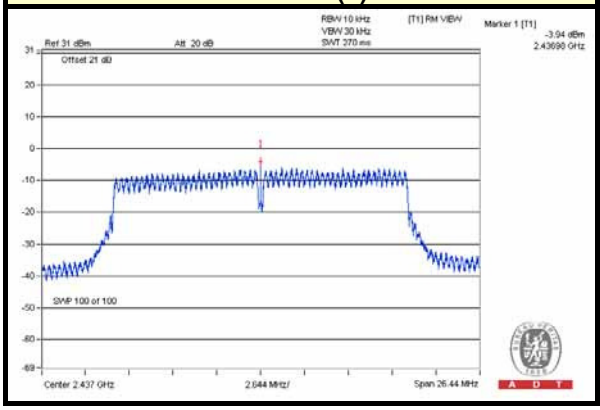
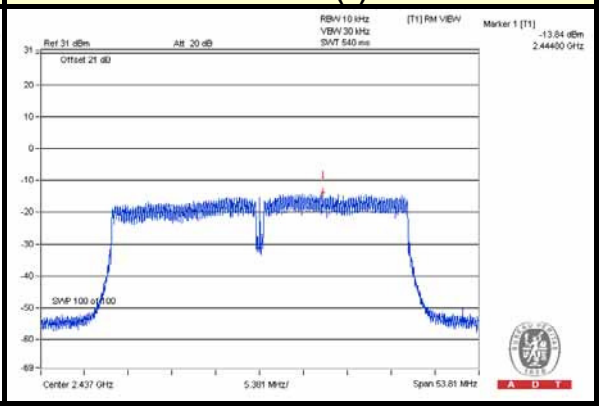
CDD MODE	
SPECTRUM PLOT OF WORST VALUE	
802.11b / Chain(1) : CH11	802.11g / Chain(0) : CH6
	
VHT20 / Chain(1) : CH6	VHT40 / Chain(1) : CH6
	

Beamforming MODE							
VHT20							
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=3) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	1	2412	-12.20	4.77	-7.43	7.23	PASS
	6	2437	-5.52	4.77	-0.75	7.23	PASS
	11	2462	-13.18	4.77	-8.41	7.23	PASS
1	1	2412	-8.14	4.77	-3.37	7.23	PASS
	6	2437	-3.94	4.77	0.83	7.23	PASS
	11	2462	-10.54	4.77	-5.77	7.23	PASS
2	1	2412	-12.19	4.77	-7.42	7.23	PASS
	6	2437	-5.53	4.77	-0.76	7.23	PASS
	11	2462	-13.32	4.77	-8.55	7.23	PASS

VHT40								
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD W/O DUTY FACTOR (dBm)	10 log (N=3) dB	DUTY FACTOR (dB)	TOTAL PSD WITH DUTY FACTOR (dBm)	LIMIT (dBm)	PASS /FAIL
0	3	2422	-18.53	4.77	0.11	-13.65	7.23	PASS
	6	2437	-13.92	4.77	0.11	-9.04	7.23	PASS
	9	2452	-17.64	4.77	0.11	-12.76	7.23	PASS
1	3	2422	-17.13	4.77	0.11	-12.25	7.23	PASS
	6	2437	-13.84	4.77	0.11	-8.96	7.23	PASS
	9	2452	-17.95	4.77	0.11	-13.07	7.23	PASS
2	3	2422	-16.96	4.77	0.11	-12.08	7.23	PASS
	6	2437	-13.84	4.77	0.11	-8.96	7.23	PASS
	9	2452	-17.88	4.77	0.11	-13.00	7.23	PASS

Note : 1. Directional gain = 2dBi + 10log(3) = 6.77dBi > 6dBi , so the power density limit shall be reduced to 8-(6.77-6) = 7.23dBm.

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

Beamforming MODE	
SPECTRUM PLOT OF WORST VALUE	
VHT20 / Chain(1) : CH6	VHT40 / Chain(1) : CH6
	

4.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

4.6.2 TEST INSTRUMENTS

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

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Nov. 12 to 13, 2014

4.6.3 TEST PROCEDURE

Measurement Procedure - Reference Level

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

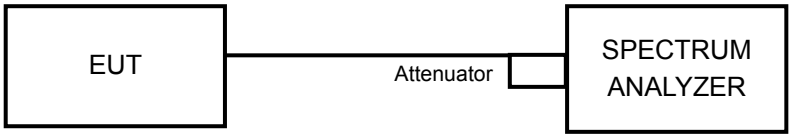
Measurement Procedure –Unwanted Emission Level

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

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITION

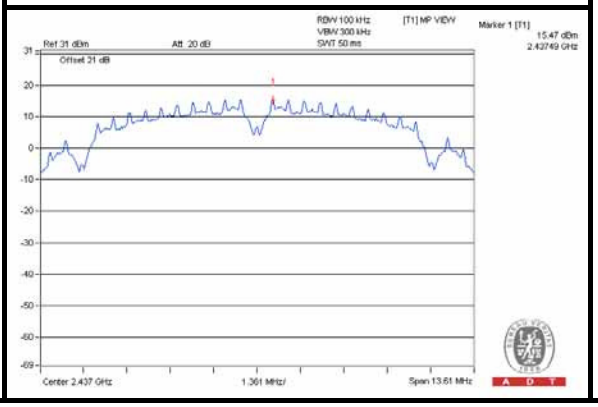
Same as Item 4.3.6

4.6.7 TEST RESULTS

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

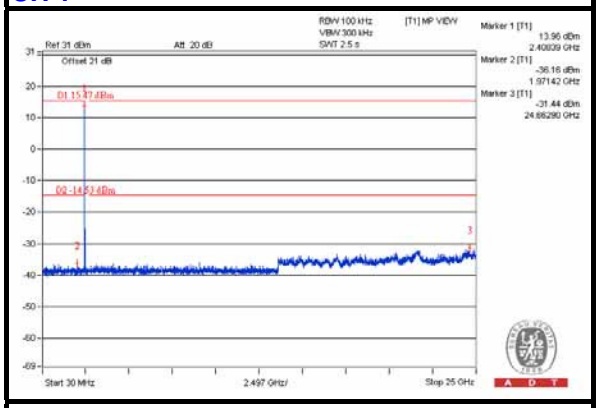
CDD MODE: 802.11b

Maximum REF

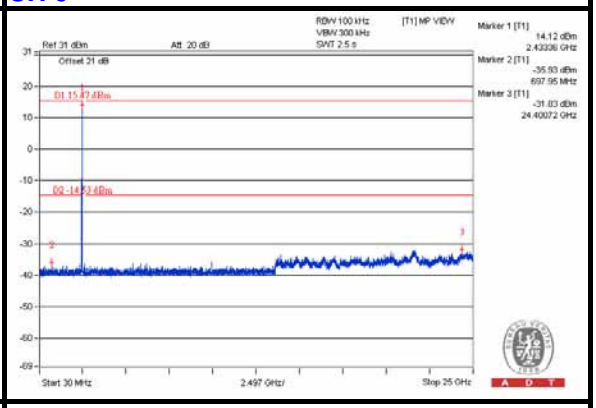


Chain(0)

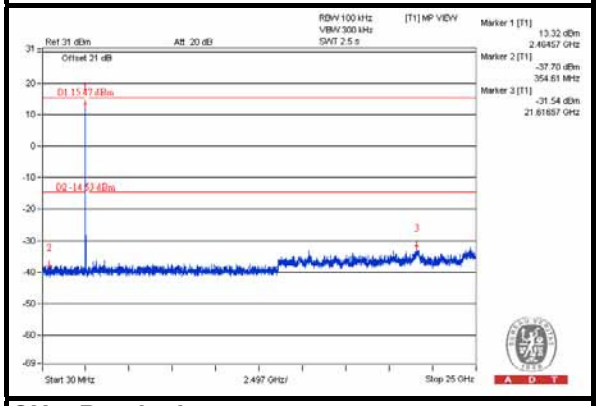
CH 1



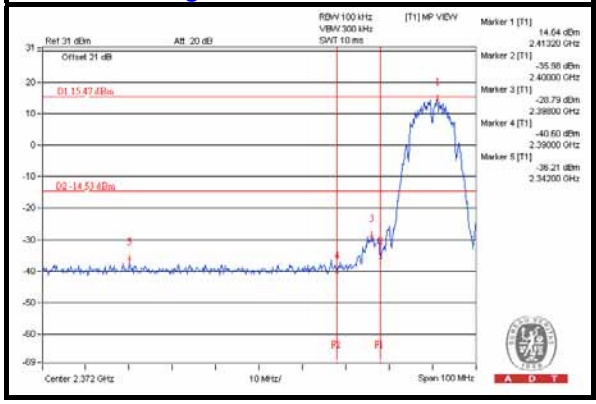
CH 6



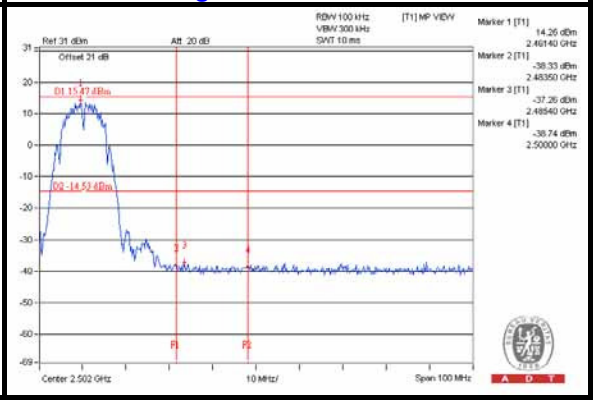
CH 11



CH 1 Band edge

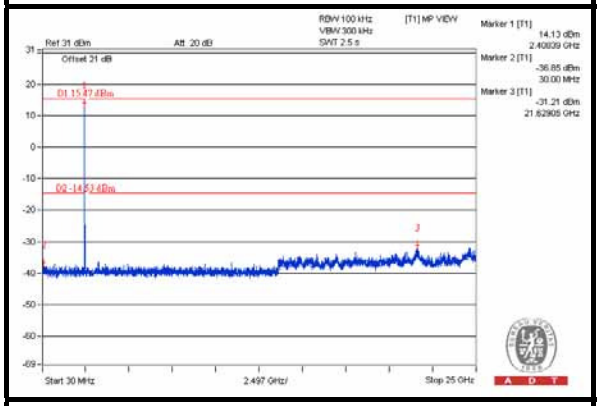


CH 11 Band edge

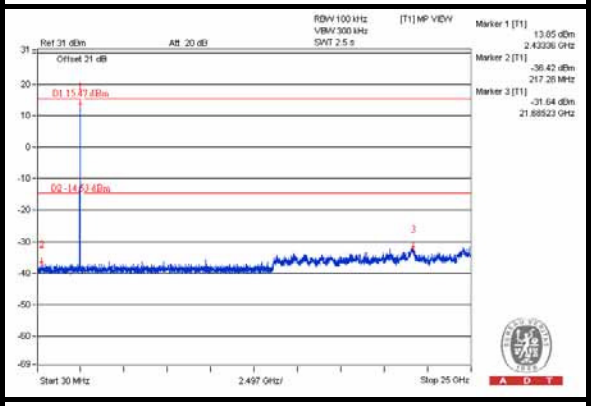


Chain(1)

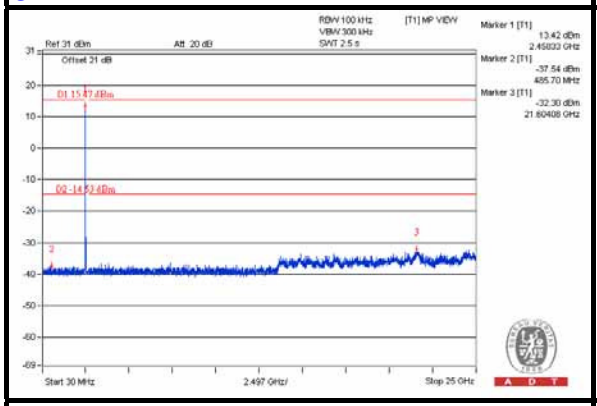
CH 1



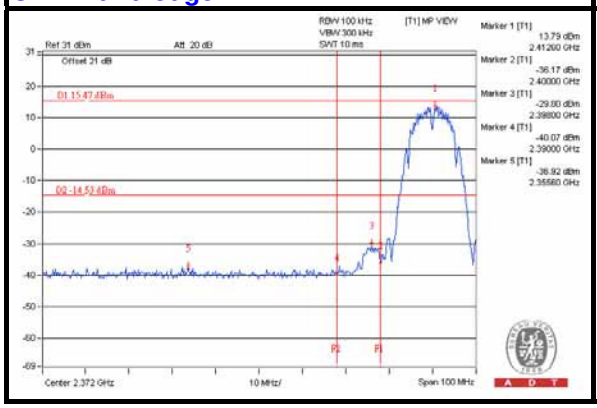
CH 6



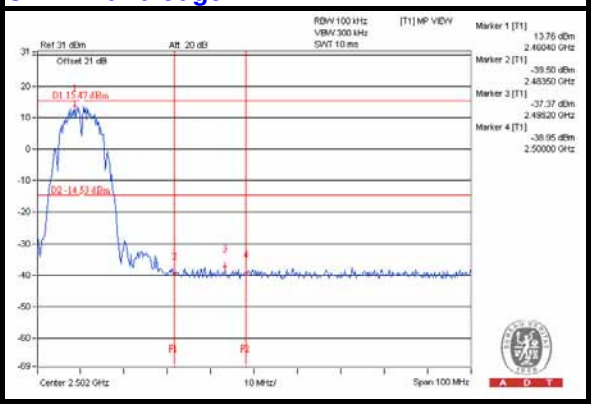
CH 11



CH 1 Band edge

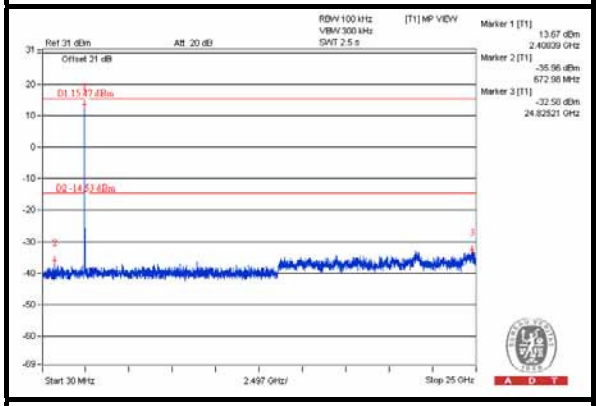


CH 11 Band edge

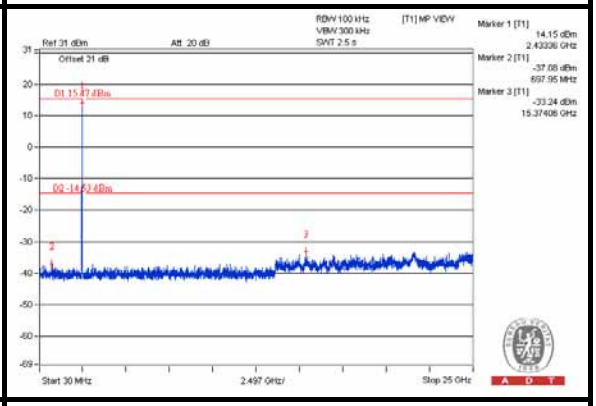


Chain(2)

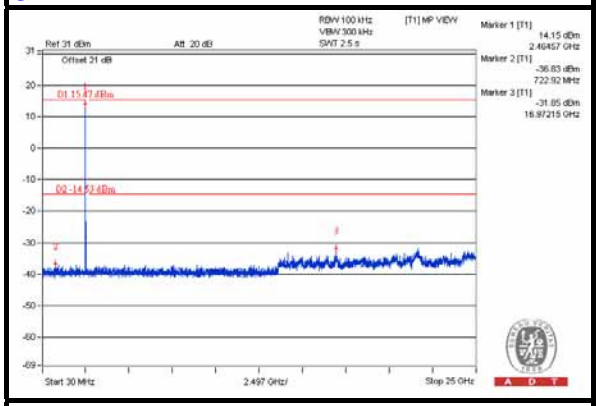
CH 1



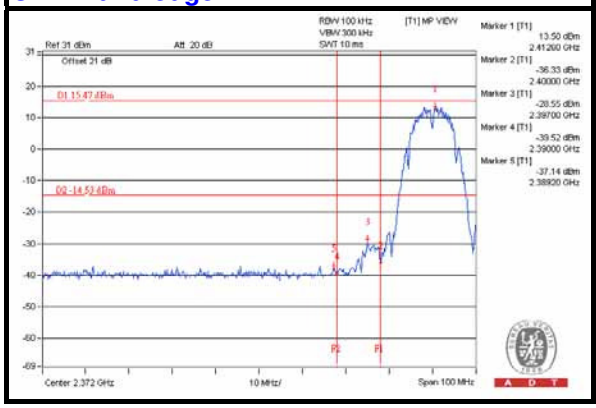
CH 6



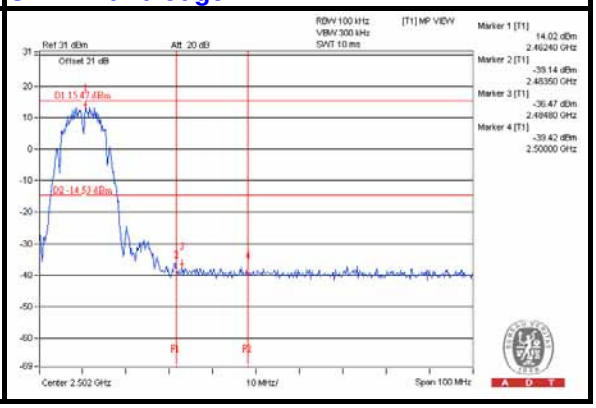
CH 11



CH 1 Band edge

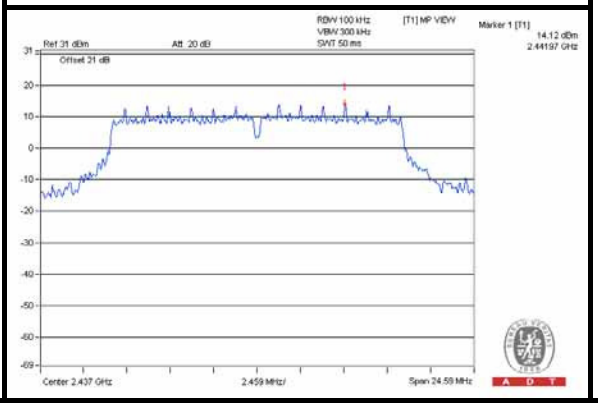


CH 11 Band edge



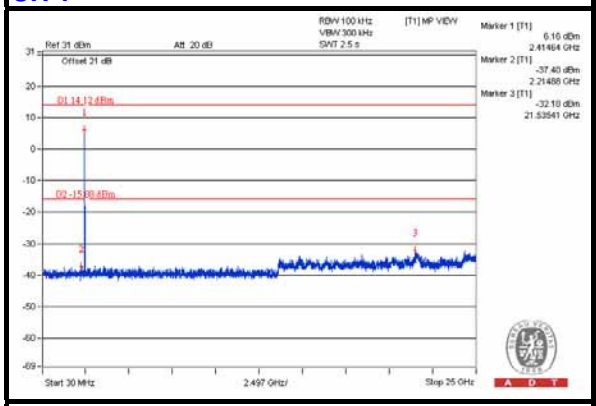
CDD MODE: 802.11g

Maximum REF

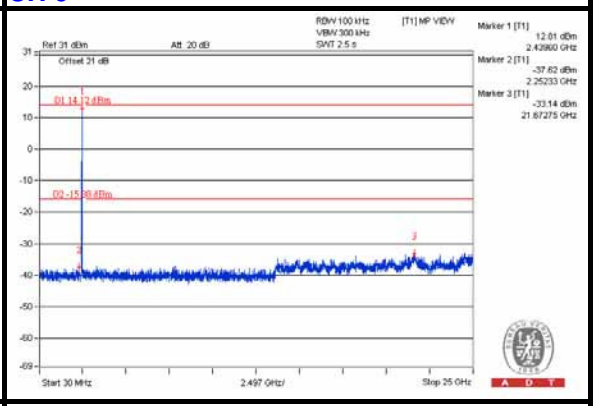


Chain(0)

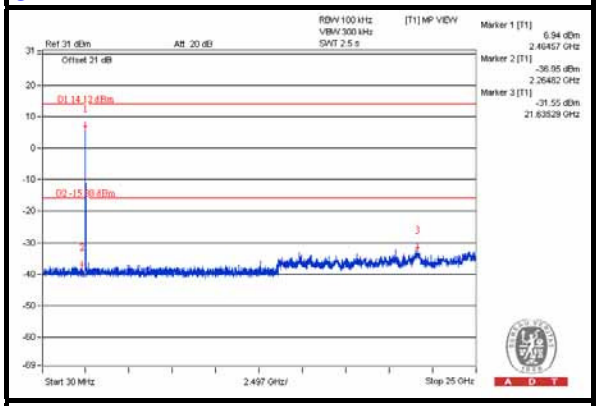
CH 1



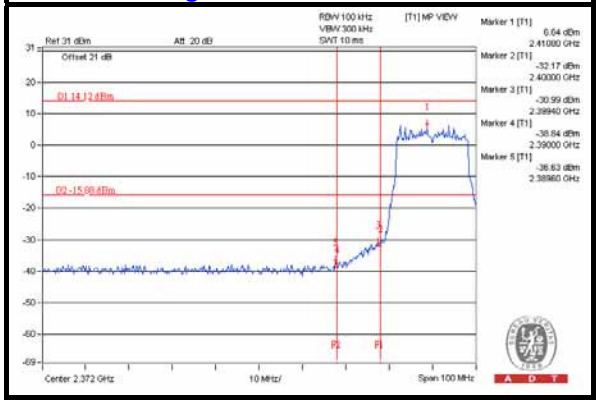
CH 6



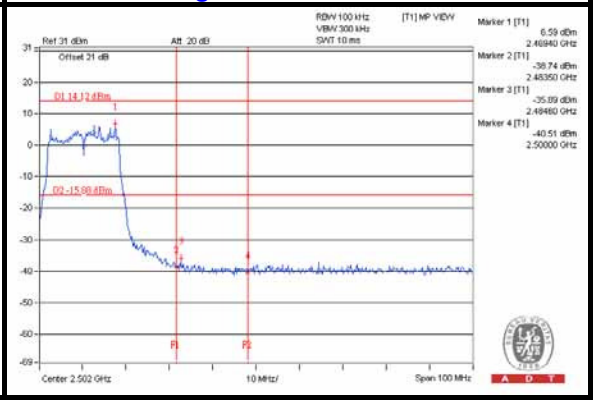
CH 11



CH 1 Band edge

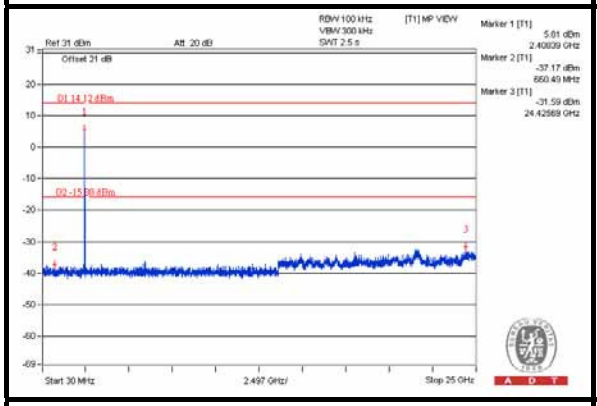


CH 11 Band edge

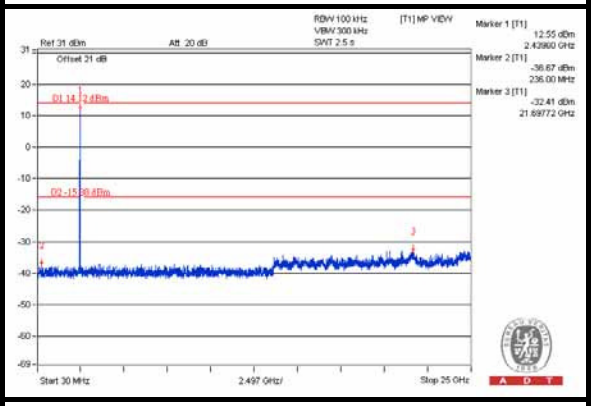


Chain(1)

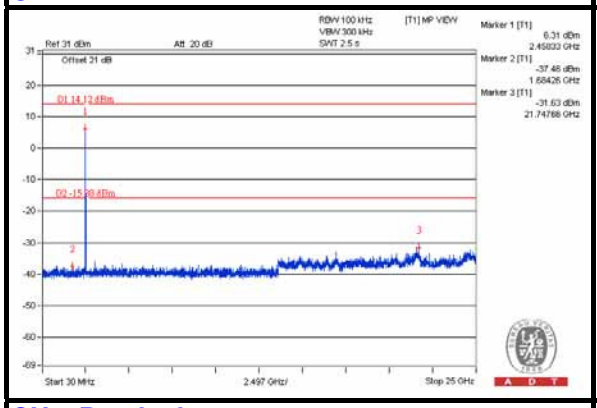
CH 1



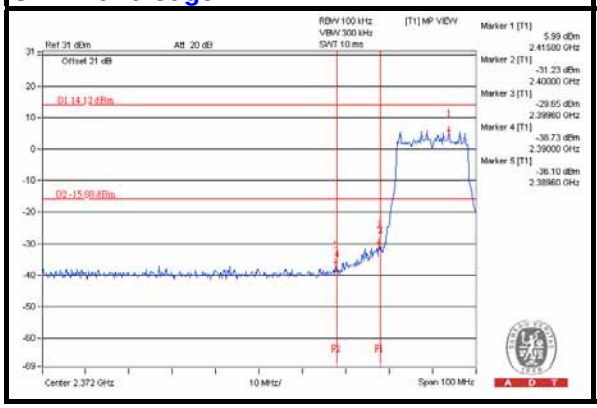
CH 6



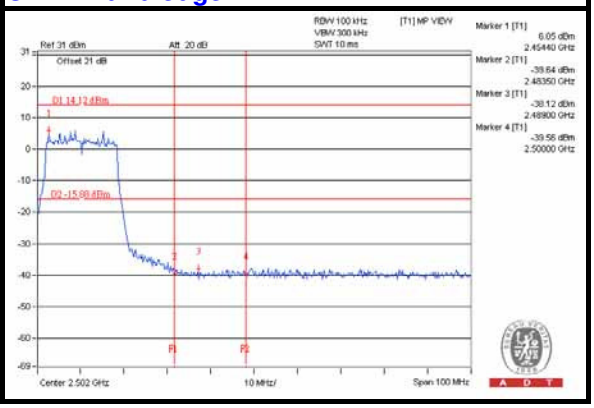
CH 11



CH 1 Band edge

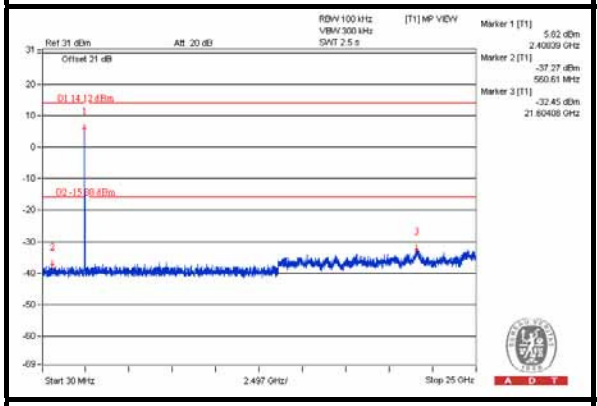


CH 11 Band edge

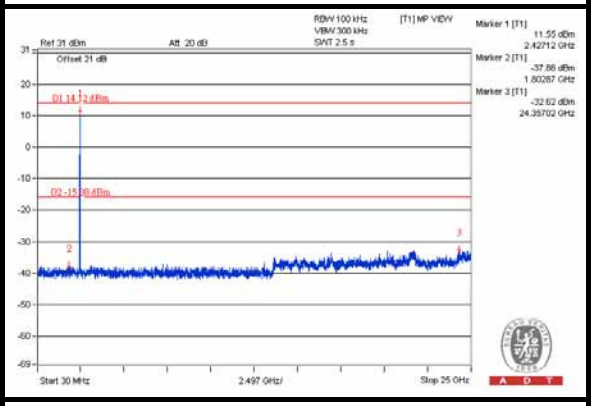


Chain(2)

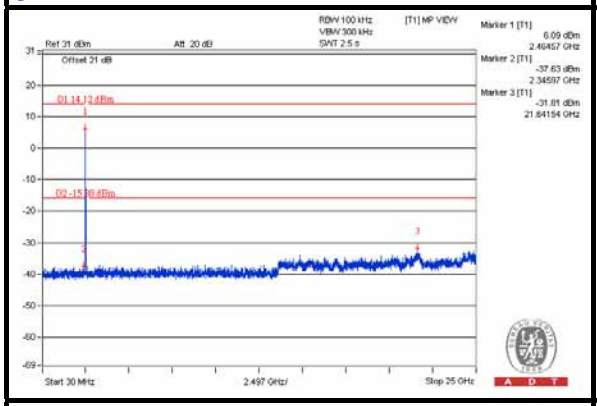
CH 1



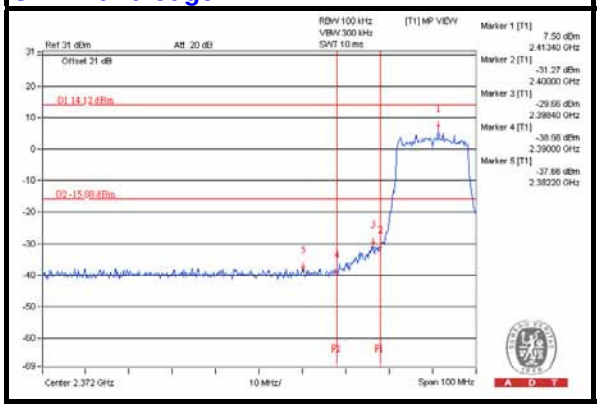
CH 6



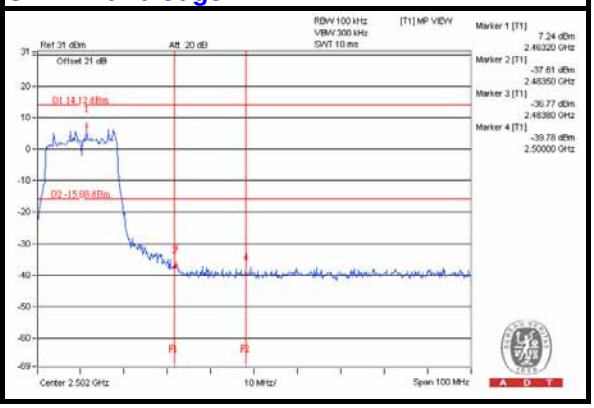
CH 11



CH 1 Band edge

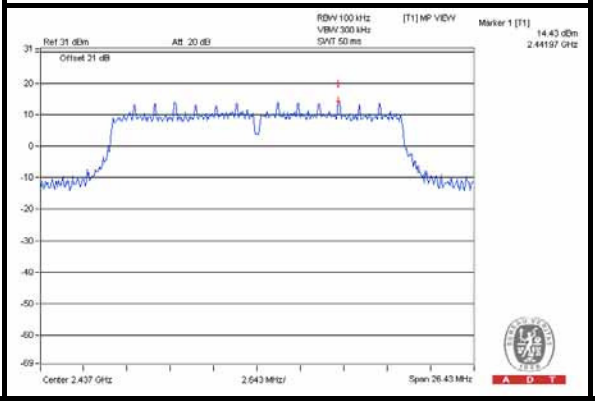


CH 11 Band edge



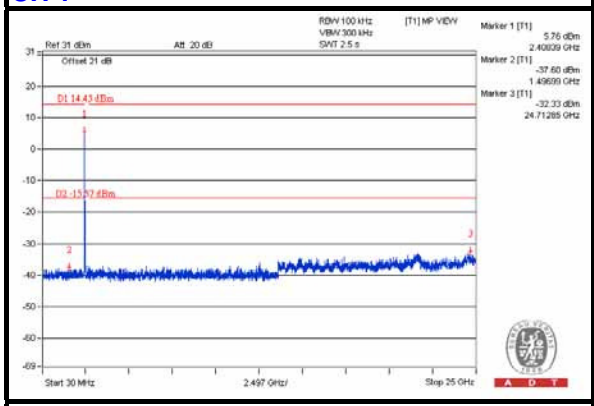
CDD MODE: VHT20

Maximum REF

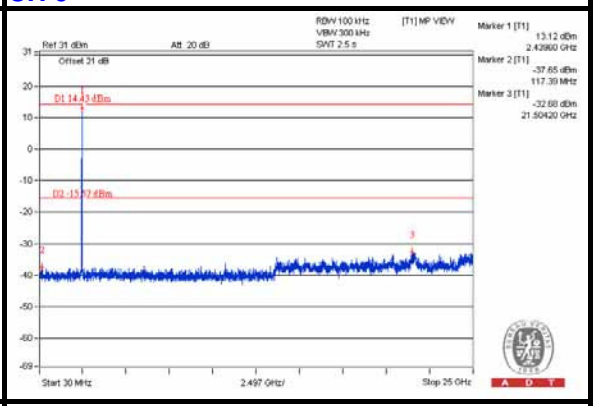


Chain(0)

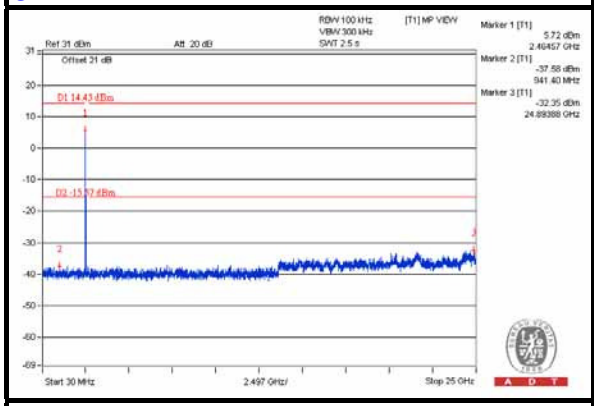
CH 1



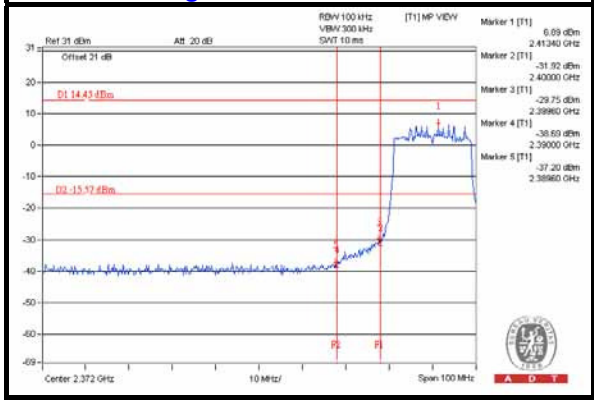
CH 6



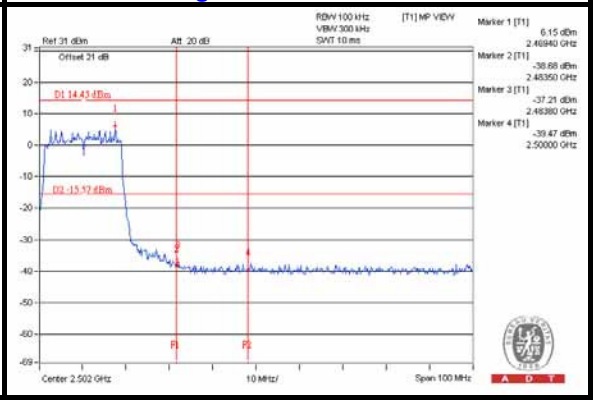
CH 11



CH 1 Band edge

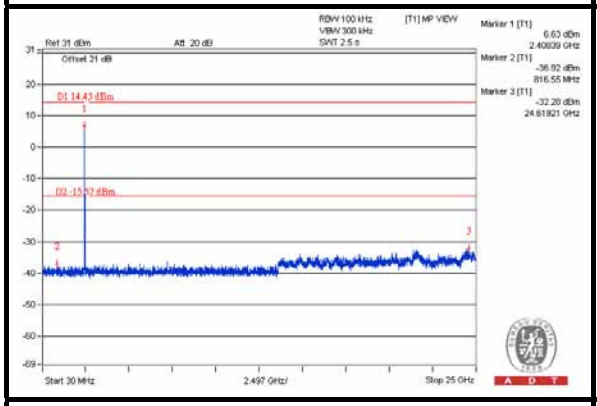


CH 11 Band edge

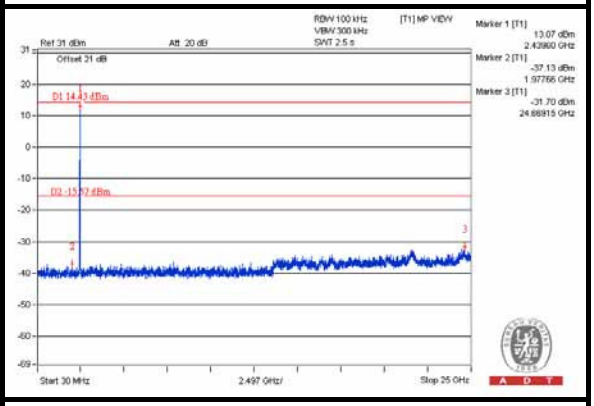


Chain(1)

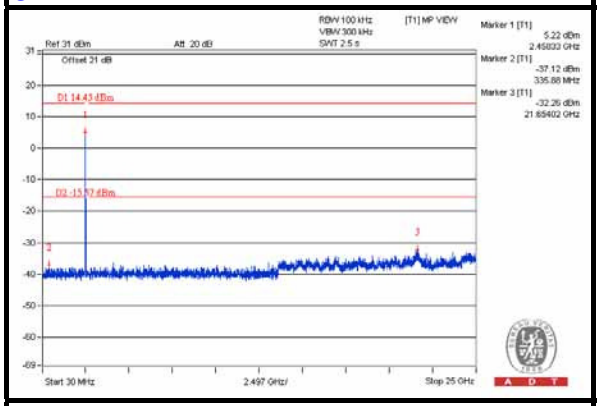
CH 1



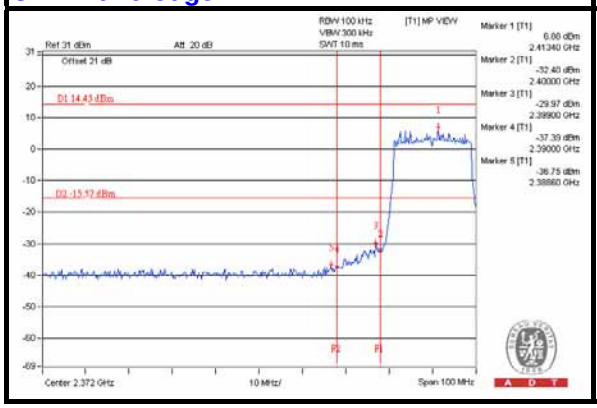
CH 6



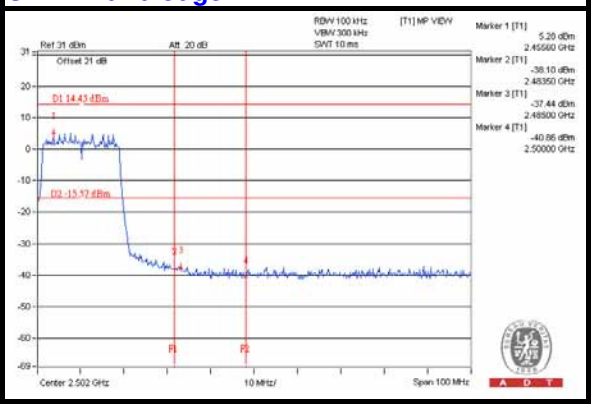
CH 11



CH 1 Band edge

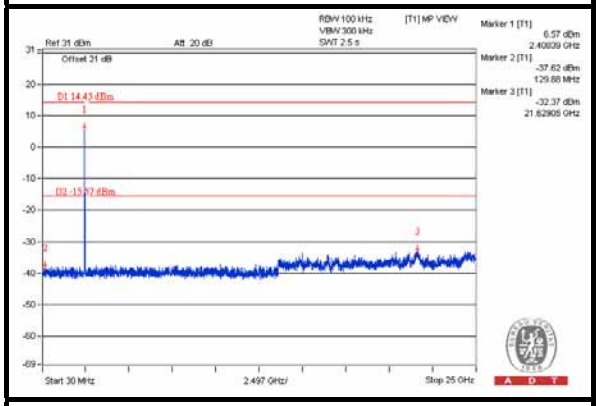


CH 11 Band edge

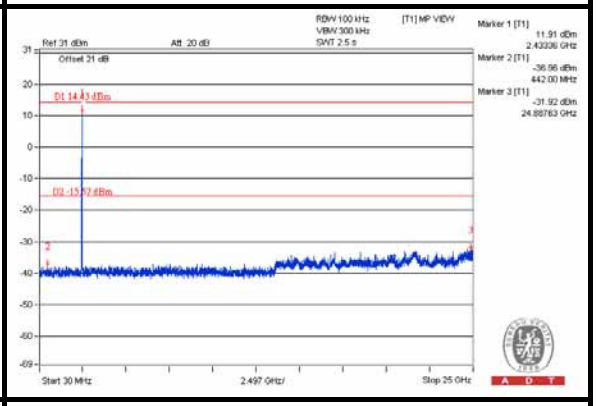


Chain(2)

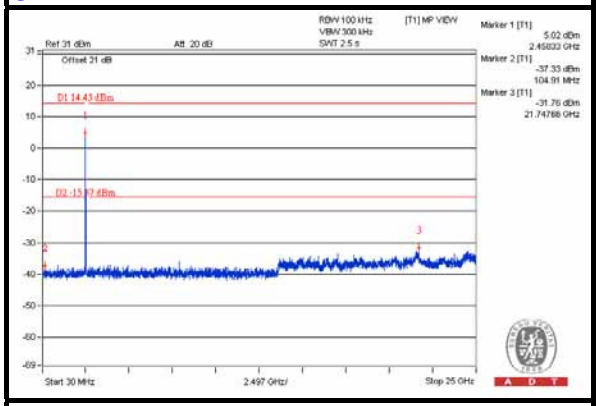
CH 1



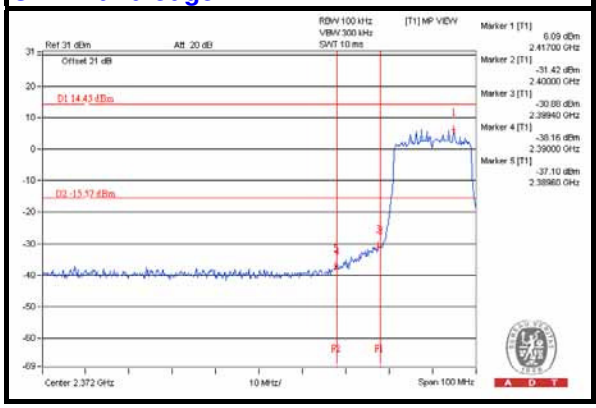
CH 6



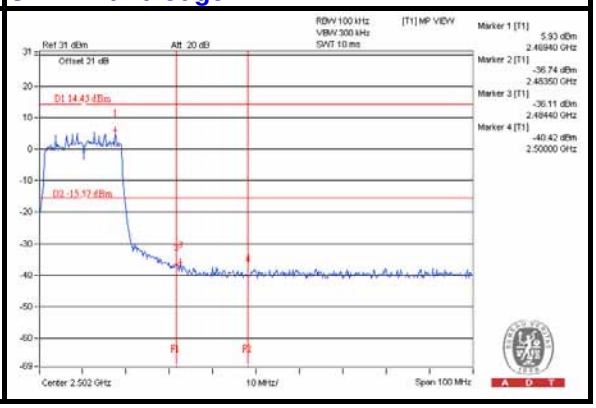
CH 11



CH 1 Band edge

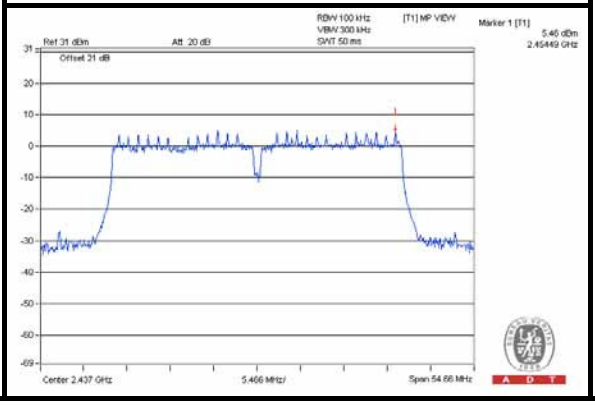


CH 11 Band edge



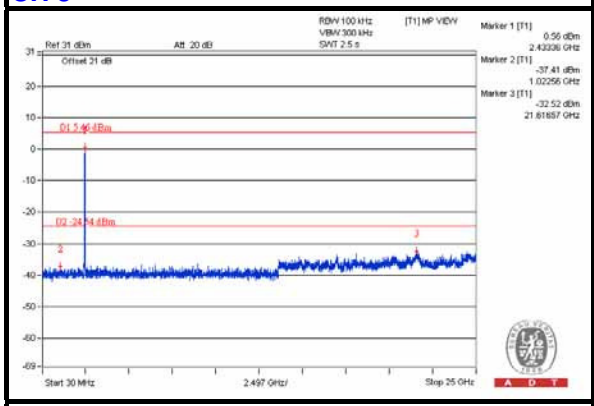
CDD MODE: VHT40

Maximum REF

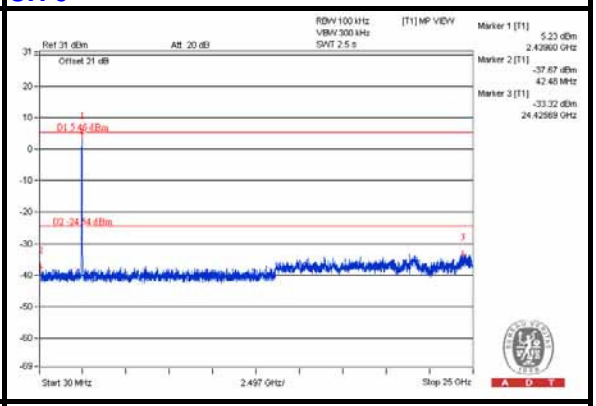


Chain(0)

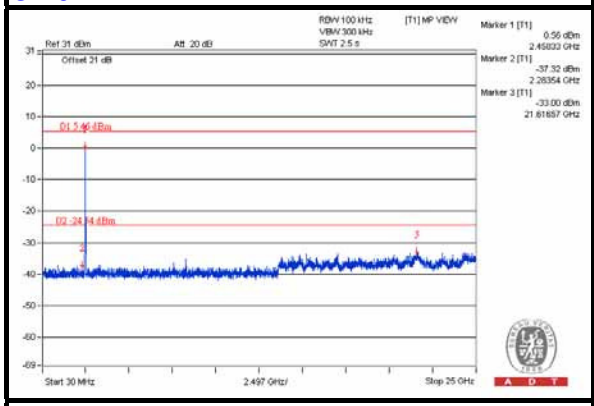
CH 3



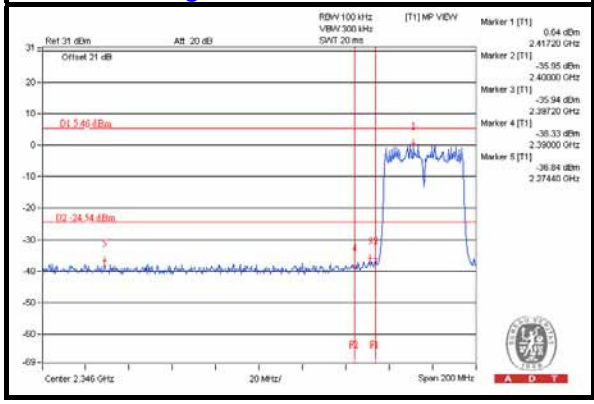
CH 6



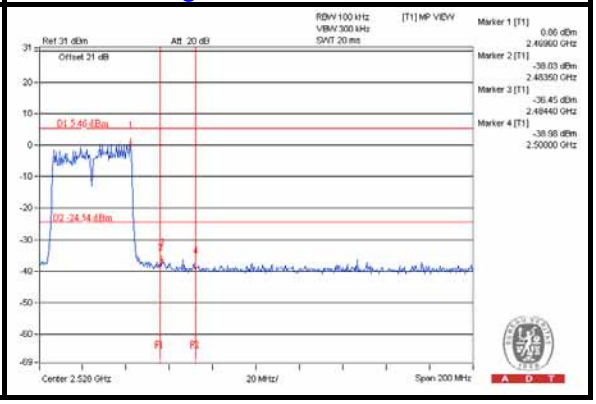
CH 9



CH 3 Band edge

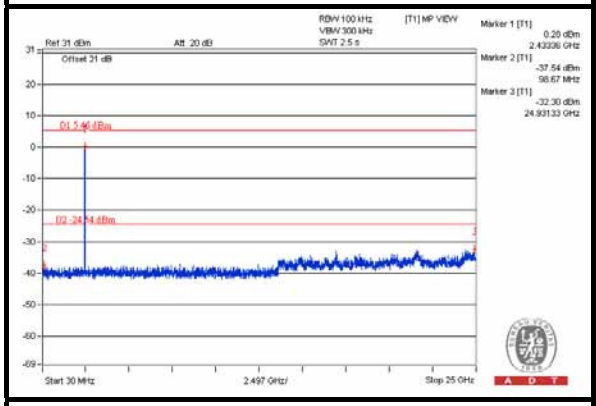


CH 9 Band edge

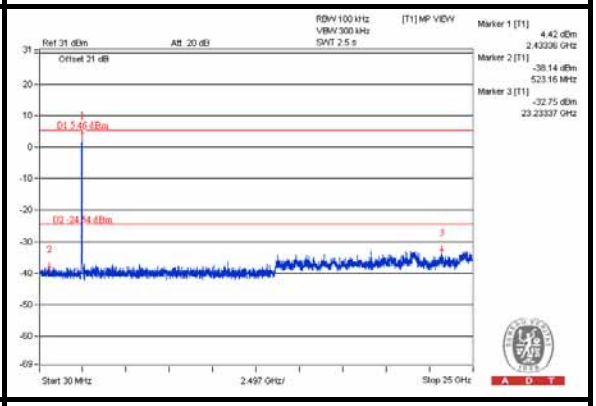


Chain(1)

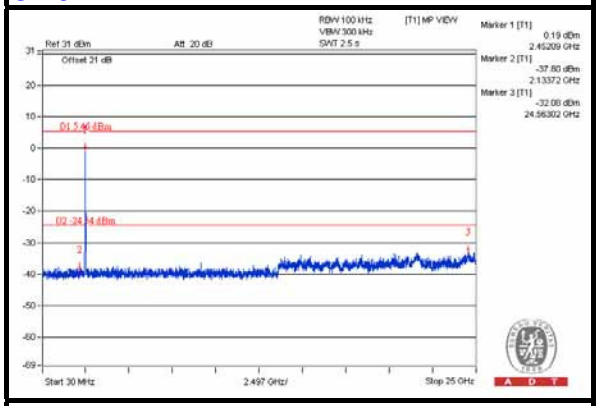
CH 3



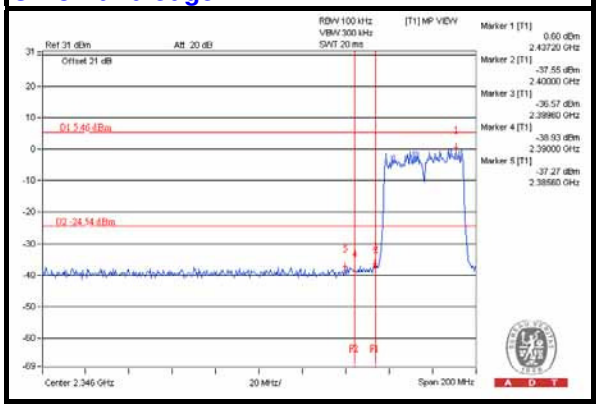
CH 6



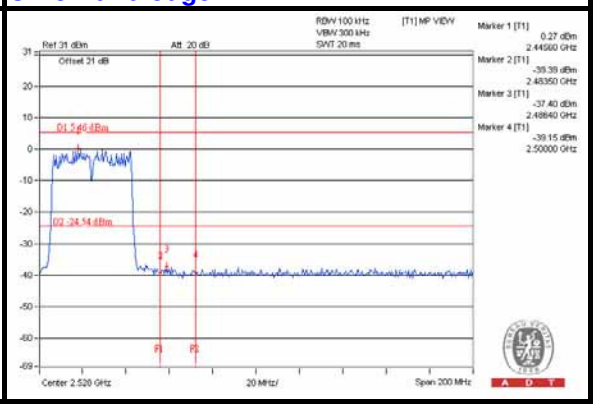
CH 9



CH 3 Band edge

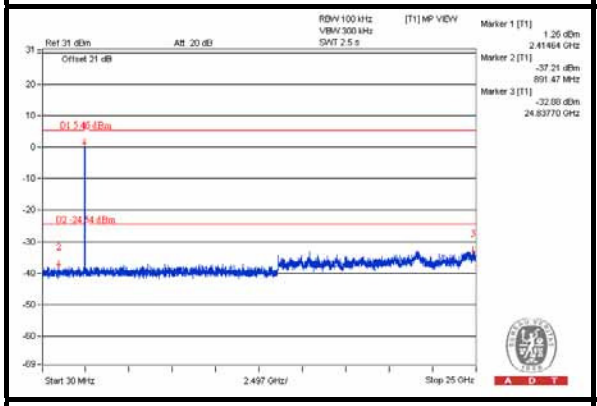


CH 9 Band edge

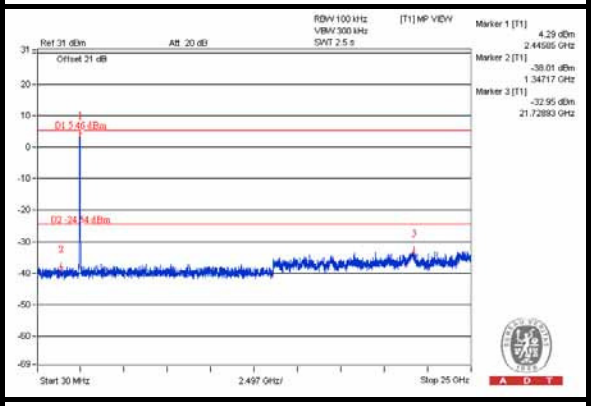


Chain(2)

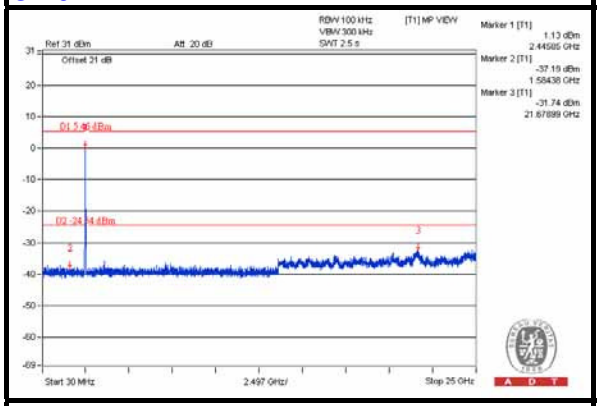
CH 3



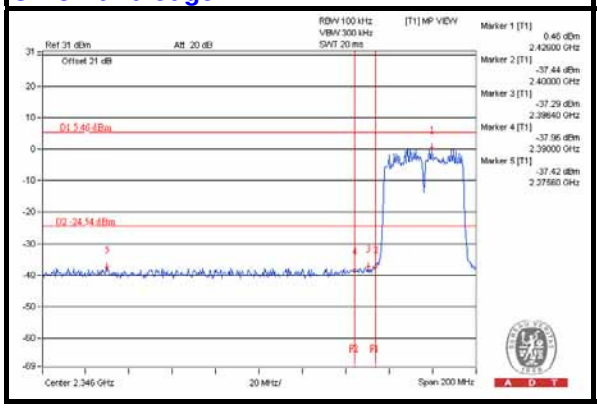
CH 6



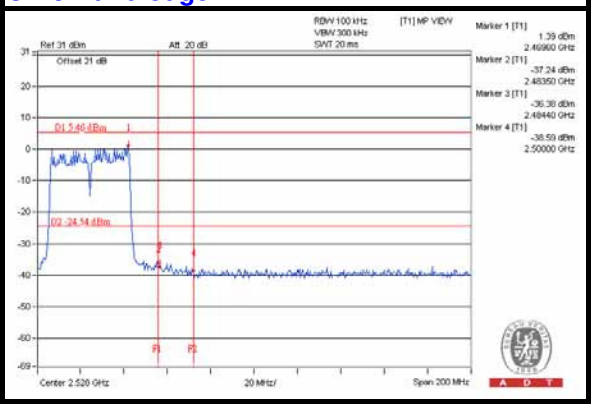
CH 9



CH 3 Band edge

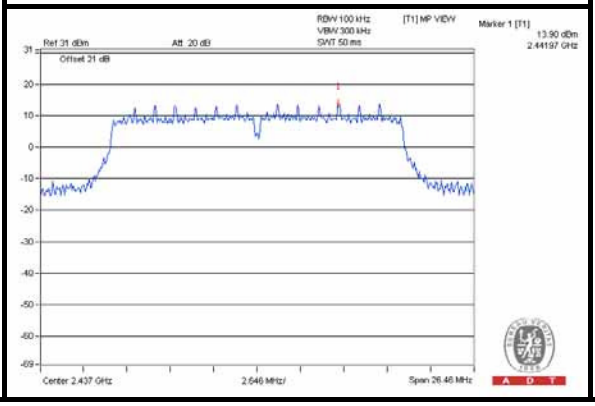


CH 9 Band edge



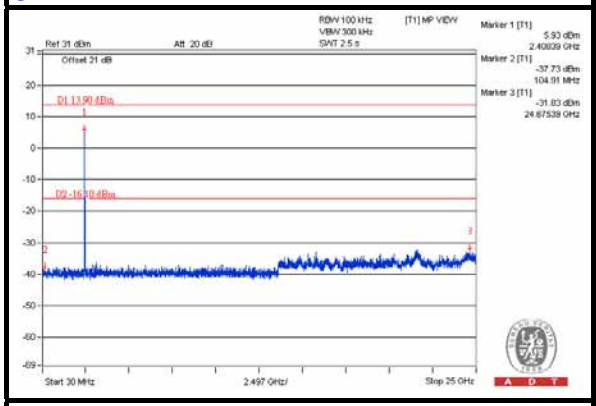
Beamforming Mode: VHT20

Maximum REF

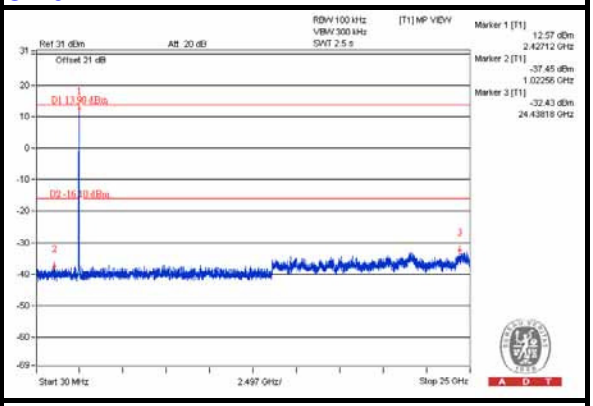


Chain(0)

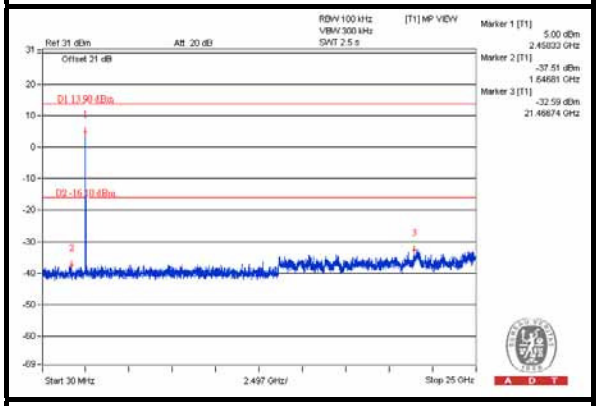
CH 1



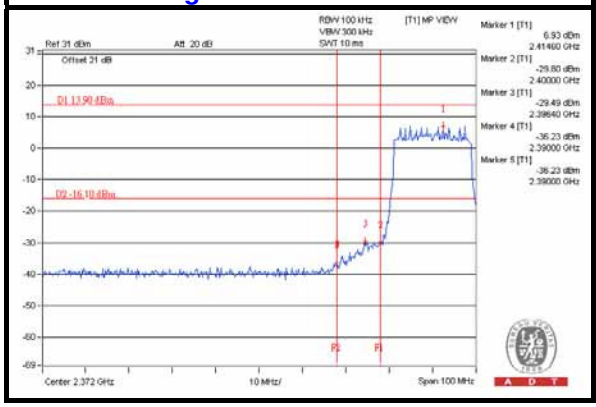
CH 6



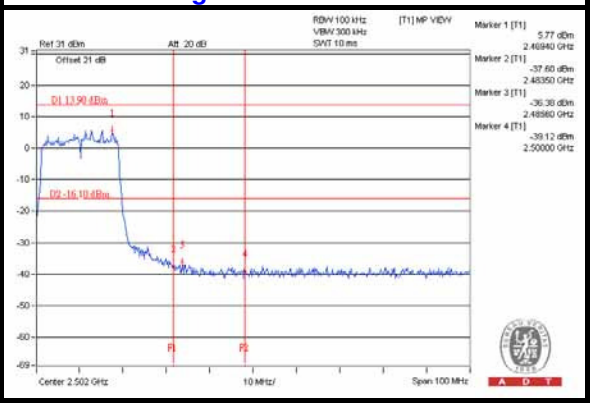
CH 11



CH 1 Band edge

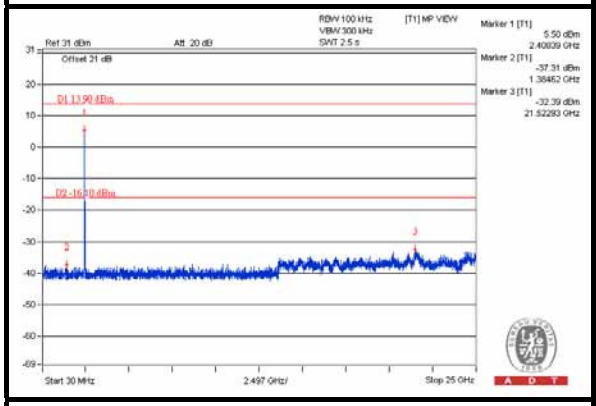


CH 11 Band edge

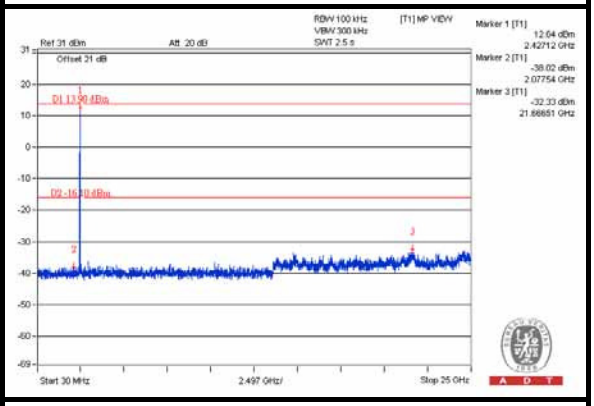


Chain(1)

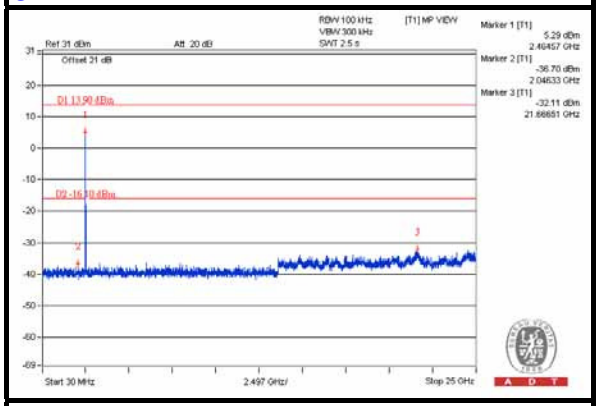
CH 1



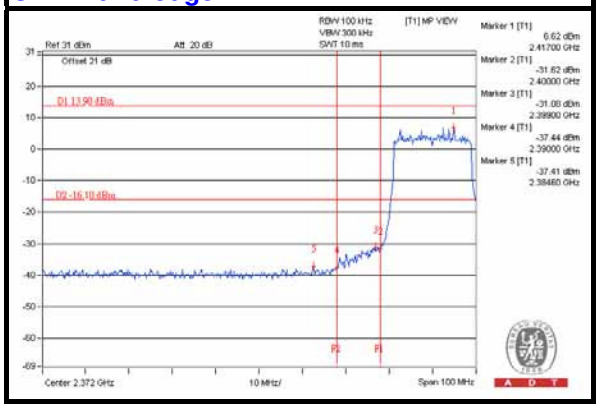
CH 6



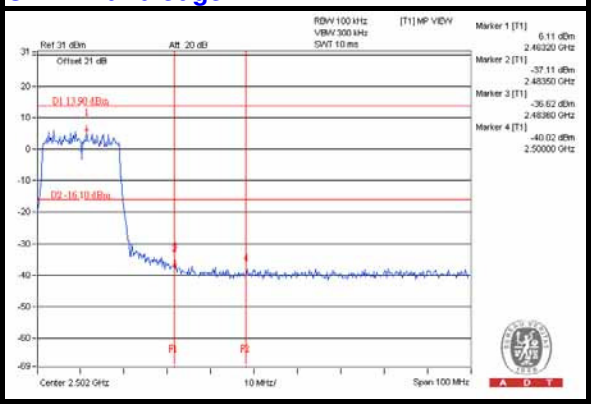
CH 11



CH 1 Band edge

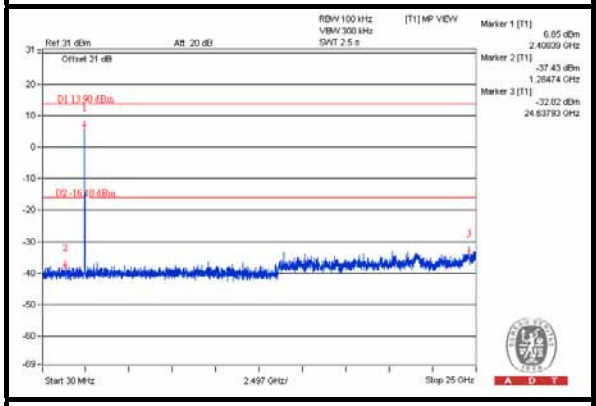


CH 11 Band edge

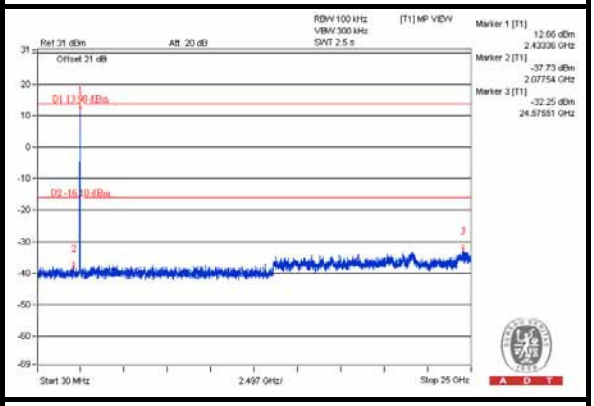


Chain(2)

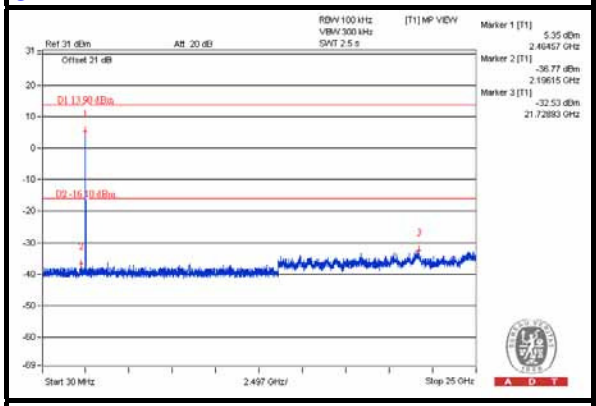
CH 1



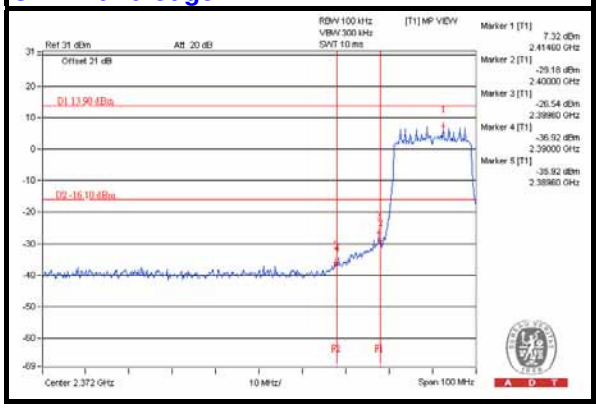
CH 6



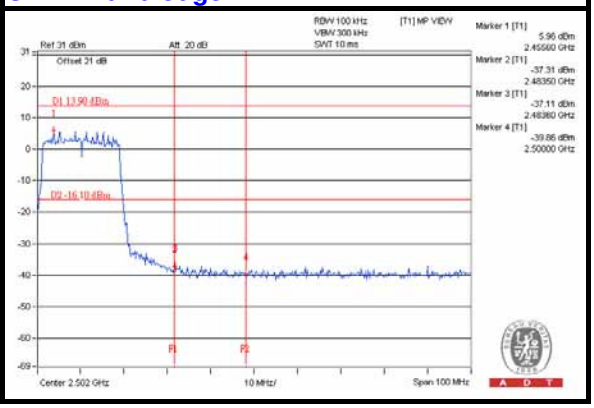
CH 11



CH 1 Band edge

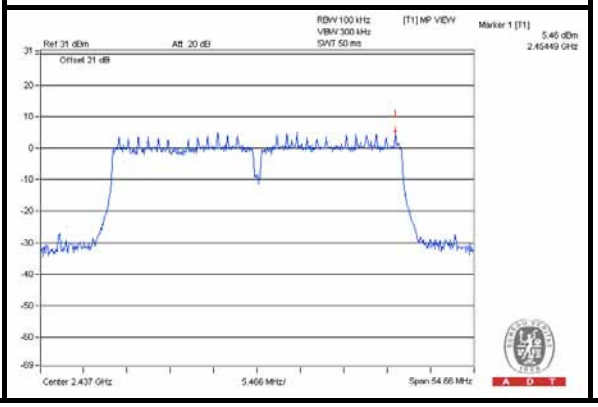


CH 11 Band edge



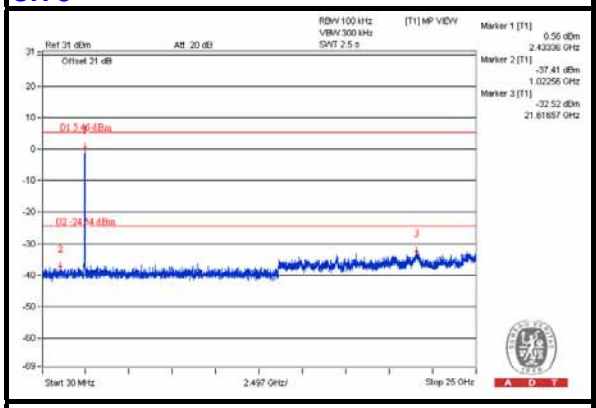
Beamforming Mode: VHT40

Maximum REF

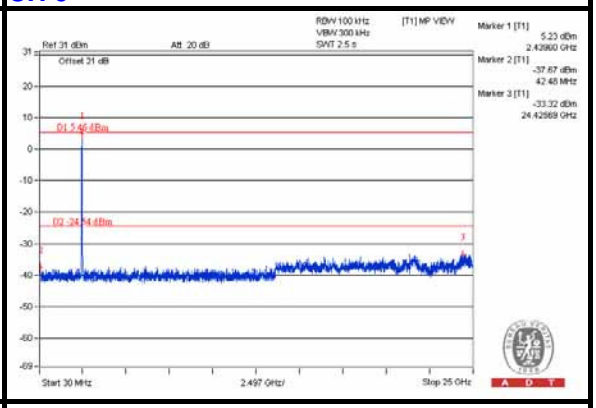


Chain(0)

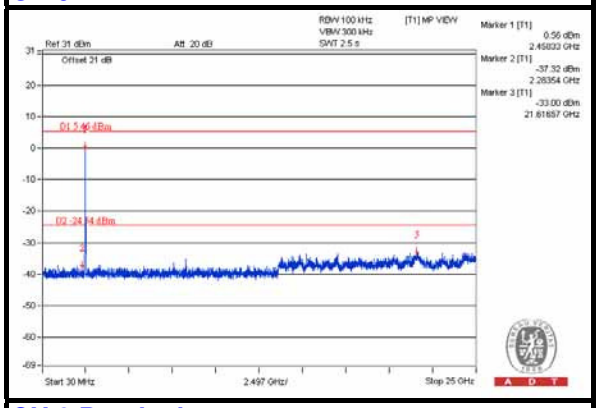
CH 3



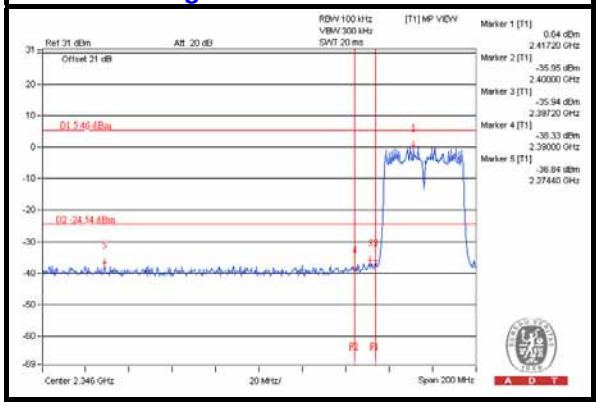
CH 6



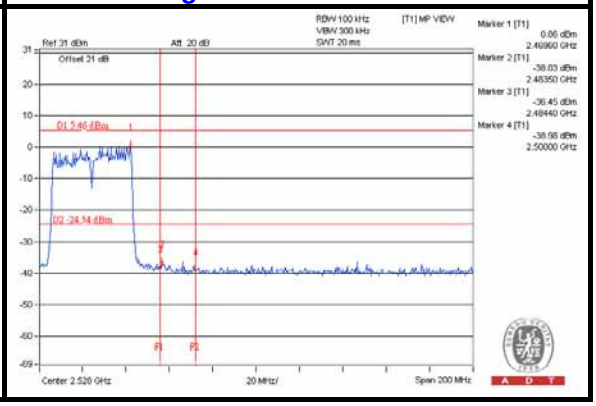
CH 9



CH 3 Band edge

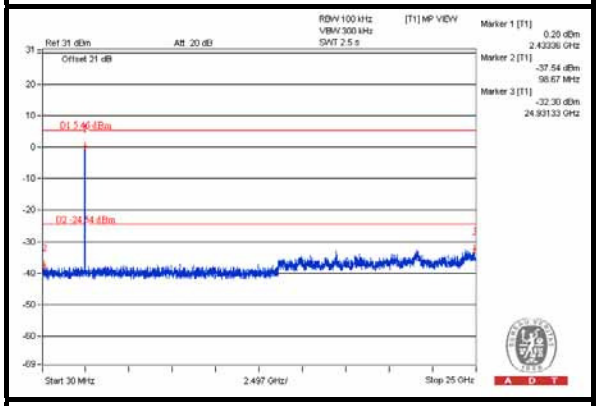


CH 9 Band edge

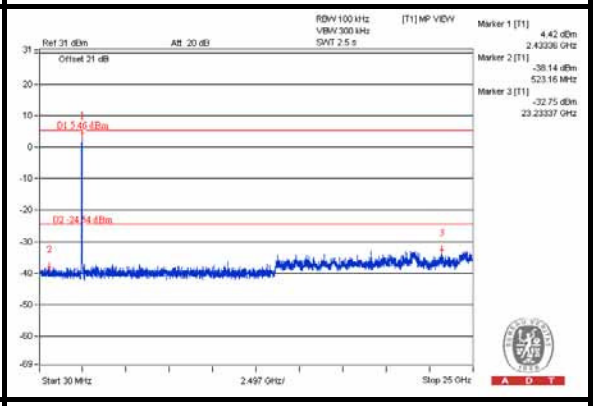


Chain(1)

CH 3



CH 6



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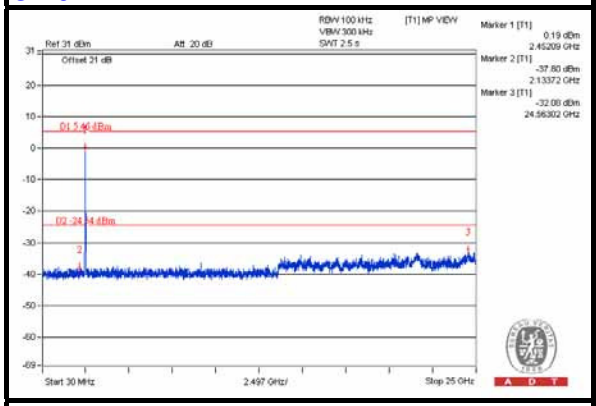

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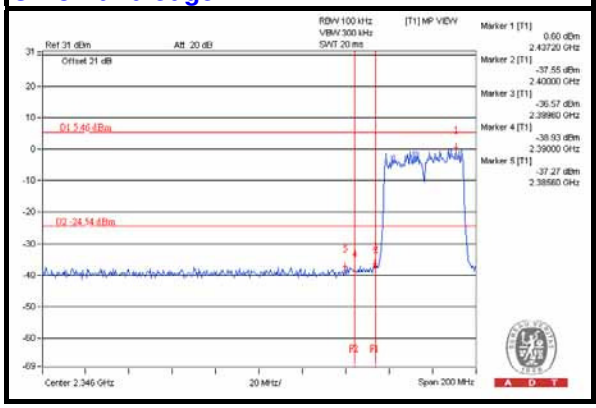
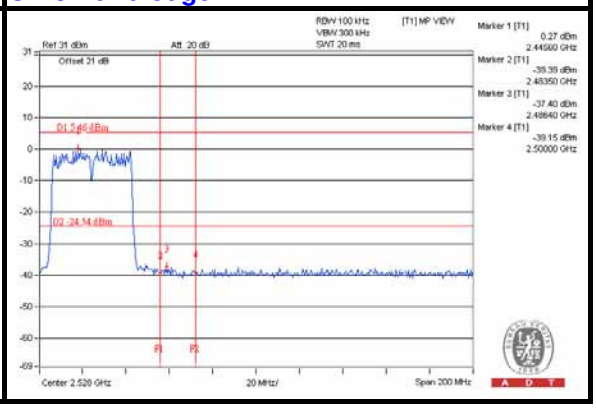
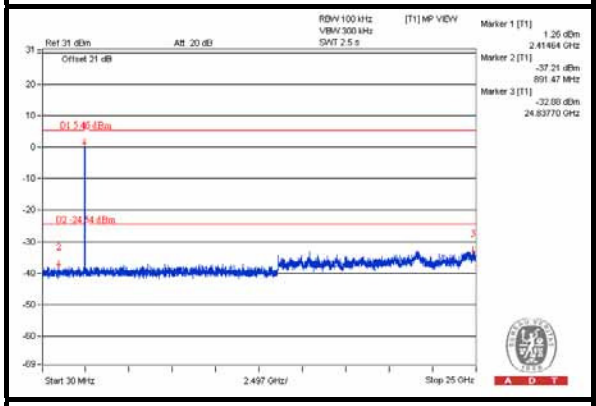


CH 9 Band edge

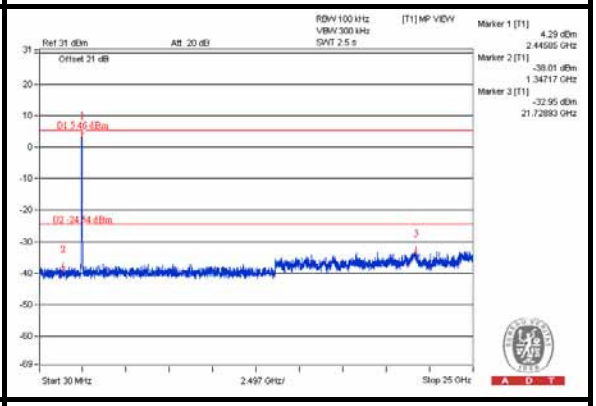


Chain(2)

CH 3



CH 6



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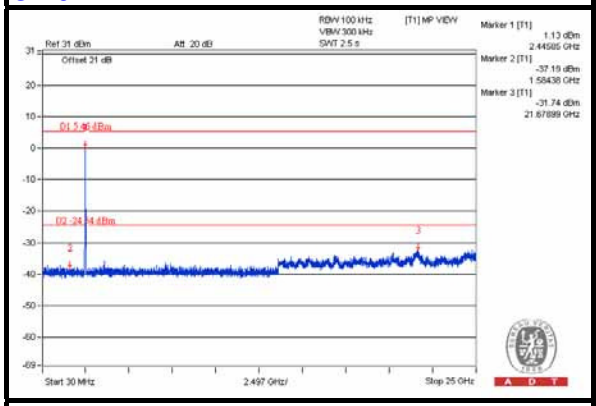

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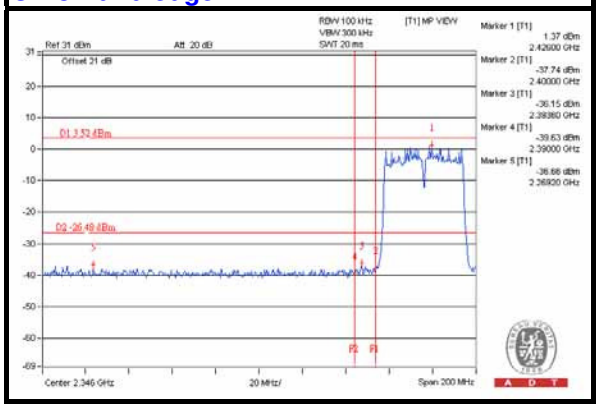
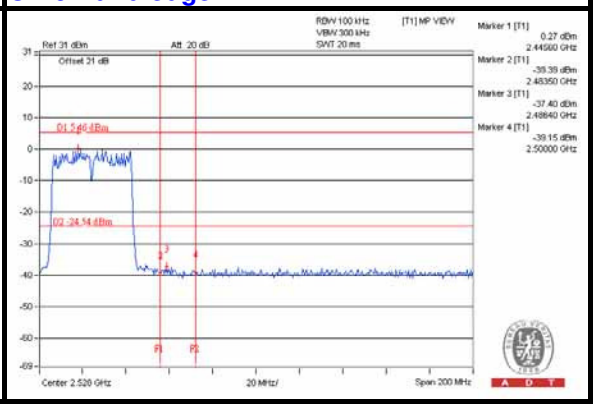


CH 9 Band edge



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

5.1 CONDUCTED EMISSION MEASUREMENT

5.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

5.1.2 TEST INSTRUMENTS

For mode 1 test

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS 30	100375	Apr. 29, 2014	Apr. 28, 2015
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 15, 2014	Sep. 14, 2015
Line-Impedance Stabilization Network (for Peripheral) ROHDE & SCHWARZ	ENV216	100071	Nov. 13, 2013	Nov. 12, 2014
RF Cable (JYEBAO)	5DFB	COCCAB-001	Mar. 10 , 2014	Mar. 09, 2015
50 ohms Terminator	N/A	EMC-03	Sep. 22, 2014	Sep. 21, 2015
50 ohms Terminator	N/A	EMC-02	Sep. 30, 2014	Sep. 29, 2015
Software ADT	BV ADT_Cond_V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3 The VCCI Con C Registration No. is C-3611.
4 Tested Date: Oct. 21, 2014

For mode 2 test

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS 30	100375	Apr. 29, 2014	Apr. 28, 2015
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 15, 2014	Sep. 14, 2015
Line-Impedance Stabilization Network (for Peripheral) ROHDE & SCHWARZ	ENV216	100071	Nov. 11, 2014	Nov. 10, 2015
RF Cable (JYEBAO)	5DFB	COCCAB-001	Mar. 10 , 2014	Mar. 09, 2015
50 ohms Terminator	N/A	EMC-03	Sep. 22, 2014	Sep. 21, 2015
50 ohms Terminator	N/A	EMC-02	Sep. 30, 2014	Sep. 29, 2015
Software ADT	BV ADT_Cond_V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3 The VCCI Con C Registration No. is C-3611.
4 Tested Date: Nov. 14, 2014

5.1.3 TEST PROCEDURES

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

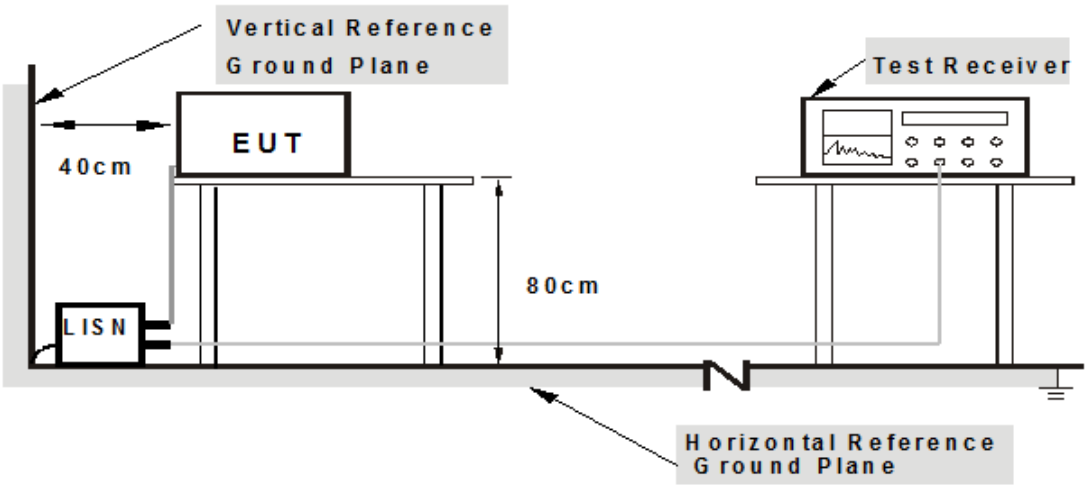
NOTE:

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

5.1.4 DEVIATION FROM TEST STANDARD

No deviation

5.1.5 TEST SETUP



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

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

5.1.6 EUT OPERATING CONDITIONS

Same as the 4.1.6

5.1.7 TEST RESULTS (MODE 1)

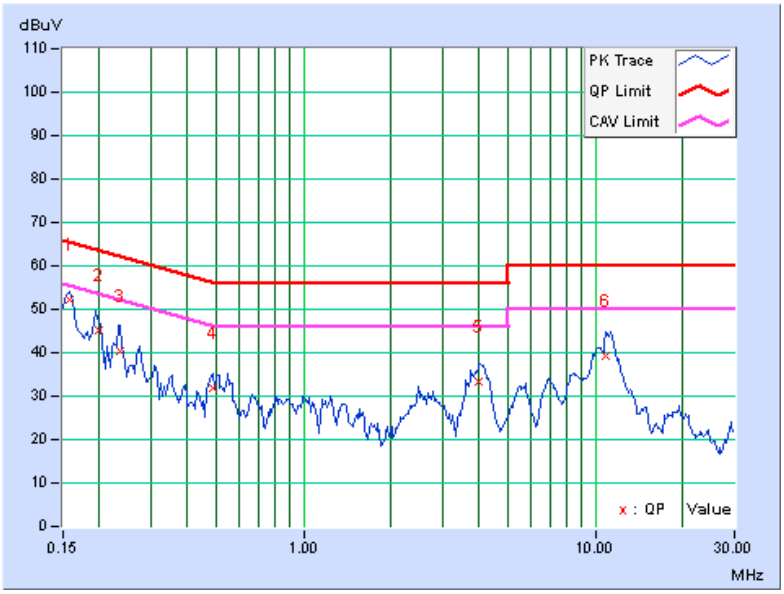
CDD MODE

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

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	0.07	51.98	46.27	52.05	46.34	65.58	55.58	-13.53	-9.24
2	0.19784	0.07	45.27	38.92	45.34	38.99	63.70	53.70	-18.36	-14.71
3	0.23594	0.07	40.35	34.19	40.42	34.26	62.24	52.24	-21.81	-17.97
4	0.48984	0.10	31.72	29.02	31.82	29.12	56.17	46.17	-24.35	-17.05
5	4.00781	0.25	32.98	25.39	33.23	25.64	56.00	46.00	-22.77	-20.36
6	10.91797	0.47	38.80	33.68	39.27	34.15	60.00	50.00	-20.73	-15.85

REMARKS:

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

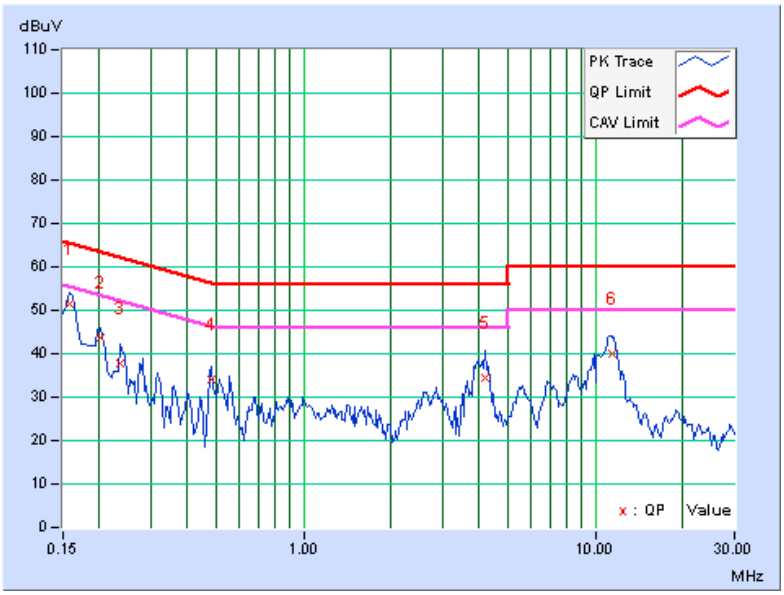


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	0.06	51.37	44.76	51.43	44.82	65.58	55.58	-14.14	-10.75
2	0.20078	0.06	43.82	38.03	43.88	38.09	63.58	53.58	-19.70	-15.49
3	0.23594	0.07	37.89	31.75	37.96	31.82	62.24	52.24	-24.28	-20.42
4	0.48594	0.10	33.87	29.66	33.97	29.76	56.24	46.24	-22.27	-16.48
5	4.18359	0.27	34.20	25.59	34.47	25.86	56.00	46.00	-21.53	-20.14
6	11.40625	0.50	39.66	34.60	40.16	35.10	60.00	50.00	-19.84	-14.90

REMARKS:

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



5.1.8 TEST RESULTS (MODE 2)

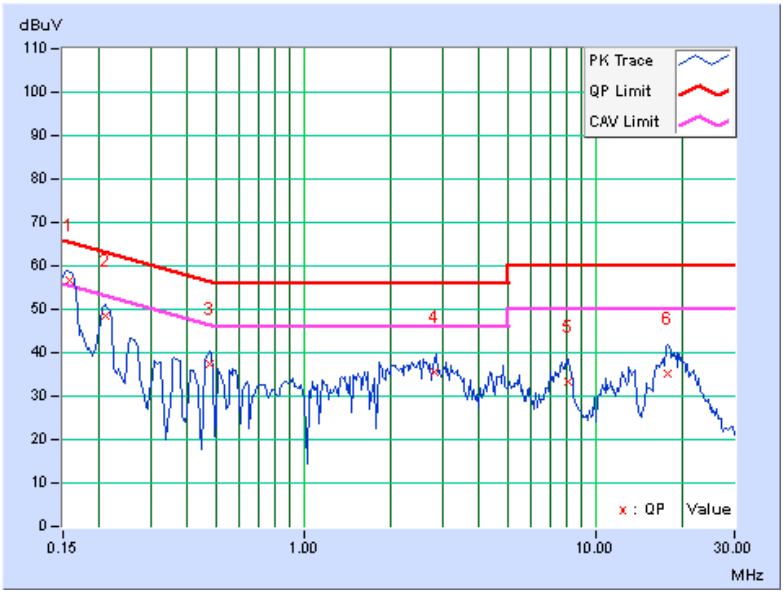
CDD MODE

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

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.15781**	**0.07**	**56.76**	**47.10**	**56.83**	**47.17**	**65.58**	**55.58**	**-8.75**	**-8.41**
2	0.20859	0.07	48.50	39.65	48.57	39.72	63.26	53.26	-14.69	-13.54
3	0.47813	0.10	37.24	32.76	37.34	32.86	56.37	46.37	-19.04	-13.52
4	2.80078	0.21	35.27	25.75	35.48	25.96	56.00	46.00	-20.52	-20.04
5	8.03516	0.38	33.06	26.00	33.44	26.38	60.00	50.00	-26.56	-23.62
6	17.77344	0.65	34.53	26.40	35.18	27.05	60.00	50.00	-24.82	-22.95

REMARKS:

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

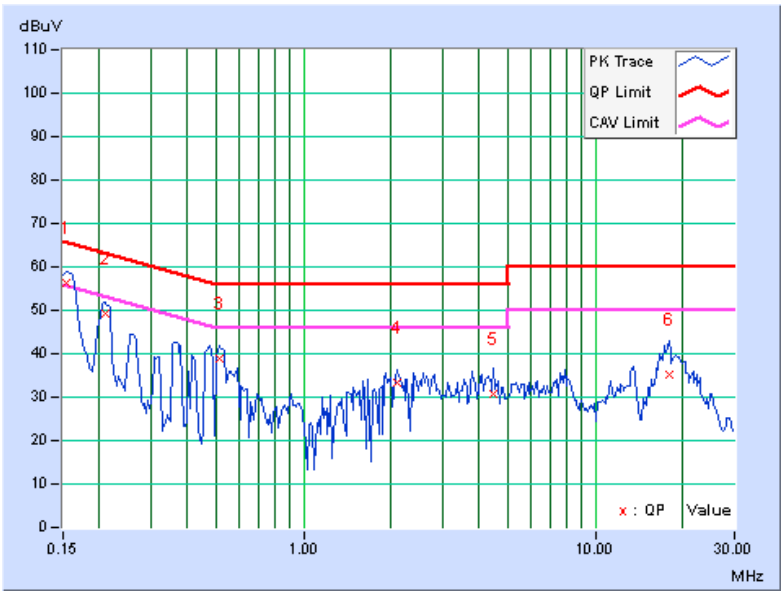


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	0.06	56.32	44.37	56.38	44.43	65.79	55.79	-9.40	-11.35
2	0.20859	0.06	49.10	40.50	49.16	40.56	63.26	53.26	-14.10	-12.70
3	0.51719	0.10	38.64	27.65	38.74	27.75	56.00	46.00	-17.26	-18.25
4	2.08984	0.18	33.14	22.64	33.32	22.82	56.00	46.00	-22.68	-23.18
5	4.46094	0.28	30.35	18.44	30.63	18.72	56.00	46.00	-25.37	-27.28
6	17.85938	0.68	34.34	25.36	35.02	26.04	60.00	50.00	-24.98	-23.96

REMARKS:

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



5.2 RADIATED AND BANDEDGE EMISSION MEASUREMENT

5.2.1 LIMITS OF RADIATED AND BANDEDGE EMISSION MEASUREMENT

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

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

NOTE:

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

5.2.2 TEST INSTRUMENTS

For Below 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY50010156	Aug. 11, 2014	Aug. 10, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-04	Nov. 13, 2013	Nov. 12, 2014
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Feb. 27, 2014	Feb. 26, 2015
RF Cable	NA	CHHCAB_001	Oct. 05, 2014	Oct. 04, 2015
Horn_Antenna AISI	AIH.8018	0000220091110	Aug. 26, 2014	Aug. 25, 2015
Pre-Amplifier Agilent	8449B	300801923	Oct. 29, 2013	Oct. 28, 2014
RF Cable	NA	131206 131215 SNMY23685/4	Jan. 17, 2014	Jan. 16, 2015
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 13, 2013	Nov. 12, 2014
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Aug. 26, 2014	Aug. 25, 2015
RF Cable	NA	RF104-121 RF104-204	Dec. 12, 2013	Dec. 11, 2014
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3 The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
5 The CANADA Site Registration No. is IC 7450H-3.
6 Tested Date: Oct. 22, 2014

For Above 1GHz:

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

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3 The test was performed in 966 Chamber No. G.
4. The FCC Site Registration No. is 966073.
5 The VCCI Site Registration No. is G-137.
6 The CANADA Site Registration No. is IC 7450H-2.
7 Tested Date: Nov. 03, 2014

5.2.3 TEST PROCEDURES

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

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

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

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

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

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

Note:

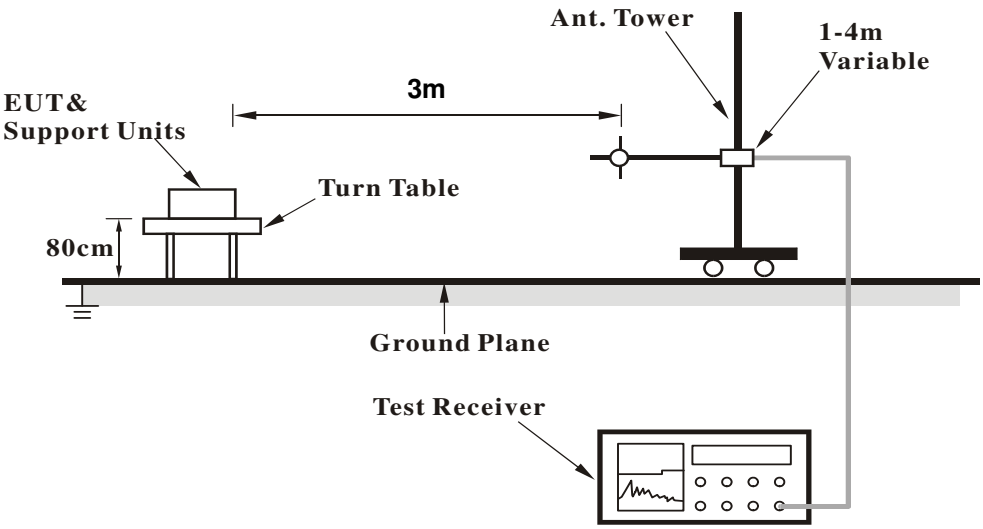
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

5.2.4 DEVIATION FROM TEST STANDARD

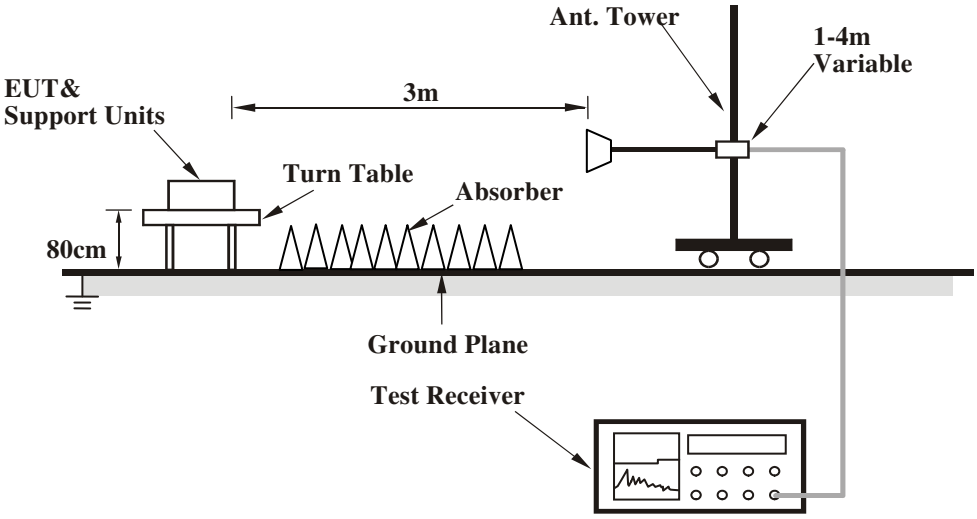
No deviation

5.2.5 TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

5.2.6 EUT OPERATING CONDITIONS

Same as the 4.1.6

5.2.7 TEST RESULTS

CDD MODE

BELOW 1GHz WORST-CASE DATA

802.11a

CHANNEL	TX Channel 157	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	374.98	36.4 QP	46.0	-9.6	1.50 H	116	46.53	-10.15
2	500.01	36.3 QP	46.0	-9.7	1.00 H	283	43.51	-7.19
3	625.00	41.5 QP	46.0	-4.5	1.00 H	134	45.80	-4.30
4	749.98	39.6 QP	46.0	-6.4	1.00 H	102	41.58	-1.97
5	875.02	41.4 QP	46.0	-4.6	2.00 H	117	41.73	-0.36
6	1000.00	40.8 QP	54.0	-13.3	1.50 H	280	39.10	1.65
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	33.98	33.2 QP	40.0	-6.9	1.50 V	360	47.40	-14.25
2	51.17	32.4 QP	40.0	-7.6	1.00 V	154	45.84	-13.42
3	375.03	37.2 QP	46.0	-8.9	1.50 V	123	47.30	-10.15
4	500.01	37.5 QP	46.0	-8.5	1.00 V	140	44.67	-7.19
5	625.00	39.2 QP	46.0	-6.8	1.50 V	201	43.46	-4.30
6	875.02	40.6 QP	46.0	-5.4	2.00 V	264	40.93	-0.36

REMARKS:

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

ABOVE 1GHz DATA

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5745.00	119.2 PK			1.11 H	293	110.78	8.42
2	*5745.00	110.3 AV			1.11 H	293	101.88	8.42
3	11490.00	54.5 PK	74.0	-19.5	1.08 H	102	40.15	14.35
4	11490.00	42.8 AV	54.0	-11.2	1.08 H	102	28.45	14.35
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5745.00	123.6 PK			1.00 V	248	115.18	8.42
2	*5745.00	114.4 AV			1.00 V	248	105.98	8.42
3	11490.00	54.1 PK	74.0	-19.9	1.05 V	67	39.75	14.35
4	11490.00	42.3 AV	54.0	-11.7	1.05 V	67	27.95	14.35

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5000.00	55.3 PK	74.0	-18.7	1.14 H	135	48.88	6.42
2	5000.00	49.3 AV	54.0	-4.7	1.14 H	135	42.88	6.42
3	*5785.00	118.0 PK			1.15 H	288	109.51	8.49
4	*5785.00	109.0 AV			1.15 H	288	100.51	8.49
5	11570.00	54.2 PK	74.0	-19.8	1.05 H	118	39.89	14.31
6	11570.00	42.5 AV	54.0	-11.5	1.05 H	118	28.19	14.31
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5000.00	56.0 PK	74.0	-18.0	1.19 V	127	49.58	6.42
2	5000.00	50.4 AV	54.0	-3.6	1.19 V	127	43.98	6.42
3	*5785.00	124.9 PK			1.00 V	242	116.41	8.49
4	*5785.00	113.6 AV			1.00 V	242	105.11	8.49
5	11570.00	57.7 PK	74.0	-16.3	1.03 V	67	43.39	14.31
6	11570.00	43.9 AV	54.0	-10.1	1.03 V	67	29.59	14.31

REMARKS:

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

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) 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	118.4 PK			1.08 H	308	109.81	8.59
2	*5825.00	109.3 AV			1.08 H	308	100.71	8.59
3	11650.00	54.4 PK	74.0	-19.6	1.06 H	65	40.02	14.38
4	11650.00	43.0 AV	54.0	-11.0	1.06 H	65	28.62	14.38
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	125.3 PK			1.00 V	70	116.71	8.59
2	*5825.00	113.4 AV			1.00 V	70	104.81	8.59
3	11650.00	57.7 PK	74.0	-16.3	1.07 V	56	43.32	14.38
4	11650.00	43.7 AV	54.0	-10.3	1.07 V	56	29.32	14.38

REMARKS:

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

802.11ac (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5745.00	119.5 PK			1.10 H	303	111.08	8.42
2	*5745.00	110.4 AV			1.10 H	303	101.98	8.42
3	11490.00	54.9 PK	74.0	-19.1	1.11 H	106	40.55	14.35
4	11490.00	43.0 AV	54.0	-11.0	1.11 H	106	28.65	14.35
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5745.00	121.5 PK			1.00 V	71	113.08	8.42
2	*5745.00	112.2 AV			1.00 V	71	103.78	8.42
3	11490.00	54.3 PK	74.0	-19.7	1.08 V	77	39.95	14.35
4	11490.00	42.3 AV	54.0	-11.7	1.08 V	77	27.95	14.35

REMARKS:

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

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK) 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	118.2 PK			1.19 H	279	109.71	8.49
2	*5785.00	109.2 AV			1.19 H	279	100.71	8.49
3	11570.00	52.9 PK	74.0	-21.1	1.10 H	124	38.59	14.31
4	11570.00	41.3 AV	54.0	-12.7	1.10 H	124	26.99	14.31
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	124.8 PK			1.02 V	255	116.31	8.49
2	*5785.00	113.6 AV			1.02 V	255	105.11	8.49
3	11570.00	57.4 PK	74.0	-16.6	1.00 V	52	43.09	14.31
4	11570.00	43.6 AV	54.0	-10.4	1.00 V	52	29.29	14.31

REMARKS:

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

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) 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	117.6 PK			1.24 H	278	109.01	8.59
2	*5825.00	110.3 AV			1.24 H	278	101.71	8.59
3	11650.00	53.0 PK	74.0	-21.0	1.11 H	119	38.62	14.38
4	11650.00	41.2 AV	54.0	-12.8	1.11 H	119	26.82	14.38
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	123.6 PK			1.00 V	71	115.01	8.59
2	*5825.00	113.7 AV			1.00 V	71	105.11	8.59
3	11650.00	57.1 PK	74.0	-16.9	1.06 V	55	42.72	14.38
4	11650.00	43.2 AV	54.0	-10.8	1.06 V	55	28.82	14.38

REMARKS:

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

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	111.6 PK			1.21 H	281	103.11	8.44
2	*5755.00	101.3 AV			1.21 H	281	92.81	8.44
3	11510.00	52.6 PK	74.0	-21.4	1.09 H	126	38.26	14.34
4	11510.00	40.9 AV	54.0	-13.1	1.09 H	126	26.56	14.34
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5755.00	115.6 PK			1.00 V	72	107.11	8.44
2	*5755.00	105.3 AV			1.00 V	72	96.81	8.44
3	11510.00	56.5 PK	74.0	-17.5	1.03 V	70	42.16	14.34
4	11510.00	42.7 AV	54.0	-11.3	1.03 V	70	28.36	14.34

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5000.00	57.4 PK	74.0	-16.6	1.22 H	257	50.98	6.42
2	5000.00	49.8 AV	54.0	-4.2	1.22 H	257	43.38	6.42
3	*5795.00	116.8 PK			1.17 H	278	108.30	8.50
4	*5795.00	106.3 AV			1.17 H	278	97.80	8.50
5	11590.00	52.8 PK	74.0	-21.2	1.04 H	113	38.50	14.30
6	11590.00	41.3 AV	54.0	-12.7	1.04 H	113	27.00	14.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5000.00	57.0 PK	74.0	-17.0	1.00 V	86	50.58	6.42
2	**5000.00**	**50.8 AV**	**54.0**	**-3.2**	**1.00 V**	**86**	**44.38**	**6.42**
3	*5795.00	120.8 PK			1.00 V	70	112.30	8.50
4	*5795.00	110.5 AV			1.00 V	70	102.00	8.50
5	11590.00	56.4 PK	74.0	-17.6	1.06 V	69	42.10	14.30
6	11590.00	42.9 AV	54.0	-11.1	1.06 V	69	28.60	14.30

REMARKS:

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

802.11ac (VHT80)

CHANNEL	TX Channel 155	DETECTOR FUNCTION	Peak (PK)
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	5133.00	56.4 PK	74.0	-17.6	1.09 H	115	49.68	6.72
2	**5133.00**	**53.9 AV**	**54.0**	**-0.1**	**1.09 H**	**115**	**47.18**	**6.72**
3	*5775.00	108.8 PK			1.36 H	70	100.33	8.47
4	*5775.00	98.6 AV			1.36 H	70	90.13	8.47
5	11550.00	53.3 PK	74.0	-20.7	1.07 H	127	38.98	14.32
6	11550.00	41.6 AV	54.0	-12.4	1.07 H	127	27.28	14.32
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5133.00	59.8 PK	74.0	-14.2	1.03 V	252	53.08	6.72
2	5133.00	52.7 AV	54.0	-1.3	1.03 V	252	45.98	6.72
3	*5775.00	112.9 PK			1.00 V	71	104.43	8.47
4	*5775.00	102.1 AV			1.00 V	71	93.63	8.47
5	11550.00	56.4 PK	74.0	-17.6	1.06 V	69	42.08	14.32
6	11550.00	42.9 AV	54.0	-11.1	1.06 V	69	28.58	14.32

REMARKS:

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

5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

5.3.2 TEST INSTRUMENTS

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

Note:

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

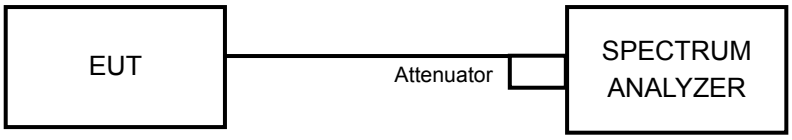
5.3.3 TEST PROCEDURE

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

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP

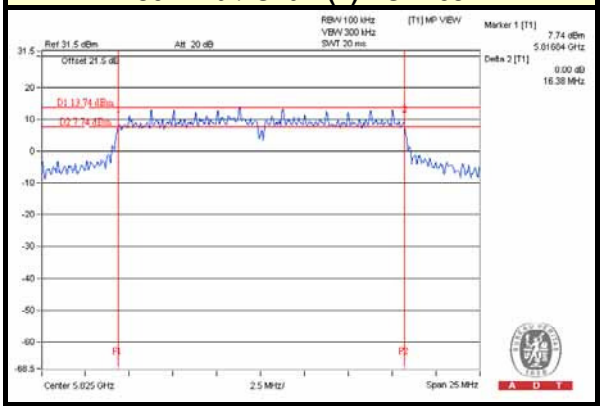
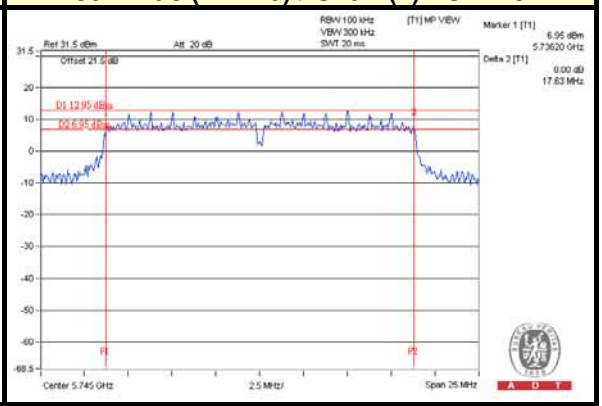
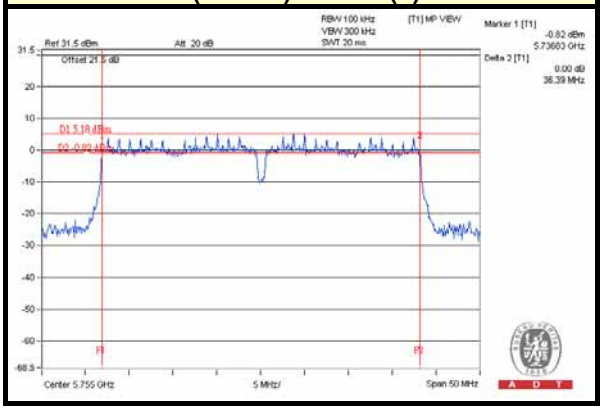
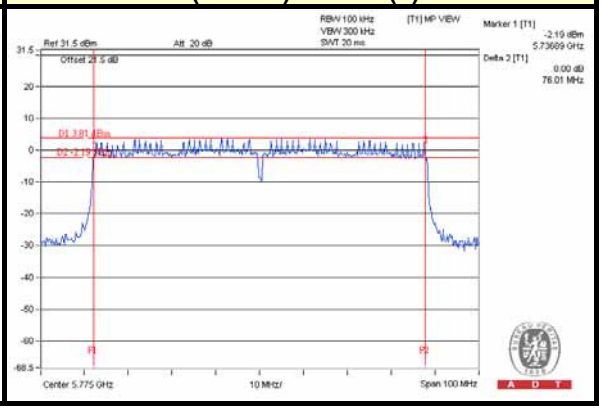


5.3.6 EUT OPERATING CONDITIONS

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

5.3.7 TEST RESULTS

CDD MODE						
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
802.11a						
149	5745	16.39	16.39	16.39	0.5	PASS
157	5785	16.40	16.40	16.38	0.5	PASS
165	5825	16.41	16.38	16.39	0.5	PASS
802.11ac (VHT20)						
149	5745	17.65	17.65	17.63	0.5	PASS
157	5785	17.64	17.66	17.66	0.5	PASS
165	5825	17.64	17.65	17.63	0.5	PASS
802.11ac (VHT40)						
151	5755	36.40	36.42	36.39	0.5	PASS
159	5795	36.43	36.46	36.44	0.5	PASS
802.11ac (VHT80)						
155	5775	76.01	76.15	76.13	0.5	PASS

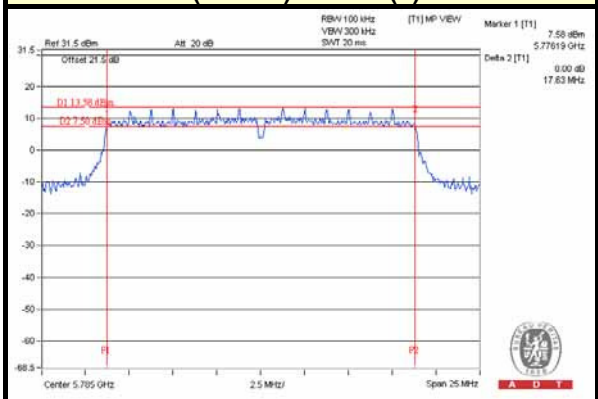
CDD MODE	
SPECTRUM PLOT OF WORST VALUE	
802.11a / Chain(1) : CH165	802.11ac (VHT20) / Chain(2) : CH149
	
802.11ac (VHT40) / Chain(2) : CH151	802.11ac (VHT80) / Chain(0) : CH155
	

Beamforming MODE						
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
802.11ac (VHT20)						
149	5745	17.65	17.65	17.63	0.5	PASS
157	5785	17.64	17.66	17.66	0.5	PASS
165	5825	17.64	17.65	17.63	0.5	PASS
802.11ac (VHT40)						
151	5755	36.40	36.42	36.39	0.5	PASS
159	5795	36.45	36.47	36.43	0.5	PASS
802.11ac (VHT80)						
155	5775	76.01	76.15	76.13	0.5	PASS

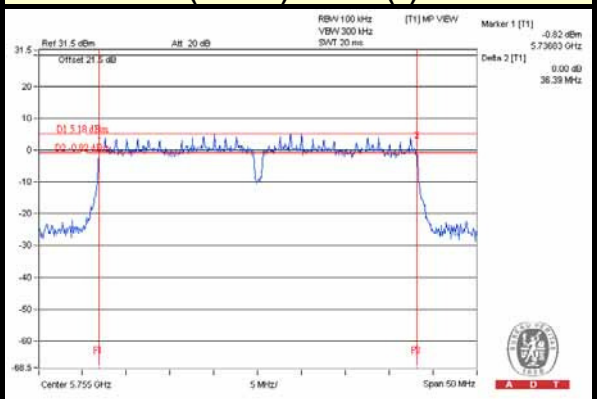
Beamforming MODE

SPECTRUM PLOT OF WORST VALUE

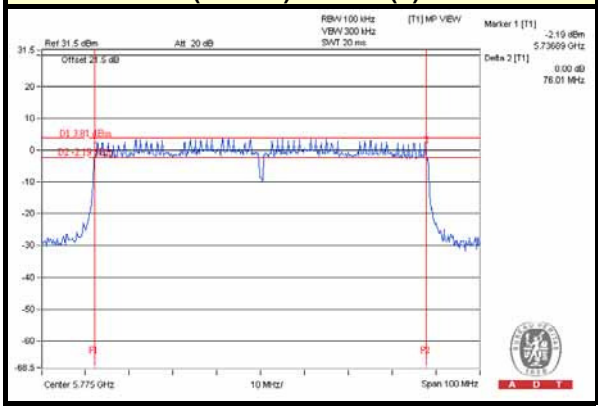
802.11ac (VHT20) / Chain(0) : CH157



802.11ac (VHT40) / Chain(2) : CH151



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



5.4 CONDUCTED OUTPUT POWER MEASUREMENT

5.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

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

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

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

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

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

5.4.2 INSTRUMENTS

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

Note:

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

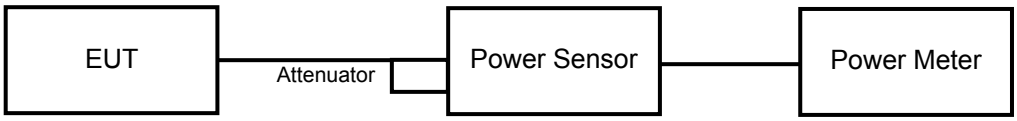
5.4.3 TEST PROCEDURES

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

5.4.4 DEVIATION FROM TEST STANDARD

No deviation.

5.4.5 TEST SETUP



5.4.6 EUT OPERATING CONDITIONS

Same as Item 5.3.6

5.4.7 TEST RESULTS

CDD MODE								
CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
802.11a								
149	5745	25.60	24.19	24.17	886.716	29.48	30	PASS
157	5785	26.02	24.58	24.53	970.815	29.87	30	PASS
165	5825	25.99	24.59	24.56	970.691	29.87	30	PASS
802.11ac (VHT20)								
149	5745	25.03	24.08	24.06	828.962	29.19	30	PASS
157	5785	25.93	24.55	24.52	959.983	29.82	30	PASS
165	5825	25.85	24.52	24.59	955.471	29.80	30	PASS
802.11ac (VHT40)								
151	5755	21.39	20.22	20.11	345.482	25.38	30	PASS
159	5795	25.54	24.15	24.31	887.886	29.48	30	PASS
802.11ac (VHT80)								
155	5775	21.49	20.25	20.29	353.759	25.49	30	PASS

Beamforming MODE								
CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
802.11ac (VHT20)								
149	5745	24.23	23.16	23.34	687.638	28.37	28.43	PASS
157	5785	24.46	23.01	23.03	680.149	28.33	28.43	PASS
165	5825	24.30	22.92	23.16	672.051	28.27	28.43	PASS
802.11ac (VHT40)								
151	5755	21.39	20.22	20.11	345.482	25.38	28.43	PASS
159	5795	24.25	22.95	23.06	665.617	28.23	28.43	PASS
802.11ac (VHT80)								
155	5775	21.49	20.25	20.29	353.759	25.49	28.43	PASS

NOTE: Directional gain = 2.8dBi + 10log(3) = 7.57dBi > 6dBi , so the power limit shall be reduced to 30-(7.57-6) = 28.43dBm.

5.5 POWER SPECTRAL DENSITY MEASUREMENT

5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.5.2 TEST INSTRUMENTS

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

Note:

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

5.5.3 TEST PROCEDURE

For 802.11a, 802.11ac (VHT20):

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

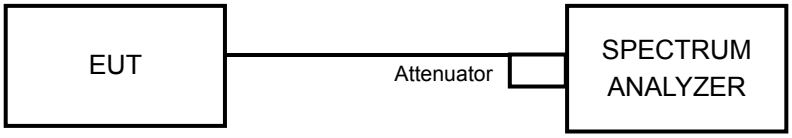
For 802.11ac (VHT40), 802.11ac (VHT80):

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

5.5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5.5 TEST SETUP



5.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

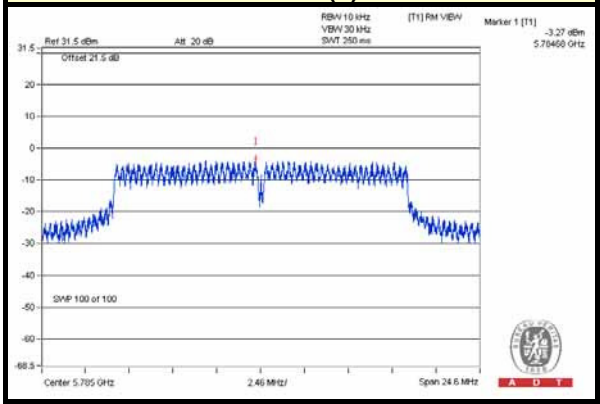
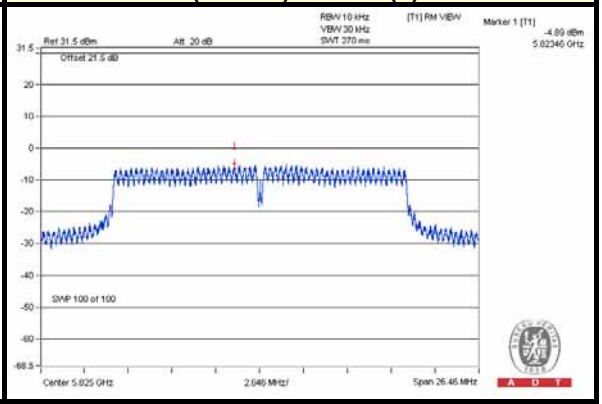
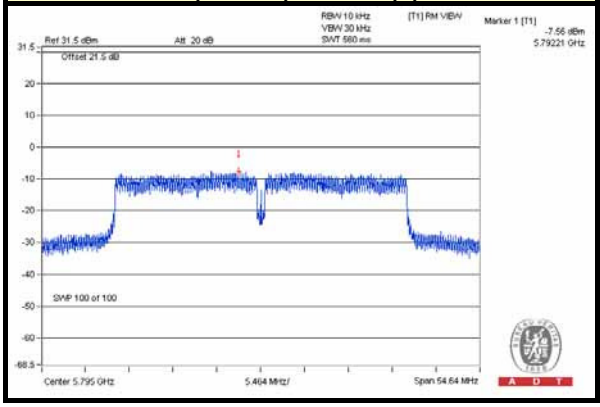
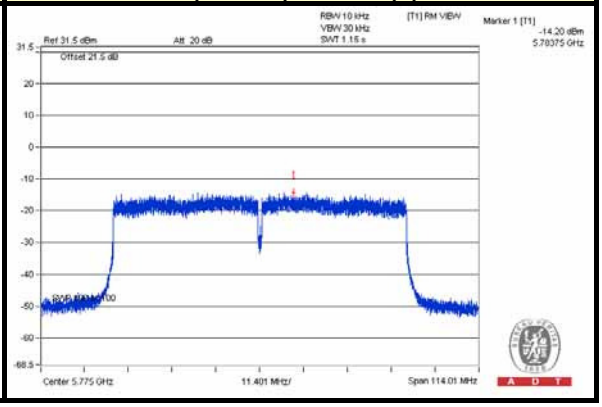
5.5.7 TEST RESULTS

CDD MODE							
802.11a							
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=3) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	149	5745	-3.57	4.77	1.20	6.43	PASS
	157	5785	-3.27	4.77	1.50	6.43	PASS
	165	5825	-3.93	4.77	0.84	6.43	PASS
1	149	5745	-5.13	4.77	-0.36	6.43	PASS
	157	5785	-5.09	4.77	-0.32	6.43	PASS
	165	5825	-5.04	4.77	-0.27	6.43	PASS
2	149	5745	-4.96	4.77	-0.19	6.43	PASS
	157	5785	-4.84	4.77	-0.07	6.43	PASS
	165	5825	-4.99	4.77	-0.22	6.43	PASS
802.11ac (VHT20)							
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=3) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	149	5745	-5.38	4.77	-0.61	6.43	PASS
	157	5785	-4.95	4.77	-0.18	6.43	PASS
	165	5825	-4.89	4.77	-0.12	6.43	PASS
1	149	5745	-6.60	4.77	-1.83	6.43	PASS
	157	5785	-6.13	4.77	-1.36	6.43	PASS
	165	5825	-5.96	4.77	-1.19	6.43	PASS
2	149	5745	-6.41	4.77	-1.64	6.43	PASS
	157	5785	-6.41	4.77	-1.64	6.43	PASS
	165	5825	-6.53	4.77	-1.76	6.43	PASS

CDD MODE								
802.11ac (VHT40)								
TX CHAIN	CHANNEL	FREQ. (MHz)	PSD W/O DUTY FACTOR (dBm)	10 log (N=3) dB	DUTY FACTOR (dB)	TOTAL PSD WITH DUTY FACTOR (dBm)	LIMIT (dBm)	PASS /FAIL
0	151	5755	-11.50	4.77	0.11	-6.62	6.43	PASS
	159	5795	-7.56	4.77	0.11	-2.68	6.43	PASS
1	151	5755	-12.90	4.77	0.11	-8.02	6.43	PASS
	159	5795	-9.31	4.77	0.11	-4.43	6.43	PASS
2	151	5755	-13.94	4.77	0.11	-9.06	6.43	PASS
	159	5795	-9.46	4.77	0.11	-4.58	6.43	PASS
802.11ac (VHT80)								
TX CHAIN	CHANNEL	FREQ. (MHz)	PSD W/O DUTY FACTOR (dBm)	10 log (N=3) dB	DUTY FACTOR (dB)	TOTAL PSD WITH DUTY FACTOR (dBm)	LIMIT (dBm)	PASS /FAIL
0	155	5775	-14.20	4.77	0.20	-9.23	6.43	PASS
1	155	5775	-14.33	4.77	0.20	-9.36	6.43	PASS
2	155	5775	-15.22	4.77	0.20	-10.25	6.43	PASS

Note : 1. Directional gain = 2.8dBi + 10log(3) = 7.57dBi > 6dBi , so the power density limit shall be reduced to 8-(7.57-6) = 6.43dBm.

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

CDD MODE	
SPECTRUM PLOT OF WORST VALUE	
802.11a / Chain(0) : CH157	802.11ac (VHT20) / Chain(0) : CH165
	
802.11ac (VHT40) / Chain(0) : CH159	802.11ac (VHT80) / Chain(0) : CH155
	

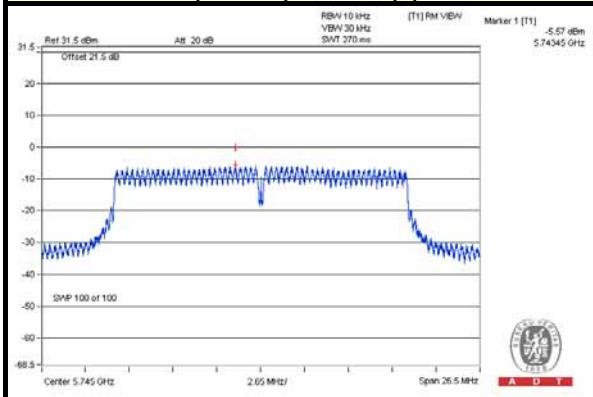
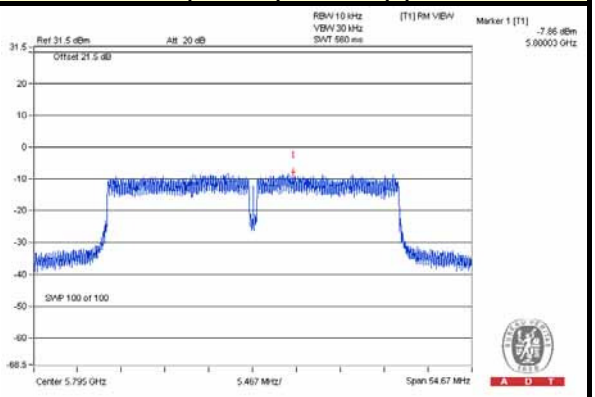
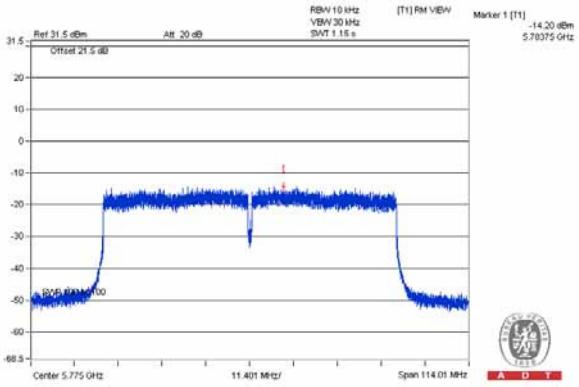
Beamforming MODE							
802.11ac (VHT20)							
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=3) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	149	5745	-5.57	4.77	-0.80	6.43	PASS
	157	5785	-5.85	4.77	-1.08	6.43	PASS
	165	5825	-5.94	4.77	-1.17	6.43	PASS
1	149	5745	-6.61	4.77	-1.84	6.43	PASS
	157	5785	-7.02	4.77	-2.25	6.43	PASS
	165	5825	-7.21	4.77	-2.44	6.43	PASS
2	149	5745	-6.59	4.77	-1.82	6.43	PASS
	157	5785	-7.17	4.77	-2.40	6.43	PASS
	165	5825	-6.71	4.77	-1.94	6.43	PASS

802.11ac (VHT40)								
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD W/O DUTY FACTOR (dBm)	10 log (N=3) dB	DUTY FACTOR (dB)	TOTAL PSD WITH DUTY FACTOR (dBm)	LIMIT (dBm)	PASS /FAIL
0	151	5755	-11.50	4.77	0.11	-6.62	6.43	PASS
	159	5795	-7.86	4.77	0.11	-2.98	6.43	PASS
1	151	5755	-12.90	4.77	0.11	-8.02	6.43	PASS
	159	5795	-9.76	4.77	0.11	-4.88	6.43	PASS
2	151	5755	-13.94	4.77	0.11	-9.06	6.43	PASS
	159	5795	-9.80	4.77	0.11	-4.92	6.43	PASS

802.11ac (VHT80)								
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD W/O DUTY FACTOR (dBm)	10 log (N=3) dB	DUTY FACTOR (dB)	TOTAL PSD WITH DUTY FACTOR (dBm)	LIMIT (dBm)	PASS /FAIL
0	155	5775	-14.20	4.77	0.20	-9.23	6.43	PASS
1	155	5775	-14.33	4.77	0.20	-9.36	6.43	PASS
2	155	5775	-15.22	4.77	0.20	-10.25	6.43	PASS

Note : 1. Directional gain = 2.8dBi + 10log(3) = 7.57dBi > 6dBi , so the power density limit shall be reduced to 8-(7.57-6) = 6.43dBm.

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

Beamforming MODE	
SPECTRUM PLOT OF WORST VALUE	
802.11ac (VHT20) / Chain(0) : CH149	802.11ac (VHT40) / Chain(0) : CH159
	
802.11ac (VHT80) / Chain(0) : CH155	
	

5.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

5.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

5.6.2 TEST INSTRUMENTS

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

Note:

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

5.6.3 TEST PROCEDURE

Measurement Procedure - Reference Level

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

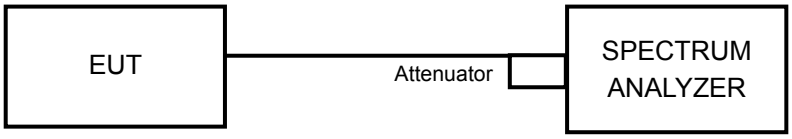
Measurement Procedure –Unwanted Emission Level

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

5.6.4 DEVIATION FROM TEST STANDARD

No deviation

5.6.5 TEST SETUP



5.6.6 EUT OPERATING CONDITION

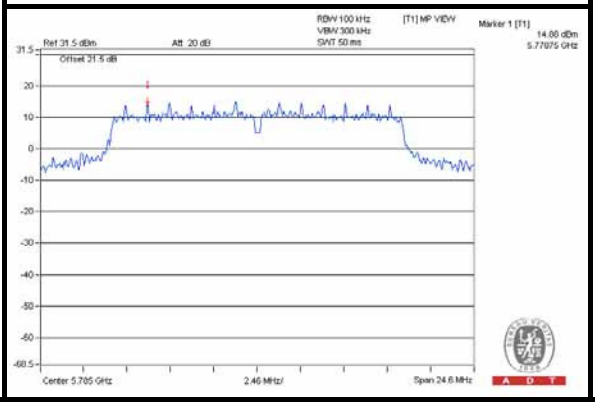
Same as Item 4.3.6

5.6.7 TEST RESULTS

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

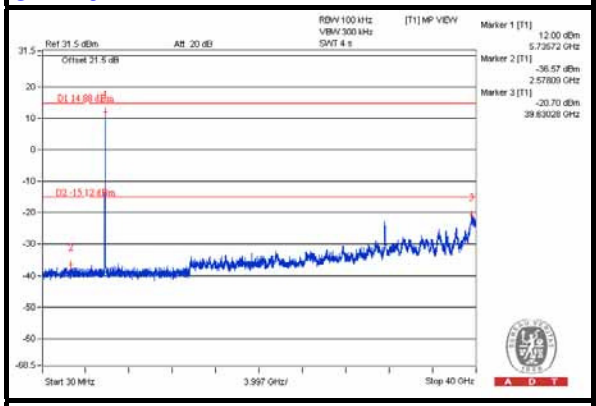
CDD MODE: 802.11a

Maximum REF

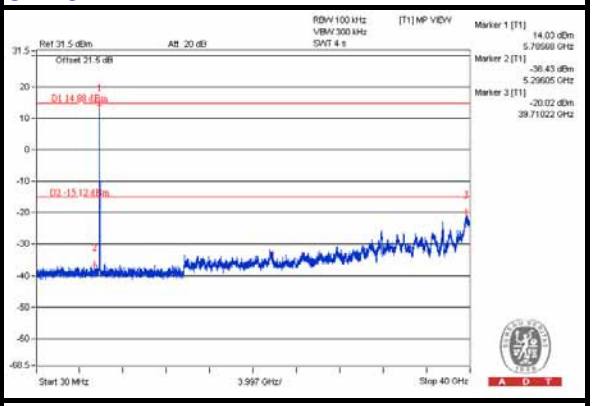


Chain(0)

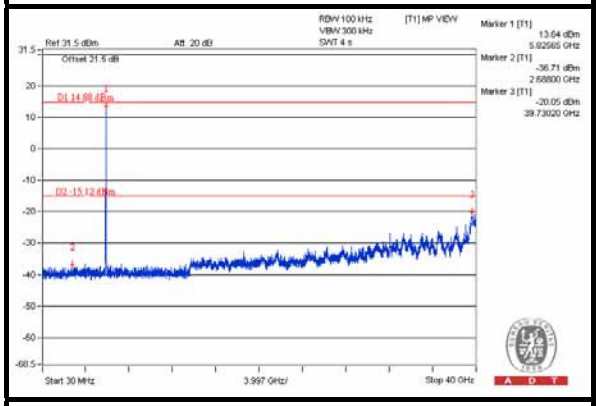
CH 149



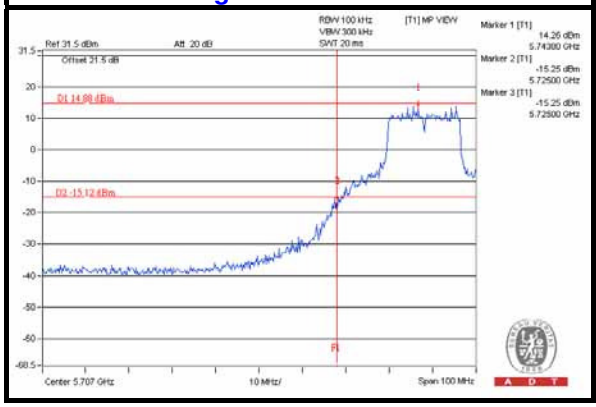
CH 157



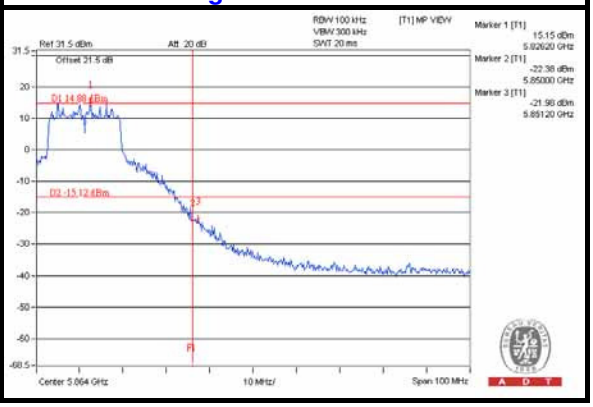
CH 165



CH 149 Band edge

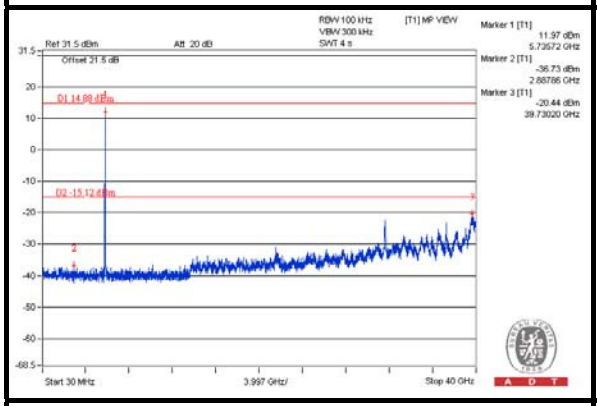


CH 165 Band edge

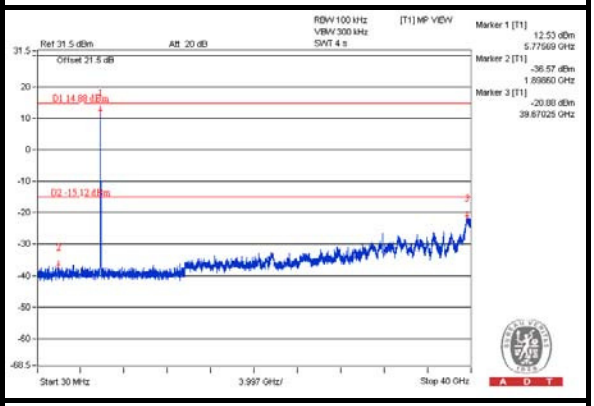


Chain(1)

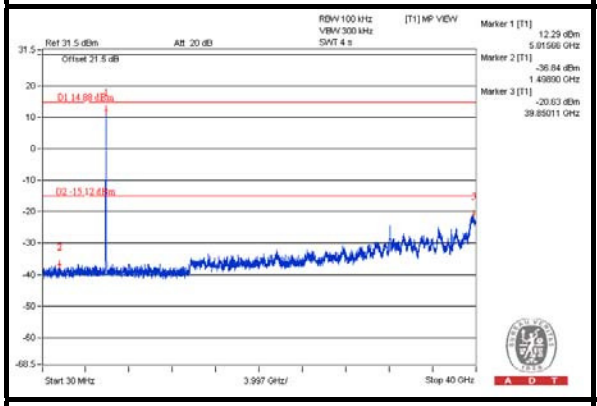
CH 149



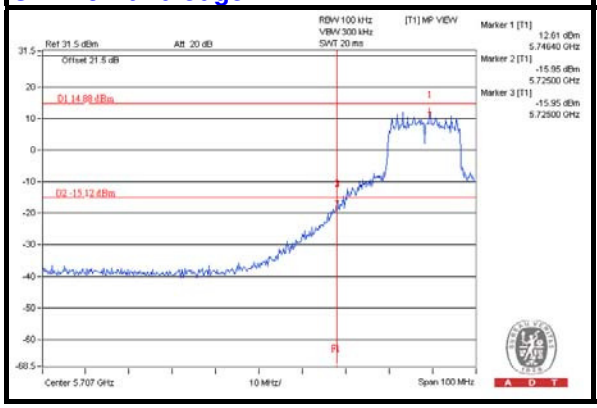
CH 157



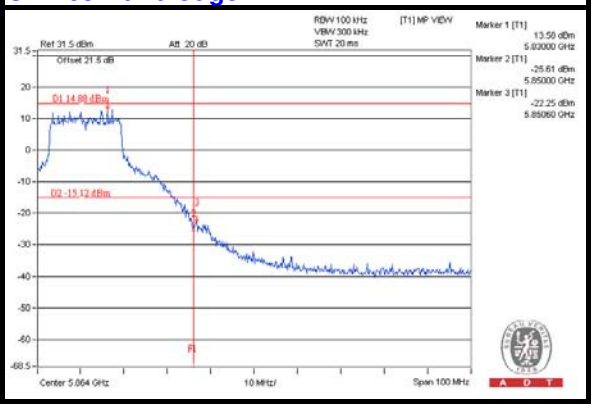
CH 165



CH 149 Band edge

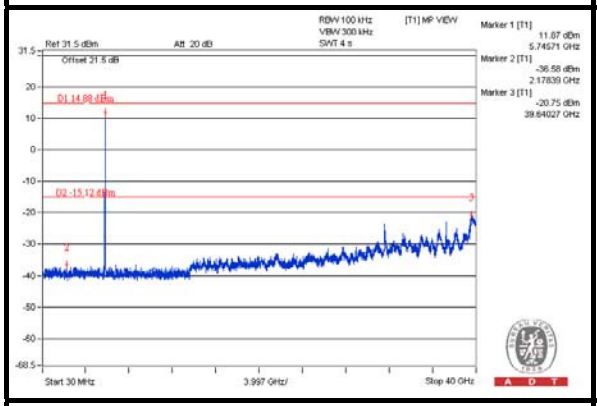


CH 165 Band edge

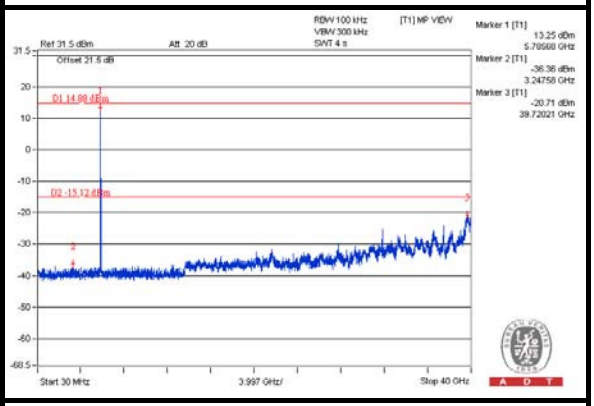


Chain(2)

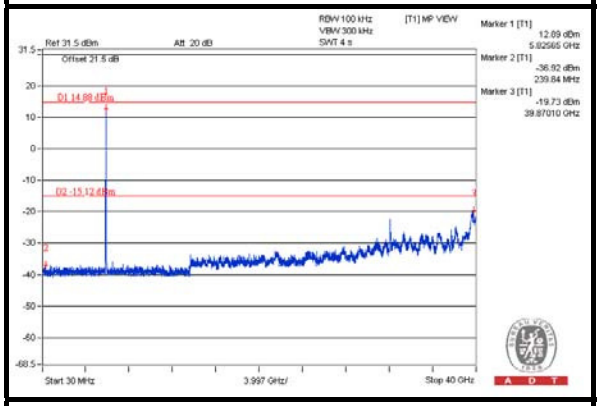
CH 149



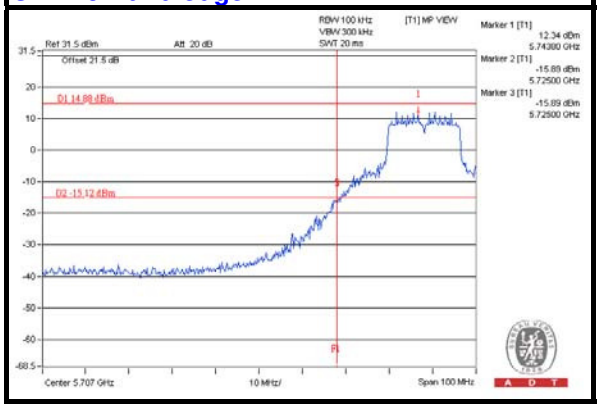
CH 157



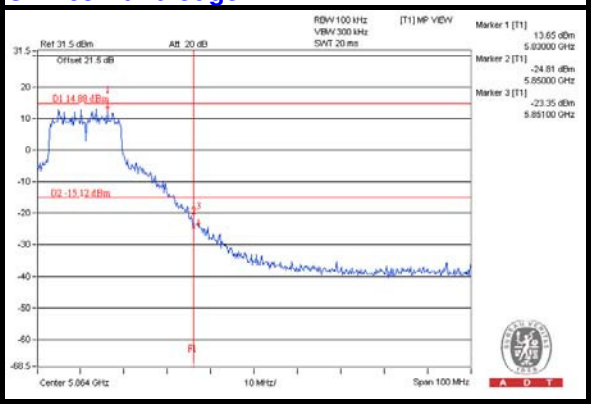
CH 165



CH 149 Band edge

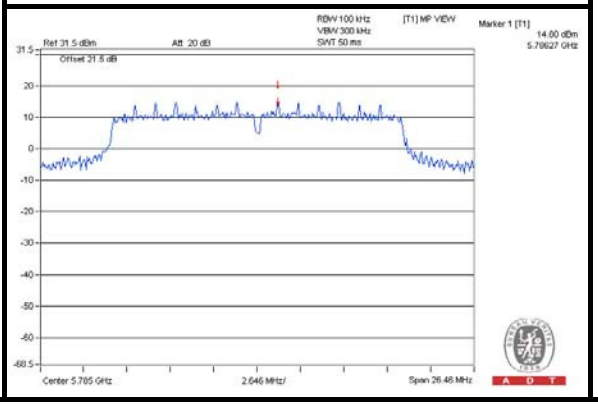


CH 165 Band edge



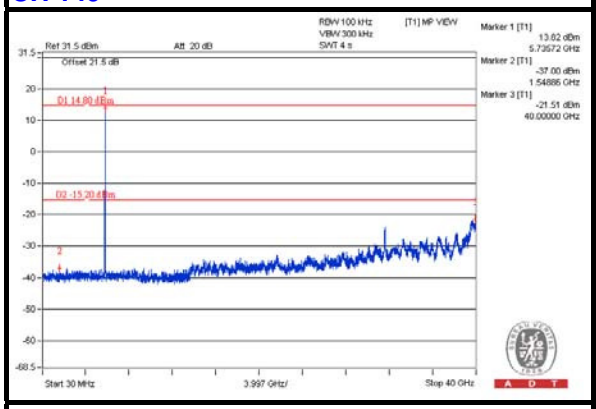
CDD MODE: 802.11ac (VHT20)

Maximum REF

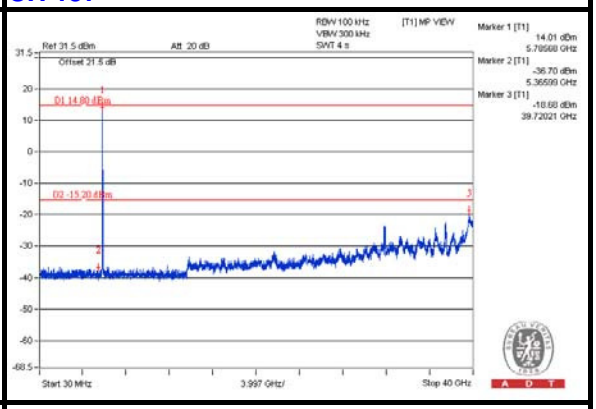


Chain(0)

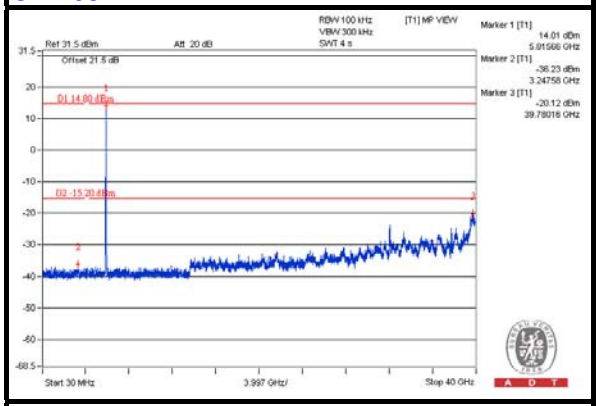
CH 149



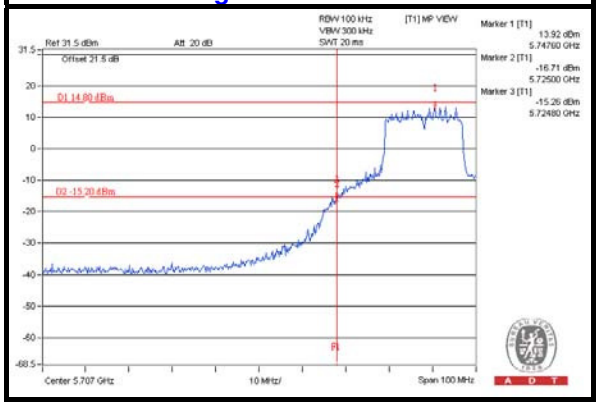
CH 157



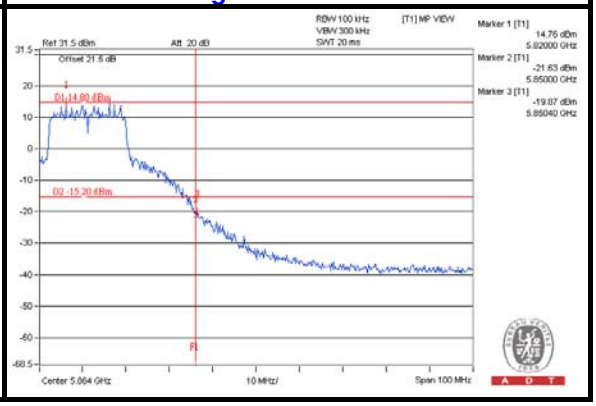
CH 165



CH 149 Band edge

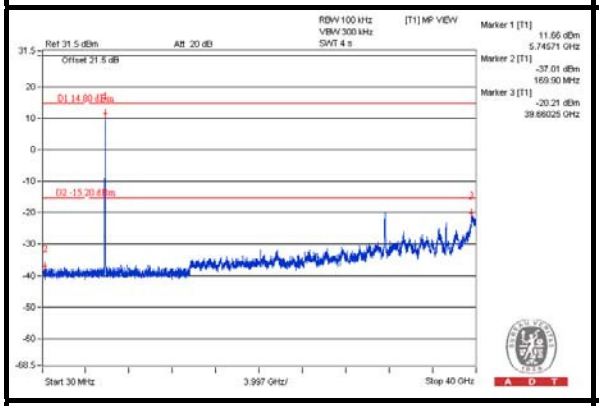


CH 165 Band edge

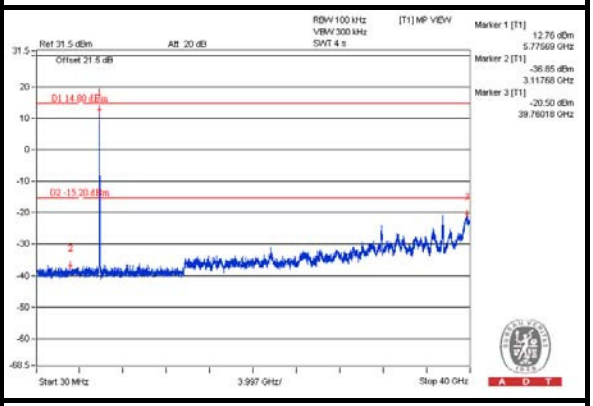


Chain(1)

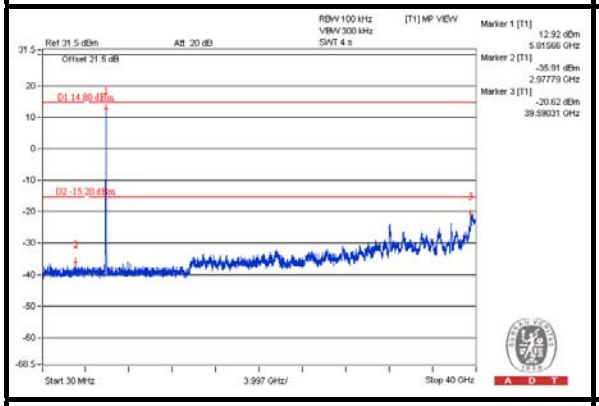
CH 149



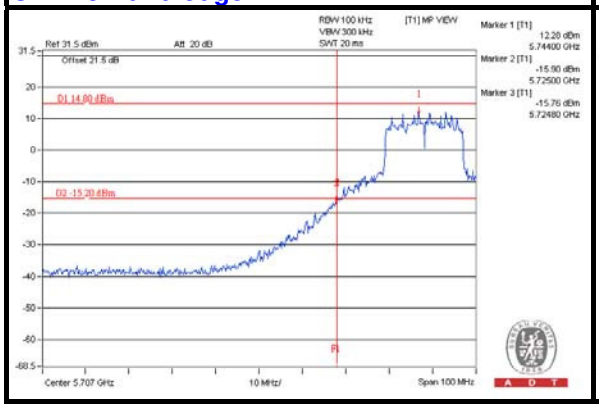
CH 157



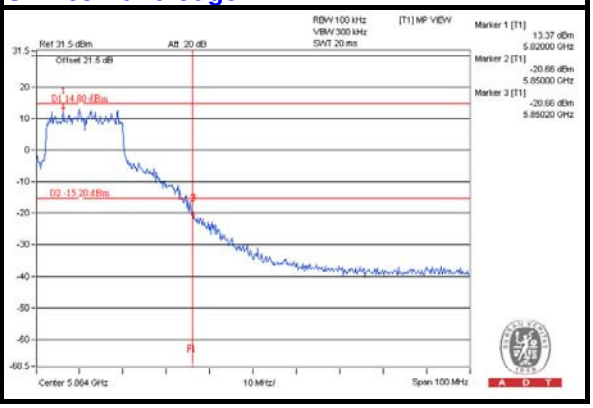
CH 165



CH 149 Band edge

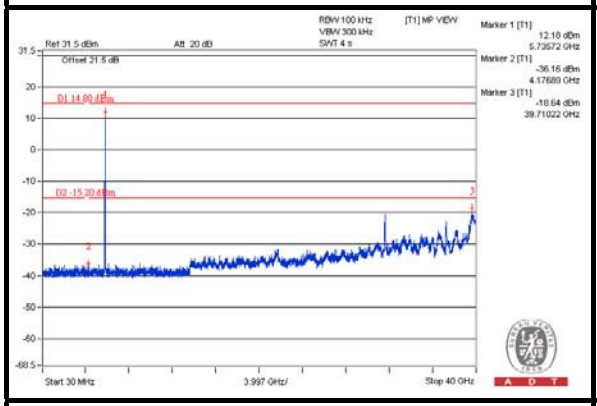


CH 165 Band edge

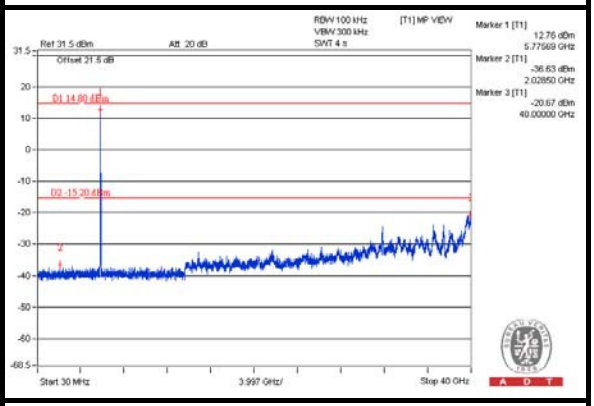


Chain(2)

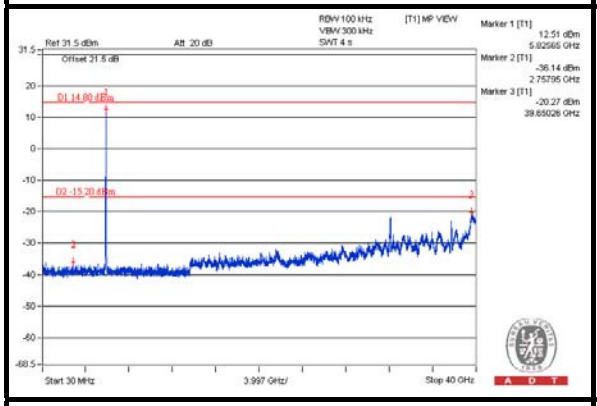
CH 149



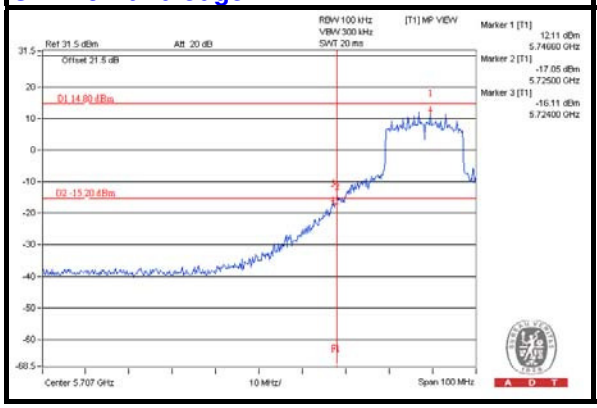
CH 157



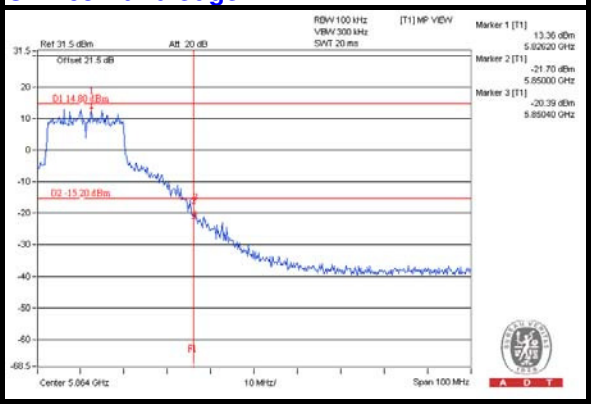
CH 165



CH 149 Band edge

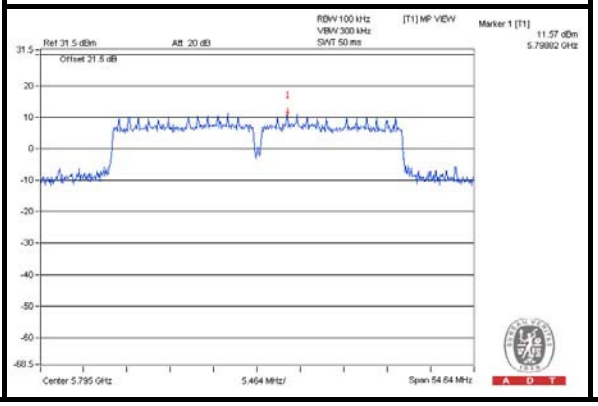


CH 165 Band edge



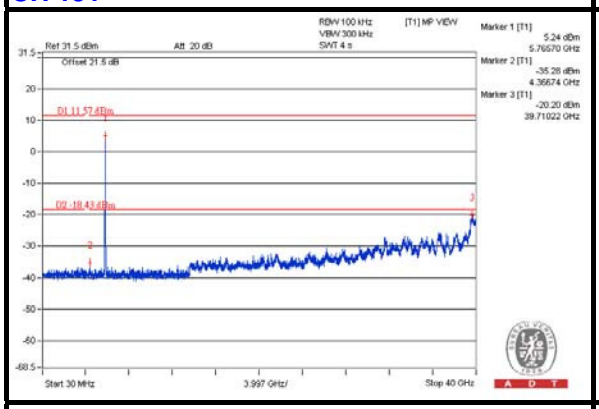
CDD MODE: 802.11ac (VHT40)

Maximum REF

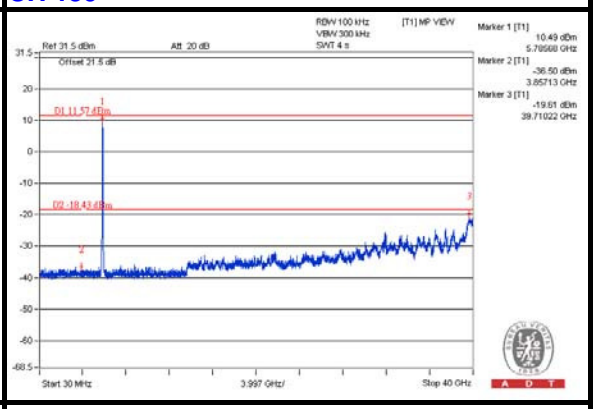


Chain(0)

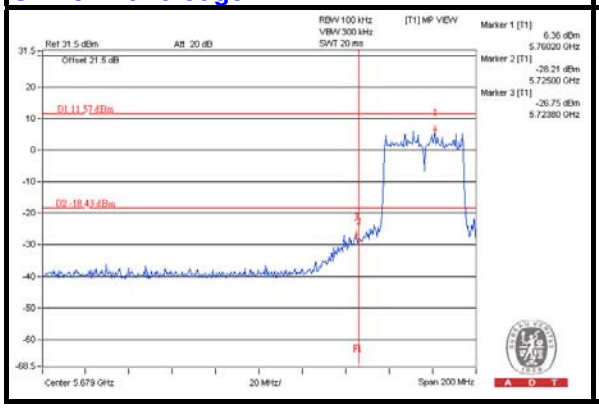
CH 151



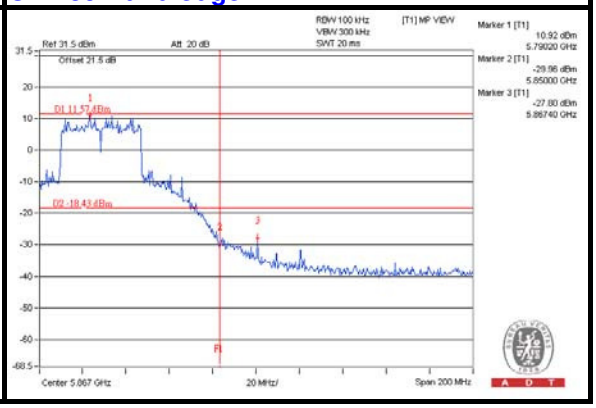
CH 159



CH 151 Band edge

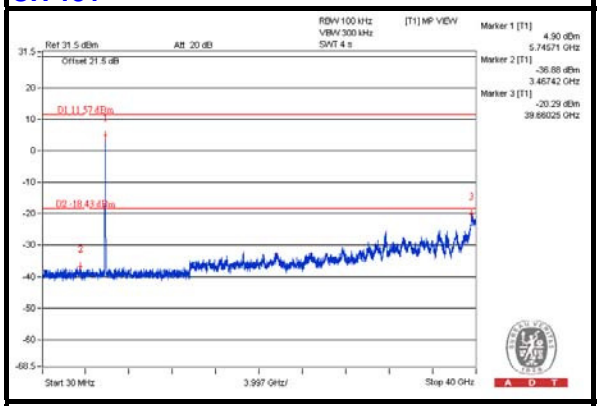


CH 159 Band edge

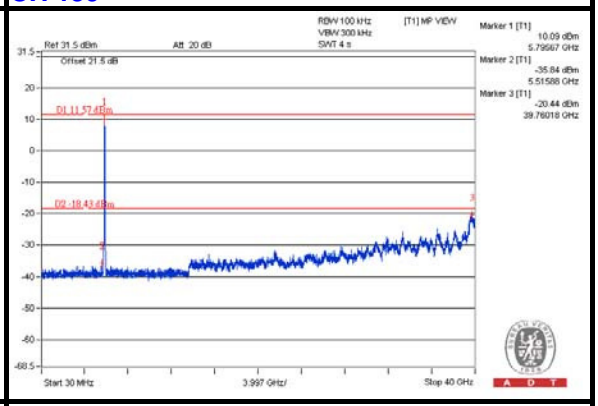


Chain(1)

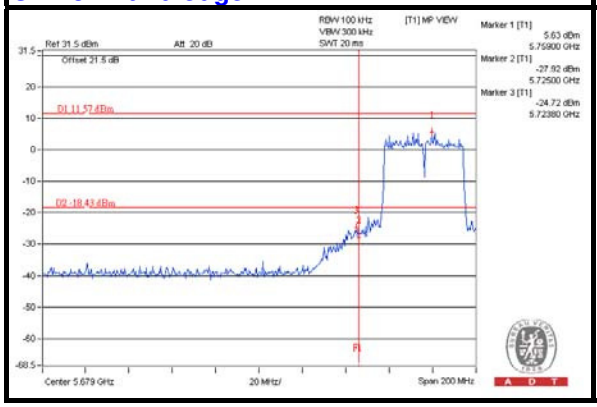
CH 151



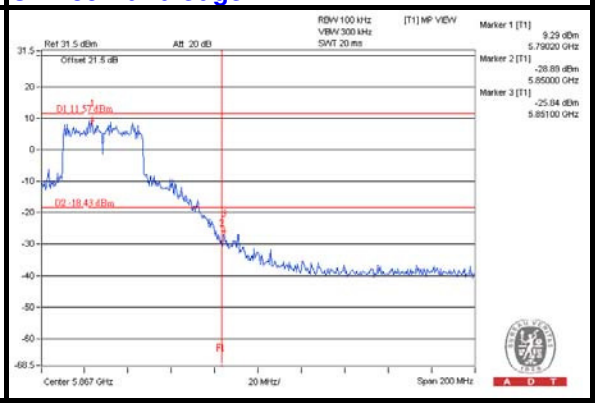
CH 159



CH 151 Band edge

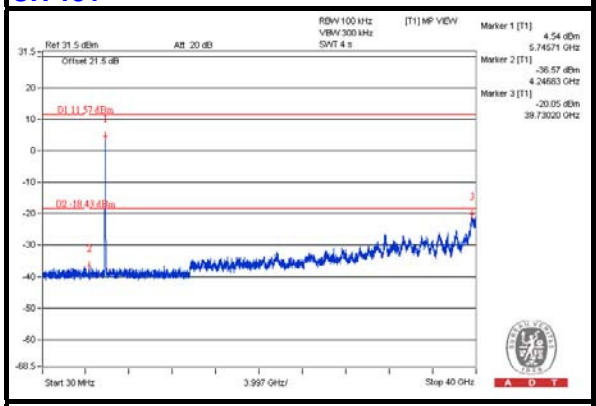


CH 159 Band edge

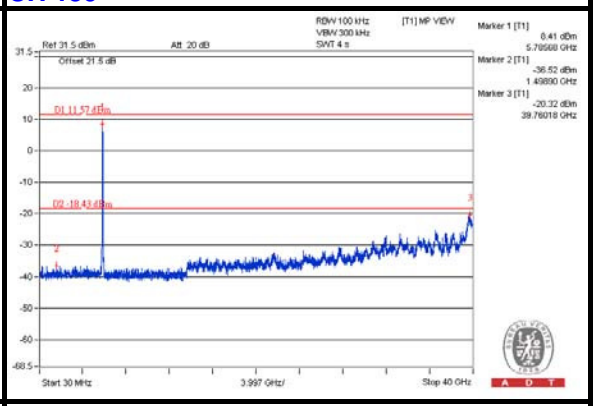


Chain(2)

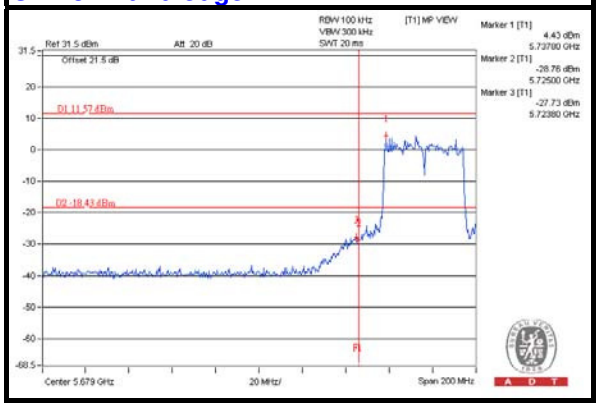
CH 151



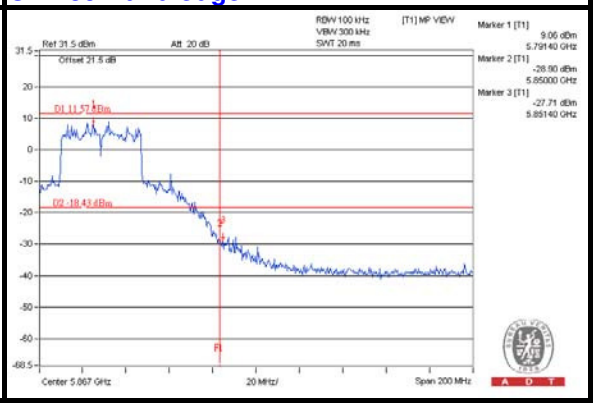
CH 159



CH 151 Band edge

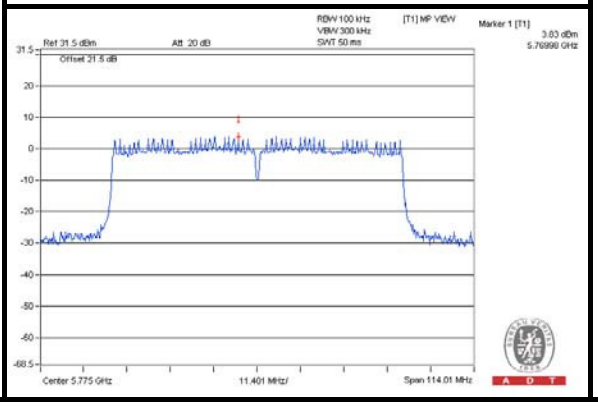


CH 159 Band edge



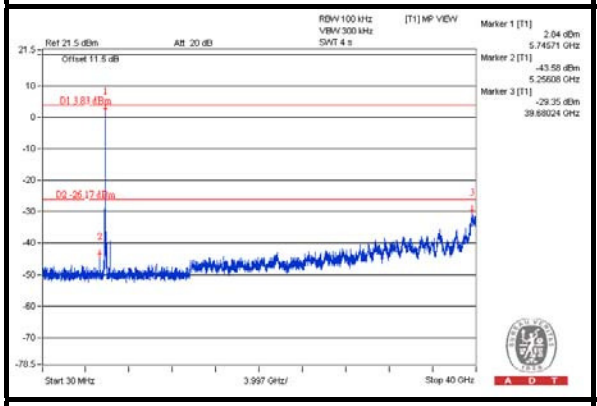
CDD MODE: 802.11ac (VHT80)

Maximum REF

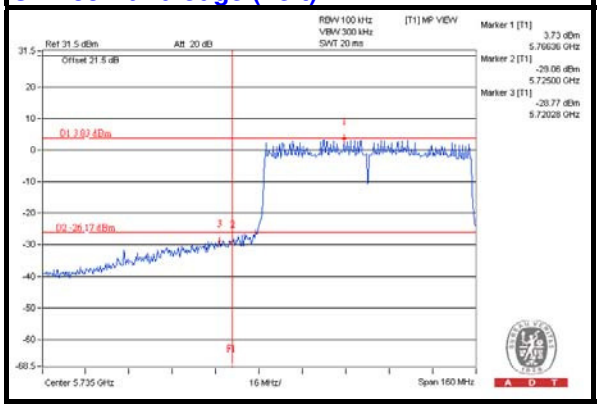


Chain(0)

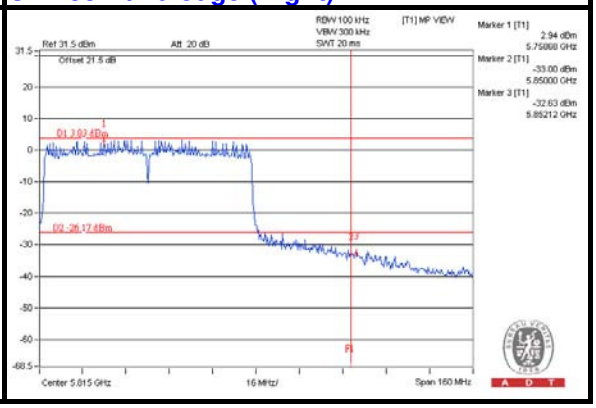
CH 155



CH 155 Band edge (Left)

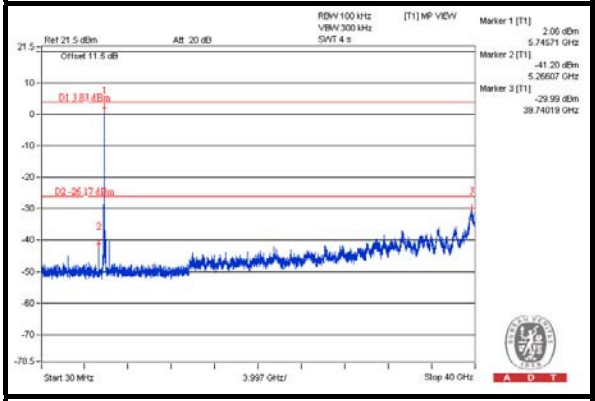


CH 155 Band edge (Right)

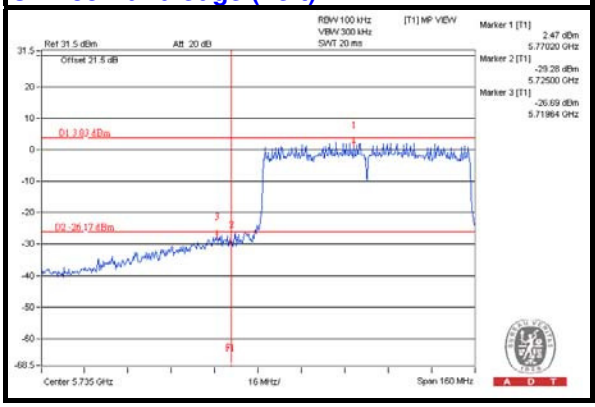


Chain(1)

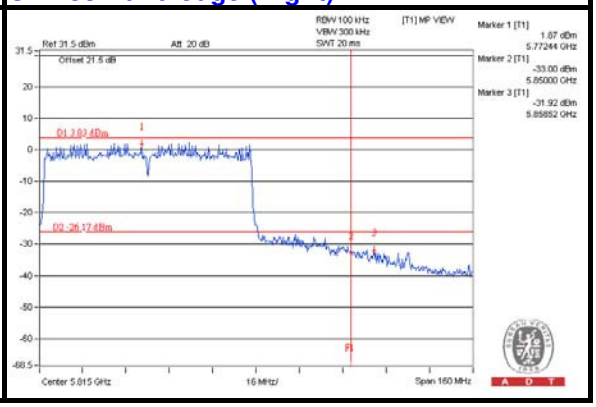
CH 155



CH 155 Band edge (Left)

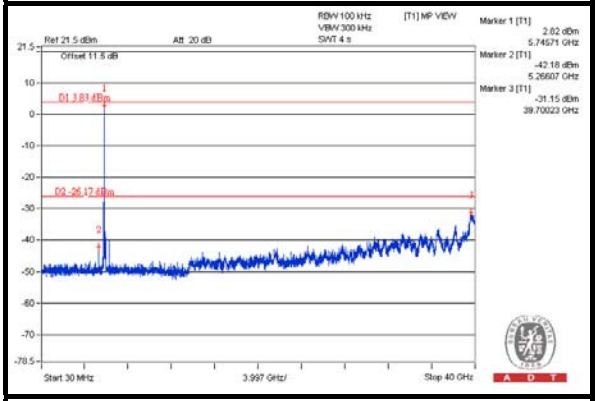


CH 155 Band edge (Right)

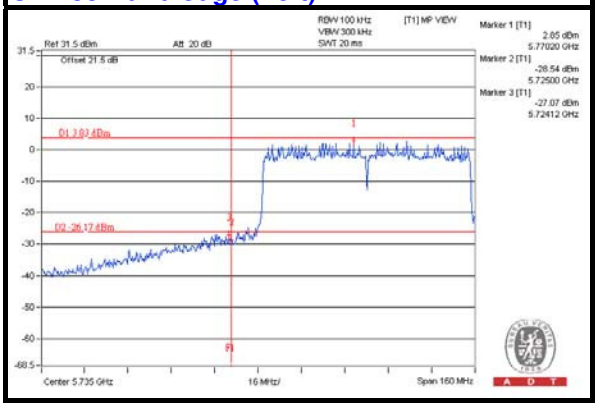


Chain(2)

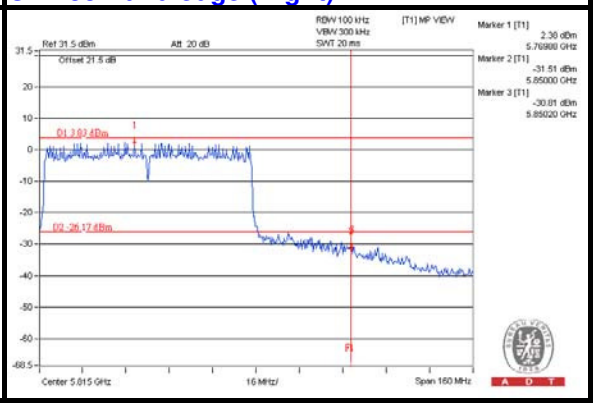
CH 155



CH 155 Band edge (Left)

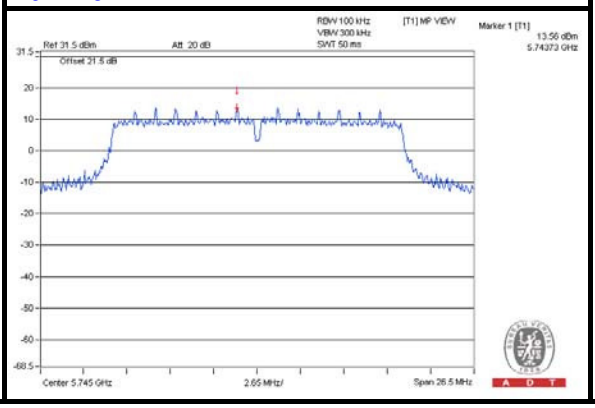


CH 155 Band edge (Right)



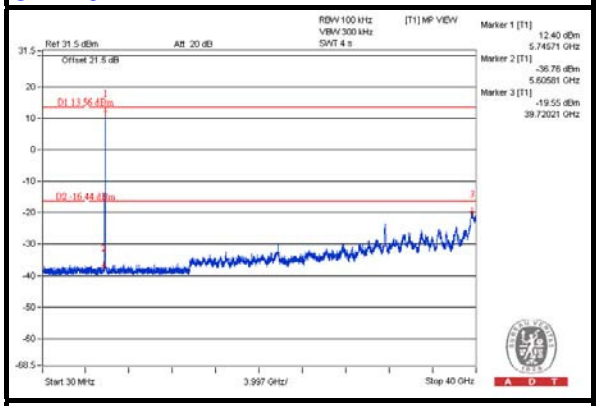
Beamforming Mode: 802.11ac (VHT20)

Maximum REF

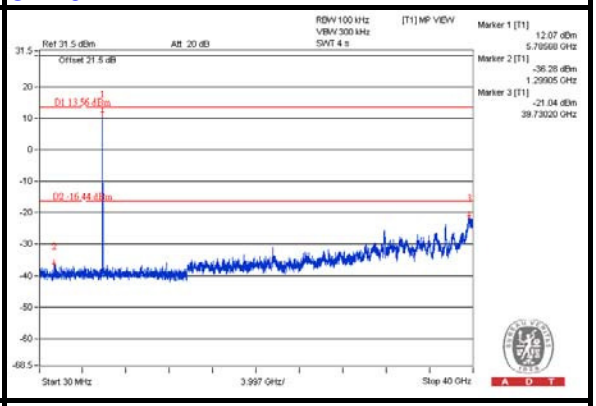


Chain(0)

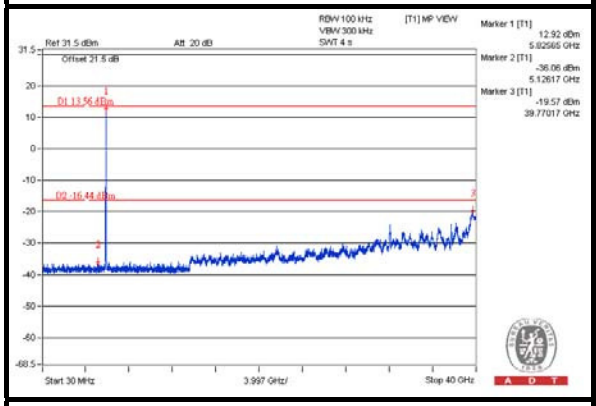
CH 149



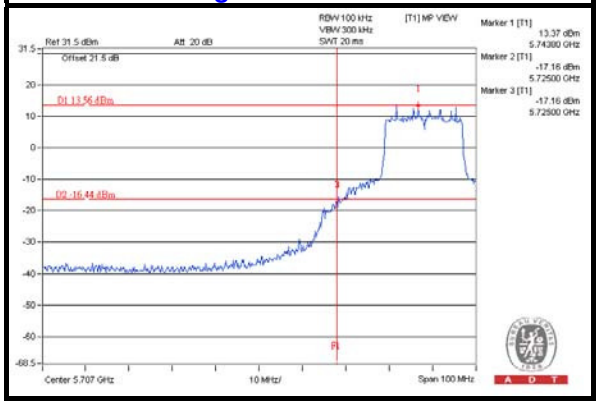
CH 157



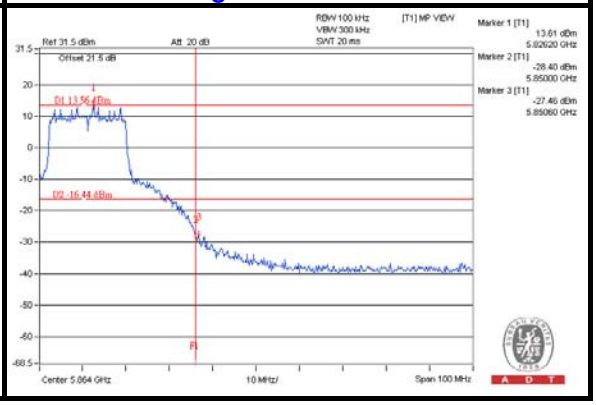
CH 165



CH 149 Band edge

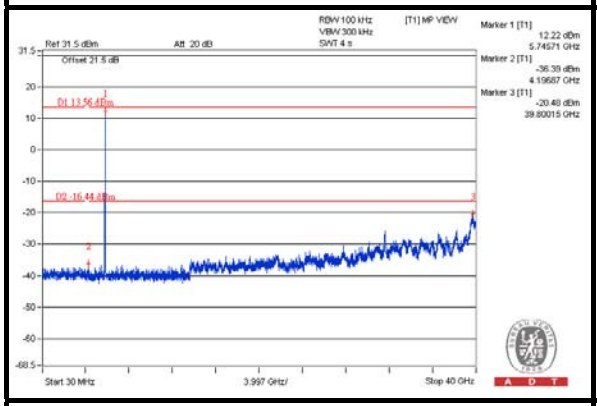


CH 165 Band edge

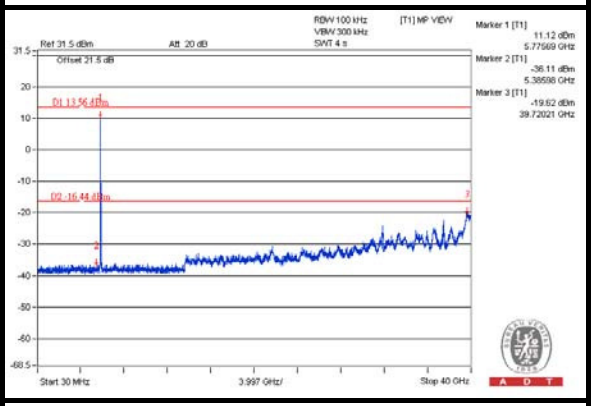


Chain(1)

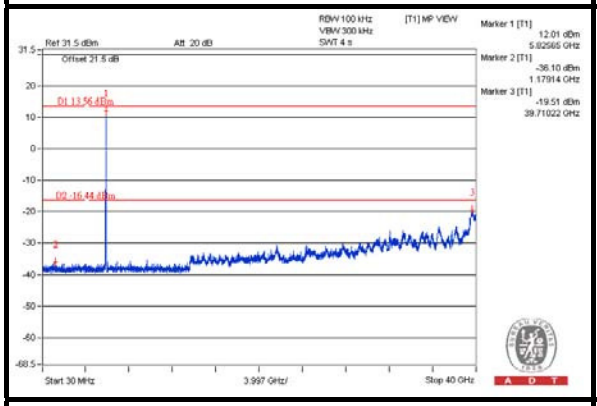
CH 149



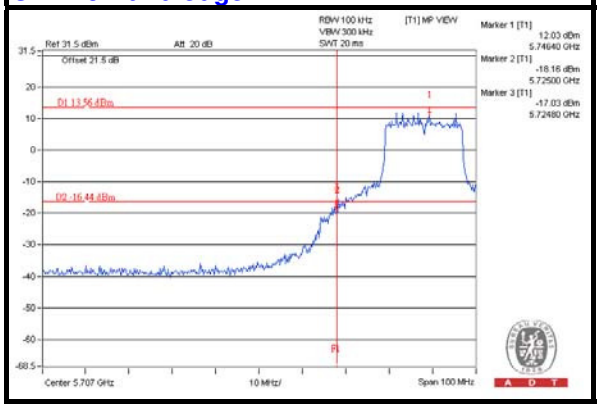
CH 157



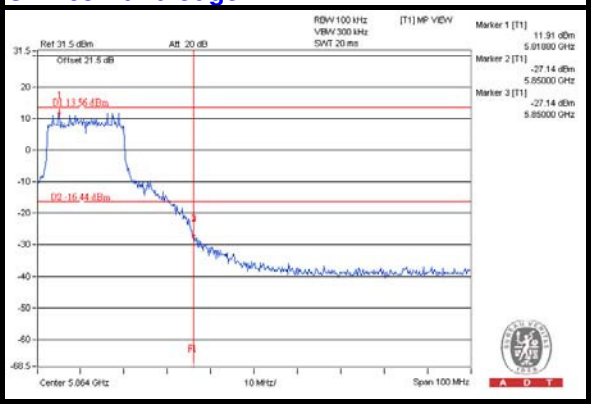
CH 165



CH 149 Band edge

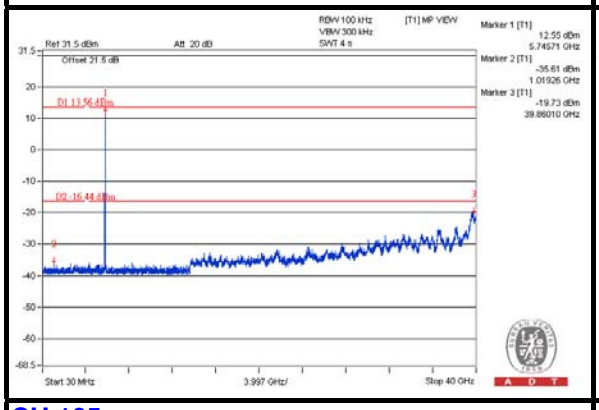


CH 165 Band edge

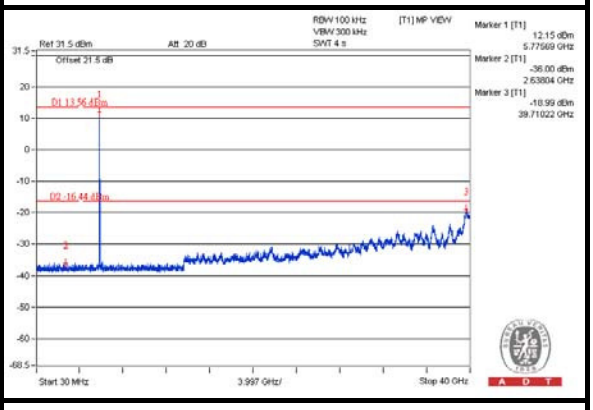


Chain(2)

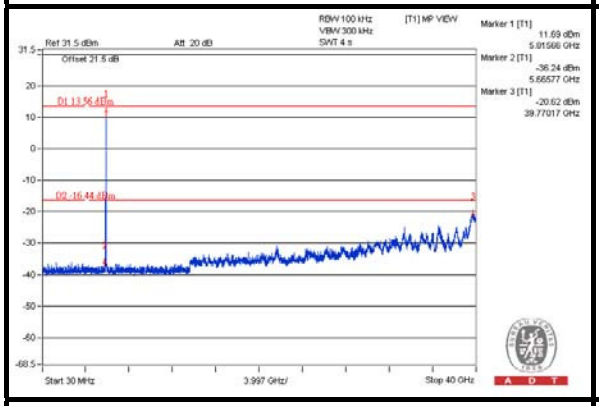
CH 149



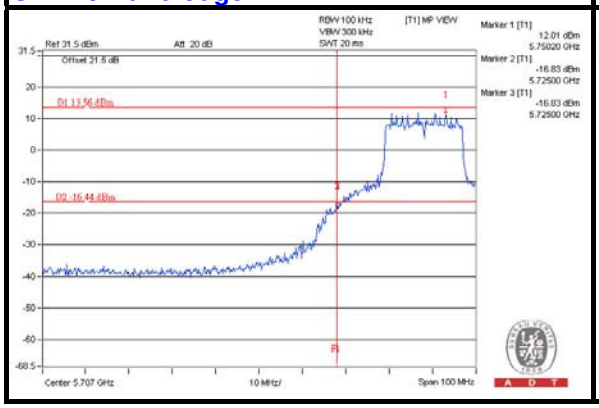
CH 157



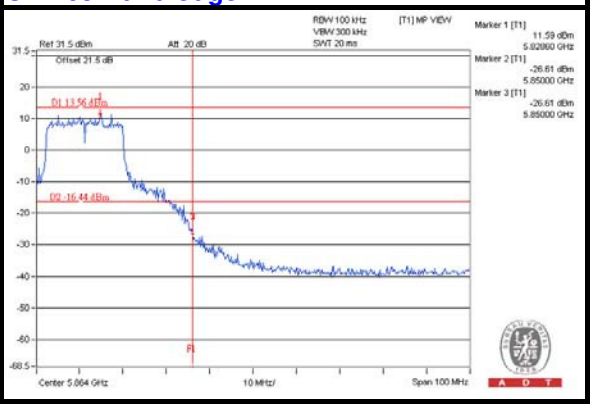
CH 165



CH 149 Band edge

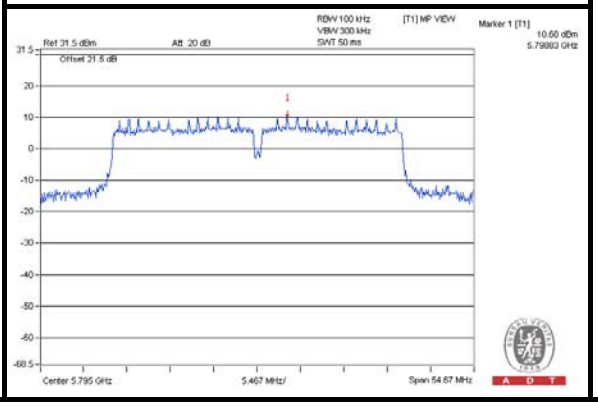


CH 165 Band edge



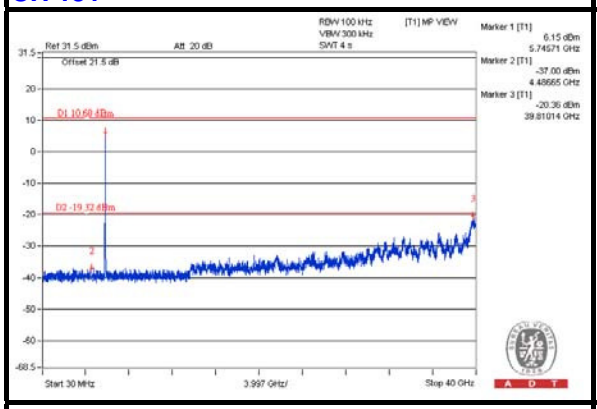
Beamforming Mode: 802.11ac (VHT40)

Maximum REF

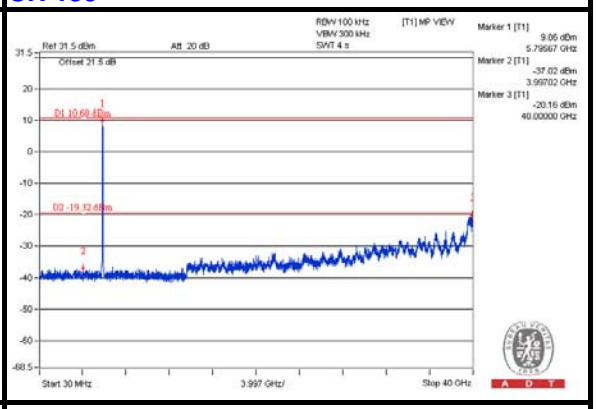


Chain(0)

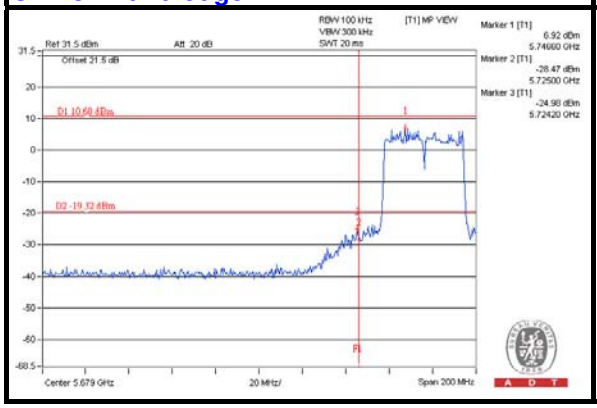
CH 151



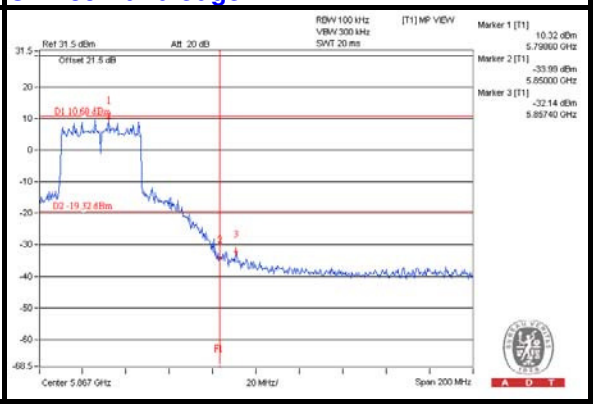
CH 159



CH 151 Band edge

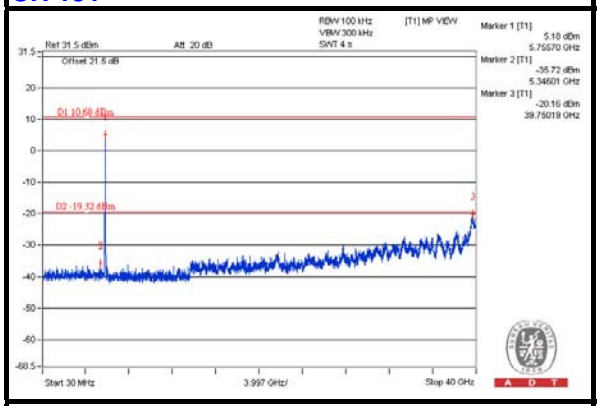


CH 159 Band edge

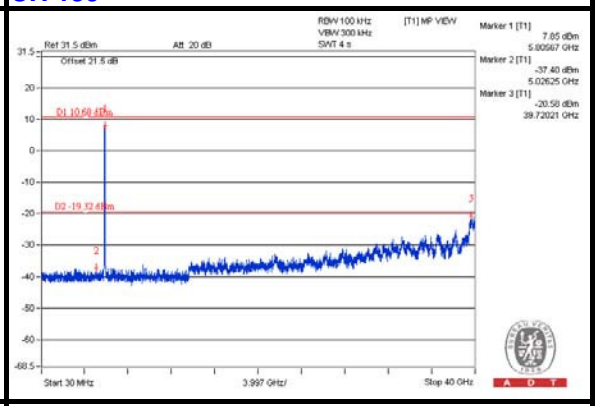


Chain(1)

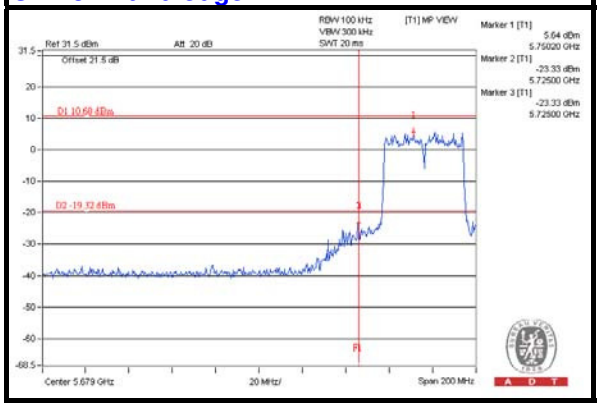
CH 151



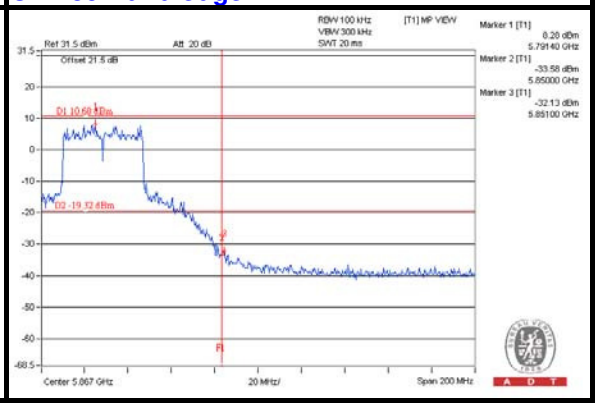
CH 159



CH 151 Band edge

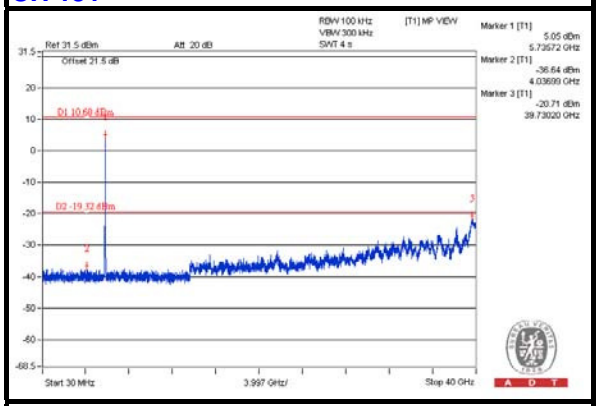


CH 159 Band edge

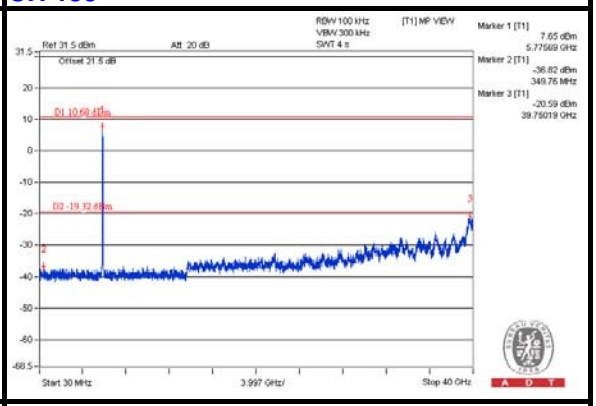


Chain(2)

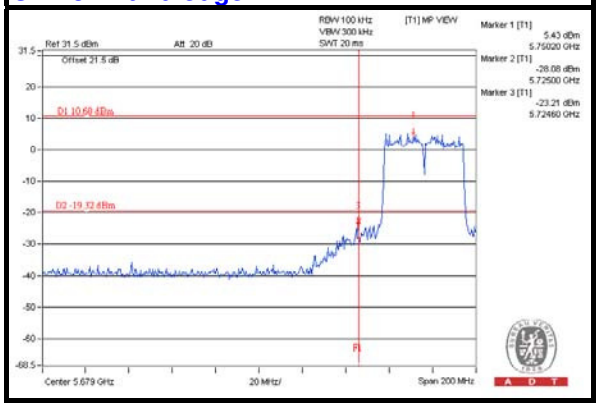
CH 151



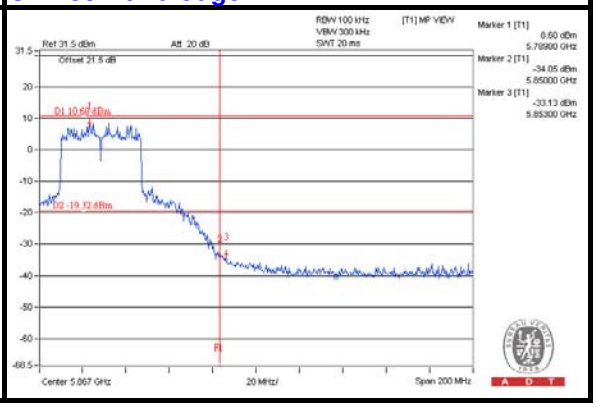
CH 159



CH 151 Band edge

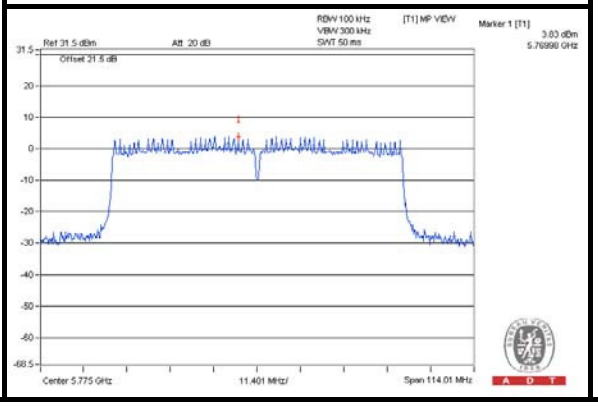


CH 159 Band edge



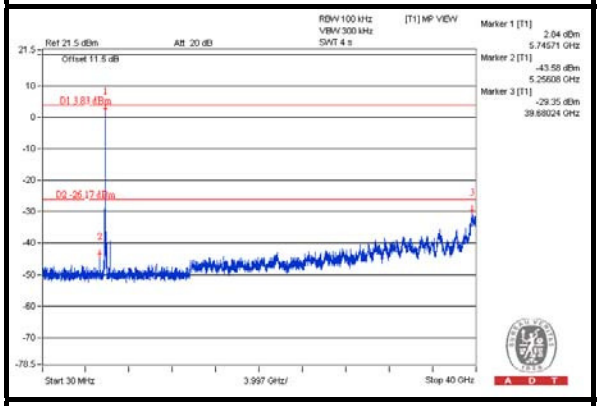
Beamforming Mode: 802.11ac (VHT80)

Maximum REF

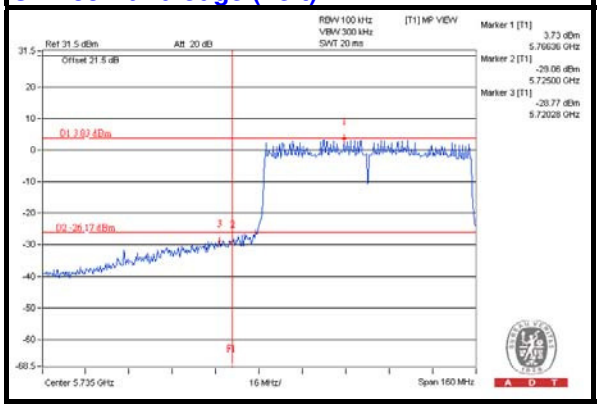


Chain(0)

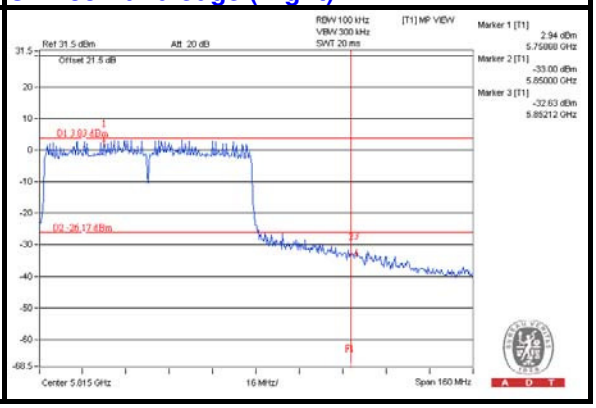
CH 155



CH 155 Band edge (Left)

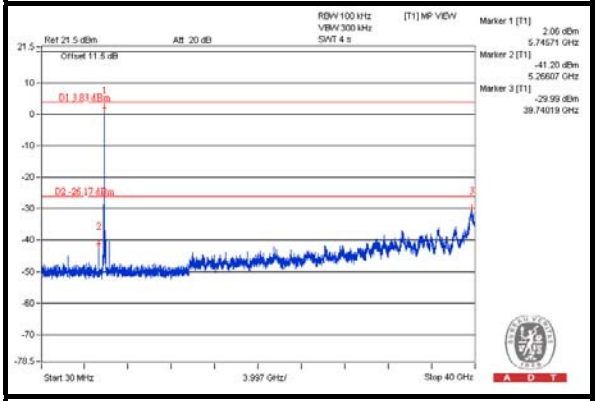


CH 155 Band edge (Right)

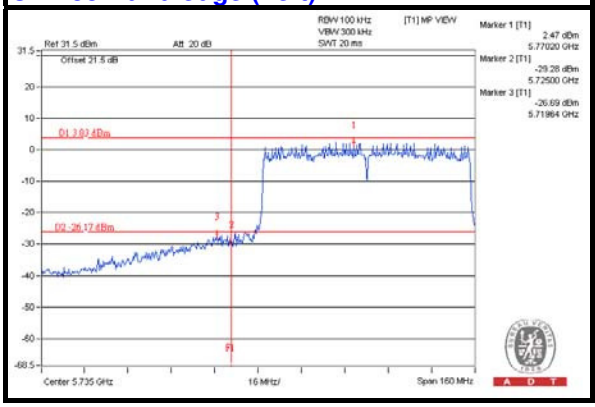


Chain(1)

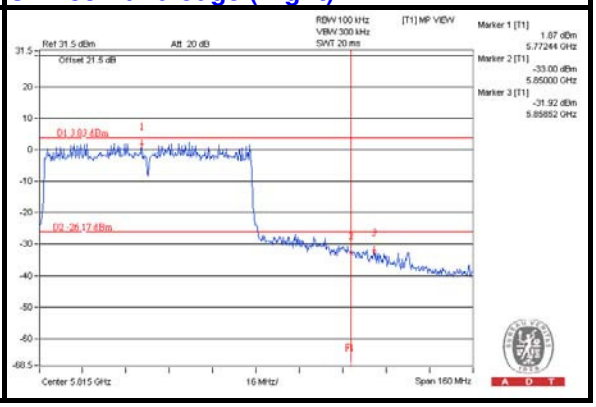
CH 155



CH 155 Band edge (Left)

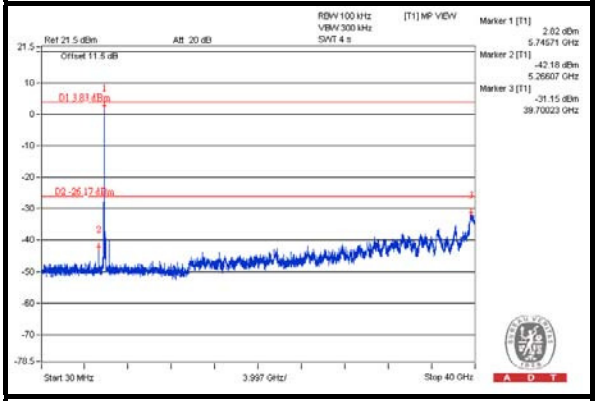


CH 155 Band edge (Right)

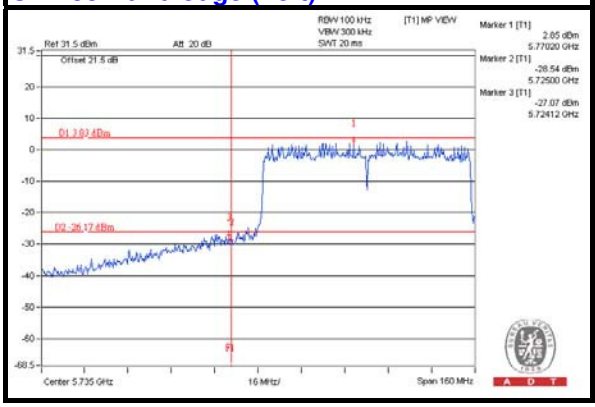


Chain(2)

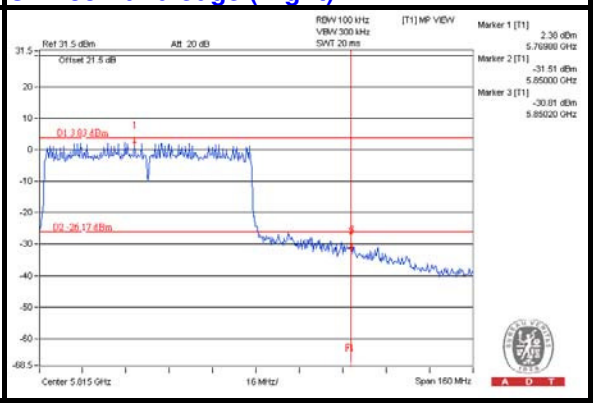
CH 155



CH 155 Band edge (Left)



CH 155 Band edge (Right)



6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

7. INFORMATION ON THE TESTING LABORATORIES

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

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

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

Hsin Chu EMC/RF/Telecom Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Lab:
Tel: 886-3-3183232
Fax: 886-3-3270892

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

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

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

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

--- END ---