FCC Test Report (15.247)

Report No.:	RF150921E04
FCC ID:	RRKWAPAC14
Test Model:	WAP-AC14
Series Model:	T1023WLAN-PA
Received Date:	Sep. 21, 2015
Test Date:	Sep. 30 to Oct. 05, 2015
Issued Date:	Nov. 18, 2015
Applicant:	Alpha Networks Inc.
Address:	No.8 Li-shing 7th Rd., Science-based Industrial Park, Hsinchu, Taiwan, R.O.C.
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.
Test Location (1):	No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.
Test Location (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.
Test Location (3):	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.

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Release Control Record

Issue No.	Description	Date Issued
RF150921E04	Original release.	Nov. 18, 2015

1 Certificate of Conformity

Product:	11ac 4T4R enterprise AP
Brand:	Freescale
Test Model:	WAP-AC14
Series Model:	T1023WLAN-PA
Sample Status:	ENGINEERING SAMPLE
Applicant:	Alpha Networks Inc.
Test Date:	Sep. 30 to Oct. 05, 2015
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10: 2013

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

Prepared by : _____ , **Date:** Nov. 18, 2015

Claire Kuan / Specialist

Approved by : _____ , **Date:** Nov. 18, 2015

May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (SECTION 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -10.12dB at 0.19297MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.3dB at 2483.50MHz & 2486.20MHz
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is R-SMA not a standard connector.

NOTE: 1. The EUT was operating in 2.4 ~ 2.4835GHz, 5.15~5.25GHz and 5.725~5.85GHz frequencies band. This report was recorded the RF parameters including 2.4 ~ 2.4835GHz. For the 5.15~5.25GHz and 5.725~5.85GHz 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:

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.86 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.19 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.43 dB
	6GHz ~ 18GHz	3.49 dB
	18GHz ~ 40GHz	4.11 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	11ac 4T4R enterprise AP
Brand	Freescale
Test Model	WAP-AC14
Series Model	T1023WLAN-PA
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from Power adapter or 48Vdc from POE adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode
Modulation Technology	DSSS,OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a: up to 54Mbps 802.11n: up to 600Mbps 802.11ac: up to 1733.3Mbps
Operating Frequency	**For 15.247:** 2.412 ~ 2.462GHz **For 15.407:** 5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz
Number of Channel	**For 2.4GHz:** 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40) **For 5GHz:** 9 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 4 for 802.11n (HT40), 802.11ac (VHT40) 2 for 802.11ac (VHT80)
Output Power	**For 2.4GHz:** 802.11b: 743.05mW 802.11g: 491.526mW 802.11n (HT20): 615.378mW 802.11n (HT40): 90.294mW **For 5GHz:** 802.11a: 857.501mW 802.11ac (VHT20): 797.147mW 802.11ac (VHT40): 577.099mW 802.11ac (VHT80): 60.113mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Power adapter x 1
Data Cable Supplied	NA

Note:

1. The EUT has two model names, which are identical to each other in all aspects except for the following table:

Brand	Model No.	Difference
Freescale	WAP-AC14	For marketing purposes
	T1023WLAN-PA	

From the above models, model: WAP-AC14 was selected as representative model for the test and its data was recorded in this report.

2. 2.4GHz and 5GHz technology can transmit at same time.
3. The emission of the simultaneous operation (2.4GHz & 5GHz) has been evaluated and no non-compliance was found.

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

For 2.4GHz									
Transmitter Circuit	Brand	Model	Antenna Gain (dBi) (excluding cable loss)	Frequency range (GHz to GHz)	Cable Loss(dB)	Net Gain (dBi) (Included cable loss)	Antenna Type	Connecter Type	Cable Length (mm)
Chain (0)	NA	5320813170AWG	4.04	2.4-2.4835	1.2	2.84	Dipole	R-SMA	430
Chain (1)		5320813170AWG							
Chain (2)		5320813170AWG							
Chain (3)		5320813170AWG							
For 5GHz									
Transmitter Circuit	Brand	Model	Antenna Gain (dBi) (excluding cable loss)	Frequency range (GHz to GHz)	Cable Loss(dB)	Net Gain (dBi) (Included cable loss)	Antenna Type	Connecter Type	Cable Length (mm)
Chain (0)	NA	5321813181AWG	6.37	5.15-5.85	1.5	4.87	Dipole	R-SMA	130
Chain (1)		5321813181AWG							
Chain (2)		5321813181AWG							
Chain (3)		5321813181AWG							

5. The EUT must be supplied with a power adapter or POE as following table:

Power adapter		
Brand Name	Model No.	Spec.
APD	DA-48T12	Input: 100-240V, 1.4A, 50-60Hz AC output cable: Unshielded, 1.5m Output: 12V, 4A DC output cable: Unshielded, 1.15m
POE (only for test, not for sale)		
Brand Name	Model No.	Spec.
Base-Unit	EBU-101G-T2 LF	DC Input: 48V DC Output: 48V

The POE must be supplied with the following adapter:

POE adapter (only for test, not for sale)		
Brand Name	Model No.	Spec.
UNIFIVE	UEC345-4808	Input: 100-240V, 1A, 50/60Hz Output: 48V, 0.875A DC output cable: Unshielded, 1.8m
The EUT was pre-tested with Power adapter & POE, the worst case was found in Power adapter. Therefore only the test data of the Power adapter was recorded in this report.		

6. The EUT incorporates a MIMO function.

2.4GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	4TX	4RX
802.11g	6 ~ 54Mbps	4TX	4RX
802.11n (HT20)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
802.11n (HT40)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
5GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	4TX	4RX
802.11n (HT20)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
802.11n (HT40)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
802.11ac (VHT20)	MCS 0~8, Nss=1	4TX	4RX
	MCS 0~8, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS0~8, Nss=4	4TX	4RX
802.11ac (VHT40)	MCS 0~9, Nss=1	4TX	4RX
	MCS 0~9, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS0~9, Nss=4	4TX	4RX
802.11ac (VHT80)	MCS 0~9, Nss=1	4TX	4RX
	MCS 0~9, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS0~9, Nss=4	4TX	4RX

Note:
1. 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)

7. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

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

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

7 channels are provided for 802.11n (HT40):

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

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

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

NOTE: "-"means no effect.

Radiated Emission Test (Above 1GHz):

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

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

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

Radiated Emission Test (Below 1GHz):

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

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

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

Power Line Conducted Emission Test:

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

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

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

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

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

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

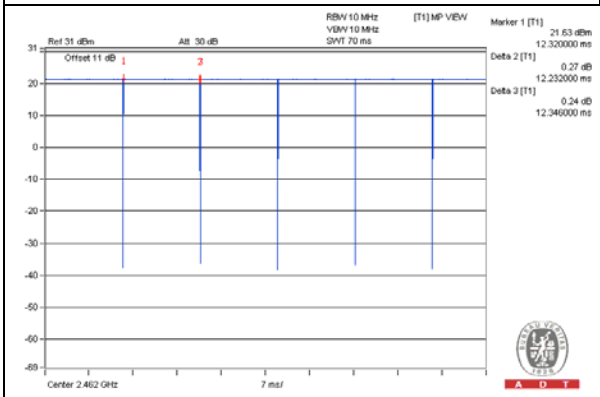
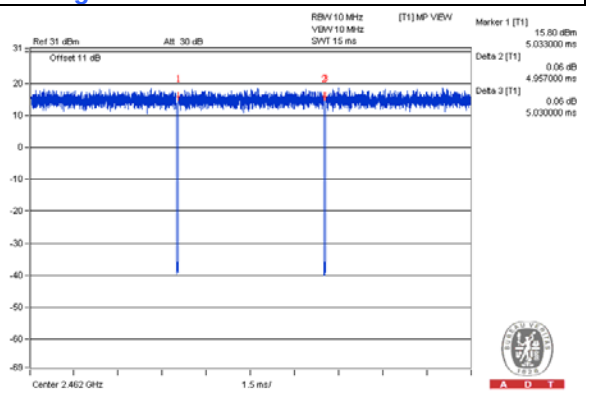
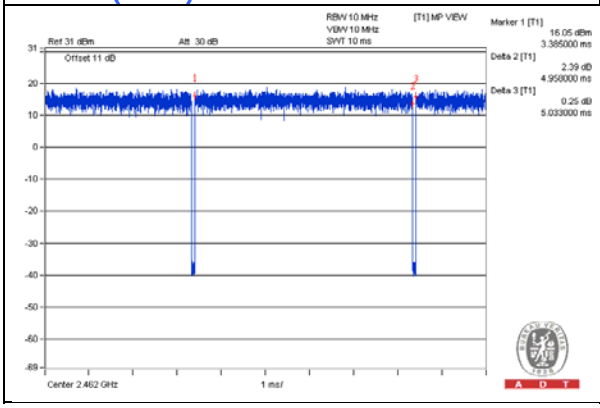
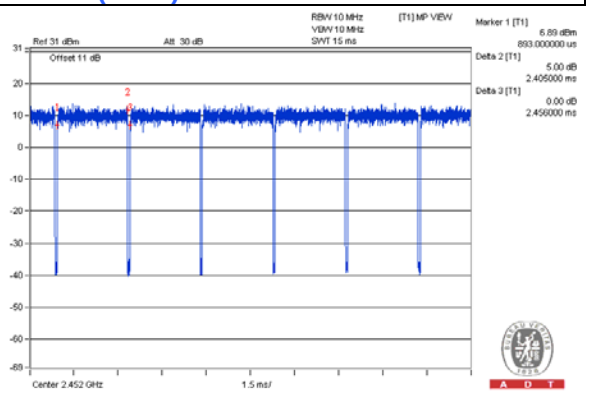
For Conducted Output Power / Power Spectral Density / 6dB Bandwidth Measurement					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n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

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	26deg. C, 67%RH	120Vac, 60Hz	Nelson Teng
RE<1G	25deg. C, 70%RH	120Vac, 60Hz	Alex Ku
PLC	28deg. C, 65%RH	120Vac, 60Hz	Eagle Chen
APCM	25deg. C, 60%RH	120Vac, 60Hz	Gary Cheng

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is ≥ 98 %, duty factor is not required.
Duty cycle of test signal is < 98 %, duty factor shall be considered.
802.11b: Duty cycle = 12.232 ms/12.346 ms = 0.991
802.11g: Duty cycle = 4.957 ms/5.03 ms = 0.985
802.11n (HT20): Duty cycle = 4.958 ms/5.033 ms = 0.985
802.11n (HT40): Duty cycle = 2.405 ms/2.456 ms = 0.979, Duty factor = 10 * log[(1/(2.405/2.456)]= 0.09

802.11b	802.11g
	
802.11n (HT20)	**802.11n (HT40)**
	

3.4 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	NOTEBOOK COMPUTER	SONY	SVS151A12P	275548477000805	FCC DoC	Provided by Lab
B.	HUB	Linksys	NA	NA	NA	Provided by Lab
C.	IPOD	Apple	MD778TA/A	CC4JG680F4T1	NA	Provided by Lab
D.	POE	Base-Unit	EBU-101G-T2 LF	NA	NA	Supplied by Client

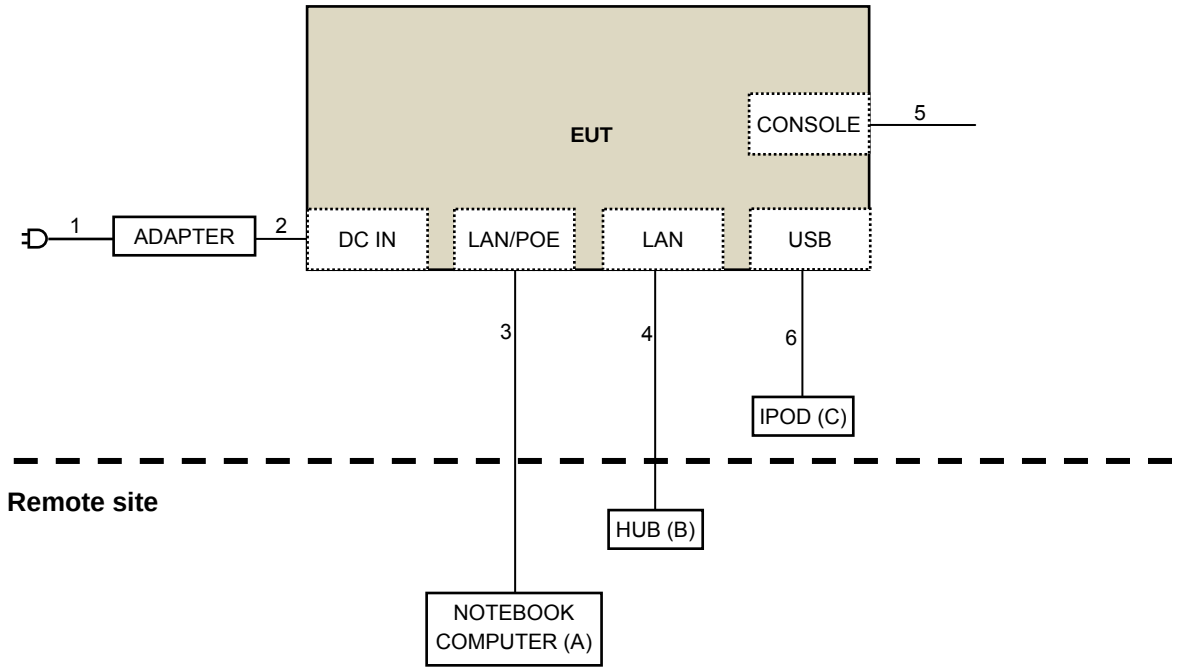
Note:

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

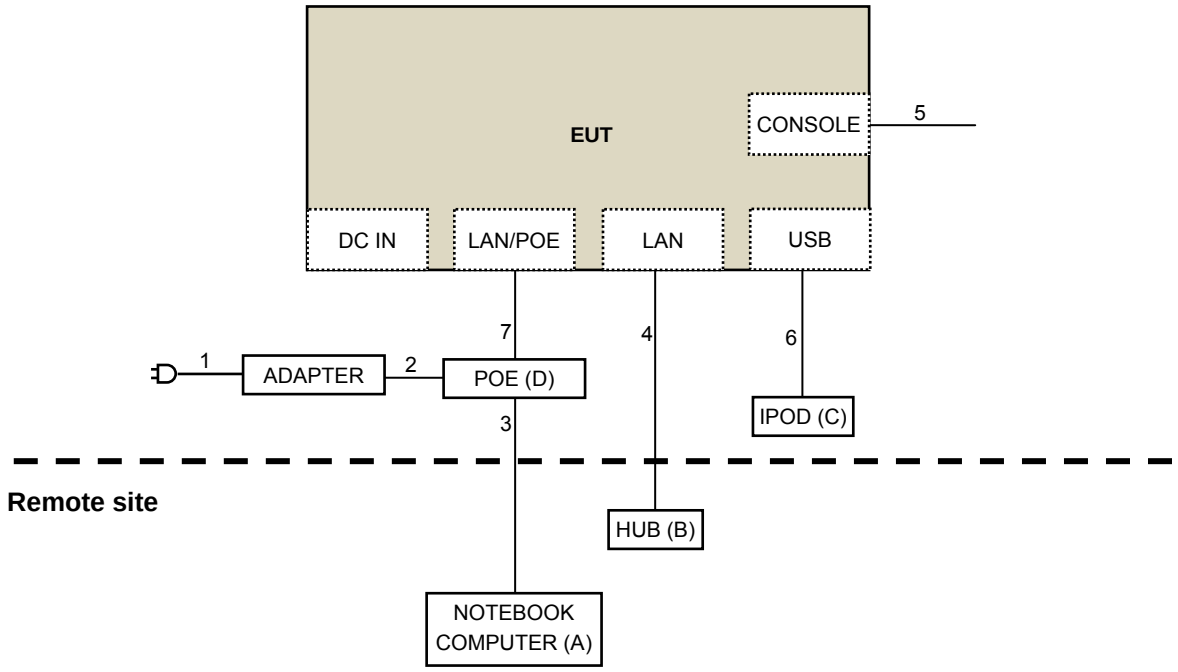
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	AC	1	1.5	No	0	Supplied by Client
2.	DC	1	1.15	No	0	Supplied by Client
3.	RJ45	1	10	No	0	Provided by Lab
4.	RJ45	1	10	No	0	Provided by Lab
5.	RJ45 TO CONSOLE	1	1.8	No	0	Supplied by Client
6.	USB	1	0.1	Yes	0	Provided by Lab
7.	RJ45	1	3	No	0	Provided by Lab

3.4.1 Configuration of System under Test

For adapter Mode:



For POE Mode:



3.5 General Description of Applied Standards

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

FCC Part 15, Subpart C (15.247)
558074 D01 DTS Meas Guidance v03r03
662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

4.1.2 Test Instruments

For below 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY54450088	July 24, 2015	July 23, 2016
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-06	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Feb. 03, 2015	Feb. 02, 2016
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 03, 2015	Apr. 02, 2016
Software	ADT_Radiated_V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 4.
3. The FCC Site Registration No. is 292998
4. The CANADA Site Registration No. is 20331-2
5. Tested Date: Oct. 02, 2015

For other test items:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY54450088	July 24, 2015	July 23, 2016
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Feb. 06, 2015	Feb. 05, 2016
Pre-Amplifier Agilent	8449B	3008A01922	Sep. 19, 2015	Sep. 18, 2016
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150318 150323 150324	Mar. 31, 2015	Mar. 30, 2016
Spectrum Analyzer R&S	FSV40	100964	June 26, 2015	June 25, 2016
Pre-Amplifier EMCI	EMC184045	980143	Jan. 16, 2015	Jan. 15, 2016
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Feb. 05, 2015	Feb. 04, 2016
RF Cable	SUCOFLEX 104	329751/4 RF104-204	Dec. 11, 2014	Dec. 10, 2015
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA
Power Meter Anritsu	ML2495A	1014008	Apr. 28, 2015	Apr. 27, 2016
Power Sensor Anritsu	MA2411B	0917122	Apr. 28, 2015	Apr. 27, 2016
Spectrum Analyzer R&S	FSP40	100060	May 08, 2015	May 07, 2016

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 4.
3. The FCC Site Registration No. is 292998
4. The CANADA Site Registration No. is 20331-2
5. Tested Date: Oct. 02 to 05, 2015

4.1.3 Test Procedures

a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

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

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

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

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

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

Note:

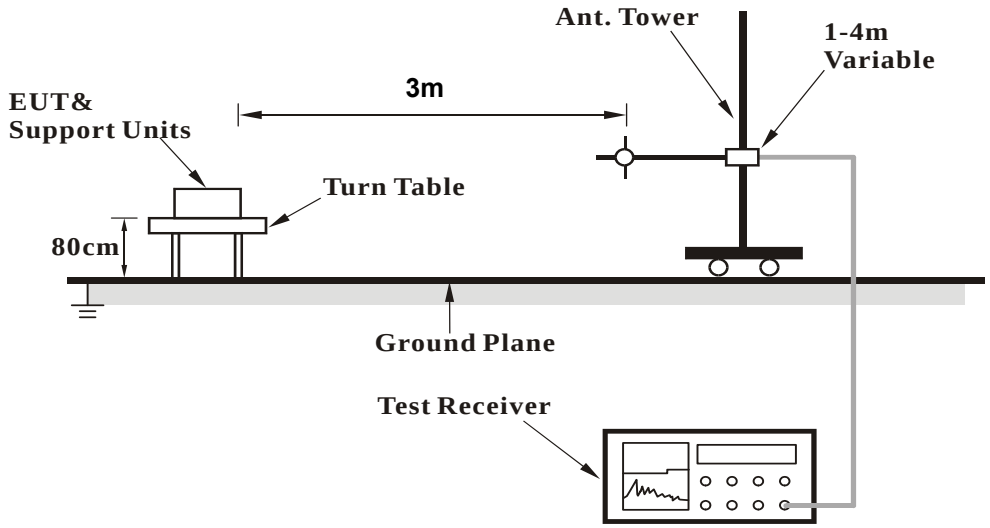
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (10 log(1/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.

4.1.4 Deviation from Test Standard

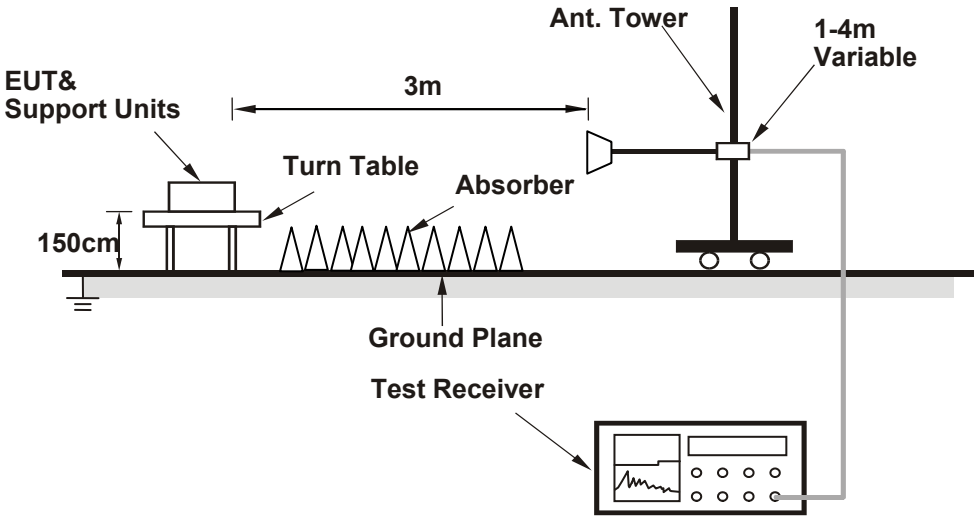
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Conditions

1. Connect the EUT with the support unit A (Notebook Computer) which is placed on remote site.
2. Controlling software (QDART.exe[Ver3.0126.0]) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2386.80	55.4 PK	74.0	-18.6	1.14 H	135	61.60	-6.20
2	2386.80	47.1 AV	54.0	-6.9	1.14 H	135	53.30	-6.20
3	*2412.00	107.6 PK			1.14 H	135	113.69	-6.09
4	*2412.00	105.2 AV			1.14 H	135	111.29	-6.09
5	4824.00	46.2 PK	74.0	-27.8	2.35 H	105	46.39	-0.19
6	4824.00	40.8 AV	54.0	-13.2	2.35 H	105	40.99	-0.19
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	2386.80	60.5 PK	74.0	-13.5	1.29 V	253	66.70	-6.20
2	2386.80	52.1 AV	54.0	-1.9	1.29 V	253	58.30	-6.20
3	*2412.00	119.1 PK			1.29 V	253	125.19	-6.09
4	*2412.00	117.1 AV			1.29 V	253	123.19	-6.09
5	4824.00	49.2 PK	74.0	-24.8	1.79 V	148	49.39	-0.19
6	4824.00	46.1 AV	54.0	-7.9	1.79 V	148	46.29	-0.19

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	118.3 PK			1.03 H	132	124.30	-6.00
2	*2437.00	115.7 AV			1.03 H	132	121.70	-6.00
3	4874.00	51.1 PK	74.0	-22.9	2.34 H	133	51.09	0.01
4	4874.00	45.6 AV	54.0	-8.4	2.34 H	133	45.59	0.01
5	7311.00	54.0 PK	74.0	-20.0	2.29 H	74	47.69	6.31
6	7311.00	45.7 AV	54.0	-8.3	2.29 H	74	39.39	6.31
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	*2437.00	127.4 PK			1.76 V	130	133.40	-6.00
2	*2437.00	124.1 AV			1.76 V	130	130.10	-6.00
3	4874.00	54.6 PK	74.0	-19.4	1.88 V	153	54.59	0.01
4	4874.00	51.6 AV	54.0	-2.4	1.88 V	153	51.59	0.01
5	7311.00	56.1 PK	74.0	-17.9	2.41 V	218	49.79	6.31
6	7311.00	50.7 AV	54.0	-3.3	2.41 V	218	44.39	6.31

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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	109.8 PK			1.08 H	135	115.71	-5.91
2	*2462.00	107.7 AV			1.08 H	135	113.61	-5.91
3	2486.20	58.8 PK	74.0	-15.2	1.08 H	135	64.62	-5.82
4	2486.20	49.2 AV	54.0	-4.8	1.08 H	135	55.02	-5.82
5	4924.00	45.9 PK	74.0	-28.1	2.35 H	121	45.76	0.14
6	4924.00	40.6 AV	54.0	-13.4	2.35 H	121	40.46	0.14
7	7386.00	48.1 PK	74.0	-25.9	2.31 H	81	41.64	6.46
8	7386.00	40.1 AV	54.0	-13.9	2.31 H	81	33.64	6.46
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	119.4 PK			1.31 V	245	125.31	-5.91
2	*2462.00	117.1 AV			1.31 V	245	123.01	-5.91
3	2486.20	63.0 PK	74.0	-11.0	1.31 V	245	68.82	-5.82
4	**2486.20**	**53.7 AV**	**54.0**	**-0.3**	**1.31 V**	**245**	**59.52**	**-5.82**
5	4924.00	49.4 PK	74.0	-24.6	1.82 V	163	49.26	0.14
6	4924.00	46.4 AV	54.0	-7.6	1.82 V	163	46.26	0.14
7	7386.00	50.8 PK	74.0	-23.2	2.47 V	207	44.34	6.46
8	7386.00	45.4 AV	54.0	-8.6	2.47 V	207	38.94	6.46

REMARKS:

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

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.6 PK	74.0	-17.4	1.10 H	135	62.79	-6.19
2	2390.00	41.0 AV	54.0	-13.0	1.10 H	135	47.19	-6.19
3	*2412.00	106.9 PK			1.10 H	135	112.99	-6.09
4	*2412.00	96.5 AV			1.10 H	135	102.59	-6.09
5	4824.00	49.6 PK	74.0	-24.4	1.46 H	252	49.79	-0.19
6	4824.00	37.8 AV	54.0	-16.2	1.46 H	252	37.99	-0.19
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	67.1 PK	74.0	-6.9	1.25 V	292	73.29	-6.19
2	2390.00	52.7 AV	54.0	-1.3	1.25 V	292	58.89	-6.19
3	*2412.00	116.1 PK			1.25 V	292	122.19	-6.09
4	*2412.00	106.7 AV			1.25 V	292	112.79	-6.09
5	4824.00	50.3 PK	74.0	-23.7	1.41 V	180	50.49	-0.19
6	4824.00	39.7 AV	54.0	-14.3	1.41 V	180	39.89	-0.19

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	52.8 PK	74.0	-21.2	1.03 H	133	58.99	-6.19
2	2390.00	41.3 AV	54.0	-12.7	1.03 H	133	47.49	-6.19
3	*2437.00	112.2 PK			1.03 H	133	118.20	-6.00
4	*2437.00	103.1 AV			1.03 H	133	109.10	-6.00
5	2483.50	55.2 PK	74.0	-18.8	1.03 H	133	61.02	-5.82
6	2483.50	45.4 AV	54.0	-8.6	1.03 H	133	51.22	-5.82
7	4874.00	51.7 PK	74.0	-22.3	1.42 H	64	51.69	0.01
8	4874.00	39.5 AV	54.0	-14.5	1.42 H	64	39.49	0.01
9	7311.00	57.1 PK	74.0	-16.9	1.24 H	130	50.79	6.31
10	7311.00	44.8 AV	54.0	-9.2	1.24 H	130	38.49	6.31
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	2390.00	63.8 PK	74.0	-10.2	1.44 V	293	69.99	-6.19
2	2390.00	50.6 AV	54.0	-3.4	1.44 V	293	56.79	-6.19
3	*2437.00	123.4 PK			1.44 V	293	129.40	-6.00
4	*2437.00	113.5 AV			1.44 V	293	119.50	-6.00
5	2483.50	66.0 PK	74.0	-8.0	1.44 V	293	71.82	-5.82
6	2483.50	52.8 AV	54.0	-1.2	1.44 V	293	58.62	-5.82
7	4874.00	54.4 PK	74.0	-19.6	2.19 V	205	54.39	0.01
8	4874.00	40.9 AV	54.0	-13.1	2.19 V	205	40.89	0.01
9	7311.00	58.7 PK	74.0	-15.3	1.24 V	181	52.39	6.31
10	7311.00	45.7 AV	54.0	-8.3	1.24 V	181	39.39	6.31

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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	103.4 PK			1.08 H	136	109.31	-5.91
2	*2462.00	93.2 AV			1.08 H	136	99.11	-5.91
3	2483.50	55.4 PK	74.0	-18.6	1.08 H	136	61.22	-5.82
4	2483.50	43.6 AV	54.0	-10.4	1.08 H	136	49.42	-5.82
5	4924.00	49.5 PK	74.0	-24.5	1.46 H	242	49.36	0.14
6	4924.00	37.6 AV	54.0	-16.4	1.46 H	242	37.46	0.14
7	7386.00	53.2 PK	74.0	-20.8	1.40 H	246	46.74	6.46
8	7386.00	44.0 AV	54.0	-10.0	1.40 H	246	37.54	6.46
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	114.9 PK			1.21 V	293	120.81	-5.91
2	*2462.00	105.4 AV			1.21 V	293	111.31	-5.91
3	2483.50	66.8 PK	74.0	-7.2	1.21 V	293	72.62	-5.82
4	2483.50	52.1 AV	54.0	-1.9	1.21 V	293	57.92	-5.82
5	4924.00	50.2 PK	74.0	-23.8	1.39 V	184	50.06	0.14
6	4924.00	39.6 AV	54.0	-14.4	1.39 V	184	39.46	0.14
7	7386.00	55.3 PK	74.0	-18.7	1.28 V	360	48.84	6.46
8	7386.00	44.3 AV	54.0	-9.7	1.28 V	360	37.84	6.46

REMARKS:

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

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	49.0 PK	74.0	-25.0	1.36 H	136	55.19	-6.19
2	2390.00	34.3 AV	54.0	-19.7	1.36 H	136	40.49	-6.19
3	*2412.00	102.0 PK			1.36 H	136	108.09	-6.09
4	*2412.00	93.8 AV			1.36 H	136	99.89	-6.09
5	4824.00	50.1 PK	74.0	-23.9	1.45 H	264	50.29	-0.19
6	4824.00	38.1 AV	54.0	-15.9	1.45 H	264	38.29	-0.19
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.9 PK	74.0	-10.1	1.21 V	293	70.09	-6.19
2	2390.00	51.4 AV	54.0	-2.6	1.21 V	293	57.59	-6.19
3	*2412.00	115.0 PK			1.21 V	293	121.09	-6.09
4	*2412.00	105.4 AV			1.21 V	293	111.49	-6.09
5	4824.00	50.2 PK	74.0	-23.8	1.38 V	185	50.39	-0.19
6	4824.00	39.6 AV	54.0	-14.4	1.38 V	185	39.79	-0.19

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	52.2 PK	74.0	-21.8	1.00 H	143	58.39	-6.19
2	2390.00	41.7 AV	54.0	-12.3	1.00 H	143	47.89	-6.19
3	*2437.00	112.5 PK			1.01 H	128	118.50	-6.00
4	*2437.00	101.2 AV			1.01 H	128	107.20	-6.00
5	2483.50	56.4 PK	74.0	-17.6	1.07 H	122	62.22	-5.82
6	2483.50	45.6 AV	54.0	-8.4	1.07 H	122	51.42	-5.82
7	4874.00	51.9 PK	74.0	-22.1	1.45 H	52	51.89	0.01
8	4874.00	39.5 AV	54.0	-14.5	1.45 H	52	39.49	0.01
9	7311.00	57.6 PK	74.0	-16.4	1.27 H	129	51.29	6.31
10	7311.00	45.2 AV	54.0	-8.8	1.27 H	129	38.89	6.31
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	2390.00	63.6 PK	74.0	-10.4	1.42 V	281	69.79	-6.19
2	2390.00	50.4 AV	54.0	-3.6	1.42 V	281	56.59	-6.19
3	*2437.00	122.8 PK			1.42 V	281	128.80	-6.00
4	*2437.00	113.0 AV			1.42 V	281	119.00	-6.00
5	2483.50	66.0 PK	74.0	-8.0	1.42 V	281	71.82	-5.82
6	2483.50	52.3 AV	54.0	-1.7	1.42 V	281	58.12	-5.82
7	4874.00	54.1 PK	74.0	-19.9	2.20 V	202	54.09	0.01
8	4874.00	40.5 AV	54.0	-13.5	2.20 V	202	40.49	0.01
9	7311.00	58.4 PK	74.0	-15.6	1.22 V	174	52.09	6.31
10	7311.00	45.2 AV	54.0	-8.8	1.22 V	174	38.89	6.31

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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	103.4 PK			1.12 H	143	109.31	-5.91
2	*2462.00	93.2 AV			1.12 H	143	99.11	-5.91
3	2483.50	55.1 PK	74.0	-18.9	1.12 H	142	60.92	-5.82
4	2483.50	43.2 AV	54.0	-10.8	1.12 H	142	49.02	-5.82
5	4924.00	49.2 PK	74.0	-24.8	1.48 H	237	49.06	0.14
6	4924.00	37.2 AV	54.0	-16.8	1.48 H	237	37.06	0.14
7	7386.00	53.0 PK	74.0	-21.0	1.38 H	262	46.54	6.46
8	7386.00	43.7 AV	54.0	-10.3	1.38 H	262	37.24	6.46
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	114.6 PK			1.18 V	293	120.51	-5.91
2	*2462.00	105.0 AV			1.18 V	293	110.91	-5.91
3	2483.50	67.5 PK	74.0	-6.5	1.18 V	293	73.32	-5.82
4	**2483.50**	**53.7 AV**	**54.0**	**-0.3**	**1.18 V**	**293**	**59.52**	**-5.82**
5	4924.00	50.2 PK	74.0	-23.8	1.41 V	173	50.06	0.14
6	4924.00	39.8 AV	54.0	-14.2	1.41 V	173	39.66	0.14
7	7386.00	55.5 PK	74.0	-18.5	1.25 V	360	49.04	6.46
8	7386.00	44.4 AV	54.0	-9.6	1.25 V	360	37.94	6.46

REMARKS:

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

802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2387.95	51.8 PK	74.0	-22.2	1.33 H	136	57.99	-6.19
2	2387.95	47.8 AV	54.0	-6.2	1.33 H	136	53.99	-6.19
3	*2422.00	96.3 PK			1.33 H	136	102.36	-6.06
4	*2422.00	90.1 AV			1.33 H	136	96.16	-6.06
5	4844.00	48.7 PK	74.0	-25.3	1.53 H	242	48.81	-0.11
6	4844.00	36.7 AV	54.0	-17.3	1.53 H	242	36.81	-0.11
7	7266.00	52.2 PK	74.0	-21.8	1.40 H	268	45.94	6.26
8	7266.00	42.3 AV	54.0	-11.7	1.40 H	268	36.04	6.26
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	2387.95	67.7 PK	74.0	-6.3	1.14 V	297	73.89	-6.19
2	2387.95	53.6 AV	54.0	-0.4	1.14 V	297	59.79	-6.19
3	*2422.00	108.5 PK			1.14 V	297	114.56	-6.06
4	*2422.00	99.5 AV			1.14 V	297	105.56	-6.06
5	4844.00	50.4 PK	74.0	-23.6	1.16 V	300	50.51	-0.11
6	4844.00	38.7 AV	54.0	-15.3	1.16 V	300	38.81	-0.11
7	7266.00	54.5 PK	74.0	-19.5	1.31 V	360	48.24	6.26
8	7266.00	43.2 AV	54.0	-10.8	1.31 V	360	36.94	6.26

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	51.1 PK	74.0	-22.9	1.43 H	32	57.29	-6.19
2	2390.00	47.8 AV	54.0	-6.2	1.43 H	32	53.99	-6.19
3	*2437.00	98.2 PK			1.43 H	132	104.20	-6.00
4	*2437.00	91.8 AV			1.43 H	132	97.80	-6.00
5	2488.17	49.4 PK	74.0	-24.6	1.43 H	132	55.22	-5.82
6	2488.17	41.7 AV	54.0	-12.3	1.43 H	132	47.52	-5.82
7	4874.00	49.3 PK	74.0	-24.7	1.50 H	223	49.29	0.01
8	4874.00	37.2 AV	54.0	-16.8	1.50 H	223	37.19	0.01
9	7311.00	53.2 PK	74.0	-20.8	1.39 H	273	46.89	6.31
10	7311.00	44.1 AV	54.0	-9.9	1.39 H	273	37.79	6.31
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	2390.00	68.2 PK	74.0	-5.8	1.28 V	248	74.39	-6.19
2	2390.00	53.4 AV	54.0	-0.6	1.28 V	248	59.59	-6.19
3	*2437.00	113.9 PK			1.28 V	248	119.90	-6.00
4	*2437.00	104.3 AV			1.28 V	248	110.30	-6.00
5	2488.17	66.8 PK	74.0	-7.2	1.28 V	248	72.62	-5.82
6	2488.17	49.5 AV	54.0	-4.5	1.28 V	248	55.32	-5.82
7	4874.00	49.9 PK	74.0	-24.1	1.47 V	173	49.89	0.01
8	4874.00	39.5 AV	54.0	-14.5	1.47 V	173	39.49	0.01
9	7311.00	55.6 PK	74.0	-18.4	1.30 V	360	49.29	6.31
10	7311.00	44.5 AV	54.0	-9.5	1.30 V	360	38.19	6.31

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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	99.7 PK			1.36 H	141	105.65	-5.95
2	*2452.00	90.3 AV			1.36 H	141	96.25	-5.95
3	2485.45	52.1 PK	74.0	-21.9	1.36 H	141	57.92	-5.82
4	2485.45	47.6 AV	54.0	-6.4	1.36 H	141	53.42	-5.82
5	4904.00	48.8 PK	74.0	-25.2	1.55 H	228	48.68	0.12
6	4904.00	37.1 AV	54.0	-16.9	1.55 H	228	36.98	0.12
7	7356.00	51.8 PK	74.0	-22.2	1.40 H	258	45.40	6.40
8	7356.00	42.1 AV	54.0	-11.9	1.40 H	258	35.70	6.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	110.1 PK			1.15 V	295	116.05	-5.95
2	*2452.00	100.5 AV			1.15 V	295	106.45	-5.95
3	2485.45	68.7 PK	74.0	-5.3	1.15 V	295	74.52	-5.82
4	2485.45	52.4 AV	54.0	-1.6	1.15 V	295	58.22	-5.82
5	4904.00	50.1 PK	74.0	-23.9	1.17 V	309	49.98	0.12
6	4904.00	38.4 AV	54.0	-15.6	1.17 V	309	38.28	0.12
7	7356.00	53.9 PK	74.0	-20.1	1.31 V	360	47.50	6.40
8	7356.00	42.9 AV	54.0	-11.1	1.31 V	360	36.50	6.40

REMARKS:

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

Below 1GHz Data:

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	83.08	30.1 QP	40.0	-9.9	2.00 H	54	55.66	-25.56
2	360.02	40.9 QP	46.0	-5.1	1.00 H	109	58.72	-17.84
3	657.83	35.0 QP	46.0	-11.0	1.00 H	83	46.00	-11.02
4	750.01	39.7 QP	46.0	-6.3	1.00 H	360	48.87	-9.21
5	775.01	38.6 QP	46.0	-7.5	1.00 H	33	47.47	-8.92
6	925.04	34.6 QP	46.0	-11.4	1.50 H	82	41.25	-6.69
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	63.37	33.4 QP	40.0	-6.6	1.00 V	2	54.67	-21.28
2	216.39	34.1 QP	46.0	-11.9	1.00 V	43	57.44	-23.38
3	361.19	40.9 QP	46.0	-5.1	1.50 V	360	58.72	-17.79
4	658.03	35.7 QP	46.0	-10.3	1.50 V	360	46.71	-11.02
5	749.98	38.8 QP	46.0	-7.2	1.50 V	164	47.97	-9.21
6	775.03	39.2 QP	46.0	-6.8	1.50 V	193	48.09	-8.92

REMARKS:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

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

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100287	Apr. 17, 2015	Apr. 16, 2016
Line-Impedance Stabilization Network (for EUT) R&S	ENV216	100071	Nov. 10, 2014	Nov. 09, 2015
RF Cable	5D-FB	COACAB-001	May 25, 2015	May 24, 2016
50 ohms Terminator	50	3	Oct. 17, 2014	Oct. 16, 2015
50 ohms Terminator	N/A	EMC-04	Oct. 21, 2014	Oct. 20, 2015
Software BVADT	BVADT_Cond_ V7.3.7.3	NA	NA	NA
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 11, 2015	June 10, 2016

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. A.
3. The VCCI Con A Registration No. is C-817.
4. Tested Date: Sep. 30, 2015

4.2.3 Test Procedures

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

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

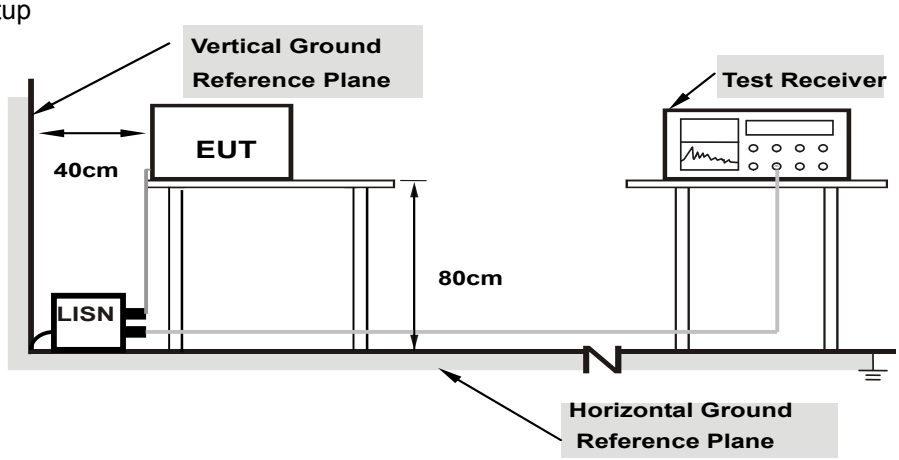
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

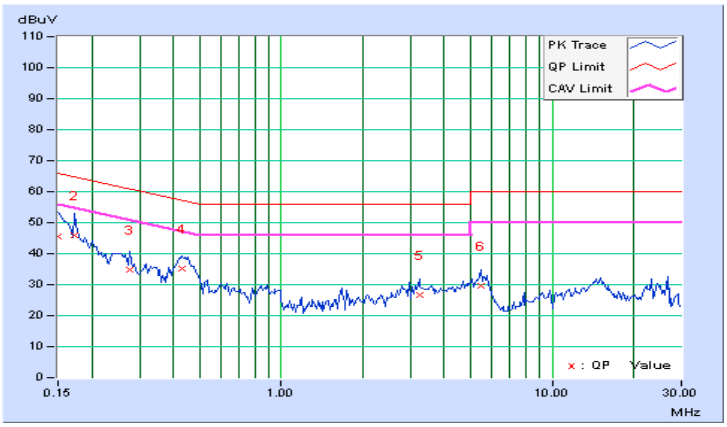
4.2.7 Test Results(Mode 1)

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.77	35.66	21.30	45.43	31.07	66.00	56.00	-20.57	-24.93
2	0.17344	9.78	36.04	19.32	45.82	29.10	64.79	54.79	-18.97	-25.69
3	0.27500	9.80	25.12	13.30	34.92	23.10	60.97	50.97	-26.04	-27.86
4	0.43125	9.83	25.50	14.08	35.33	23.91	57.23	47.23	-21.90	-23.32
5	3.23438	9.95	16.68	9.30	26.63	19.25	56.00	46.00	-29.37	-26.75
6	5.44141	10.00	19.58	13.56	29.58	23.56	60.00	50.00	-30.42	-26.44

REMARKS:

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

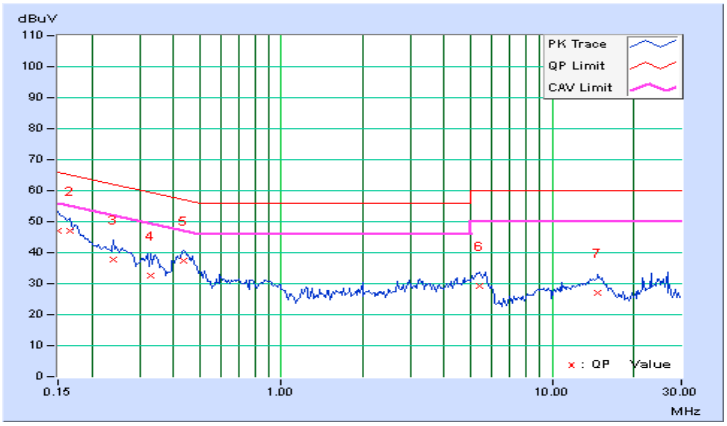


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.78	37.14	21.02	46.92	30.80	66.00	56.00	-19.08	-25.20
2	0.16562	9.79	37.14	22.98	46.93	32.77	65.18	55.18	-18.25	-22.41
3	0.23984	9.81	28.00	14.56	37.81	24.37	62.10	52.10	-24.29	-27.73
4	0.32969	9.83	22.58	9.70	32.41	19.53	59.46	49.46	-27.05	-29.93
5	0.43516	9.84	27.40	18.34	37.24	28.18	57.15	47.15	-19.91	-18.97
6	5.41406	10.02	19.14	12.76	29.16	22.78	60.00	50.00	-30.84	-27.22
7	14.67578	10.23	16.86	9.60	27.09	19.83	60.00	50.00	-32.91	-30.17

REMARKS:

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



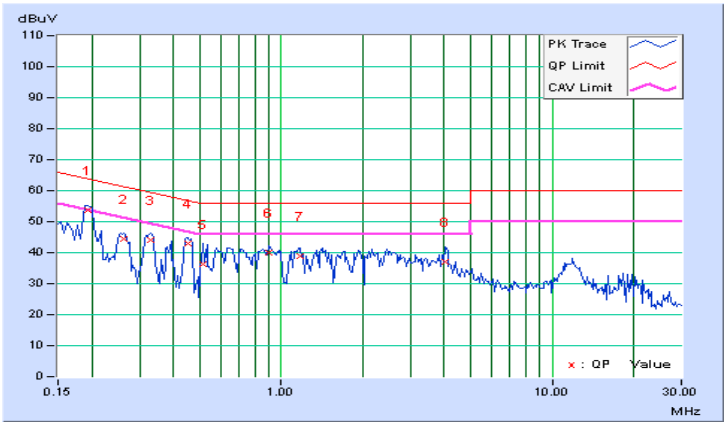
4.2.8 Test Results(Mode 2)

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.19297**	**9.79**	**44.00**	**32.84**	**53.79**	**42.63**	**63.91**	**53.91**	**-10.12**	**-11.28**
2	0.26328	9.80	34.76	24.58	44.56	34.38	61.33	51.33	-16.76	-16.94
3	0.32969	9.82	34.16	27.32	43.98	37.14	59.46	49.46	-15.48	-12.32
4	0.45078	9.84	33.22	26.02	43.06	35.86	56.86	46.86	-13.81	-11.01
5	0.51719	9.84	26.62	14.12	36.46	23.96	56.00	46.00	-19.54	-22.04
6	0.89609	9.88	30.02	18.28	39.90	28.16	56.00	46.00	-16.10	-17.84
7	1.17969	9.90	29.10	17.12	39.00	27.02	56.00	46.00	-17.00	-18.98
8	4.00781	9.97	27.04	16.96	37.01	26.93	56.00	46.00	-18.99	-19.07

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

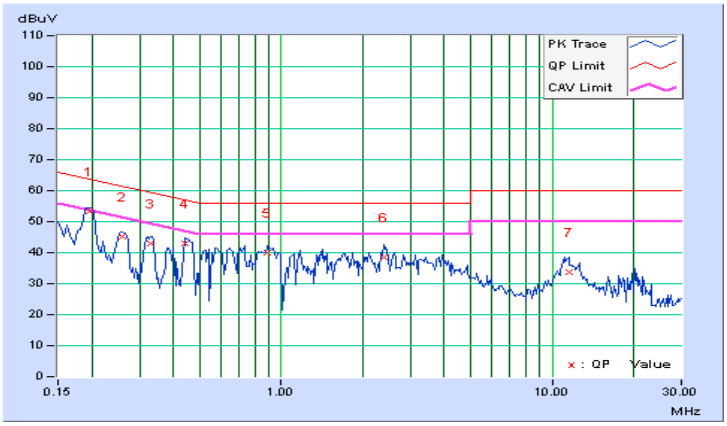


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.19687	9.80	43.52	33.20	53.32	43.00	63.74	53.74	-10.42	-10.74
2	0.25938	9.81	35.28	24.94	45.09	34.75	61.45	51.45	-16.36	-16.70
3	0.32969	9.83	33.26	26.90	43.09	36.73	59.46	49.46	-16.37	-12.73
4	0.44297	9.84	32.98	20.56	42.82	30.40	57.01	47.01	-14.18	-16.60
5	0.89219	9.88	30.02	17.34	39.90	27.22	56.00	46.00	-16.10	-18.78
6	2.40625	9.95	28.50	20.18	38.45	30.13	56.00	46.00	-17.55	-15.87
7	11.54297	10.17	23.46	17.00	33.63	27.17	60.00	50.00	-26.37	-22.83

REMARKS:

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

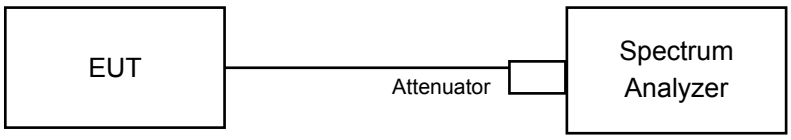


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 Deviation fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	8.59	8.10	8.07	8.10	0.5	Pass
6	2437	9.12	9.10	10.08	9.61	0.5	Pass
11	2462	8.12	8.11	8.58	9.01	0.5	Pass

802.11g

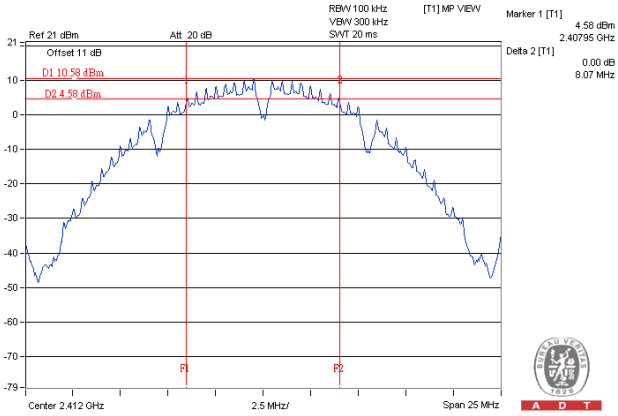
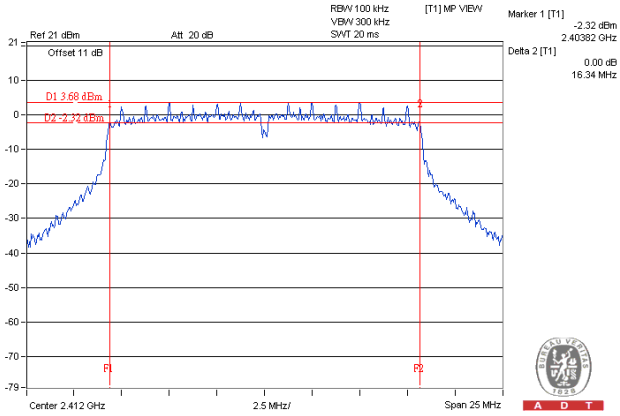
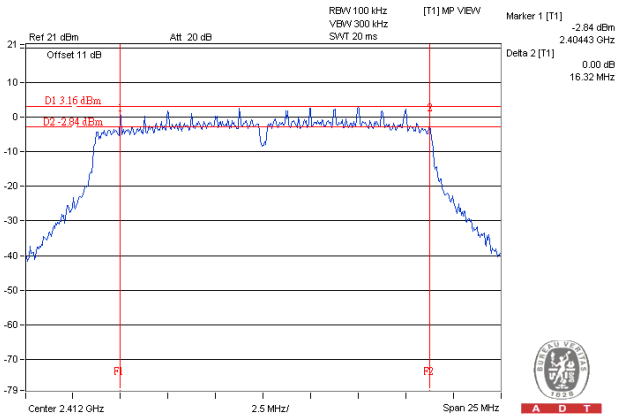
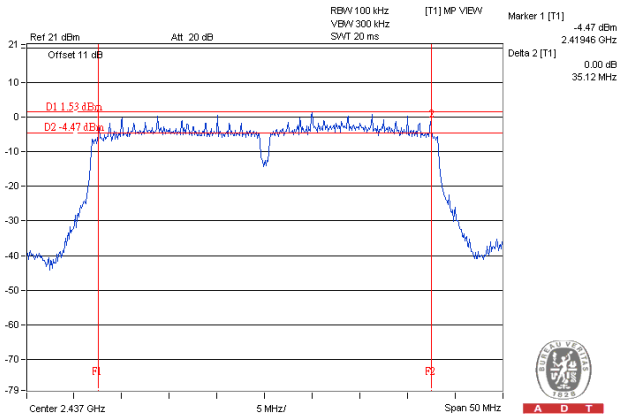
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	16.36	16.34	16.34	16.38	0.5	Pass
6	2437	16.37	16.34	16.37	16.38	0.5	Pass
11	2462	16.36	16.39	16.37	16.35	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	16.95	16.32	16.97	17.61	0.5	Pass
6	2437	17.30	16.56	17.58	17.58	0.5	Pass
11	2462	16.84	17.32	17.59	16.37	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
3	2422	35.29	35.51	35.86	35.38	0.5	Pass
6	2437	35.47	35.38	35.12	35.83	0.5	Pass
9	2452	35.24	35.44	35.78	35.88	0.5	Pass

Spectrum Plot of Worst Value	
802.11b – Chain 2: CH 1	**802.11g – Chain 2: CH 1**
	
802.11n (HT20) – Chain 1: CH 1	**802.11n (HT40) – Chain 2: CH 6**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

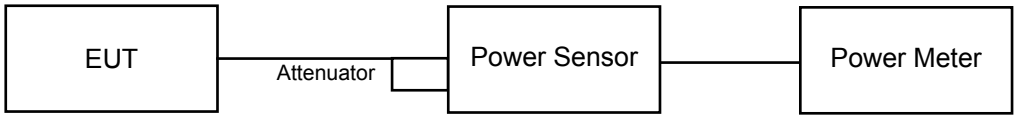
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

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

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

An average power sensor was used on the output port of the EUT. A power meter was used to read the response of the average power senso and set the detector to average. Record the power level.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

802.11b

Channel	Frequency (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	19.41	19.13	19.19	19.62	343.75	25.36	30	Pass
6	2437	23.00	22.45	22.34	22.93	743.05	28.71	30	Pass
11	2462	19.59	18.88	18.82	19.23	328.22	25.16	30	Pass

802.11g

Channel	Frequency (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	13.76	13.01	13.47	13.41	87.928	19.44	30	Pass
6	2437	21.58	20.54	20.49	20.88	491.526	26.92	30	Pass
11	2462	12.79	12.30	12.43	12.38	70.789	18.50	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	13.73	13.24	13.56	12.79	86.401	19.37	30	Pass
6	2437	22.51	21.23	21.63	22.01	615.378	27.89	30	Pass
11	2462	13.71	12.72	13.16	13.39	84.731	19.28	30	Pass

802.11n (HT40)

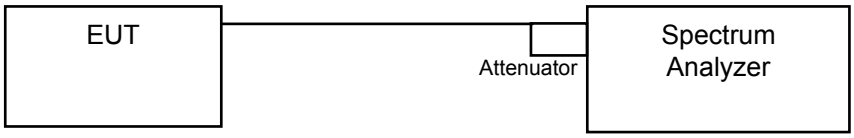
Channel	Frequency (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	10.43	9.96	9.96	10.50	42.077	16.24	30	Pass
6	2437	14.13	13.25	13.49	13.21	90.294	19.56	30	Pass
9	2452	10.50	10.08	10.28	10.20	42.543	16.29	30	Pass

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

For AVG. power (duty cycle ≥ 98%)
a) Set instrument center frequency to DTS channel center frequency.
b) Set span to at least 1.5 times the OBW.
c) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d) Set VBW ≥3 x RBW.
e) Detector = power averaging (RMS) or sample detector (when RMS not available).
f) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g) Sweep time = auto couple.
h) Employ trace averaging (RMS) mode over a minimum of 100 traces.
i) Use the peak marker function to determine the maximum amplitude level.
For AVG. power (duty cycle < 98%)
a) Measure the duty cycle (x).
b) Set instrument center frequency to DTS channel center frequency.
c) Set span to at least 1.5 times the OBW.
d) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
e) Set VBW ≥3 x RBW.
f) Detector = power averaging (RMS) or sample detector (when RMS not available).
g) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
h) Sweep time = auto couple.
i) Do not use sweep triggering. Allow sweep to “free run”.
j) Employ trace averaging (RMS) mode over a minimum of 100 traces.
k) Use the peak marker function to determine the maximum amplitude level.
l) Add 10 log (1/x), where x is the duty cycle measured in step (a, to the measured PSD to compute the average PSD during the actual transmission time.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	1	2412	-8.67	6.02	-2.65	5.14	Pass
	6	2437	-5.35	6.02	0.67	5.14	Pass
	11	2462	-9.09	6.02	-3.07	5.14	Pass
1	1	2412	-8.95	6.02	-2.93	5.14	Pass
	6	2437	-6.27	6.02	-0.25	5.14	Pass
	11	2462	-9.09	6.02	-3.07	5.14	Pass
2	1	2412	-9.28	6.02	-3.26	5.14	Pass
	6	2437	-6.13	6.02	-0.11	5.14	Pass
	11	2462	-8.87	6.02	-2.85	5.14	Pass
3	1	2412	-9.14	6.02	-3.12	5.14	Pass
	6	2437	-6.43	6.02	-0.41	5.14	Pass
	11	2462	-9.21	6.02	-3.19	5.14	Pass

Note: 1. Directional gain = 2.84dBi + 10log(4) = 8.86dBi > 6dBi , so the power density limit shall be reduced to 8-(8.86-6) = 5.14dBm.

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	1	2412	-16.33	6.02	-10.31	5.14	Pass
	6	2437	-8.71	6.02	-2.69	5.14	Pass
	11	2462	-16.88	6.02	-10.86	5.14	Pass
1	1	2412	-16.61	6.02	-10.59	5.14	Pass
	6	2437	-9.19	6.02	-3.17	5.14	Pass
	11	2462	-17.21	6.02	-11.19	5.14	Pass
2	1	2412	-16.25	6.02	-10.23	5.14	Pass
	6	2437	-8.92	6.02	-2.90	5.14	Pass
	11	2462	-17.24	6.02	-11.22	5.14	Pass
3	1	2412	-16.26	6.02	-10.24	5.14	Pass
	6	2437	-8.91	6.02	-2.89	5.14	Pass
	11	2462	-17.37	6.02	-11.35	5.14	Pass

Note: 1. Directional gain = 2.84dBi + 10log(4) = 8.86dBi > 6dBi , so the power density limit shall be reduced to 8-(8.86-6) = 5.14dBm.

802.11n (HT20)

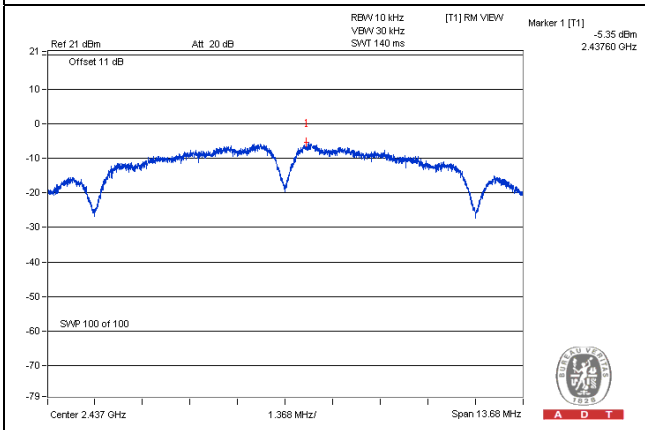
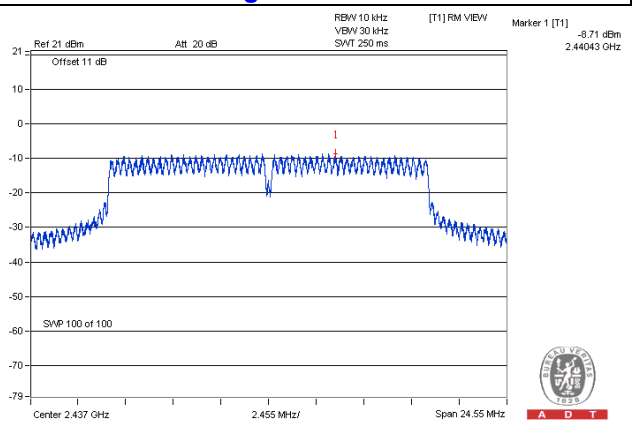
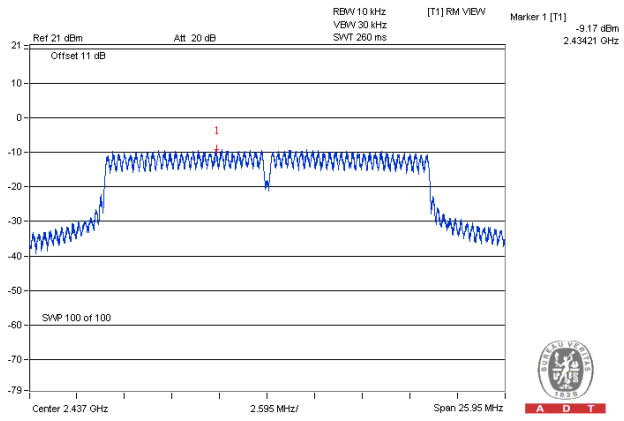
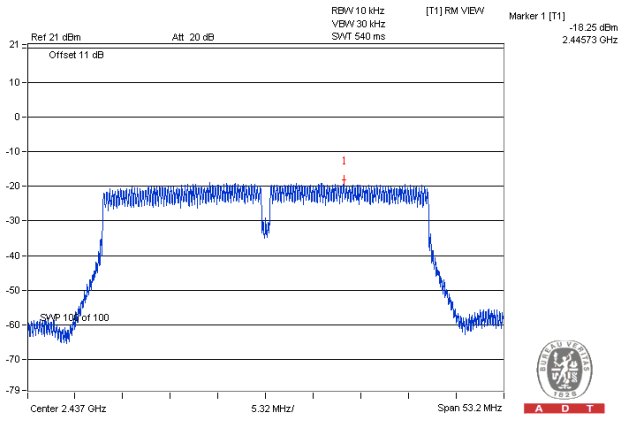
TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	1	2412	-17.45	6.02	-11.43	5.14	Pass
	6	2437	-9.17	6.02	-3.15	5.14	Pass
	11	2462	-17.71	6.02	-11.69	5.14	Pass
1	1	2412	-17.70	6.02	-11.68	5.14	Pass
	6	2437	-9.41	6.02	-3.39	5.14	Pass
	11	2462	-17.96	6.02	-11.94	5.14	Pass
2	1	2412	-17.56	6.02	-11.54	5.14	Pass
	6	2437	-9.27	6.02	-3.25	5.14	Pass
	11	2462	-17.53	6.02	-11.51	5.14	Pass
3	1	2412	-17.53	6.02	-11.51	5.14	Pass
	6	2437	-9.28	6.02	-3.26	5.14	Pass
	11	2462	-17.19	6.02	-11.17	5.14	Pass

Note: 1. Directional gain = 2.84dBi + 10log(4) = 8.86dBi > 6dBi , so the power density limit shall be reduced to 8-(8.86-6) = 5.14dBm.

802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm)	10 log (N=4) dB	Duty Factor (dB)	TOTAL PSD With Duty Factor (dBm)	Limit (dBm)	Pass /Fail
0	3	2422	-21.47	6.02	0.09	-15.36	5.14	PASS
	6	2437	-18.25	6.02	0.09	-12.14	5.14	PASS
	9	2452	-22.03	6.02	0.09	-15.92	5.14	PASS
1	3	2422	-22.07	6.02	0.09	-15.96	5.14	PASS
	6	2437	-18.58	6.02	0.09	-12.47	5.14	PASS
	9	2452	-22.01	6.02	0.09	-15.90	5.14	PASS
2	3	2422	-21.80	6.02	0.09	-15.69	5.14	PASS
	6	2437	-18.97	6.02	0.09	-12.86	5.14	PASS
	9	2452	-21.98	6.02	0.09	-15.87	5.14	PASS
3	3	2422	-21.96	6.02	0.09	-15.85	5.14	PASS
	6	2437	-19.19	6.02	0.09	-13.08	5.14	PASS
	9	2452	-22.43	6.02	0.09	-16.32	5.14	PASS

Note: 1. Directional gain = 2.84dBi + 10log(4) = 8.86dBi > 6dBi , so the power density limit shall be reduced to 8-(8.86-6) = 5.14dBm.

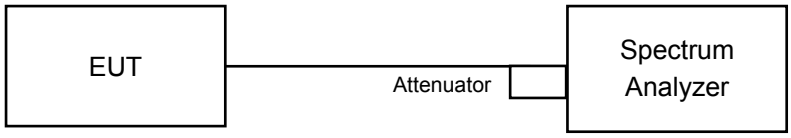
Spectrum Plot of Worst Value	
802.11b – Chain 0: CH 6	**802.11g– Chain 0: CH 6**
	
802.11n (HT20) – Chain 0: CH 6	**802.11n (HT40) – Chain 0: CH 6**
	

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOBE

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Same as Item 4.3.6

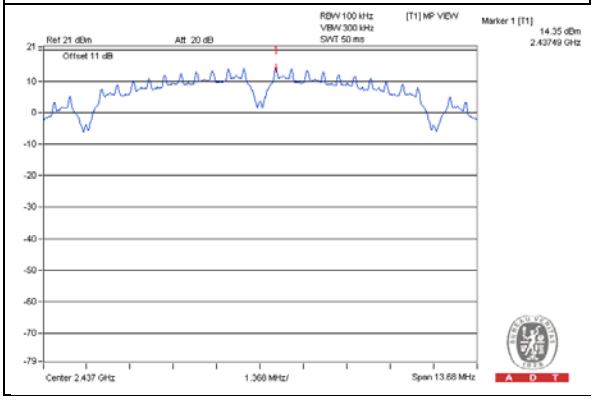
4.6.7 Test Results

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

CDD Mode

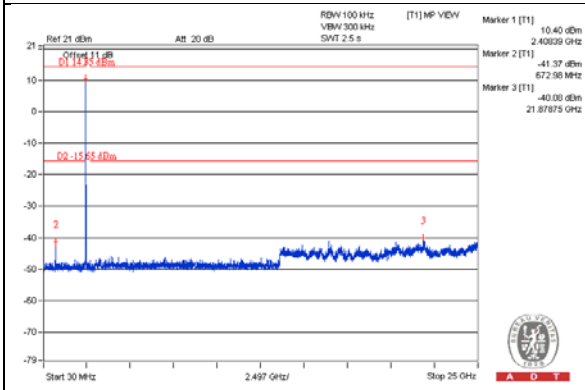
802.11b

Maximum REF

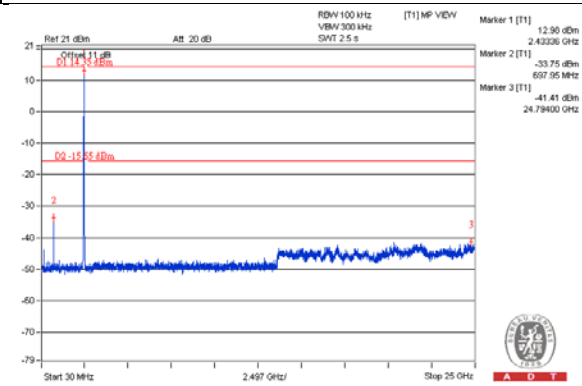


Chain 0

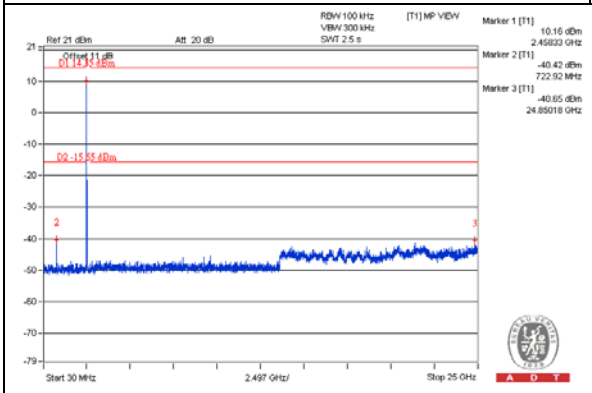
CH 1



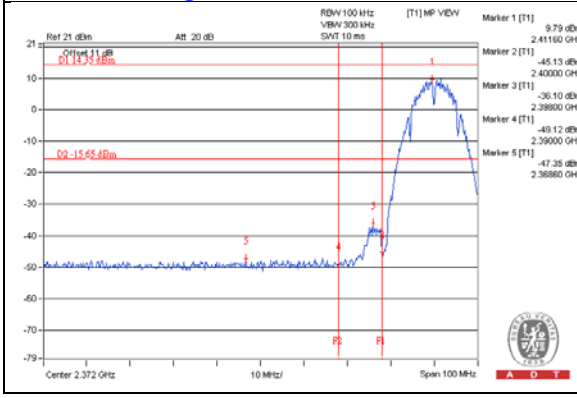
CH 6



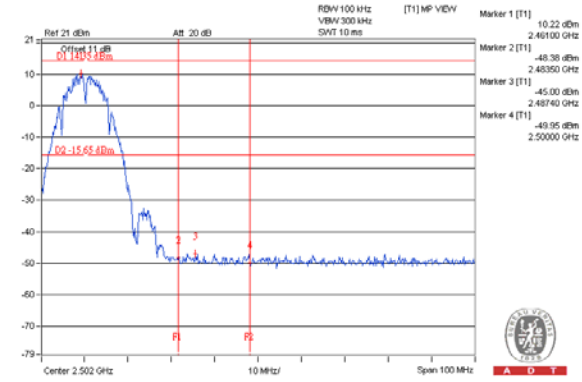
CH 11



CH 1 Band edge

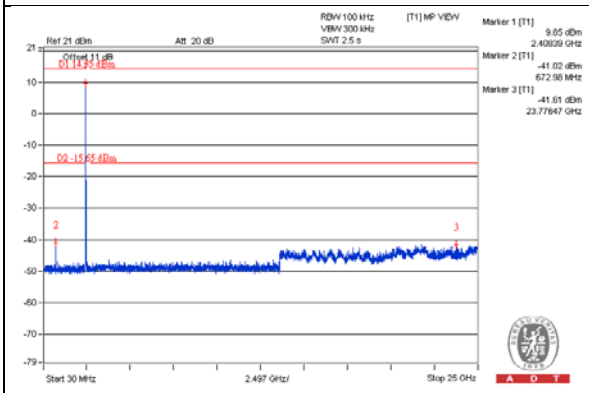


CH 11 Band edge

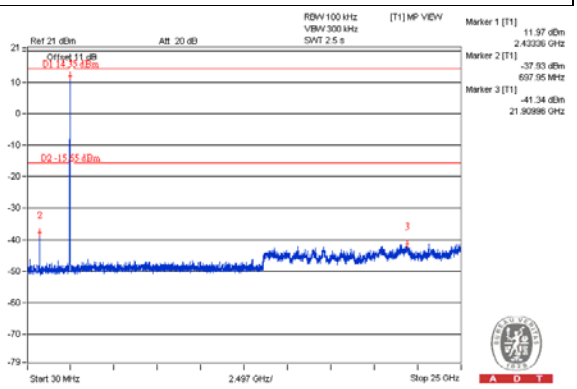


Chain 1

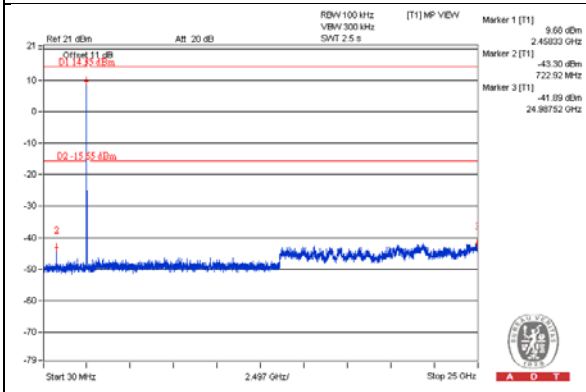
CH 1



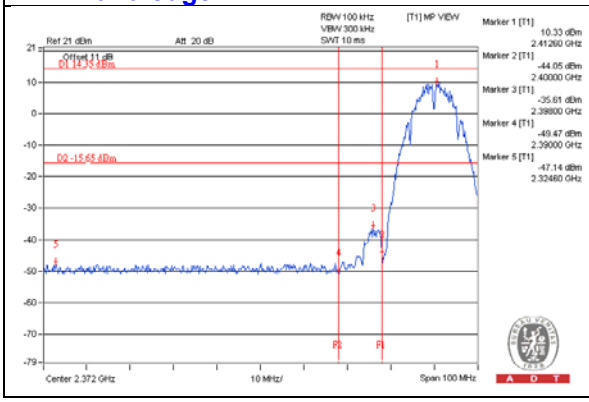
CH 6



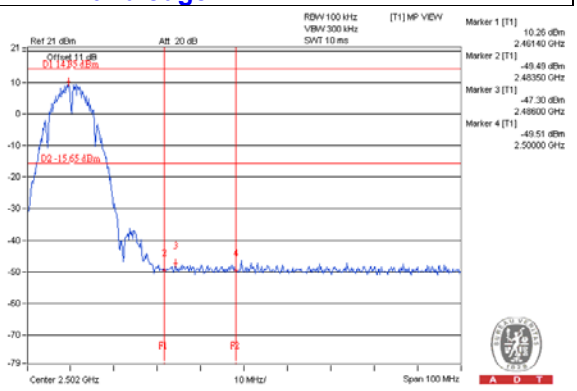
CH 11



CH 1 Band edge

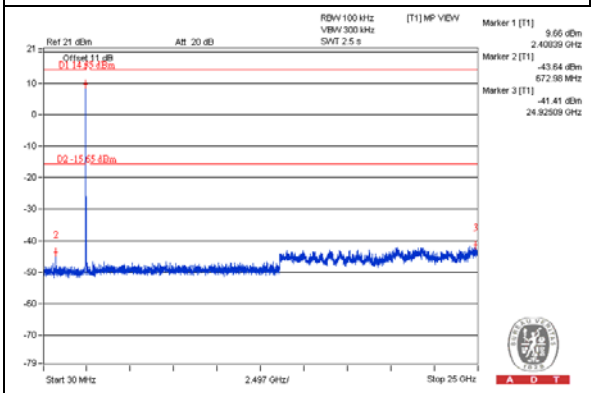


CH 11 Band edge

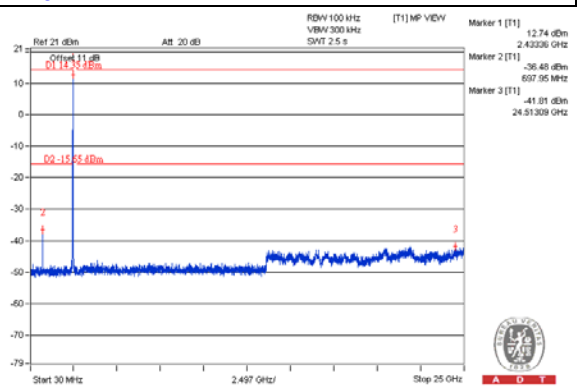


Chain 2

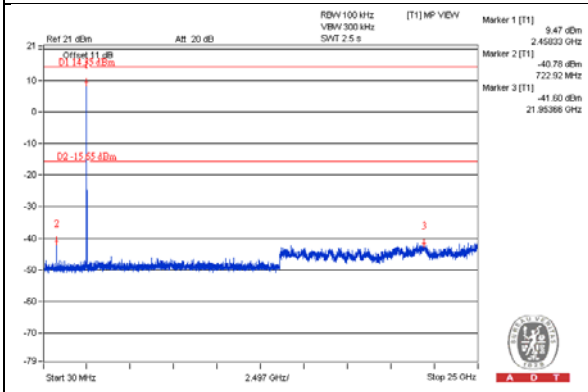
CH 1



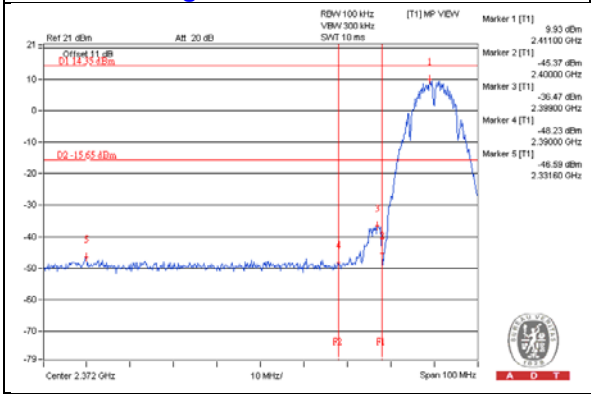
CH 6



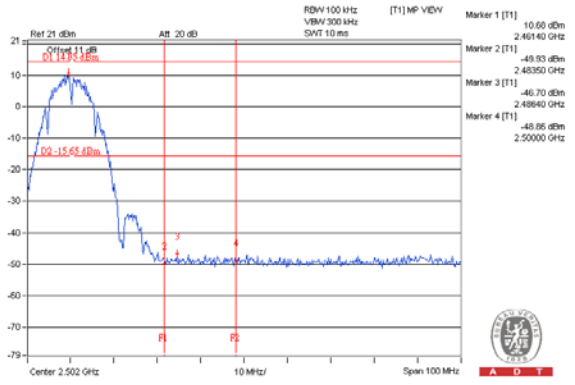
CH 11



CH 1 Band edge

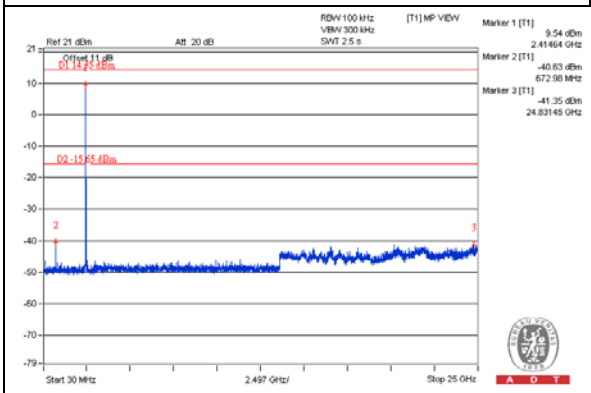


CH 11 Band edge

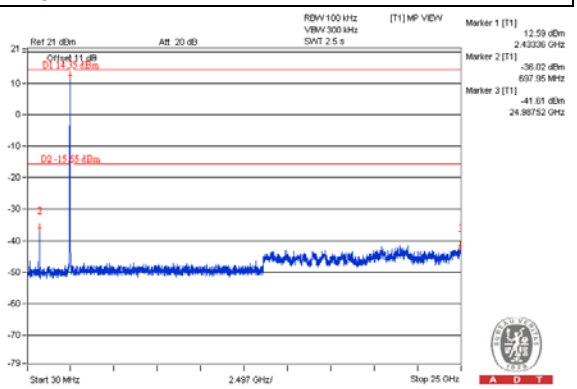


Chain 3

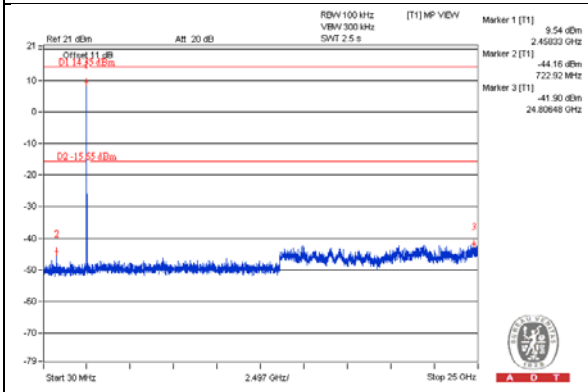
CH 1



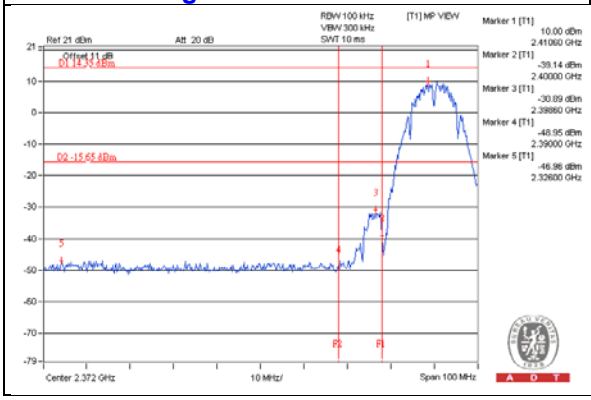
CH 6



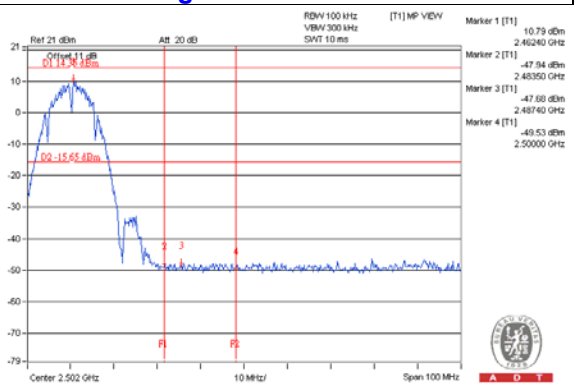
CH 11



CH 1 Band edge

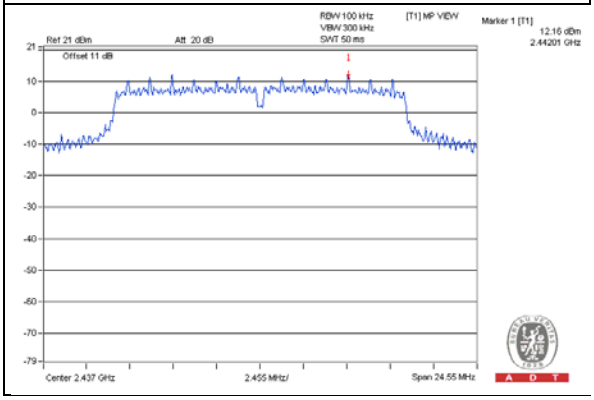


CH 11 Band edge



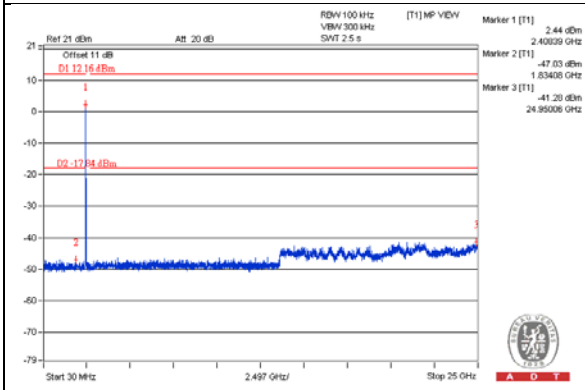
802.11g

Maximum REF

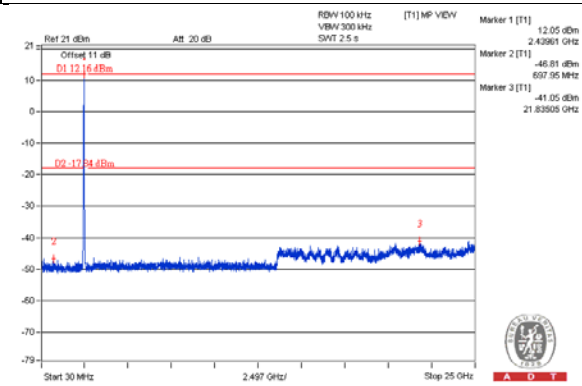


Chain 0

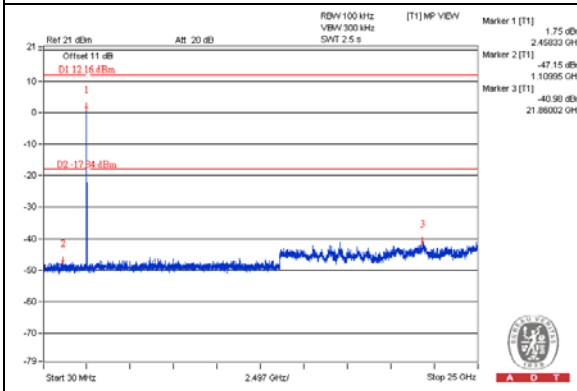
CH 1



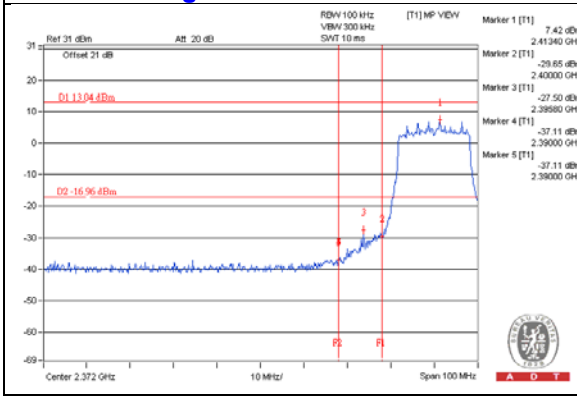
CH 6



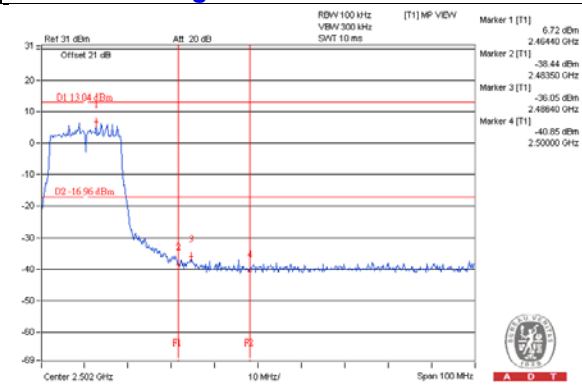
CH 11



CH 1 Band edge

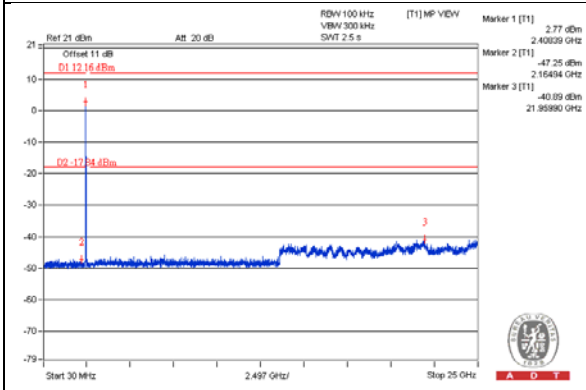


CH 11 Band edge

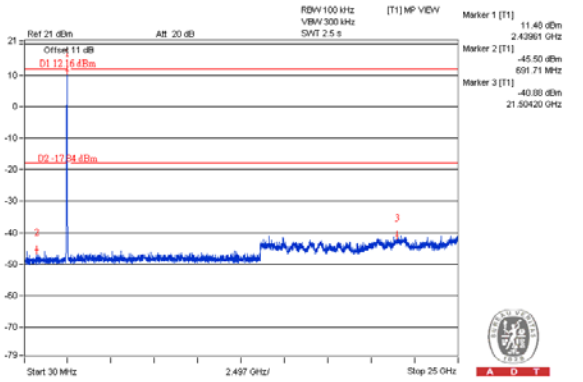


Chain 1

CH 1



CH 6



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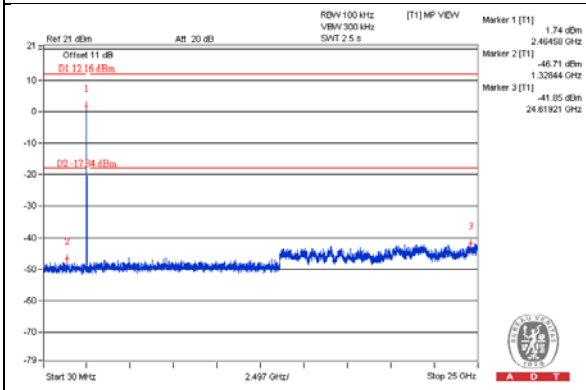
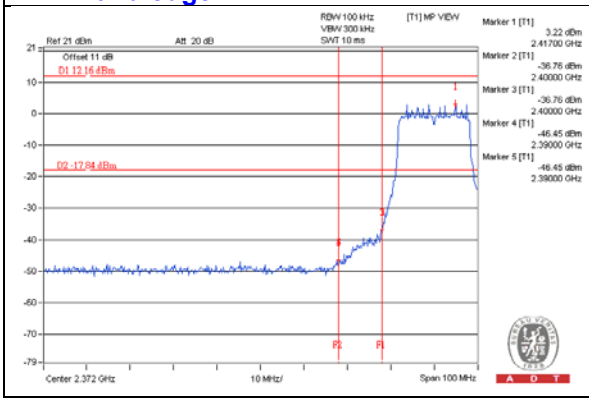
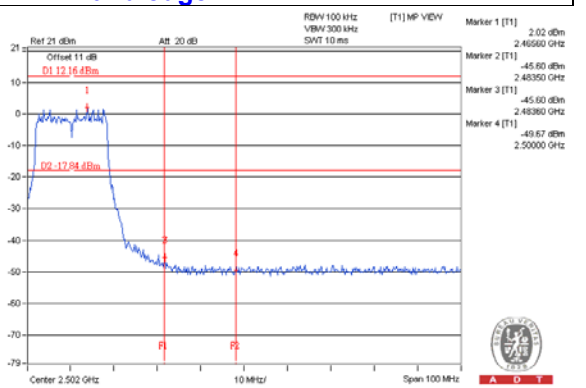


CH 1 Band edge

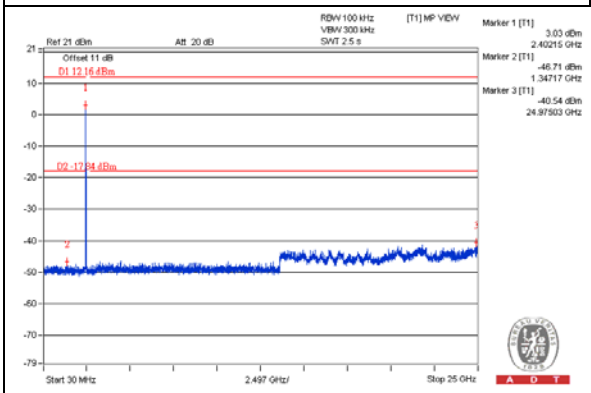


CH 11 Band edge

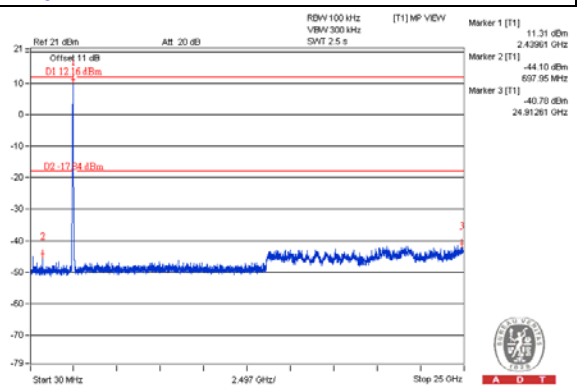


Chain 2

CH 1



CH 6



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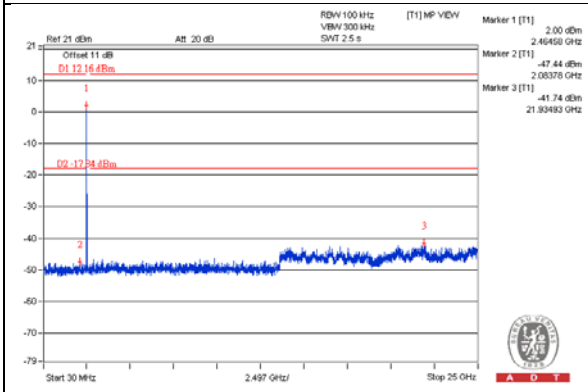
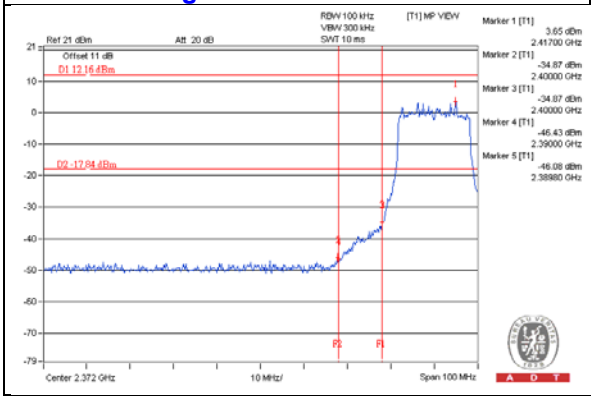
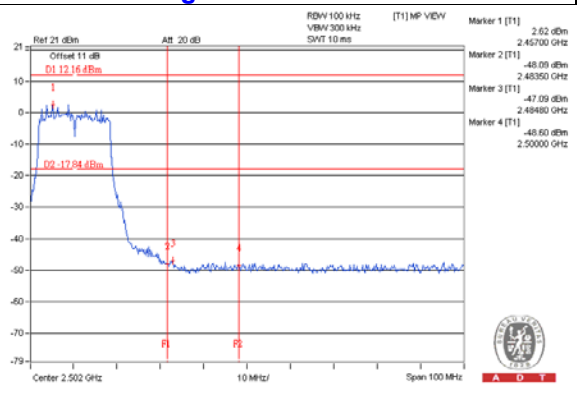


CH 1 Band edge

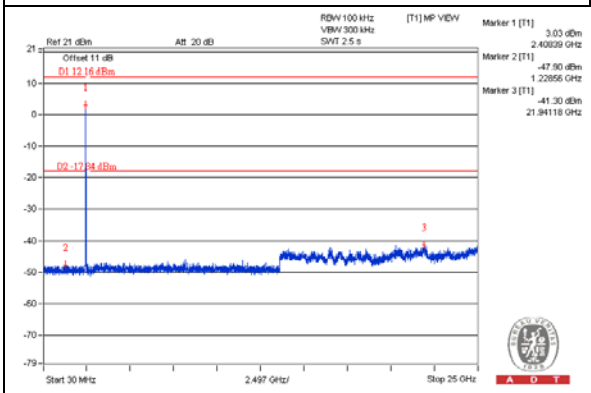


CH 11 Band edge

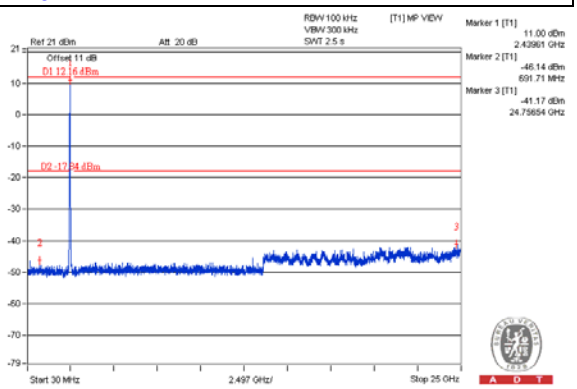


Chain 3

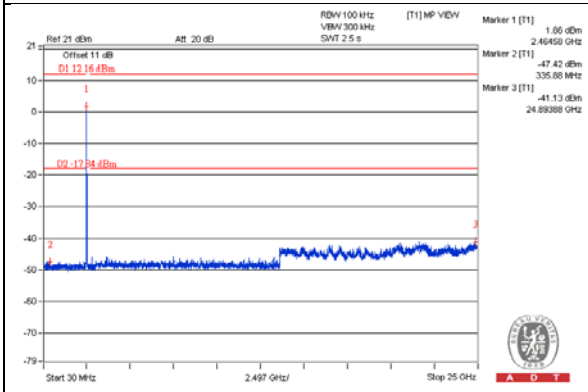
CH 1



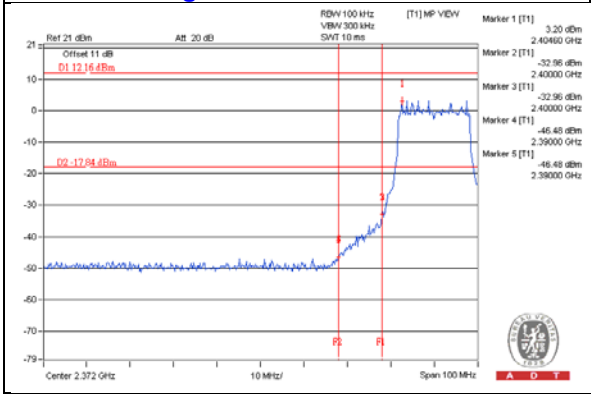
CH 6



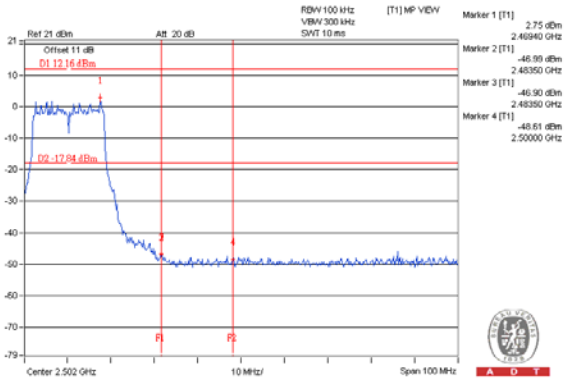
CH 11



CH 1 Band edge

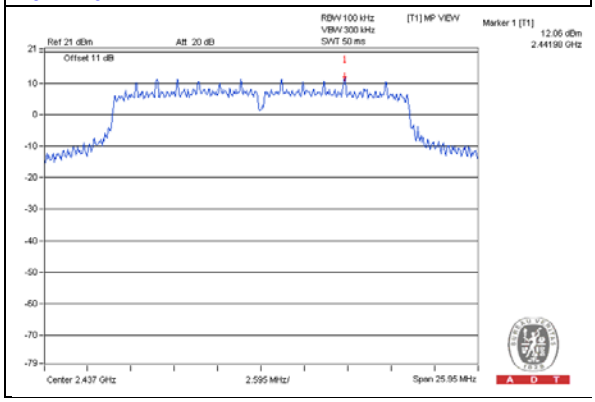


CH 11 Band edge



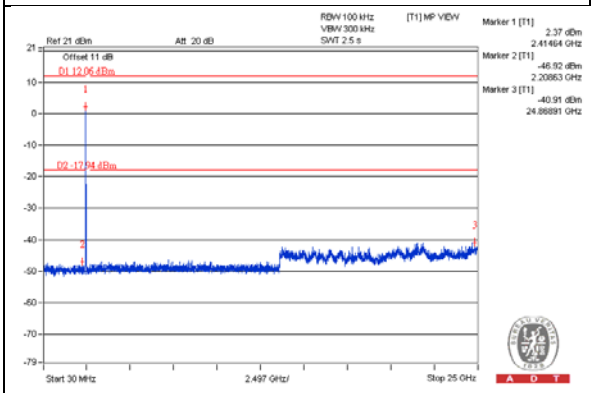
802.11n (HT20)

Maximum REF

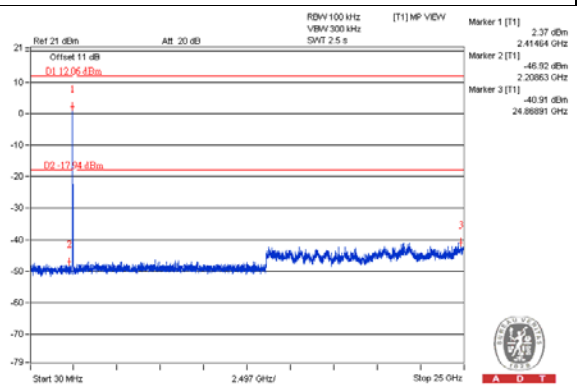


Chain 0

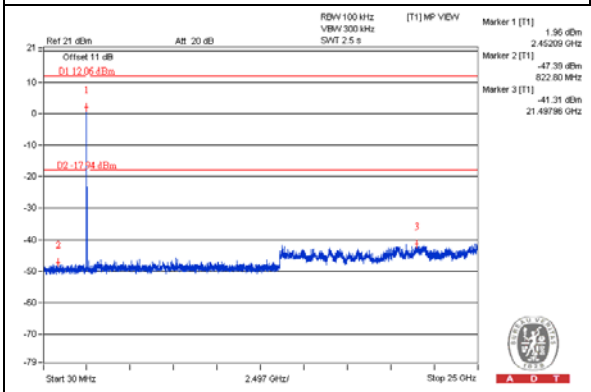
CH 1



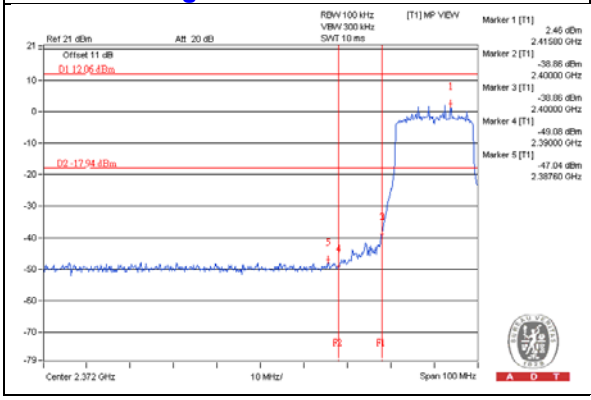
CH 6



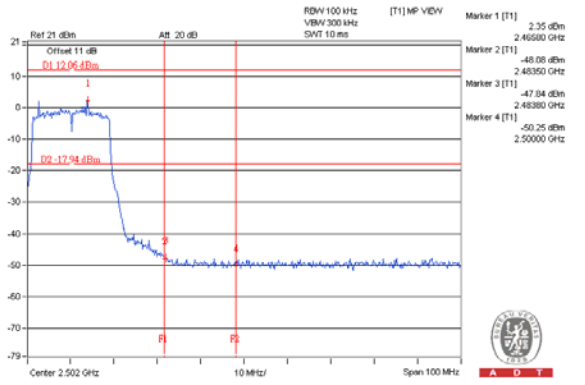
CH 11



CH 1 Band edge

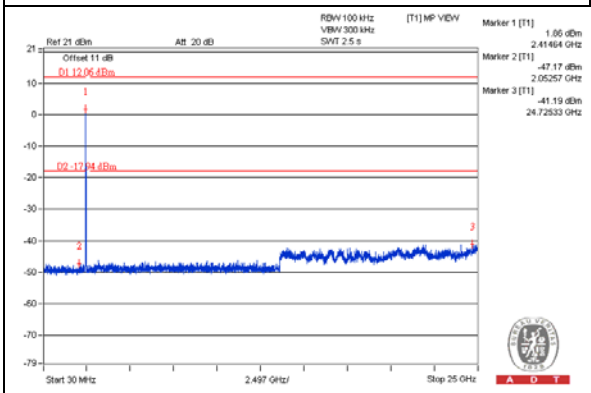


CH 11 Band edge

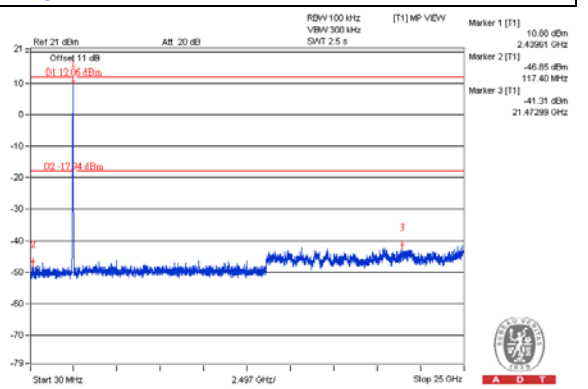


Chain 1

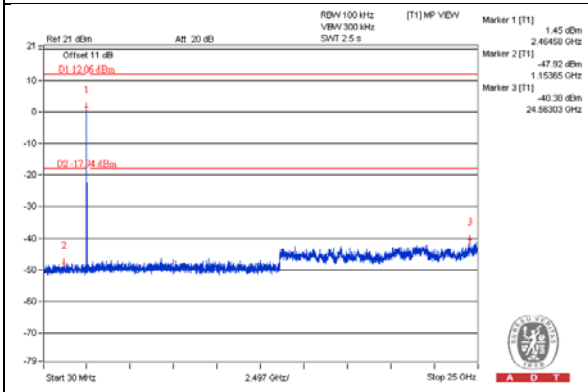
CH 1



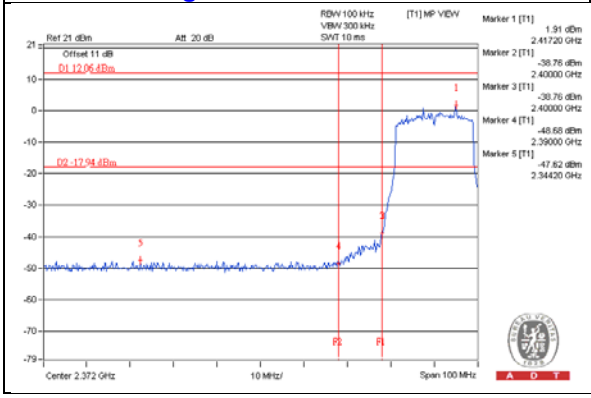
CH 6



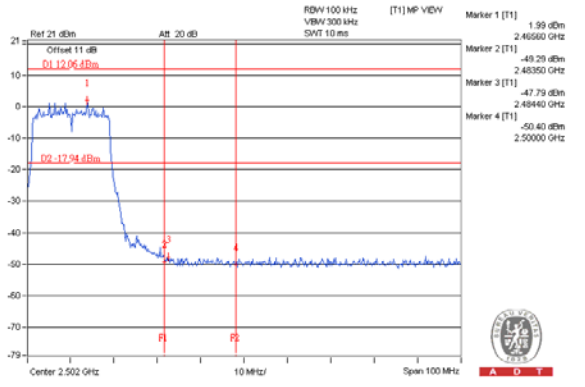
CH 11



CH 1 Band edge

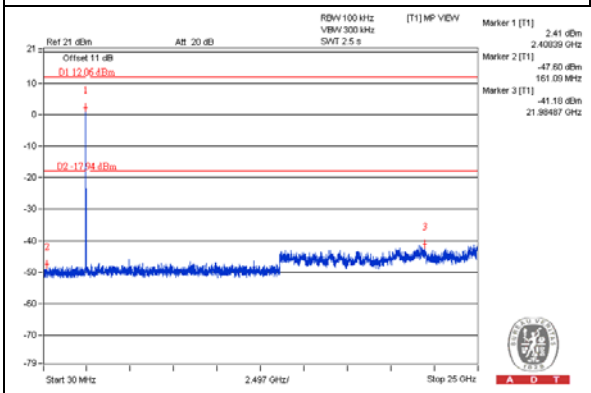


CH 11 Band edge

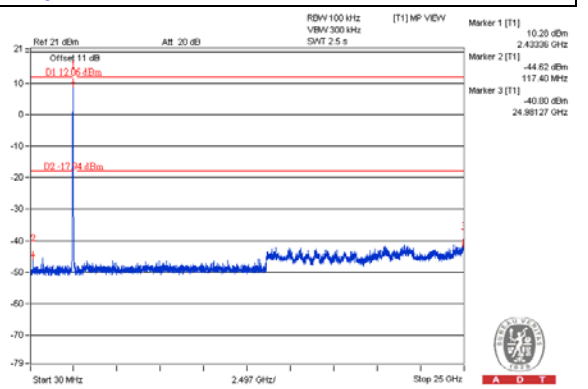


Chain 2

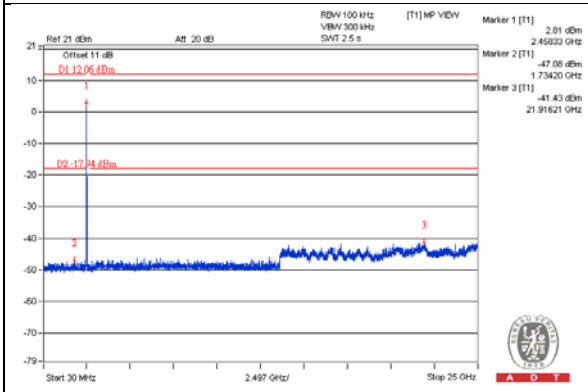
CH 1



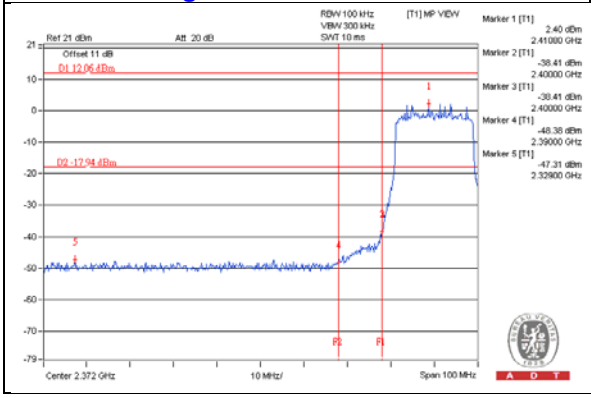
CH 6



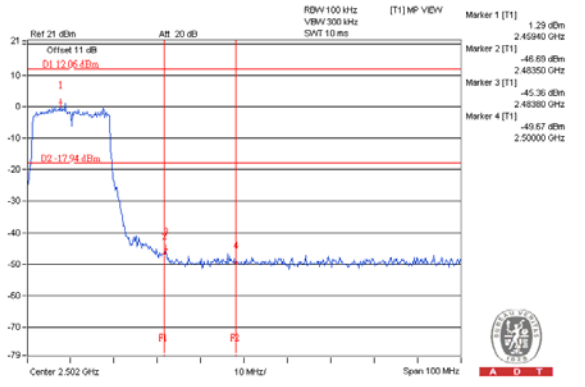
CH 11



CH 1 Band edge

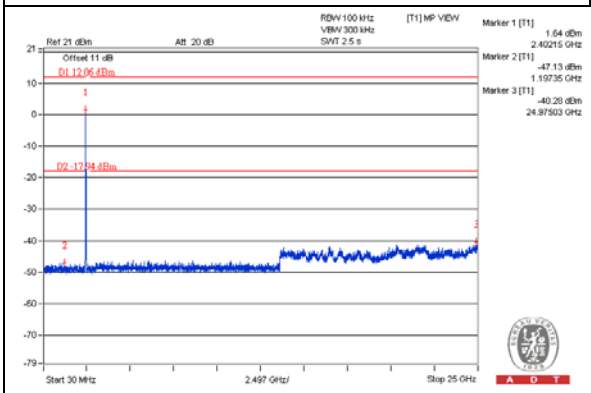


CH 11 Band edge

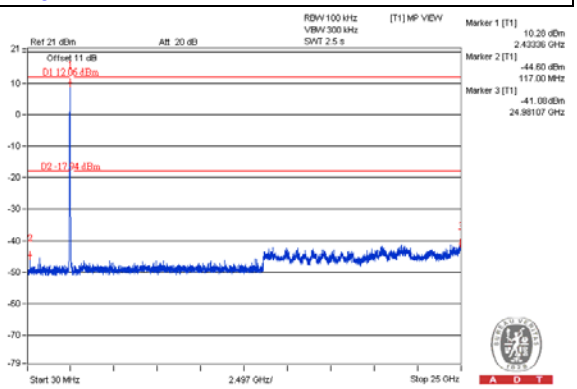


Chain 3

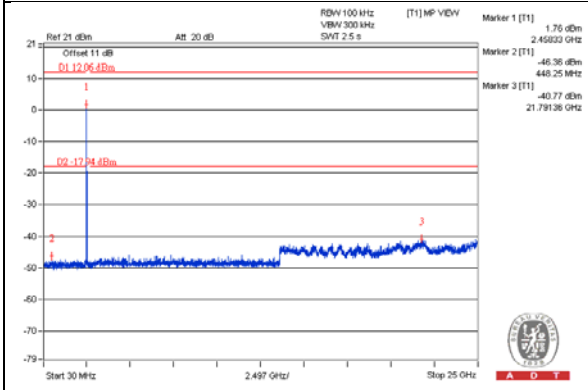
CH 1



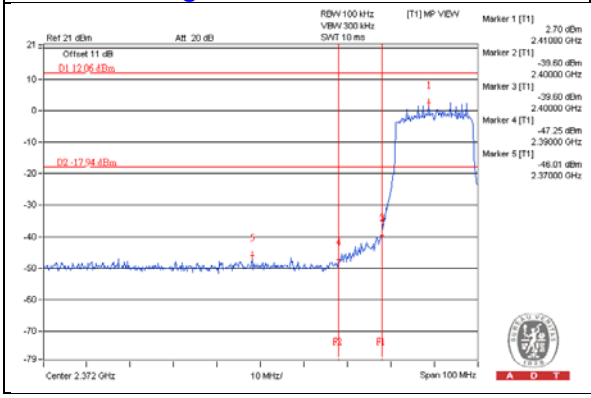
CH 6



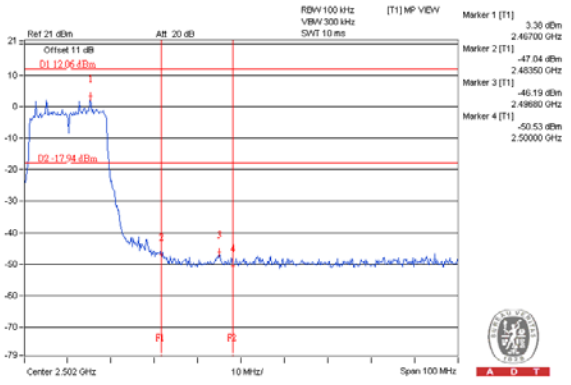
CH 11



CH 1 Band edge

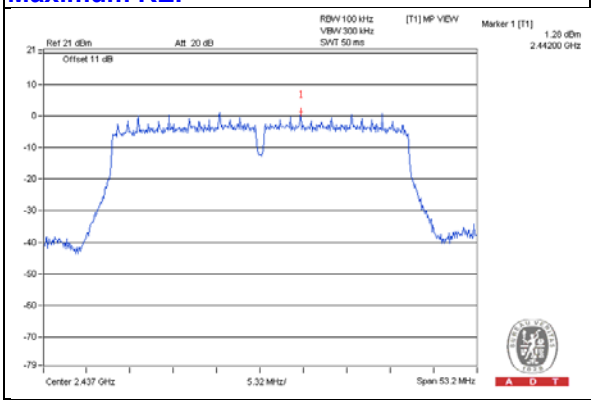


CH 11 Band edge



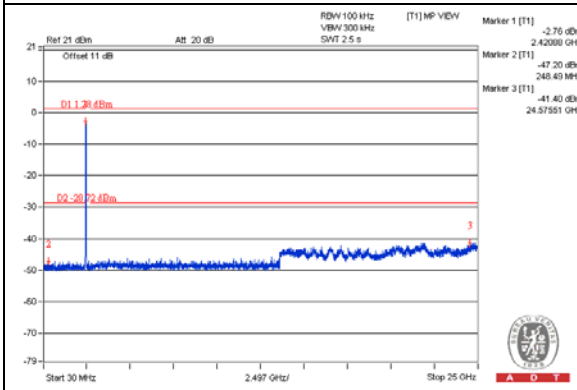
802.11n (HT40)

Maximum REF

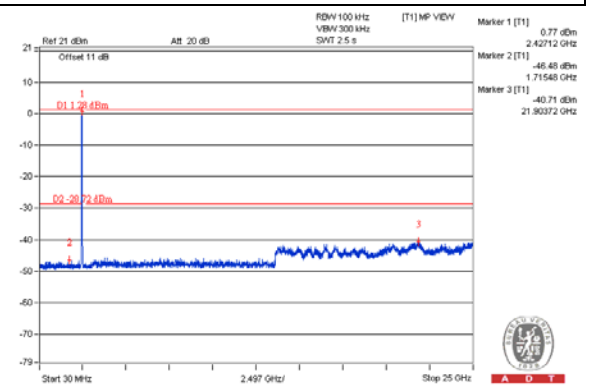


Chain 0

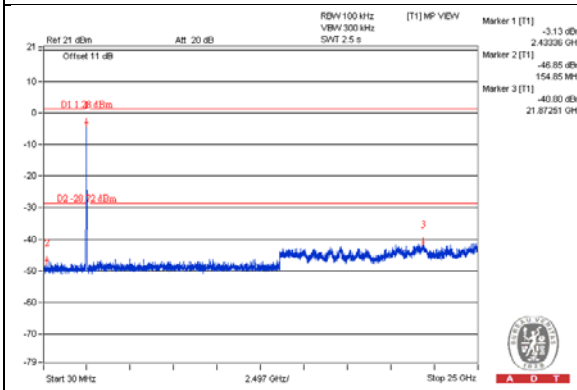
CH 3



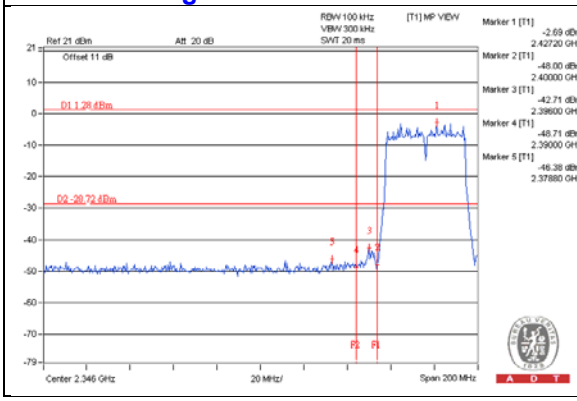
CH 6



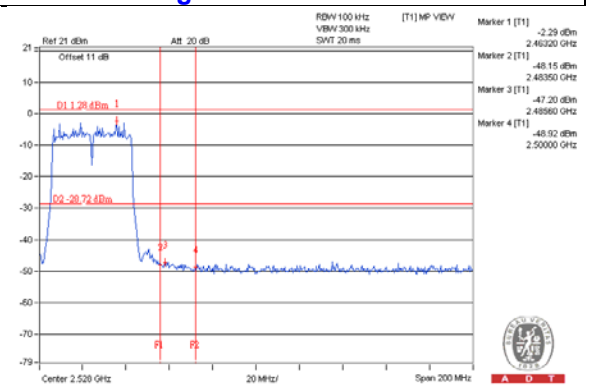
CH 9



CH 3 Band edge

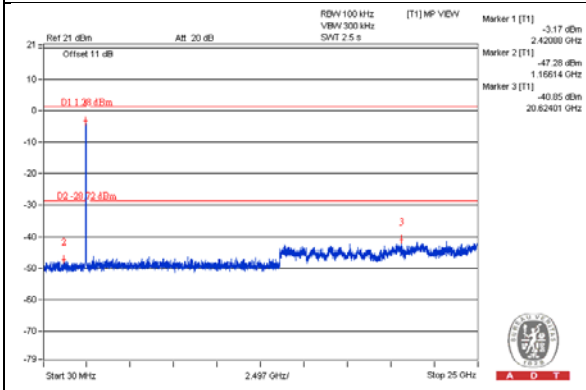


CH 9 Band edge

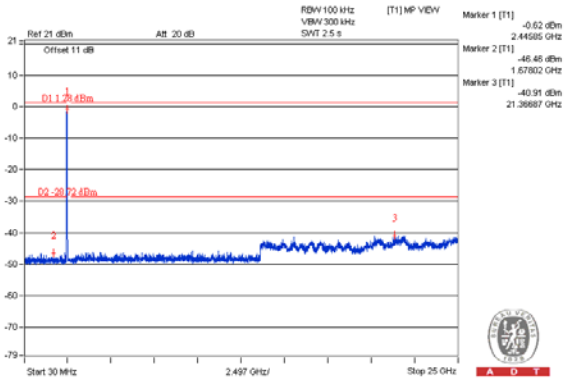


Chain 1

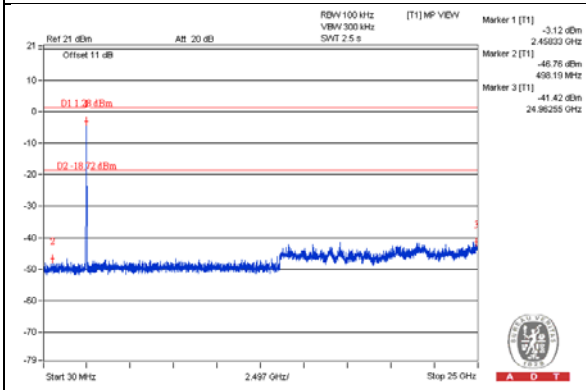
CH 3



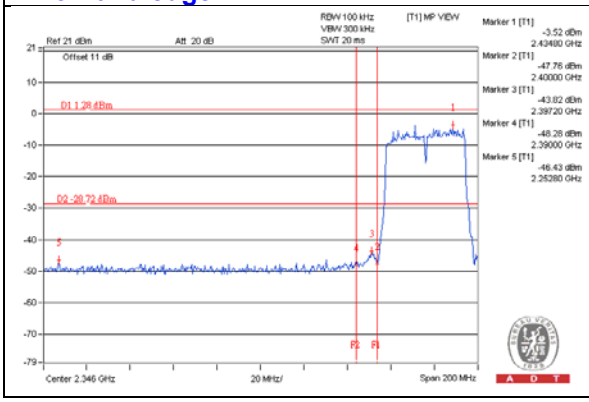
CH 6



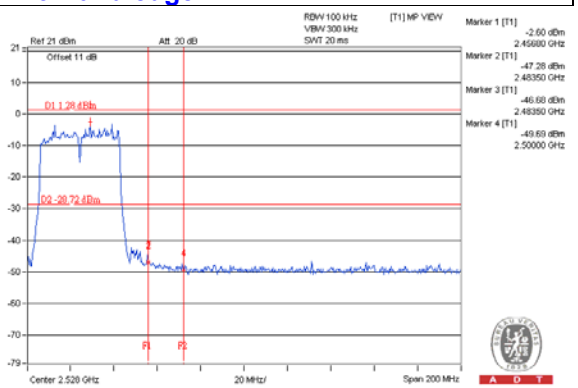
CH 9



CH 3 Band edge

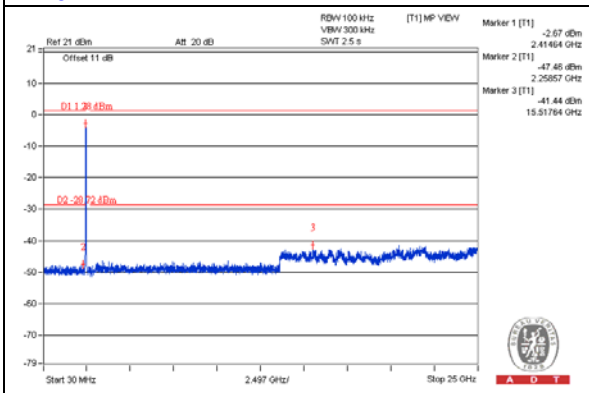


CH 9 Band edge

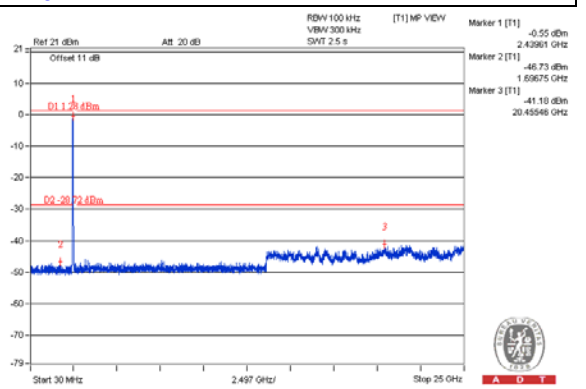


Chain 2

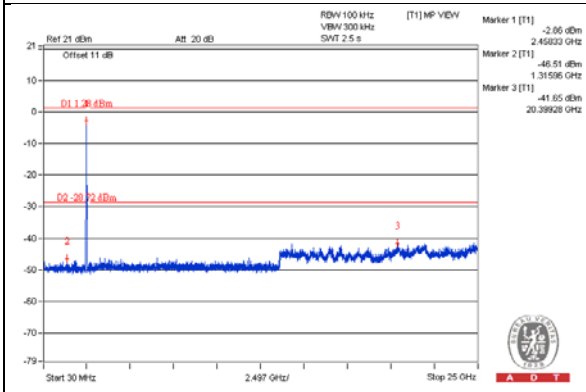
CH 3



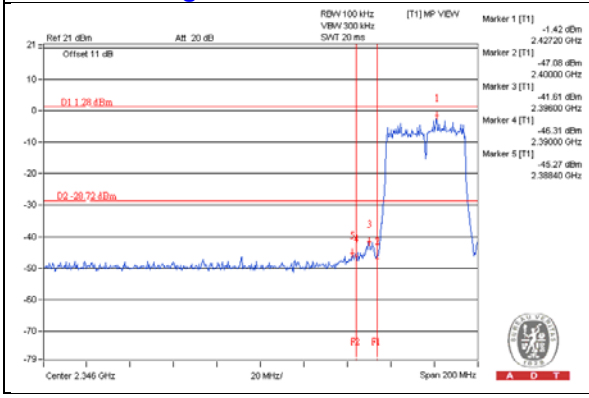
CH 6



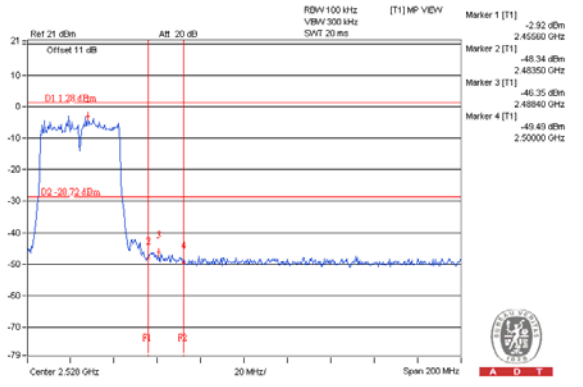
CH 9



CH 3 Band edge

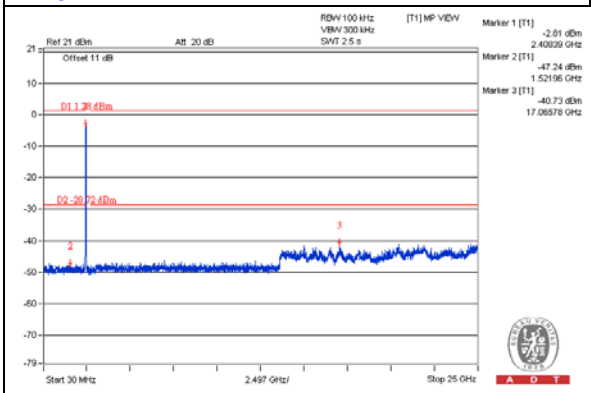


CH 9 Band edge

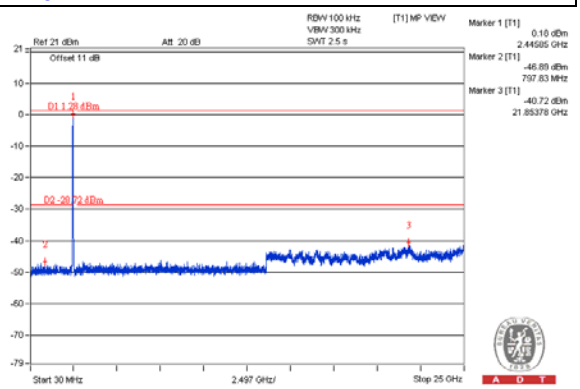


Chain 3

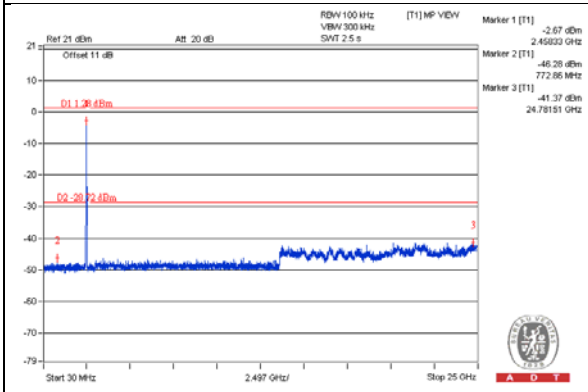
CH 3



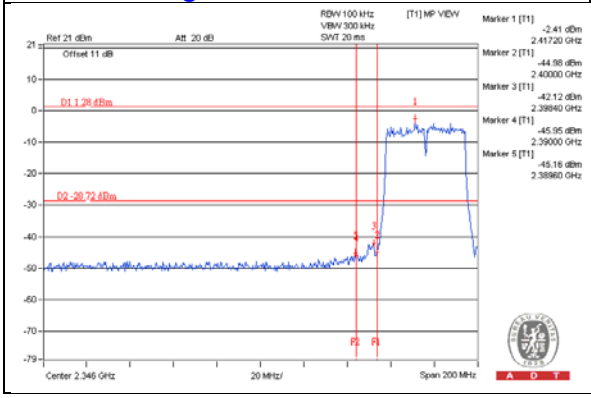
CH 6



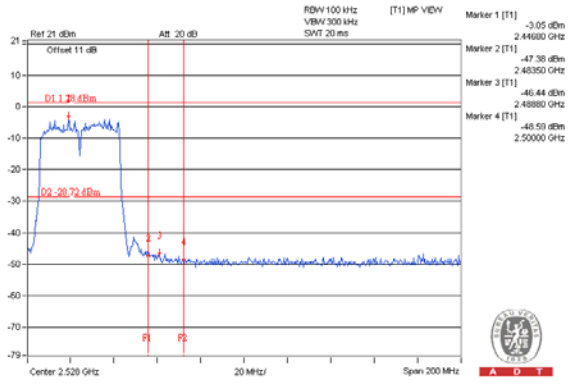
CH 9



CH 3 Band edge



CH 9 Band edge



5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

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

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