FCC TEST REPORT

REPORT NO.: RF140213C12

MODEL NO.: CPE510

FCC ID: TE7CPE510

RECEIVED: Feb. 13, 2014

TESTED: Mar. 28 ~ Jun. 20, 2014

ISSUED: Jun. 23, 2014

APPLICANT: TP-LINK TECHNOLOGIES CO., LTD.

ADDRESS: Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China

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

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.

TEST LOCATION: No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF140213C12	Original release	Jun. 23, 2014

1. CERTIFICATION

PRODUCT:	5GHz 300Mbps 13dBi Outdoor CPE
MODEL NO.:	CPE510
BRAND:	TP-LINK
APPLICANT:	TP-LINK TECHNOLOGIES CO., LTD.
TESTED:	Mar. 28 ~ Jun. 20, 2014
TEST SAMPLE:	ENGINEERING SAMPLE
STANDARDS:	**FCC Part 15, Subpart C (Section 15.247)**
	ANSI C63.10-2009

The above equipment (model: CPE510) 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 : Celine Chou , **DATE :** Jun. 23, 2014

Celine Chou / Specialist

APPROVED BY : Ken Liu , **DATE :** Jun. 23, 2014

Ken Liu / Senior Manager

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

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 -12.38dB at 21.78012MHz.
15.205 & 209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.2dB at 11570.00 & 11510.00MHz.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -4.8dB at 5725.00MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is Weld not a standard connector.

2.1 MEASUREMENT UNCERTAINTY

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	150kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.34 dB
	200MHz ~1000MHz	3.35 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	5GHz 300Mbps 13dBi Outdoor CPE
MODEL NO.	CPE510
POWER SUPPLY	24Vdc (POE Adapter)
MODULATION TYPE	64QAM, 16QAM, QPSK, BPSK
MODULATION TECHNOLOGY	OFDM
TRANSFER RATE	802.11a (10MHz): 27 / 24/ 18/ 12/ 9/ 6/ 4.5/ 3Mbps 802.11a (20MHz): 54/ 48/ 36/ 24/ 18/ 12/ 9/ 6Mbps 802.11n (HT10): MCS0 ~ 15 802.11n (HT20): MCS0 ~ 15 802.11n (HT40): MCS0 ~ 15
OPERATING FREQUENCY	5745 ~ 5850MHz
NUMBER OF CHANNEL	5 for 802.11a, 802.11n (HT10), 802.11n (HT20) 2 for 802.11n (HT40)
OUTPUT POWER	201.971mW
ANTENNA TYPE	Fixed Antenna with 13dBi gain
ANTENNA CONNECTOR	Weld
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	POE Adapter

NOTE:

1. The EUT incorporates a MIMO function. Physically, the EUT provides 2 completed transmitters and 2 receivers.

MODULATION MODE	TX FUNCTION
802.11a (10MHz)	2TX
802.11a (20MHz)	2TX
802.11n (HT10)	2TX
802.11n (HT20)	2TX
802.11n (HT40)	2TX

2. The EUT consumes power from the following POE Adapter.

POE Adapter	
Brand	TP-LINK
Model	T240100-2-POE
Input Power	100-240Vac, 50-60Hz
Output Power	24Vdc, 1.0A
Power Line	1.5m non-shielded cable without core

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

3.2 DESCRIPTION OF TEST MODES

5 channels are provided for 802.11a (10MHz), 802.11a (20MHz), 802.11n (HT10), 802.11n (HT20):

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

2 channels are provided for 802.11n (HT40):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755MHz	159	5795MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

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

Where **RE≥1G:** Radiated Emission above 1GHz **RE<1G:** Radiated Emission below 1GHz
PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

NOTE:
The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane.**

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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a (10MHz)	149 to 165	149, 157, 165	OFDM	BPSK	3.0
-	802.11a (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (HT10)	149 to 165	149, 157, 165	OFDM	BPSK	MCS0
	802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	MCS0
	802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	MCS0

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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a (10MHz)	149 to 165	149	OFDM	BPSK	3.0

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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a (10MHz)	149 to 165	149	OFDM	BPSK	3.0

BANDEDGE 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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a (10MHz)	149 to 165	149, 165	OFDM	BPSK	3.0
-	802.11a (20MHz)	149 to 165	149, 165	OFDM	BPSK	6.0
-	802.11n (HT10)	149 to 165	149, 165	OFDM	BPSK	MCS0
	802.11n (HT20)	149 to 165	149, 165	OFDM	BPSK	MCS0
	802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	MCS0

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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a (10MHz)	149 to 165	149, 157, 165	OFDM	BPSK	3.0
-	802.11a (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (HT10)	149 to 165	149, 157, 165	OFDM	BPSK	MCS0
	802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	MCS0
	802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	MCS0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	21deg. C, 69%RH	120Vac, 60Hz	Chris Lin
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Chris Lin
PLC	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
APCM	25deg. C, 60%RH	120Vac, 60Hz	Leo Chan

3.3 DUTY CYCLE OF TEST SIGNAL

Duty cycle is < 98%, duty factor shall be considered.

802.11a (10MHz): Duty cycle = 2.705/2.798 = 0.967, Duty factor = 10 * log(1/0.967) = 0.15

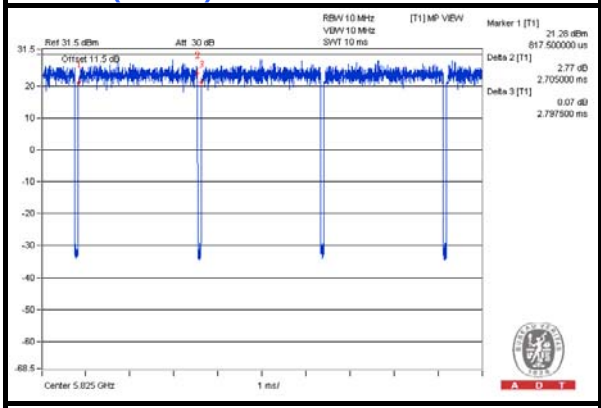
802.11a (20MHz): Duty cycle = 1.358/1.413 = 0.961, Duty factor = 10 * log(1/0.961) = 0.17

802.11n (HT10): Duty cycle = 2.719/2.801 = 0.971, Duty factor = 10 * log(1/0.971) = 0.13

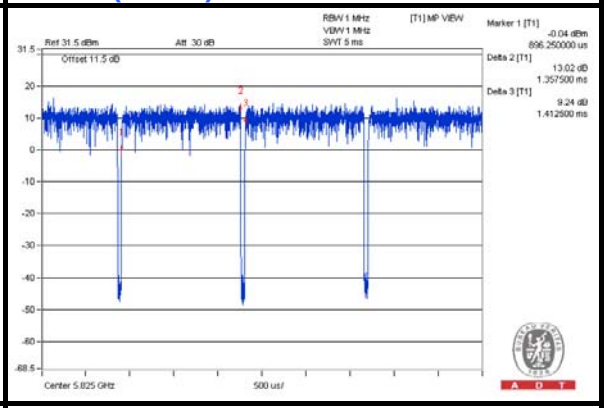
802.11n (HT20): Duty cycle = 1.266/1.321 = 0.958, Duty factor = 10 * log(1/0.958) = 0.18

802.11n (HT40): Duty cycle = 0.631/0.665 = 0.949, Duty factor = 10 * log(1/0.949) = 0.23

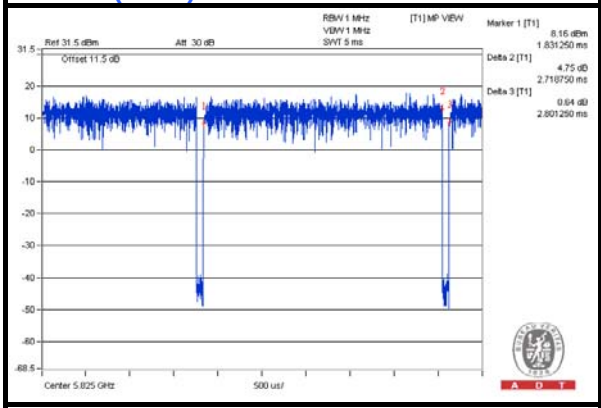
802.11a (10MHz)



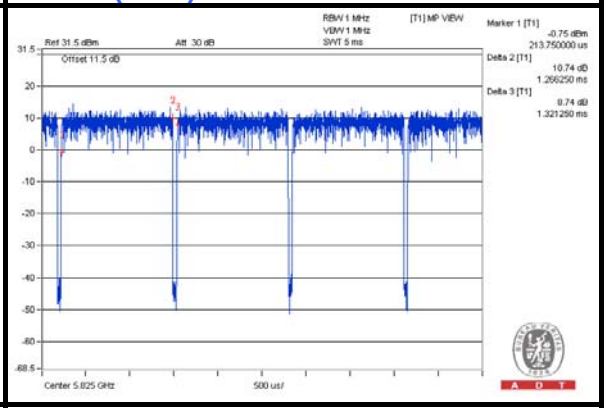
802.11a (20MHz)



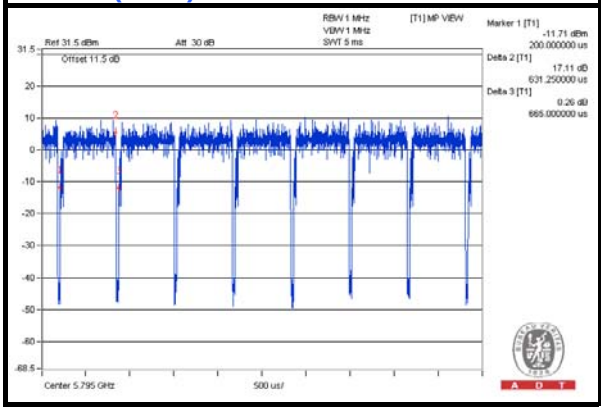
802.11n (HT10)



802.11n (HT20)



802.11n (HT40)



3.4 DESCRIPTION OF SUPPORT UNITS

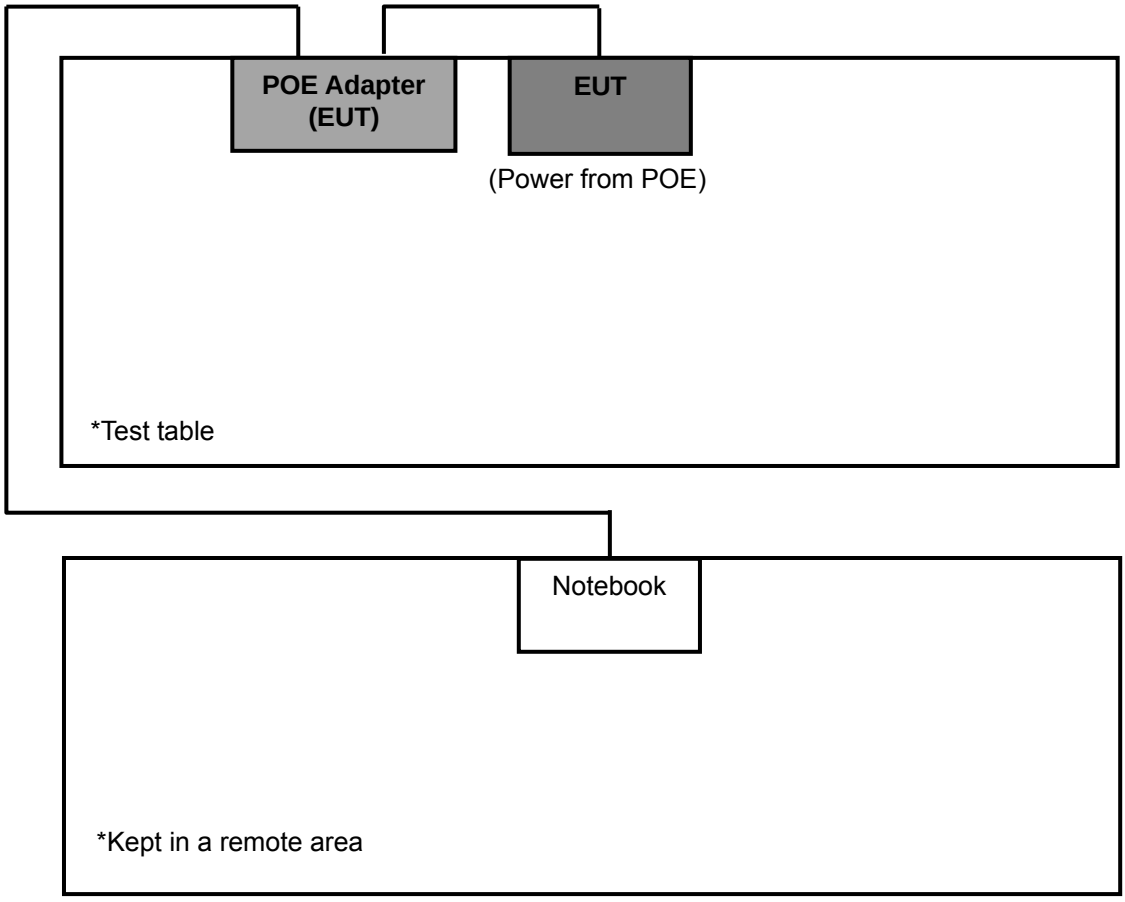
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	DELL	D531	CN-0XM006-48643 -81U-2610	QDS-BRCM1020

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1.8m RJ45 Cable and 1.8m RJ45 Cable.

NOTE:
1. All power cords of the above support units are non-shielded (1.8 m).
2. Item 1 acted as a communication partner to transfer data.

3.4.1 CONFIGURATION OF SYSTEM UNDER TEST



3.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

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

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

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It 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 30dB under any condition of modulation.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	Jan. 02, 2014	Jan. 01, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Mar. 03, 2014	Mar. 02, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Feb. 26, 2014	Feb. 25, 2015
HORN Antenna SCHWARZBECK	9120D	209	Sep. 12, 2013	Sep. 11, 2014
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 15, 2013	Jul. 14, 2014
Preamplifier Agilent	8447D	2944A10633	Oct. 07, 2013	Oct. 06, 2014
Preamplifier Agilent	8449B	3008A01964	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	214378/4	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6 +309224/4	Aug. 26, 2013	Aug. 25, 2014
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2013	Oct. 17, 2014
High Speed Peak Power Meter	ML2495A	0824011	Jul. 29, 2013	Jul. 28, 2014
Power Sensor	MA2411B	0738171	Jul. 29, 2013	Jul. 28, 2014

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

2. The test was performed in HwaYa Chamber 3.

3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

4. The FCC Site Registration No. is 988962.

5. The IC Site Registration No. is IC 7450F-3.

4.1.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. 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. Height of receiving 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 Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE:

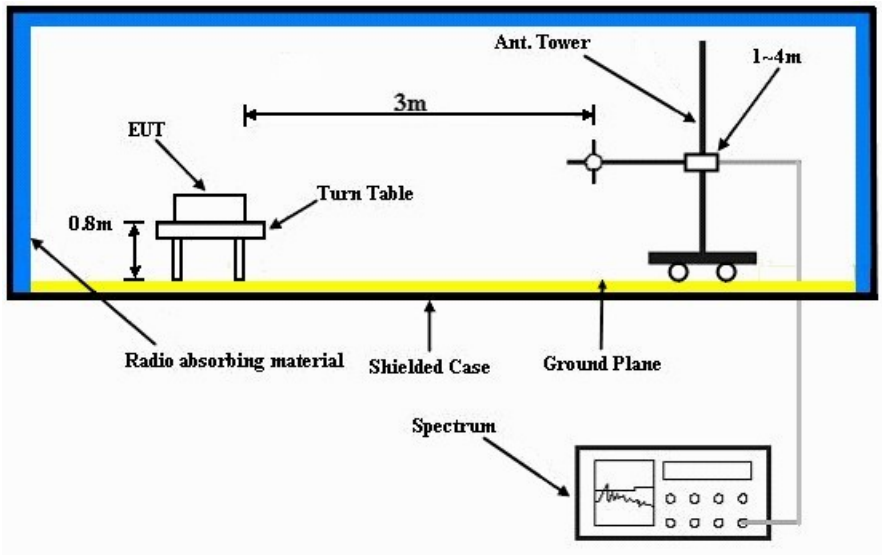
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz(Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

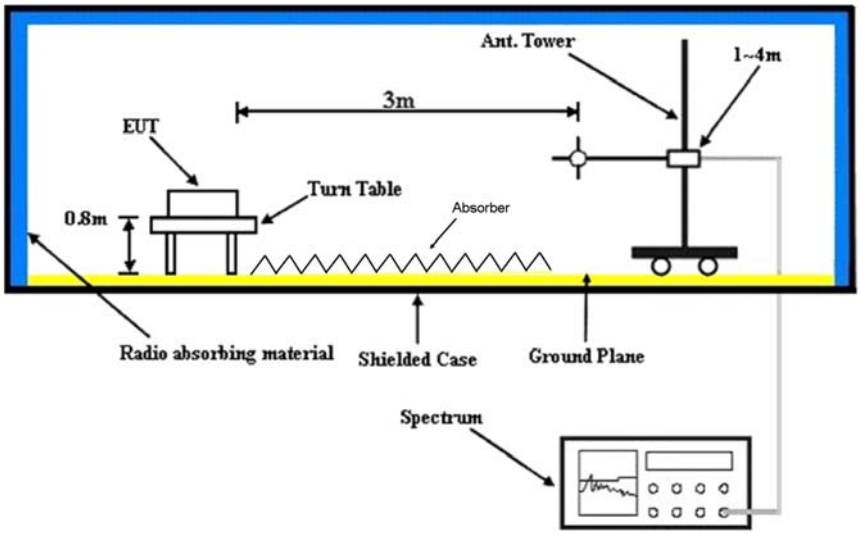
No deviation.

4.1.5 TEST SETUP

Frequency range 30MHz~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

a. Placed the EUT on the testing table.
b. Prepared a notebook to act as communication partner and placed it outside of testing area.
c. The communication partner connected with EUT via a RJ45 cable and run a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
d. The communication partner sent data to EUT by command "PING".

4.1.7 TEST RESULTS

ABOVE 1GHz DATA：

802.11a (10MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 69%RH	TESTED BY	Chris Lin

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	#5725.00	65.1 PK	87.5	-22.4	1.29 H	266	59.10	6.00
2	#5725.00	53.6 AV	76.0	-22.4	1.29 H	266	47.60	6.00
3	*5745.00	117.5 PK			1.58 H	258	79.00	38.50
4	*5745.00	106.0 AV			1.58 H	258	67.50	38.50
5	11490.00	68.7 PK	74.0	-5.3	1.69 H	88	48.30	20.40
6	11490.00	53.5 AV	54.0	-0.5	1.69 H	88	33.10	20.40
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	#5725.00	66.1 PK	88.5	-22.4	1.29 V	266	60.10	6.00
2	#5725.00	54.2 AV	76.6	-22.4	1.29 V	266	48.20	6.00
3	*5745.00	118.5 PK			1.50 V	259	80.00	38.50
4	*5745.00	106.6 AV			1.50 V	259	68.10	38.50
5	11490.00	61.4 PK	74.0	-12.6	1.15 V	96	41.00	20.40
6	11490.00	48.8 AV	54.0	-5.2	1.15 V	96	28.40	20.40

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 69%RH	TESTED BY	Chris Lin

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	117.6 PK			1.60 H	266	79.00	38.60
2	*5785.00	106.2 AV			1.60 H	266	67.60	38.60
3	11570.00	65.7 PK	74.0	-8.3	1.23 H	139	45.30	20.40
4	11570.00	53.6 AV	54.0	-0.4	1.23 H	139	33.20	20.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	118.4 PK			1.00 V	257	79.80	38.60
2	*5785.00	107.3 AV			1.00 V	257	68.70	38.60
3	11570.00	61.7 PK	74.0	-12.3	1.30 V	51	41.30	20.40
4	11570.00	49.0 AV	54.0	-5.0	1.30 V	51	28.60	20.40

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 69%RH	TESTED BY	Chris Lin

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	116.9 PK			1.61 H	263	78.20	38.70
2	*5825.00	105.2 AV			1.61 H	263	66.50	38.70
3	#5850.00	64.2 PK	86.9	-22.7	1.34 H	270	58.00	6.20
4	#5850.00	52.5 AV	75.2	-22.7	1.34 H	270	46.30	6.20
5	11650.00	68.6 PK	74.0	-5.4	1.39 H	80	48.30	20.30
6	11650.00	53.6 AV	54.0	-0.4	1.39 H	80	33.30	20.30
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	*5825.00	117.3 PK			1.00 V	256	78.60	38.70
2	*5825.00	107.1 AV			1.00 V	256	68.40	38.70
3	#5850.00	64.6 PK	87.3	-22.7	1.34 V	270	58.40	6.20
4	#5850.00	54.4 AV	77.1	-22.7	1.34 V	270	48.20	6.20
5	11650.00	62.9 PK	74.0	-11.1	1.14 V	85	42.60	20.30
6	11650.00	48.7 AV	54.0	-5.3	1.14 V	85	28.40	20.30

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.
7. "#":The radiated frequency is out the restricted band.

802.11a (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 69%RH	TESTED BY	Chris Lin

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	#5725.00	74.2 PK	85.2	-11.0	1.42 H	260	68.20	6.00
2	#5725.00	64.0 AV	75.0	-11.0	1.42 H	260	58.00	6.00
3	*5745.00	115.2 PK			1.65 H	264	76.70	38.50
4	*5745.00	105.0 AV			1.65 H	264	66.50	38.50
5	11490.00	65.9 PK	74.0	-8.1	1.02 H	146	45.50	20.40
6	11490.00	53.5 AV	54.0	-0.5	1.00 H	144	33.10	20.40
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	#5725.00	75.7 PK	86.7	-11.0	1.40 V	258	69.70	6.00
2	#5725.00	65.2 AV	76.2	-11.0	1.40 V	258	59.20	6.00
3	*5745.00	116.7 PK			1.00 V	256	78.20	38.50
4	*5745.00	106.2 AV			1.00 V	256	67.70	38.50
5	11490.00	62.4 PK	74.0	-11.6	1.10 V	145	42.00	20.40
6	11490.00	49.1 AV	54.0	-4.9	1.10 V	145	28.70	20.40

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 69%RH	TESTED BY	Chris Lin

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	114.1 PK			1.58 H	260	75.50	38.60
2	*5785.00	104.2 AV			1.58 H	260	65.60	38.60
3	11570.00	67.7 PK	74.0	-6.3	1.53 H	79	47.30	20.40
4	11570.00	53.6 AV	54.0	-0.4	1.53 H	79	33.20	20.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	116.2 PK			1.00 V	256	77.60	38.60
2	*5785.00	105.7 AV			1.00 V	256	67.10	38.60
3	11570.00	61.4 PK	74.0	-12.6	1.00 V	159	41.00	20.40
4	11570.00	49.1 AV	54.0	-4.9	1.00 V	159	28.70	20.40

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 69%RH	TESTED BY	Chris Lin

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	115.4 PK			1.61 H	266	76.70	38.70
2	*5825.00	105.0 AV			1.61 H	266	66.30	38.70
3	#5850.00	62.9 PK	85.4	-22.5	1.25 H	255	56.70	6.20
4	#5850.00	52.5 AV	75.0	-22.5	1.25 H	255	46.30	6.20
5	11650.00	67.0 PK	74.0	-7.0	1.68 H	81	46.70	20.30
6	11650.00	53.6 AV	54.0	-0.4	1.68 H	81	33.30	20.30
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	*5825.00	116.4 PK			1.62 V	256	77.70	38.70
2	*5825.00	104.9 AV			1.62 V	256	66.20	38.70
3	#5850.00	63.9 PK	86.4	-22.5	1.25 V	255	57.70	6.20
4	#5850.00	52.4 AV	74.9	-22.5	1.25 V	255	46.20	6.20
5	11650.00	62.2 PK	74.0	-11.8	1.18 V	92	41.90	20.30
6	11650.00	48.4 AV	54.0	-5.6	1.18 V	92	28.10	20.30

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.
7. "#":The radiated frequency is out the restricted band.

802.11n (HT10)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 69%RH	TESTED BY	Chris Lin

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	#5725.00	78.7 PK	86.1	-7.4	1.15 H	17	72.70	6.00
2	#5725.00	67.4 AV	74.8	-7.4	1.15 H	17	61.40	6.00
3	*5745.00	116.1 PK			1.54 H	260	77.60	38.50
4	*5745.00	104.8 AV			1.54 H	260	66.30	38.50
5	11490.00	68.2 PK	74.0	-5.8	1.66 H	80	47.80	20.40
6	11490.00	53.6 AV	54.0	-0.4	1.66 H	80	33.20	20.40
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	#5725.00	78.5 PK	85.9	-7.4	1.15 V	17	72.50	6.00
2	#5725.00	67.1 AV	74.5	-7.4	1.15 V	17	61.10	6.00
3	*5745.00	115.9 PK			1.36 V	261	77.40	38.50
4	*5745.00	104.5 AV			1.36 V	261	66.00	38.50
5	11490.00	60.9 PK	74.0	-13.1	1.10 V	350	40.50	20.40
6	11490.00	48.3 AV	54.0	-5.7	1.10 V	350	27.90	20.40

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 69%RH	TESTED BY	Chris Lin

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	116.3 PK			1.54 H	263	77.70	38.60
2	*5785.00	104.9 AV			1.54 H	263	66.30	38.60
3	11570.00	67.8 PK	74.0	-6.2	1.54 H	79	47.40	20.40
4	11570.00	53.5 AV	54.0	-0.5	1.54 H	79	33.10	20.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	116.4 PK			1.35 V	261	77.80	38.60
2	*5785.00	105.2 AV			1.35 V	261	66.60	38.60
3	11570.00	63.2 PK	74.0	-10.8	1.03 V	66	42.80	20.40
4	11570.00	50.4 AV	54.0	-3.6	1.03 V	66	30.00	20.40

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 69%RH	TESTED BY	Chris Lin

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	115.2 PK			1.37 H	268	76.50	38.70
2	*5825.00	104.5 AV			1.37 H	268	65.80	38.70
3	#5850.00	65.2 PK	85.2	-20.0	1.23 H	258	59.00	6.20
4	#5850.00	54.5 AV	74.5	-20.0	1.23 H	258	48.30	6.20
5	11650.00	68.1 PK	74.0	-5.9	1.65 H	80	47.80	20.30
6	11650.00	53.5 AV	54.0	-0.5	1.65 H	80	33.20	20.30
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	*5825.00	117.4 PK			1.47 V	261	78.70	38.70
2	*5825.00	106.2 AV			1.47 V	261	67.50	38.70
3	#5850.00	57.4 PK	87.4	-30.0	1.10 V	350	51.20	6.20
4	#5850.00	56.2 AV	76.2	-20.0	1.10 V	350	50.00	6.20
5	11650.00	62.9 PK	74.0	-11.1	1.15 V	96	42.60	20.30
6	11650.00	50.7 AV	54.0	-3.3	1.15 V	96	30.40	20.30

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.
7. "#":The radiated frequency is out the restricted band.

802.11n (HT20)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 69%RH	TESTED BY	Chris Lin

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	#5725.00	74.8 PK	83.9	-9.1	1.00 H	257	68.80	6.00
2	#5725.00	64.7 AV	73.8	-9.1	1.00 H	257	58.70	6.00
3	*5745.00	113.9 PK			1.61 H	262	75.40	38.50
4	*5745.00	103.8 AV			1.61 H	262	65.30	38.50
5	11490.00	67.6 PK	74.0	-6.4	1.44 H	75	47.20	20.40
6	11490.00	53.7 AV	54.0	-0.3	1.44 H	75	33.30	20.40
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	#5725.00	75.1 PK	84.3	-9.2	1.00 V	257	69.10	6.00
2	#5725.00	65.7 AV	74.9	-9.2	1.00 V	257	59.70	6.00
3	*5745.00	114.3 PK			1.00 V	256	75.80	38.50
4	*5745.00	104.9 AV			1.00 V	256	66.40	38.50
5	11490.00	61.9 PK	74.0	-12.1	1.15 V	96	41.50	20.40
6	11490.00	49.0 AV	54.0	-5.0	1.15 V	96	28.60	20.40

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 69%RH	TESTED BY	Chris Lin

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	114.5 PK			1.58 H	261	75.90	38.60
2	*5785.00	103.6 AV			1.58 H	261	65.00	38.60
3	11570.00	67.7 PK	74.0	-6.3	1.71 H	77	47.30	20.40
4	**11570.00**	**53.8 AV**	**54.0**	**-0.2**	**1.71 H**	**77**	**33.40**	**20.40**
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	115.8 PK			1.50 V	255	77.20	38.60
2	*5785.00	105.9 AV			1.50 V	255	67.30	38.60
3	11570.00	61.9 PK	74.0	-12.1	1.25 V	96	41.50	20.40
4	11570.00	49.0 AV	54.0	-5.0	1.25 V	96	28.60	20.40

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 69%RH	TESTED BY	Chris Lin

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	114.3 PK			1.63 H	265	75.60	38.70
2	*5825.00	104.1 AV			1.63 H	265	65.40	38.70
3	#5850.00	62.9 PK	84.3	-21.4	1.30 H	260	56.70	6.20
4	#5850.00	52.7 AV	74.1	-21.4	1.30 H	260	46.50	6.20
5	11650.00	66.8 PK	74.0	-7.2	1.67 H	79	46.50	20.30
6	11650.00	53.5 AV	54.0	-0.5	1.67 H	79	33.20	20.30
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	*5825.00	115.7 PK			1.00 V	257	77.00	38.70
2	*5825.00	105.8 AV			1.00 V	257	67.10	38.70
3	#5850.00	64.3 PK	85.7	-21.4	1.30 V	260	58.10	6.20
4	#5850.00	54.4 AV	75.8	-21.4	1.30 V	260	48.20	6.20
5	11650.00	61.9 PK	74.0	-12.1	1.26 V	96	41.60	20.30
6	11650.00	48.9 AV	54.0	-5.1	1.26 V	96	28.60	20.30

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.
7. "#":The radiated frequency is out the restricted band.

802.11n (HT40)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 151	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 69%RH	TESTED BY	Chris Lin

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	#5725.00	76.0 PK	80.8	-4.8	1.00 H	262	70.00	6.00
2	#5725.00	66.2 AV	71.0	-4.8	1.00 H	262	60.20	6.00
3	*5755.00	110.8 PK			1.64 H	268	104.70	6.10
4	*5755.00	101.0 AV			1.64 H	268	94.90	6.10
5	11510.00	65.9 PK	74.0	-8.1	1.70 H	78	45.50	20.40
6	**11510.00**	**53.8 AV**	**54.0**	**-0.2**	**1.70 H**	**78**	**33.40**	**20.40**
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	#5725.00	78.2 PK	83.0	-4.8	1.00 V	262	72.20	6.00
2	#5725.00	68.1 AV	72.9	-4.8	1.00 V	262	62.10	6.00
3	*5755.00	113.0 PK			1.39 V	256	74.40	38.60
4	*5755.00	102.9 AV			1.39 V	256	64.30	38.60
5	11510.00	61.6 PK	74.0	-12.4	1.33 V	28	41.20	20.40
6	11510.00	49.1 AV	54.0	-4.9	1.33 V	28	28.70	20.40

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 69%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	110.8 PK			1.57 H	259	72.20	38.60
2	*5795.00	100.6 AV			1.57 H	259	62.00	38.60
3	#5850.00	58.7 PK	80.8	-22.1	1.40 H	253	52.50	6.20
4	#5850.00	48.5 AV	70.6	-22.1	1.40 H	253	42.30	6.20
5	11590.00	62.7 PK	74.0	-11.3	1.05 H	86	42.30	20.40
6	11590.00	53.6 AV	54.0	-0.4	1.05 H	86	33.20	20.40
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	*5795.00	112.9 PK			1.00 V	255	74.30	38.60
2	*5795.00	102.0 AV			1.00 V	255	63.40	38.60
3	#5850.00	60.8 PK	82.9	-22.1	1.40 V	253	54.60	6.20
4	#5850.00	49.9 AV	72.0	-22.1	1.40 V	253	43.70	6.20
5	11590.00	62.9 PK	74.0	-11.1	1.30 V	41	42.50	20.40
6	11590.00	49.0 AV	54.0	-5.0	1.30 V	41	28.60	20.40

REMARKS:

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

BELOW 1GHz WORST-CASE DATA：802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

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	57.12	25.9 QP	40.0	-14.1	1.99 H	349	40.80	-14.90
2	169.89	21.6 QP	43.5	-21.9	1.24 H	89	35.50	-13.90
3	276.82	23.8 QP	46.0	-22.2	1.00 H	268	36.70	-12.90
4	675.40	32.0 QP	46.0	-14.0	1.24 H	152	36.80	-4.80
5	821.23	28.4 QP	46.0	-17.6	1.24 H	260	30.20	-1.80
6	916.50	40.3 QP	46.0	-5.7	1.00 H	328	40.20	0.10
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	57.12	23.8 QP	40.0	-16.2	1.01 V	282	38.70	-14.90
2	171.83	19.6 QP	43.5	-23.9	1.01 V	16	33.70	-14.10
3	414.87	20.3 QP	46.0	-25.7	1.50 V	65	30.60	-10.30
4	539.30	22.8 QP	46.0	-23.2	1.26 V	279	30.50	-7.70
5	770.67	27.9 QP	46.0	-18.1	2.00 V	128	30.40	-2.50
6	900.94	32.3 QP	46.0	-13.7	1.26 V	100	32.60	-0.30

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

4.2 CONDUCTED EMISSION MEASUREMENT

4.2.1 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 0.50MHz.

3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 29, 2013	Nov. 28, 2014
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 27, 2013	Dec. 26, 2014
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 13, 2014	Feb. 12, 2015
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 17, 2013	Jul. 16, 2014
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

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

2. The test was performed in HwaYa Shielded Room 1.

3. The VCCI Site Registration No. is C-2040.

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.

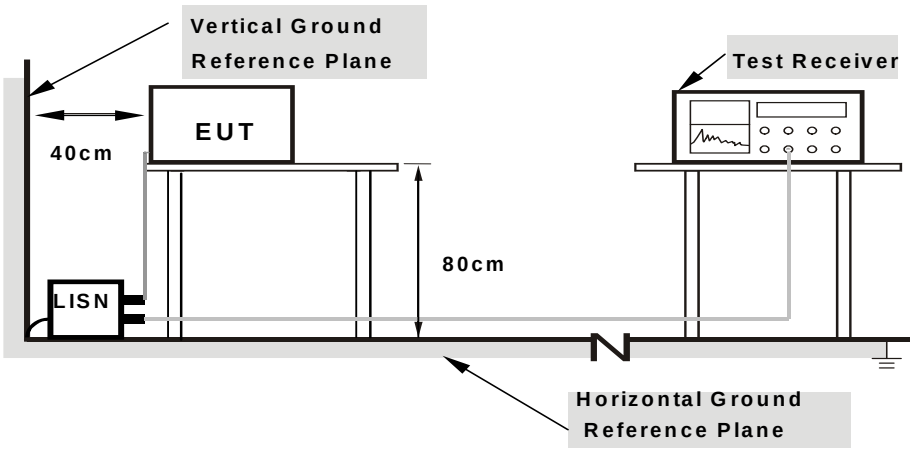
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: 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



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

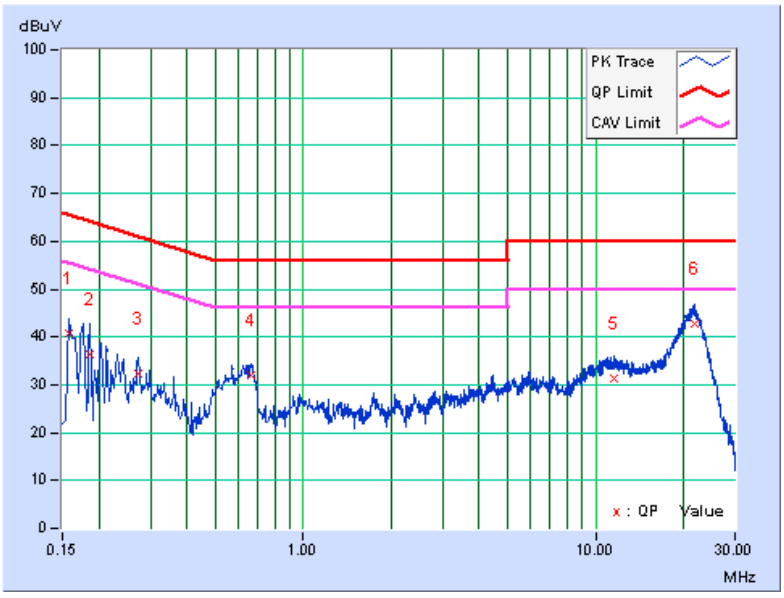
CONDUCTED WORST-CASE DATA：802.11a (10MHz)

PHASE	Line 1	6dB BANDWIDTH	9kHz

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15802	0.08	40.59	26.45	40.67	26.53	65.57	55.57	-24.90	-29.04
2	0.18519	0.07	36.33	22.36	36.40	22.43	64.25	54.25	-27.85	-31.82
3	0.27120	0.07	32.35	24.60	32.42	24.67	61.08	51.08	-28.66	-26.41
4	0.66081	0.09	31.91	26.92	32.00	27.01	56.00	46.00	-24.00	-18.99
5	11.52028	0.59	30.81	25.65	31.40	26.24	60.00	50.00	-28.60	-23.76
6	**21.78012**	**1.09**	**41.54**	**36.53**	**42.63**	**37.62**	**60.00**	**50.00**	**-17.37**	**-12.38**

REMARKS:

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

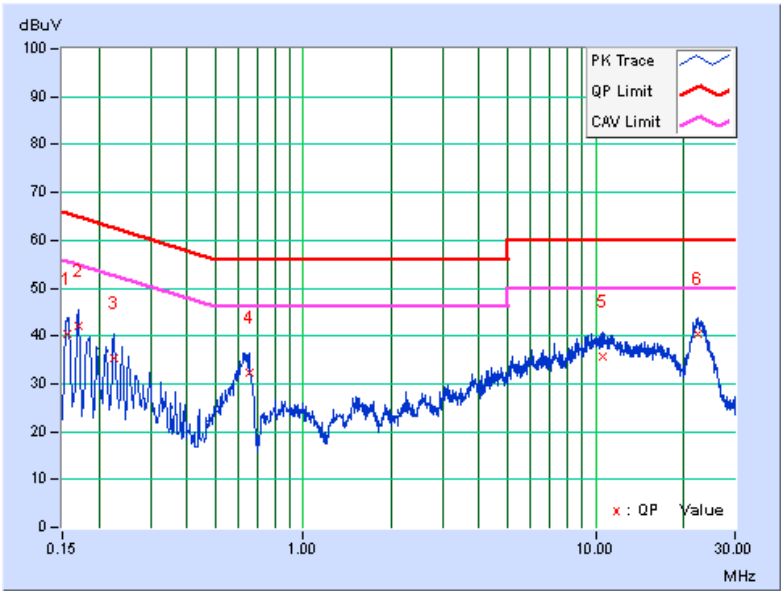


PHASE	Line 2	6dB BANDWIDTH	9kHz

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15677	0.05	40.28	27.29	40.33	27.34	65.63	55.63	-25.30	-28.29
2	0.16955	0.05	41.95	28.47	42.00	28.52	64.98	54.98	-22.98	-26.46
3	0.22434	0.05	35.32	24.07	35.37	24.12	62.66	52.66	-27.28	-28.53
4	0.65388	0.08	32.40	27.25	32.48	27.33	56.00	46.00	-23.52	-18.67
5	10.54669	0.47	35.10	29.92	35.57	30.39	60.00	50.00	-24.43	-19.61
6	22.46437	0.96	39.31	34.29	40.27	35.25	60.00	50.00	-19.73	-14.75

REMARKS:

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

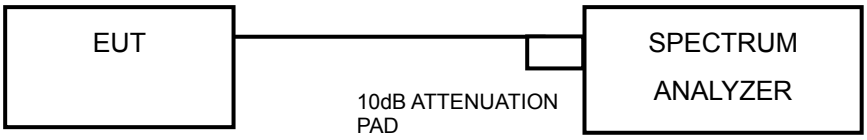


4.3 6dB BANDWIDTH MEASUREMENT

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 FROM TEST STANDARD

No deviation.

4.3.6 EUT OPERATING CONDITIONS

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

4.3.7 TEST RESULTS

802.11a (10MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	8.23	8.24	0.5	PASS
157	5785	8.83	8.22	0.5	PASS
165	5825	8.22	8.24	0.5	PASS

802.11a (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	16.38	16.39	0.5	PASS
157	5785	16.36	16.38	0.5	PASS
165	5825	16.38	16.39	0.5	PASS

802.11n (HT10)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	8.23	8.24	0.5	PASS
157	5785	8.21	8.22	0.5	PASS
165	5825	8.23	8.23	0.5	PASS

802.11n (HT20)

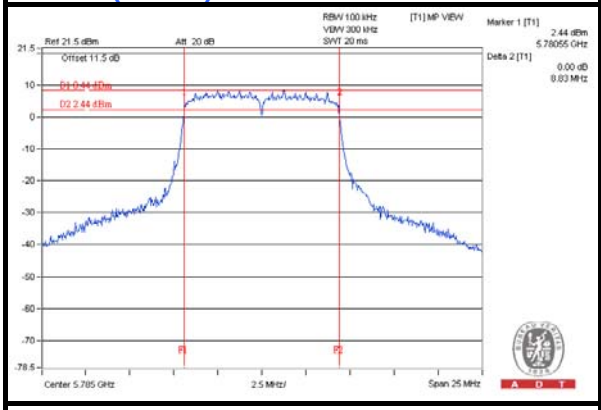
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	17.11	17.59	0.5	PASS
157	5785	17.35	17.57	0.5	PASS
165	5825	17.57	17.32	0.5	PASS

802.11n (HT40)

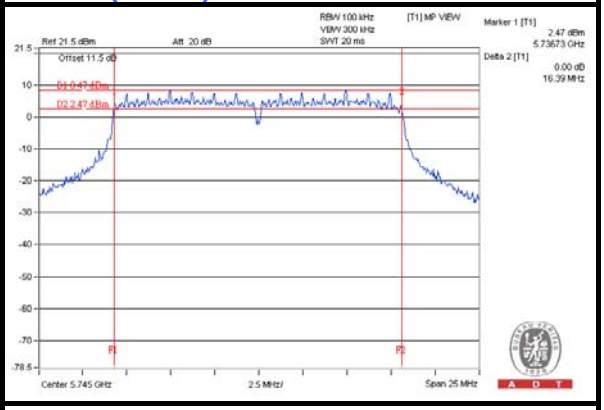
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
151	5755	36.15	35.81	0.5	PASS
159	5795	36.19	35.84	0.5	PASS

SPECTRUM PLOT OF WORST VALUE

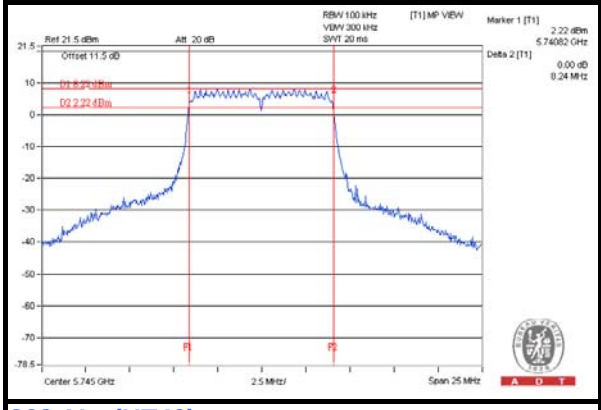
802.11a (10MHz)



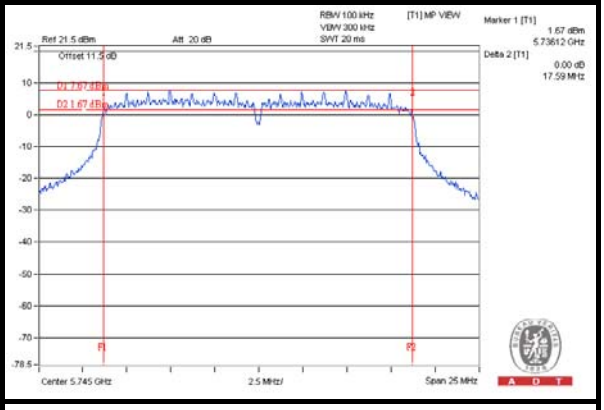
802.11a (20MHz)



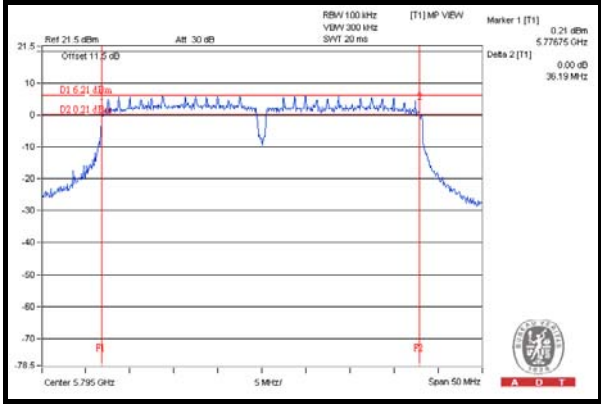
802.11n (HT10)



802.11n (HT20)



802.11n (HT40)



4.4 CONDUCTED OUTPUT POWER

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

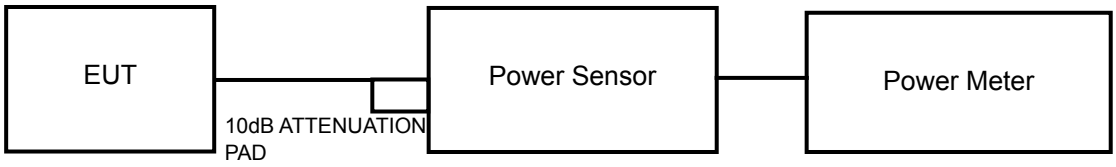
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

Per KDB 662911 D01 Multiple Transmitter Output v02r01 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 sensor. Record the power level.

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.

4.4.7 TEST RESULTS

802.11a (10MHz)

CHAN.	FREQ. (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	19.89	19.37	183.996	22.65	30	PASS
157	5785	20.19	19.89	**201.971**	23.05	30	PASS
165	5825	18.73	18.77	149.981	21.76	30	PASS

802.11a (20MHz)

CHAN.	FREQ. (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	19.46	19.12	169.966	22.30	30	PASS
157	5785	19.60	18.74	166.018	22.20	30	PASS
165	5825	18.59	18.99	151.527	21.80	30	PASS

802.11n (HT10)

CHAN.	FREQ. (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	19.39	19.16	169.310	22.29	30	PASS
157	5785	19.10	18.70	155.414	21.91	30	PASS
165	5825	19.17	18.37	151.311	21.80	30	PASS

802.11n (HT20)

CHAN.	FREQ. (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	19.95	19.53	188.598	22.76	30	PASS
157	5785	19.58	18.82	166.990	22.23	30	PASS
165	5825	19.19	18.81	159.018	22.01	30	PASS

802.11n (HT40)

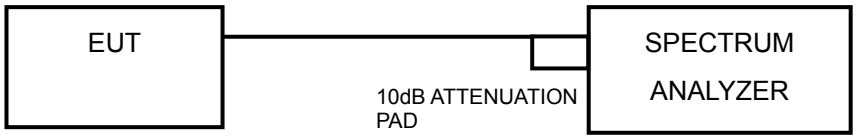
CHAN.	FREQ. (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
151	5755	19.95	19.19	181.840	22.60	30	PASS
159	5795	19.31	18.67	158.931	22.01	30	PASS

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

a. Set the RBW = 3 kHz, VBW =10 kHz, Detector = RMS.
b. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
c. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

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

802.11a (10MHz)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD W/O DUTY FACTOR (dBm/3kHz)	DUTY FACTOR	Total PSD WITH DUTY FACTOR (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-11.68	3.01	-8.67	0.15	-8.52	-2.01	PASS
	157	5785	-11.55	3.01	-8.54	0.15	-8.39	-2.01	PASS
	165	5825	-11.29	3.01	-8.28	0.15	-8.13	-2.01	PASS
1	149	5745	-12.72	3.01	-9.71	0.15	-9.56	-2.01	PASS
	157	5785	-10.60	3.01	-7.59	0.15	-7.44	-2.01	PASS
	165	5825	-12.45	3.01	-9.44	0.15	-9.29	-2.01	PASS

NOTE:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 13dBi + 10log(2) = 16.01dBi > 6dBi, so the power density limit shall be reduced to 8-(16.01-6) = -2.01dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11a (20MHz)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD W/O DUTY FACTOR (dBm/3kHz)	DUTY FACTOR	Total PSD WITH DUTY FACTOR (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-12.16	3.01	-9.15	0.17	-8.98	-2.01	PASS
	157	5785	-12.05	3.01	-9.04	0.17	-8.87	-2.01	PASS
	165	5825	-12.53	3.01	-9.52	0.17	-9.35	-2.01	PASS
1	149	5745	-13.10	3.01	-10.09	0.17	-9.92	-2.01	PASS
	157	5785	-13.55	3.01	-10.54	0.17	-10.37	-2.01	PASS
	165	5825	-13.76	3.01	-10.75	0.17	-10.58	-2.01	PASS

NOTE:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 13dBi + 10log(2) = 16.01dBi > 6dBi, so the power density limit shall be reduced to 8-(16.01-6) = -2.01dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT10)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD W/O DUTY FACTOR (dBm/3kHz)	DUTY FACTOR	Total PSD WITH DUTY FACTOR (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-11.27	3.01	-8.26	0.13	-8.13	-2.01	PASS
	157	5785	-10.31	3.01	-7.30	0.13	-7.17	-2.01	PASS
	165	5825	-11.20	3.01	-8.19	0.13	-8.06	-2.01	PASS
1	149	5745	-11.49	3.01	-8.48	0.13	-8.35	-2.01	PASS
	157	5785	-11.20	3.01	-8.19	0.13	-8.06	-2.01	PASS
	165	5825	-12.20	3.01	-9.19	0.13	-9.06	-2.01	PASS

NOTE:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 13dBi + 10log(2) = 16.01dBi > 6dBi, so the power density limit shall be reduced to 8-(16.01-6) = -2.01dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD W/O DUTY FACTOR (dBm/3kHz)	DUTY FACTOR	Total PSD WITH DUTY FACTOR (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-13.19	3.01	-10.18	0.18	-10.00	-2.01	PASS
	157	5785	-12.92	3.01	-9.91	0.18	-9.73	-2.01	PASS
	165	5825	-12.66	3.01	-9.65	0.18	-9.47	-2.01	PASS
1	149	5745	-13.89	3.01	-10.88	0.18	-10.70	-2.01	PASS
	157	5785	-13.64	3.01	-10.63	0.18	-10.45	-2.01	PASS
	165	5825	-13.98	3.01	-10.97	0.18	-10.79	-2.01	PASS

NOTE:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 13dBi + 10log(2) = 16.01dBi > 6dBi, so the power density limit shall be reduced to 8-(16.01-6) = -2.01dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

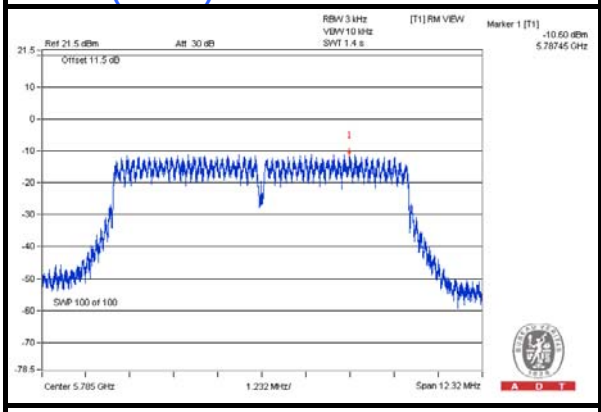
TX chain	Chan.	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD W/O DUTY FACTOR (dBm/3kHz)	DUTY FACTOR	Total PSD WITH DUTY FACTOR (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	151	5755	-14.67	3.01	-11.66	0.23	-11.43	-2.01	PASS
	159	5795	-15.41	3.01	-12.40	0.23	-12.17	-2.01	PASS
1	151	5755	-15.37	3.01	-12.36	0.23	-12.13	-2.01	PASS
	159	5795	-16.07	3.01	-13.06	0.23	-12.83	-2.01	PASS

NOTE:

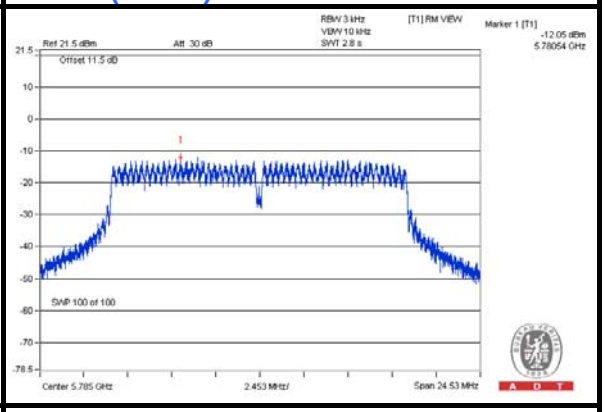
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 13dBi + 10log(2) = 16.01dBi > 6dBi, so the power density limit shall be reduced to 8-(16.01-6) = -2.01dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE

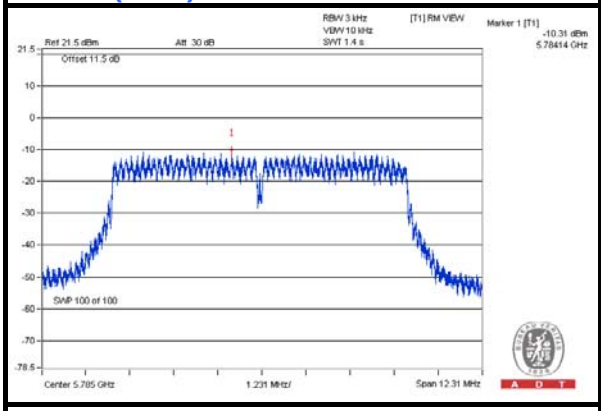
802.11a (10MHz)



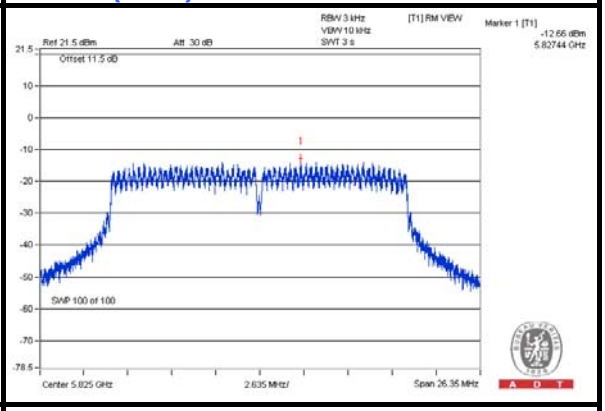
802.11a (20MHz)



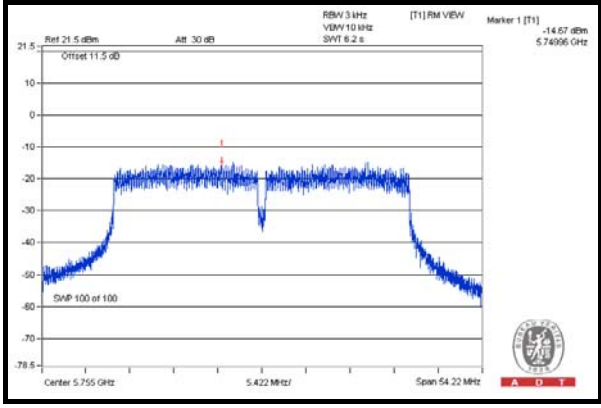
802.11n (HT10)



802.11n (HT20)



802.11n (HT40)

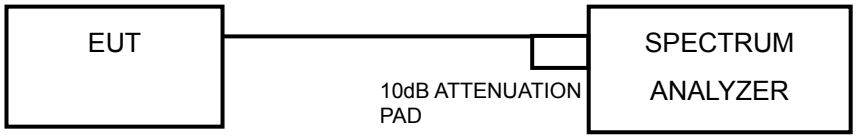


4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

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 = average.
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. Ensure that the number of measurement points ≥ span/RBW
4. According to measurement points to set differ measurement span.
5. Detector = peak.
6. Trace Mode = max hold.
7. Sweep = auto couple.

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

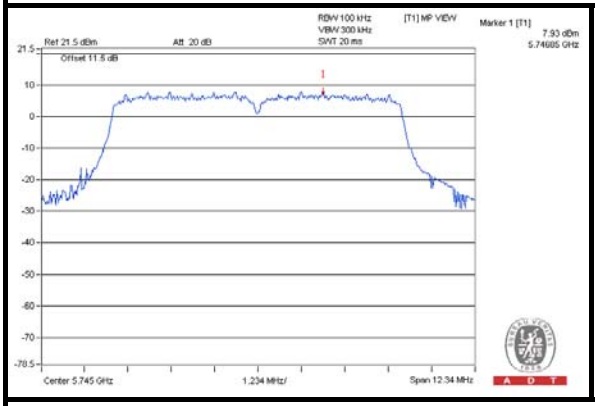
4.6.7 TEST RESULTS

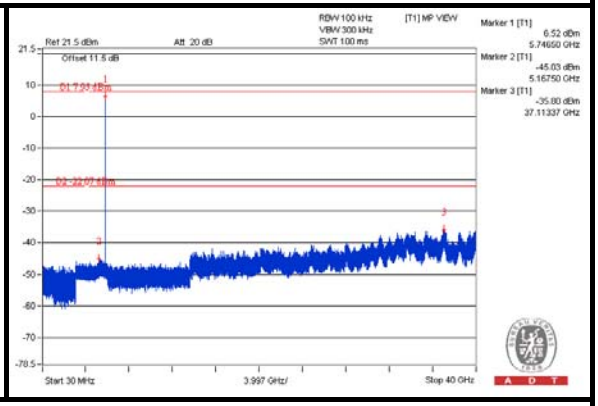
The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit. Only worst data of each operating mode is presented.

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

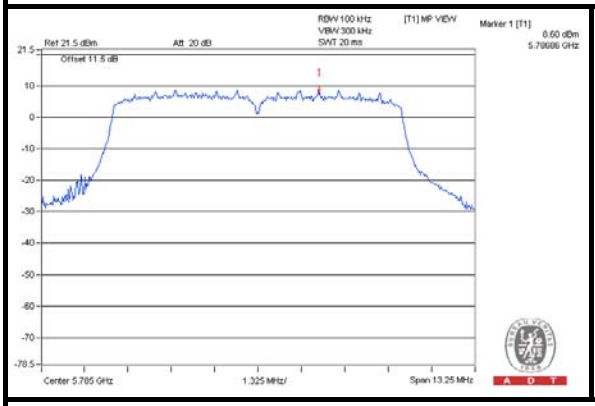
802.11a (10MHz)
CHAIN 0

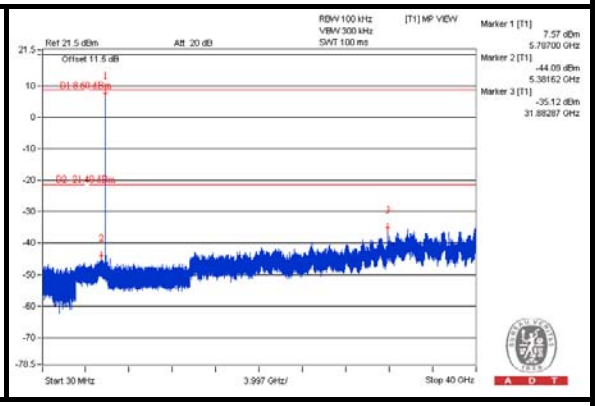
CH 149



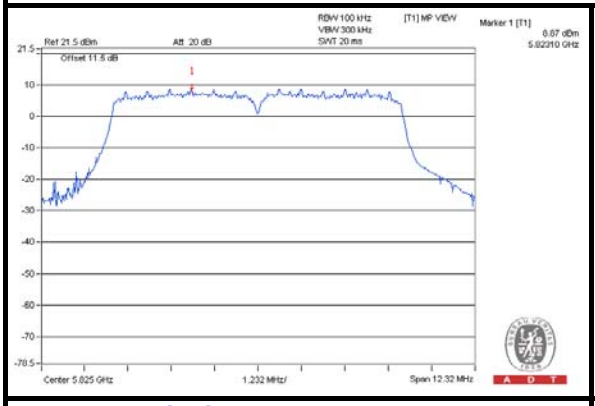


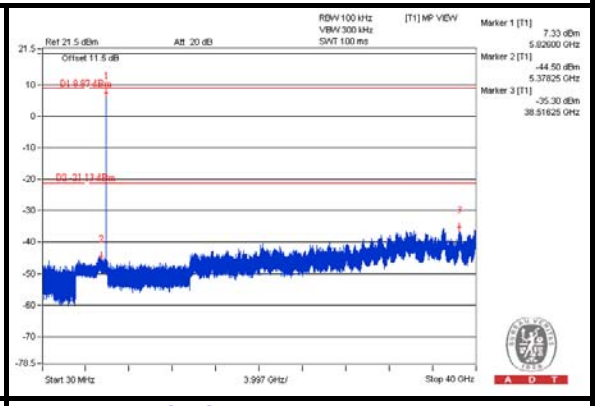
CH 157



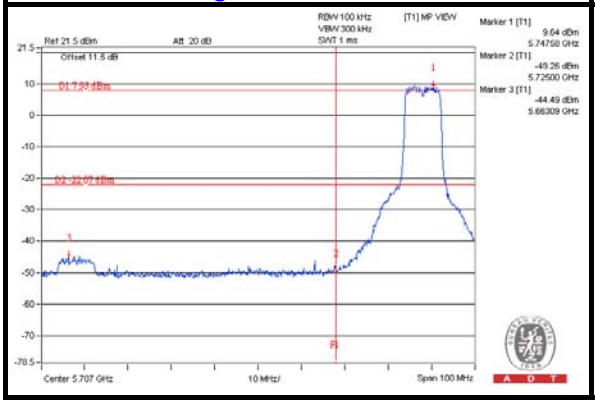


CH 165

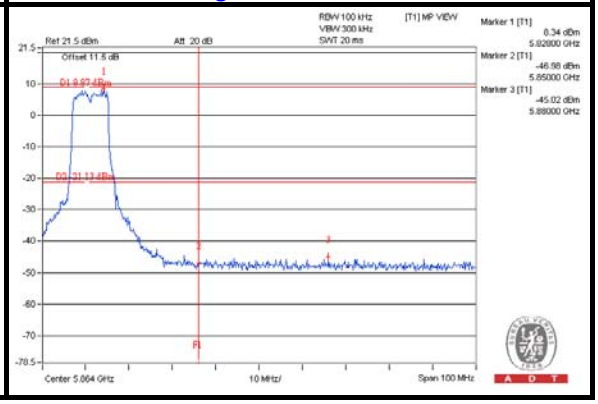




CH 149 Band edge

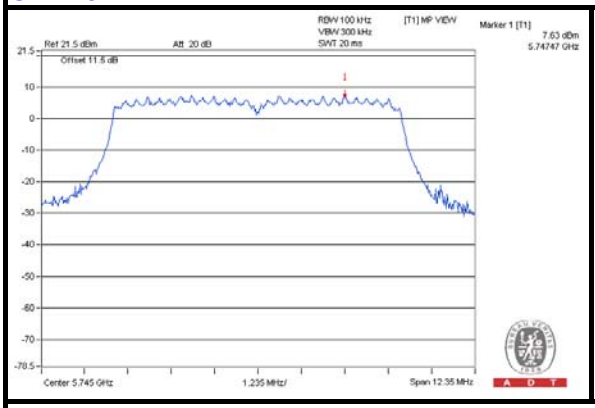


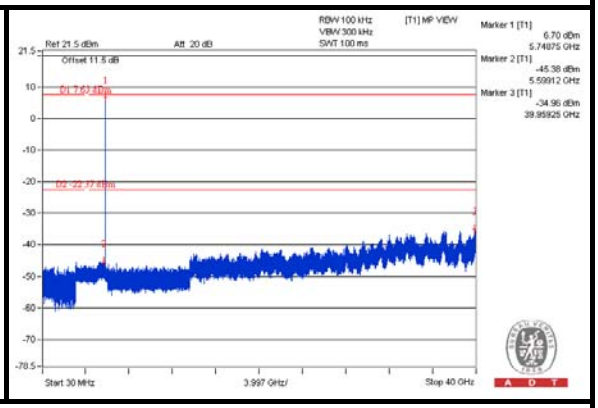
CH 165 Band edge



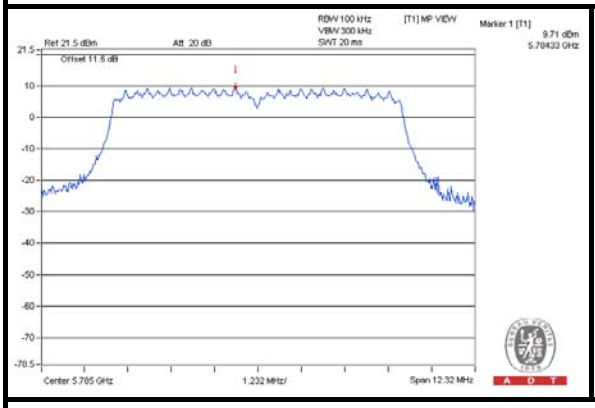
CHAIN 1

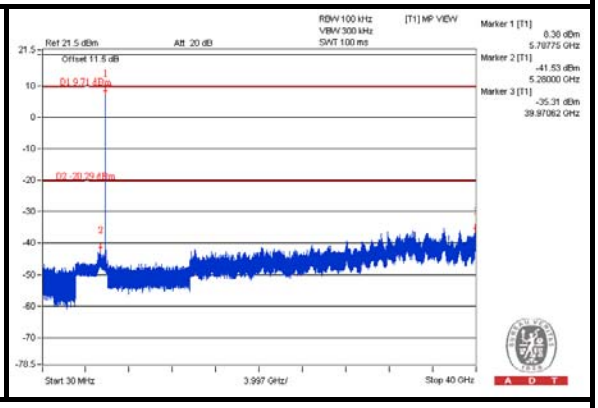
CH 149



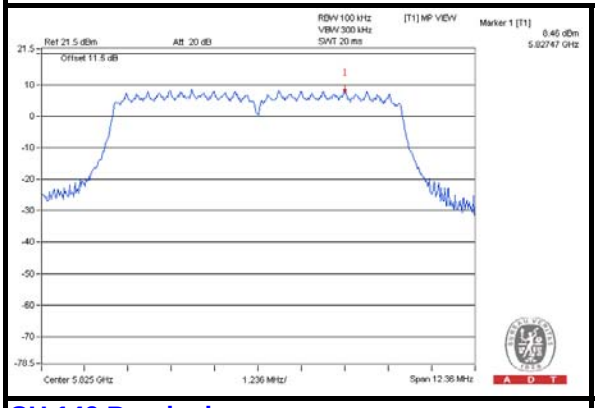


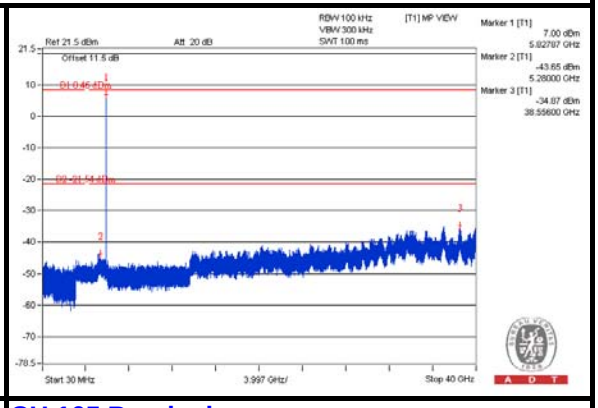
CH 157



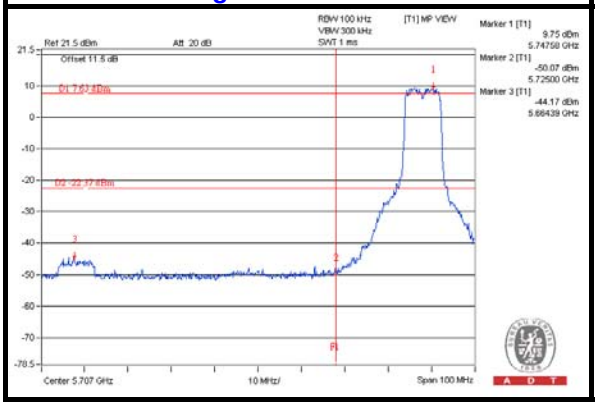


CH 165

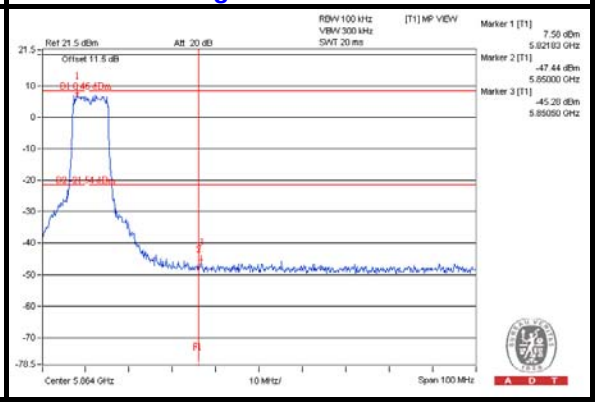




CH 149 Band edge

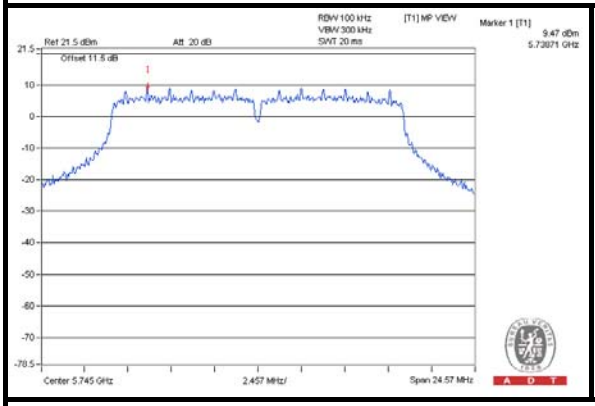


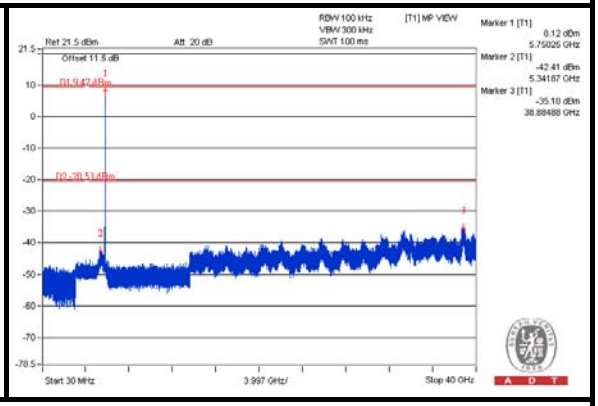
CH 165 Band edge



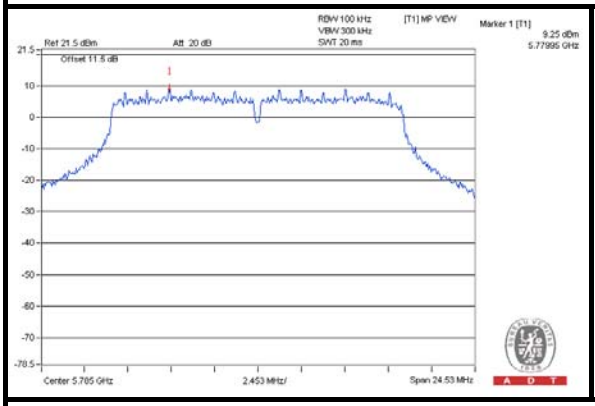
802.11a (20MHz)
CHAIN 0

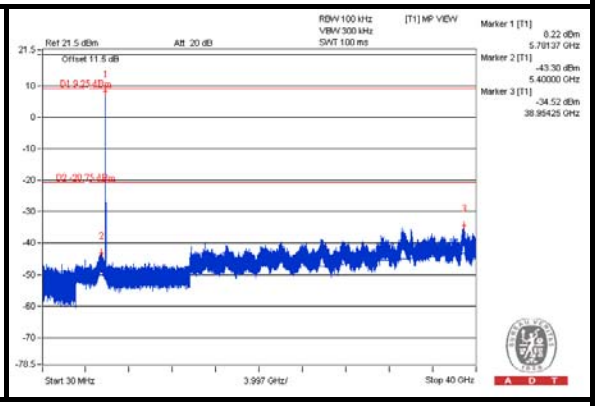
CH 149



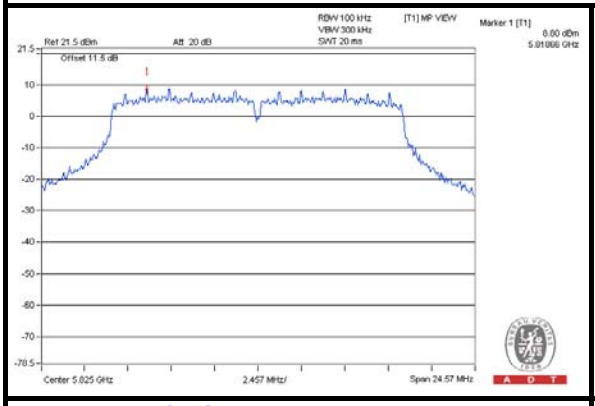


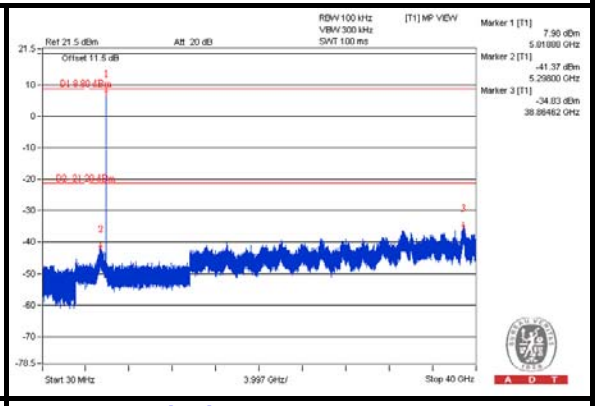
CH 157



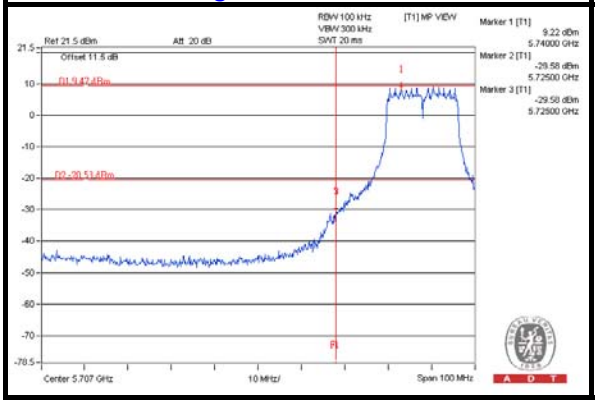


CH 165

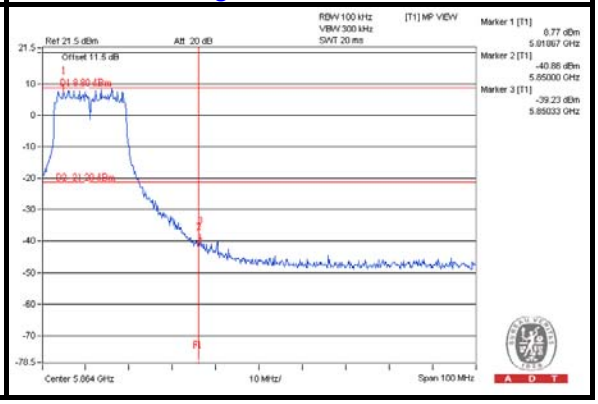




CH 149 Band edge

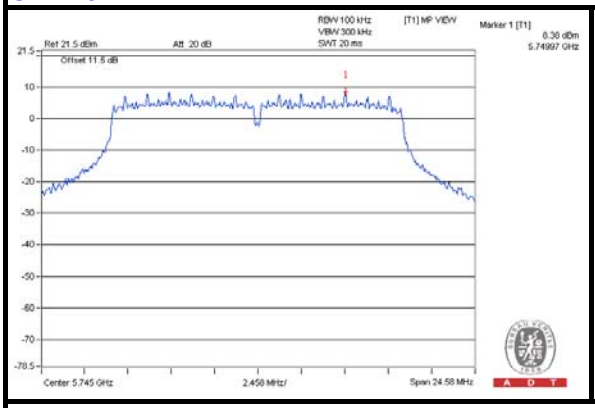


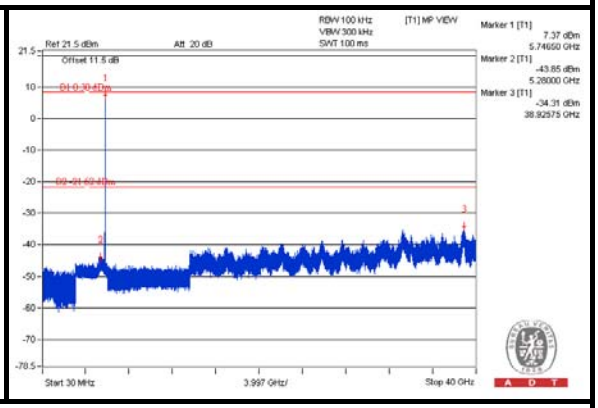
CH 165 Band edge



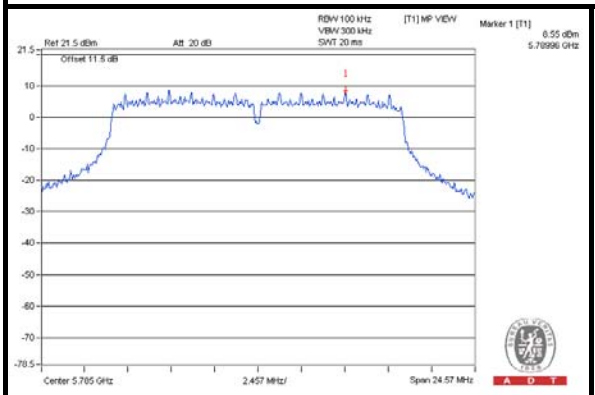
CHAIN 1

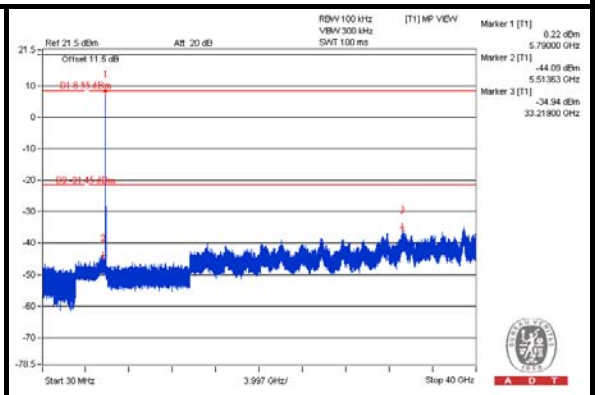
CH 149



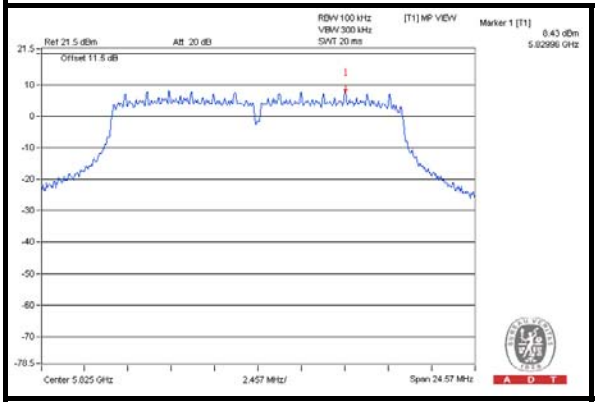


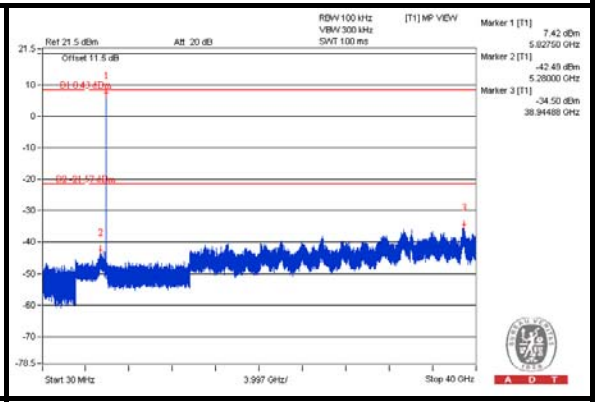
CH 157



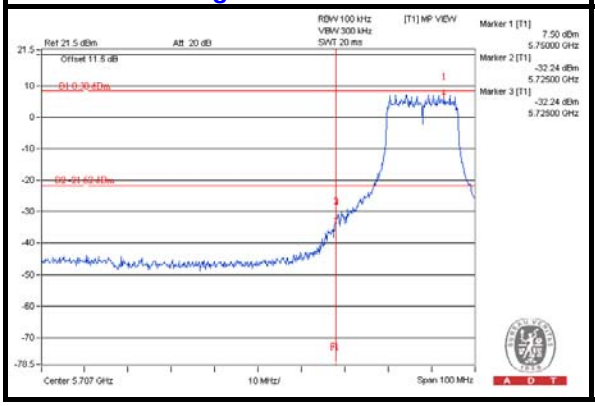


CH 165

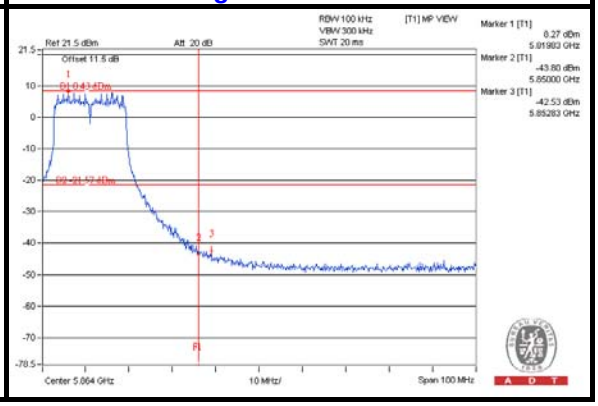




CH 149 Band edge

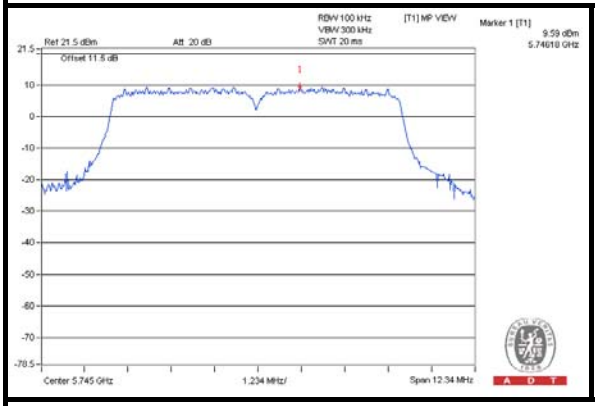


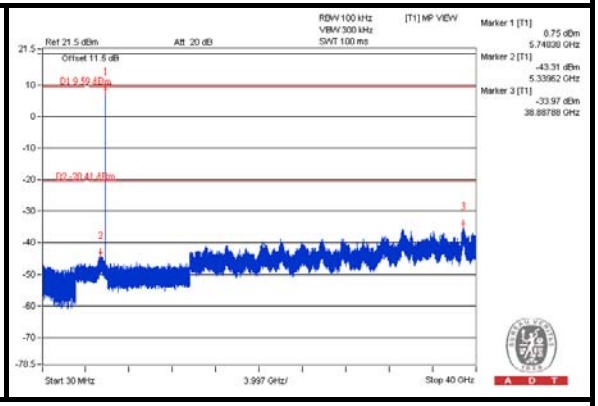
CH 165 Band edge



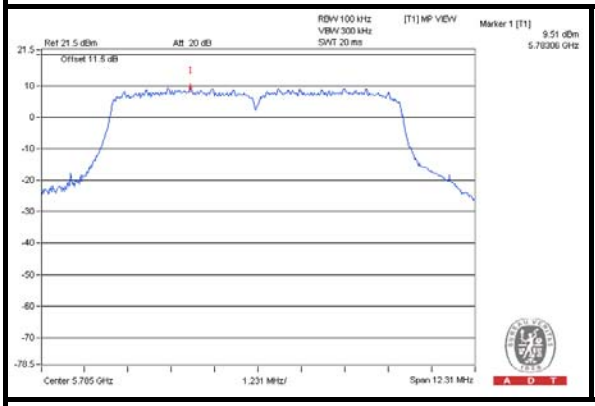
802.11n (HT10)
CHAIN 0

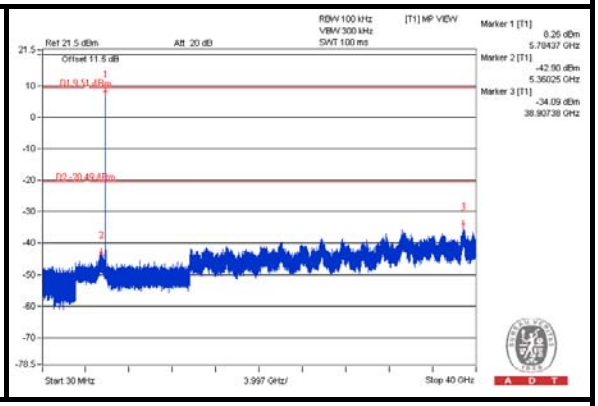
CH 149



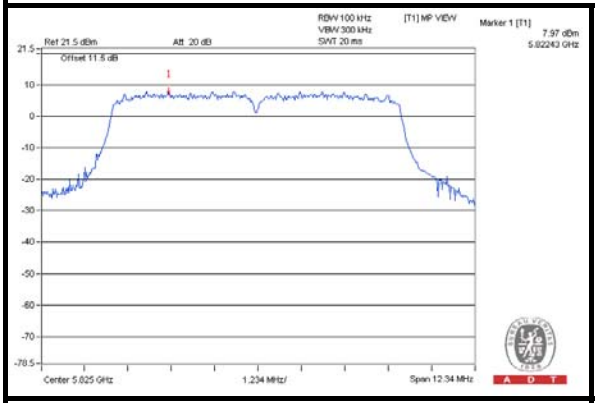


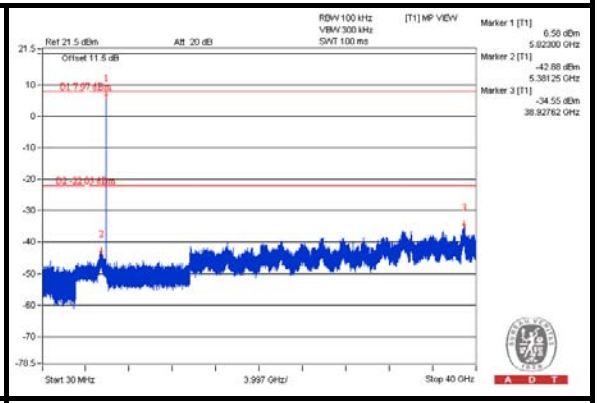
CH 157



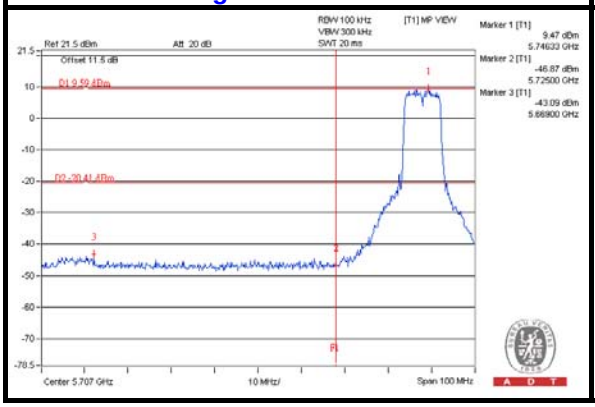


CH 165

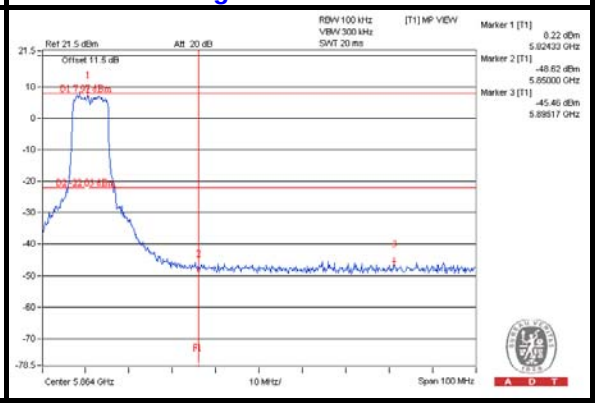




CH 149 Band edge

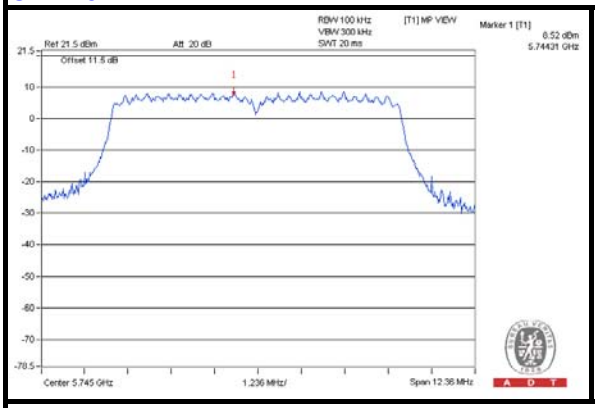


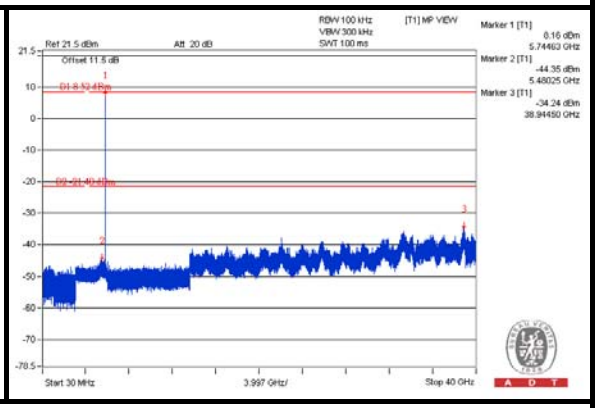
CH 165 Band edge



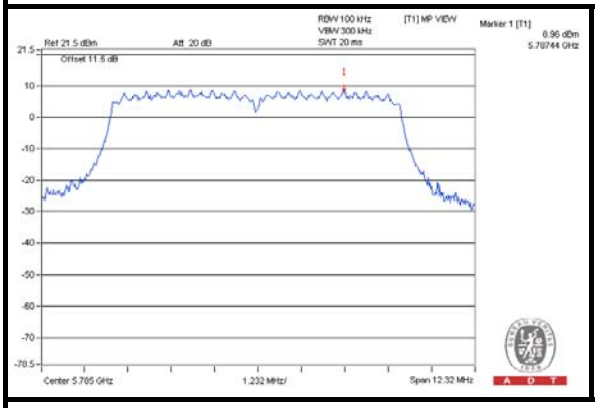
CHAIN 1

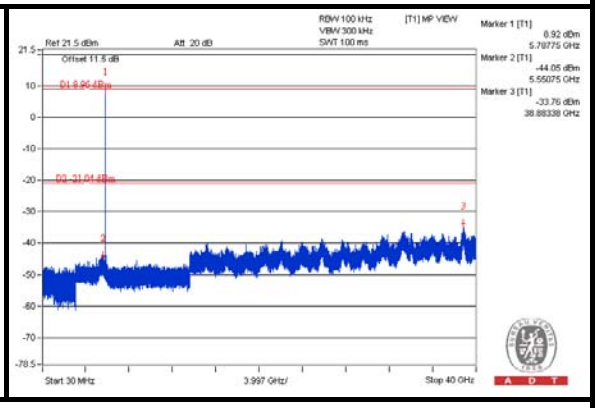
CH 149



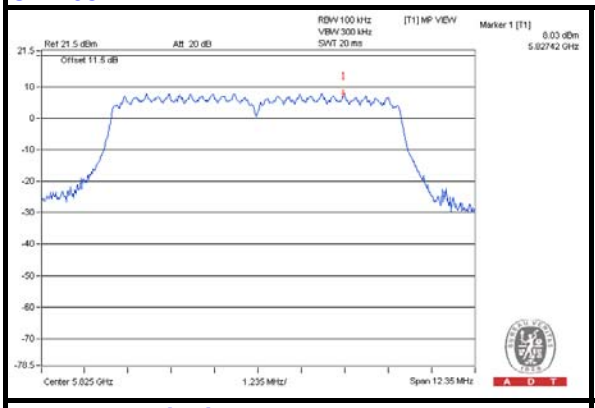


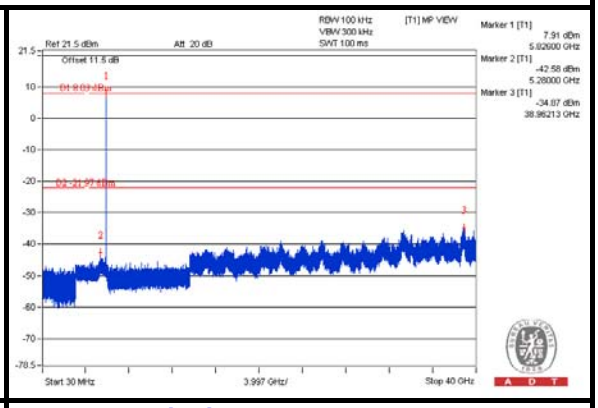
CH 157



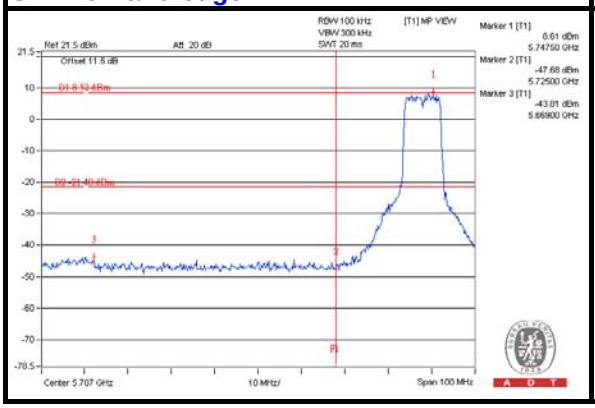


CH 165

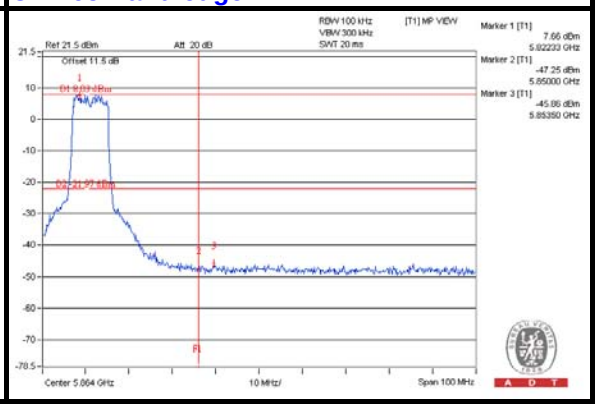




CH 149 Band edge

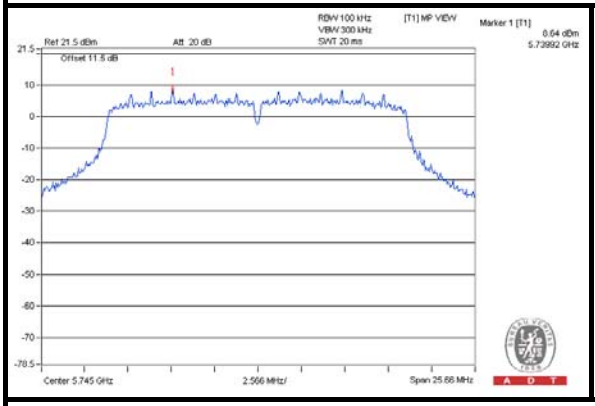


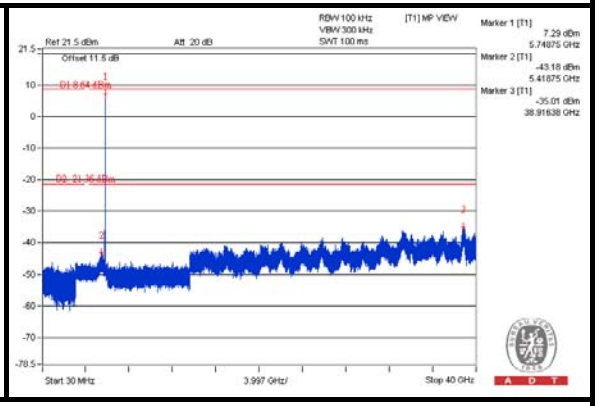
CH 165 Band edge



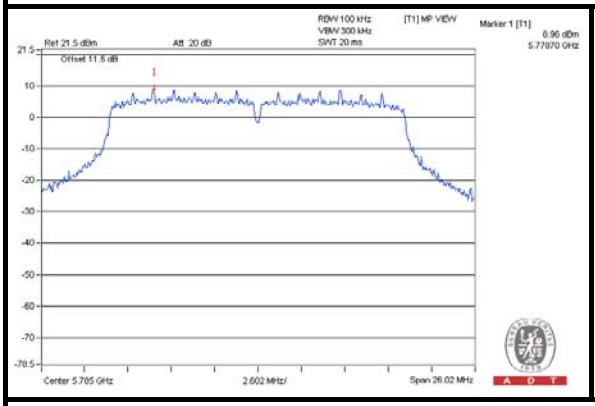
802.11n (HT20)
CHAIN 0

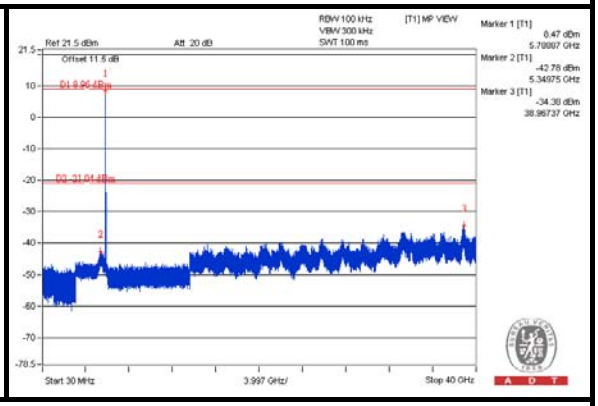
CH 149



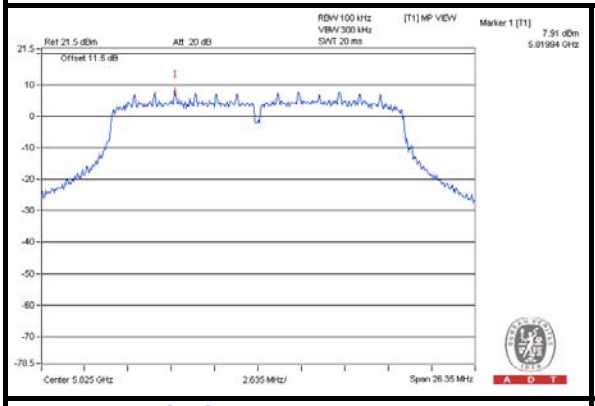


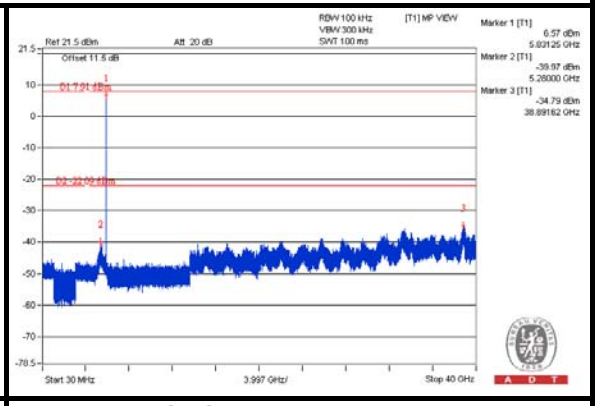
CH 157



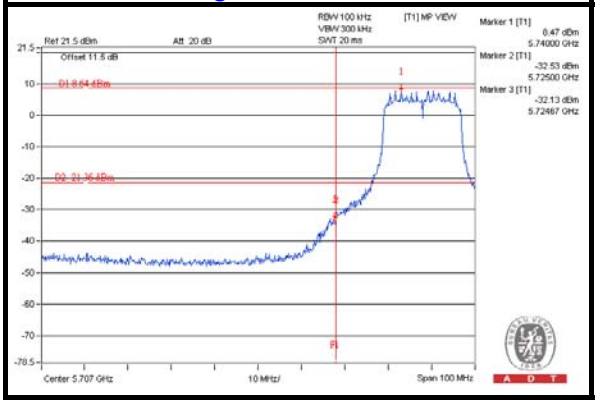


CH 165

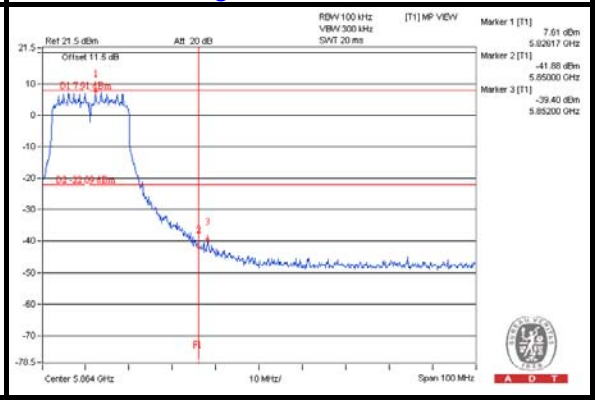




CH 149 Band edge

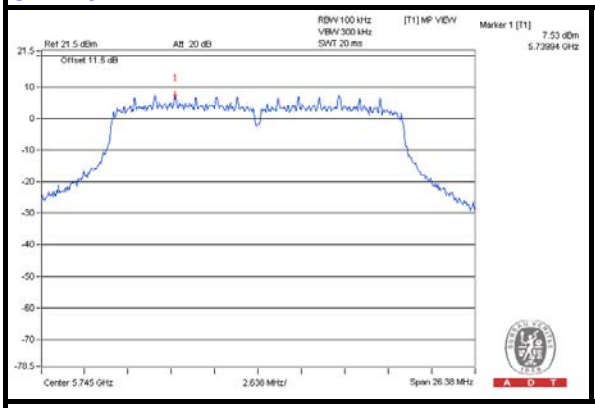


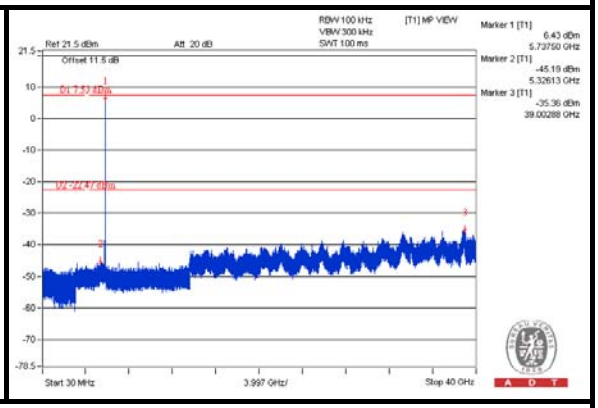
CH 165 Band edge



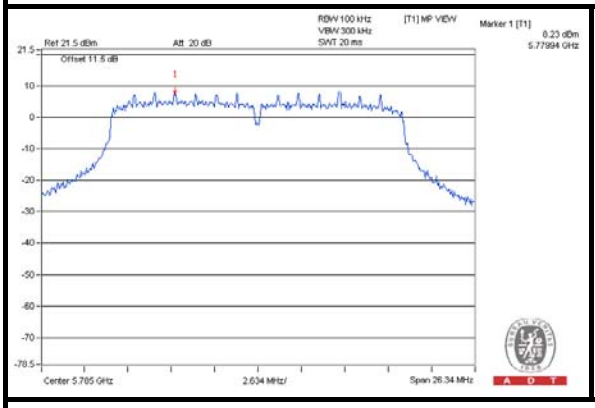
CHAIN 1

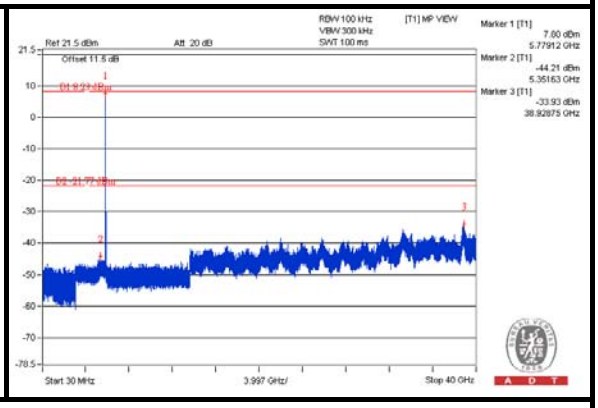
CH 149



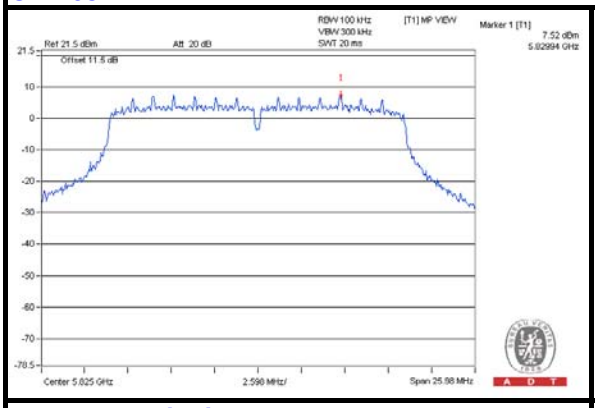


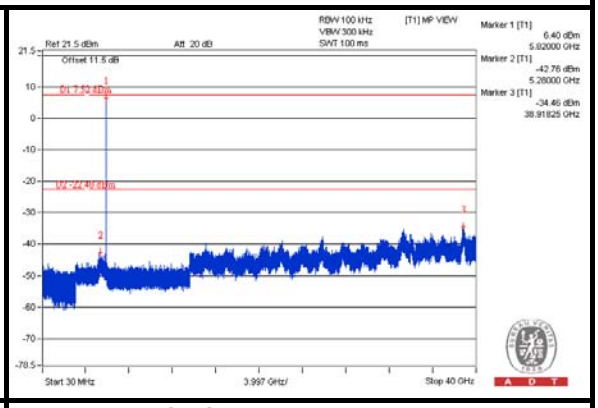
CH 157



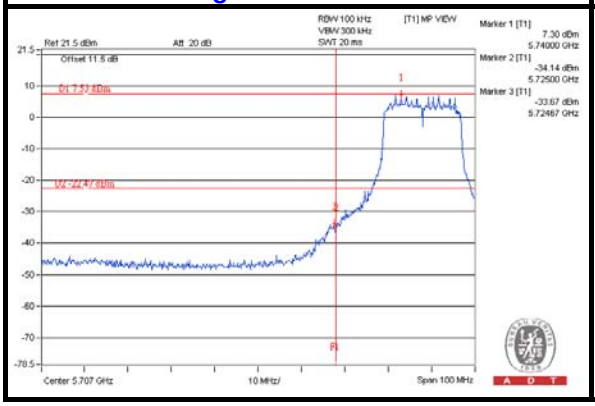


CH 165

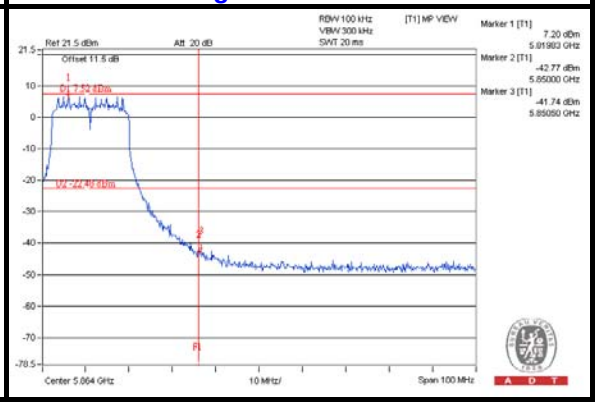




CH 149 Band edge

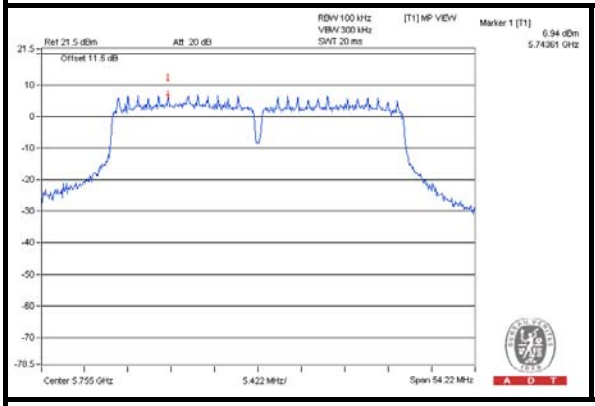


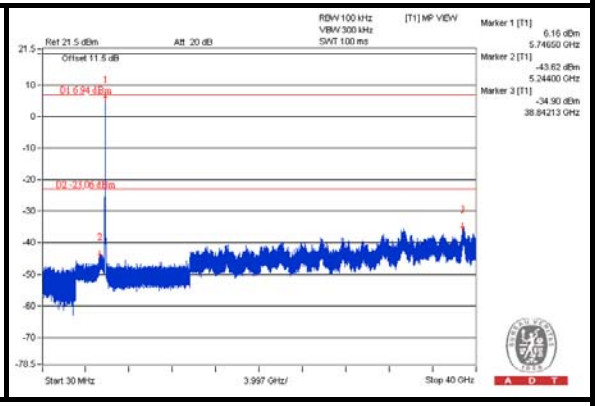
CH 165 Band edge



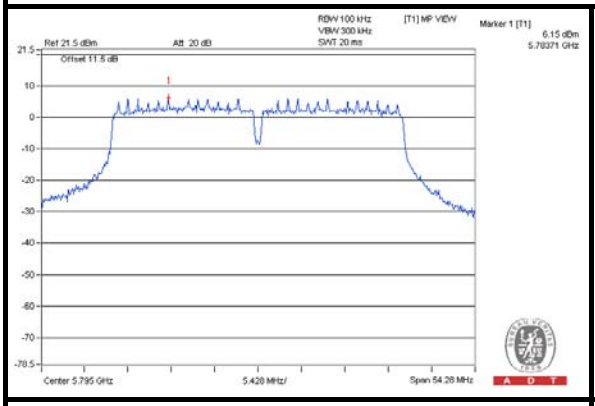
802.11n (HT40)
CHAIN 0

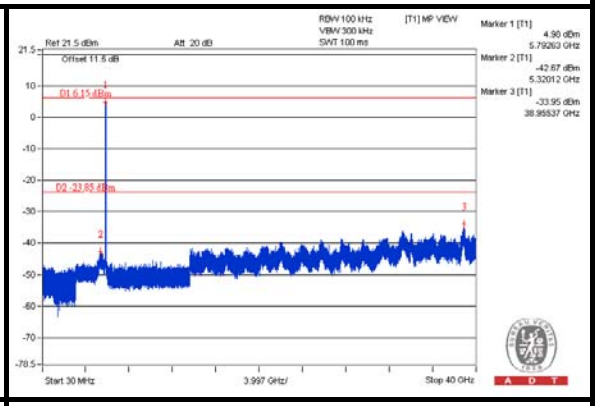
CH 151



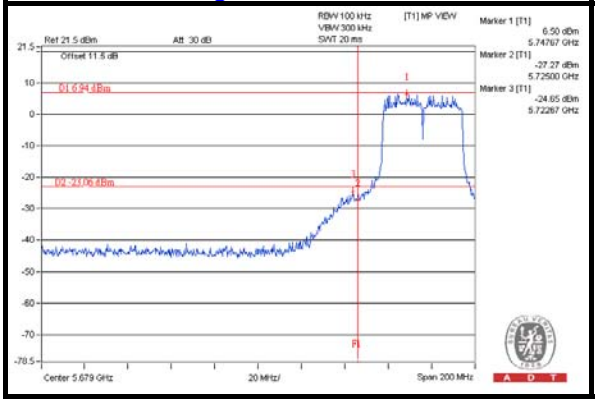


CH 159

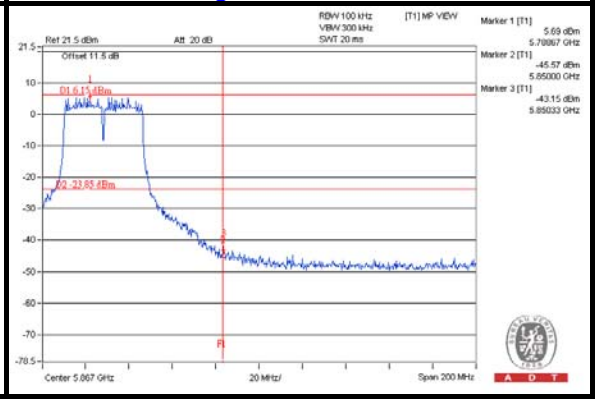




CH 151 Band edge

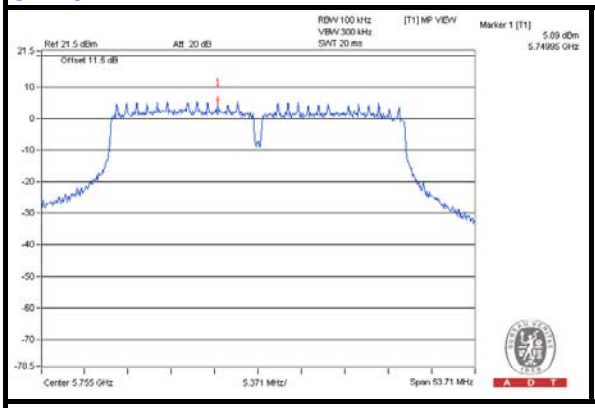


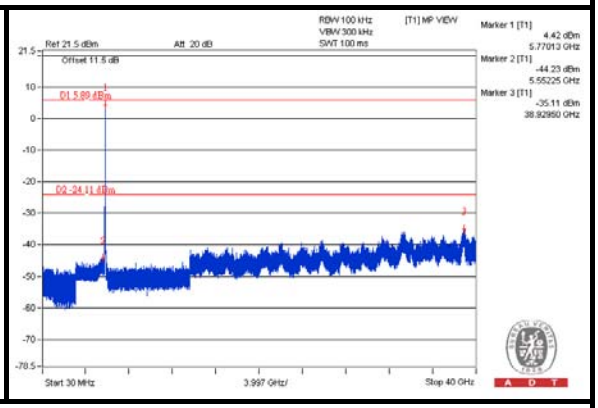
CH 159 Band edge



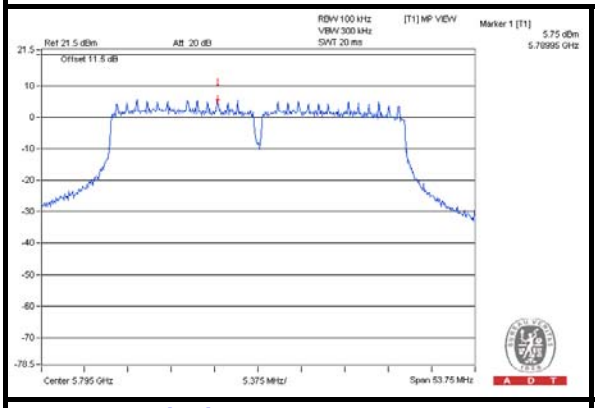
CHAIN 1

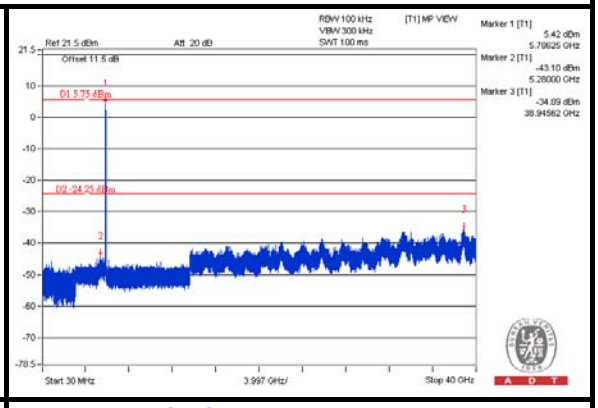
CH 151



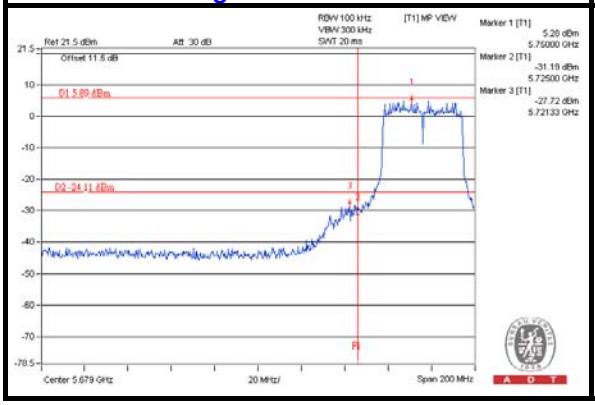


CH 159

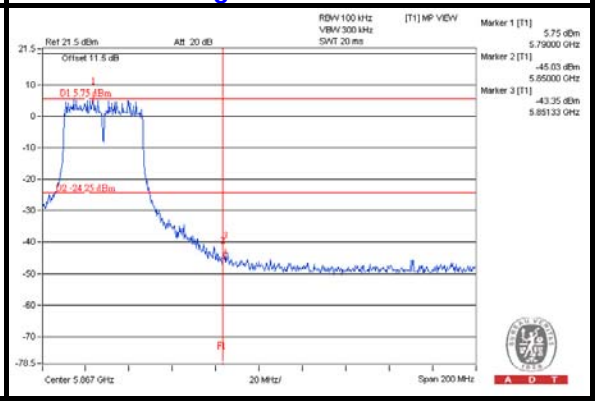




CH 151 Band edge



CH 159 Band edge



5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

6. INFORMATION ON THE TESTING LABORATORIES

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

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

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26051924

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

Hwa Ya EMC/RF/Safety Telecom 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.

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

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

---END---