FCC TEST REPORT (15.247)

REPORT NO.:	RF140306C19-1
MODEL NO.:	0P8B200
FCC ID:	NM80P8B200
RECEIVED:	Mar. 03, 2014
TESTED:	Mar. 22, 2014 ~ Mar. 31, 2014
ISSUED:	Apr. 15, 2014

APPLICANT:	HTC Corporation
ADDRESS:	1F, 6-3 Baoqiang Road, Xindian District, New Taipei City, Taiwan 231

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
RF140306C19-1	Original release	Apr. 15, 2014

1. CERTIFICATION

PRODUCT:	Smartphone
MODEL NO.:	0P8B200
BRAND:	HTC
APPLICANT:	HTC Corporation
TESTED:	Mar. 22, 2014 ~ Mar. 31, 2014
TEST SAMPLE:	PRODUCTION UNIT
STANDARDS:	**FCC Part 15, Subpart C (Section 15.247)**
	ANSI C63.10-2009

The above equipment (model: 0P8B200) 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 :** Apr. 15, 2014

Ivonne Wu / Supervisor

APPROVED BY : _____ **, DATE :** Apr. 15, 2014

Sam Chen / Senior Project Engineer

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 -4.71dB at 13.55859MHz.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.98dB at 2484.00MHz.
15.247(d)	Band Edge Measurement	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	No antenna connector is used.

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	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 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	Smartphone
MODEL NO.	0P8B200
POWER SUPPLY	5.0Vdc (adapter or host equipment) 3.8Vdc (Li-ion battery)
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: 11.0 / 5.5 / 2.0 / 1.0 Mbps 802.11g: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps 802.11a: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps 802.11n: up to MCS7
OPERATING FREQUENCY	**2.4GHz:** 2412 ~ 2462MHz **5.0GHz:** 5745 ~ 5805MHz
NUMBER OF CHANNEL	**2.4GHz:** 11 for 802.11b, 802.11g, 802.11n (20MHz) **5.0GHz:** 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
OUTPUT POWER	161.06mW for 2412 ~ 2462MHz 244.34mW for 5745 ~ 5805MHz
ANTENNA TYPE	**2.4GHz:** PIFA antenna with -3.9dBi gain **5.0GHz:** PIFA antenna with -5.9dBi gain
ANTENNA CONNECTOR	NA
DATA CABLE	Refer to Note as below
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	Refer to Note as below

NOTE:

1. The EUT's accessories list refers to Ext. Pho.
2. The above EUT information is declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

FOR 2.4GHz:

11 channels are provided for 802.11b, 802.11g and 802.11n (20MHz):

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		

FOR 5.0GHz (5745 ~ 5805MHz):

4 channels are provided for 802.11a, 802.11n (20MHz):

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

2 channels are provided for 802.11n (40MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755MHz	159	5795MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

WLAN 2.4GHz:

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 **X-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)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 6, 11	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)
-	802.11n (20MHz)	1 to 11	11	OFDM	BPSK	MCS0

POWER LINE CONDUCTED EMISSION TEST:

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11n (20MHz)	1 to 11	11	OFDM	BPSK	MCS0

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)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 6, 11	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)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0

Test CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Johnson Liao
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Johnson Liao
PLC	25deg. C, 65%RH	120Vac, 60Hz	Johnson Liao
APCM	25deg. C, 65%RH	120Vac, 60Hz	Howard Kao

WLAN 5.0GHz (5745 ~ 5805MHz):

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 **X-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	149 to 161	149, 157, 161	OFDM	BPSK	6.0
-	802.11n (20MHz)	149 to 161	149, 157, 161	OFDM	BPSK	MCS0
-	802.11n (40MHz)	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	149 to 161	161	OFDM	BPSK	6.0

POWER LINE CONDUCTED EMISSION TEST:

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	149 to 161	161	OFDM	BPSK	6.0

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	149 to 161	149, 157, 161	OFDM	BPSK	6.0
-	802.11n (20MHz)	149 to 161	149, 157, 161	OFDM	BPSK	MCS0
-	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	MCS0

ANTENNA PORT CONDUCTED MEASUREMENT:

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	149 to 161	149, 157, 161	OFDM	BPSK	6.0
-	802.11n (20MHz)	149 to 161	149, 157, 161	OFDM	BPSK	MCS0
-	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	MCS0

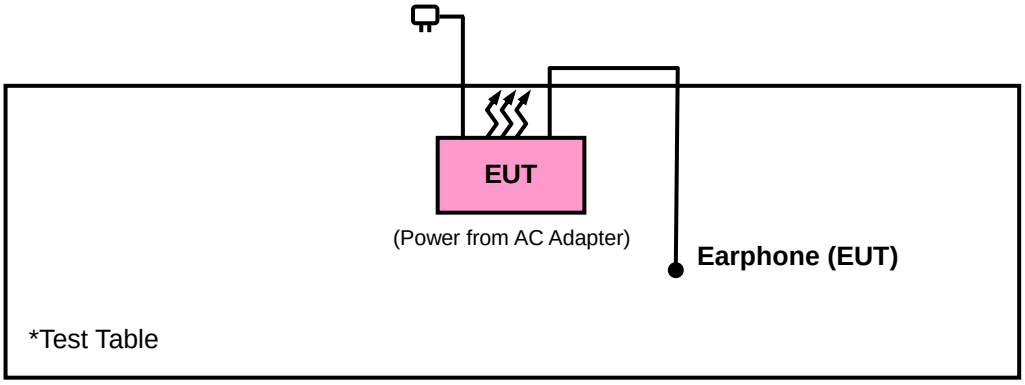
Test CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Johnson Liao
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Johnson Liao
PLC	25deg. C, 65%RH	120Vac, 60Hz	Johnson Liao
APCM	25deg. C, 65%RH	120Vac, 60Hz	Howard Kao

3.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units.

3.3.1 CONFIGURATION OF SYSTEM UNDER TEST



3.4 DUTY CYCLE TEST SIGNAL

WLAN 2.4GHz

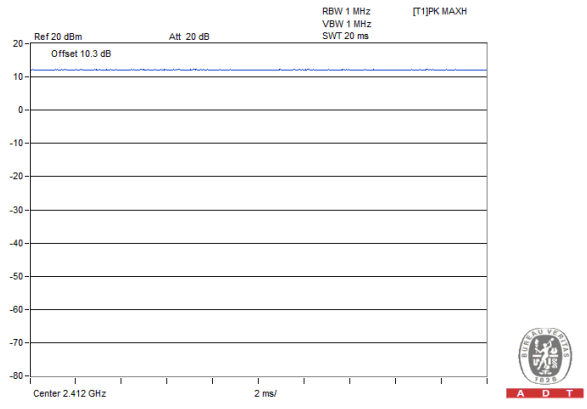
802.11b: Duty cycle of test signal is 100 %, duty factor is not required.

Duty cycle of test signal is > 98 %

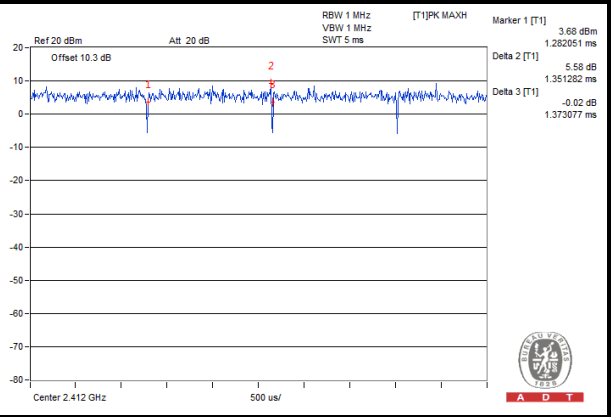
802.11g: Duty cycle = 1.351/1.373 = 0.984

802.11n (20MHz): Duty cycle = 1.266/1.290 = 0.981

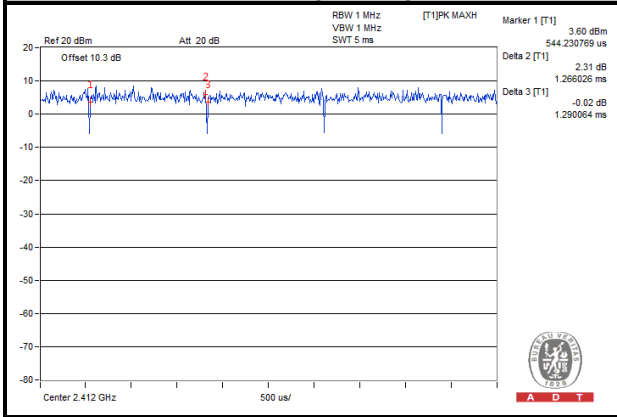
802.11b



802.11g (20MHz)



802.11n (20MHz)



5725MHz ~ 5850MHz

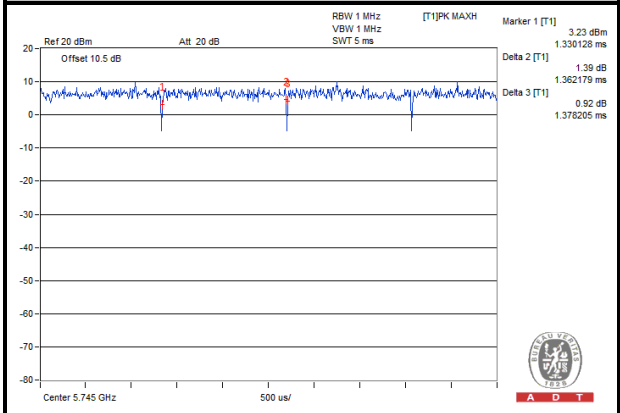
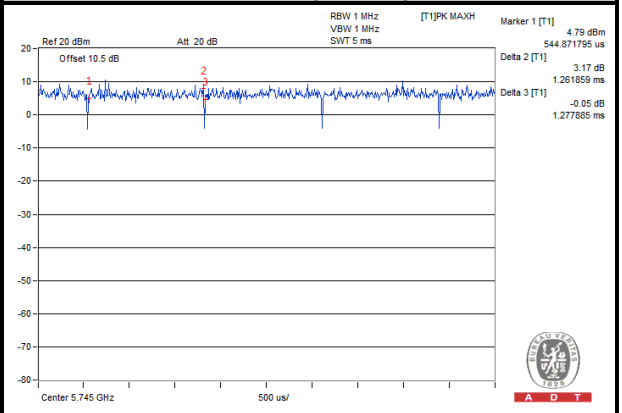
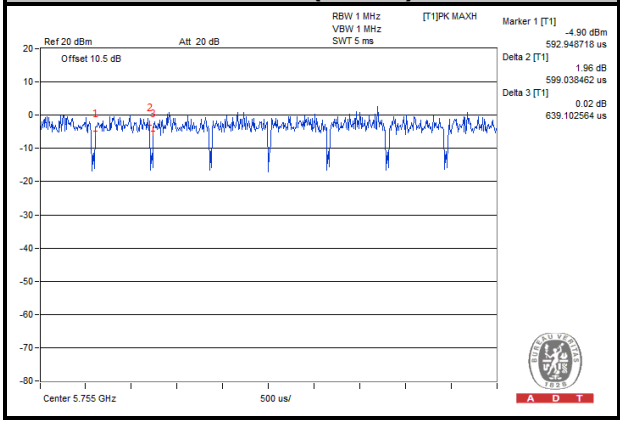
Duty cycle of test signal is > 98 %, duty factor is not required.

802.11a: Duty cycle = 1.362/1.378 = 0.988

802.11n (20MHz): Duty cycle = 1.262/1.278 = 0.987

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

802.11n (40MHz): Duty cycle = 599.04/639.10 = 0.937, Duty factor = 10 * log(1/0.937) = 0.28

802.11a	802.11n (20MHz)
	
802.11n (40MHz)	
	

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)
ANSI C63.10-2009
558074 D01 DTS Meas Guidance v03r01

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 (FOR 2.4GHz BAND)

4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

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

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100744	Apr. 15, 2013	Apr. 14, 2014
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 21, 2013	Dec. 20, 2014
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Feb. 27. 2014	Feb. 26, 2015
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Feb. 19, 2014	Feb. 18, 2015
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 18, 2013	Dec. 17, 2014
Loop Antenna	HFH2-Z2	100070	Mar. 06, 2014	Mar. 05, 2016
Preamplifier EMCI	EMC 012645	980115	Dec. 26, 2013	Dec. 25, 2014
Preamplifier EMCI	EMC 184045	980116	Jan. 13, 2014	Jan. 12, 2015
Preamplifier EMCI	EMC 330H	980112	Dec. 27, 2013	Dec. 26, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4 2950114	Oct. 18, 2013	Oct. 17, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 18, 2013	Oct. 17, 2014
RF signal cable Worken	RG-213	NA	Nov. 07, 2013	Nov. 06, 2014
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Power Meter	ML2495A	1232002	Aug. 23, 2013	Aug. 22, 2014
Power Sensor	MA2411B	1207325	Aug. 23, 2013	Aug. 22, 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 calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in HwaYa Chamber 10.
4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
5. The FCC Site Registration No. is 690701.
6. The IC Site Registration No. is IC 7450F-10.

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:

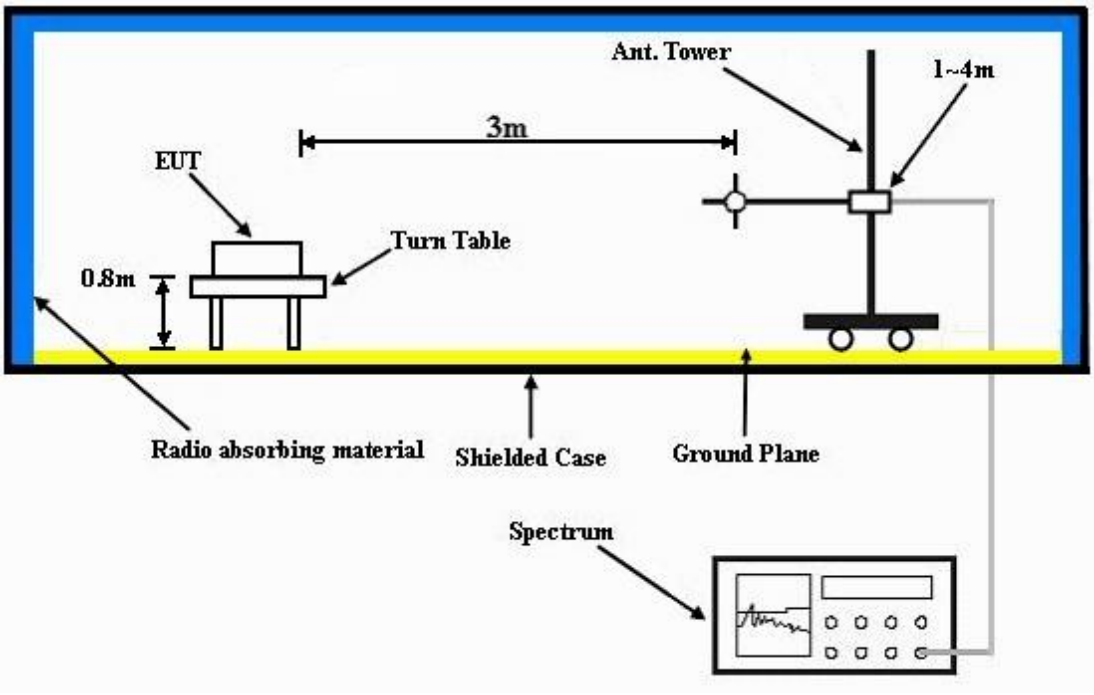
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 1kHz (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

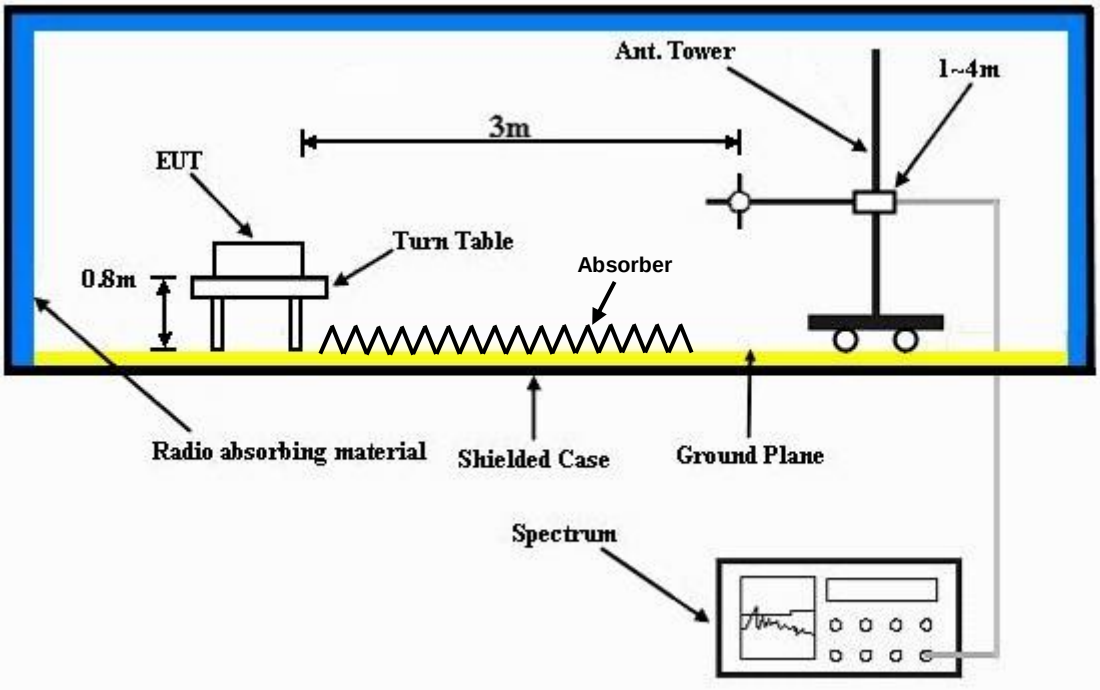
No deviation.

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 a testing table.
b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

4.1.7 TEST RESULTS

ABOVE 1GHz WORST-CASE DATA

802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Johnson Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	34.77	41.84	54	-19.23	26.91	3.54	37.52	107	31	Average
2390	50.87	57.94	74	-23.13	26.91	3.54	37.52	107	31	Peak
2412	103.65	110.67			26.96	3.54	37.52	107	31	Average
2412	107.46	114.48			26.96	3.54	37.52	107	31	Peak
2484	38.38	44.95	54	-15.62	27.15	3.6	37.32	107	31	Average
2484	51.11	57.68	74	-22.89	27.15	3.6	37.32	107	31	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	34.85	41.92	54	-19.15	26.91	3.54	37.52	161	42	Average
2390	49.26	56.33	74	-24.74	26.91	3.54	37.52	161	42	Peak
2412	95.72	102.74			26.96	3.54	37.52	161	42	Average
2412	99.43	106.45			26.96	3.54	37.52	161	42	Peak
2484	34.43	41	54	-19.57	27.15	3.6	37.32	161	42	Average
2484	47.96	54.53	74	-26.04	27.15	3.6	37.32	161	42	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2412MHz: Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Johnson Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	34.7	41.77	54	-19.3	26.91	3.54	37.52	105	38	Average
2390	49.39	56.46	74	-24.61	26.91	3.54	37.52	105	38	Peak
2437	102.44	109.28			27.06	3.56	37.46	105	38	Average
2437	106.07	112.91			27.06	3.56	37.46	105	38	Peak
2484	35.31	41.88	54	-18.69	27.15	3.6	37.32	105	38	Average
2484	50.59	57.16	74	-23.41	27.15	3.6	37.32	105	38	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	33.63	40.7	54	-20.37	26.91	3.54	37.52	130	26	Average
2390	48.61	55.68	74	-25.39	26.91	3.54	37.52	130	26	Peak
2437	96.61	103.45			27.06	3.56	37.46	130	26	Average
2437	100.38	107.22			27.06	3.56	37.46	130	26	Peak
2484	34.44	41.01	54	-19.56	27.15	3.6	37.32	130	26	Average
2484	48.88	55.45	74	-25.12	27.15	3.6	37.32	130	26	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2437MHz: Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Johnson Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	35.77	42.84	54	-18.23	26.91	3.54	37.52	105	41	Average
2390	49.89	56.96	74	-24.11	26.91	3.54	37.52	105	41	Peak
2462	101.26	107.97			27.1	3.58	37.39	105	41	Average
2462	105.01	111.72			27.1	3.58	37.39	105	41	Peak
2484	41.24	47.81	54	-12.76	27.15	3.6	37.32	105	41	Average
2484	52.37	58.94	74	-21.63	27.15	3.6	37.32	105	41	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	34.03	41.1	54	-19.97	26.91	3.54	37.52	127	26	Average
2390	48.64	55.71	74	-25.36	26.91	3.54	37.52	127	26	Peak
2462	94.94	101.65			27.1	3.58	37.39	127	26	Average
2462	98.93	105.64			27.1	3.58	37.39	127	26	Peak
2484	37.25	43.82	54	-16.75	27.15	3.6	37.32	127	26	Average
2484	50.76	57.33	74	-23.24	27.15	3.6	37.32	127	26	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2462MHz: Fundamental frequency.

802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Johnson Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	44.38	51.45	54	-9.62	26.91	3.54	37.52	105	35	Average
2390	60.95	68.02	74	-13.05	26.91	3.54	37.52	105	35	Peak
2412	97.67	104.69			26.96	3.54	37.52	105	35	Average
2412	107.38	114.4			26.96	3.54	37.52	105	35	Peak
2484	36.44	43.01	54	-17.56	27.15	3.6	37.32	105	35	Average
2484	50.93	57.5	74	-23.07	27.15	3.6	37.32	105	35	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	38.31	45.38	54	-15.69	26.91	3.54	37.52	102	14	Average
2390	53.32	60.39	74	-20.68	26.91	3.54	37.52	102	14	Peak
2412	90.72	97.74			26.96	3.54	37.52	102	14	Average
2412	99.96	106.98			26.96	3.54	37.52	102	14	Peak
2484	34.59	41.16	54	-19.41	27.15	3.6	37.32	102	14	Average
2484	49.64	56.21	74	-24.36	27.15	3.6	37.32	102	14	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2412MHz: Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Johnson Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	34.96	42.03	54	-19.04	26.91	3.54	37.52	105	29	Average
2390	51.37	58.44	74	-22.63	26.91	3.54	37.52	105	29	Peak
2437	97.49	104.33			27.06	3.56	37.46	105	29	Average
2437	106.94	113.78			27.06	3.56	37.46	105	29	Peak
2484	35.38	41.95	54	-18.62	27.15	3.6	37.32	105	29	Average
2484	50.24	56.81	74	-23.76	27.15	3.6	37.32	105	29	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	33.7	40.77	54	-20.3	26.91	3.54	37.52	104	24	Average
2390	48.49	55.56	74	-25.51	26.91	3.54	37.52	104	24	Peak
2437	89.81	96.65			27.06	3.56	37.46	104	24	Average
2437	99.48	106.32			27.06	3.56	37.46	104	24	Peak
2484	34.39	40.96	54	-19.61	27.15	3.6	37.32	104	24	Average
2484	50.08	56.65	74	-23.92	27.15	3.6	37.32	104	24	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2437MHz: Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Johnson Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	35.4	42.47	54	-18.6	26.91	3.54	37.52	104	31	Average
2390	49.9	56.97	74	-24.1	26.91	3.54	37.52	104	31	Peak
2462	97.51	104.22			27.1	3.58	37.39	104	31	Average
2462	107.18	113.89			27.1	3.58	37.39	104	31	Peak
2484	51.64	58.21	54	-2.36	27.15	3.6	37.32	104	31	Average
2484	69.27	75.84	74	-4.73	27.15	3.6	37.32	104	31	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	34.1	41.17	54	-19.9	26.91	3.54	37.52	100	14	Average
2390	49.1	56.17	74	-24.9	26.91	3.54	37.52	100	14	Peak
2462	90.3	97.01			27.1	3.58	37.39	100	14	Average
2462	99.82	106.53			27.1	3.58	37.39	100	14	Peak
2484	44.28	50.85	54	-9.72	27.15	3.6	37.32	100	14	Average
2484	62.93	69.5	74	-11.07	27.15	3.6	37.32	100	14	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2462MHz: Fundamental frequency.

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Johnson Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	48.67	55.74	54	-5.33	26.91	3.54	37.52	105	38	Average
2390	64.83	71.9	74	-9.17	26.91	3.54	37.52	105	38	Peak
2412	98.37	105.39			26.96	3.54	37.52	105	38	Average
2412	107.94	114.96			26.96	3.54	37.52	105	38	Peak
2484	36.07	42.64	54	-17.93	27.15	3.6	37.32	105	38	Average
2484	51.28	57.85	74	-22.72	27.15	3.6	37.32	105	38	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	41.72	48.79	54	-12.28	26.91	3.54	37.52	131	13	Average
2390	58.81	65.88	74	-15.19	26.91	3.54	37.52	131	13	Peak
2412	91.43	98.45			26.96	3.54	37.52	131	13	Average
2412	100.88	107.9			26.96	3.54	37.52	131	13	Peak
2484	34.37	40.94	54	-19.63	27.15	3.6	37.32	131	13	Average
2484	48.73	55.3	74	-25.27	27.15	3.6	37.32	131	13	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2412MHz: Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Johnson Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	35.81	42.88	54	-18.19	26.91	3.54	37.52	106	37	Average
2390	50.5	57.57	74	-23.5	26.91	3.54	37.52	106	37	Peak
2437	97.17	104.01			27.06	3.56	37.46	106	37	Average
2437	106.77	113.61			27.06	3.56	37.46	106	37	Peak
2484	35.44	42.01	54	-18.56	27.15	3.6	37.32	106	37	Average
2484	50.82	57.39	74	-23.18	27.15	3.6	37.32	106	37	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	34.07	41.14	54	-19.93	26.91	3.54	37.52	100	15	Average
2390	47.81	54.88	74	-26.19	26.91	3.54	37.52	100	15	Peak
2437	89.98	96.82			27.06	3.56	37.46	100	15	Average
2437	99.68	106.52			27.06	3.56	37.46	100	15	Peak
2484	34.43	41	54	-19.57	27.15	3.6	37.32	100	15	Average
2484	49.04	55.61	74	-24.96	27.15	3.6	37.32	100	15	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2437MHz: Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Johnson Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	36.08	43.15	54	-17.92	26.91	3.54	37.52	102	37	Average
2390	50.91	57.98	74	-23.09	26.91	3.54	37.52	102	37	Peak
2462	97.35	104.06			27.1	3.58	37.39	102	37	Average
2462	106.64	113.35			27.1	3.58	37.39	102	37	Peak
2484	52.02	58.59	54	-1.98	27.15	3.6	37.32	102	37	Average
2484	69.84	76.41	74	-4.16	27.15	3.6	37.32	102	37	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	35.08	42.15	54	-18.92	26.91	3.54	37.52	100	14	Average
2390	50.96	58.03	74	-23.04	26.91	3.54	37.52	100	14	Peak
2462	89.71	96.42			27.1	3.58	37.39	100	14	Average
2462	99.19	105.9			27.1	3.58	37.39	100	14	Peak
2484	46.11	52.68	54	-7.89	27.15	3.6	37.32	100	14	Average
2484	63.16	69.73	74	-10.84	27.15	3.6	37.32	100	14	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2462MHz: Fundamental frequency.

BELOW 1GHz WORST-CASE DATA:

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	30MHz ~ 1GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Quasi-peak (QP)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Johnson Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
113.16	27.56	47.9	43.5	-15.94	10.37	1.15	31.86	100	124	Peak
200.1	27.24	48.06	43.5	-16.26	9.36	1.59	31.77	100	118	Peak
254.37	21.86	40.32	46	-24.14	11.59	1.85	31.9	100	74	Peak
387.5	22.99	37.58	46	-23.01	15.05	2.38	32.02	100	105	Peak
619.9	23.54	32.72	46	-22.46	19.84	3.15	32.17	100	67	Peak
888	27.5	32.2	46	-18.5	23.36	3.93	31.99	100	28	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
30.81	29.2	47.61	40	-10.8	12.14	0.57	31.12	100	282	QP
112.89	31.32	51.77	43.5	-12.18	10.27	1.14	31.86	100	150	Peak
222.24	29.79	49.53	46	-16.21	10.3	1.7	31.74	100	228	Peak
384	22.14	36.81	46	-23.86	14.96	2.36	31.99	100	35	Peak
547.8	21.98	32.54	46	-24.02	18.41	2.94	31.91	100	145	Peak
771.1	34.48	40.35	46	-11.52	21.82	3.62	31.31	100	117	Peak

REMARKS: Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

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	100288	Nov. 17, 2013	Nov. 16, 2014
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 27, 2013	Dec. 26, 2014
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Dec. 23, 2013	Dec. 22, 2014
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 08, 2013	Jul. 07, 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 2.
3. The VCCI Site Registration No. is C-2047.

4.2.3 TEST PROCEDURES

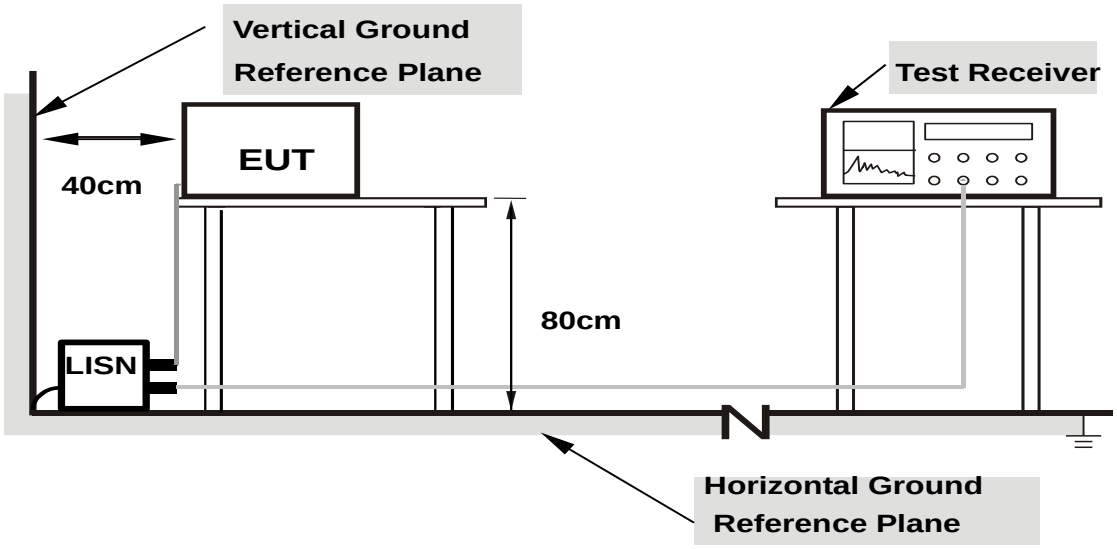
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling 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 section 4.1.6.

4.2.7 TEST RESULTS

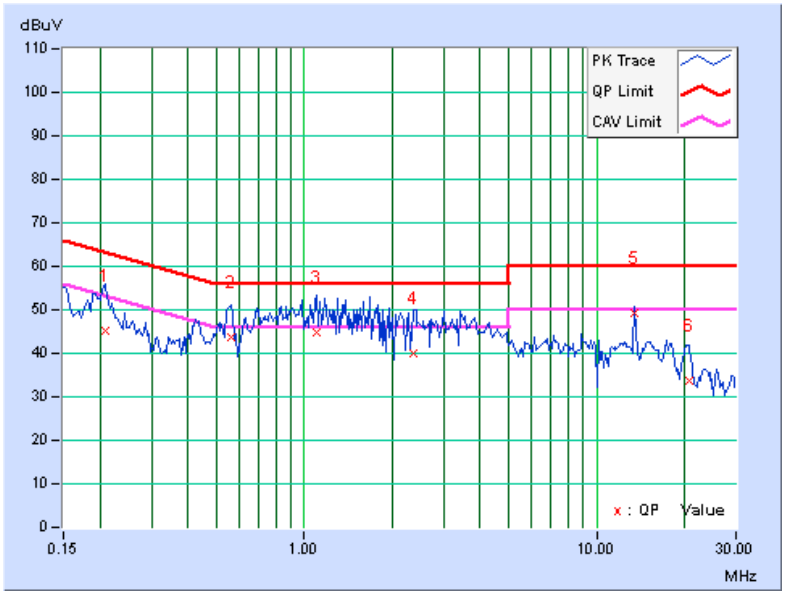
CONDUCTED WORST-CASE DATA：

PHASE	Line 1	6dB BANDWIDTH	9kHz

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	0.20859	0.28	45.08	33.13	45.36	33.41	63.26	53.26	-17.90	-19.85
2	0.56016	0.31	43.25	29.75	43.56	30.06	56.00	46.00	-12.44	-15.94
3	1.09766	0.34	44.60	33.69	44.94	34.03	56.00	46.00	-11.06	-11.97
4	2.37109	0.37	39.70	28.23	40.07	28.60	56.00	46.00	-15.93	-17.40
5	13.55859	0.52	48.67	44.77	49.19	45.29	60.00	50.00	-10.81	-4.71
6	20.65234	0.58	33.17	21.52	33.75	22.10	60.00	50.00	-26.25	-27.90

REMARKS:

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

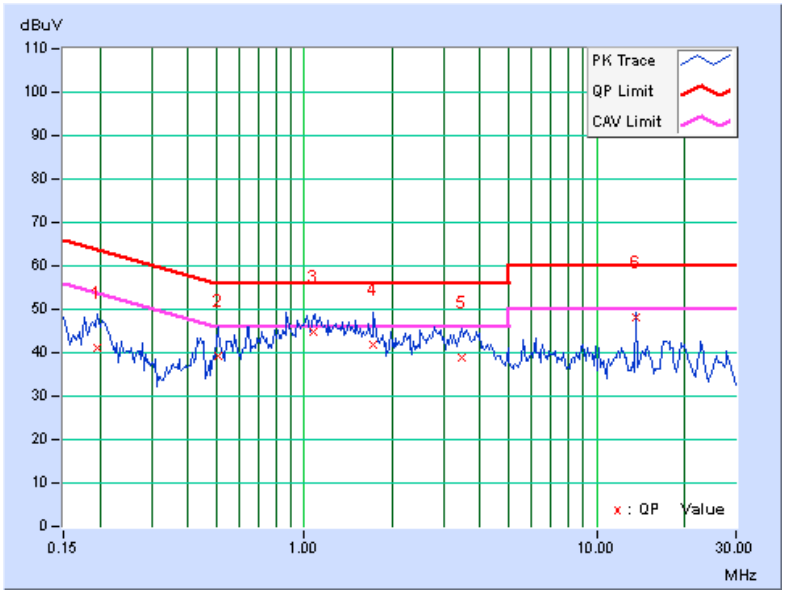


PHASE	Line 2	6dB BANDWIDTH	9kHz

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	0.28	40.87	29.16	41.15	29.44	63.74	53.74	-22.59	-24.30
2	0.50547	0.31	39.06	29.48	39.37	29.79	56.00	46.00	-16.63	-16.21
3	1.07813	0.34	44.40	34.36	44.74	34.70	56.00	46.00	-11.26	-11.30
4	1.71875	0.36	41.38	31.68	41.74	32.04	56.00	46.00	-14.26	-13.96
5	3.44922	0.42	38.37	29.46	38.79	29.88	56.00	46.00	-17.21	-16.12
6	13.56250	0.55	47.50	43.52	48.05	44.07	60.00	50.00	-11.95	-5.93

REMARKS:

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

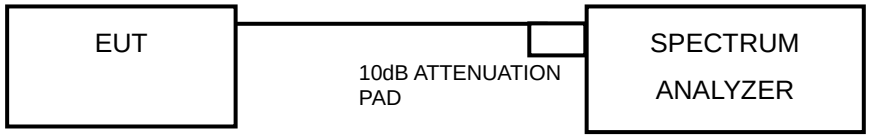


4.3 6dB BANDWIDTH MEASUREMENT

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

802.11b

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	9.07	0.5	PASS
6	2437	9.08	0.5	PASS
11	2462	9.02	0.5	PASS

802.11g

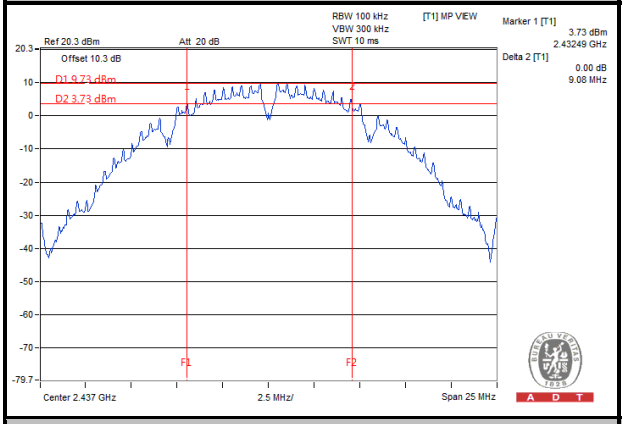
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.41	0.5	PASS
6	2437	16.41	0.5	PASS
11	2462	16.42	0.5	PASS

802.11n (20MHz)

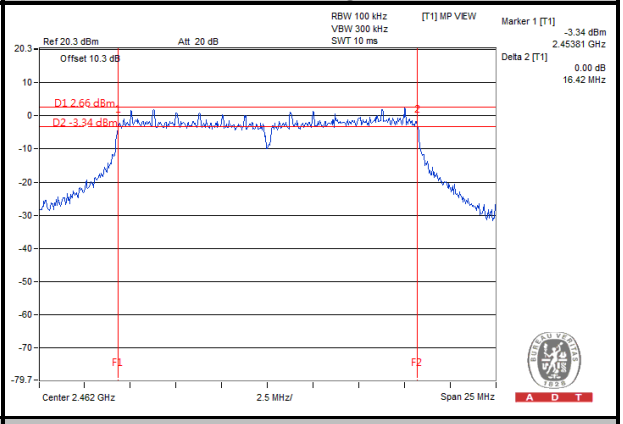
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.62	0.5	PASS
6	2437	17.36	0.5	PASS
11	2462	17.66	0.5	PASS

SPECTRUM PLOT OF WORST VALUE

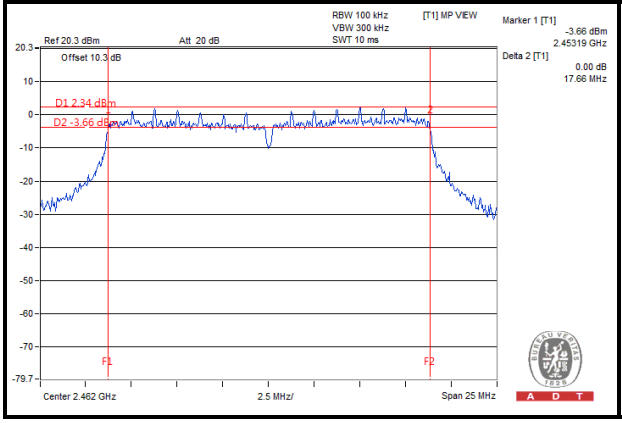
802.11b



802.11g



802.11n (20MHz)

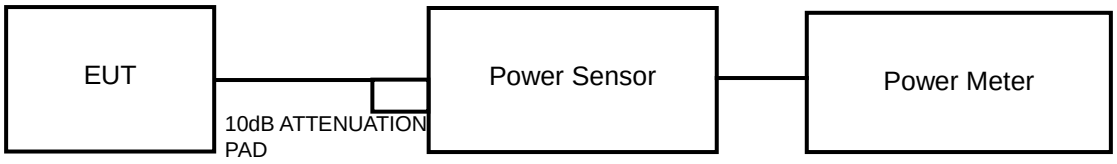


4.4 CONDUCTED OUTPUT POWER

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

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

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

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITIONS

Same as section 4.3.6.

4.4.7 TEST RESULTS

802.11b

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
1	2412	113.50	20.55	30	PASS
6	2437	115.08	20.61	30	PASS
11	2462	106.66	20.28	30	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
1	2412	145.21	21.62	30	PASS
6	2437	161.06	22.07	30	PASS
11	2462	130.32	21.15	30	PASS

802.11n (20MHz)

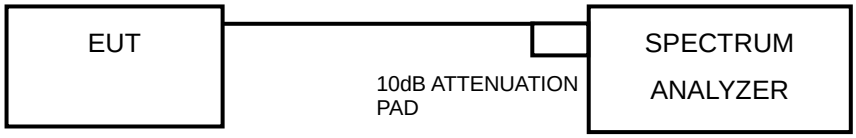
CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
1	2412	152.41	21.83	30	PASS
6	2437	152.41	21.83	30	PASS
11	2462	129.12	21.11	30	PASS

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 = peak.
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 section 4.3.6.

4.5.7 TEST RESULTS

802.11b

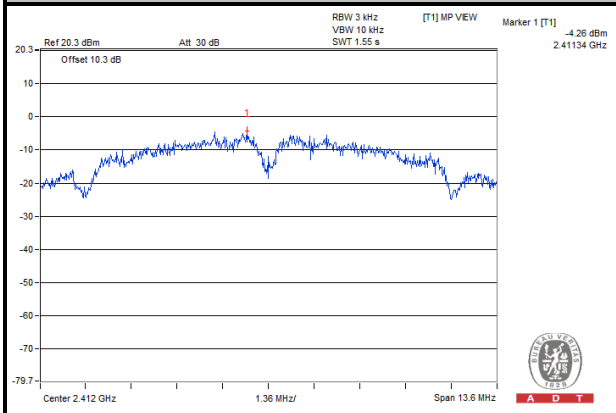
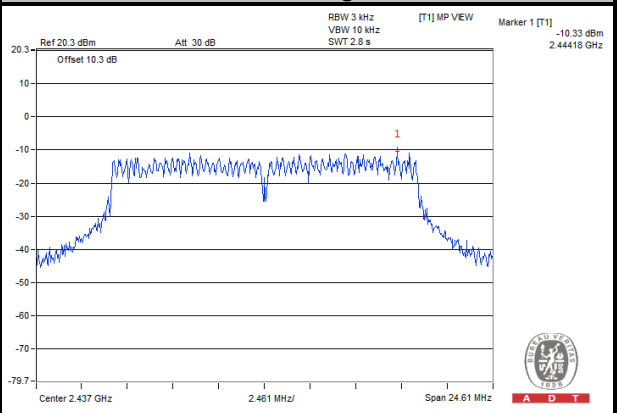
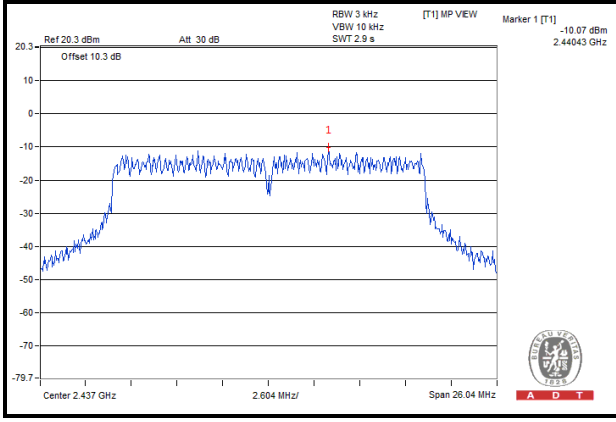
CHANNEL	FREQUENCY (MHz)	PSD (dBm/3kHz)	LIMIT (dBm/3kHz)	PASS / FAIL
1	2412	-4.26	8	PASS
6	2437	-4.73	8	PASS
11	2462	-5.12	8	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	PSD (dBm/3kHz)	LIMIT (dBm/3kHz)	PASS / FAIL
1	2412	-11.00	8	PASS
6	2437	-10.33	8	PASS
11	2462	-11.38	8	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	PSD (dBm/3kHz)	LIMIT (dBm/3kHz)	PASS / FAIL
1	2412	-10.46	8	PASS
6	2437	-10.07	8	PASS
11	2462	-12.27	8	PASS

SPECTRUM PLOT OF WORST VALUE	
802.11b	**802.11g**
	
802.11n (20MHz)	
	

4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

Below –20dB 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. 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

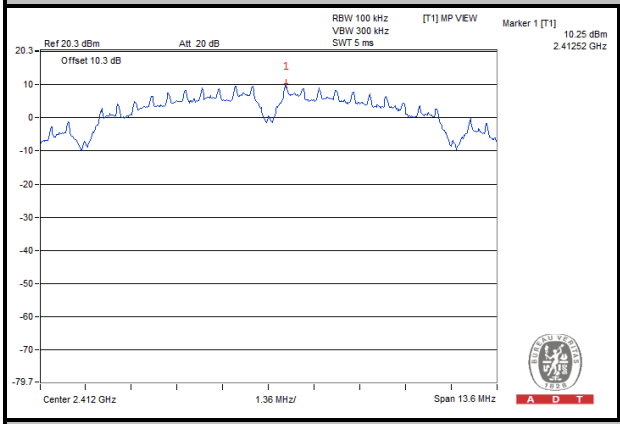
Same as section 4.3.6.

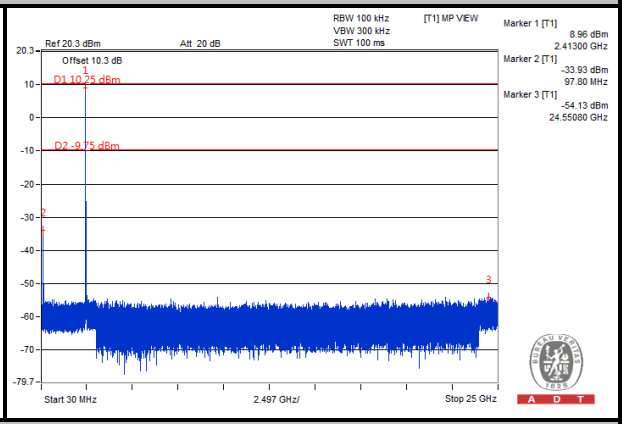
4.6.7 TEST RESULTS

The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

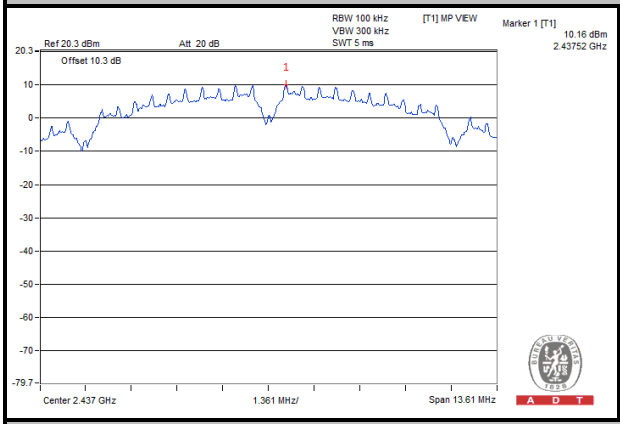
802.11b

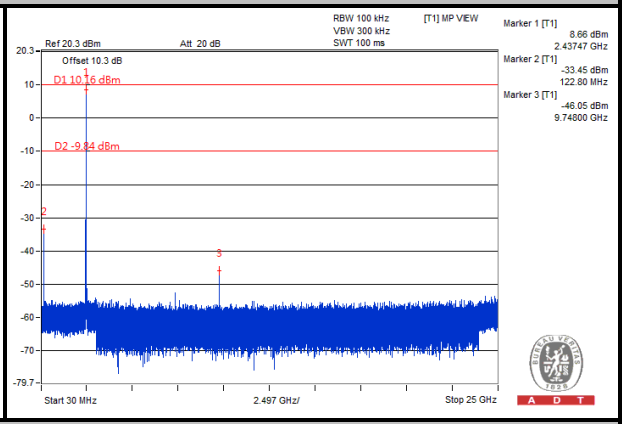
CH 1



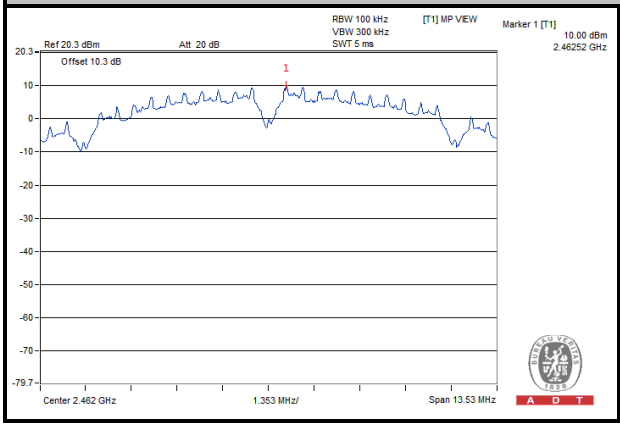


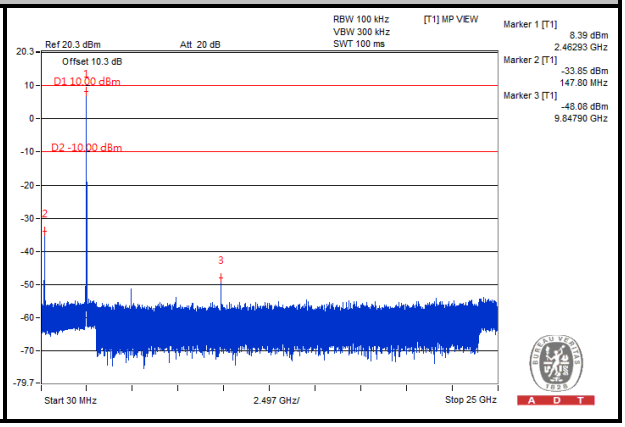
CH 6





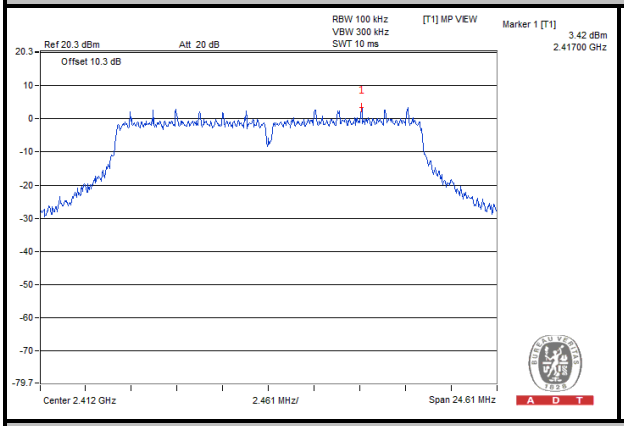
CH 11

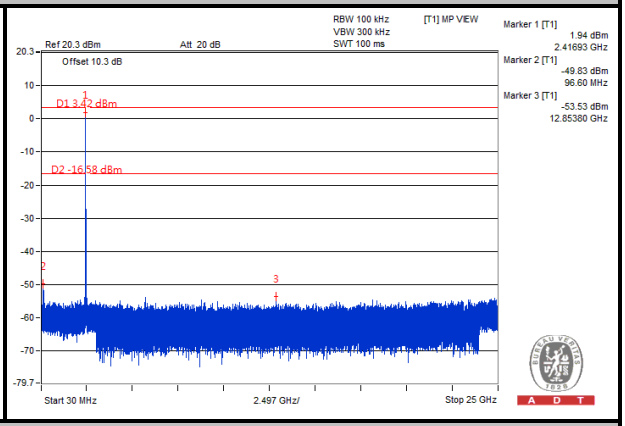




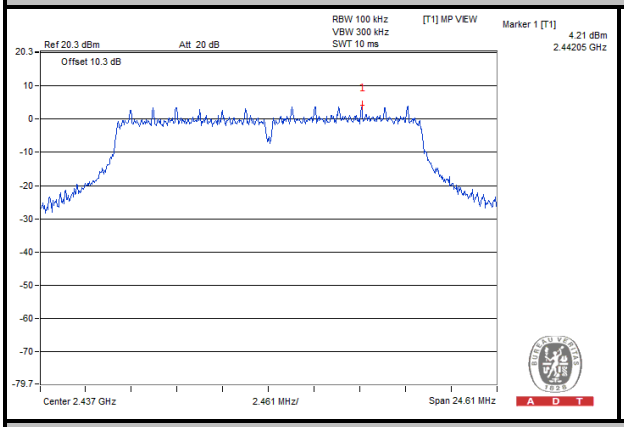
802.11g

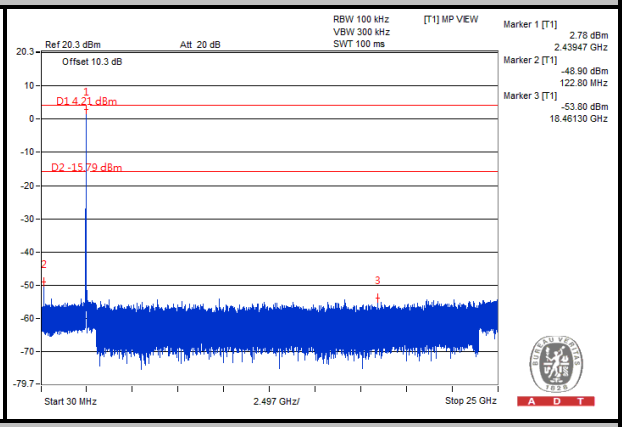
CH 1



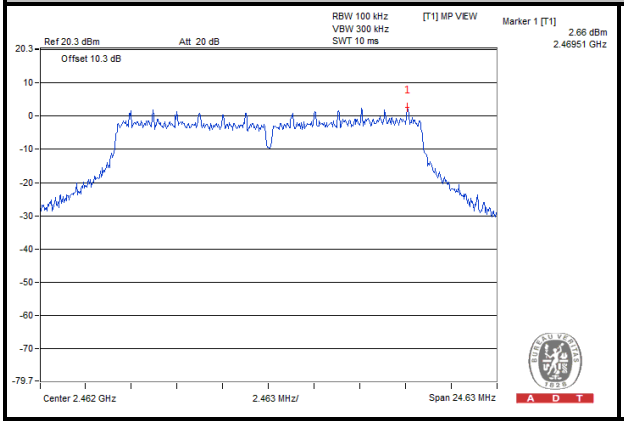


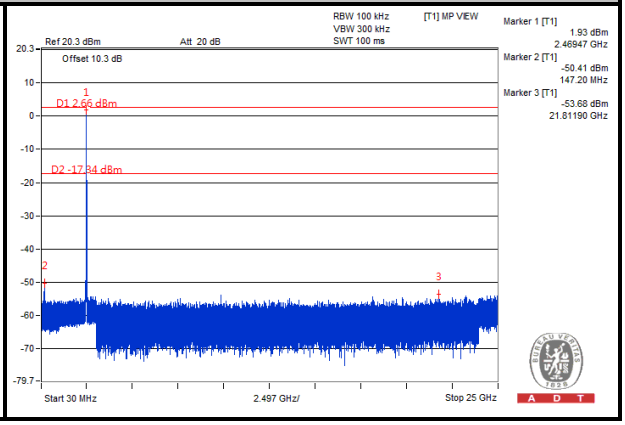
CH 6





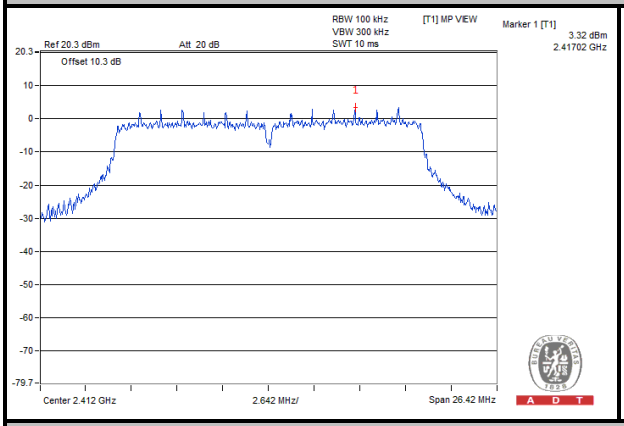
CH 11

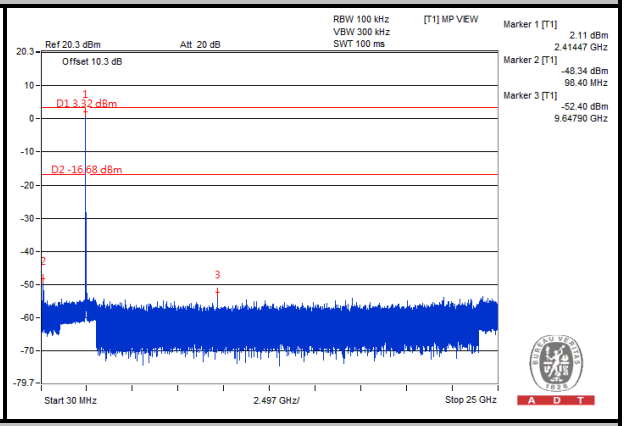




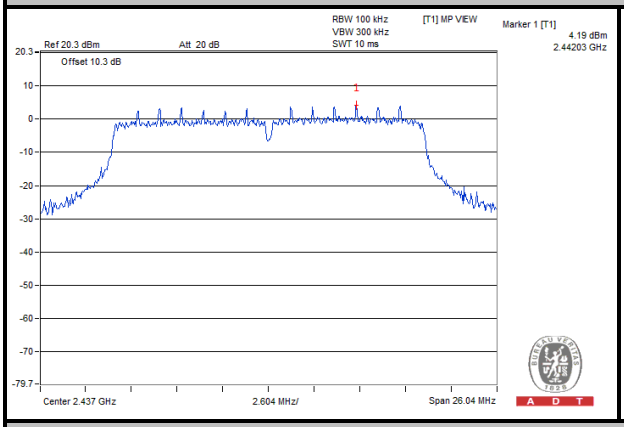
802.11n (20MHz)

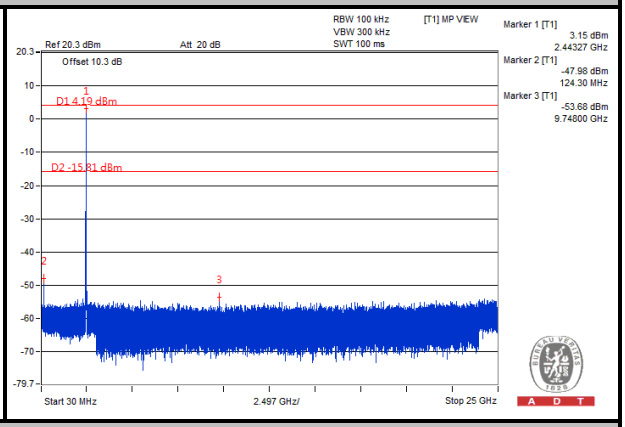
CH 1



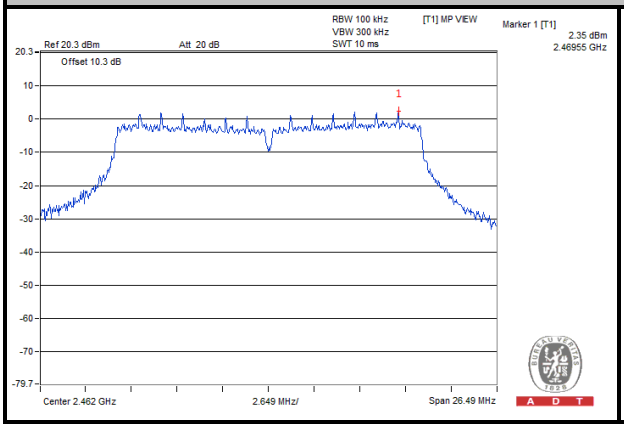


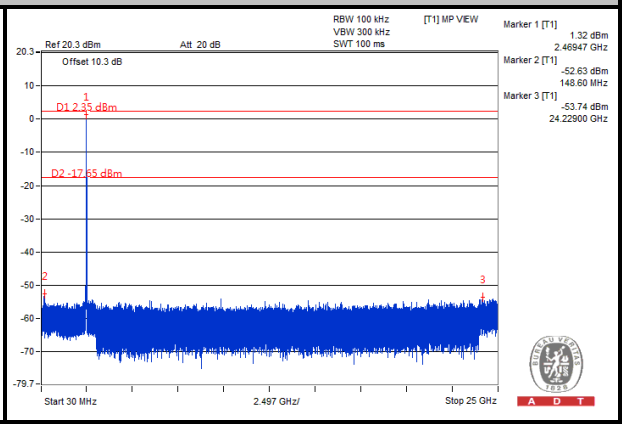
CH 6





CH 11





5. TEST TYPES AND RESULTS (FOR 5.0GHz BAND)

5.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

5.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

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

5.1.2 TEST INSTRUMENTS

Same as section 4.1.2.

5.1.3 TEST PROCEDURES

Same as section 4.1.3.

5.1.4 DEVIATION FROM TEST STANDARD

No deviation.

5.1.5 TEST SETUP

Same as section 4.1.5.

5.1.6 EUT OPERATING CONDITIONS

Same as section 4.1.6.

5.1.7 TEST RESULTS

ABOVE 1GHz WORST-CASE DATA：

802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Johnson Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	57.34	57.22	75.39	-18.05	31.96	5.59	37.43	106	356	Average
5725	71.48	71.36	85.21	-13.73	31.96	5.59	37.43	106	356	Peak
5745	95.39	95.27			31.99	5.6	37.47	106	356	Average
5745	105.21	105.09			31.99	5.6	37.47	106	356	Peak
5825	38.06	37.83	75.39	-37.33	32.12	5.64	37.53	106	356	Average
5825	59.51	59.28	85.21	-25.7	32.12	5.64	37.53	106	356	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	54.56	54.44	72.62	-18.06	31.96	5.59	37.43	100	4	Average
5725	68.89	68.77	82.27	-13.38	31.96	5.59	37.43	100	4	Peak
5745	92.62	92.5			31.99	5.6	37.47	100	4	Average
5745	102.27	102.15			31.99	5.6	37.47	100	4	Peak
5825	37.89	37.66	72.62	-34.73	32.12	5.64	37.53	100	4	Average
5825	58.46	58.23	82.27	-23.81	32.12	5.64	37.53	100	4	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5745MHz: Fundamental frequency.
3. 5725MHz & 5825MHz: Out of restricted band

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Johnson Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	38.4	38.28	75.77	-37.37	31.96	5.59	37.43	128	356	Average
5725	58.35	58.23	84.94	-26.59	31.96	5.59	37.43	128	356	Peak
5785	95.77	95.65			32.04	5.62	37.54	128	356	Average
5785	104.94	104.82			32.04	5.62	37.54	128	356	Peak
5825	38.83	38.6	75.77	-36.94	32.12	5.64	37.53	128	356	Average
5825	58.98	58.75	84.94	-25.96	32.12	5.64	37.53	128	356	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	38.01	37.89	72.84	-34.83	31.96	5.59	37.43	100	2	Average
5725	57.57	57.45	82.14	-24.57	31.96	5.59	37.43	100	2	Peak
5785	92.84	92.72			32.04	5.62	37.54	100	2	Average
5785	102.14	102.02			32.04	5.62	37.54	100	2	Peak
5825	38.19	37.96	72.84	-34.65	32.12	5.64	37.53	100	2	Average
5825	58.41	58.18	82.14	-23.73	32.12	5.64	37.53	100	2	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5785MHz: Fundamental frequency.
3. 5725MHz & 5825MHz: Out of restricted band

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 161	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Johnson Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	37.77	37.65	75.94	-38.17	31.96	5.59	37.43	106	357	Average
5725	58.35	58.23	85.08	-26.73	31.96	5.59	37.43	106	357	Peak
5805	95.94	95.75			32.1	5.63	37.54	106	357	Average
5805	105.08	104.89			32.1	5.63	37.54	106	357	Peak
5825	57.24	57.01	75.94	-18.7	32.12	5.64	37.53	106	357	Average
5825	76.55	76.32	85.08	-8.53	32.12	5.64	37.53	106	357	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	37.55	37.43	73.24	-35.69	31.96	5.59	37.43	109	6	Average
5725	58.49	58.37	82.43	-23.94	31.96	5.59	37.43	109	6	Peak
5805	93.24	93.05			32.1	5.63	37.54	109	6	Average
5805	102.43	102.24			32.1	5.63	37.54	109	6	Peak
5825	54.82	54.59	73.24	-18.42	32.12	5.64	37.53	109	6	Average
5825	77.15	76.92	82.43	-5.28	32.12	5.64	37.53	109	6	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5805MHz: Fundamental frequency.
3. 5725MHz & 5825MHz: Out of restricted band

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Johnson Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	57.66	57.54	75.2	-17.54	31.96	5.59	37.43	105	357	Average
5725	74.66	74.54	84.69	-10.03	31.96	5.59	37.43	105	357	Peak
5745	95.2	95.08			31.99	5.6	37.47	105	357	Average
5745	104.69	104.57			31.99	5.6	37.47	105	357	Peak
5825	38.19	37.96	75.2	-37.01	32.12	5.64	37.53	105	357	Average
5825	57.85	57.62	84.69	-26.84	32.12	5.64	37.53	105	357	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	55.58	55.46	72.51	-16.93	31.96	5.59	37.43	100	344	Average
5725	71.8	71.68	81.98	-10.18	31.96	5.59	37.43	100	344	Peak
5745	92.51	92.39			31.99	5.6	37.47	100	344	Average
5745	101.98	101.86			31.99	5.6	37.47	100	344	Peak
5825	38.03	37.8	72.51	-34.48	32.12	5.64	37.53	100	344	Average
5825	57.11	56.88	81.98	-24.87	32.12	5.64	37.53	100	344	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5745MHz: Fundamental frequency.
3. 5725MHz & 5825MHz: Out of restricted band

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Johnson Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	38.68	38.56	75.42	-36.74	31.96	5.59	37.43	107	357	Average
5725	59.82	59.7	84.79	-24.97	31.96	5.59	37.43	107	357	Peak
5785	95.42	95.3			32.04	5.62	37.54	107	357	Average
5785	104.79	104.67			32.04	5.62	37.54	107	357	Peak
5825	38.96	38.73	75.42	-36.46	32.12	5.64	37.53	107	357	Average
5825	59.54	59.31	84.79	-25.25	32.12	5.64	37.53	107	357	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	38.15	38.03	72.59	-34.44	31.96	5.59	37.43	100	344	Average
5725	58.84	58.72	82.15	-23.31	31.96	5.59	37.43	100	344	Peak
5785	92.59	92.47			32.04	5.62	37.54	100	344	Average
5785	102.15	102.03			32.04	5.62	37.54	100	344	Peak
5825	37.97	37.74	72.59	-34.62	32.12	5.64	37.53	100	344	Average
5825	59.96	59.73	82.15	-22.19	32.12	5.64	37.53	100	344	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5785MHz: Fundamental frequency.
3. 5725MHz & 5825MHz: Out of restricted band

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 161	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Johnson Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	37.67	37.55	75.6	-37.93	31.96	5.59	37.43	104	357	Average
5725	57.69	57.57	84.79	-27.1	31.96	5.59	37.43	104	357	Peak
5805	95.6	95.41			32.1	5.63	37.54	104	357	Average
5805	104.79	104.6			32.1	5.63	37.54	104	357	Peak
5825	58.6	58.37	75.6	-17	32.12	5.64	37.53	104	357	Average
5825	76.22	75.99	84.79	-8.57	32.12	5.64	37.53	104	357	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	37.78	37.66	72.45	-34.67	31.96	5.59	37.43	100	3	Average
5725	58.96	58.84	81.89	-22.93	31.96	5.59	37.43	100	3	Peak
5805	92.45	92.26			32.1	5.63	37.54	100	3	Average
5805	101.89	101.7			32.1	5.63	37.54	100	3	Peak
5825	54.62	54.39	72.45	-17.83	32.12	5.64	37.53	100	3	Average
5825	71.65	71.42	81.89	-10.24	32.12	5.64	37.53	100	3	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5805MHz: Fundamental frequency.
3. 5725MHz & 5825MHz: Out of restricted band

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 151	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Johnson Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	52.78	52.66	69.28	-16.5	31.96	5.59	37.43	107	354	Average
5725	64.82	64.7	79.52	-14.7	31.96	5.59	37.43	107	354	Peak
5755	89.28	89.14			32.01	5.6	37.47	107	354	Average
5755	99.52	99.38			32.01	5.6	37.47	107	354	Peak
5825	38.68	38.45	69.28	-30.6	32.12	5.64	37.53	107	354	Average
5825	59.93	59.7	79.52	-19.59	32.12	5.64	37.53	107	354	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	51.07	50.95	66.78	-15.71	31.96	5.59	37.43	100	343	Average
5725	62.95	62.83	76.11	-13.16	31.96	5.59	37.43	100	343	Peak
5755	86.78	86.64			32.01	5.6	37.47	100	343	Average
5755	96.11	95.97			32.01	5.6	37.47	100	343	Peak
5825	38.19	37.96	66.78	-28.59	32.12	5.64	37.53	100	343	Average
5825	58.44	58.21	76.11	-17.67	32.12	5.64	37.53	100	343	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5755MHz: Fundamental frequency.
3. 5725MHz & 5825MHz: Out of restricted band

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Johnson Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	38.81	38.69	72.02	-33.21	31.96	5.59	37.43	136	27	Average
5725	59.08	58.96	81.31	-22.23	31.96	5.59	37.43	136	27	Peak
5795	92.02	91.86			32.07	5.63	37.54	136	27	Average
5795	101.31	101.15			32.07	5.63	37.54	136	27	Peak
5825	54.86	54.63	72.02	-17.16	32.12	5.64	37.53	136	27	Average
5825	67.28	67.05	81.31	-14.03	32.12	5.64	37.53	136	27	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	38.31	38.19	67.19	-28.88	31.96	5.59	37.43	123	119	Average
5725	58.39	58.27	77.01	-18.62	31.96	5.59	37.43	123	119	Peak
5795	87.19	87.03			32.07	5.63	37.54	123	119	Average
5795	97.01	96.85			32.07	5.63	37.54	123	119	Peak
5825	50.3	50.07	67.19	-16.89	32.12	5.64	37.53	123	119	Average
5825	63.81	63.58	77.01	-13.2	32.12	5.64	37.53	123	119	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5795MHz: Fundamental frequency.
3. 5725MHz & 5825MHz: Out of restricted band

BELOW 1GHz WORST-CASE DATA：

802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 161	FREQUENCY RANGE	30MHz ~ 1GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Quasi-peak (QP)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Johnson Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
108.57	25.83	46.66	43.5	-17.67	9.9	1.12	31.85	100	125	Peak
200.1	27.24	48.06	43.5	-16.26	9.36	1.59	31.77	100	93	Peak
238.71	24.6	43.62	46	-21.4	10.99	1.78	31.79	100	201	Peak
377.7	27.35	42.16	46	-18.65	14.8	2.33	31.94	100	182	Peak
624.1	23.89	33	46	-22.11	19.89	3.16	32.16	100	97	Peak
890.1	27.52	32.18	46	-18.48	23.39	3.94	31.99	100	206	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
30.76	29.1	47.51	40	-10.9	12.14	0.57	31.12	100	167	QP
153.66	30.54	48.15	43.5	-12.96	12.72	1.36	31.69	100	304	Peak
252.21	24.8	43.34	46	-21.2	11.54	1.84	31.92	100	358	Peak
398.7	19.71	34.1	46	-26.29	15.31	2.42	32.12	100	158	Peak
720.7	25.38	32.43	46	-20.62	21.11	3.49	31.65	100	31	Peak
924.4	27.61	31.94	46	-18.39	23.65	4.02	32	100	274	Peak

REMARKS: Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

Margin value = Emission level – Limit value

5.2 CONDUCTED EMISSION MEASUREMENT

5.2.1 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.

5.2.2 T EST INSTRUMENTS

Same as section 4.2.2.

5.2.3 TEST PROCEDURES

Same as section 4.2.3.

5.2.4 DEVIATION FROM TEST STANDARD

No deviation.

5.2.5 TEST SETUP

Same as section 4.2.5.

5.2.6 EUT OPERATING CONDITIONS

Same as section 4.1.6.

5.2.7 TEST RESULTS

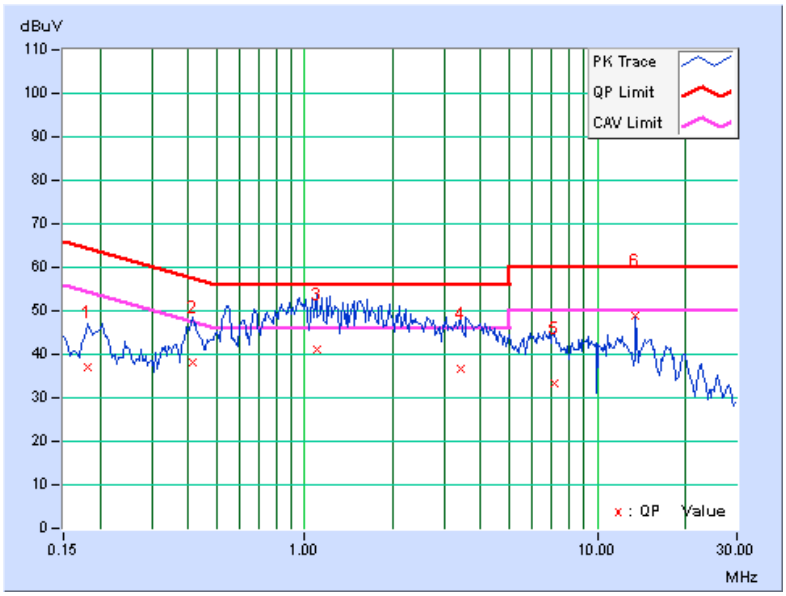
CONDUCTED WORST-CASE DATA：

PHASE	Line 1	6dB BANDWIDTH	9kHz

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	0.18125	0.27	36.66	23.56	36.93	23.83	64.43	54.43	-27.49	-30.59
2	0.41563	0.30	38.01	27.85	38.31	28.15	57.54	47.54	-19.22	-19.38
3	1.10156	0.34	40.64	28.93	40.98	29.27	56.00	46.00	-15.02	-16.73
4	3.42969	0.41	36.32	26.63	36.73	27.04	56.00	46.00	-19.27	-18.96
5	7.11719	0.47	32.86	22.79	33.33	23.26	60.00	50.00	-26.67	-26.74
6	13.55859	0.52	48.48	44.22	49.00	44.74	60.00	50.00	-11.00	-5.26

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

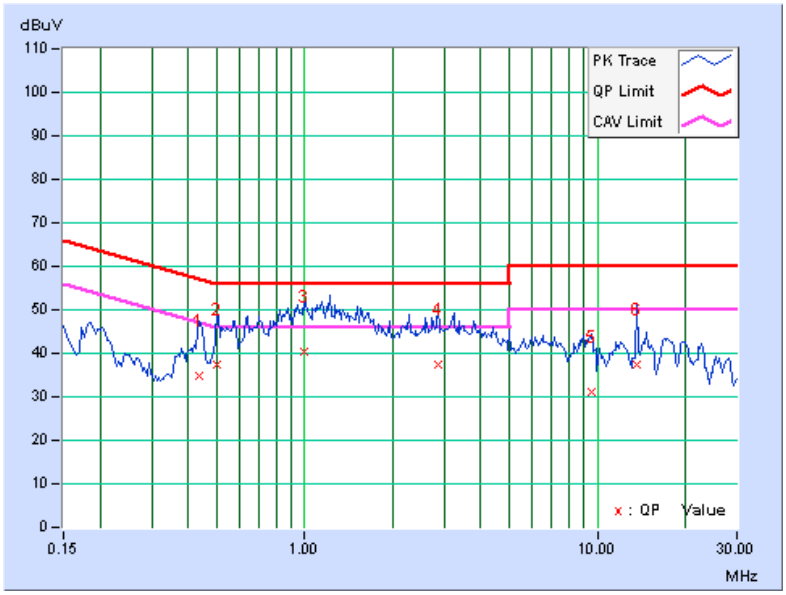


PHASE	Line 2	6dB BANDWIDTH	9kHz

No	Freq.	Corr. Factor	Reading Value [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	0.43516	0.30	34.33	25.83	34.63	26.13	57.15	47.15	-22.52	-21.02
2	0.50156	0.31	37.17	27.72	37.48	28.03	56.00	46.00	-18.52	-17.97
3	0.99375	0.34	39.87	30.84	40.21	31.18	56.00	46.00	-15.79	-14.82
4	2.86719	0.40	36.96	28.09	37.36	28.49	56.00	46.00	-18.64	-17.51
5	9.52734	0.51	30.63	22.18	31.14	22.69	60.00	50.00	-28.86	-27.31
6	13.56250	0.55	36.87	21.18	37.42	21.73	60.00	50.00	-22.58	-28.27

REMARKS:

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



5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

5.3.2 TEST SETUP

Same as section 4.3.2.

5.3.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.3.4 TEST PROCEDURE

Same as section 4.3.4.

5.3.5 DEVIATION FROM TEST STANDARD

No deviation.

5.3.6 EUT OPERATING CONDITIONS

Same as section 4.3.6.

5.3.7 TEST RESULTS

802.11a

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	16.42	0.5	PASS
157	5785	16.42	0.5	PASS
161	5805	16.43	0.5	PASS

802.11n (20MHz)

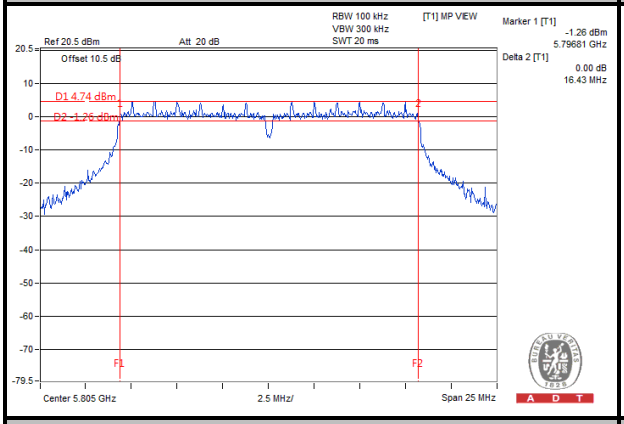
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	17.63	0.5	PASS
157	5785	17.64	0.5	PASS
161	5805	17.64	0.5	PASS

802.11n (40MHz)

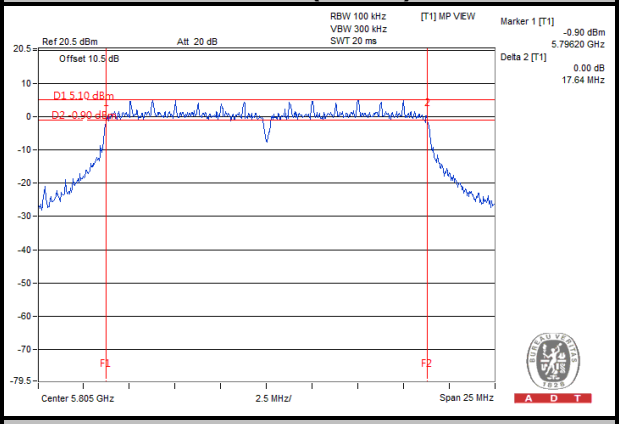
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
151	5755	35.24	0.5	PASS
159	5795	35.49	0.5	PASS

SPECTRUM PLOT OF WORST VALUE

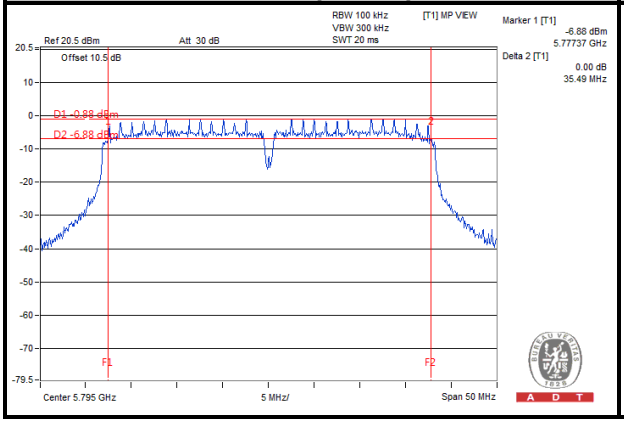
802.11a



802.11n (20MHz)



802.11n (40MHz)



5.4 MAXIMUM OUTPUT POWER

5.4.1 LIMITS OF MAXIMUM OUTPUT POWER MEASUREMENT

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

5.4.2 TEST SETUP

Same as section 4.4.2.

5.4.3 INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.4.4 TEST PROCEDURES

Same as section 4.4.4.

5.4.5 DEVIATION FROM TEST STANDARD

No deviation.

5.4.6 EUT OPERATING CONDITIONS

Same as section 4.3.6.

5.4.7 TEST RESULTS

802.11a

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
149	5745	244.34	23.88	30	PASS
157	5785	230.14	23.62	30	PASS
161	5805	231.21	23.64	30	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
149	5745	243.22	23.86	30	PASS
157	5785	237.14	23.75	30	PASS
161	5805	236.05	23.73	30	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
151	5755	173.78	22.4	30	PASS
159	5795	168.66	22.27	30	PASS

5.5 POWER SPECTRAL DENSITY MEASUREMENT

5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.5.2 TEST SETUP

Same as section 4.5.2.

5.5.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.5.4 TEST PROCEDURE.

Same as section 4.5.4.

5.5.5 DEVIATION FROM TEST STANDARD

No deviation.

5.5.6 EUT OPERATING CONDITION

Same as section 4.3.6.

5.5.7 TEST RESULTS

802.11a

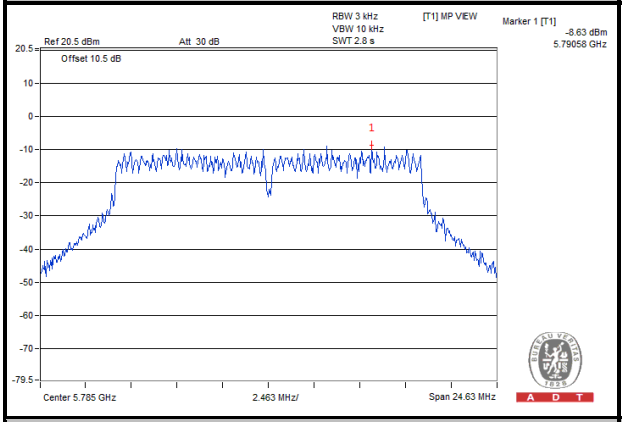
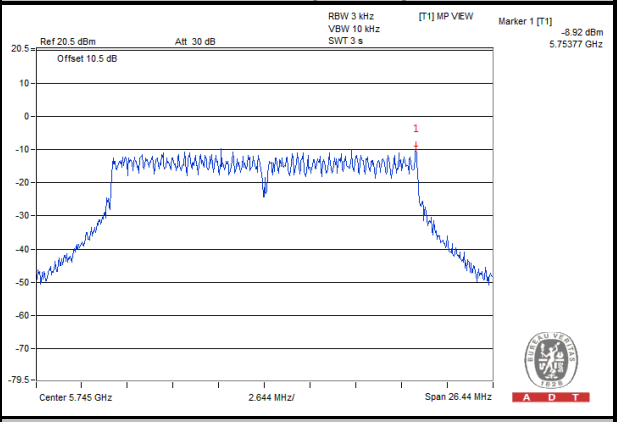
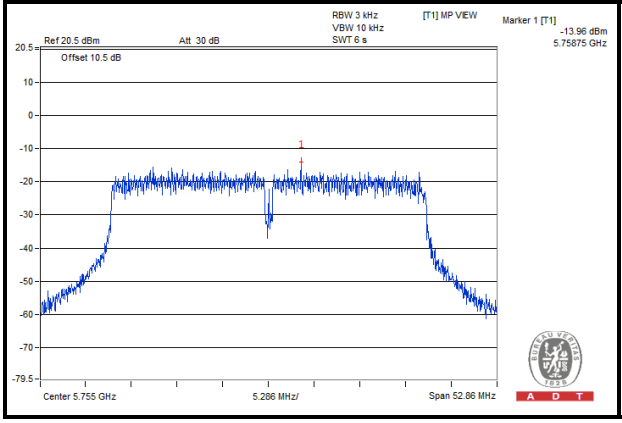
CHANNEL	FREQUENCY (MHz)	PSD (dBm/3kHz)	LIMIT (dBm/3kHz)	PASS / FAIL
149	5745	-9.99	8	PASS
157	5785	-8.63	8	PASS
161	5805	-9.06	8	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	PSD (dBm/3kHz)	LIMIT (dBm/3kHz)	PASS / FAIL
149	5745	-8.92	8	PASS
157	5785	-9.53	8	PASS
161	5805	-8.96	8	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	PSD (dBm/3kHz)	LIMIT (dBm/3kHz)	PASS / FAIL
151	5755	-13.96	8	PASS
159	5795	-14.19	8	PASS

SPECTRUM PLOT OF WORST VALUE	
802.11a	**802.11n (20MHz)**
	
802.11n (40MHz)	
	

5.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

5.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

5.6.2 TEST SETUP

Same as section 4.6.2.

5.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.6.4 TEST PROCEDURE

Same as section 4.6.4

5.6.5 DEVIATION FROM TEST STANDARD

No deviation.

5.6.6 EUT OPERATING CONDITION

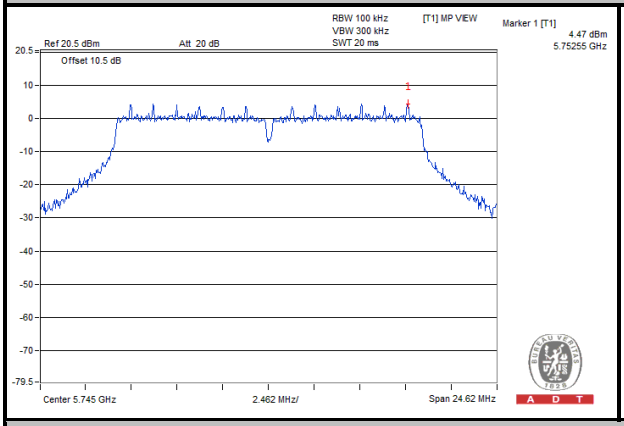
Same as section 4.3.6

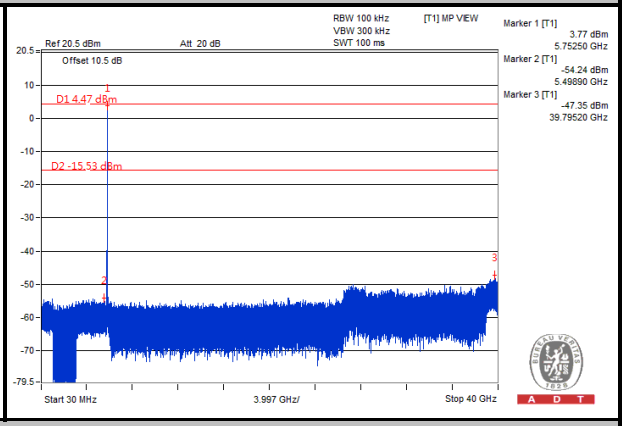
5.6.7 TEST RESULTS

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

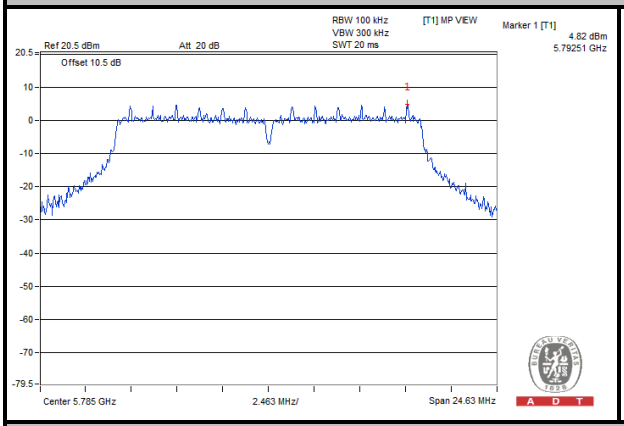
802.11a

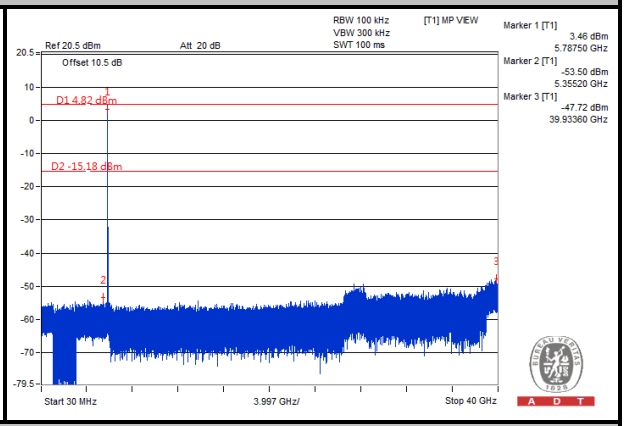
CH 149



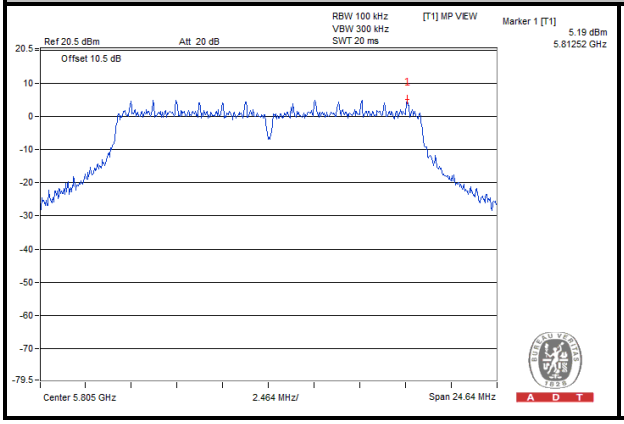


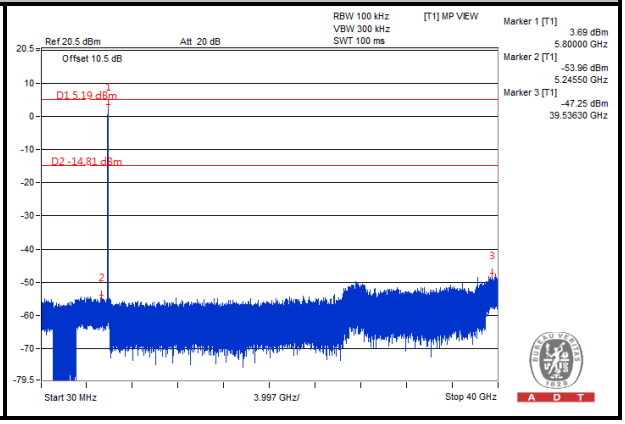
CH 157





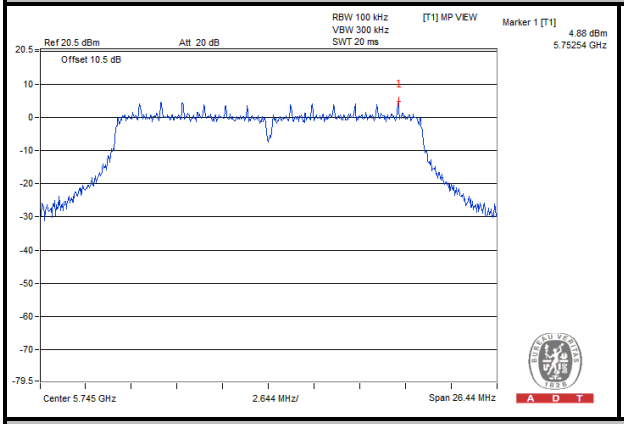
CH 161

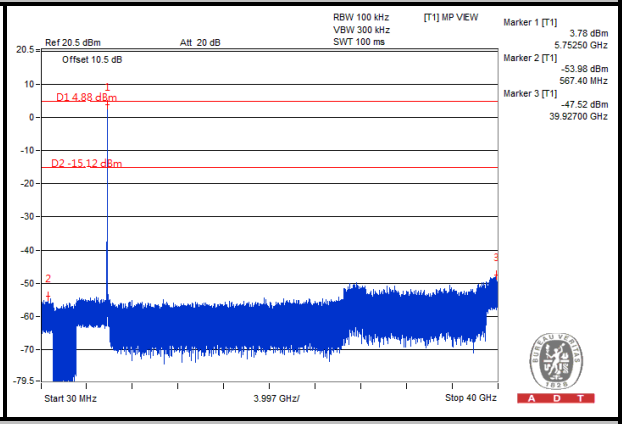




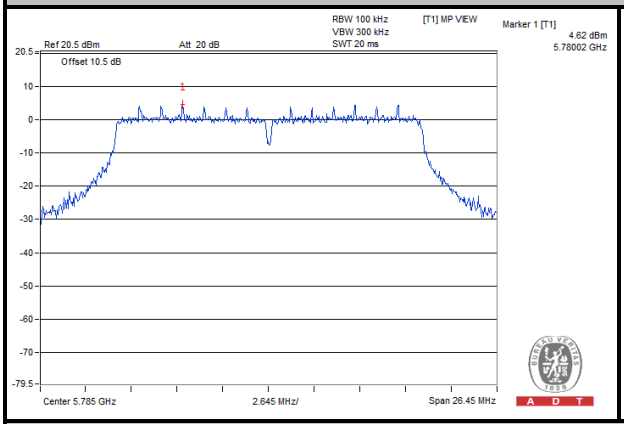
802.11n (20MHz)

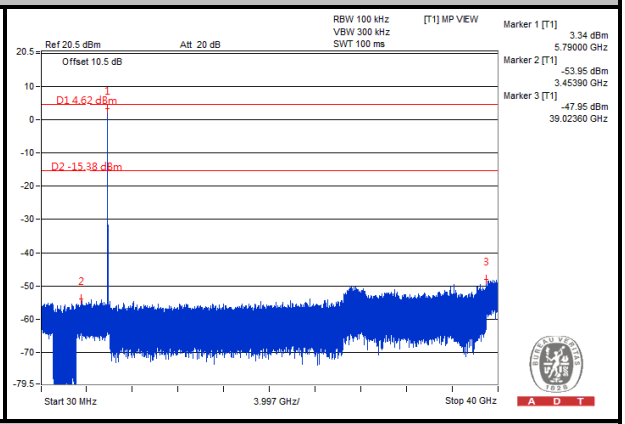
CH 149



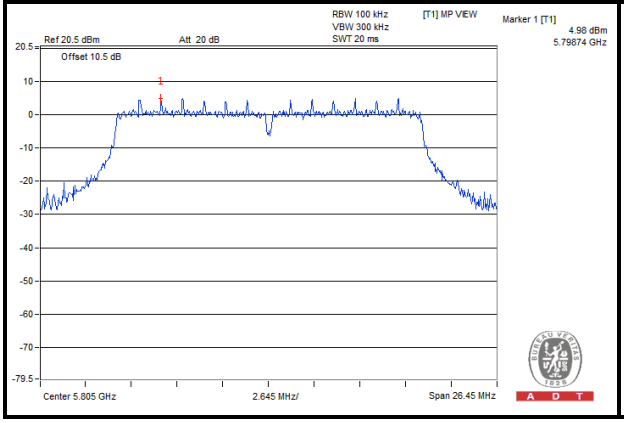


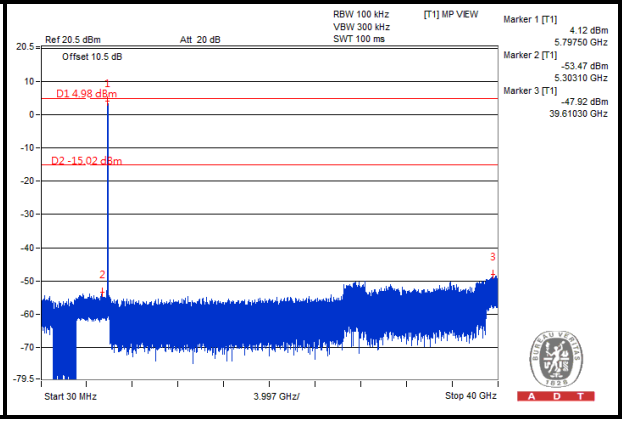
CH 157





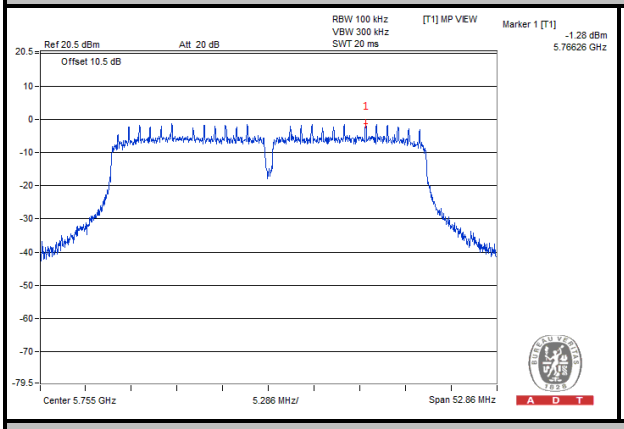
CH 161

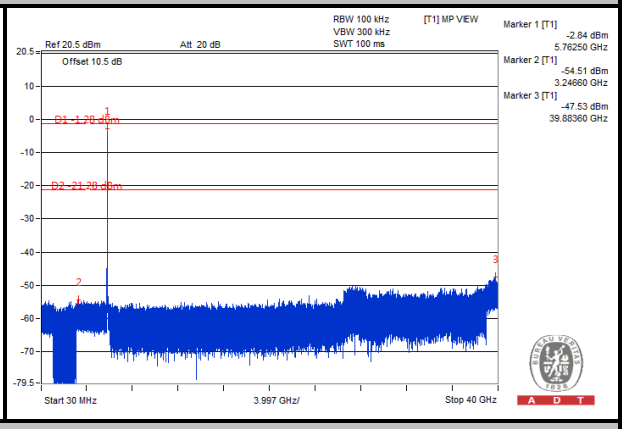




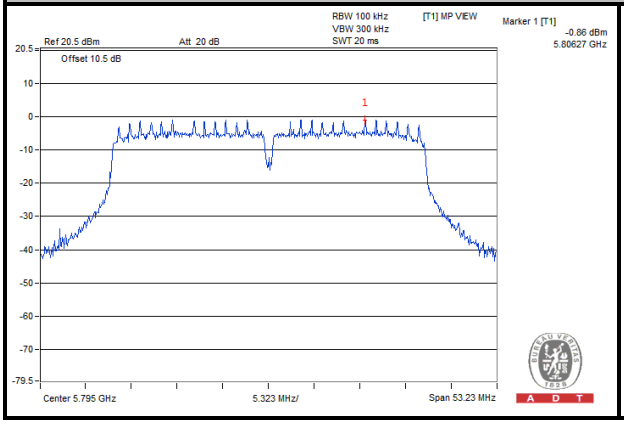
802.11n (40MHz)

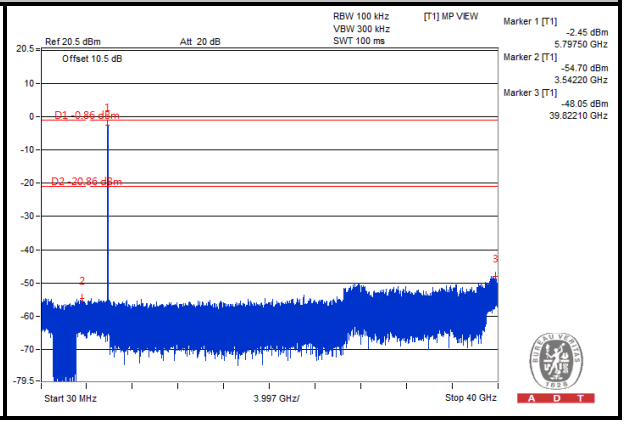
CH 151





CH 159





6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

7. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.
If you have any comments, please feel free to contact us at the following:

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

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.

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

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

---END---