



FCC TEST REPORT (15.247)

REPORT NO.: RF131113C12

MODEL NO.: 0P6B100

FCC ID: NM80P6B100

RECEIVED: Nov. 13, 2013

TESTED: Dec. 18, 2013 ~ Jan. 04, 2014

ISSUED: Jan. 10, 2014

APPLICANT: HTC Corporation

ADDRESS: No. 23,Xinghua Rd.,Taoyuan 330,Taiwan,R.O.C.

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.



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.

TABLE OF CONTENTS

RELEASE CONTROL RECORD	5
1. CERTIFICATION	6
2. SUMMARY OF TEST RESULTS	7
2.1 MEASUREMENT UNCERTAINTY	7
3. GENERAL INFORMATION	8
3.1 GENERAL DESCRIPTION OF EUT	8
3.2 DESCRIPTION OF TEST MODES	9
3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL	10
3.3 DESCRIPTION OF SUPPORT UNITS	14
3.3.1 CONFIGURATION OF SYSTEM UNDER TEST	14
3.4 DUTY CYCLE TEST SIGNAL	15
3.5 GENERAL DESCRIPTION OF APPLIED STANDARDS	17
4. TEST TYPES AND RESULTS (FOR 2.4GHz BAND)	18
4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT	18
4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT	18
4.1.2 TEST INSTRUMENTS	19
4.1.3 TEST PROCEDURES	20
4.1.4 DEVIATION FROM TEST STANDARD	20
4.1.5 TEST SETUP	21
4.1.6 EUT OPERATING CONDITIONS	22
4.1.7 TEST RESULTS	23
4.2 CONDUCTED EMISSION MEASUREMENT	35
4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	35
4.2.2 TEST INSTRUMENTS	35
4.2.3 TEST PROCEDURES	36
4.2.4 DEVIATION FROM TEST STANDARD	36
4.2.5 TEST SETUP	37
4.2.6 EUT OPERATING CONDITIONS	37
4.2.7 TEST RESULTS	38
4.3 6dB BANDWIDTH MEASUREMENT	40
4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT	40
4.3.2 TEST SETUP	40
4.3.3 TEST INSTRUMENTS	40
4.3.4 TEST PROCEDURE	40
4.3.5 DEVIATION FROM TEST STANDARD	40
4.3.6 EUT OPERATING CONDITIONS	40
4.3.7 TEST RESULTS	41
4.4 CONDUCTED OUTPUT POWER	43
4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT	43
4.4.2 TEST SETUP	43
4.4.3 TEST INSTRUMENTS	43
4.4.4 TEST PROCEDURES	43
4.4.5 DEVIATION FROM TEST STANDARD	43
4.4.6 EUT OPERATING CONDITIONS	43
4.4.7 TEST RESULTS	44
4.5 POWER SPECTRAL DENSITY MEASUREMENT	45
4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	45
4.5.2 TEST SETUP	45
4.5.3 TEST INSTRUMENTS	45
4.5.4 TEST PROCEDURE	45
4.5.5 DEVIATION FROM TEST STANDARD	45
4.5.6 EUT OPERATING CONDITION	45



4.5.7	TEST RESULTS.....	46
4.6	CONDUCTED OUT OF BAND EMISSION MEASUREMENT	48
4.6.1	LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT	48
4.6.2	TEST SETUP	48
4.6.3	TEST INSTRUMENTS	48
4.6.4	TEST PROCEDURE	48
4.6.5	DEVIATION FROM TEST STANDARD	49
4.6.6	EUT OPERATING CONDITION.....	49
4.6.7	TEST RESULTS.....	49
5.	TEST TYPES AND RESULTS (FOR 5.0GHz BAND).....	53
5.1	RADIATED EMISSION AND BANDEDGE MEASUREMENT	53
5.1.1	LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT	53
5.1.2	TEST INSTRUMENTS.....	54
5.1.3	TEST PROCEDURES	54
5.1.4	DEVIATION FROM TEST STANDARD	54
5.1.5	TEST SETUP.....	54
5.1.6	EUT OPERATING CONDITIONS	54
5.1.7	TEST RESULTS.....	55
5.2	CONDUCTED EMISSION MEASUREMENT	65
5.2.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	65
5.2.2	TEST INSTRUMENTS.....	65
5.2.3	TEST PROCEDURES	65
5.2.4	DEVIATION FROM TEST STANDARD	65
5.2.5	TEST SETUP.....	65
5.2.6	EUT OPERATING CONDITIONS	65
5.2.7	TEST RESULTS.....	66
5.3	6dB BANDWIDTH MEASUREMENT	68
5.3.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT	68
5.3.2	TEST SETUP.....	68
5.3.3	TEST INSTRUMENTS.....	68
5.3.4	TEST PROCEDURE.....	68
5.3.5	DEVIATION FROM TEST STANDARD	68
5.3.6	EUT OPERATING CONDITIONS	68
5.3.7	TEST RESULTS.....	69
5.4	MAXIMUM OUTPUT POWER	71
5.4.1	LIMITS OF MAXIMUM OUTPUT POWER MEASUREMENT	71
5.4.2	TEST SETUP.....	71
5.4.3	INSTRUMENTS	71
5.4.4	TEST PROCEDURES	71
5.4.5	DEVIATION FROM TEST STANDARD	71
5.4.6	EUT OPERATING CONDITIONS	71
5.4.7	TEST RESULTS.....	72
5.5	POWER SPECTRAL DENSITY MEASUREMENT.....	73
5.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	73
5.5.2	TEST SETUP.....	73
5.5.3	TEST INSTRUMENTS.....	73
5.5.4	TEST PROCEDURE.....	73
5.5.5	DEVIATION FROM TEST STANDARD	73
5.5.6	EUT OPERATING CONDITION.....	73
5.5.7	TEST RESULTS.....	74
5.6	CONDUCTED OUT OF BAND EMISSION MEASUREMENT	76
5.6.1	LIMITS OF OUT OF BAND EMISSION MEASUREMENT	76
5.6.2	TEST SETUP.....	76
5.6.3	TEST INSTRUMENTS.....	76
5.6.4	TEST PROCEDURE.....	76



5.6.5	DEVIATION FROM TEST STANDARD	76
5.6.6	EUT OPERATING CONDITION.....	76
5.6.7	TEST RESULTS.....	76
6.	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	95
7.	INFORMATION ON THE TESTING LABORATORIES	96
8.	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	97



RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF131113C12	Original release	Jan. 10, 2014



1. CERTIFICATION

PRODUCT: Smartphone
MODEL NO.: 0P6B100
BRAND: HTC
APPLICANT: HTC Corporation
TESTED: Dec. 18, 2013 ~ Jan. 04, 2014
TEST SAMPLE: PRODUCTION UNIT
STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**
ANSI C63.10-2009

The above equipment (model: 0P6B100) 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 : Ivonne Wu , **DATE** : Jan. 10, 2014
Ivonne Wu / Supervisor

APPROVED BY : Sam Chen , **DATE** : Jan. 10, 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 -1.05dB at 13.55859MHz.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.42dB at 2390.00MHz.
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.	0P6B100
POWER SUPPLY	5.0Vdc (adapter or host equipment) 3.8Vdc (Li-ion battery)
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: 11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to MCS7 802.11ac: up to V9
OPERATING FREQUENCY	2.4GHz: 2412 ~ 2462MHz 5.0GHz: 5745 ~ 5825MHz
NUMBER OF CHANNEL	2.4GHz: 11 for 802.11b, 802.11g, 802.11n (20MHz) 5.0GHz: 5 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz) 1 for 802.11ac (80MHz)
OUTPUT POWER	213.796mW for 2412 ~ 2462MHz 316.228mW for 5745 ~ 5825MHz
ANTENNA TYPE	2.4GHz: PIFA antenna with -2dBi gain 5.0GHz: PIFA antenna with -3.5dBi 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:

- The EUT's accessories list refers to Ext. Pho.
- There're 2 configurations for the EUT listed as below.
Main sample (A): Battery 1 + LCD Panel 1
2nd sample (B): Battery 2 + LCD Panel 2
✧ Only the worst test data was presented in the report.
- 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 ~ 5825MHz):

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

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

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (80MHz):

CHANNEL	FREQUENCY
155	5775MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

FOR 2.4GHz:

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE \geq 1G	RE<1G	PLC	APCM	
A	√	√	√	√	Main sample
B	√	√	-	-	2 nd sample

Where **RE \geq 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)
A	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
B	802.11n (20MHz)	1 to 11	1	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)
A, B	802.11n (20MHz)	1 to 11	1	OFDM	BPSK	MCS0

POWER LINE CONDUCTED EMISSION TEST:

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11n (20MHz)	1 to 11	1	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)
A	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
	802.11n (20MHz)	1 to 11	1, 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)
A	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 \geq 1G	25deg. C, 65%RH	120Vac, 60Hz	David Huang
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	David Huang
PLC	25deg. C, 65%RH	120Vac, 60Hz	Johnson Liao
APCM	25deg. C, 65%RH	120Vac, 60Hz	Demon Lin

FOR 5.0GHz (5745 ~ 5825MHz):

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Main sample

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 Z-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)
A	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	MCS0
	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	MCS0
	802.11ac (80MHz)	155	155	OFDM	BPSK	V0

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)
A	802.11n (20MHz)	149 to 165	165	OFDM	BPSK	MCS0

POWER LINE CONDUCTED EMISSION TEST:

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11n (20MHz)	149 to 165	165	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)
A	802.11a	149 to 165	149, 165	OFDM	BPSK	6.0
	802.11n (20MHz)	149 to 165	149, 165	OFDM	BPSK	MCS0
	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	MCS0
	802.11ac (80MHz)	155	155	OFDM	BPSK	V0

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)
A	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	MCS0
	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	MCS0
	802.11ac (80MHz)	155	155	OFDM	BPSK	V0

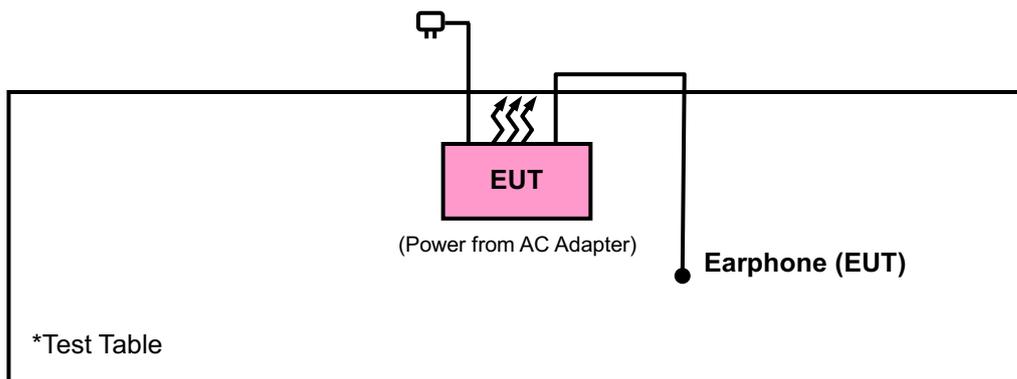
TEST CONDITION:

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

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

2.4GHz

If duty cycle is $< 98\%$

802.11b: Duty cycle = $8.237/8.429 = 0.977$, Duty factor = $10 * \log(1/0.977) = 0.10$

802.11g: Duty cycle = $1.338/1.571 = 0.852$, Duty factor = $10 * \log(1/0.852) = 0.70$

802.11n (20MHz): Duty cycle = $1.274/1.474 = 0.864$, Duty factor = $10 * \log(1/0.864) = 0.63$



5725MHz ~ 5850MHz

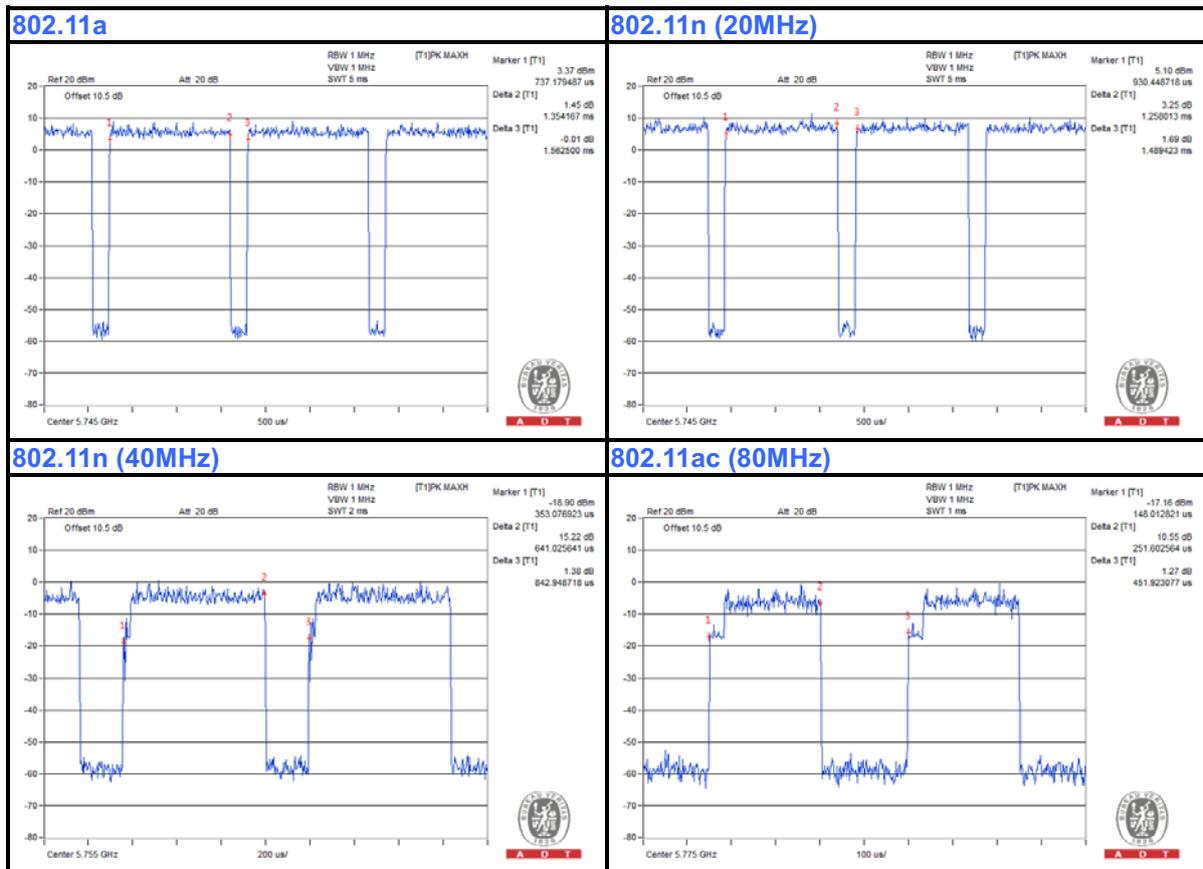
If duty cycle is < 98%

802.11a: Duty cycle = 1.354/1.563 = 0.866, Duty factor = $10 \cdot \log(1/0.866) = 0.62$

802.11n (20MHz): Duty cycle = 1.258/1.489 = 0.845, Duty factor = $10 \cdot \log(1/0.845) = 0.73$

802.11n (40MHz): Duty cycle = 641.03/842.95 = 0.760, Duty factor = $10 \cdot \log(1/0.760) = 1.19$

802.11ac (80MHz): Duty cycle = 251.60/451.92 = 0.557, Duty factor = $10 \cdot \log(1/0.557) = 2.54$





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

KDB 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	Mar. 25, 2013	Mar. 24, 2014
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Jan. 07, 2013	Jan. 06, 2014
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Jan. 07, 2013	Jan. 06, 2014
Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
Preamplifier EMCI	EMC 330H	980112	Dec. 28, 2012	Dec. 27, 2013
Preamplifier EMCI	EMC 330H	980112	Dec. 27, 2013	Dec. 26, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4	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:

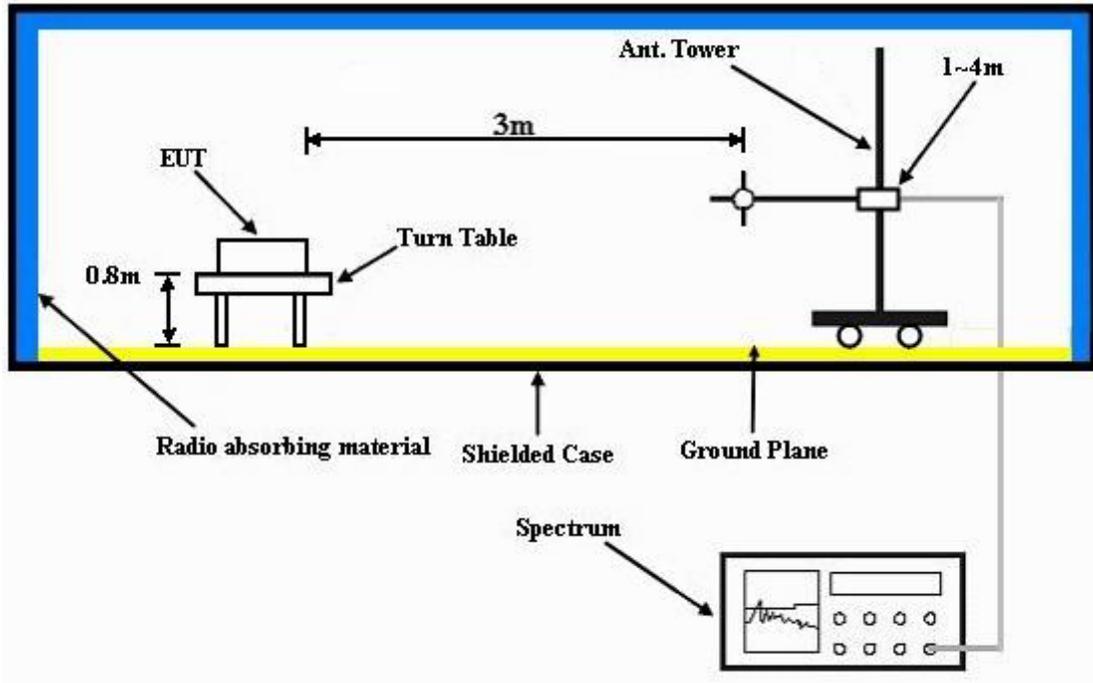
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution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

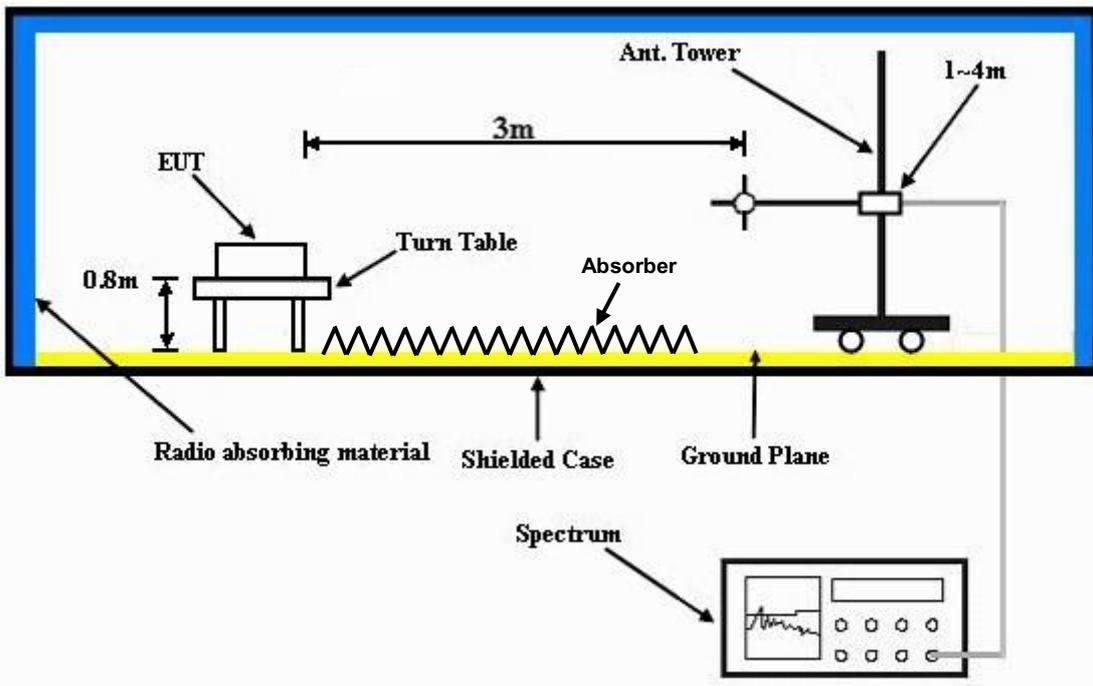
No deviation.

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

TEST MODE A

802.11b

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

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
2388	48.54	55.59	54	-5.46	26.91	3.54	37.5	107	6	Average
2388	55.54	62.59	74	-18.46	26.91	3.54	37.5	107	6	Peak
2412	104.96	111.98			26.96	3.54	37.52	107	6	Average
2412	108.91	115.93			26.96	3.54	37.52	107	6	Peak
2484	35.71	42.28	54	-18.29	27.15	3.6	37.32	107	6	Average
2484	50.86	57.43	74	-23.14	27.15	3.6	37.32	107	6	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	36.43	43.5	54	-17.57	26.91	3.54	37.52	133	4	Average
2390	51.08	58.15	74	-22.92	26.91	3.54	37.52	133	4	Peak
2412	95.69	102.71			26.96	3.54	37.52	133	4	Average
2412	100.36	107.38			26.96	3.54	37.52	133	4	Peak
2484	34.71	41.28	54	-19.29	27.15	3.6	37.32	133	4	Average
2484	50.42	56.99	74	-23.58	27.15	3.6	37.32	133	4	Peak

REMARKS:

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

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

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	35.41	42.48	54	-18.59	26.91	3.54	37.52	106	7	Average
2390	48.87	55.94	74	-25.13	26.91	3.54	37.52	106	7	Peak
2437	104.02	110.86			27.06	3.56	37.46	106	7	Average
2437	107.86	114.7			27.06	3.56	37.46	106	7	Peak
2484	36.07	42.64	54	-17.93	27.15	3.6	37.32	106	7	Average
2484	50.98	57.55	74	-23.02	27.15	3.6	37.32	106	7	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	34.41	41.48	54	-19.59	26.91	3.54	37.52	133	4	Average
2390	49.84	56.91	74	-24.16	26.91	3.54	37.52	133	4	Peak
2437	95.94	102.78			27.06	3.56	37.46	133	4	Average
2437	100.09	106.93			27.06	3.56	37.46	133	4	Peak
2484	34.5	41.07	54	-19.5	27.15	3.6	37.32	133	4	Average
2484	51.43	58	74	-22.57	27.15	3.6	37.32	133	4	Peak

REMARKS:

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

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

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	35.2	42.27	54	-18.8	26.91	3.54	37.52	106	5	Average
2390	50.42	57.49	74	-23.58	26.91	3.54	37.52	106	5	Peak
2462	103.71	110.42			27.1	3.58	37.39	106	5	Average
2462	107.6	114.31			27.1	3.58	37.39	106	5	Peak
2484	45.65	52.22	54	-8.35	27.15	3.6	37.32	106	5	Average
2484	55.16	61.73	74	-18.84	27.15	3.6	37.32	106	5	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	133	4	Average
2390	50.56	57.63	74	-23.44	26.91	3.54	37.52	133	4	Peak
2462	94.85	101.56			27.1	3.58	37.39	133	4	Average
2462	99.23	105.94			27.1	3.58	37.39	133	4	Peak
2484	35.34	41.91	54	-18.66	27.15	3.6	37.32	133	4	Average
2484	50.45	57.02	74	-23.55	27.15	3.6	37.32	133	4	Peak

REMARKS:

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

802.11g

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

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	49.8	56.87	54	-4.2	26.91	3.54	37.52	104	22	Average
2390	70.85	77.92	74	-3.15	26.91	3.54	37.52	104	22	Peak
2412	96.52	103.54			26.96	3.54	37.52	104	22	Average
2412	105.39	112.41			26.96	3.54	37.52	104	22	Peak
2484	36.35	42.92	54	-17.65	27.15	3.6	37.32	104	22	Average
2484	52.07	58.64	74	-21.93	27.15	3.6	37.32	104	22	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	43.47	50.54	54	-10.53	26.91	3.54	37.52	195	338	Average
2390	67.74	74.81	74	-6.26	26.91	3.54	37.52	195	338	Peak
2412	90.22	97.24			26.96	3.54	37.52	195	338	Average
2412	99.38	106.4			26.96	3.54	37.52	195	338	Peak
2488	36.04	42.54	54	-17.96	27.2	3.62	37.32	195	338	Average
2488	51.86	58.36	74	-22.14	27.2	3.62	37.32	195	338	Peak

REMARKS:

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

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

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	37.74	44.81	54	-16.26	26.91	3.54	37.52	105	20	Average
2390	52.01	59.08	74	-21.99	26.91	3.54	37.52	105	20	Peak
2437	96.92	103.76			27.06	3.56	37.46	105	20	Average
2437	106.44	113.28			27.06	3.56	37.46	105	20	Peak
2484	38.88	45.45	54	-15.12	27.15	3.6	37.32	105	20	Average
2484	52.62	59.19	74	-21.38	27.15	3.6	37.32	105	20	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
2346	35.6	42.82	54	-18.4	26.77	3.5	37.49	160	342	Average
2346	51.75	58.97	74	-22.25	26.77	3.5	37.49	160	342	Peak
2437	91.14	97.98			27.06	3.56	37.46	160	342	Average
2437	100.62	107.46			27.06	3.56	37.46	160	342	Peak
2490	37.22	43.72	54	-16.78	27.2	3.62	37.32	160	342	Average
2490	52.14	58.64	74	-21.86	27.2	3.62	37.32	160	342	Peak

REMARKS:

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

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

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
2376	36.16	43.28	54	-17.84	26.86	3.52	37.5	105	12	Average
2376	51.79	58.91	74	-22.21	26.86	3.52	37.5	105	12	Peak
2462	96.91	103.62			27.1	3.58	37.39	105	12	Average
2462	106.05	112.76			27.1	3.58	37.39	105	12	Peak
2484	51.18	57.75	54	-2.82	27.15	3.6	37.32	105	12	Average
2484	69.96	76.53	74	-4.04	27.15	3.6	37.32	105	12	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
2380	35.68	42.8	54	-18.32	26.86	3.52	37.5	192	348	Average
2380	51.46	58.58	74	-22.54	26.86	3.52	37.5	192	348	Peak
2462	90.23	96.94			27.1	3.58	37.39	192	348	Average
2462	99.48	106.19			27.1	3.58	37.39	192	348	Peak
2484	44.62	51.19	54	-9.38	27.15	3.6	37.32	192	348	Average
2484	62.92	69.49	74	-11.08	27.15	3.6	37.32	192	348	Peak

REMARKS:

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

802.11n (20MHz)

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

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	51.56	58.63	54	-2.44	26.91	3.54	37.52	106	23	Average
2390	72.58	79.65	74	-1.42	26.91	3.54	37.52	106	23	Peak
2412	96.61	103.63			26.96	3.54	37.52	106	23	Average
2412	105.25	112.27			26.96	3.54	37.52	106	23	Peak
2490	36.44	42.94	54	-17.56	27.2	3.62	37.32	106	23	Average
2490	52.07	58.57	74	-21.93	27.2	3.62	37.32	106	23	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	45.22	52.29	54	-8.78	26.91	3.54	37.52	195	338	Average
2390	63.87	70.94	74	-10.13	26.91	3.54	37.52	195	338	Peak
2412	89.86	96.88			26.96	3.54	37.52	195	338	Average
2412	99.59	106.61			26.96	3.54	37.52	195	338	Peak
2490	35.67	42.17	54	-18.33	27.2	3.62	37.32	195	338	Average
2490	52.48	58.98	74	-21.52	27.2	3.62	37.32	195	338	Peak

REMARKS:

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

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

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
2326	37.46	44.73	54	-16.54	26.72	3.48	37.47	107	28	Average
2326	52.2	59.47	74	-21.8	26.72	3.48	37.47	107	28	Peak
2437	95.32	102.16			27.06	3.56	37.46	107	28	Average
2437	104.44	111.28			27.06	3.56	37.46	107	28	Peak
2488	39.14	45.64	54	-14.86	27.2	3.62	37.32	107	28	Average
2488	52.05	58.55	74	-21.95	27.2	3.62	37.32	107	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
2378	35.54	42.66	54	-18.46	26.86	3.52	37.5	160	342	Average
2378	51.42	58.54	74	-22.58	26.86	3.52	37.5	160	342	Peak
2437	87.04	93.88			27.06	3.56	37.46	160	342	Average
2437	96.89	103.73			27.06	3.56	37.46	160	342	Peak
2488	36.81	43.31	54	-17.19	27.2	3.62	37.32	160	342	Average
2488	51.59	58.09	74	-22.41	27.2	3.62	37.32	160	342	Peak

REMARKS:

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

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

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	35.01	42.08	54	-18.99	26.91	3.54	37.52	107	6	Average
2390	49.33	56.4	74	-24.67	26.91	3.54	37.52	107	6	Peak
2462	97.02	103.73			27.1	3.58	37.39	107	6	Average
2462	106.88	113.59			27.1	3.58	37.39	107	6	Peak
2484	52.04	58.61	54	-1.96	27.15	3.6	37.32	107	6	Average
2484	66.89	73.46	74	-7.11	27.15	3.6	37.32	107	6	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	105	0	Average
2390	50.34	57.41	74	-23.66	26.91	3.54	37.52	105	0	Peak
2462	88.96	95.67			27.1	3.58	37.39	105	0	Average
2462	98.47	105.18			27.1	3.58	37.39	105	0	Peak
2484	44.19	50.76	54	-9.81	27.15	3.6	37.32	105	0	Average
2484	59.25	65.82	74	-14.75	27.15	3.6	37.32	105	0	Peak

REMARKS:

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

TEST MODE: B

802.11n (20MHz)

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

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	51.44	58.51	54	-2.56	26.91	3.54	37.52	102	182	Average
2390	72.11	79.18	74	-1.89	26.91	3.54	37.52	102	182	Peak
2412	95.79	102.81			26.96	3.54	37.52	102	182	Average
2412	104.82	111.84			26.96	3.54	37.52	102	182	Peak
2490	35.95	42.45	54	-18.05	27.2	3.62	37.32	102	182	Average
2490	51.88	58.38	74	-22.12	27.2	3.62	37.32	102	182	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	44.66	51.73	54	-9.34	26.91	3.54	37.52	114	56	Average
2390	63.08	70.15	74	-10.92	26.91	3.54	37.52	114	56	Peak
2412	89.43	96.45			26.96	3.54	37.52	114	56	Average
2412	98.89	105.91			26.96	3.54	37.52	114	56	Peak
2490	35	41.5	54	-19	27.2	3.62	37.32	114	56	Average
2490	51.79	58.29	74	-22.21	27.2	3.62	37.32	114	56	Peak

REMARKS:

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



BELOW 1GHz WORST-CASE DATA:

TEST MODE: A

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	30MHz ~ 1GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	David Huang

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
57	24.07	42.36	40	-15.93	12.25	0.81	31.35	100	178	Peak
111.54	25.11	45.64	43.5	-18.39	10.18	1.14	31.85	100	216	Peak
194.7	30.28	50.73	43.5	-13.22	9.7	1.57	31.72	100	272	Peak
326.6	22.93	39.02	46	-23.07	13.59	2.15	31.83	100	85	Peak
538	22.02	32.64	46	-23.98	18.19	2.91	31.72	100	8	Peak
720	25.61	32.69	46	-20.39	21.09	3.49	31.66	100	178	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
30.54	30.34	48.75	40	-9.66	12.14	0.57	31.12	100	236	Peak
62.13	27.63	46.53	40	-12.37	11.71	0.84	31.45	100	321	Peak
188.22	22.46	42.43	43.5	-21.04	10.19	1.54	31.7	100	54	Peak
343.4	17.64	33.29	46	-28.36	13.98	2.2	31.83	100	126	Peak
513.5	22.48	33.62	46	-23.52	17.62	2.82	31.58	100	244	Peak
752.9	26.74	32.94	46	-19.26	21.56	3.58	31.34	100	76	Peak

REMARKS: Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value

TEST MODE: B

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	30MHz ~ 1GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	David Huang

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
42.69	19.19	35.99	40	-20.81	13.58	0.7	31.08	100	174	Peak
112.62	25.15	45.6	43.5	-18.35	10.27	1.14	31.86	102	162	Peak
226.29	21.26	40.88	46	-24.74	10.46	1.72	31.8	113	224	Peak
524.7	21.92	32.81	46	-24.08	17.88	2.86	31.63	100	74	Peak
720	25.61	32.69	46	-20.39	21.09	3.49	31.66	100	106	Peak
930	28.95	33.23	46	-17.05	23.68	4.03	31.99	100	122	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
39.72	27.06	43.86	40	-12.94	13.54	0.65	30.99	152	166	Peak
106.14	18.62	39.79	43.5	-24.88	9.62	1.1	31.89	110	251	Peak
188.22	22.46	42.43	43.5	-21.04	10.19	1.54	31.7	131	159	Peak
461	21.41	34.2	46	-24.59	16.54	2.65	31.98	100	316	Peak
617.1	24.66	33.85	46	-21.34	19.81	3.14	32.14	100	135	Peak
899.2	28.53	33.07	46	-17.47	23.5	3.97	32.01	100	203	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 (dB μ V)	
	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

Tested Date: Dec. 21, 2013

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. 28, 2012	Dec. 27, 2013
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100104	Dec. 06, 2013	Dec. 05, 2014
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 2.
3. The VCCI Site Registration No. is C-2047.

4.2.3 TEST PROCEDURES

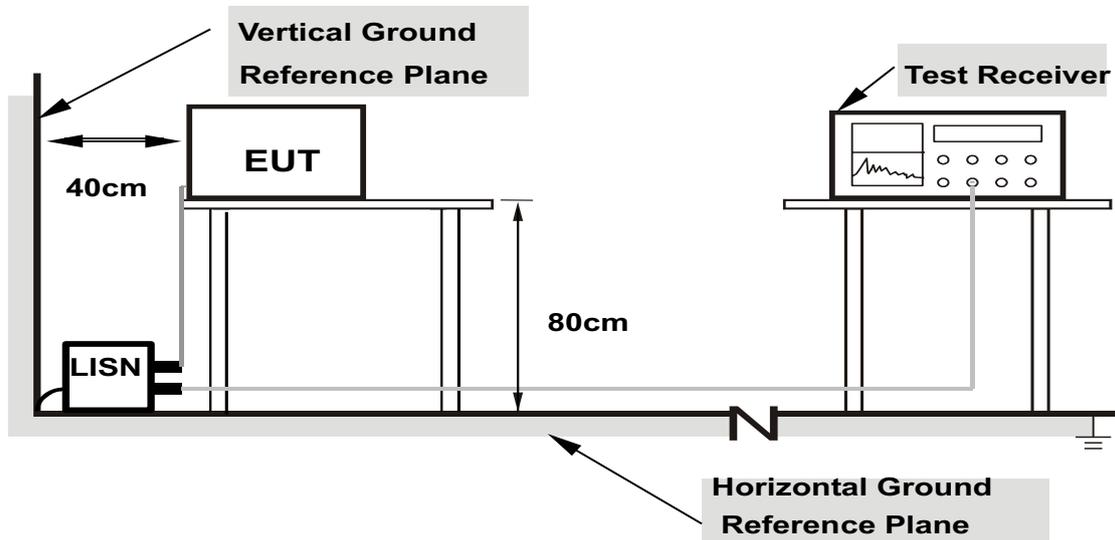
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

4.2.7 TEST RESULTS

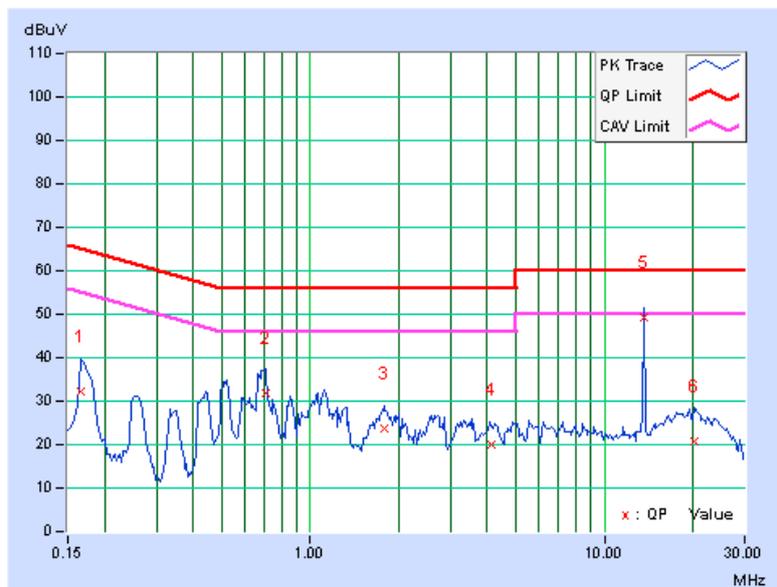
CONDUCTED WORST-CASE DATA :

PHASE	Line 1	6dB BANDWIDTH	9kHz
-------	--------	---------------	------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.16562	0.17	32.16	17.62	32.33	17.79	65.18
2	0.70469	0.24	31.48	22.09	31.72	22.33	56.00	46.00	-24.28	-23.67
3	1.78125	0.28	23.38	14.19	23.66	14.47	56.00	46.00	-32.34	-31.53
4	4.12109	0.37	19.66	12.06	20.03	12.43	56.00	46.00	-35.97	-33.57
5	13.56250	0.50	48.92	43.40	49.42	43.90	60.00	50.00	-10.58	-6.10
6	20.25391	0.64	20.19	13.61	20.83	14.25	60.00	50.00	-39.17	-35.75

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

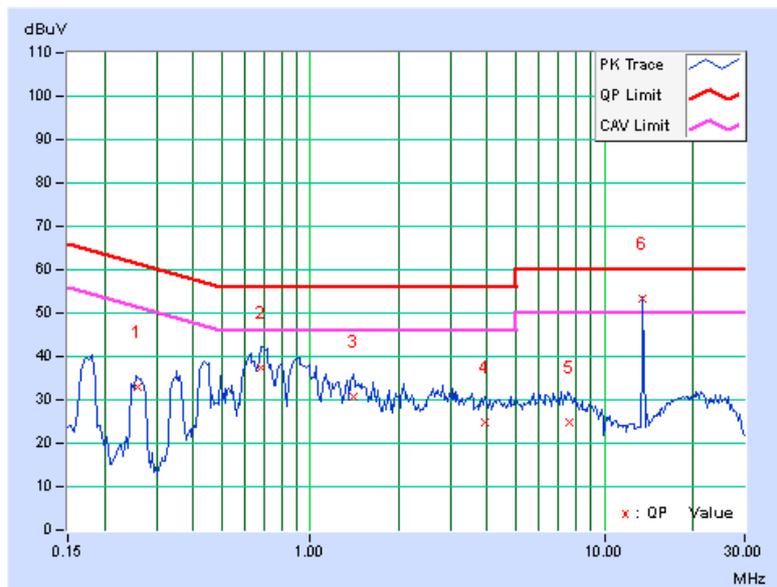


PHASE	Line 2	6dB BANDWIDTH	9kHz
-------	--------	---------------	------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.25938	0.20	32.68	24.84	32.88	25.04	61.45
2	0.68125	0.24	37.33	25.45	37.57	25.69	56.00	46.00	-18.43	-20.31
3	1.40625	0.25	30.37	17.82	30.62	18.07	56.00	46.00	-25.38	-27.93
4	3.94531	0.39	24.36	13.08	24.75	13.47	56.00	46.00	-31.25	-32.53
5	7.59375	0.44	24.50	14.76	24.94	15.20	60.00	50.00	-35.06	-34.80
6	13.55859	0.57	52.79	48.38	53.36	48.95	60.00	50.00	-6.64	-1.05

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

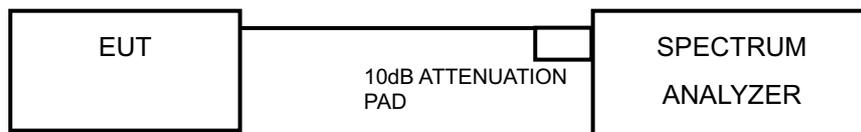


4.3 6dB BANDWIDTH MEASUREMENT

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) $\geq 3 \times$ 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	9.05	0.5	PASS
6	2437	8.11	0.5	PASS
11	2462	8.58	0.5	PASS

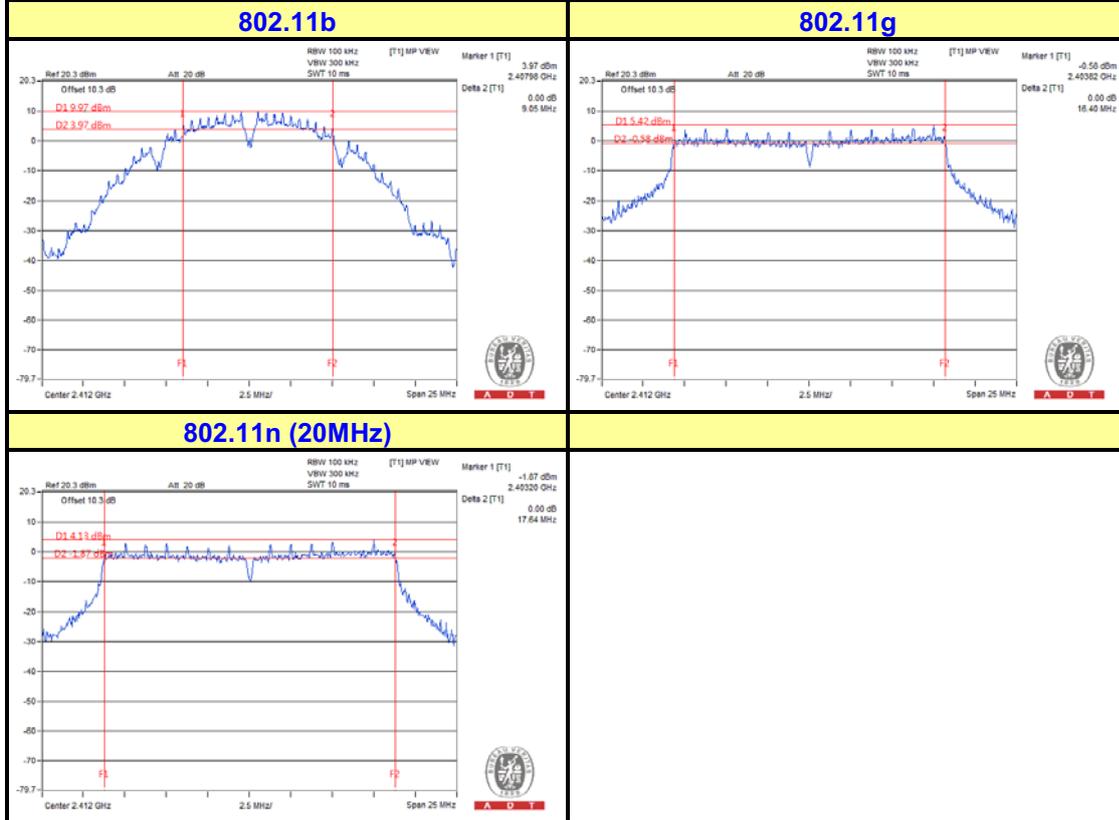
802.11g

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.4	0.5	PASS
6	2437	16.4	0.5	PASS
11	2462	16.37	0.5	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.64	0.5	PASS
6	2437	17.63	0.5	PASS
11	2462	17.23	0.5	PASS

SPECTRUM PLOT OF WORST VALUE

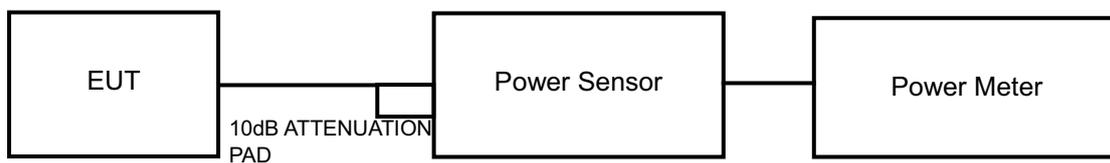


4.4 CONDUCTED OUTPUT POWER

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 Item 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	110.154	20.42	30	PASS
6	2437	123.027	20.9	30	PASS
11	2462	108.143	20.34	30	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	213.796	23.3	30	PASS
6	2437	207.014	23.16	30	PASS
11	2462	207.014	23.16	30	PASS

802.11n (20MHz)

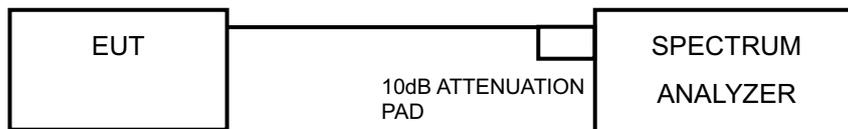
CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	177.419	22.49	30	PASS
6	2437	193.642	22.87	30	PASS
11	2462	181.970	22.6	30	PASS

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

- Set the RBW = 3 kHz, VBW = 10 kHz, Detector = peak.
- Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
- 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

802.11b

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-3.73	8	PASS
6	2437	-4.04	8	PASS
11	2462	-5.09	8	PASS

802.11g

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-10.27	8	PASS
6	2437	-9.50	8	PASS
11	2462	-8.71	8	PASS

802.11n (20MHz)

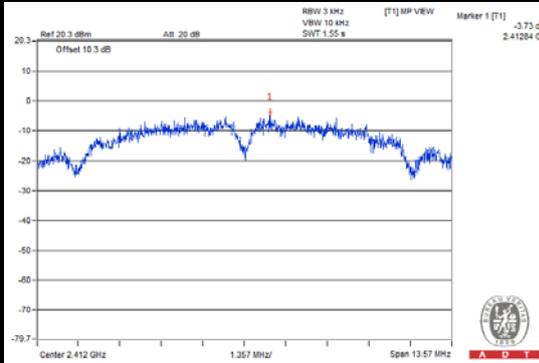
Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-11.08	8	PASS
6	2437	-10.55	8	PASS
11	2462	-9.38	8	PASS



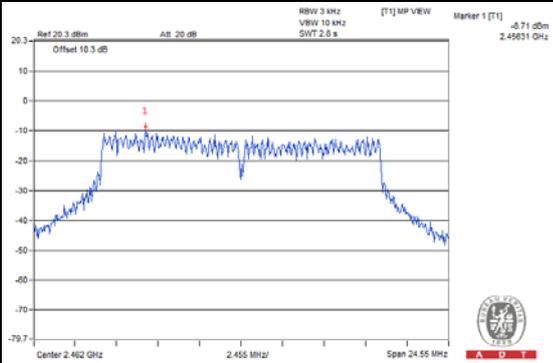
A D T

SPECTRUM PLOT OF WORST VALUE

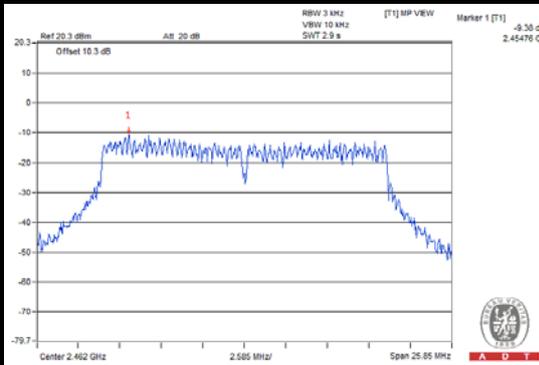
802.11b



802.11g



802.11n (20MHz)

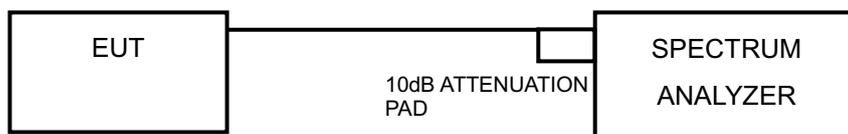


4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

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 \geq 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 \geq 300 kHz.
3. Ensure that the number of measurement points \geq 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

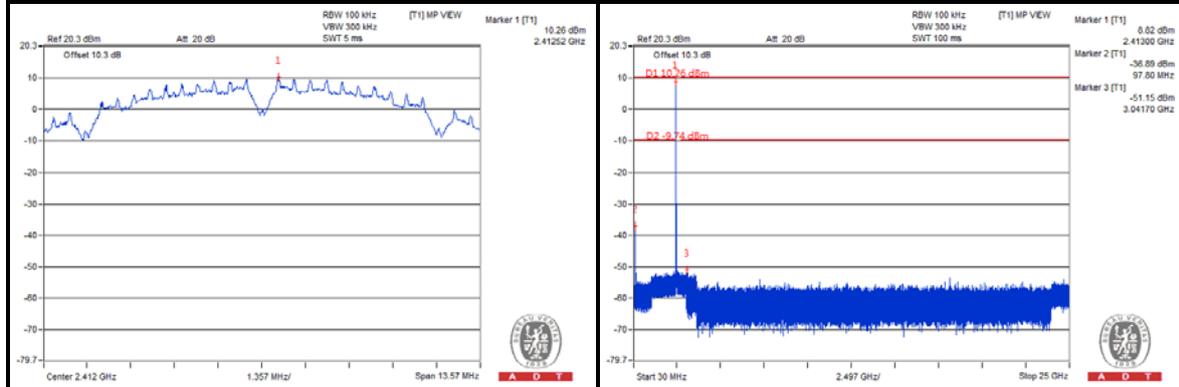
Same as Item 4.3.6

4.6.7 TEST RESULTS

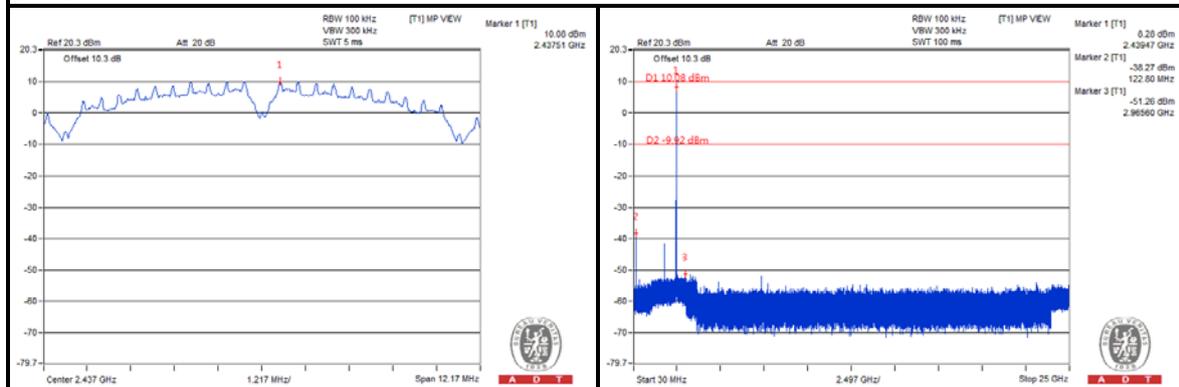
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b

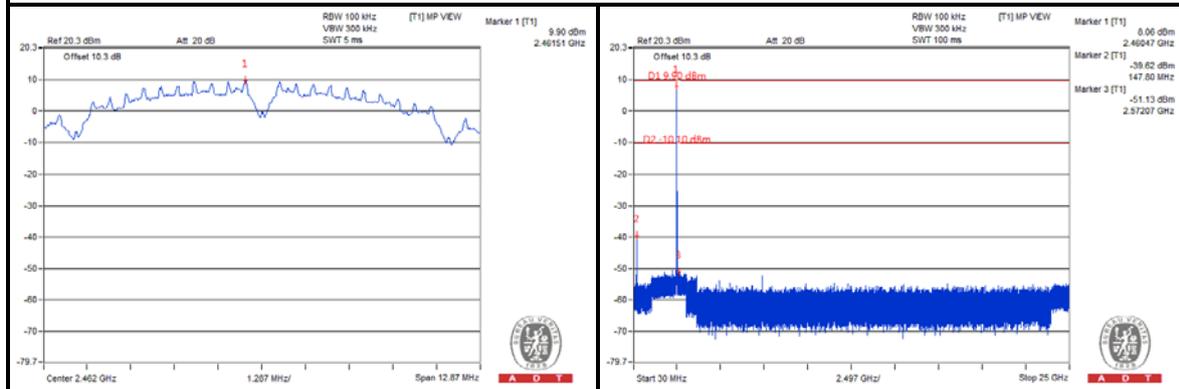
CH 1



CH 6

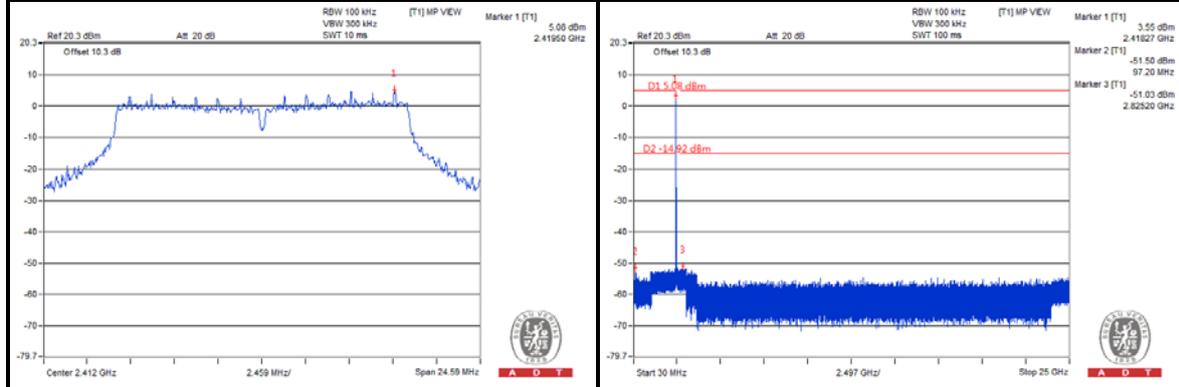


CH 11

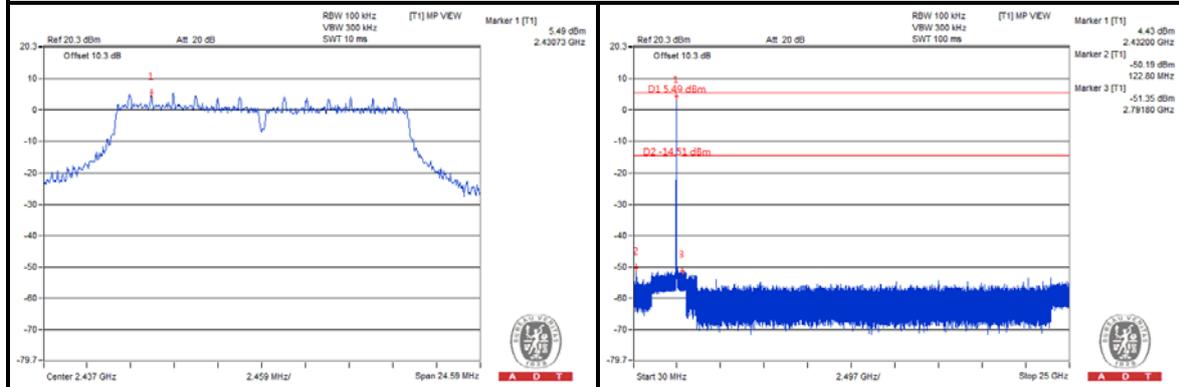


802.11g

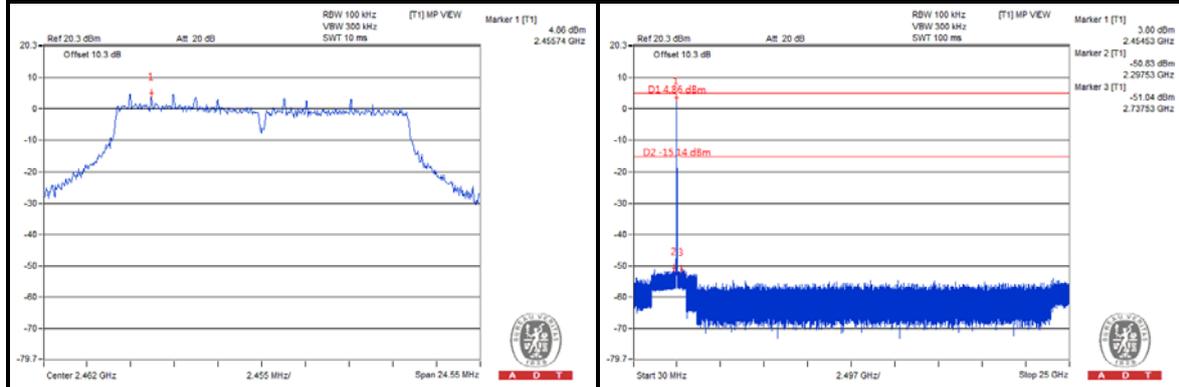
CH 1



CH 6

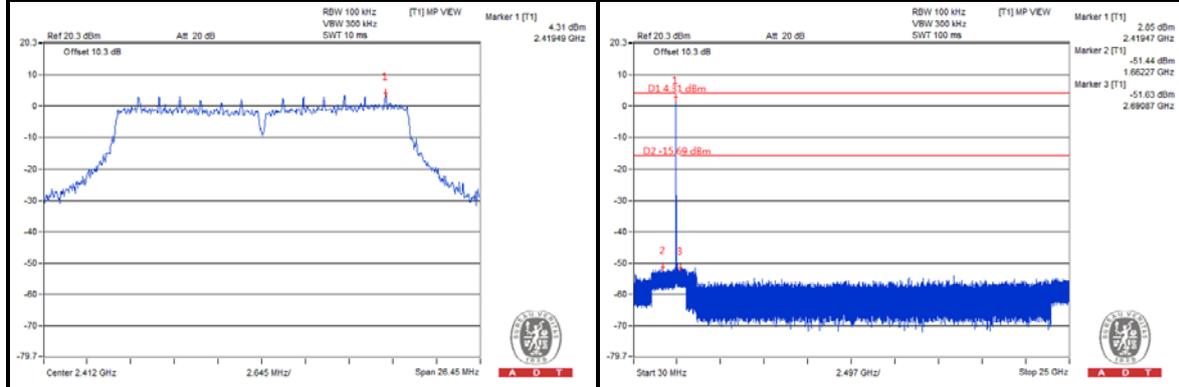


CH 11

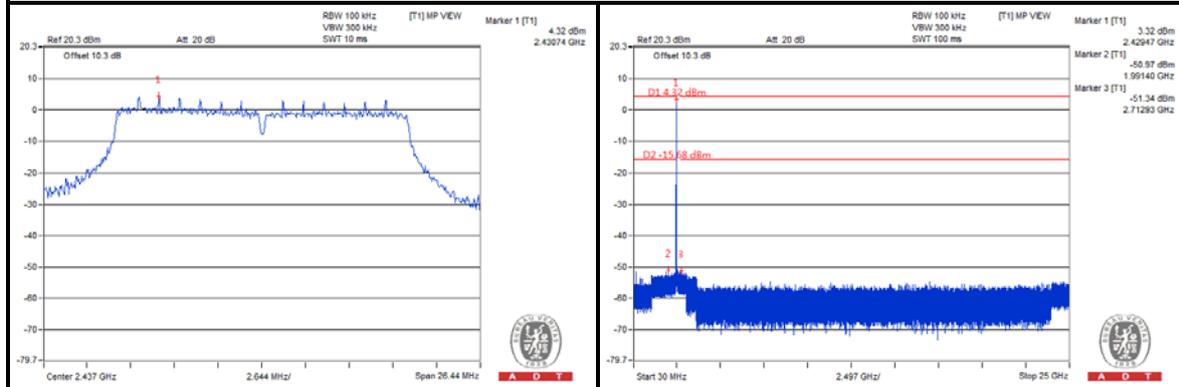


802.11n (20MHz)

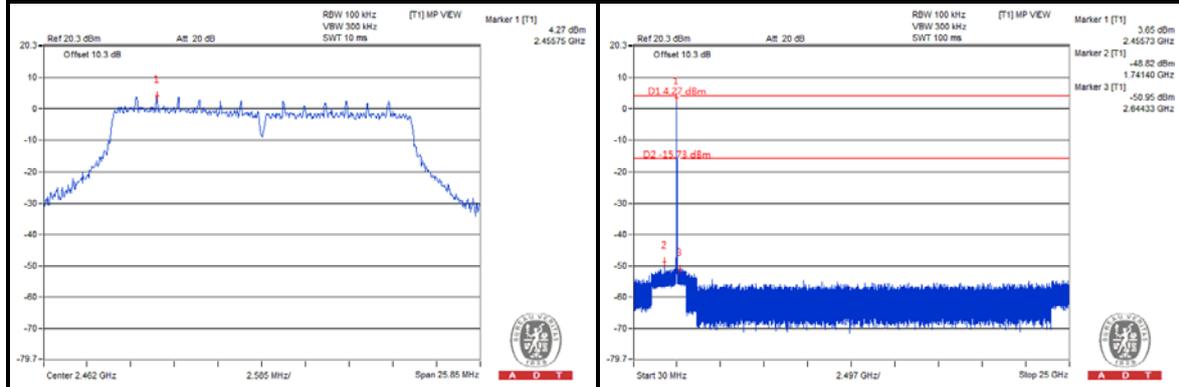
CH 1



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 item 4.1.2.

5.1.3 TEST PROCEDURES

Same as item 4.1.3.

5.1.4 DEVIATION FROM TEST STANDARD

No deviation.

5.1.5 TEST SETUP

Same as item 4.1.5.

5.1.6 EUT OPERATING CONDITIONS

Same as 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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	David Huang

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	43.31	43.19	68.85	-25.54	31.96	5.59	37.43	100	35	Average
5725	61.91	61.79	78.06	-16.15	31.96	5.59	37.43	100	35	Peak
5745	88.85	88.73			31.99	5.6	37.47	100	35	Average
5745	98.06	97.94			31.99	5.6	37.47	100	35	Peak
5850	38.2	37.9	68.85	-30.65	32.15	5.66	37.51	100	35	Average
5850	58	57.7	78.06	-20.06	32.15	5.66	37.51	100	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
5725	49.48	49.36	76.55	-27.07	31.96	5.59	37.43	100	36	Average
5725	67.39	67.27	85.94	-18.55	31.96	5.59	37.43	100	36	Peak
5745	96.55	96.43			31.99	5.6	37.47	100	36	Average
5745	105.94	105.82			31.99	5.6	37.47	100	36	Peak
5850	38.53	38.23	76.55	-38.02	32.15	5.66	37.51	100	36	Average
5850	59.12	58.82	85.94	-26.82	32.15	5.66	37.51	100	36	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5745MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band

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

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	38.25	38.13	69.21	-30.96	31.96	5.59	37.43	100	35	Average
5725	58.3	58.18	78.57	-20.27	31.96	5.59	37.43	100	35	Peak
5785	89.21	89.09			32.04	5.62	37.54	100	35	Average
5785	98.57	98.45			32.04	5.62	37.54	100	35	Peak
5850	38.26	37.96	69.21	-30.95	32.15	5.66	37.51	100	35	Average
5850	58.58	58.28	78.57	-19.99	32.15	5.66	37.51	100	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
5725	38.58	38.46	76.83	-38.25	31.96	5.59	37.43	100	36	Average
5725	58.61	58.49	85.95	-27.34	31.96	5.59	37.43	100	36	Peak
5785	96.83	96.71			32.04	5.62	37.54	100	36	Average
5785	105.95	105.83			32.04	5.62	37.54	100	36	Peak
5850	38.69	38.39	76.83	-38.14	32.15	5.66	37.51	100	36	Average
5850	58.01	57.71	85.95	-27.94	32.15	5.66	37.51	100	36	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5785MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	David Huang

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	37.88	37.76	68.86	-30.98	31.96	5.59	37.43	100	31	Average
5725	58.45	58.33	78.06	-19.61	31.96	5.59	37.43	100	31	Peak
5825	88.86	88.63			32.12	5.64	37.53	100	31	Average
5825	98.06	97.83			32.12	5.64	37.53	100	31	Peak
5850	41.45	41.15	68.86	-12.55	32.15	5.66	37.51	100	31	Average
5850	61.12	60.82	78.06	-12.88	32.15	5.66	37.51	100	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
5725	38.42	38.3	76.72	-38.3	31.96	5.59	37.43	100	39	Average
5725	58.58	58.46	85.27	-26.69	31.96	5.59	37.43	100	39	Peak
5825	96.72	96.49			32.12	5.64	37.53	100	39	Average
5825	105.27	105.04			32.12	5.64	37.53	100	39	Peak
5850	45.81	45.51	76.72	-30.91	32.15	5.66	37.51	100	39	Average
5850	64.53	64.23	85.27	-20.74	32.15	5.66	37.51	100	39	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5825MHz: Fundamental frequency.
3. 5725MHz & 5850MHz: Out of restricted band

802.11n (20MHz)

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

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	48.88	48.76	69.29	-20.41	31.96	5.59	37.43	100	35	Average
5725	67.15	67.03	78.95	-11.8	31.96	5.59	37.43	100	35	Peak
5745	89.29	89.17			31.99	5.6	37.47	100	35	Average
5745	98.95	98.83			31.99	5.6	37.47	100	35	Peak
5850	38.21	37.91	69.29	-15.79	32.15	5.66	37.51	100	35	Average
5850	59.3	59	78.95	-14.7	32.15	5.66	37.51	100	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
5725	56.27	56.15	77.14	-20.87	31.96	5.59	37.43	100	43	Average
5725	76.82	76.7	86.58	-9.76	31.96	5.59	37.43	100	43	Peak
5745	97.14	97.02			31.99	5.6	37.47	100	43	Average
5745	106.58	106.46			31.99	5.6	37.47	100	43	Peak
5850	38.47	38.17	77.14	-38.67	32.15	5.66	37.51	100	43	Average
5850	59.35	59.05	86.58	-27.23	32.15	5.66	37.51	100	43	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5745MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band

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

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	38.17	38.05	69.69	-31.52	31.96	5.59	37.43	100	34	Average
5725	58.86	58.74	78.96	-20.1	31.96	5.59	37.43	100	34	Peak
5785	89.69	89.57			32.04	5.62	37.54	100	34	Average
5785	98.96	98.84			32.04	5.62	37.54	100	34	Peak
5850	38.4	38.1	69.69	-15.6	32.15	5.66	37.51	100	34	Average
5850	58.96	58.66	78.96	-15.04	32.15	5.66	37.51	100	34	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	39.09	38.97	77.76	-14.91	31.96	5.59	37.43	100	38	Average
5725	58.58	58.46	87.09	-15.42	31.96	5.59	37.43	100	38	Peak
5785	97.76	97.64			32.04	5.62	37.54	100	38	Average
5785	107.09	106.97			32.04	5.62	37.54	100	38	Peak
5850	38.97	38.67	77.76	-38.79	32.15	5.66	37.51	100	38	Average
5850	59.73	59.43	87.09	-27.36	32.15	5.66	37.51	100	38	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5785MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	David Huang

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	38.1	37.98	69.7	-31.6	31.96	5.59	37.43	100	32	Average
5725	58.73	58.61	78.53	-19.8	31.96	5.59	37.43	100	32	Peak
5825	89.7	89.47			32.12	5.64	37.53	100	32	Average
5825	98.53	98.3			32.12	5.64	37.53	100	32	Peak
5850	45.45	45.15	69.7	-8.55	32.15	5.66	37.51	100	32	Average
5850	63.35	63.05	78.53	-10.65	32.15	5.66	37.51	100	32	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	38.79	38.67	77.45	-15.21	31.96	5.59	37.43	100	37	Average
5725	58.69	58.57	86.69	-15.31	31.96	5.59	37.43	100	37	Peak
5825	97.45	97.22			32.12	5.64	37.53	100	37	Average
5825	106.69	106.46			32.12	5.64	37.53	100	37	Peak
5850	49.76	49.46	77.45	-27.69	32.15	5.66	37.51	100	37	Average
5850	68.47	68.17	86.69	-18.22	32.15	5.66	37.51	100	37	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5825MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band

802.11n (40MHz)

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

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	39.76	39.64	63.12	-23.36	31.96	5.59	37.43	100	34	Average
5725	58.08	57.96	72.64	-14.56	31.96	5.59	37.43	100	34	Peak
5755	83.12	82.98			32.01	5.6	37.47	100	34	Average
5755	92.64	92.5			32.01	5.6	37.47	100	34	Peak
5850	38.59	38.29	63.12	-15.41	32.15	5.66	37.51	100	34	Average
5850	59.23	58.93	72.64	-14.77	32.15	5.66	37.51	100	34	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	44.12	44	71.11	-9.88	31.96	5.59	37.43	100	32	Average
5725	59.83	59.71	81.19	-14.17	31.96	5.59	37.43	100	32	Peak
5755	91.11	90.97			32.01	5.6	37.47	100	32	Average
5755	101.19	101.05			32.01	5.6	37.47	100	32	Peak
5850	38.43	38.13	71.11	-32.68	32.15	5.66	37.51	100	32	Average
5850	59.09	58.79	81.19	-22.1	32.15	5.66	37.51	100	32	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5755MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band

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

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	38.59	38.47	63.01	-24.42	31.96	5.59	37.43	100	34	Average
5725	58.8	58.68	72.09	-13.29	31.96	5.59	37.43	100	34	Peak
5795	83.01	82.85			32.07	5.63	37.54	100	34	Average
5795	92.09	91.93			32.07	5.63	37.54	100	34	Peak
5850	38.63	38.33	63.01	-15.37	32.15	5.66	37.51	100	34	Average
5850	59.98	59.68	72.09	-14.02	32.15	5.66	37.51	100	34	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	38.42	38.3	70.87	-15.58	31.96	5.59	37.43	100	44	Average
5725	57.83	57.71	79.93	-16.17	31.96	5.59	37.43	100	44	Peak
5795	90.87	90.71			32.07	5.63	37.54	100	44	Average
5795	99.93	99.77			32.07	5.63	37.54	100	44	Peak
5850	39.33	39.03	70.87	-31.54	32.15	5.66	37.51	100	44	Average
5850	59.79	59.49	79.93	-20.14	32.15	5.66	37.51	100	44	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 & 5850MHz: Out of restricted band

802.11ac (80MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 155	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	David Huang

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	41.51	41.39	61.73	-20.22	31.96	5.59	37.43	100	35	Average
5725	60.49	60.37	71.35	-10.86	31.96	5.59	37.43	100	35	Peak
5775	81.73	81.57			32.04	5.62	37.5	100	35	Average
5775	91.35	91.19			32.04	5.62	37.5	100	35	Peak
5850	39.55	39.25	61.73	-22.18	32.15	5.66	37.51	100	35	Average
5850	60.23	59.93	71.35	-11.12	32.15	5.66	37.51	100	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
5725	46	45.88	69.22	-23.22	31.96	5.59	37.43	100	43	Average
5725	66.49	66.37	78.68	-12.19	31.96	5.59	37.43	100	43	Peak
5775	89.22	89.06			32.04	5.62	37.5	100	43	Average
5775	98.68	98.52			32.04	5.62	37.5	100	43	Peak
5850	42.32	42.02	69.22	-26.9	32.15	5.66	37.51	100	43	Average
5850	61.43	61.13	78.68	-17.25	32.15	5.66	37.51	100	43	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5775MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band

BELOW 1GHz WORST-CASE DATA :

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	30MHz ~ 1GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Quasi-peak (QP)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	David Huang

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
63.48	20.98	40.19	40	-19.02	11.47	0.86	31.54	100	115	Peak
145.83	22.31	40.07	43.5	-21.19	12.54	1.32	31.62	100	59	Peak
188.76	30.51	50.54	43.5	-12.99	10.12	1.54	31.69	100	172	Peak
349.7	22.29	37.75	46	-23.71	14.15	2.23	31.84	100	149	Peak
591.2	22.96	32.65	46	-23.04	19.41	3.06	32.16	100	86	Peak
787.2	27.73	33.43	46	-18.27	22.05	3.66	31.41	100	43	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
38.91	26.74	43.71	40	-13.26	13.39	0.64	31	100	180	Peak
108.84	19.03	39.86	43.5	-24.47	9.9	1.12	31.85	100	296	Peak
180.39	22.67	42.27	43.5	-20.83	10.74	1.5	31.84	100	322	Peak
438.6	20.46	33.79	46	-25.54	16.1	2.57	32	100	162	Peak
597.5	24.08	33.68	46	-21.92	19.54	3.08	32.22	100	48	Peak
930	26.99	31.27	46	-19.01	23.68	4.03	31.99	100	188	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 (dB μ V)	
	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 TEST INSTRUMENTS

Same as item 4.2.2.

5.2.3 TEST PROCEDURES

Same as item 4.2.3.

5.2.4 DEVIATION FROM TEST STANDARD

No deviation.

5.2.5 TEST SETUP

Same as item 4.2.5.

5.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

5.2.7 TEST RESULTS

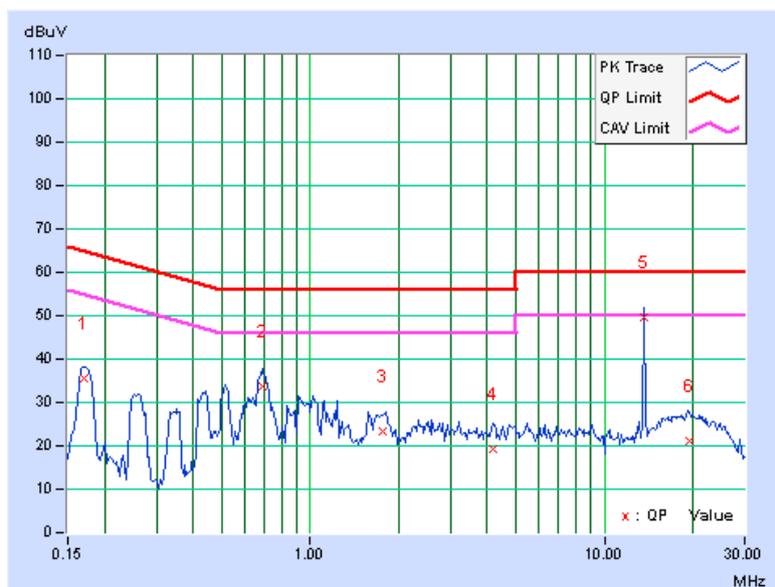
CONDUCTED WORST-CASE DATA :

PHASE	Line 1	6dB BANDWIDTH	9kHz
--------------	--------	----------------------	------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.16953	0.17	35.23	25.93	35.40	26.10	64.98
2	0.68516	0.24	33.42	25.31	33.66	25.55	56.00	46.00	-22.34	-20.45
3	1.75391	0.28	23.12	14.53	23.40	14.81	56.00	46.00	-32.60	-31.19
4	4.17578	0.37	18.88	11.70	19.25	12.07	56.00	46.00	-36.75	-33.93
5	13.56250	0.50	49.08	43.51	49.58	44.01	60.00	50.00	-10.42	-5.99
6	19.41406	0.63	20.44	13.90	21.07	14.53	60.00	50.00	-38.93	-35.47

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

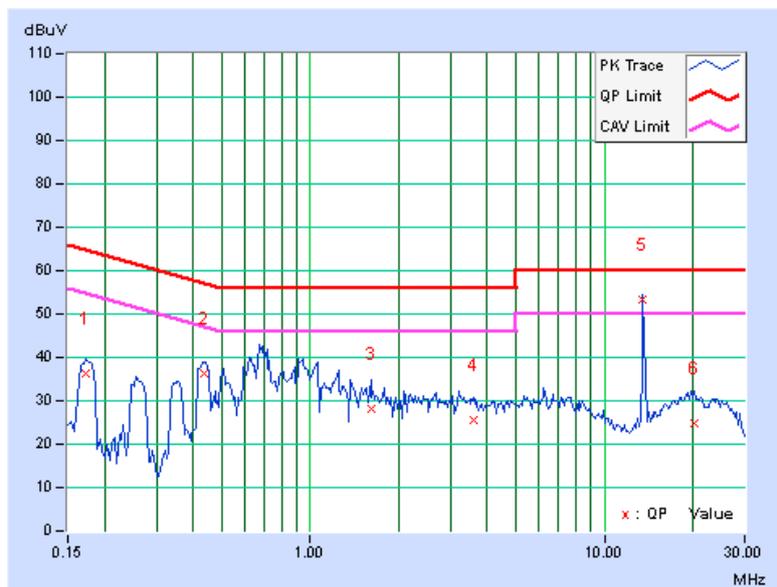


PHASE	Line 2	6dB BANDWIDTH	9kHz
-------	--------	---------------	------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.17344	0.18	36.08	28.12	36.26	28.30	64.79
2	0.43516	0.25	35.94	24.94	36.19	25.19	57.15	47.15	-20.96	-21.96
3	1.60547	0.26	27.83	15.56	28.09	15.82	56.00	46.00	-27.91	-30.18
4	3.58594	0.37	25.05	13.73	25.42	14.10	56.00	46.00	-30.58	-31.90
5	13.55859	0.57	52.69	48.34	53.26	48.91	60.00	50.00	-6.74	-1.09
6	20.24219	0.73	24.17	17.27	24.90	18.00	60.00	50.00	-35.10	-32.00

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 item 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 item 4.3.4.

5.3.5 DEVIATION FROM TEST STANDARD

No deviation.

5.3.6 EUT OPERATING CONDITIONS

Same as item 4.3.6.

5.3.7 TEST RESULTS

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	16.38	0.5	PASS
157	5785	16.41	0.5	PASS
165	5825	16.43	0.5	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	17.64	0.5	PASS
157	5785	17.62	0.5	PASS
165	5825	17.65	0.5	PASS

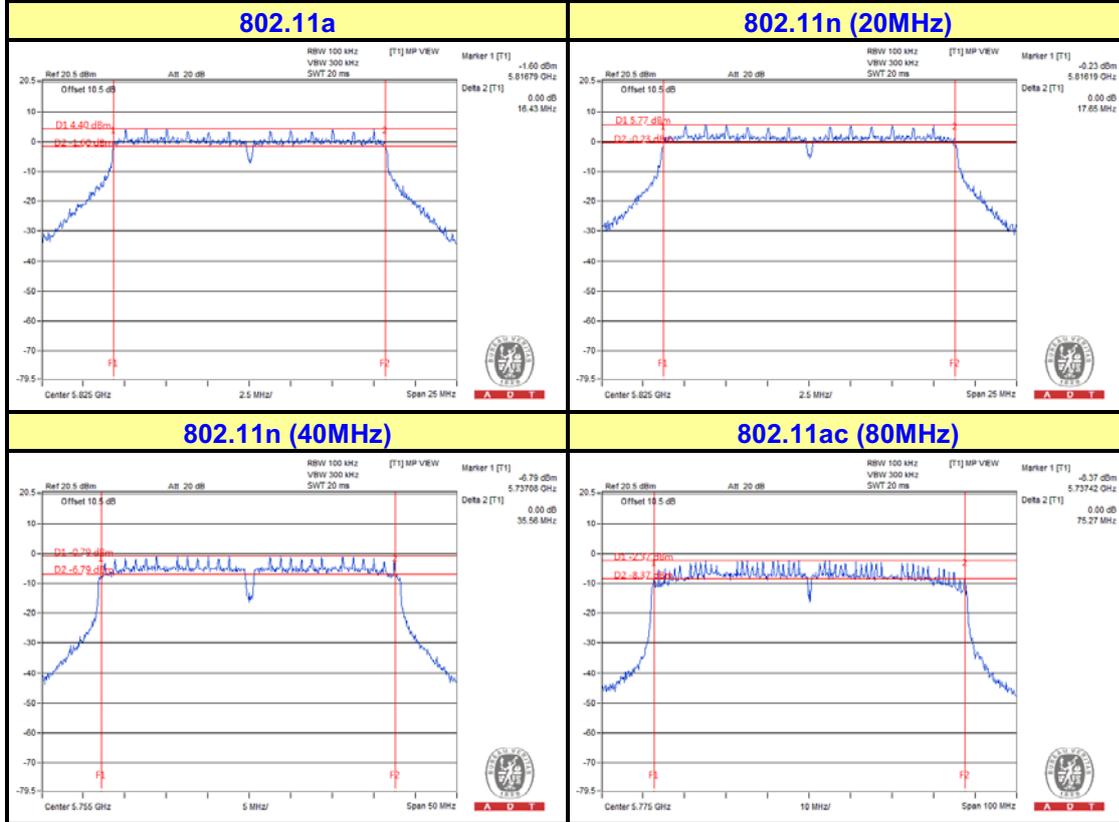
802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
151	5755	35.56	0.5	PASS
159	5795	35.39	0.5	PASS

802.11ac (80MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
155	5775	75.27	0.5	PASS

SPECTRUM PLOT OF WORST VALUE



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 Item 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 Item 4.4.4.

5.4.5 DEVIATION FROM TEST STANDARD

No deviation.

5.4.6 EUT OPERATING CONDITIONS

Same as Item 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	279.898	24.47	30	PASS
157	5785	295.121	24.7	30	PASS
165	5825	292.415	24.66	30	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
149	5745	309.742	24.91	30	PASS
157	5785	316.228	25	30	PASS
165	5825	315.500	24.99	30	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
151	5755	203.704	23.09	30	PASS
159	5795	210.863	23.24	30	PASS

802.11ac (80MHz)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
155	5775	110.917	20.45	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 item 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 item 4.5.4.

5.5.5 DEVIATION FROM TEST STANDARD

No deviation.

5.5.6 EUT OPERATING CONDITION

Same as item 4.3.6.

5.5.7 TEST RESULTS

802.11a

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
149	5745	-9.74	8	PASS
157	5785	-9.07	8	PASS
165	5825	-9.94	8	PASS

802.11n (20MHz)

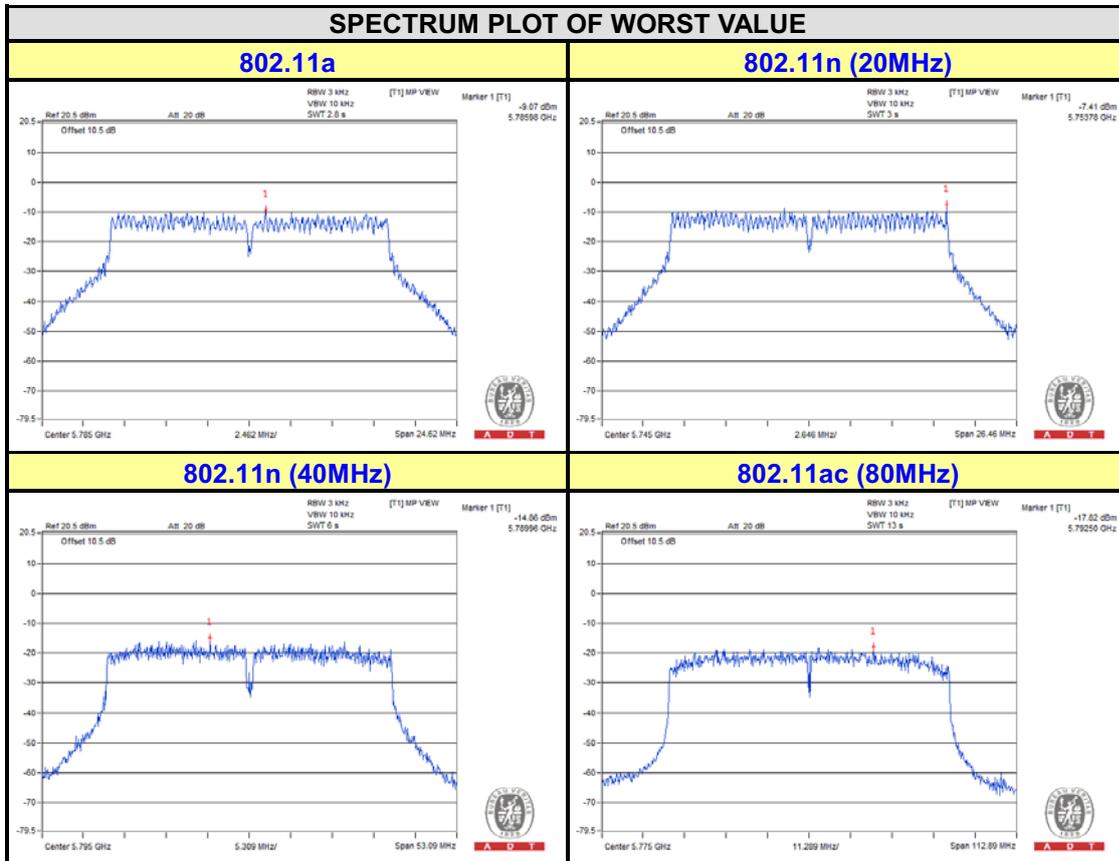
Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
149	5745	-7.41	8	PASS
157	5785	-8.53	8	PASS
165	5825	-9.16	8	PASS

802.11n (40MHz)

Channel	FREQ. (MHz)	PSD (dBm/100kHz)	Limit (dBm/3kHz)	PASS /FAIL
151	5755	-15.27	8	PASS
159	5795	-14.86	8	PASS

802.11ac (80MHz)

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
155	5775	-17.82	8	PASS



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 Item 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 Item 4.6.4

5.6.5 DEVIATION FROM TEST STANDARD

No deviation.

5.6.6 EUT OPERATING CONDITION

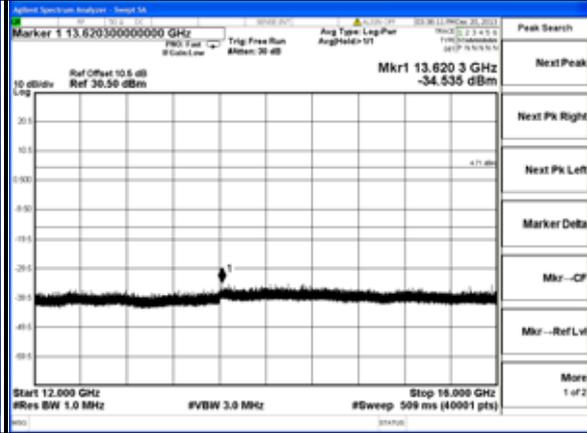
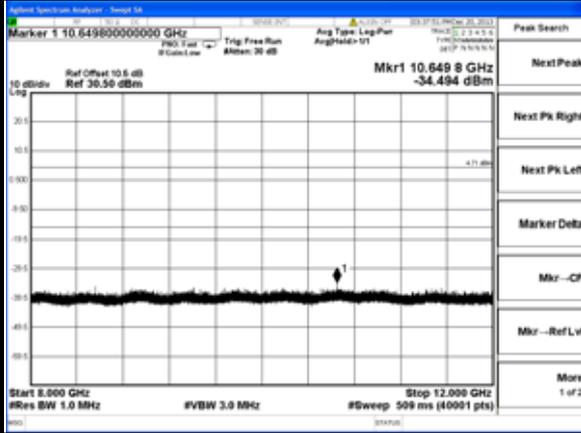
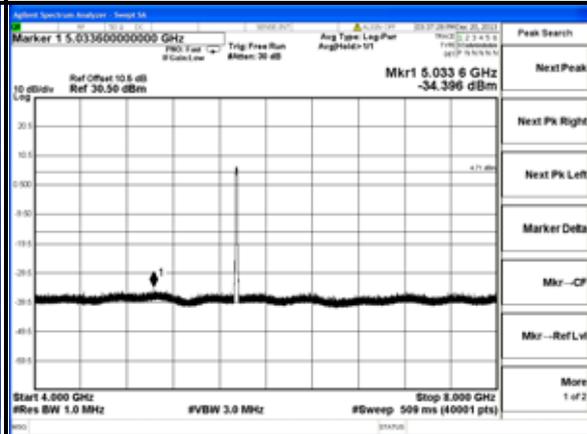
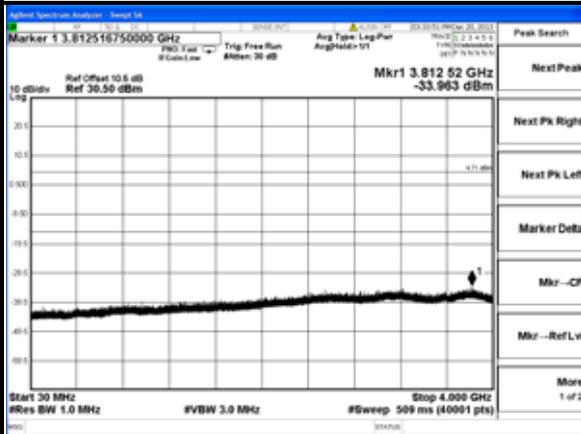
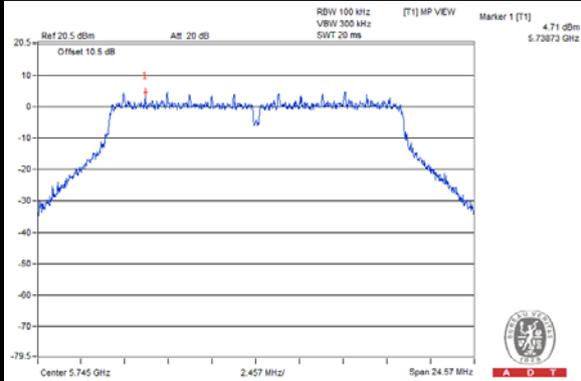
Same as Item 4.3.6

5.6.7 TEST RESULTS

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

802.11a

CH 149





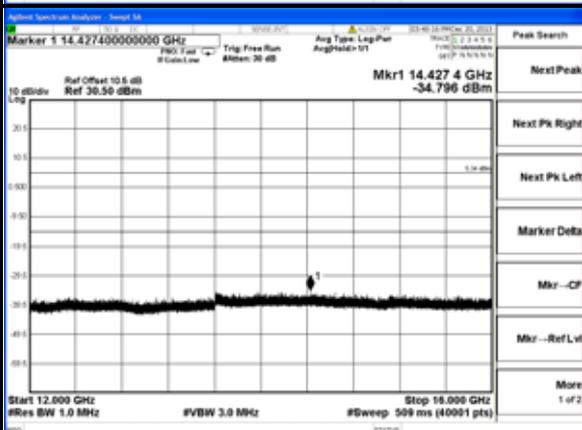
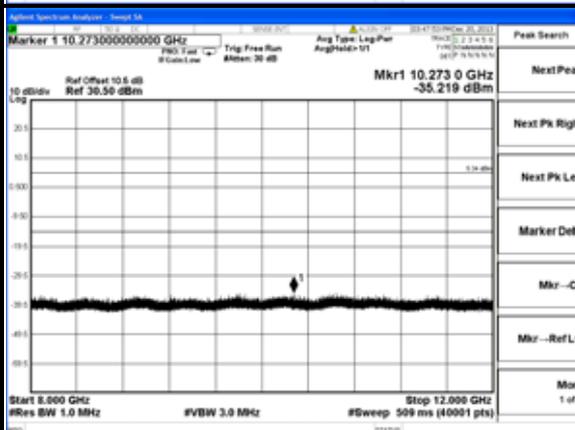
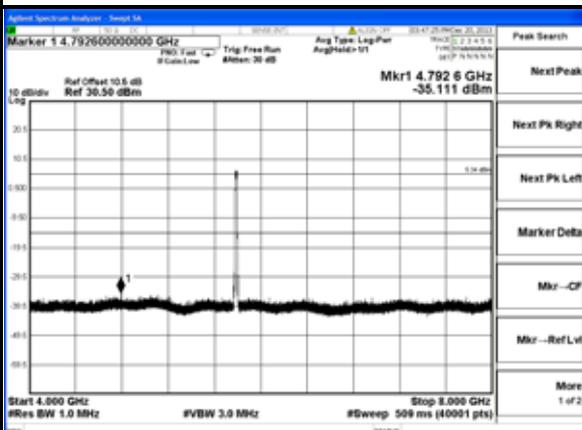
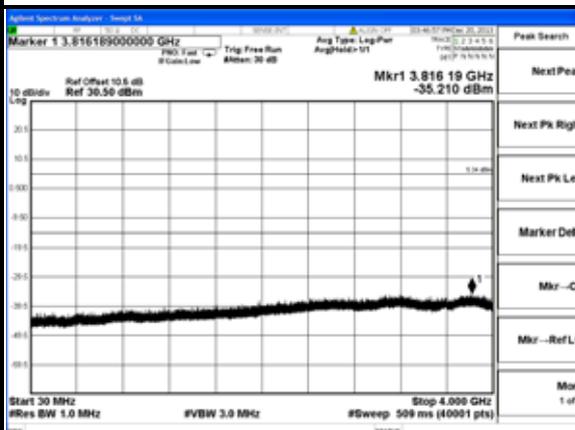
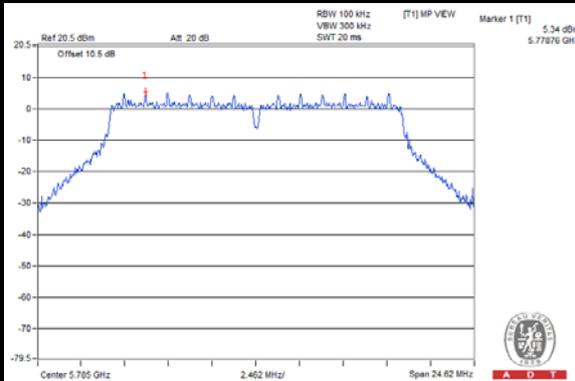
A D T





A D T

CH 157





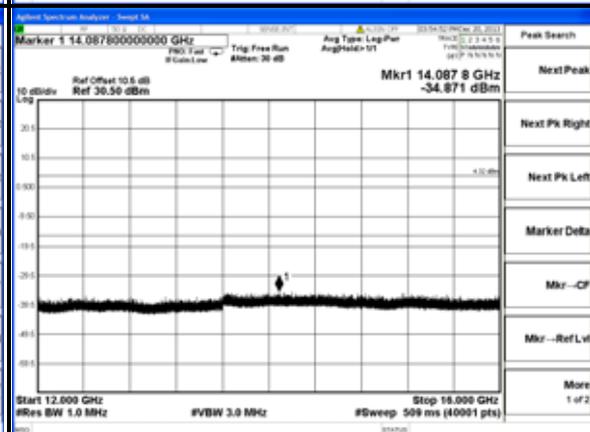
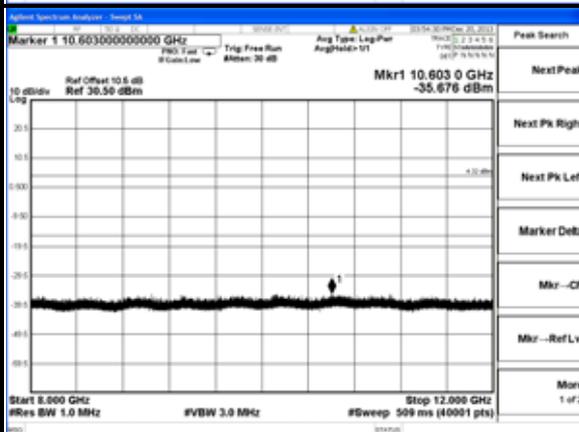
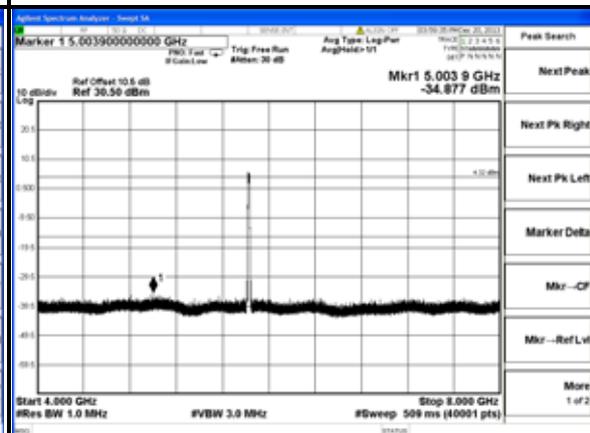
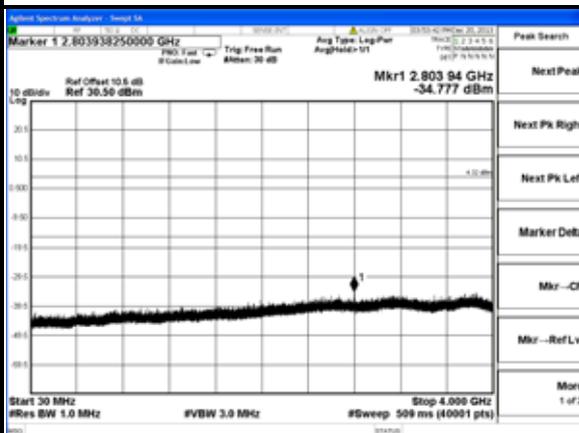
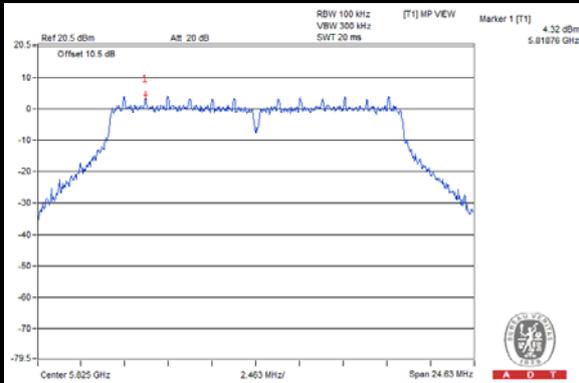
A D T





A D T

CH 165



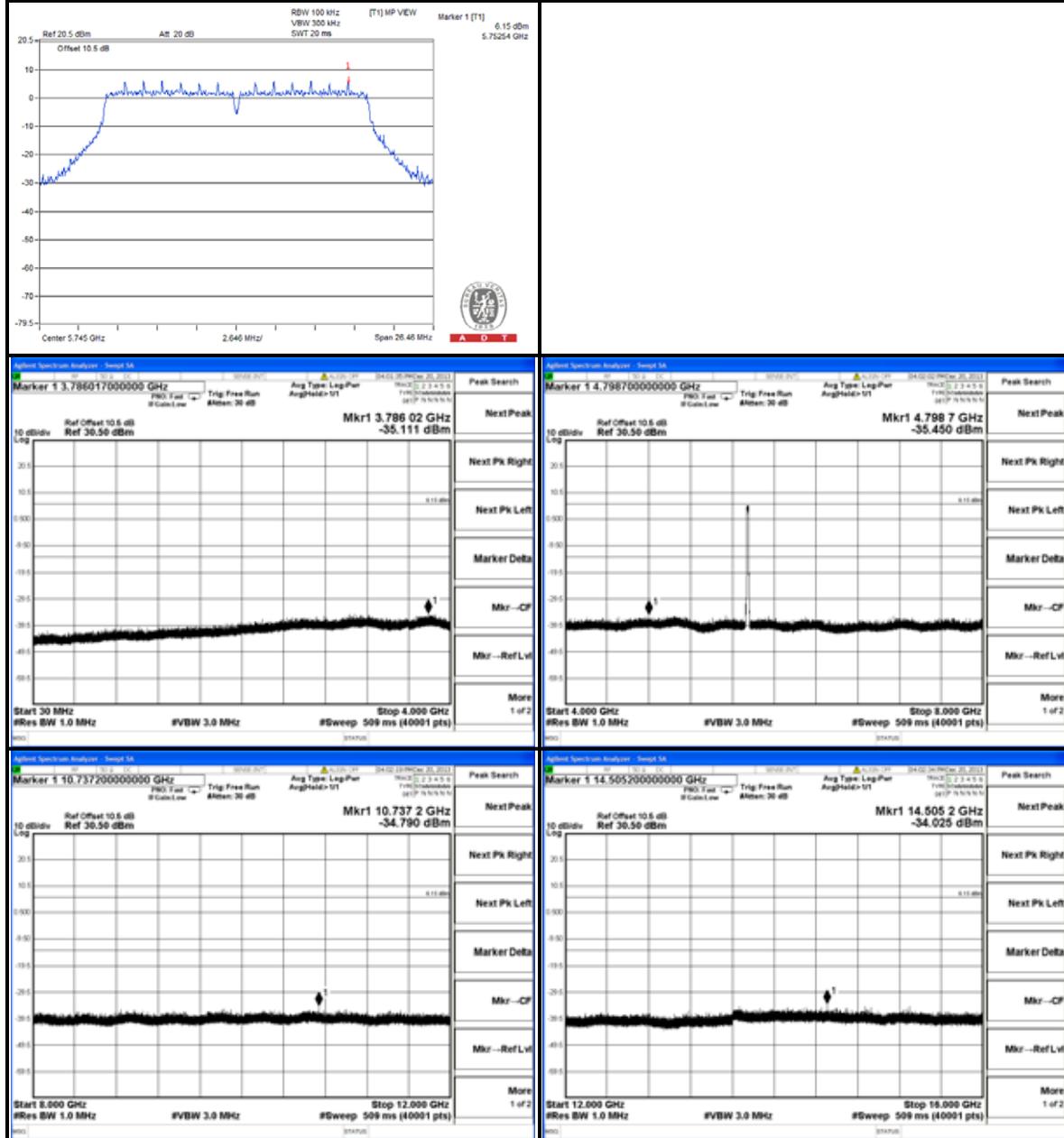


A D T



802.11n (20MHz)

CH 149





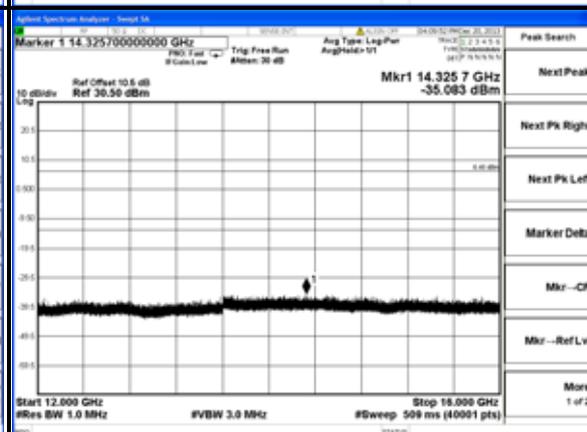
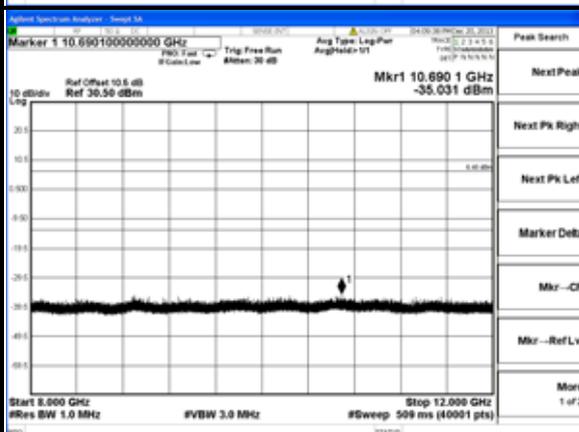
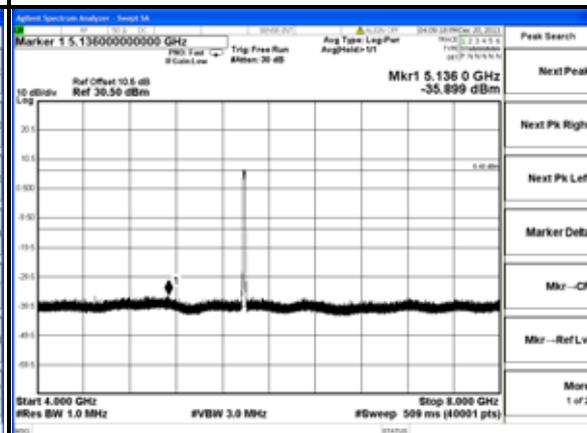
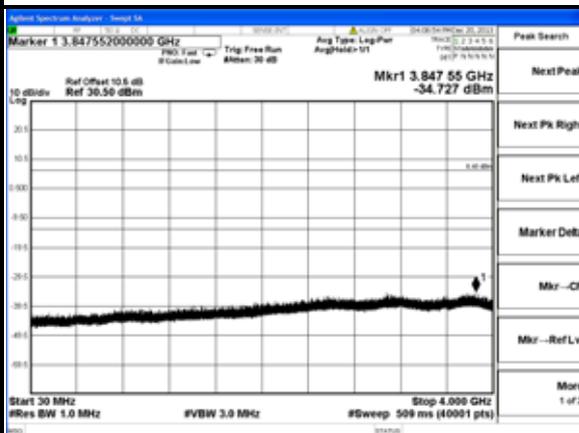
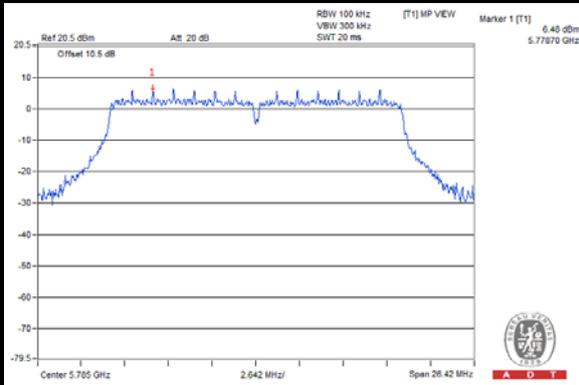
A D T





A D T

CH 157





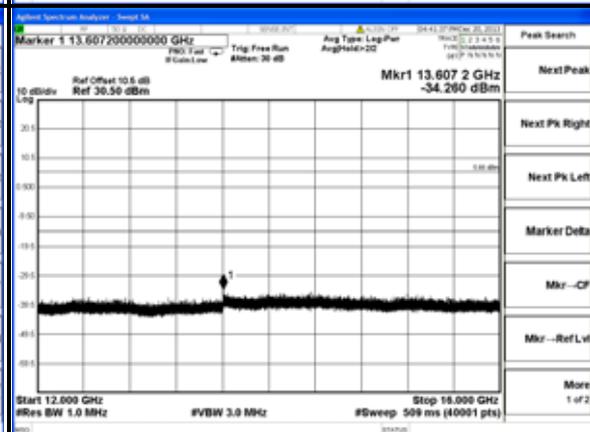
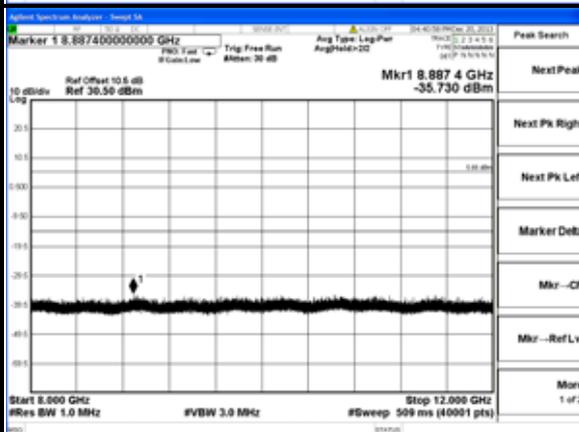
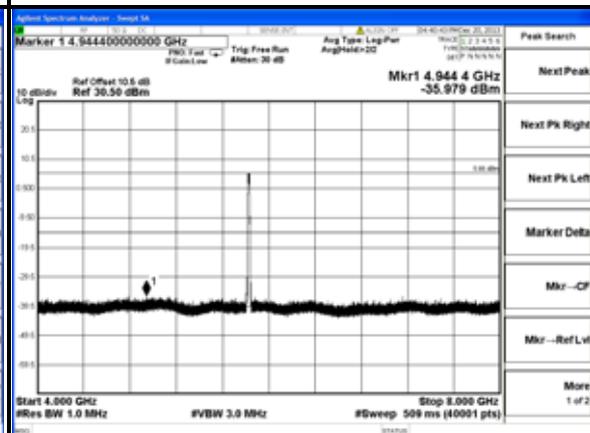
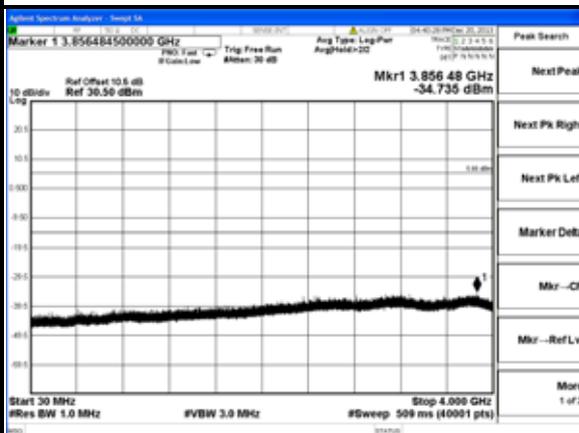
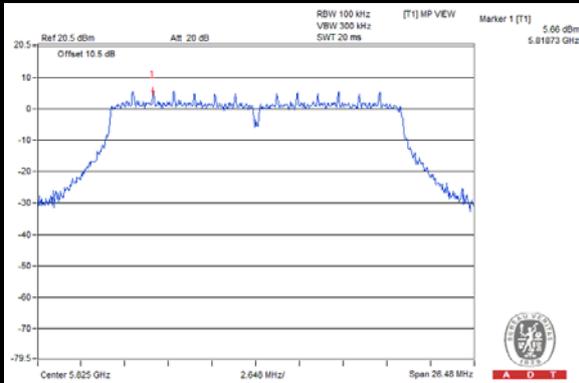
A D T





A D T

CH 165



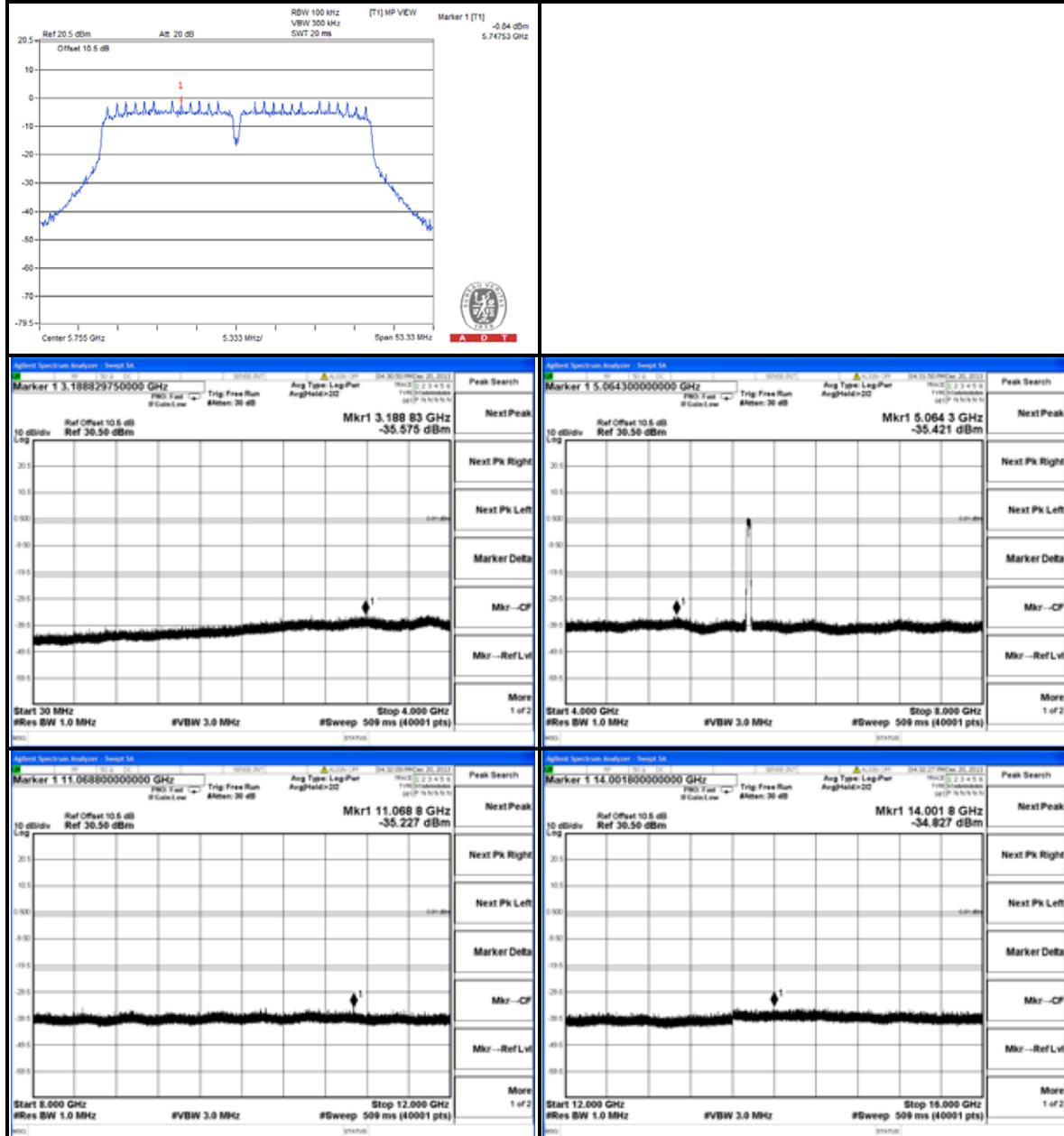


A D T



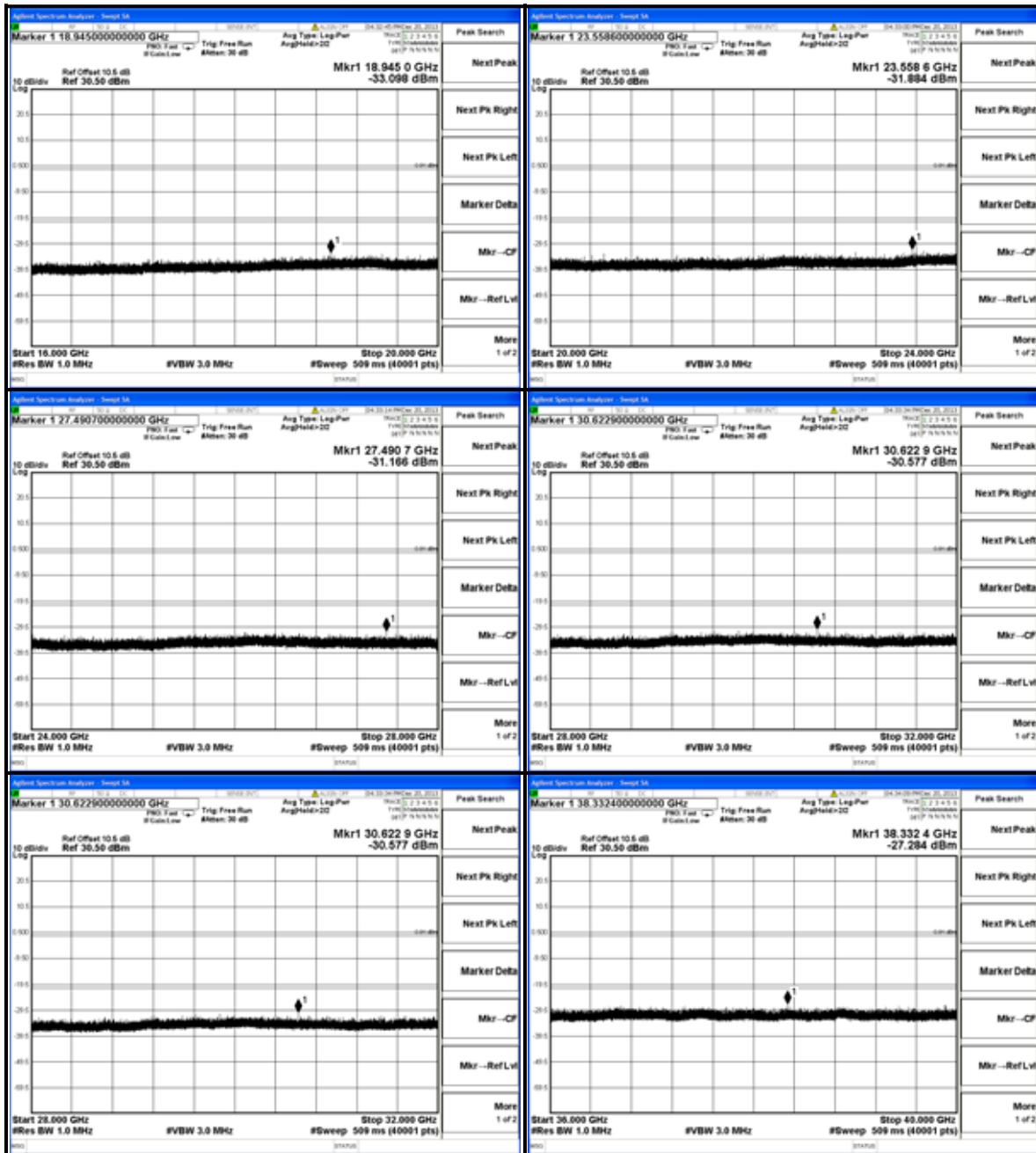
802.11n (40MHz)

CH 151





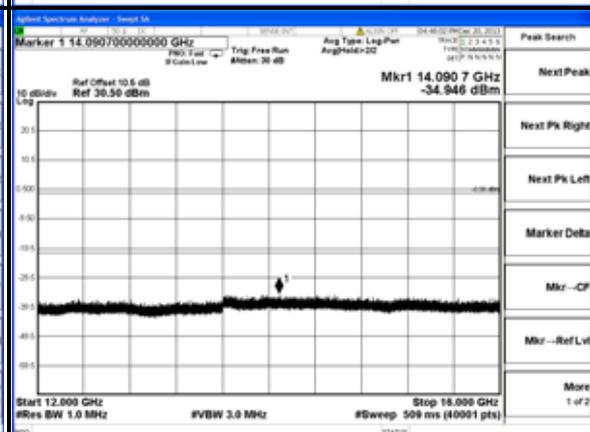
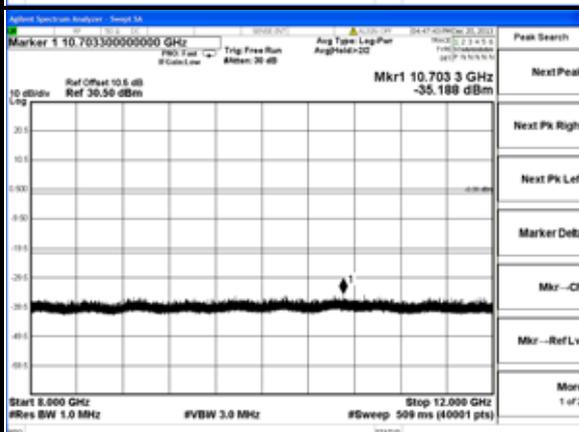
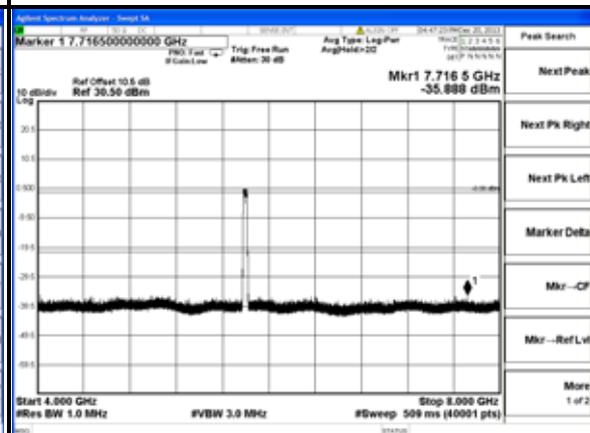
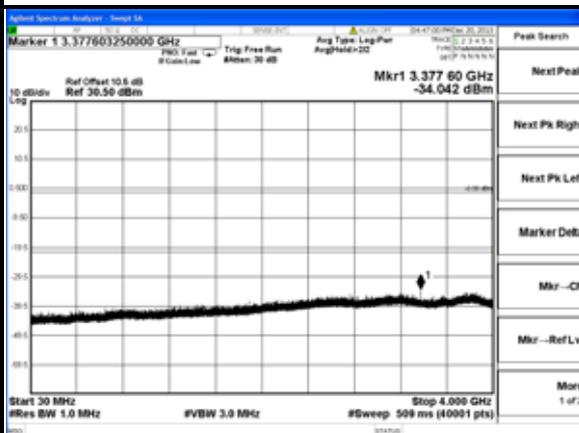
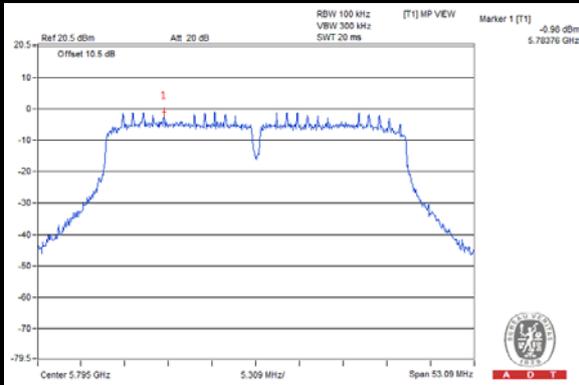
A D T





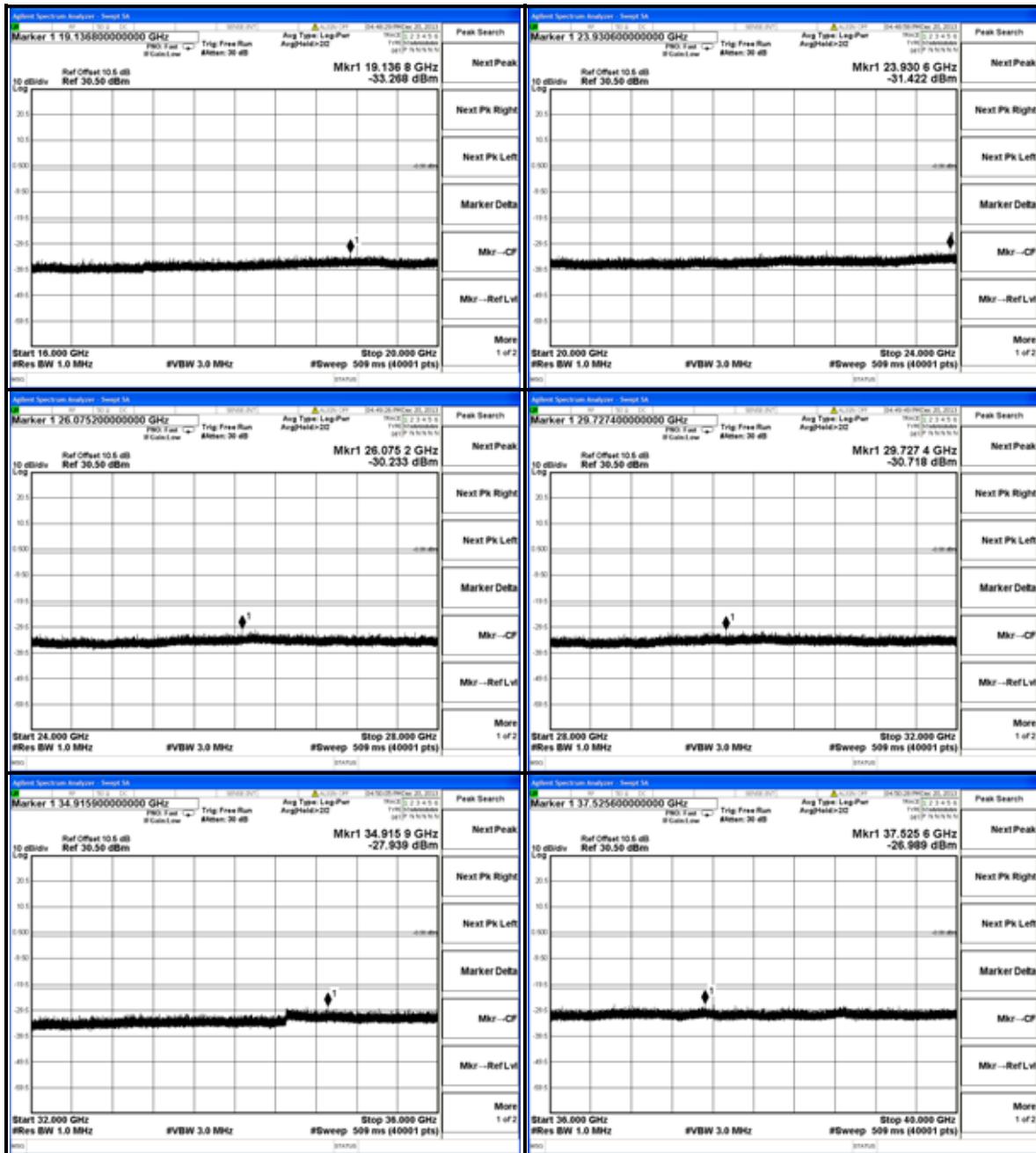
A D T

CH 159

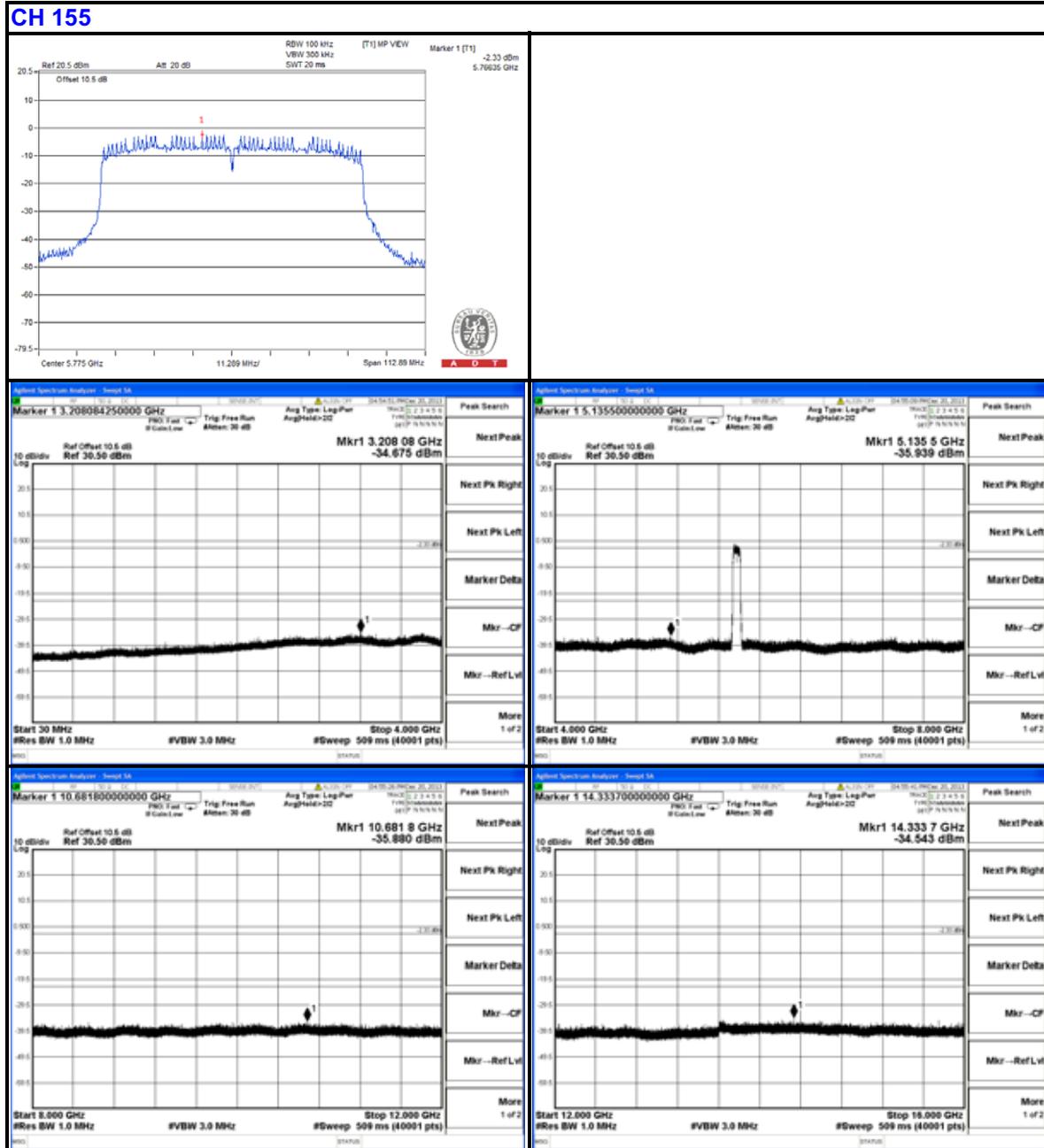




A D T

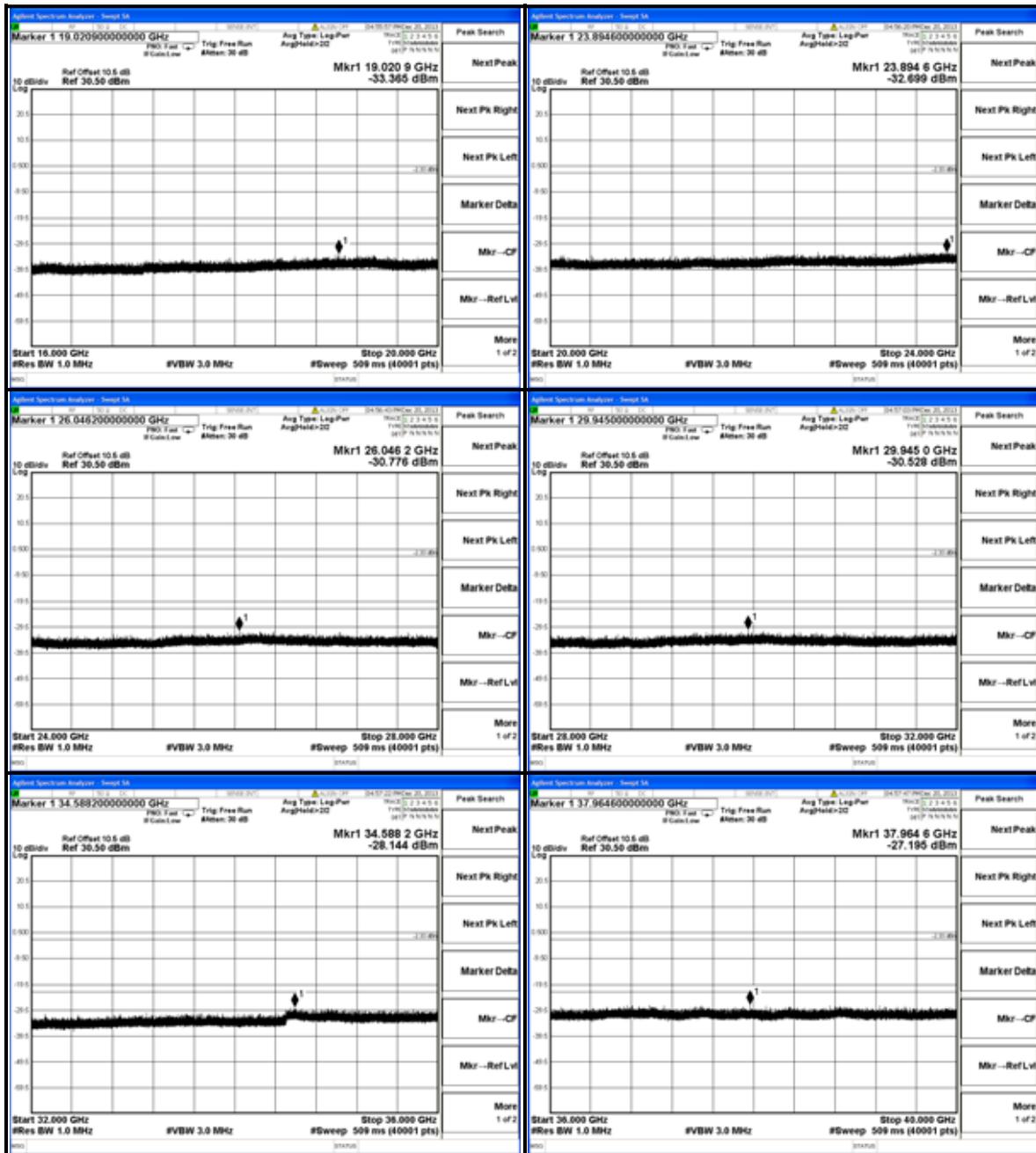


802.11ac (80MHz)





A D T





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---