

FCC TEST REPORT (15.247)

REPORT NO.: RF140815C28

MODEL NO.: ADX1300

FCC ID: 2ACZ3ADX1300

RECEIVED: Aug. 15, 2014

TESTED: Aug. 27, 2014 ~ Nov. 12, 2014

ISSUED: Nov. 14, 2014

APPLICANT: Teksilon, LLC

ADDRESS: 15799 Skyridge Drive Riverside, CA 92503

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

LAB ADDRESS: No. 47-2, 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.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF140815C28	Original release	Nov. 14, 2014

1. CERTIFICATION

PRODUCT: CAMERA CONTROLLER

MODEL NO.: ADX1300

BRAND: TEKSILON

APPLICANT: Teksilon, LLC

TESTED: Aug. 27, 2014 ~ Nov. 12, 2014

TEST SAMPLE: Production Unit

STANDARDS: FCC Part 15, Subpart C (Section 15.247)

ANSI C63.10-2009

The above equipment (model: ADX1300) 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 : Gina Liu , **DATE** : Nov. 14, 2014
Gina Liu / Specialist

APPROVED BY : Sam chen , **DATE** : Nov. 14, 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 -13.97dB at 0.42761MHz.
15.205 & 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -2.39dB at 2390MHz.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	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	CAMERA CONTROLLER
MODEL NO.	ADX1300
POWER SUPPLY	12Vdc (adapter)
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: 11.0 / 5.5 / 2.0 / 1.0 Mbps 802.11g: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps 802.11n: up to MCS7
OPERATING FREQUENCY	2412 ~ 2462MHz
NUMBER OF CHANNEL	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
OUTPUT POWER	269.333mW for 2412 ~ 2462MHz
ANTENNA TYPE	Dipole antenna with 1.5dBi 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 contains following accessory devices.

ITEM	BRAND	MODEL	SPECIFICATION
Adapter	FSP GROUP INC.	FSP060-DBAE1	I/P: 100-240Vac, 50-60Hz, 1.5A O/P: 12Vdc, 5.0A

- The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

MODULATION MODE	TX FUNCTION
802.11b	1TX
802.11g	1TX
802.11n (20MHz)	1TX, 2TX
802.11n (40MHz)	1TX, 2TX

- 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		

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

WLAN 2.4GHz:

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

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
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A, B	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
A, B	802.11n (40MHz)	3 to 9	3, 6, 9	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	802.11n (20MHz)	1 to 11	6	OFDM	BPSK	MCS0

POWER LINE CONDUCTED EMISSION TEST:

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11n (20MHz)	1 to 11	6	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, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A, B	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
A, B	802.11n (40MHz)	3 to 9	3, 6, 9	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
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A, B	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
A, B	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	MCS0

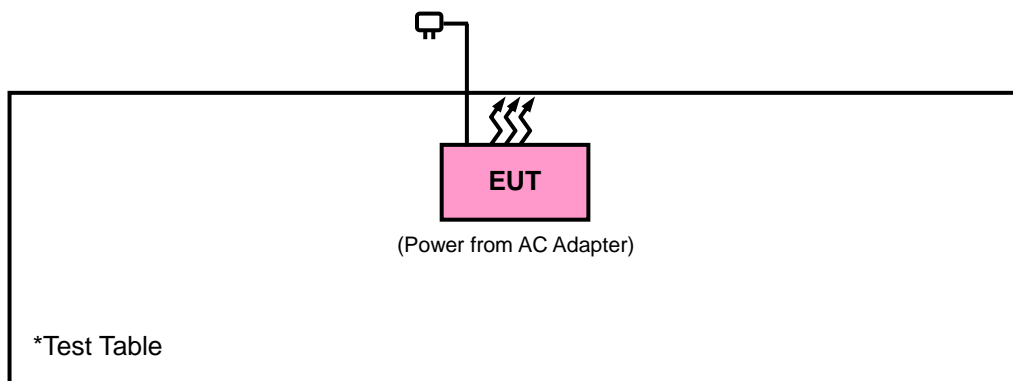
TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE \geq 1G	25deg. C, 65%RH	120Vac, 60Hz	Anson Lin
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Anson Lin
PLC	25deg. C, 65%RH	120Vac, 60Hz	Gavin Wu
APCM	25deg. C, 65%RH	120Vac, 60Hz	Kevin 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

WLAN 2.4GHz

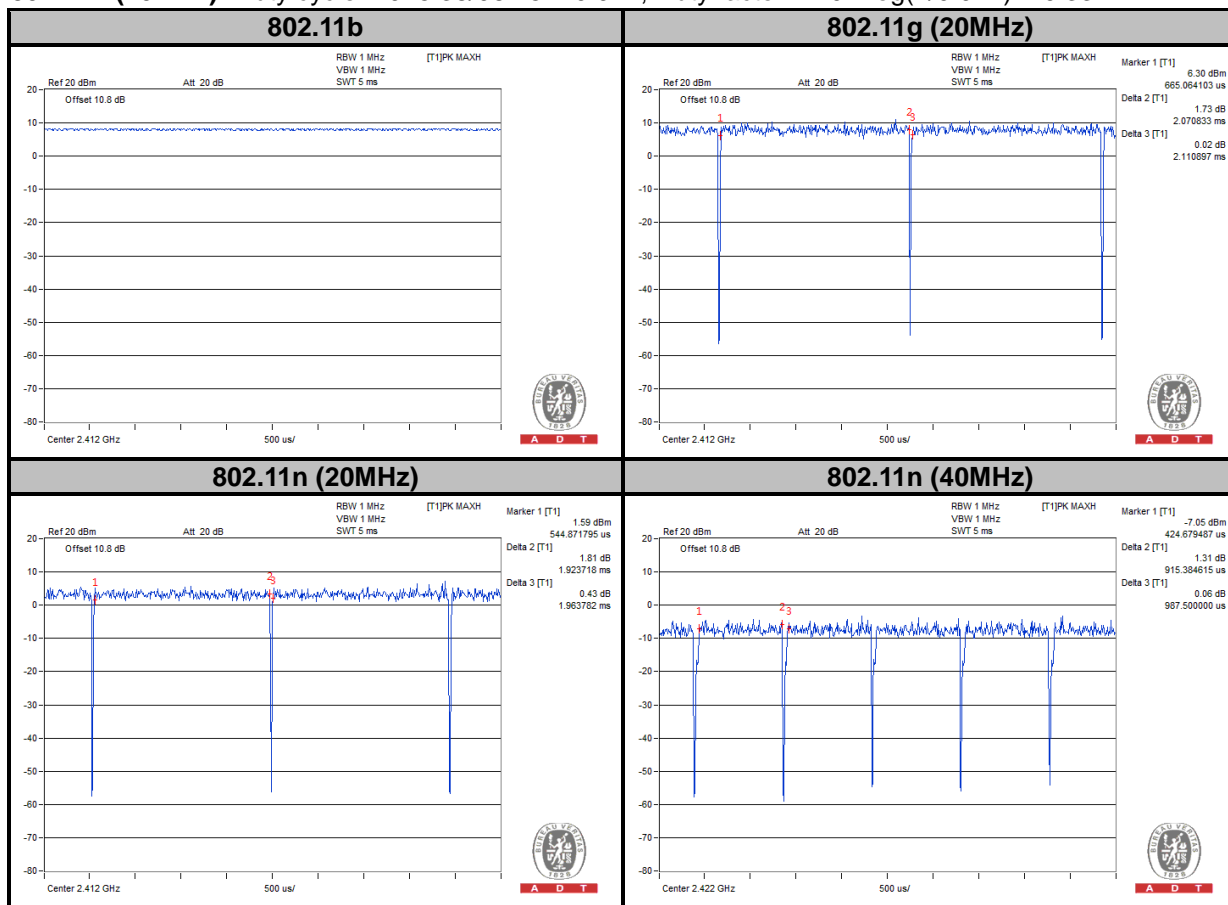
MODE A

802.11b: Duty cycle of test signal is 100 %

802.11g: Duty cycle of test signal is > 98 %

802.11n (20MHz): Duty cycle = $1.923/1.963 = 0.98$, Duty factor = $10 * \log(1/0.98) = 0.09$

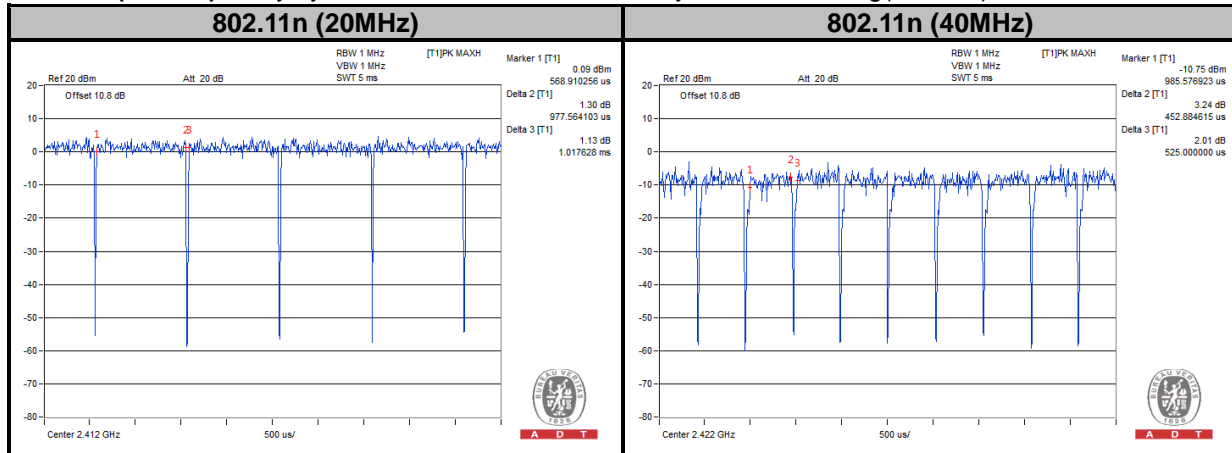
802.11n (40MHz): Duty cycle = $915.38/987.5 = 0.927$, Duty factor = $10 * \log(1/0.927) = 0.33$



MODE B

802.11n (20MHz): Duty cycle = $0.977/1.017 = 0.961$, Duty factor = $10 * \log(1/0.961) = 0.17$

802.11n (40MHz): Duty cycle = $452.88/525 = 0.863$, Duty factor = $10 * \log(1/0.863) = 0.64$



3.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart C (15.247)

558074 D01 DTS Meas Guidance v03r02

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2009

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

NOTE: The EUT 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 Agilent	N9038A	MY51210203	Jan. 17, 2014	Jan. 16, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 21, 2013	Dec. 20, 2014
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Feb. 27, 2014	Feb. 26, 2015
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Feb. 19, 2014	Feb. 18, 2015
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 18, 2013	Dec. 17, 2014
Loop Antenna	HFH2-Z2	100070	Mar. 06, 2014	Mar. 05, 2016
Preamplifier EMCI	EMC 012645	980115	Dec. 26, 2013	Dec. 25, 2014
Preamplifier EMCI	EMC 184045	980116	Jan. 13, 2014	Jan. 12, 2015
Preamplifier EMCI	EMC 330H	980112	Dec. 27, 2013	Dec. 26, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4 2950114	Oct. 18, 2014	Oct. 17, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 18, 2014	Oct. 17, 2015
RF signal cable Worken	RG-213	NA	Nov. 07, 2014	Nov. 06, 2015
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	1012010	Aug. 22, 2014	Aug. 21, 2015
Power Sensor	MA2411B	1315050	Aug. 22, 2014	Aug. 21, 2015

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. 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:

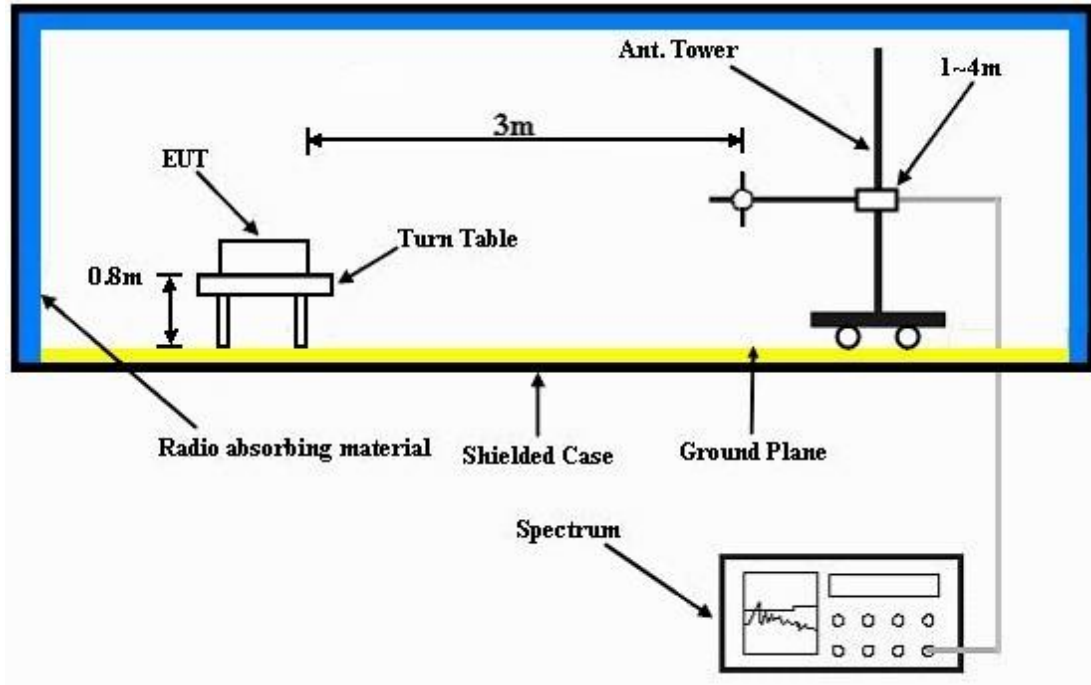
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution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

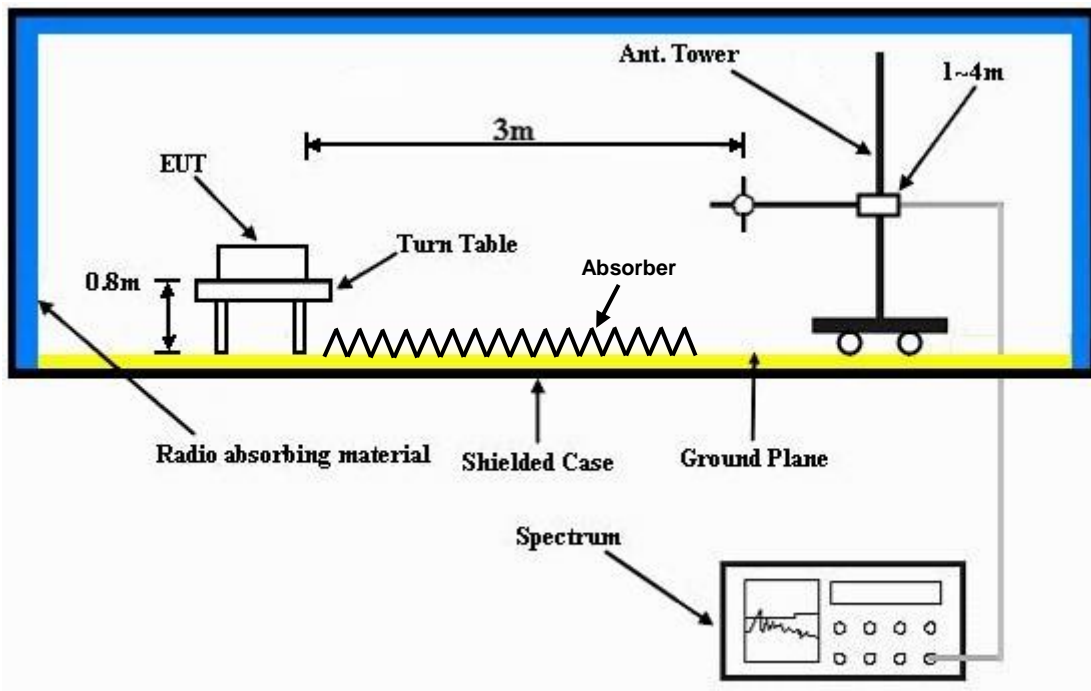
No deviation.

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).



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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

MODE A

802.11b

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

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	39.88	46.95	54	-14.12	26.91	3.54	37.52	100	123	Average
2390	56.33	63.4	74	-17.67	26.91	3.54	37.52	100	123	Peak
2412	108.42	115.44			26.96	3.54	37.52	100	123	Average
2412	112.59	119.61			26.96	3.54	37.52	100	123	Peak
2490	39.79	46.29	54	-14.21	27.2	3.62	37.32	100	123	Average
2490	57.47	63.97	74	-16.53	27.2	3.62	37.32	100	123	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
2320	36.87	44.14	54	-17.13	26.72	3.48	37.47	193	150	Average
2320	56.08	63.35	74	-17.92	26.72	3.48	37.47	193	150	Peak
2412	103.26	110.28			26.96	3.54	37.52	193	150	Average
2412	107.27	114.29			26.96	3.54	37.52	193	150	Peak
2490	34.97	41.47	54	-19.03	27.2	3.62	37.32	193	150	Average
2490	55.54	62.04	74	-18.46	27.2	3.62	37.32	193	150	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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

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
2324	37.78	45.05	54	-16.22	26.72	3.48	37.47	129	115	Average
2324	56.31	63.58	74	-17.69	26.72	3.48	37.47	129	115	Peak
2437	109.3	116.14			27.06	3.56	37.46	129	115	Average
2437	113.6	120.44			27.06	3.56	37.46	129	115	Peak
2486	35.6	42.17	54	-18.4	27.15	3.6	37.32	129	115	Average
2486	56.73	63.3	74	-17.27	27.15	3.6	37.32	129	115	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
2336	34.69	41.91	54	-19.31	26.77	3.48	37.47	190	188	Average
2336	56.65	63.87	74	-17.35	26.77	3.48	37.47	190	188	Peak
2437	103.89	110.73			27.06	3.56	37.46	190	188	Average
2437	108.26	115.1			27.06	3.56	37.46	190	188	Peak
2492	34.14	40.57	54	-19.86	27.2	3.62	37.25	190	188	Average
2492	56.37	62.8	74	-17.63	27.2	3.62	37.25	190	188	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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

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
2344	37.15	44.37	54	-16.85	26.77	3.5	37.49	100	126	Average
2344	56.54	63.76	74	-17.46	26.77	3.5	37.49	100	126	Peak
2462	106.3	113.01			27.1	3.58	37.39	100	126	Average
2462	111.6	118.31			27.1	3.58	37.39	100	126	Peak
2492	43.23	49.66	54	-10.77	27.2	3.62	37.25	100	126	Average
2492	56.7	63.13	74	-17.3	27.2	3.62	37.25	100	126	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
2366	35.26	42.43	54	-18.74	26.81	3.52	37.5	191	189	Average
2366	56.33	63.5	74	-17.67	26.81	3.52	37.5	191	189	Peak
2462	101.06	107.77			27.1	3.58	37.39	191	189	Average
2462	105.39	112.1			27.1	3.58	37.39	191	189	Peak
2488	37.64	44.14	54	-16.36	27.2	3.62	37.32	191	189	Average
2488	56.67	63.17	74	-17.33	27.2	3.62	37.32	191	189	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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

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	51.61	58.68	54	-2.39	26.91	3.54	37.52	103	229	Average
2390	72.57	79.64	74	-1.43	26.91	3.54	37.52	103	229	Peak
2412	103.21	110.23			26.96	3.54	37.52	103	229	Average
2412	112.79	119.81			26.96	3.54	37.52	103	229	Peak
2496	36.69	43.12	54	-17.31	27.2	3.62	37.25	103	229	Average
2496	55.32	61.75	74	-18.68	27.2	3.62	37.25	103	229	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	44.98	52.05	54	-9.02	26.91	3.54	37.52	187	169	Average
2390	64.91	71.98	74	-9.09	26.91	3.54	37.52	187	169	Peak
2412	96.41	103.43			26.96	3.54	37.52	187	169	Average
2412	106.31	113.33			26.96	3.54	37.52	187	169	Peak
2498	35	41.43	54	-19	27.2	3.62	37.25	187	169	Average
2498	56.89	63.32	74	-17.11	27.2	3.62	37.25	187	169	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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

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
2384	42.04	49.16	54	-11.96	26.86	3.52	37.5	100	231	Average
2384	57.65	64.77	74	-16.35	26.86	3.52	37.5	100	231	Peak
2437	106.55	113.39			27.06	3.56	37.46	100	231	Average
2437	116.14	122.98			27.06	3.56	37.46	100	231	Peak
2484	42	48.57	54	-12	27.15	3.6	37.32	100	231	Average
2484	57.63	64.2	74	-16.37	27.15	3.6	37.32	100	231	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
2388	35.57	42.62	54	-18.43	26.91	3.54	37.5	100	184	Average
2388	55.88	62.93	74	-18.12	26.91	3.54	37.5	100	184	Peak
2437	100.8	107.64			27.06	3.56	37.46	100	184	Average
2437	110.68	117.52			27.06	3.56	37.46	100	184	Peak
2492	35	41.43	54	-19	27.2	3.62	37.25	100	184	Average
2492	55.68	62.11	74	-18.32	27.2	3.62	37.25	100	184	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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

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	39.23	46.3	54	-14.77	26.91	3.54	37.52	100	228	Average
2390	57.38	64.45	74	-16.62	26.91	3.54	37.52	100	228	Peak
2462	103.65	110.36			27.1	3.58	37.39	100	228	Average
2462	113.51	120.22			27.1	3.58	37.39	100	228	Peak
2484	52.98	59.55	54	-1.02	27.15	3.6	37.32	100	228	Average
2484	72.51	79.08	74	-1.49	27.15	3.6	37.32	100	228	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
2360	34.27	41.45	54	-19.73	26.81	3.5	37.49	100	175	Average
2360	56.52	63.7	74	-17.48	26.81	3.5	37.49	100	175	Peak
2462	97.81	104.52			27.1	3.58	37.39	100	175	Average
2462	107.79	114.5			27.1	3.58	37.39	100	175	Peak
2484	41.63	48.2	54	-12.37	27.15	3.6	37.32	100	175	Average
2484	60.85	67.42	74	-13.15	27.15	3.6	37.32	100	175	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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

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
2374	39.2	46.32	54	-14.8	26.86	3.52	37.5	100	170	Average
2374	56.15	63.27	74	-17.85	26.86	3.52	37.5	100	170	Peak
2412	93.59	100.61			26.96	3.54	37.52	100	170	Average
2412	103.77	110.79			26.96	3.54	37.52	100	170	Peak
2496	34.41	40.84	54	-19.59	27.2	3.62	37.25	100	170	Average
2496	56.21	62.64	74	-17.79	27.2	3.62	37.25	100	170	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
2374	39.2	46.32	54	-14.8	26.86	3.52	37.5	100	170	Average
2374	56.15	63.27	74	-17.85	26.86	3.52	37.5	100	170	Peak
2412	93.59	100.61			26.96	3.54	37.52	100	170	Average
2412	103.77	110.79			26.96	3.54	37.52	100	170	Peak
2496	34.41	40.84	54	-19.59	27.2	3.62	37.25	100	170	Average
2496	56.21	62.64	74	-17.79	27.2	3.62	37.25	100	170	Peak

REMARKS:

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



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

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
2384	39.21	46.33	54	-14.79	26.86	3.52	37.5	100	228	Average
2384	57.25	64.37	74	-16.75	26.86	3.52	37.5	100	228	Peak
2437	102.91	109.75			27.06	3.56	37.46	100	228	Average
2437	112.38	119.22			27.06	3.56	37.46	100	228	Peak
2488	38.82	45.32	54	-15.18	27.2	3.62	37.32	100	228	Average
2488	57.66	64.16	74	-16.34	27.2	3.62	37.32	100	228	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
2362	35.29	42.47	54	-18.71	26.81	3.5	37.49	200	6	Average
2362	56.48	63.66	74	-17.52	26.81	3.5	37.49	200	6	Peak
2437	96.84	103.68			27.06	3.56	37.46	200	6	Average
2437	106.71	113.55			27.06	3.56	37.46	200	6	Peak
2490	35.01	41.51	54	-18.99	27.2	3.62	37.32	200	6	Average
2490	55.87	62.37	74	-18.13	27.2	3.62	37.32	200	6	Peak

REMARKS:

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



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

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	37.49	44.54	54	-16.51	26.91	3.54	37.5	100	230	Average
2388	56.1	63.15	74	-17.9	26.91	3.54	37.5	100	230	Peak
2462	97.84	104.55			27.1	3.58	37.39	100	230	Average
2462	108.78	115.49			27.1	3.58	37.39	100	230	Peak
2484	44.65	51.22	54	-9.35	27.15	3.6	37.32	100	230	Average
2484	64.18	70.75	74	-9.82	27.15	3.6	37.32	100	230	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
2384	34.1	41.22	54	-19.9	26.86	3.52	37.5	100	164	Average
2384	56.82	63.94	74	-17.18	26.86	3.52	37.5	100	164	Peak
2462	93.49	100.2			27.1	3.58	37.39	100	164	Average
2462	102.37	109.08			27.1	3.58	37.39	100	164	Peak
2496	37.05	43.48	54	-16.95	27.2	3.62	37.25	100	164	Average
2496	56	62.43	74	-18	27.2	3.62	37.25	100	164	Peak

REMARKS:

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

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

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	43.35	50.4	54	-10.65	26.91	3.54	37.5	100	245	Average
2388	59.02	66.07	74	-14.98	26.91	3.54	37.5	100	245	Peak
2422	94.23	101.12			27.01	3.56	37.46	100	245	Average
2422	104.49	111.38			27.01	3.56	37.46	100	245	Peak
2494	36.32	42.75	54	-17.68	27.2	3.62	37.25	100	245	Average
2494	55.9	62.33	74	-18.1	27.2	3.62	37.25	100	245	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	38.63	45.7	54	-15.37	26.91	3.54	37.52	200	8	Average
2390	56.61	63.68	74	-17.39	26.91	3.54	37.52	200	8	Peak
2422	90.59	97.48			27.01	3.56	37.46	200	8	Average
2422	99.05	105.94			27.01	3.56	37.46	200	8	Peak
2488	34.52	41.02	54	-19.48	27.2	3.62	37.32	200	8	Average
2488	56.35	62.85	74	-17.65	27.2	3.62	37.32	200	8	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2422MHz: Fundamental frequency.



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

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	42.07	49.14	54	-11.93	26.91	3.54	37.52	128	277	Average
2390	57.8	64.87	74	-16.2	26.91	3.54	37.52	128	277	Peak
2437	99.88	106.72			27.06	3.56	37.46	128	277	Average
2437	109.17	116.01			27.06	3.56	37.46	128	277	Peak
2488	41.06	47.56	54	-12.94	27.2	3.62	37.32	128	277	Average
2488	56.57	63.07	74	-17.43	27.2	3.62	37.32	128	277	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
2370	40.85	47.97	54	-13.15	26.86	3.52	37.5	200	10	Average
2370	56.21	63.33	74	-17.79	26.86	3.52	37.5	200	10	Peak
2437	92.14	98.98			27.06	3.56	37.46	200	10	Average
2437	103.19	110.03			27.06	3.56	37.46	200	10	Peak
2498	37.87	44.3	54	-16.13	27.2	3.62	37.25	200	10	Average
2498	56.51	62.94	74	-17.49	27.2	3.62	37.25	200	10	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 9	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

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
2358	38.95	46.13	54	-15.05	26.81	3.5	37.49	100	243	Average
2358	56.7	63.88	74	-17.3	26.81	3.5	37.49	100	243	Peak
2452	94.18	100.93			27.06	3.58	37.39	100	243	Average
2452	104.68	111.43			27.06	3.58	37.39	100	243	Peak
2486	37.98	44.55	54	-16.02	27.15	3.6	37.32	100	243	Average
2486	56.89	63.46	74	-17.11	27.15	3.6	37.32	100	243	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
2382	35.19	42.31	54	-18.81	26.86	3.52	37.5	132	13	Average
2382	56.97	64.09	74	-17.03	26.86	3.52	37.5	132	13	Peak
2452	88.43	95.18			27.06	3.58	37.39	132	13	Average
2452	98.36	105.11			27.06	3.58	37.39	132	13	Peak
2494	36.79	43.22	54	-17.21	27.2	3.62	37.25	132	13	Average
2494	56.82	63.25	74	-17.18	27.2	3.62	37.25	132	13	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2452MHz: Fundamental frequency.

MODE B

802.11n (20MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	48.02	55.09	54	-5.98	26.91	3.54	37.52	133	253	Average
2390	63.63	70.7	74	-10.37	26.91	3.54	37.52	133	253	Peak
2412	101.39	108.41			26.96	3.54	37.52	133	253	Average
2412	111.64	118.66			26.96	3.54	37.52	133	253	Peak
2500	37.35	43.78	54	-16.65	27.2	3.62	37.25	133	253	Average
2500	56.19	62.62	74	-17.81	27.2	3.62	37.25	133	253	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	41.31	48.38	54	-12.69	26.91	3.54	37.52	199	167	Average
2390	58.99	66.06	74	-15.01	26.91	3.54	37.52	199	167	Peak
2412	94.85	101.87			26.96	3.54	37.52	191	158	Average
2412	104.56	111.58			26.96	3.54	37.52	191	158	Peak
2494	33.83	40.26	54	-20.17	27.2	3.62	37.25	191	158	Average
2494	55.81	62.24	74	-18.19	27.2	3.62	37.25	191	158	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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

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
2316	36.99	44.31	54	-17.01	26.67	3.48	37.47	104	228	Average
2316	56.26	63.58	74	-17.74	26.67	3.48	37.47	104	228	Peak
2437	102.11	108.95			27.06	3.56	37.46	104	228	Average
2437	112.78	119.62			27.06	3.56	37.46	104	228	Peak
2492	37.39	43.82	54	-16.61	27.2	3.62	37.25	104	228	Average
2492	56.81	63.24	74	-17.19	27.2	3.62	37.25	104	228	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
2386	33.74	40.81	54	-20.26	26.91	3.52	37.5	188	190	Average
2386	56.34	63.41	74	-17.66	26.91	3.52	37.5	188	190	Peak
2437	96.64	103.48			27.06	3.56	37.46	188	190	Average
2437	106	112.84			27.06	3.56	37.46	188	190	Peak
2488	33.98	40.48	54	-20.02	27.2	3.62	37.32	188	190	Average
2488	55.86	62.36	74	-18.14	27.2	3.62	37.32	188	190	Peak

REMARKS:

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



A D T

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

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
2382	40.34	47.46	54	-13.66	26.86	3.52	37.5	105	226	Average
2382	56.94	64.06	74	-17.06	26.86	3.52	37.5	105	226	Peak
2462	101.23	107.94			27.1	3.58	37.39	105	226	Average
2462	111.32	118.03			27.1	3.58	37.39	105	226	Peak
2484	47.05	53.62	54	-6.95	27.15	3.6	37.32	103	232	Average
2484	60.98	67.55	74	-13.02	27.15	3.6	37.32	103	232	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
2388	35.81	42.86	54	-18.19	26.91	3.54	37.5	191	189	Average
2388	55.79	62.84	74	-18.21	26.91	3.54	37.5	191	189	Peak
2462	95.73	102.44			27.1	3.58	37.39	191	189	Average
2462	105.53	112.24			27.1	3.58	37.39	191	189	Peak
2484	39.66	46.23	54	-14.34	27.15	3.6	37.32	188	176	Average
2484	56.77	63.34	74	-17.23	27.15	3.6	37.32	188	176	Peak

REMARKS:

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

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

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	47.83	54.9	54	-6.17	26.91	3.54	37.52	108	229	Average
2390	62.38	69.45	74	-11.62	26.91	3.54	37.52	109	229	Peak
2422	97.59	104.48			27.01	3.56	37.46	106	128	Average
2422	107.19	114.08			27.01	3.56	37.46	106	128	Peak
2490	36.79	43.29	54	-17.21	27.2	3.62	37.32	106	128	Average
2490	56.17	62.67	74	-17.83	27.2	3.62	37.32	106	128	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
2386	41.72	48.79	54	-12.28	26.91	3.52	37.5	199	161	Average
2386	57.83	64.9	74	-16.17	26.91	3.52	37.5	199	161	Peak
2422	91.69	98.58			27.01	3.56	37.46	193	173	Average
2422	101.48	108.37			27.01	3.56	37.46	193	173	Peak
2488	34.28	40.78	54	-19.72	27.2	3.62	37.32	193	173	Average
2488	55.91	62.41	74	-18.09	27.2	3.62	37.32	193	173	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2422MHz: Fundamental frequency.

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

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
2384	48.22	55.34	54	-5.78	26.86	3.52	37.5	106	225	Average
2384	61.36	68.48	74	-12.64	26.86	3.52	37.5	106	225	Peak
2437	100.32	107.16			27.06	3.56	37.46	106	225	Average
2437	110.87	117.71			27.06	3.56	37.46	106	225	Peak
2484	44.24	50.81	54	-9.76	27.15	3.6	37.32	106	225	Average
2484	58.81	65.38	74	-15.19	27.15	3.6	37.32	106	225	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	41.83	48.9	54	-12.17	26.91	3.54	37.52	193	166	Average
2390	56.97	64.04	74	-17.03	26.91	3.54	37.52	193	166	Peak
2437	94.8	101.64			27.06	3.56	37.46	193	166	Average
2437	104.64	111.48			27.06	3.56	37.46	193	166	Peak
2500	37.4	43.83	54	-16.6	27.2	3.62	37.25	193	166	Average
2500	56.3	62.73	74	-17.7	27.2	3.62	37.25	193	166	Peak

REMARKS:

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 9	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

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
2380	37.69	44.81	54	-16.31	26.86	3.52	37.5	128	248	Average
2380	56.4	63.52	74	-17.6	26.86	3.52	37.5	128	248	Peak
2452	96.31	103.06			27.06	3.58	37.39	128	248	Average
2452	107.34	114.09			27.06	3.58	37.39	128	248	Peak
2484	47.36	53.93	54	-6.64	27.15	3.6	37.32	126	252	Average
2484	62.71	69.28	74	-11.29	27.15	3.6	37.32	126	252	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
2310	34.01	41.33	54	-19.99	26.67	3.46	37.45	190	160	Average
2310	54.38	61.7	74	-19.62	26.67	3.46	37.45	190	160	Peak
2452	91.1	97.85			27.06	3.58	37.39	190	160	Average
2452	101.73	108.48			27.06	3.58	37.39	190	160	Peak
2494	38.76	45.19	54	-15.24	27.2	3.62	37.25	190	160	Average
2494	57.52	63.95	74	-16.48	27.2	3.62	37.25	190	160	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2452MHz: Fundamental frequency.

BELOW 1GHz WORST-CASE DATA:

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	30MHz ~ 1GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

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
56.19	29.06	47.25	40	-10.94	12.35	0.8	31.34	114	158	Peak
151.77	28.17	45.77	43.5	-15.33	12.71	1.35	31.66	139	162	Peak
252.75	33.26	51.75	46	-12.74	11.57	1.85	31.91	100	50	Peak
402.9	32.56	46.83	46	-13.44	15.39	2.43	32.09	125	102	Peak
584.9	32.32	42.15	46	-13.68	19.26	3.04	32.13	131	207	Peak
834.1	30.35	35.66	46	-15.65	22.66	3.78	31.75	117	119	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
31.89	29.61	47.84	40	-10.39	12.3	0.58	31.11	106	36	Peak
42.15	34.26	51.06	40	-5.74	13.58	0.7	31.08	100	58	Peak
56.46	28.66	46.85	40	-11.34	12.35	0.8	31.34	109	226	Peak
400.8	26.7	41.04	46	-19.3	15.35	2.43	32.12	103	100	Peak
582.8	30.22	40.1	46	-15.78	19.21	3.04	32.13	105	199	Peak
759.9	27.27	33.45	46	-18.73	21.66	3.6	31.44	100	98	Peak

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

Margin value = Emission level – Limit value

4.2 CONDUCTED EMISSION MEASUREMENT

4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

- NOTE:** 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Apr. 24, 2014	Apr. 23, 2015
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 27, 2013	Dec. 26, 2014
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Dec. 23, 2013	Dec. 22, 2014
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 10, 2014	Jul. 09, 2015
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 2.
3. The VCCI Site Registration No. is C-2047.



A D T

4.2.3 TEST PROCEDURES

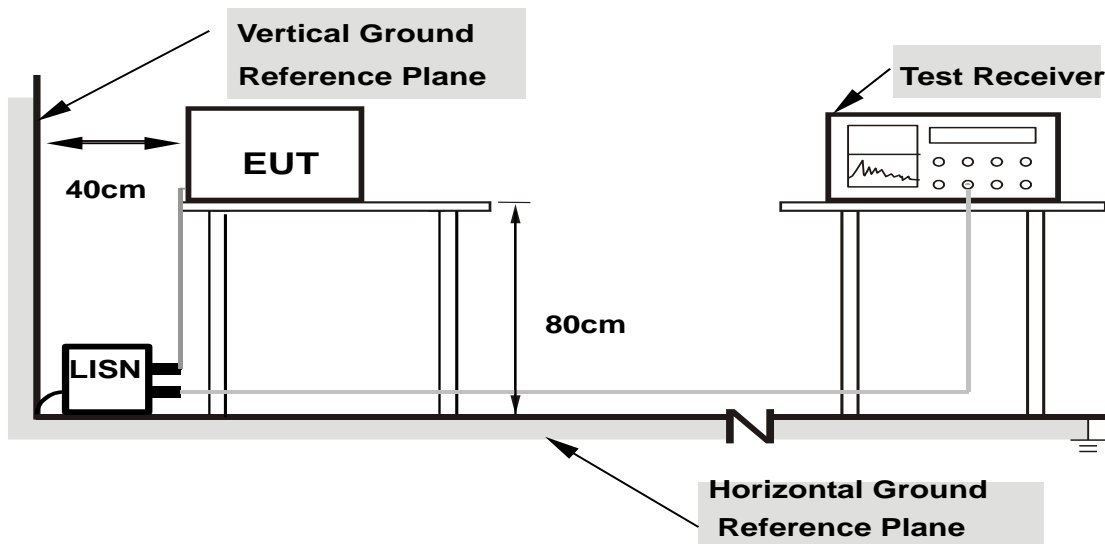
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



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

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

4.2.6 EUT OPERATING CONDITIONS

Same as section 4.1.6.

4.2.7 TEST RESULTS

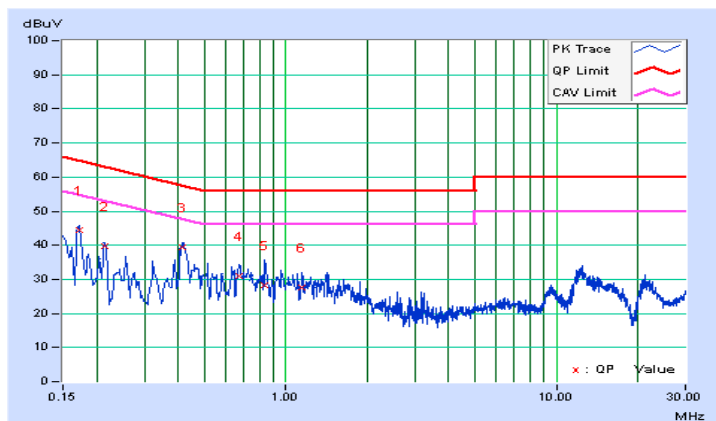
CONDUCTED WORST-CASE DATA :

PHASE	Line 1	6dB BANDWIDTH	9kHz
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Phase Of Power : Line (L)										
No	Frequency	Correction	Reading Value		Emission Level		Limit		Margin	
	(MHz)	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17237	0.08	44.50	30.28	44.58	30.36	64.85	54.85	-20.27	-24.49
2	0.21282	0.07	39.60	26.84	39.67	26.91	63.09	53.09	-23.42	-26.18
3	0.41560	0.08	39.18	30.65	39.26	30.73	57.54	47.54	-18.27	-16.80
4	0.66957	0.09	31.01	22.87	31.10	22.96	56.00	46.00	-24.90	-23.04
5	0.83816	0.10	28.07	20.94	28.17	21.04	56.00	46.00	-27.83	-24.96
6	1.14614	0.12	27.55	20.65	27.67	20.77	56.00	46.00	-28.33	-25.23

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

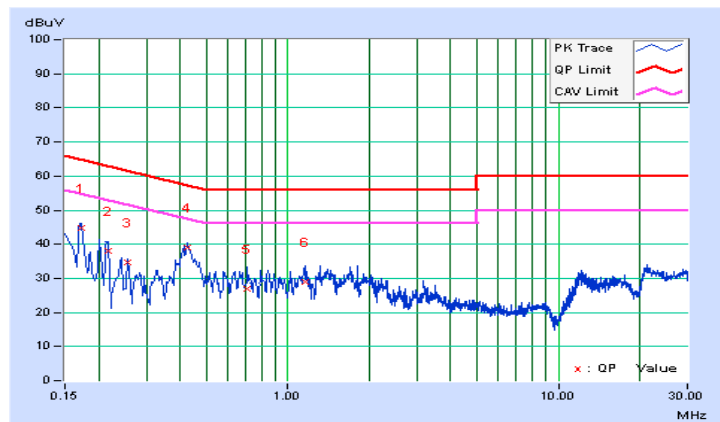


PHASE	Line 2	6dB BANDWIDTH	9kHz
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17147	0.05	44.67	29.99	44.72	30.04	64.89	54.89	-20.17	-24.85
2	0.21647	0.05	38.03	22.10	38.08	22.15	62.95	52.95	-24.87	-30.80
3	0.25557	0.06	34.55	22.45	34.61	22.51	61.57	51.57	-26.97	-29.07
4	0.42761	0.07	38.93	33.26	39.00	33.33	57.30	47.30	-18.30	-13.97
5	0.70913	0.08	26.90	20.55	26.98	20.63	56.00	46.00	-29.02	-25.37
6	1.15524	0.10	28.89	22.29	28.99	22.39	56.00	46.00	-27.01	-23.61

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

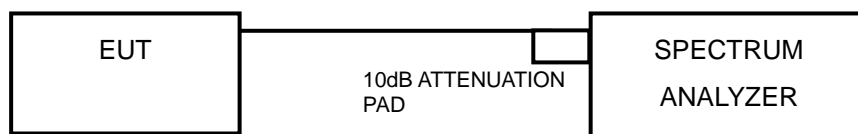


4.3 6dB BANDWIDTH MEASUREMENT

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

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- 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

MODE A

802.11b

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	12.17	0.5	PASS
6	2437	12.19	0.5	PASS
11	2462	12.13	0.5	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	15.15	0.5	PASS
6	2437	15.35	0.5	PASS
11	2462	15.15	0.5	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.21	0.5	PASS
6	2437	17.32	0.5	PASS
11	2462	16.84	0.5	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
3	2422	36.41	0.5	PASS
6	2437	36.38	0.5	PASS
9	2452	36.42	0.5	PASS



A D T

MODE B

802.11n (20MHz)

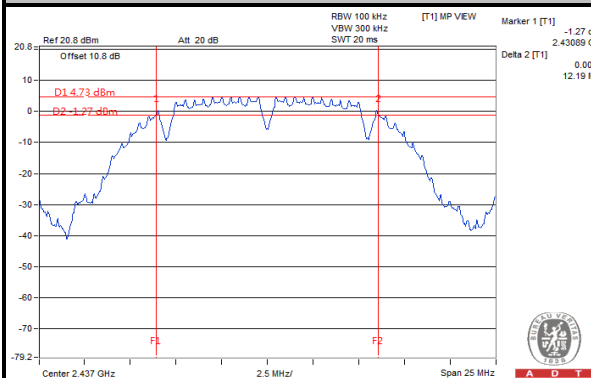
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	17.64	17.64	0.5	PASS
6	2437	17.65	17.63	0.5	PASS
11	2462	17.65	17.64	0.5	PASS

802.11n (40MHz)

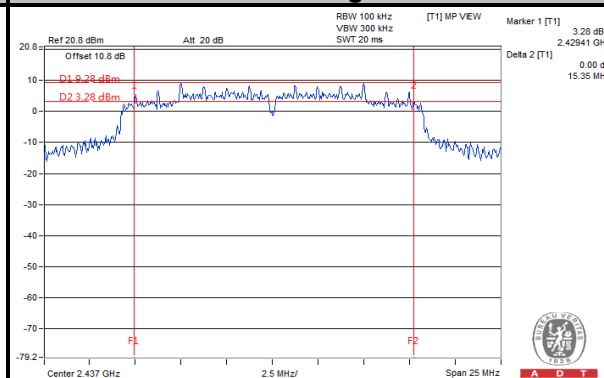
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
3	2422	36.52	36.50	0.5	PASS
6	2437	36.53	36.56	0.5	PASS
9	2452	36.48	36.49	0.5	PASS

SPECTRUM PLOT OF WORST VALUE

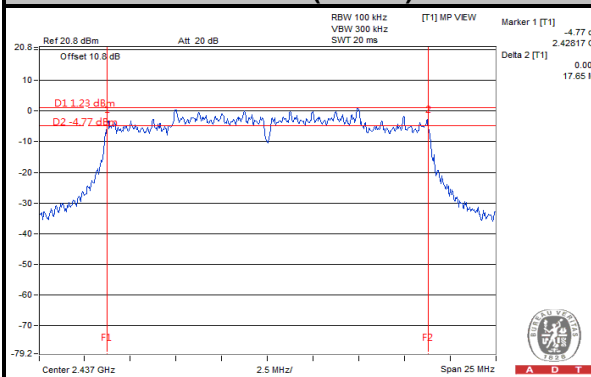
802.11b



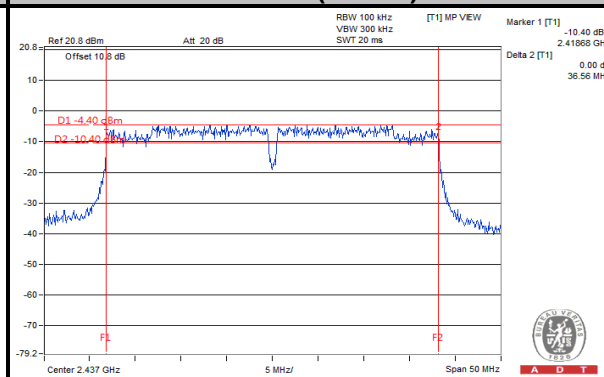
802.11g



802.11n (20MHz)



802.11n (40MHz)



4.4 CONDUCTED OUTPUT POWER

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

Per KDB 662911 D01 Multiple Transmitter Output v02r01 Method of conducted output power measurement on IEEE 802.11 devices,

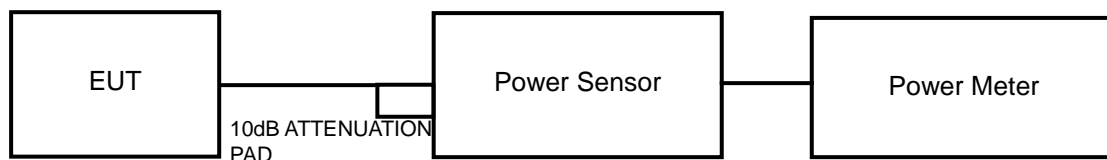
Array Gain = 0 dB (i.e., no array gain) for $NANT \leq 4$;

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

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

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

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.4.4 TEST PROCEDURES

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

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITIONS

Same as section 4.3.6.

4.4.7 TEST RESULTS

MODE A

802.11b

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
1	2412	69.50	18.42	30	PASS
6	2437	81.85	19.13	30	PASS
11	2462	79.25	18.99	30	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
1	2412	184.50	22.66	30	PASS
6	2437	232.81	23.67	30	PASS
11	2462	190.99	22.81	30	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
1	2412	141.91	21.52	30	PASS
6	2437	201.84	23.05	30	PASS
11	2462	140.60	21.48	30	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
3	2422	68.87	18.38	30	PASS
6	2437	139.00	21.43	30	PASS
9	2452	61.52	17.89	30	PASS

**A D T****MODE B****802.11n (20MHz)**

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	20.21	20.14	208.230	23.19	30	PASS
6	2437	21.44	21.14	269.333	24.30	30	PASS
11	2462	20.43	20.29	217.313	23.37	30	PASS

802.11n (40MHz)

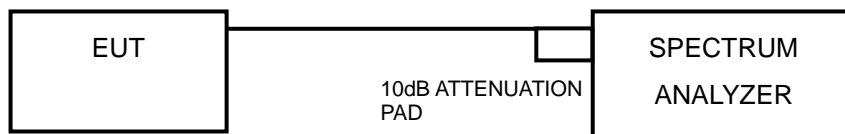
CHAN.	FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
3	2422	16.75	17.05	98.014	19.91	30	PASS
6	2437	20.89	20.93	246.624	23.92	30	PASS
9	2452	17.83	17.76	120.377	20.81	30	PASS

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 section 4.3.6.

4.5.7 TEST RESULTS

MODE A

802.11b

CHANNEL	FREQUENCY (MHz)	PSD (dBm/3kHz)	LIMIT (dBm/3kHz)	PASS / FAIL
1	2412	-9.54	8	PASS
6	2437	-9.30	8	PASS
11	2462	-8.85	8	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	PSD (dBm/3kHz)	LIMIT (dBm/3kHz)	PASS / FAIL
1	2412	-9.96	8	PASS
6	2437	-6.11	8	PASS
11	2462	-9.13	8	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	PSD (dBm/3kHz)	LIMIT (dBm/3kHz)	PASS / FAIL
1	2412	-13.36	8	PASS
6	2437	-9.92	8	PASS
11	2462	-14.14	8	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	PSD (dBm/3kHz)	LIMIT (dBm/3kHz)	PASS / FAIL
3	2422	-20.78	8	PASS
6	2437	-15.46	8	PASS
9	2452	-21.25	8	PASS

MODE 2

802.11n (20MHz)

TX Chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-16.26	3.01	-13.25	8	PASS
	6	2437	-14.44	3.01	-11.43	8	PASS
	11	2462	-15.42	3.01	-12.41	8	PASS
1	1	2412	-16.26	3.01	-13.25	8	PASS
	6	2437	-14.43	3.01	-11.42	8	PASS
	11	2462	-16.72	3.01	-13.71	8	PASS

NOTE: Directional gain = 1.5dBi + 10log(2) = 4.51dBi < 6dBi, so the limit no need to reduced.

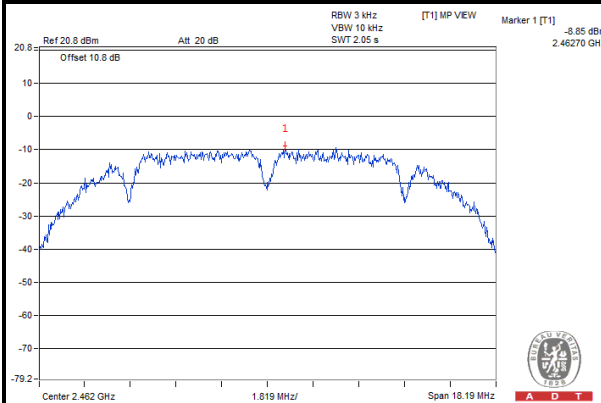
802.11n (40MHz)

TX Chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	3	2422	-22.17	3.01	-19.16	8	PASS
	6	2437	-16.18	3.01	-13.17	8	PASS
	9	2452	-21.31	3.01	-18.30	8	PASS
1	3	2422	-22.50	3.01	-19.49	8	PASS
	6	2437	-17.05	3.01	-14.04	8	PASS
	9	2452	-21.35	3.01	-18.34	8	PASS

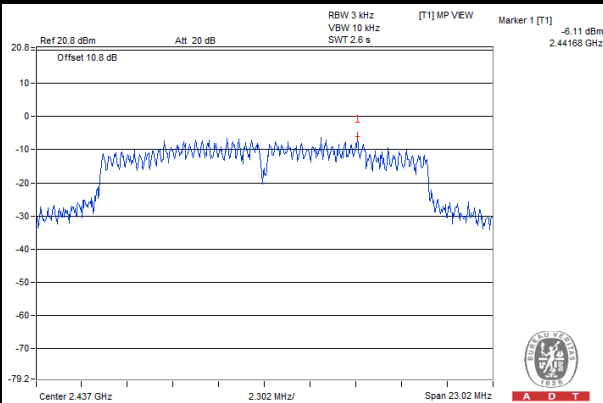
NOTE: Directional gain = 1.5dBi + 10log(2) = 4.51dBi < 6dBi, so the limit no need to reduced.

SPECTRUM PLOT OF WORST VALUE

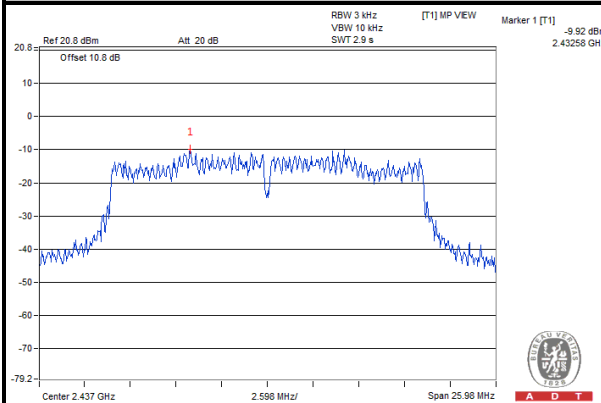
802.11b



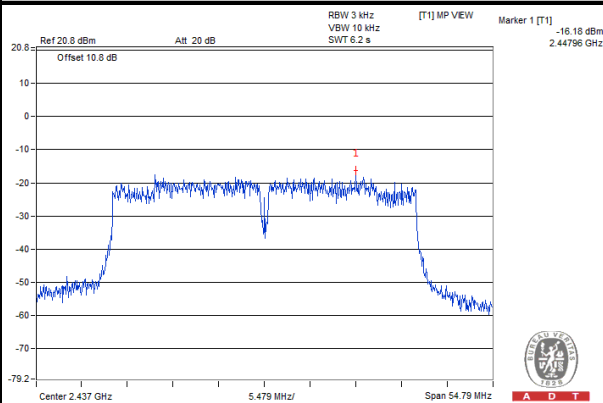
802.11g



802.11n (20MHz)



802.11n (40MHz)

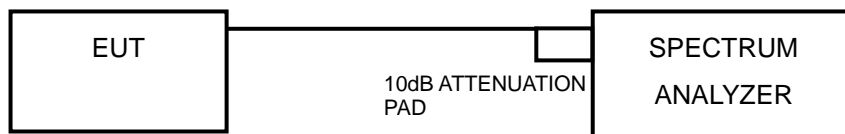


4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

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

4.6.2 TEST SETUP



4.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.6.4 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOB

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

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITION

Same as section 4.3.6.

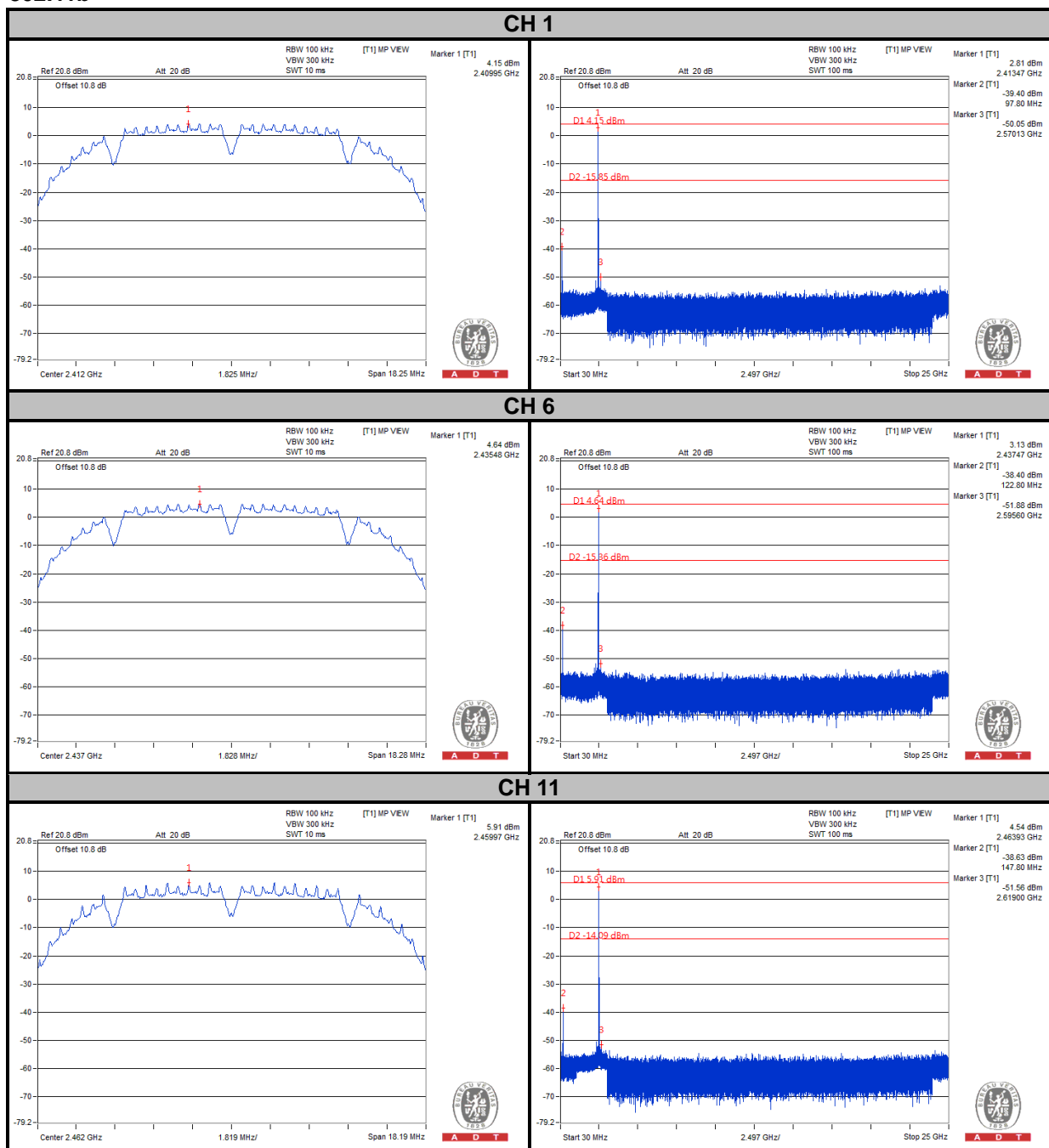
4.6.7 TEST RESULTS

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

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

MODE A

802.11b

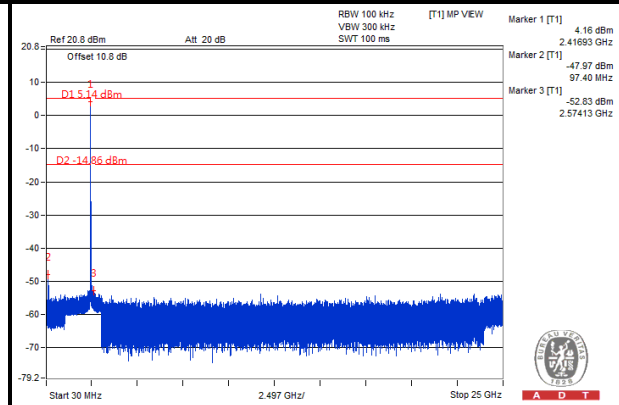
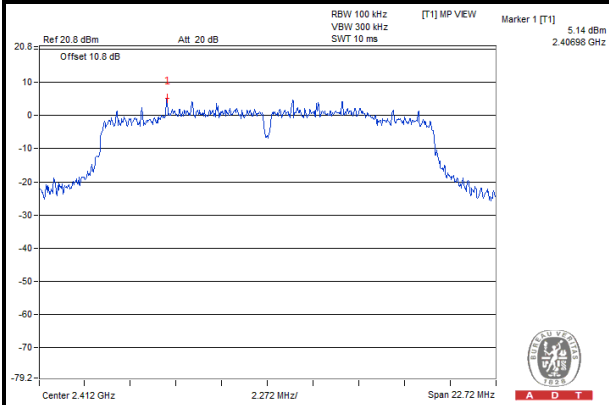




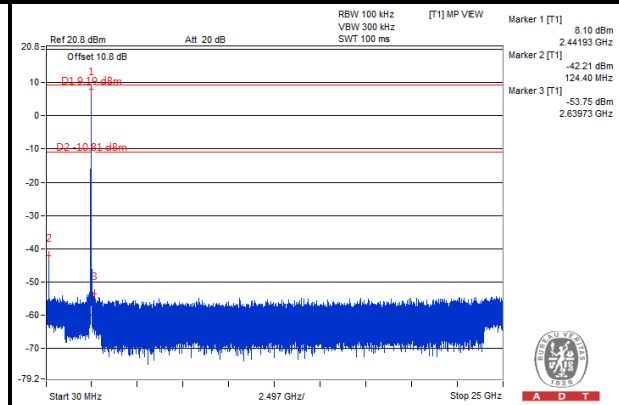
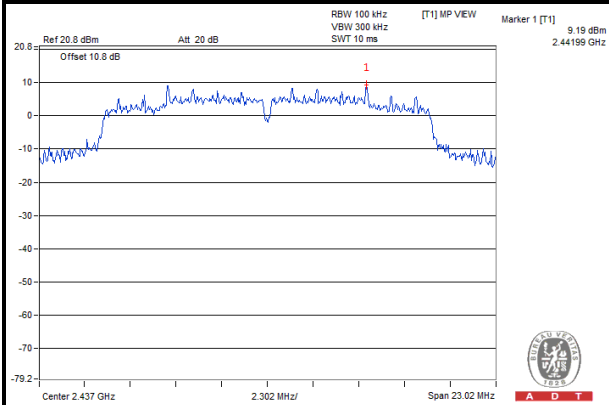
A D T

802.11g

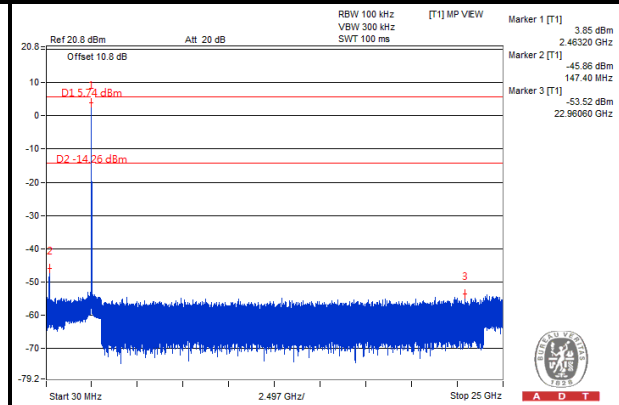
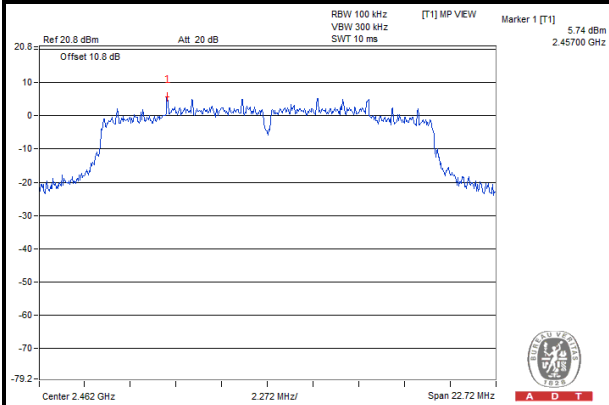
CH 1



CH 6



CH 11

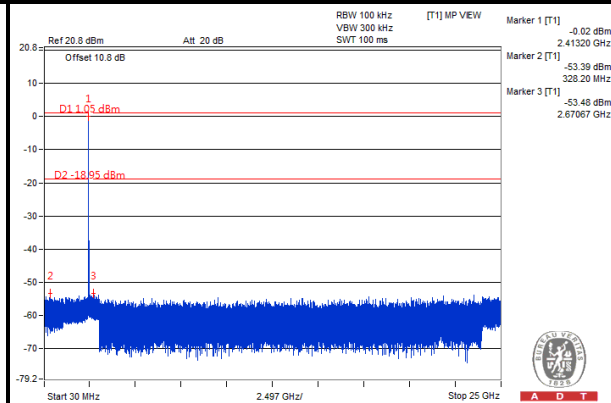
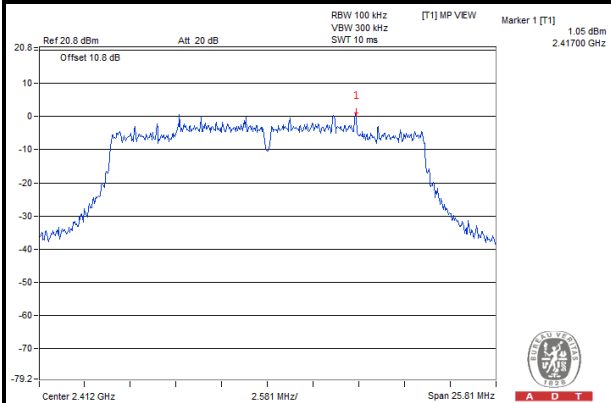




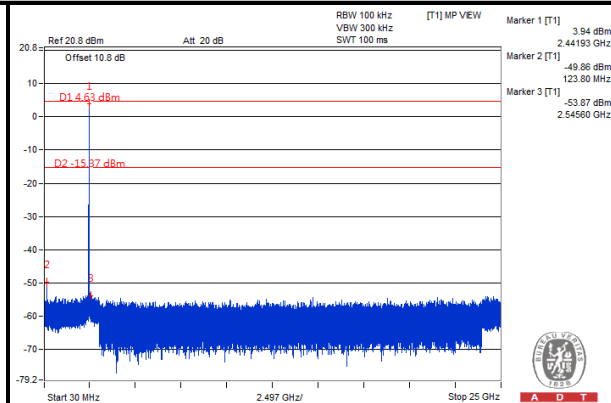
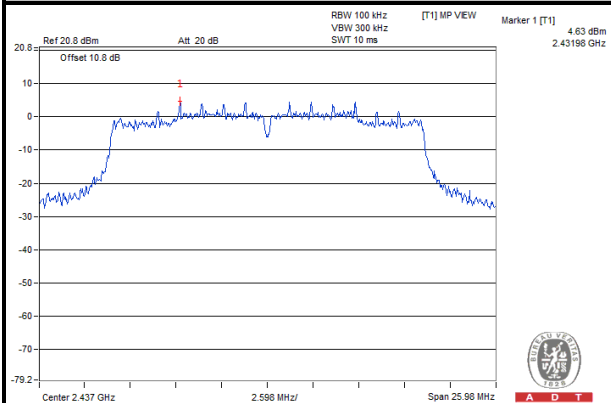
A D T

802.11n (20MHz)

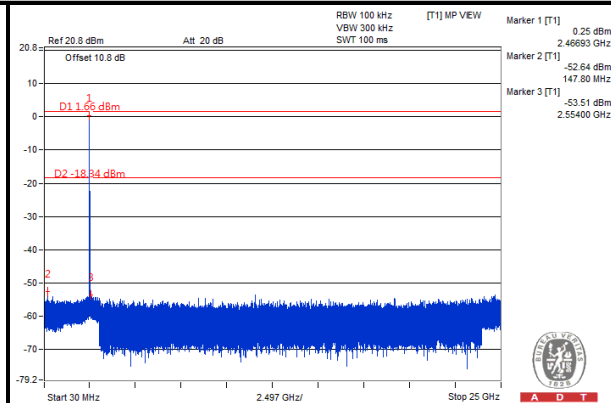
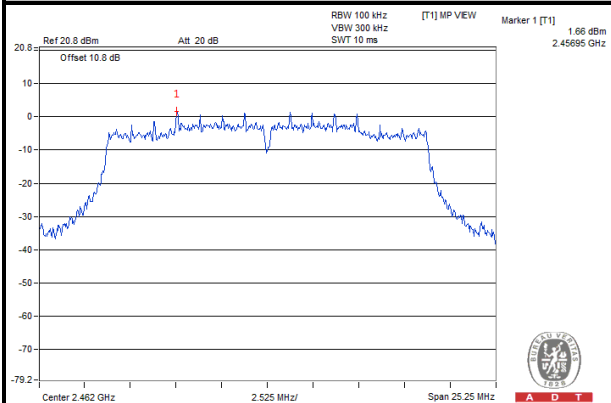
CH 1



CH 6



CH 11

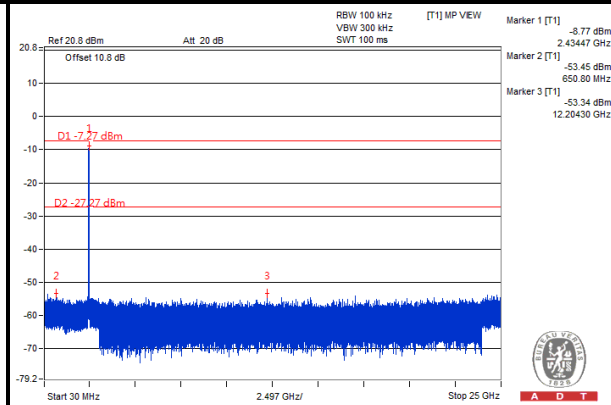
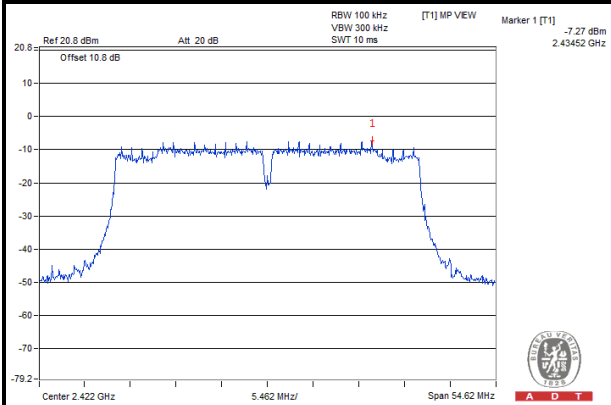




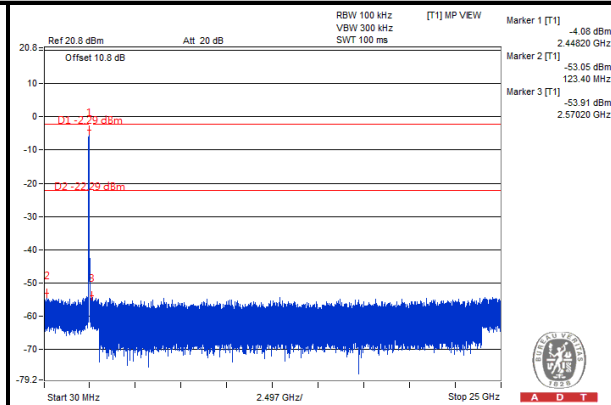
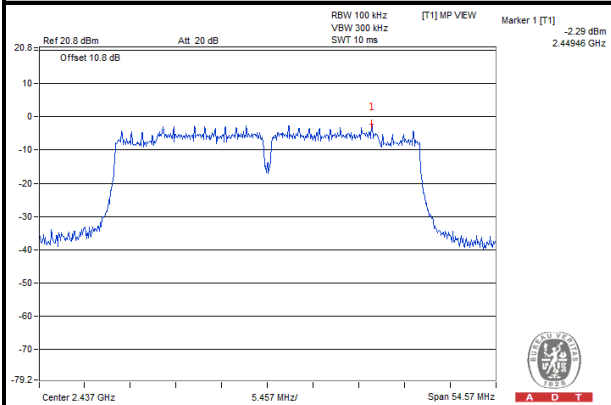
A D T

802.11n (40MHz)

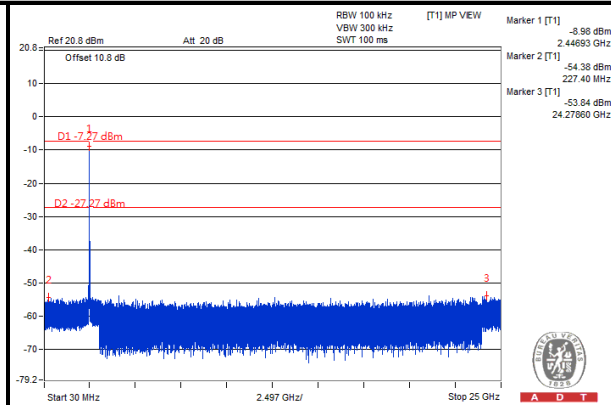
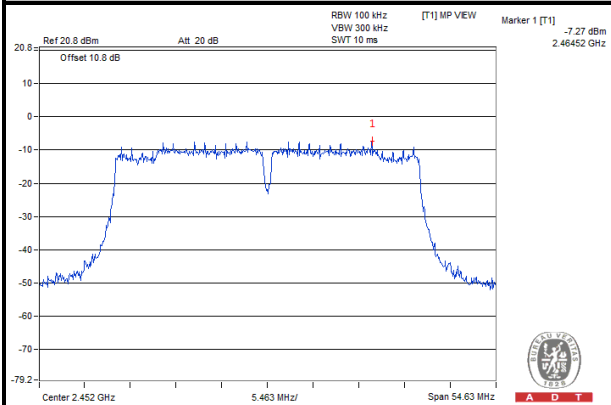
CH 3



CH 6



CH 9





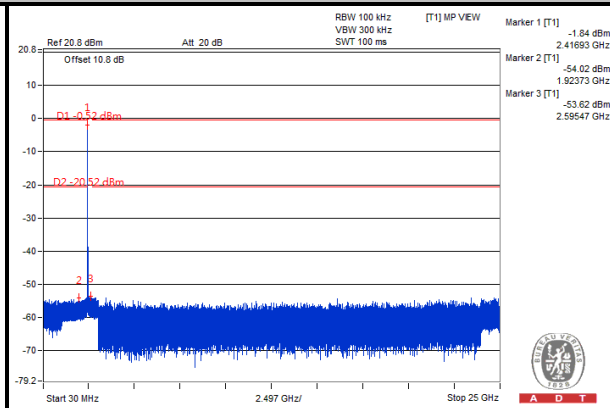
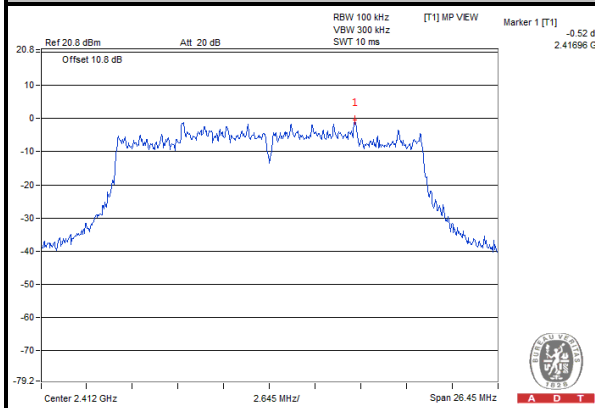
A D T

MODE B

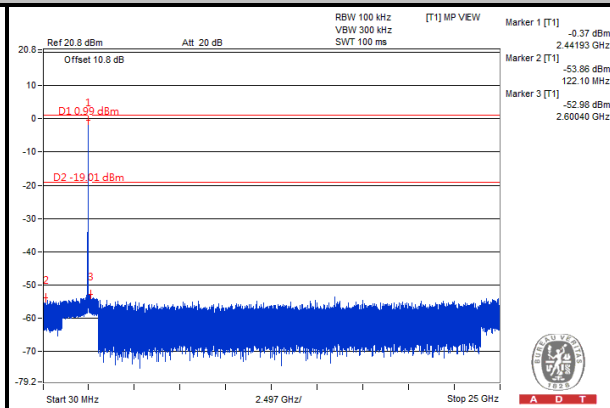
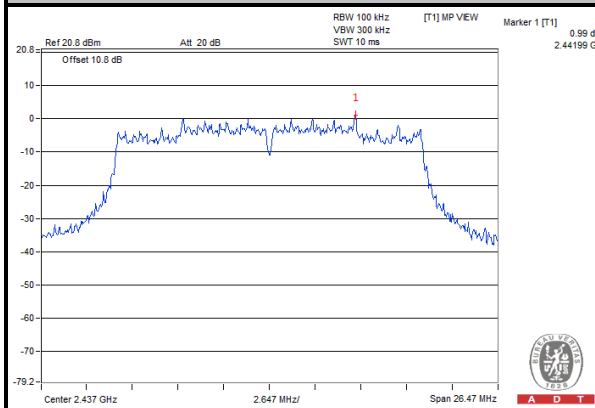
802.11n (20MHz)

CHAIN 0

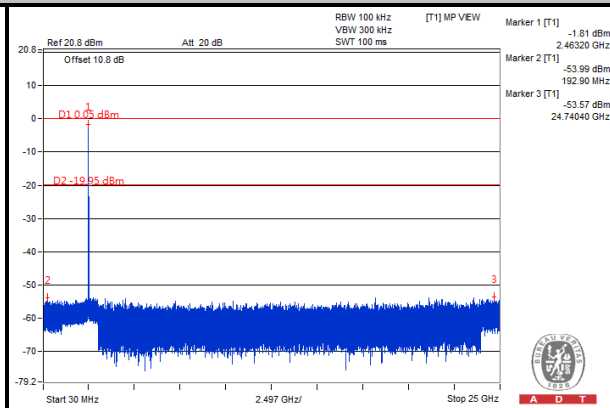
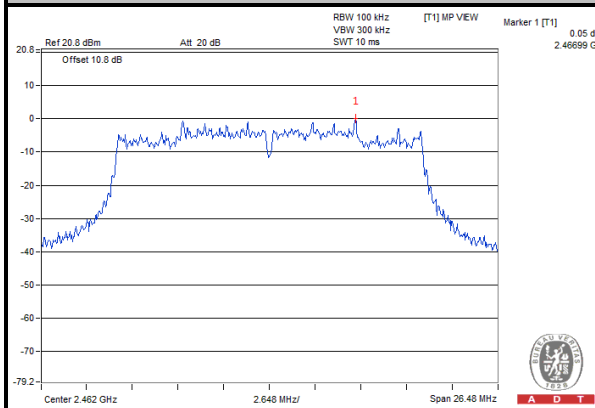
CH 1



CH 6



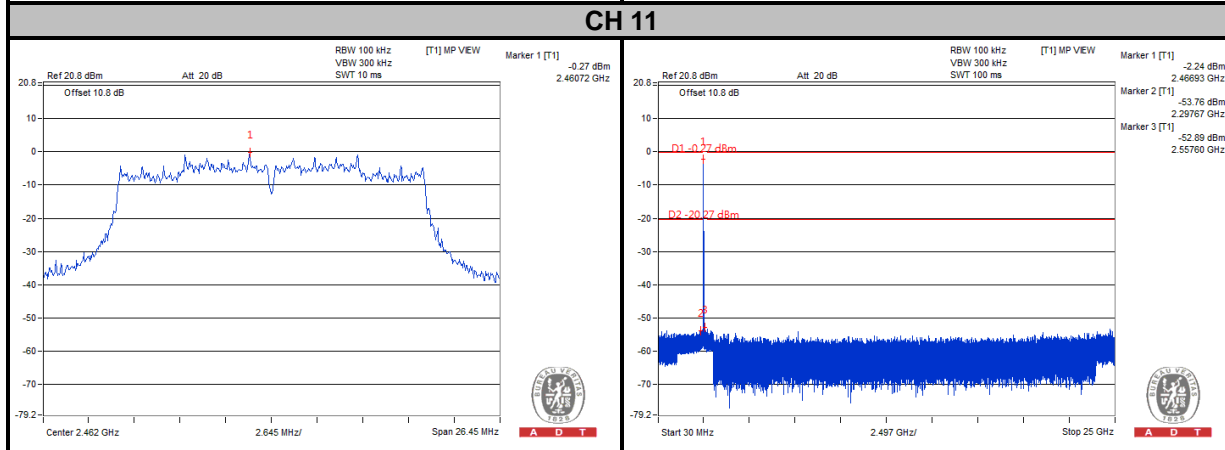
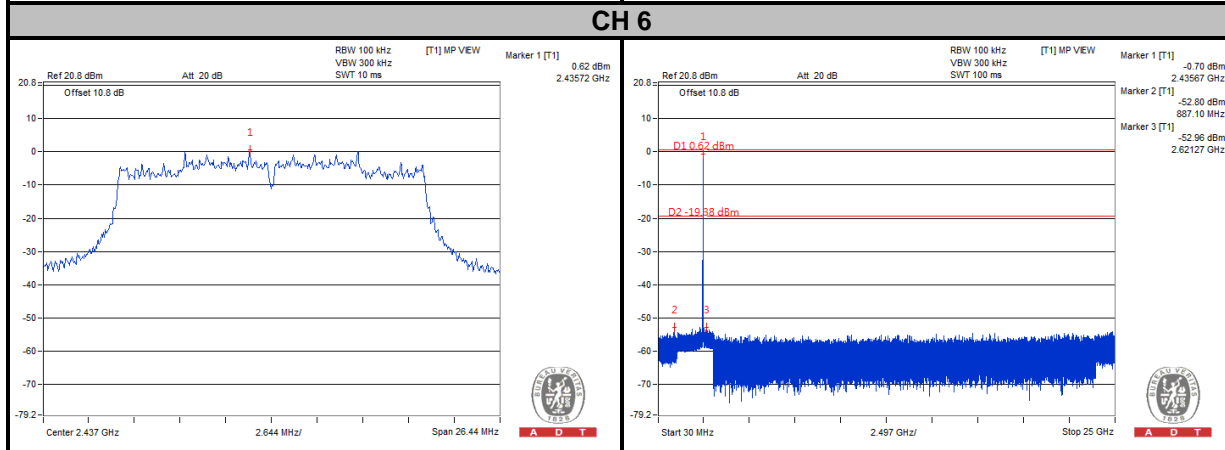
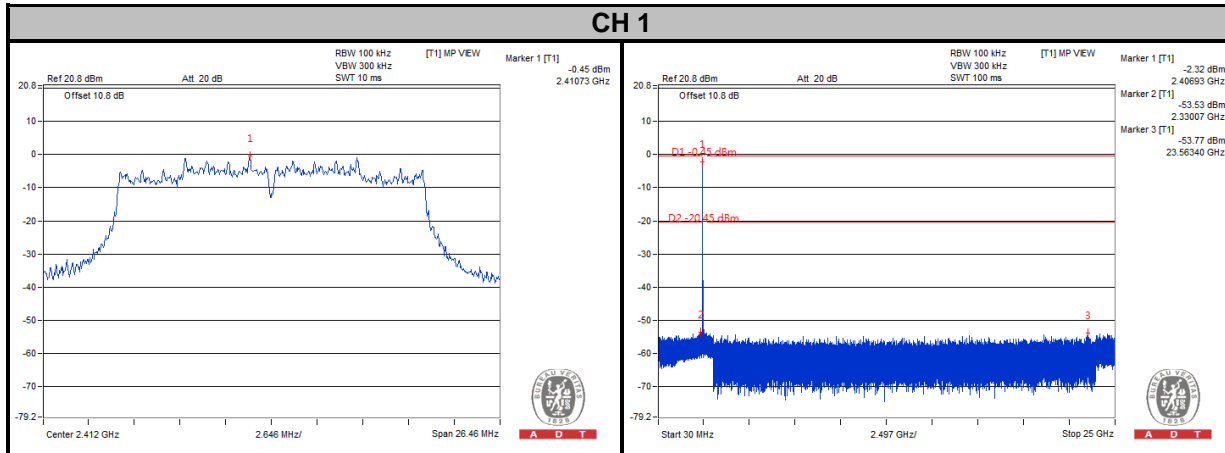
CH 11





A D T

CHAIN 1



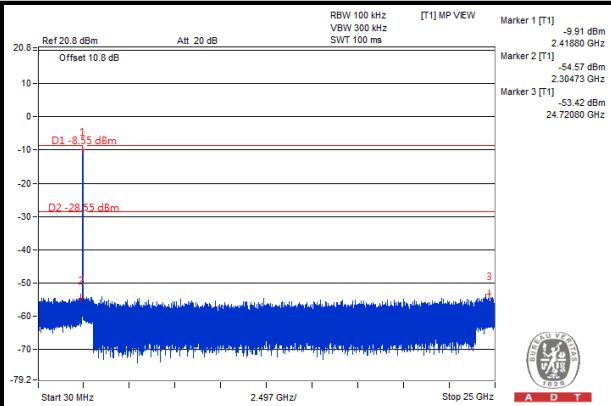
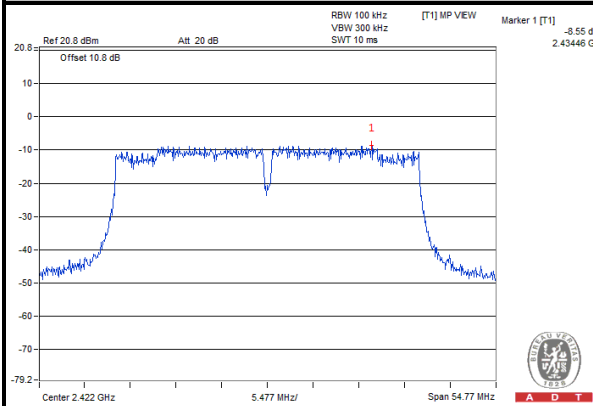


A D T

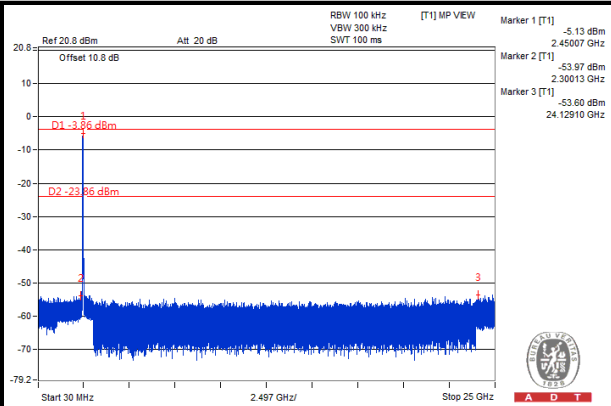
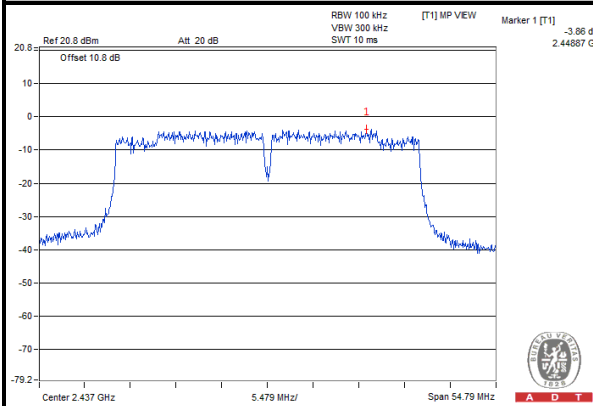
802.11n (40MHz)

CHAIN 0

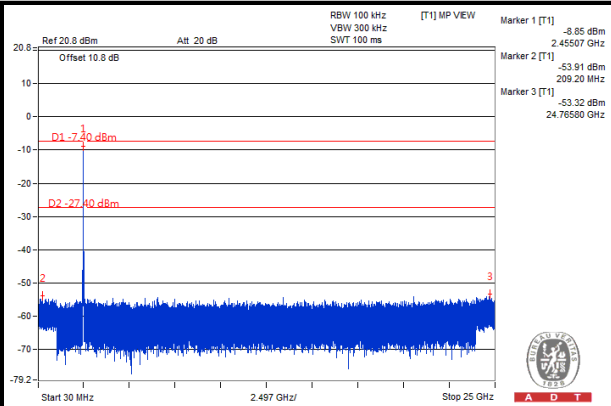
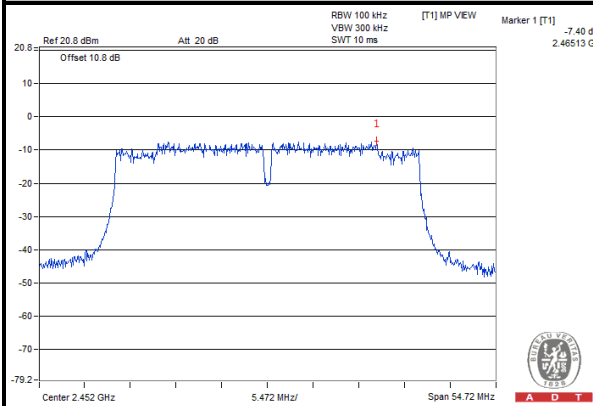
CH 3



CH 6



CH 9

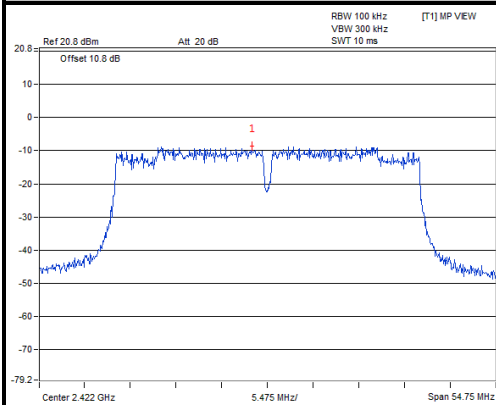




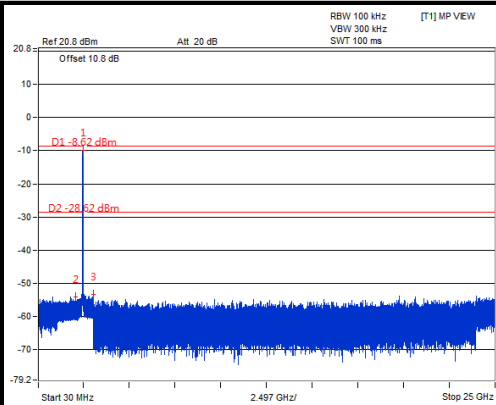
A D T

CHAIN 1

CH 3

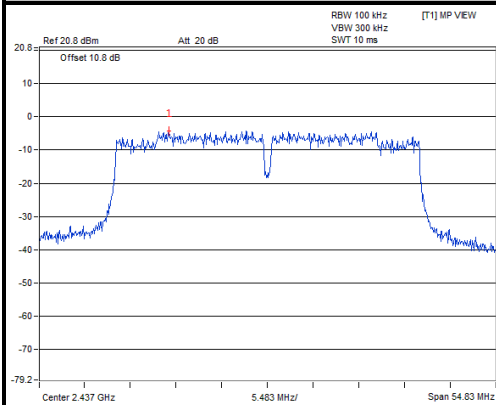


A D T

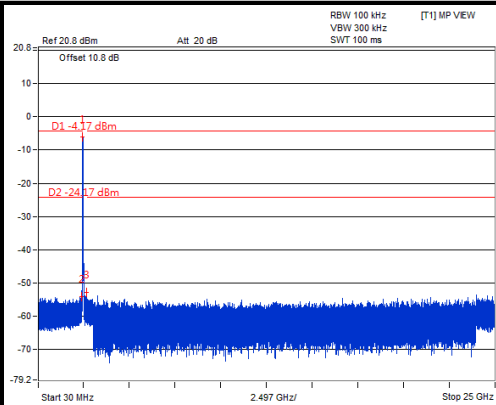


A D T

CH 6

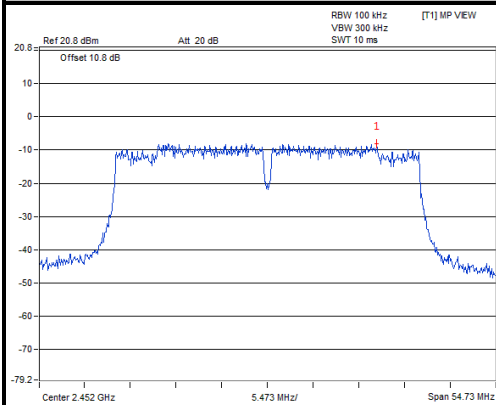


A D T

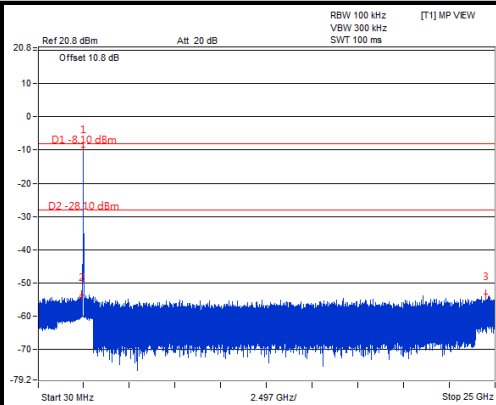


A D T

CH 9



A D T



A D T

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

6. INFORMATION ON THE TESTING LABORATORIES

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

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

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Lab:

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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



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7. 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.

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