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FCC TEST REPORT (15.247)

REPORT NO.: RF991224C08

MODEL NO.: APL23-081

FCC ID: QWU-081

RECEIVED: Dec. 24, 2010

TESTED: Dec. 28, 2010 ~ Jan. 20, 2011

ISSUED: Jan. 26, 2011

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
Original release	N/A	Jan. 26, 2011



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1. CERTIFICATION

PRODUCT: Access Point 802.11 a/b/g/n

MODEL NO.: APL23-081

BRAND: SonicWALL

APPLICANT: SonicWALL, Inc.

TEST SAMPLE: ENGINEERING SAMPLE

TESTED: Dec. 28, 2010 ~ Jan. 20, 2011

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

ANSI C63.4-2003

ANSI C63.10-2009

The above equipment (Model: APL23-081) 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 : Andrea Hsia , DATE: Jan. 26, 2011
Andrea Hsia / Specialist

APPROVED BY : Gary Chang , DATE: Jan. 26, 2011
Gary Chang / Assistant Manager

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -0.73dB at 9.553MHz.
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 33.79, 2390.00 & 7386.00MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector are R-TNC(2.4GHz) & R-SMA (5.0 GHz) not a standard connector.

2.1 MEASUREMENT UNCERTAINTY

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.34 dB
	200MHz ~1000MHz	3.35 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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



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3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Access Point 802.11 a/b/g/n
MODEL NO.	APL23-081
FCC ID	QWU-081
NOMINAL VOLTAGE	12Vdc (Adapter) 48Vdc (PoE)
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/ 1.0Mbps 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 300.0Mbps
OPERATING FREQUENCY	2.4GHz: 2412.0 ~ 2462.0MHz 5.0GHz: 5745.0 ~ 5825.0MHz
NUMBER OF CHANNEL	2.4GHz: 11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz) 5.0GHz: 5 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
OUTPUT POWER	382.0mW for 2412.0 ~ 2462.0MHz 267.1mW for 5745.0 ~ 5825.0MHz
ANTENNA TYPE	Refer to Note as below
ANTENNA CONNECTER	Refer to Note as below
DATA CABLE	NA
I/O PORTS	RJ45, RS232
ACCESSORY DEVICES	Adapter

NOTE:

- The EUT is an Access Point 802.11 a/b/g/n. The test data are separated into following test reports.

	TEST STANDARD	REFERENCE REPORT
WLAN 802.11b/g, 802.11n	FCC Part 15, Subpart C (Section 15.247)	RF991224C08
WLAN 802.11a, 802.11n (5745~5825 MHz)		
WLAN 802.11a, 802.11n (5180~ 5240MHz)	FCC Part 15, Subpart E (Section 15.407)	RF991224C08-1

- The frequency bands used in this EUT are listed as follows:

Frequency Band (MHz)	2412~2462	5180~5240	5745~5825
802.11b	√		
802.11g	√		
802.11a		√	√
802.11n (20MHz)	√	√	√
802.11n (40MHz)	√	√	√

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

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

4. The EUT uses following adapter. & POE

BRAND	SINO-AMERICAN
MODEL	SAL124A-1220V-6
INPUT POWER	100-240Vac, 50-60Hz, 0.8A
OUTPUT POWER	12Vdc, 1.66A
POEWR LINE	DC:1.8 m non-shielded cable with one core AC:1.8 m non-shielded cable without core

POE	
BRAND	SonicWall
MODEL	PD-6083G300
INPUT	100-250Vac, 50/60Hz, 0.5A
OUTPUT	48Vdc, 0.35A

**POE is only for option accessory.

5. The antenna used in this EUT is listed as below table:

ITEM	TYPE	MASTER WAVE MODEL NO.	ANTENNA CONNECTOR	GAIN (dBi)
2.4 GHz	Dipole	98620MRTX000	R-TNC	3.0dBi
5.0 GHz	Dipole	98620URSX000	R-SMA	4.0dBi

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

3.2 DESCRIPTION OF TEST MODES

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
1	2422MHz	5	2442MHz
2	2427MHz	6	2447MHz
3	2432MHz	7	2452MHz
4	2437MHz		

FOR 5.0GHz (5745 ~ 5825MHz):

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

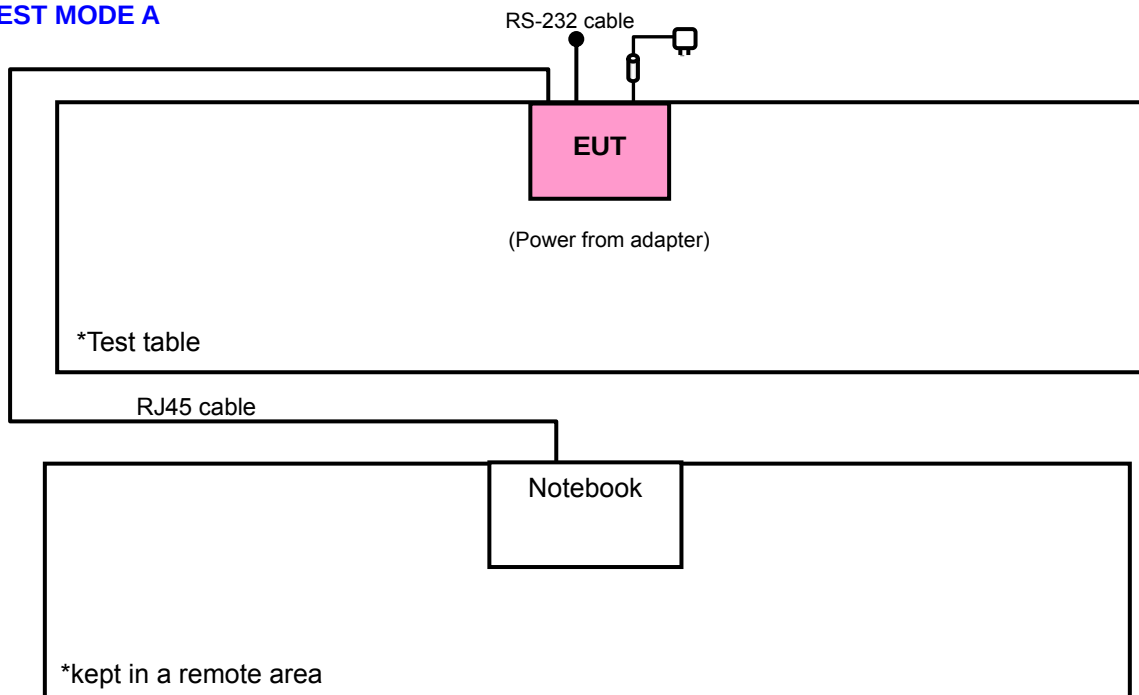
CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

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

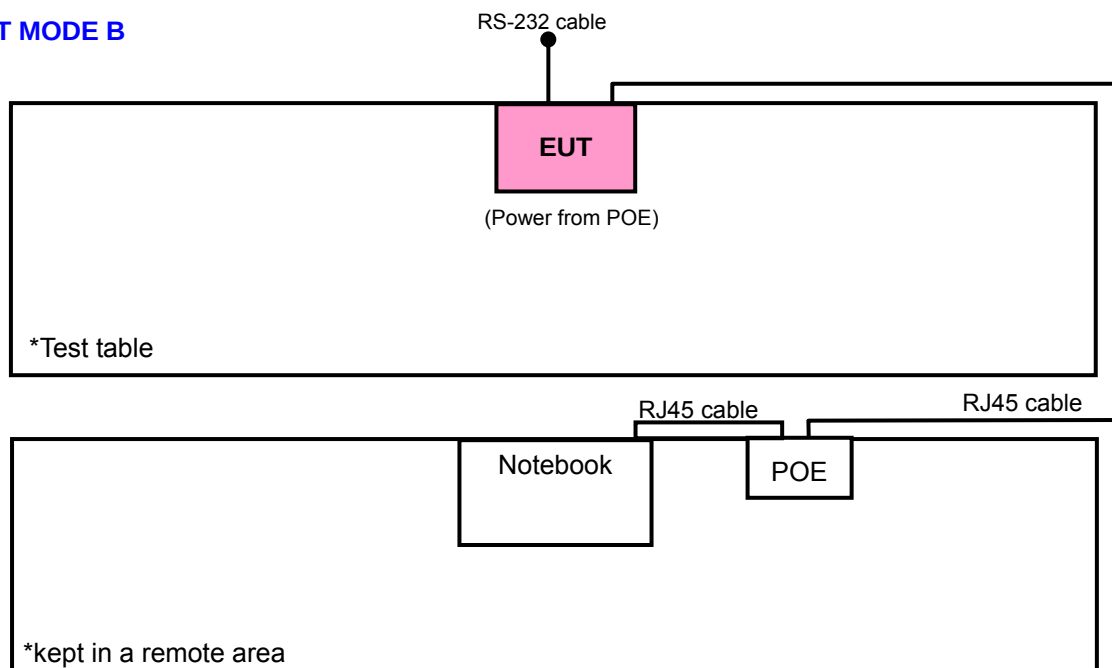
CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755MHz	159	5795MHz

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST

TEST MODE A



TEST MODE B



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

FOR 2.4GHz:

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	APCM	
A	√	√	√	√	Power from adapter
B	-	√	√	-	Power from POE

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: "-" means no effect.

RADIATED EMISSION TEST (ABOVE 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

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	7.2
	802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	15.0

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	6	OFDM	BPSK	7.2

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 & B	802.11n (20MHz)	1 to 11	6	OFDM	BPSK	7.2

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	7.2
	802.11n (40MHz)	1 to 7	1, 7	OFDM	BPSK	15.0

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	7.2
	802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	15.0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	23deg. C, 68%RH, 1020 hPa	120Vac, 60Hz	Sun Lin
RE<1G	21deg. C, 60%RH, 1020 hPa	120Vac, 60Hz	Match Tsui
	23deg. C, 68%RH, 1008 hPa	48Vdc	Sun Lin
PLC	20deg. C, 60%RH, 1019 hPa	120Vac, 60Hz	Match Tsui
	25deg. C, 65%RH, 1020 hPa	48Vdc	David Huang
APCM	21deg. C, 60%RH, 1020 hPa	120Vac, 60Hz	Match Tsui

FOR 5.745 ~ 5.825GHz:

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

Where **RE≥1G**: Radiated Emission above 1GHz

RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

NOTE: "-" means no effect.

RADIATED EMISSION TEST (ABOVE 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

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	7.2
	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0

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)	149 to 165	165	OFDM	BPSK	7.2

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 & B	802.11n (20MHz)	149 to 165	165	OFDM	BPSK	7.2

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	7.2
	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0

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	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE_≥1G	23deg. C, 68%RH, 1020 hPa	120Vac, 60Hz	Sun Lin
RE_{<}1G	21deg. C, 60%RH, 1020 hPa	120Vac, 60Hz 48Vdc	Match Tsui
PLC	20deg. C, 60%RH, 1019 hPa	120Vac, 60Hz	Match Tsui
	25deg. C, 65%RH, 1020 hPa	48Vdc	David Huang
APCM	21deg. C, 60%RH, 1020 hPa	120Vac, 60Hz	Match Tsui

3.3 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 C63.4-2003

ANSI C63.10-2009

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

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.4 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	DELL	D600	CN-0D2125-48643-4CC-5381	QDS-BRCM1005-D

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	10 m RJ45 UTP cable

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

4. TEST TYPES AND RESULTS (FOR 2.4GHz BAND)

4.1 RADIATED EMISSION MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

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. As shown in 15.35(b), 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	ESIB7	100033	Jul. 29, 2010	Jul. 28, 2011
Spectrum Analyzer Agilent	E4446A	MY48250266	Aug. 11, 2010	Aug. 10, 2011
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Apr. 27, 2010	Apr. 26, 2011
HORN Antenna SCHWARZBECK	9120D	9120D-405	Feb. 03, 2010	Feb. 02, 2011
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 27, 2010	Dec. 26, 2011
Preamplifier Agilent	8447D	2944A10633	Nov. 02, 2010	Nov. 01, 2011
Preamplifier Agilent	8449B	3008A01964	Nov. 02, 2010	Nov. 01, 2011
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	238141/4	May 14, 2010	May 13, 2011
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	12738/6	May 14, 2010	May 13, 2011
Software ADT.	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table ADT.	TT100.	TT93021703	NA	NA
Turn Table Controller ADT.	SC100.	SC93021703	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 Chamber 3.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 988962.
5. The IC Site Registration No. is IC 7450F-3.

4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height 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.

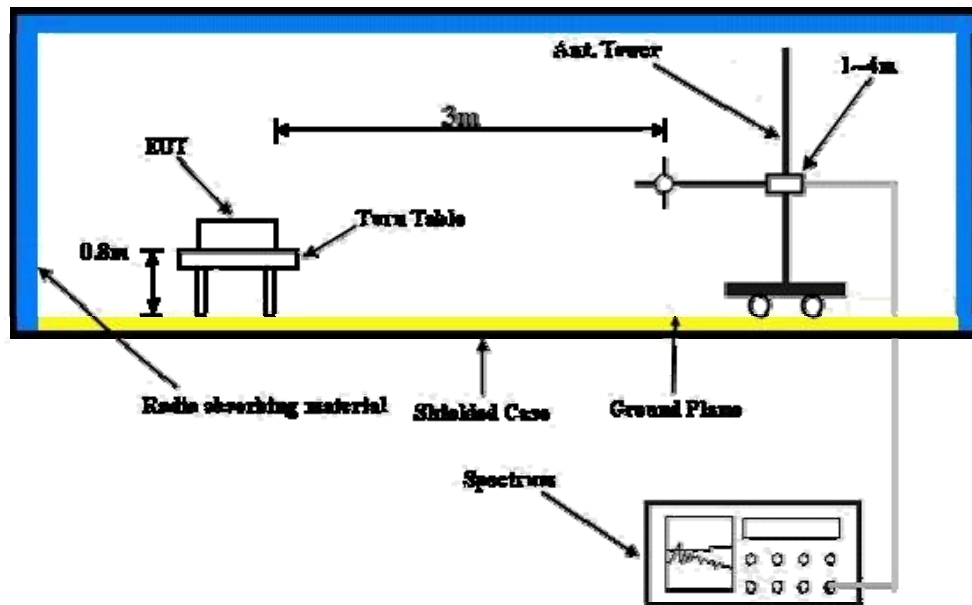
NOTE:

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 100kHz and video bandwidth is 300kHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz 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



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

4.1.6 EUT OPERATING CONDITIONS

- Placed the EUT on the testing table.
- Prepared notebook systems to act as communication partners and placed them outside of testing area.
- The communication partners connected with EUT via a RJ45 cable and run a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- The necessary accessories enable the EUT in full functions.



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4.1.7 TEST RESULTS

802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 68%RH 1020 hPa	TESTED BY	Sun Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.0 PK	74.0	-19.0	1.05 H	114	24.50	30.50
2	2390.00	46.2 AV	54.0	-7.8	1.05 H	114	15.70	30.50
3	*2412.00	98.1 PK			1.04 H	114	67.50	30.60
4	*2412.00	94.5 AV			1.04 H	114	63.90	30.60
5	4824.00	51.8 PK	74.0	-22.2	1.00 H	20	15.70	36.10
6	4824.00	48.7 AV	54.0	-5.3	1.00 H	20	12.60	36.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.4 PK	74.0	-15.6	1.11 V	149	27.90	30.50
2	2390.00	52.4 AV	54.0	-1.6	1.11 V	149	21.90	30.50
3	*2412.00	111.1 PK			1.11 V	149	80.50	30.60
4	*2412.00	107.3 AV			1.11 V	149	76.70	30.60
5	4824.00	54.2 PK	74.0	-19.8	1.00 V	209	18.10	36.10
6	4824.00	52.0 AV	54.0	-2.0	1.00 V	209	15.90	36.10

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 68%RH 1020 hPa	TESTED BY	Sun Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	93.9 PK			1.08 H	86	63.30	30.60
2	*2437.00	90.1 AV			1.08 H	86	59.50	30.60
3	4874.00	47.8 PK	74.0	-26.2	1.66 H	212	11.60	36.20
4	4874.00	41.6 AV	54.0	-12.4	1.66 H	212	5.40	36.20
5	7311.00	52.2 PK	74.0	-21.8	1.46 H	27	9.60	42.60
6	7311.00	44.0 AV	54.0	-10.0	1.46 H	27	1.40	42.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	106.8 PK			1.05 V	39	76.20	30.60
2	*2437.00	102.3 AV			1.05 V	39	71.70	30.60
3	4874.00	54.8 PK	74.0	-19.2	1.28 V	211	18.60	36.20
4	4874.00	52.8 AV	54.0	-1.2	1.28 V	211	16.60	36.20
5	7311.00	58.3 PK	74.0	-15.7	1.92 V	134	15.70	42.60
6	7311.00	52.7 AV	54.0	-1.3	1.92 V	134	10.10	42.60

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 68%RH 1020 hPa	TESTED BY	Sun Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	94.3 PK			1.15 H	105	63.60	30.70
2	*2462.00	90.5 AV			1.15 H	105	59.80	30.70
3	2483.50	55.0 PK	74.0	-19.0	1.14 H	102	24.20	30.80
4	2483.50	45.6 AV	54.0	-8.4	1.14 H	102	14.80	30.80
5	4924.00	47.3 PK	74.0	-26.7	1.53 H	253	11.00	36.30
6	4924.00	41.5 AV	54.0	-12.5	1.53 H	253	5.20	36.30
7	7386.00	51.8 PK	74.0	-22.2	1.25 H	104	9.10	42.70
8	7386.00	44.2 AV	54.0	-9.8	1.25 H	104	1.50	42.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	107.5 PK			1.02 V	284	76.80	30.70
2	*2462.00	103.4 AV			1.02 V	284	72.70	30.70
3	2483.50	56.5 PK	74.0	-17.5	1.00 V	298	25.70	30.80
4	2483.50	46.5 AV	54.0	-7.5	1.00 V	298	15.70	30.80
5	4924.00	54.1 PK	74.0	-19.9	1.04 V	296	17.80	36.30
6	4924.00	52.5 AV	54.0	-1.5	1.04 V	296	16.20	36.30
7	7386.00	59.1 PK	74.0	-14.9	1.08 V	45	16.40	42.70
8	7386.00	53.0 AV	54.0	-1.0	1.08 V	45	10.30	42.70

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



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802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 68%RH 1020 hPa	TESTED BY	Sun Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.6 PK	74.0	-17.4	1.05 H	165	26.10	30.50
2	2390.00	42.9 AV	54.0	-11.1	1.05 H	165	12.40	30.50
3	*2412.00	99.8 PK			1.05 H	165	69.20	30.60
4	*2412.00	89.3 AV			1.05 H	165	58.70	30.60
5	4824.00	45.0 PK	74.0	-29.0	1.49 H	213	8.90	36.10
6	4824.00	33.0 AV	54.0	-21.0	1.49 H	213	-3.10	36.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.5 PK	74.0	-1.5	1.03 V	48	42.00	30.50
2	2390.00	47.3 AV	54.0	-6.7	1.03 V	48	16.80	30.50
3	*2412.00	110.6 PK			1.02 V	62	80.00	30.60
4	*2412.00	100.2 AV			1.02 V	62	69.60	30.60
5	4824.00	47.2 PK	74.0	-26.8	1.43 V	102	11.10	36.10
6	4824.00	33.2 AV	54.0	-20.8	1.43 V	102	-2.90	36.10

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 68%RH 1020 hPa	TESTED BY	Sun Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	54.7 PK	74.0	-19.3	1.17 H	168	24.20	30.50
2	2390.00	45.4 AV	54.0	-8.6	1.17 H	168	14.90	30.50
3	*2437.00	103.0 PK			1.15 H	178	72.40	30.60
4	*2437.00	92.7 AV			1.15 H	178	62.10	30.60
5	2483.50	54.7 PK	74.0	-19.3	1.17 H	168	23.90	30.80
6	2483.50	45.3 AV	54.0	-8.7	1.17 H	168	14.50	30.80
7	4874.00	47.4 PK	74.0	-26.6	1.01 H	211	11.20	36.20
8	4874.00	35.5 AV	54.0	-18.5	1.01 H	211	-0.70	36.20
9	7311.00	62.1 PK	74.0	-11.9	1.47 H	25	19.50	42.60
10	7311.00	48.7 AV	54.0	-5.3	1.47 H	25	6.10	42.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.2 PK	74.0	-6.8	1.00 V	56	36.70	30.50
2	2390.00	51.0 AV	54.0	-3.0	1.00 V	56	20.50	30.50
3	*2437.00	114.2 PK			1.02 V	58	83.60	30.60
4	*2437.00	104.3 AV			1.02 V	58	73.70	30.60
5	2483.50	66.8 PK	74.0	-7.2	1.00 V	56	36.00	30.80
6	2483.50	51.2 AV	54.0	-2.8	1.00 V	56	20.40	30.80
7	4874.00	57.1 PK	74.0	-16.9	1.16 V	298	20.90	36.20
8	4874.00	43.8 AV	54.0	-10.2	1.16 V	298	7.60	36.20
9	7311.00	67.4 PK	74.0	-6.6	1.18 V	45	24.80	42.60
10	7311.00	52.7 AV	54.0	-1.3	1.18 V	45	10.10	42.60

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 68%RH 1020 hPa	TESTED BY	Sun Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	101.9 PK			1.12 H	128	71.20	30.70
2	*2462.00	91.3 AV			1.12 H	128	60.60	30.70
3	2483.50	57.3 PK	74.0	-16.7	1.15 H	132	26.50	30.80
4	2483.50	46.5 AV	54.0	-7.5	1.15 H	132	15.70	30.80
5	4924.00	48.8 PK	74.0	-25.2	1.45 H	75	12.50	36.30
6	4924.00	35.6 AV	54.0	-18.4	1.45 H	75	-0.70	36.30
7	7386.00	61.5 PK	74.0	-12.5	1.68 H	7	18.80	42.70
8	7386.00	47.1 AV	54.0	-6.9	1.68 H	7	4.40	42.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	112.8 PK			1.00 V	54	82.10	30.70
2	*2462.00	102.7 AV			1.00 V	54	72.00	30.70
3	2483.50	72.6 PK	74.0	-1.4	1.00 V	54	41.80	30.80
4	2483.50	52.4 AV	54.0	-1.6	1.00 V	54	21.60	30.80
5	4924.00	53.5 PK	74.0	-20.5	1.16 V	297	17.20	36.30
6	4924.00	40.1 AV	54.0	-13.9	1.16 V	297	3.80	36.30
7	7386.00	67.6 PK	74.0	-6.4	1.08 V	46	24.90	42.70
8	7386.00	51.0 AV	54.0	-3.0	1.08 V	46	8.30	42.70

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



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802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 68%RH 1020 hPa	TESTED BY	Sun Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.2 PK	74.0	-17.8	1.04 H	153	25.70	30.50
2	2390.00	42.7 AV	54.0	-11.3	1.04 H	153	12.20	30.50
3	*2412.00	100.3 PK			1.02 H	177	69.70	30.60
4	*2412.00	90.0 AV			1.02 H	177	59.40	30.60
5	4824.00	45.3 PK	74.0	-28.7	1.12 H	45	9.20	36.10
6	4824.00	33.2 AV	54.0	-20.8	1.12 H	45	-2.90	36.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.6 PK	74.0	-1.4	1.01 V	47	42.10	30.50
2	2390.00	48.4 AV	54.0	-5.6	1.01 V	47	17.90	30.50
3	*2412.00	111.0 PK			1.01 V	64	80.40	30.60
4	*2412.00	100.9 AV			1.01 V	64	70.30	30.60
5	4824.00	47.4 PK	74.0	-26.6	1.25 V	117	11.30	36.10
6	4824.00	33.5 AV	54.0	-20.5	1.25 V	117	-2.60	36.10

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 68%RH 1020 hPa	TESTED BY	Sun Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	54.3 PK	74.0	-19.7	1.43 H	348	23.80	30.50
2	2390.00	43.4 AV	54.0	-10.6	1.43 H	348	12.90	30.50
3	*2437.00	102.8 PK			1.43 H	348	72.20	30.60
4	*2437.00	92.6 AV			1.43 H	348	62.00	30.60
5	4874.00	49.2 PK	74.0	-24.8	1.22 H	207	13.00	36.20
6	4874.00	36.2 AV	54.0	-17.8	1.22 H	207	0.00	36.20
7	7311.00	62.0 PK	74.0	-12.0	1.07 H	28	19.40	42.60
8	7311.00	48.2 AV	54.0	-5.8	1.07 H	28	5.60	42.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.7 PK	74.0	-10.3	1.06 V	47	33.20	30.50
2	2390.00	50.3 AV	54.0	-3.7	1.06 V	47	19.80	30.50
3	*2437.00	114.0 PK			1.06 V	40	83.40	30.60
4	*2437.00	104.1 AV			1.06 V	40	73.50	30.60
5	4874.00	56.2 PK	74.0	-17.8	1.18 V	23	20.00	36.20
6	4874.00	41.9 AV	54.0	-12.1	1.18 V	23	5.70	36.20
7	7311.00	67.0 PK	74.0	-7.0	1.01 V	46	24.40	42.60
8	7311.00	52.5 AV	54.0	-1.5	1.01 V	46	9.90	42.60

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 68%RH 1020 hPa	TESTED BY	Sun Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	101.6 PK			1.04 H	290	70.90	30.70
2	*2462.00	91.0 AV			1.04 H	290	60.30	30.70
3	2483.50	59.7 PK	74.0	-14.3	1.04 H	303	28.90	30.80
4	2483.50	46.7 AV	54.0	-7.3	1.04 H	303	15.90	30.80
5	4924.00	46.4 PK	74.0	-27.6	1.06 H	208	10.10	36.30
6	4924.00	34.8 AV	54.0	-19.2	1.06 H	208	-1.50	36.30
7	7386.00	61.4 PK	74.0	-12.6	1.00 H	10	18.70	42.70
8	7386.00	46.7 AV	54.0	-7.3	1.00 H	10	4.00	42.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	112.5 PK			1.07 V	348	81.80	30.70
2	*2462.00	102.5 AV			1.07 V	348	71.80	30.70
3	2483.50	71.9 PK	74.0	-2.1	1.00 V	40	41.10	30.80
4	2483.50	52.9 AV	54.0	-1.1	1.00 V	40	22.10	30.80
5	4924.00	49.6 PK	74.0	-24.4	1.26 V	205	13.30	36.30
6	4924.00	37.4 AV	54.0	-16.6	1.26 V	205	1.10	36.30
7	7386.00	67.7 PK	74.0	-6.3	1.09 V	43	25.00	42.70
8	7386.00	52.5 AV	54.0	-1.5	1.09 V	43	9.80	42.70

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



A D T

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 68%RH 1020 hPa	TESTED BY	Sun Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.3 PK	74.0	-17.7	1.42 H	135	25.80	30.50
2	2390.00	44.2 AV	54.0	-9.8	1.42 H	135	13.70	30.50
3	*2422.00	91.9 PK			1.41 H	145	61.30	30.60
4	*2422.00	82.5 AV			1.41 H	145	51.90	30.60
5	4824.00	43.4 PK	74.0	-30.6	1.00 H	312	7.30	36.10
6	4824.00	31.3 AV	54.0	-22.7	1.00 H	312	-4.80	36.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.2 PK	74.0	-4.8	1.09 V	351	38.70	30.50
2	2390.00	52.2 AV	54.0	-1.8	1.09 V	351	21.70	30.50
3	*2422.00	103.8 PK			1.08 V	354	73.20	30.60
4	*2422.00	94.9 AV			1.08 V	354	64.30	30.60
5	4824.00	43.8 PK	74.0	-30.2	1.00 V	0	7.70	36.10
6	4824.00	31.7 AV	54.0	-22.3	1.00 V	0	-4.40	36.10

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 68%RH 1020 hPa	TESTED BY	Sun Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	52.4 PK	74.0	-21.6	1.29 H	283	21.90	30.50
2	2390.00	43.6 AV	54.0	-10.4	1.29 H	283	13.10	30.50
3	*2437.00	95.1 PK			1.29 H	283	64.50	30.60
4	*2437.00	85.2 AV			1.29 H	283	54.60	30.60
5	2483.50	55.9 PK	74.0	-18.1	1.29 H	283	25.10	30.80
6	2483.50	43.6 AV	54.0	-10.4	1.29 H	283	12.80	30.80
7	4874.00	43.1 PK	74.0	-30.9	1.18 H	360	6.90	36.20
8	4874.00	31.8 AV	54.0	-22.2	1.18 H	360	-4.40	36.20
9	7311.00	54.6 PK	74.0	-19.4	1.16 H	68	12.00	42.60
10	7311.00	41.0 AV	54.0	-13.0	1.16 H	68	-1.60	42.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	70.2 PK	74.0	-3.8	1.08 V	351	39.70	30.50
2	2390.00	53.0 AV	54.0	-1.0	1.08 V	351	22.50	30.50
3	*2437.00	107.1 PK			1.06 V	351	76.50	30.60
4	*2437.00	98.3 AV			1.06 V	351	67.70	30.60
5	2483.50	63.8 PK	74.0	-10.2	1.05 V	341	33.00	30.80
6	2483.50	51.4 AV	54.0	-2.6	1.05 V	341	20.60	30.80
7	4874.00	45.1 PK	74.0	-28.9	1.13 V	360	8.90	36.20
8	4874.00	33.1 AV	54.0	-20.9	1.13 V	360	-3.10	36.20
9	7311.00	61.4 PK	74.0	-12.6	1.05 V	127	18.80	42.60
10	7311.00	46.1 AV	54.0	-7.9	1.05 V	127	3.50	42.60

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 7	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 68%RH 1020 hPa	TESTED BY	Sun Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	94.0 PK			1.29 H	283	63.30	30.70
2	*2452.00	84.4 AV			1.29 H	283	53.70	30.70
3	2483.50	60.2 PK	74.0	-13.8	1.25 H	285	29.40	30.80
4	2483.50	44.7 AV	54.0	-9.3	1.25 H	285	13.90	30.80
5	4904.00	43.3 PK	74.0	-30.7	1.14 H	360	7.10	36.20
6	4904.00	32.1 AV	54.0	-21.9	1.14 H	360	-4.10	36.20
7	7356.00	53.8 PK	74.0	-20.2	1.16 H	227	11.10	42.70
8	7356.00	40.0 AV	54.0	-14.0	1.16 H	227	-2.70	42.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	106.1 PK			1.07 V	350	75.40	30.70
2	*2452.00	97.0 AV			1.07 V	350	66.30	30.70
3	2483.50	71.3 PK	74.0	-2.7	1.28 V	346	40.50	30.80
4	2483.50	52.5 AV	54.0	-1.5	1.28 V	346	21.70	30.80
5	4904.00	43.9 PK	74.0	-30.1	1.07 V	360	7.70	36.20
6	4904.00	32.1 AV	54.0	-21.9	1.07 V	360	-4.10	36.20
7	7356.00	57.9 PK	74.0	-16.1	1.15 V	128	15.20	42.70
8	7356.00	44.8 AV	54.0	-9.2	1.15 V	128	2.10	42.70

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



A D T

BELOW 1GHz WORST-CASE DATA : 802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23deg. C, 68%RH 1020 hPa	TEST MODE	A
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	199.05	36.5 QP	43.5	-7.0	1.00 H	301	26.00	10.50
2	249.60	37.7 QP	46.0	-8.3	1.00 H	91	24.70	13.00
3	403.20	37.5 QP	46.0	-8.5	1.50 H	340	20.00	17.50
4	500.42	37.2 QP	46.0	-8.8	1.25 H	199	16.90	20.30
5	626.80	41.4 QP	46.0	-4.6	1.00 H	238	18.50	22.90
6	805.67	37.7 QP	46.0	-8.3	1.25 H	88	12.30	25.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	37.45	36.6 QP	40.0	-3.4	1.00 V	50	23.20	13.40
2	88.00	34.2 QP	40.0	-5.8	1.25 V	268	25.50	8.70
3	375.98	35.4 QP	46.0	-10.6	1.00 V	151	18.50	16.90
4	626.80	37.7 QP	46.0	-8.3	1.50 V	163	14.80	22.90
5	794.01	35.0 QP	46.0	-11.0	1.50 V	325	9.80	25.20
6	877.61	36.0 QP	46.0	-10.0	1.00 V	100	9.40	26.60

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23deg. C, 68%RH 1020 hPa	TEST MODE	B
TESTED BY	Sun Lin		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	199.05	32.5 QP	43.5	-11.0	1.75 H	307	22.00	10.50
2	331.26	33.6 QP	46.0	-12.4	1.00 H	355	17.80	15.80
3	405.15	32.5 QP	46.0	-13.5	1.25 H	16	14.90	17.60
4	626.80	35.4 QP	46.0	-10.6	1.25 H	154	12.50	22.90
5	745.40	33.3 QP	46.0	-12.7	1.00 H	151	8.60	24.70
6	803.73	32.5 QP	46.0	-13.5	2.00 H	46	7.20	25.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	34.72	38.1 QP	40.0	-1.9	1.00 V	353	25.70	12.40
2	333.21	38.1 QP	46.0	-7.9	1.25 V	193	22.30	15.80
3	401.26	35.9 QP	46.0	-10.1	1.50 V	94	18.40	17.50
4	504.31	32.6 QP	46.0	-13.4	1.25 V	43	12.30	20.30
5	626.80	32.2 QP	46.0	-13.8	1.50 V	196	9.30	22.90
6	792.06	34.8 QP	46.0	-11.2	1.25 V	127	9.60	25.20

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

4.2 CONDUCTED EMISSION MEASUREMENT

4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 23, 2010	Nov. 22, 2011
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 30, 2010	Dec. 29, 2011
LISN ROHDE & SCHWARZ	ESH3-Z5	100312	Jun. 28, 2010	Jun. 27, 2011
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Jul. 08, 2010	Jul. 07, 2011
V-LISN SCHWARZBECK	NNBL 8226-2	8226-142	Jul. 12, 2010	Jul. 11, 2011
Software ADT	ADT_Cond_ V7.3.7	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

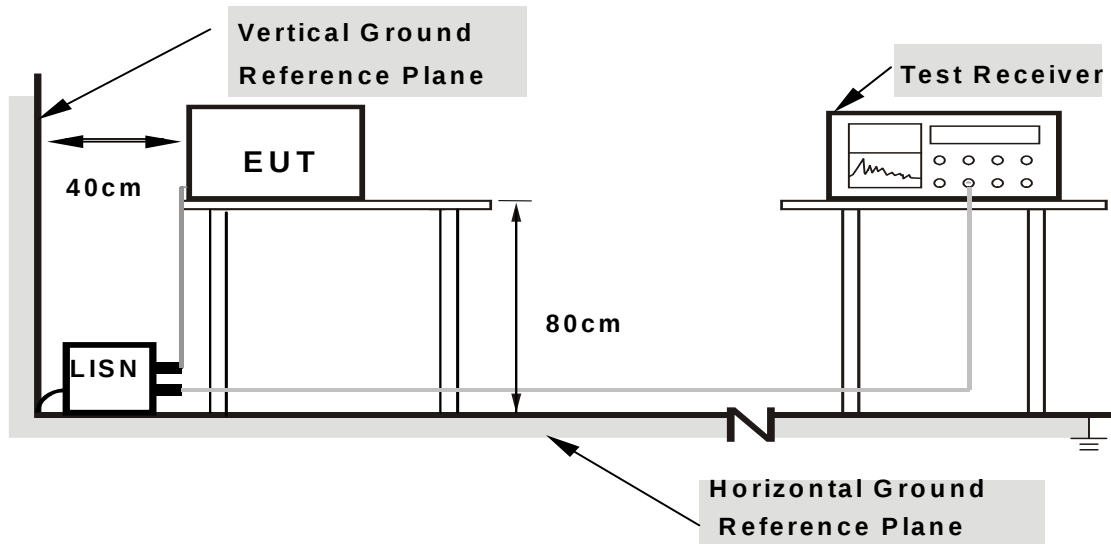
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

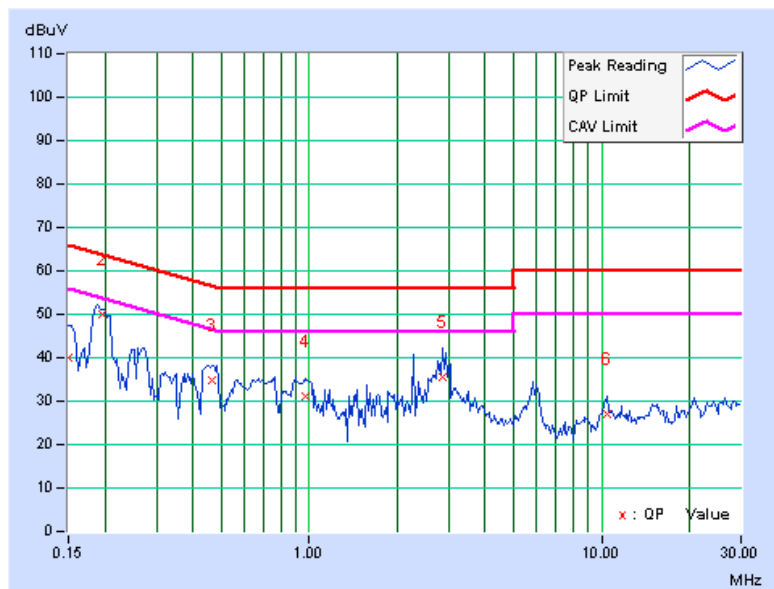
4.2.7 TEST RESULTS

CONDUCTED WORST-CASE DATA : 802.11n (20MHz)

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	A		

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	0.150	0.16	39.66	-	39.82	-	66.00	56.00	-26.18	-
2	0.197	0.16	49.72	-	49.88	-	63.75	53.75	-13.87	-
3	0.463	0.19	34.56	-	34.75	-	56.65	46.65	-21.90	-
4	0.970	0.23	30.82	-	31.05	-	56.00	46.00	-24.95	-
5	2.855	0.33	35.38	-	35.71	-	56.00	46.00	-20.29	-
6	10.410	0.36	26.52	-	26.88	-	60.00	50.00	-33.12	-

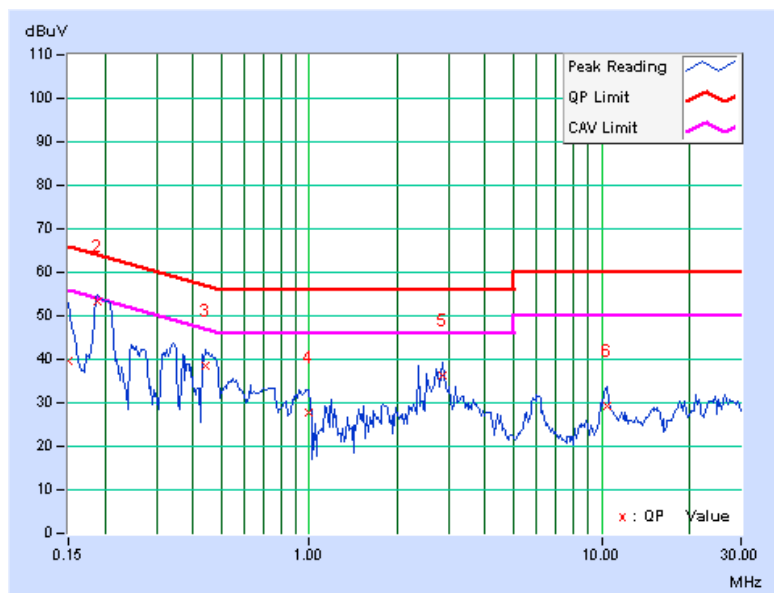
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	A		

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	0.150	0.12	39.48	-	39.60	-	66.00	56.00	-26.40	-
2	0.189	0.13	53.04	-	53.17	-	64.08	54.08	-10.91	-
3	0.443	0.16	38.18	-	38.34	-	57.01	47.01	-18.66	-
4	0.990	0.22	27.68	-	27.90	-	56.00	46.00	-28.10	-
5	2.852	0.33	36.02	-	36.35	-	56.00	46.00	-19.65	-
6	10.434	0.46	28.98	-	29.44	-	60.00	50.00	-30.56	-

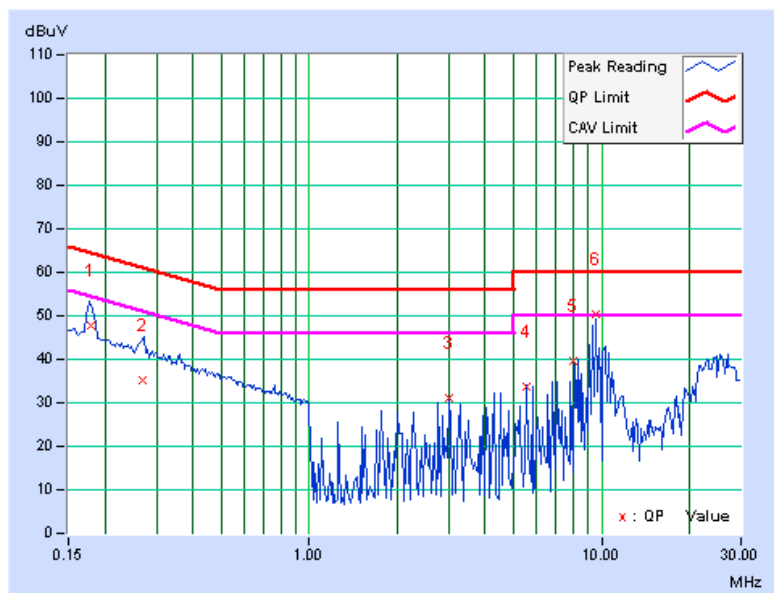
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	B		

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	0.180	0.16	47.56	-	47.72	-	64.48	54.48	-16.76	-
2	0.269	0.17	34.84	-	35.01	-	61.14	51.14	-26.14	-
3	3.016	0.33	30.70	-	31.03	-	56.00	46.00	-24.97	-
4	5.530	0.35	33.44	-	33.79	-	60.00	50.00	-26.21	-
5	8.043	0.35	39.22	-	39.57	-	60.00	50.00	-20.43	-
6	9.553	0.35	49.84	48.88	50.19	49.23	60.00	50.00	-9.81	-1.23

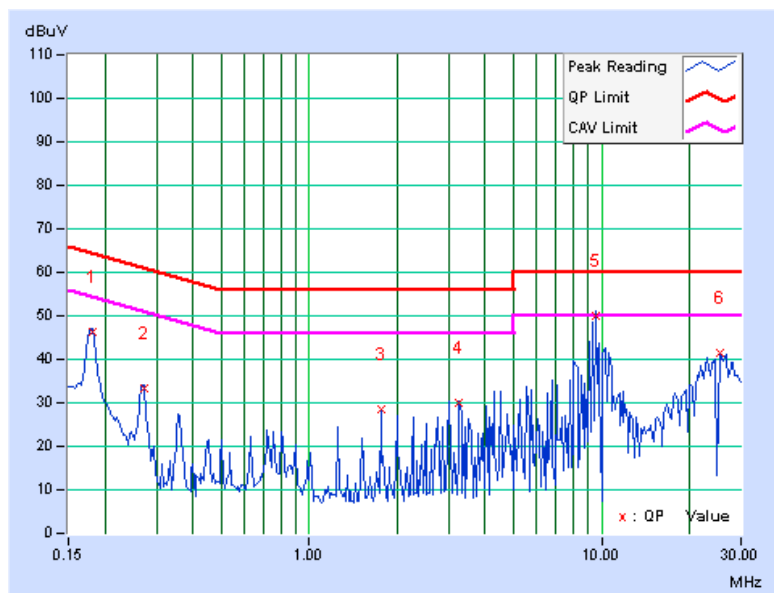
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	B		

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	0.181	0.13	46.24	-	46.37	-	64.43	54.43	-18.06	-
2	0.271	0.14	33.32	-	33.46	-	61.08	51.08	-27.62	-
3	1.758	0.28	28.10	-	28.38	-	56.00	46.00	-27.62	-
4	3.266	0.34	29.58	-	29.92	-	56.00	46.00	-26.08	-
5	9.543	0.43	49.74	48.84	50.17	49.27	60.00	50.00	-9.83	-0.73
6	25.364	0.85	40.60	-	41.45	-	60.00	50.00	-18.55	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. 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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
SPECTRUM ANALYZER R&S	FSP40	100039	Jul. 09, 2010	Jul. 08, 2011

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

4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 300kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

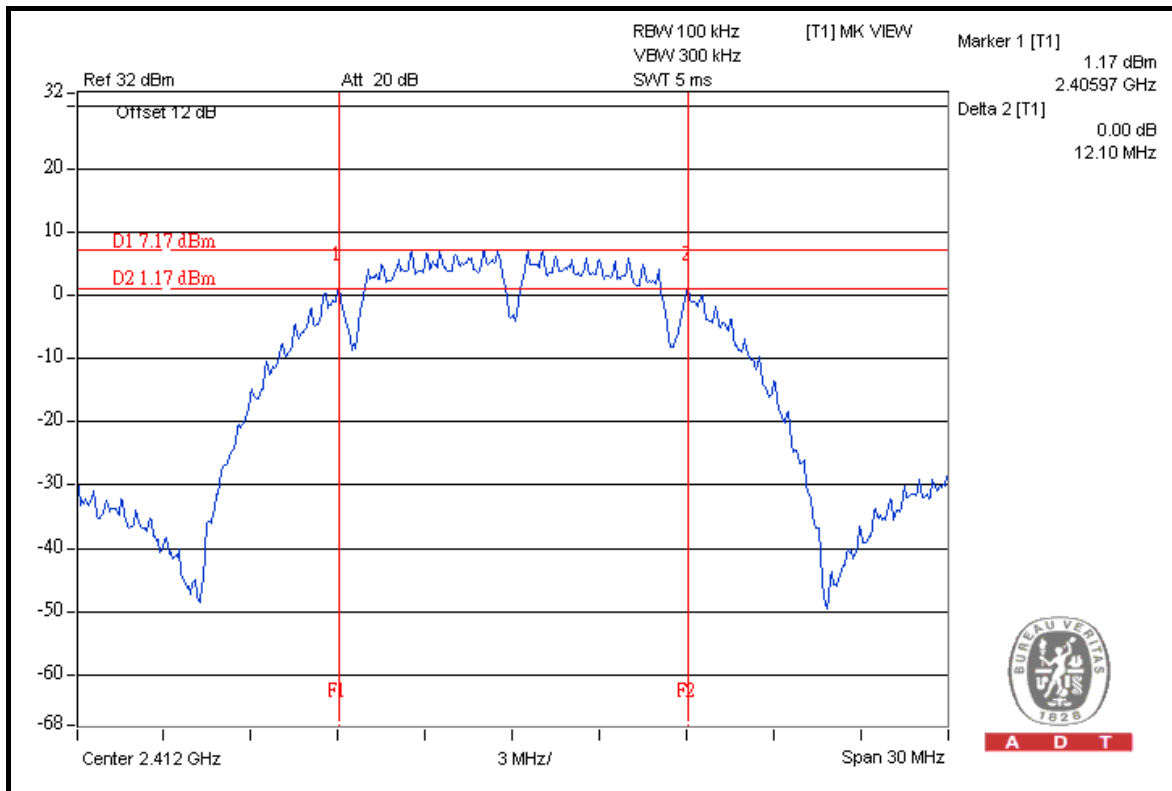
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	12.10	11.12	0.5	PASS
6	2437	10.16	10.16	0.5	PASS
11	2462	11.17	10.17	0.5	PASS

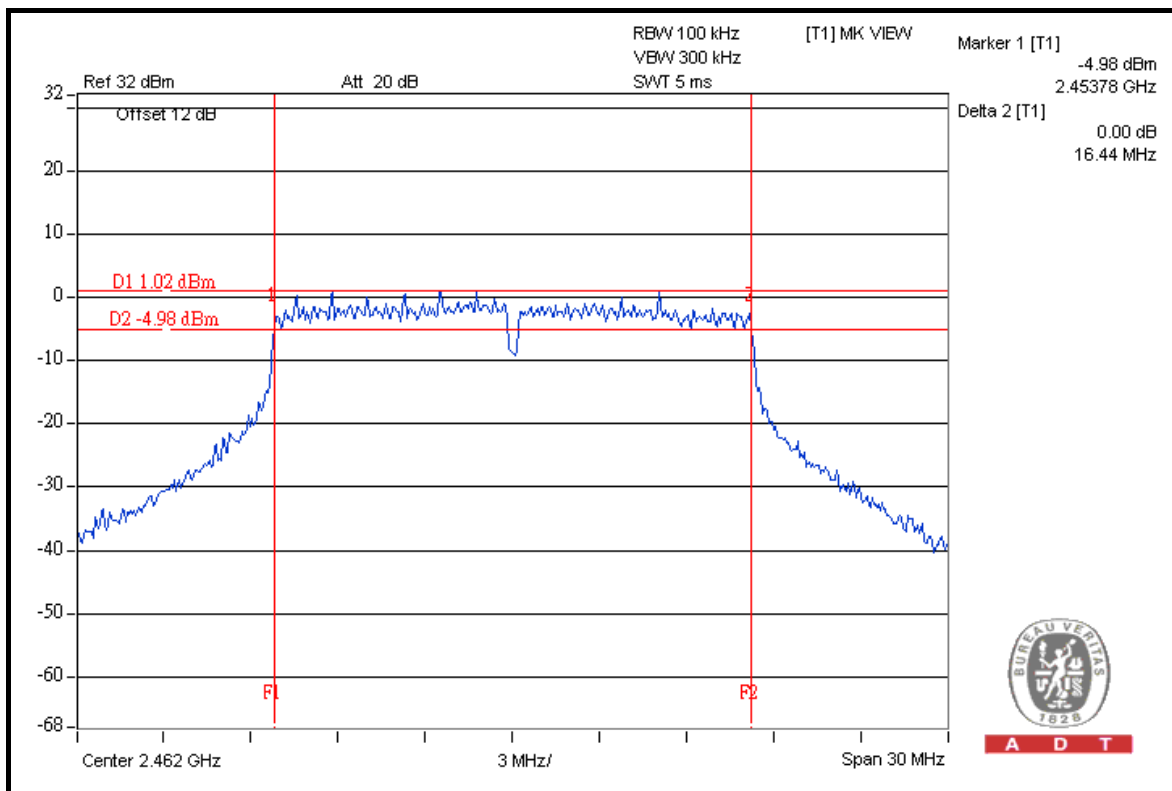
CHAIN 0: CH 1



802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	16.37	16.39	0.5	PASS
6	2437	16.36	16.37	0.5	PASS
11	2462	16.10	16.44	0.5	PASS

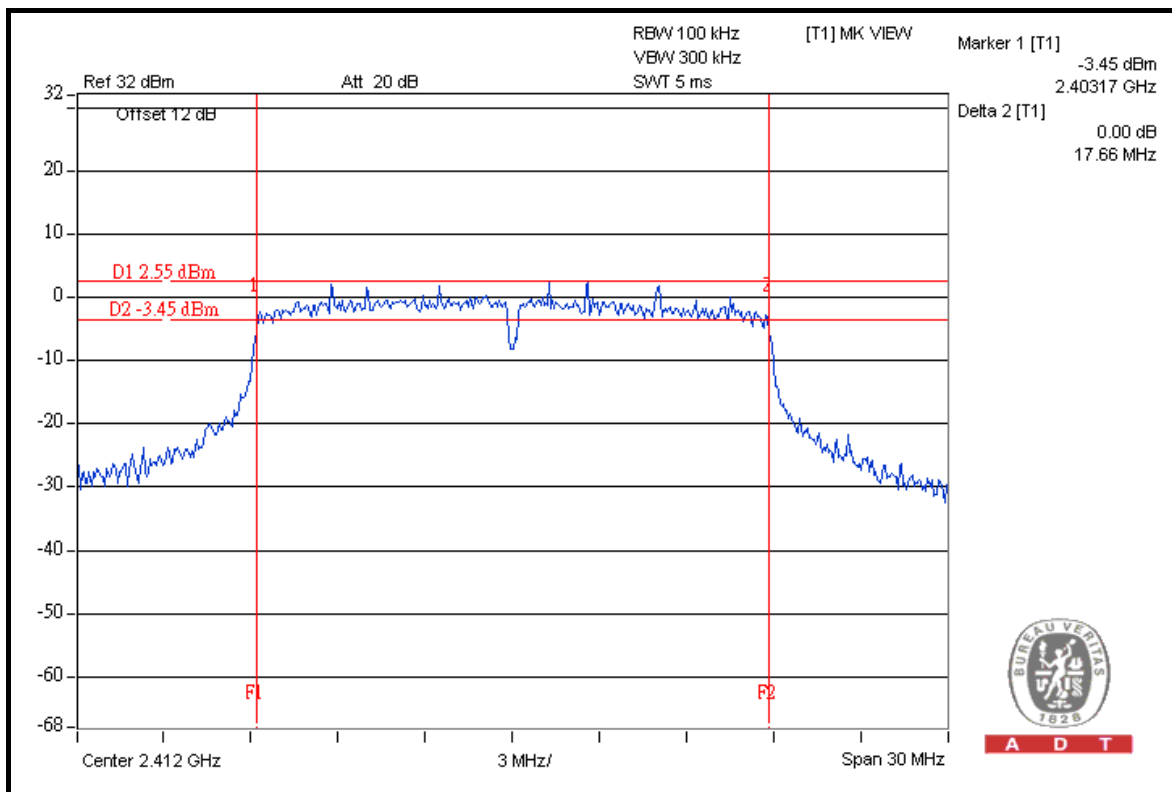
CHAIN 1: CH 11



802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	17.66	17.55	0.5	PASS
6	2437	17.32	17.63	0.5	PASS
11	2462	17.60	17.60	0.5	PASS

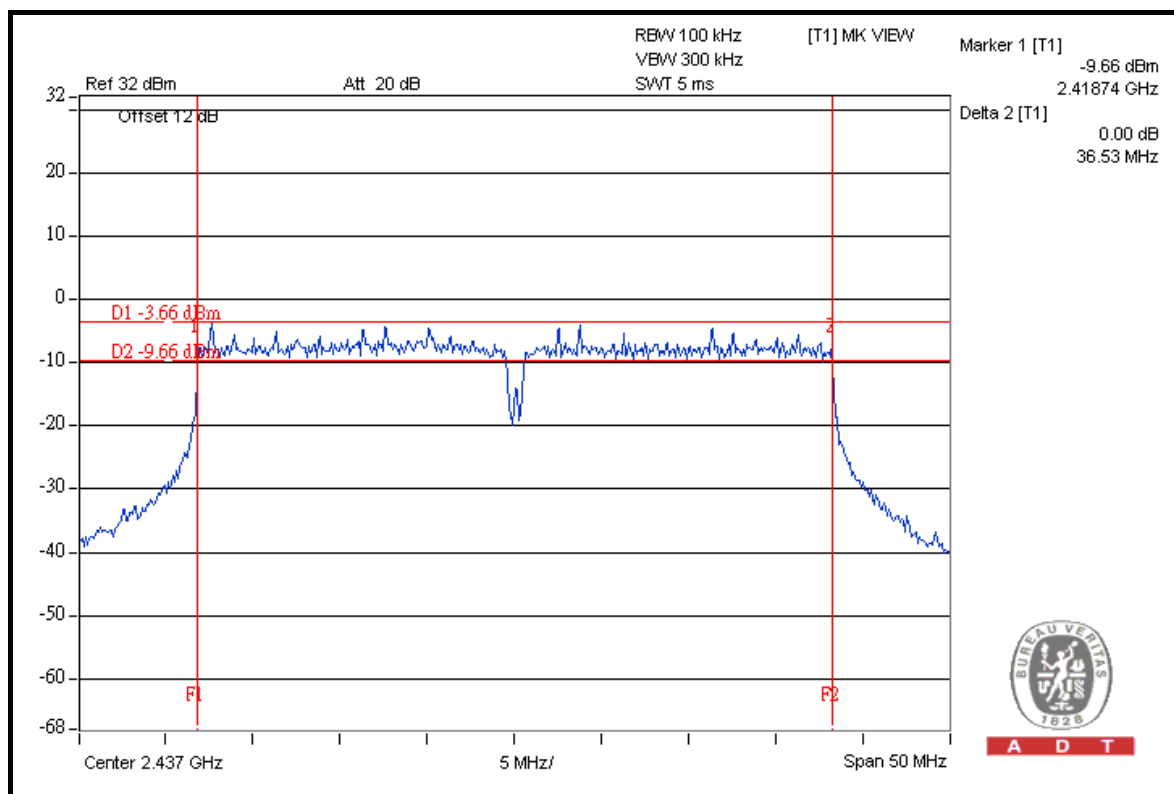
FOR CHAIN 0: CH 1



802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2422	36.44	36.51	0.5	PASS
4	2437	36.49	36.53	0.5	PASS
7	2452	35.90	36.53	0.5	PASS

FOR CHAIN 1: CH 4



4.4 MAXIMUM OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM OUTPUT POWER MEASUREMENT

The Maximum Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
High Speed Peak Power Meter	ML2495A	0842014	Apr. 21, 2010	Apr. 20, 2011
Power Sensor	MA2411B	0738404	Apr. 21, 2010	Apr. 20, 2011

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. Measurement Bandwidth of ML2495A is 65MHz greater than 6dB bandwidth of emission.

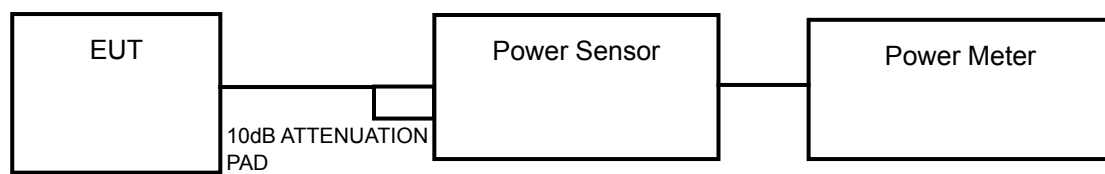
4.4.3 TEST PROCEDURES

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

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.7 TEST RESULTS

802.11b

CHAN.	CHAN. FREQ. (MHz)	POWER OUTPUT (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	19.7	19.4	180.4	22.6	30	PASS
6	2437	15.1	14.7	61.9	17.9	30	PASS
11	2462	15.2	14.8	63.3	18.0	30	PASS

802.11g

CHAN.	CHAN. FREQ. (MHz)	POWER OUTPUT (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	20.7	20.3	224.6	23.5	30	PASS
6	2437	22.9	22.7	381.2	25.8	30	PASS
11	2462	21.9	21.0	280.8	24.5	30	PASS

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	POWER OUTPUT (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	21.5	21.2	273.1	24.4	30	PASS
6	2437	23.1	22.5	382.0	25.8	30	PASS
11	2462	22.4	21.6	318.3	25.0	30	PASS

802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	POWER OUTPUT (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2422	18.6	18.3	140.1	21.5	30	PASS
4	2437	21.3	20.8	255.1	24.1	30	PASS
7	2452	21.0	20.8	246.1	23.9	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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
SPECTRUM ANALYZER R&S	FSP40	100039	Jul. 09, 2010	Jul. 08, 2011

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

4.5.3 TEST PROCEDURE

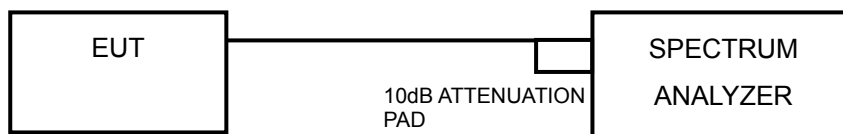
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

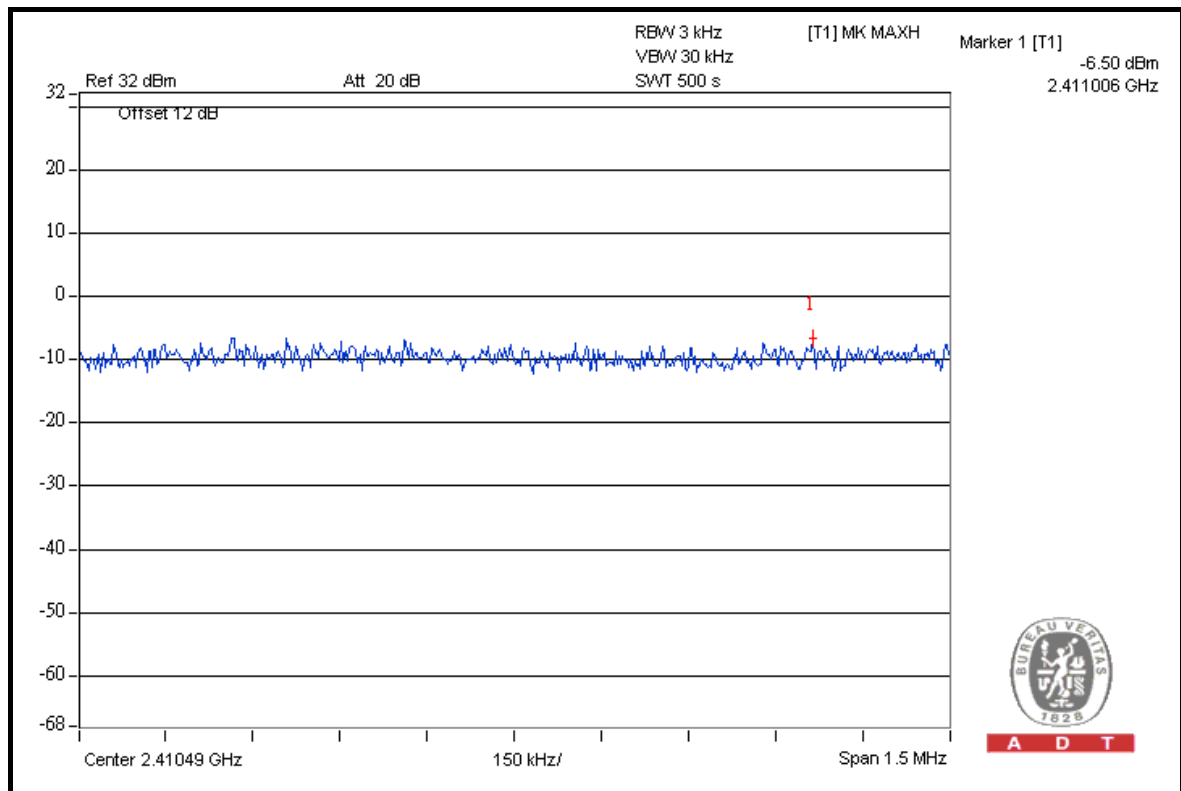
Same as Item 4.3.6

4.5.7 TEST RESULTS

802.11b

CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1			
1	2412	-6.5	-6.5	-3.5	8	PASS
6	2437	-11.0	-11.0	-8.0	8	PASS
11	2462	-11.0	-10.9	-7.9	8	PASS

FOR CHAIN 0: CH 1





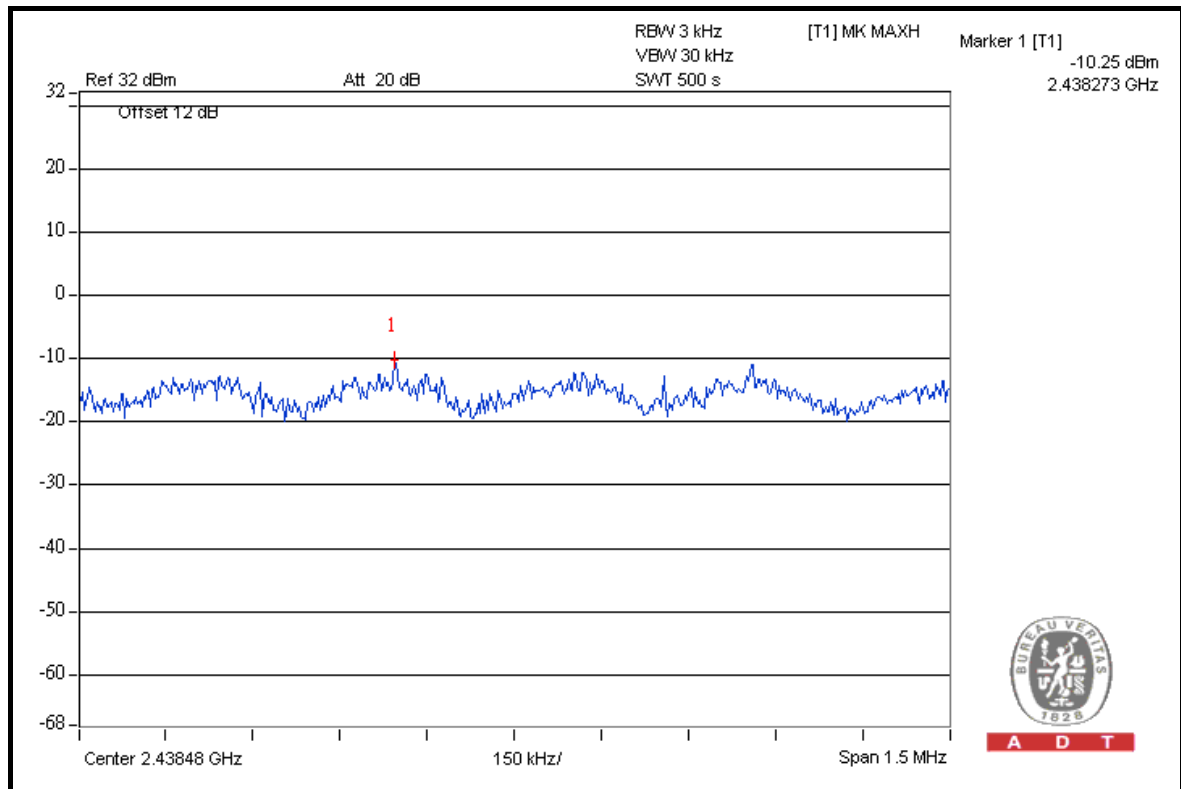
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802.11g

CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1			
1	2412	-12.6	-13.8	-10.1	7.99	PASS
6	2437	-10.3	-11.6	-7.9	7.99	PASS
11	2462	-11.4	-13.0	-9.1	7.99	PASS

Directional gain = $3.0\text{dBi} + 10\log(2) = 6.01\text{dBi} > 6\text{dBi}$, conducted power limit is reduced from 30dBm down to $8-(6.01-6)=29.99\text{dBm}$

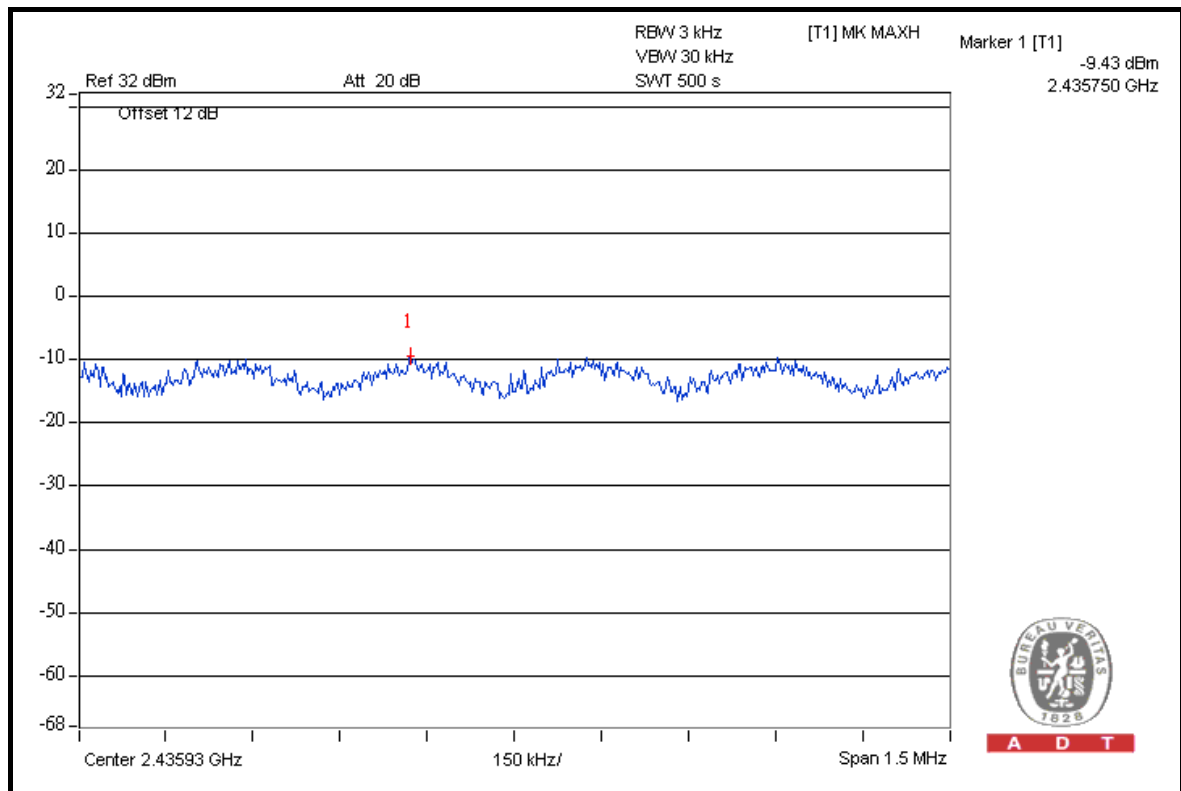
FOR CHAIN 0: CH 6



802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1			
1	2412	-11.0	-12.9	-8.8	8	PASS
6	2437	-9.4	-11.5	-7.3	8	PASS
11	2462	-10.1	-12.7	-8.2	8	PASS

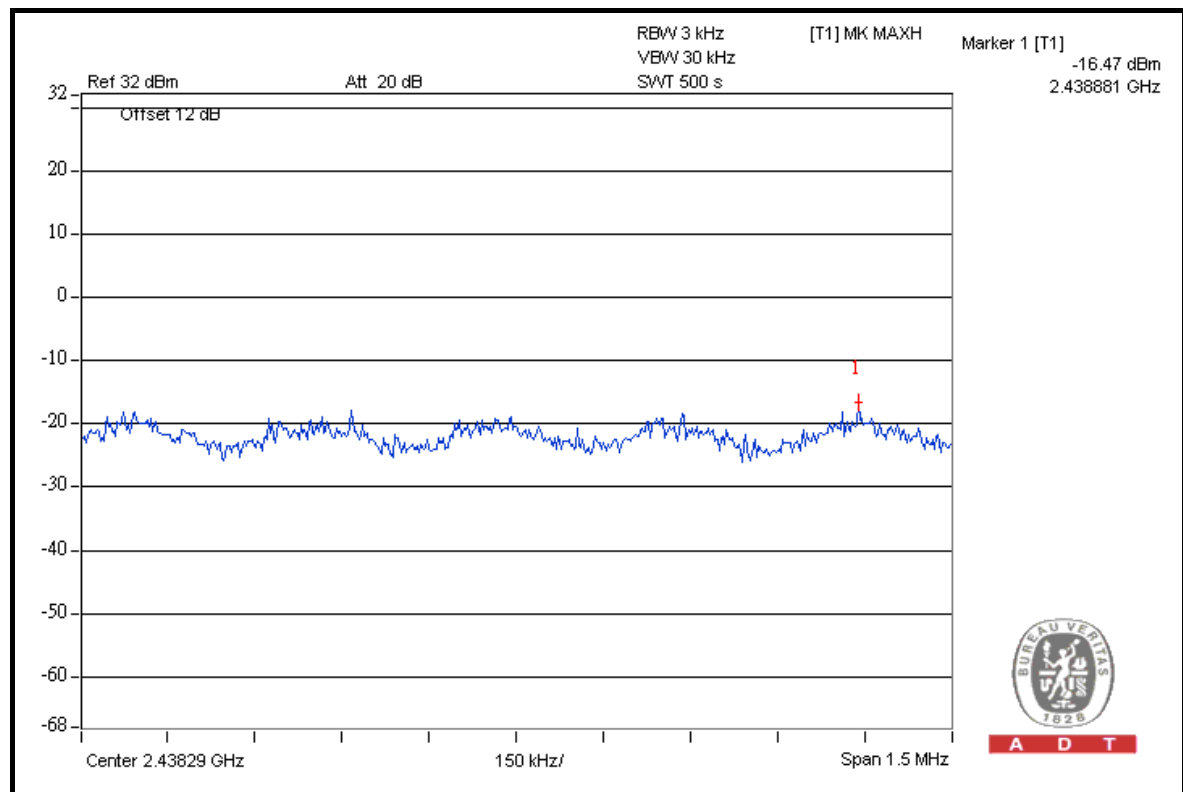
FOR CHAIN 0: CH 6



802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1			
1	2422	-19.1	-19.6	-16.3	8	PASS
4	2437	-16.5	-17.1	-13.8	8	PASS
7	2452	-16.7	-17.0	-13.8	8	PASS

FOR CHAIN 0: CH 4



4.6 BAND EDGES MEASUREMENT

4.6.1 LIMITS OF BAND EDGES MEASUREMENT

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

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100033	Jul. 29, 2010	Jul. 28, 2011
Spectrum Analyzer Agilent	E4446A	MY48250266	Aug. 11, 2010	Aug. 10, 2011
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Apr. 27, 2010	Apr. 26, 2011
HORN Antenna SCHWARZBECK	9120D	9120D-405	Feb. 03, 2010	Feb. 02, 2011
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 27, 2010	Dec. 26, 2011
Preamplifier Agilent	8447D	2944A10633	Nov. 02, 2010	Nov. 01, 2011
Preamplifier Agilent	8449B	3008A01964	Nov. 02, 2010	Nov. 01, 2011
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	238141/4	May 14, 2010	May 13, 2011
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	12738/6	May 14, 2010	May 13, 2011
Software ADT.	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table ADT.	TT100.	TT93021703	NA	NA
Turn Table Controller ADT.	SC100.	SC93021703	NA	NA

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

4.6.3 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter 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. The antenna is a broadband antenna, and its height 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. Set both RBW and VBW of spectrum analyzer to 100kHz and 300kHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots (Peak RBW = 100kHz, VBW = 300kHz) are attached on the following pages.

NOTE: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 EUT OPERATING CONDITION

Same as Item 4.3.6

4.6.6 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 in part 15.247(d).

802.11b

RESTRICT BAND (2310 ~ 2390 MHz)

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2412.00 (PK)	111.1	54.74	56.36	74.00
2412.00 (AV)	107.3	57.78	49.52	54.00

RESTRICT BAND (2483.5 ~ 2500 MHz)

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2462.00 (PK)	107.5	53.11	54.39	74.00
2462.00 (AV)	103.4	58.54	44.86	54.00

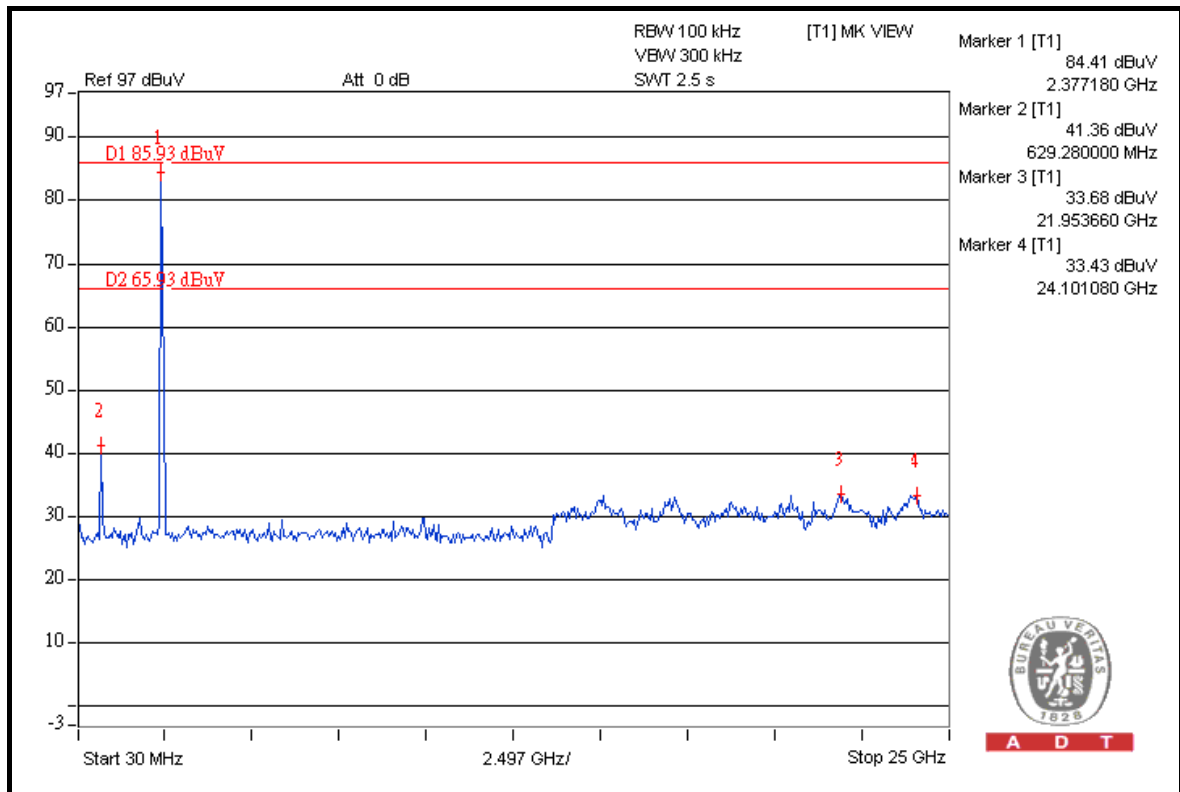
NOTE:

- Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission. Please check following 3 pages.
- Maximum field strength in restrict band = Fundamental emission – Delta.

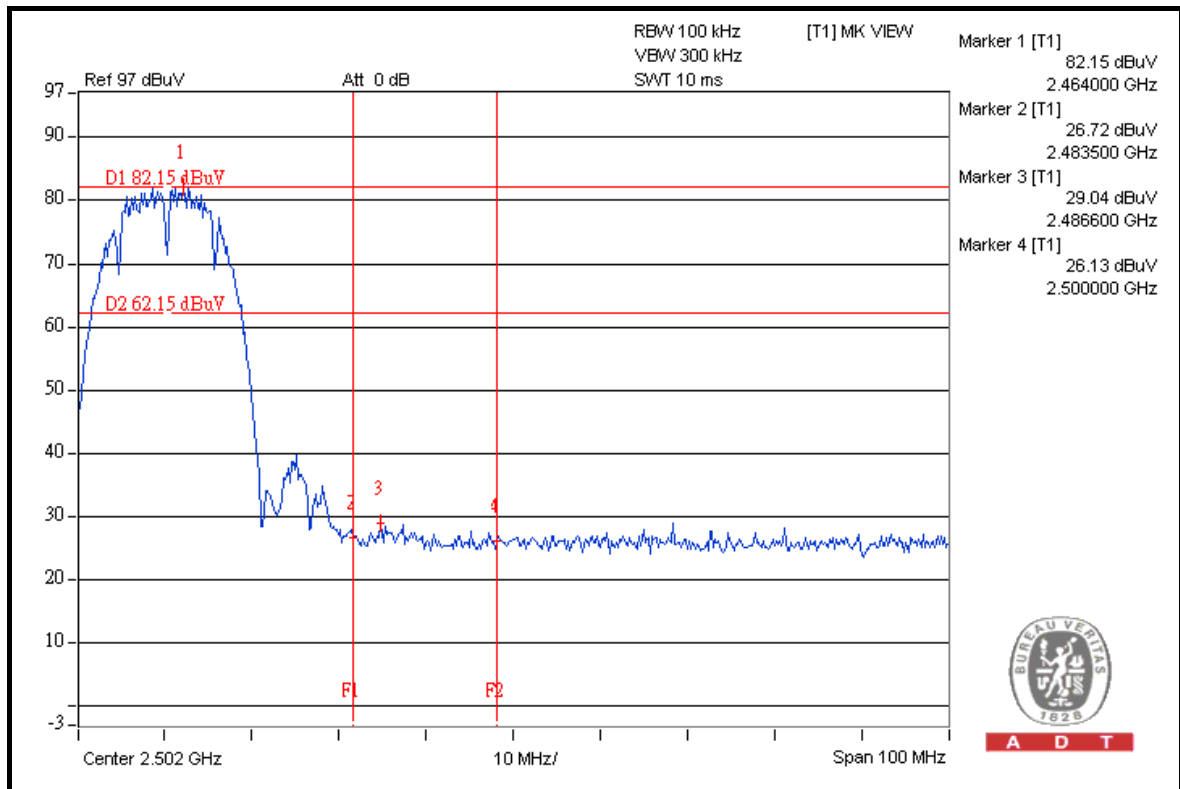




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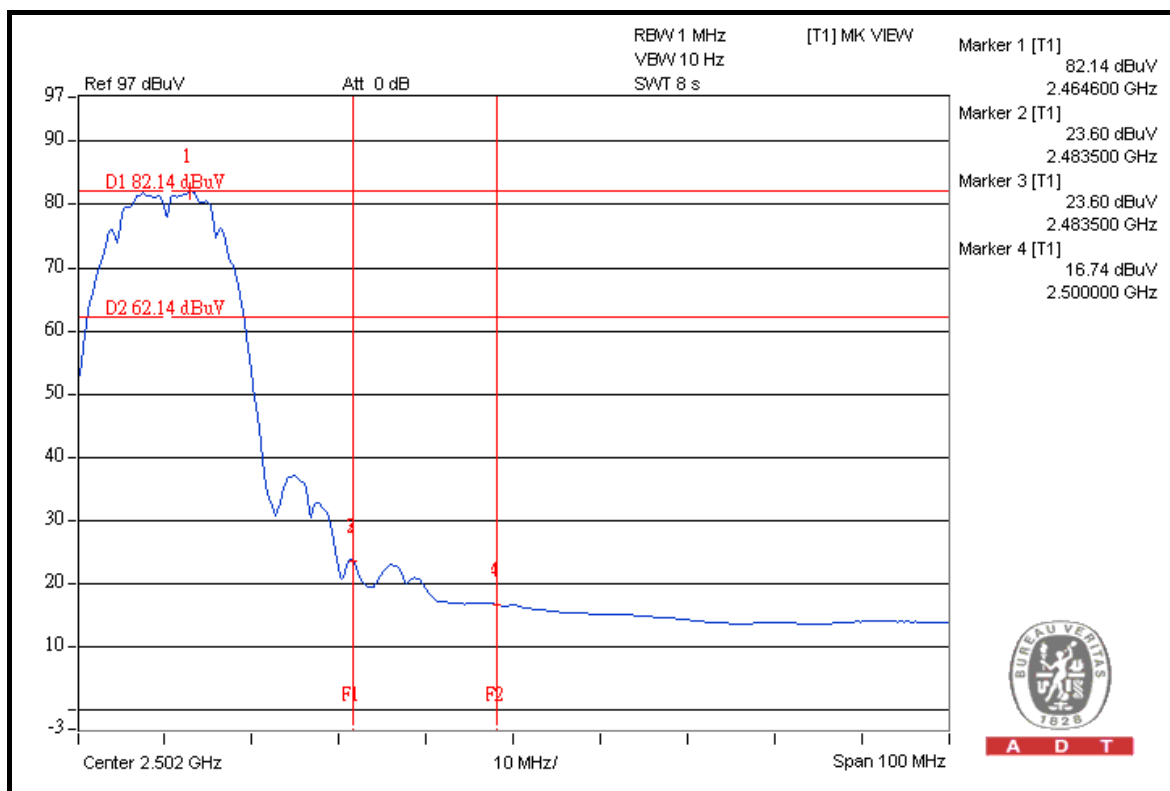
A D T



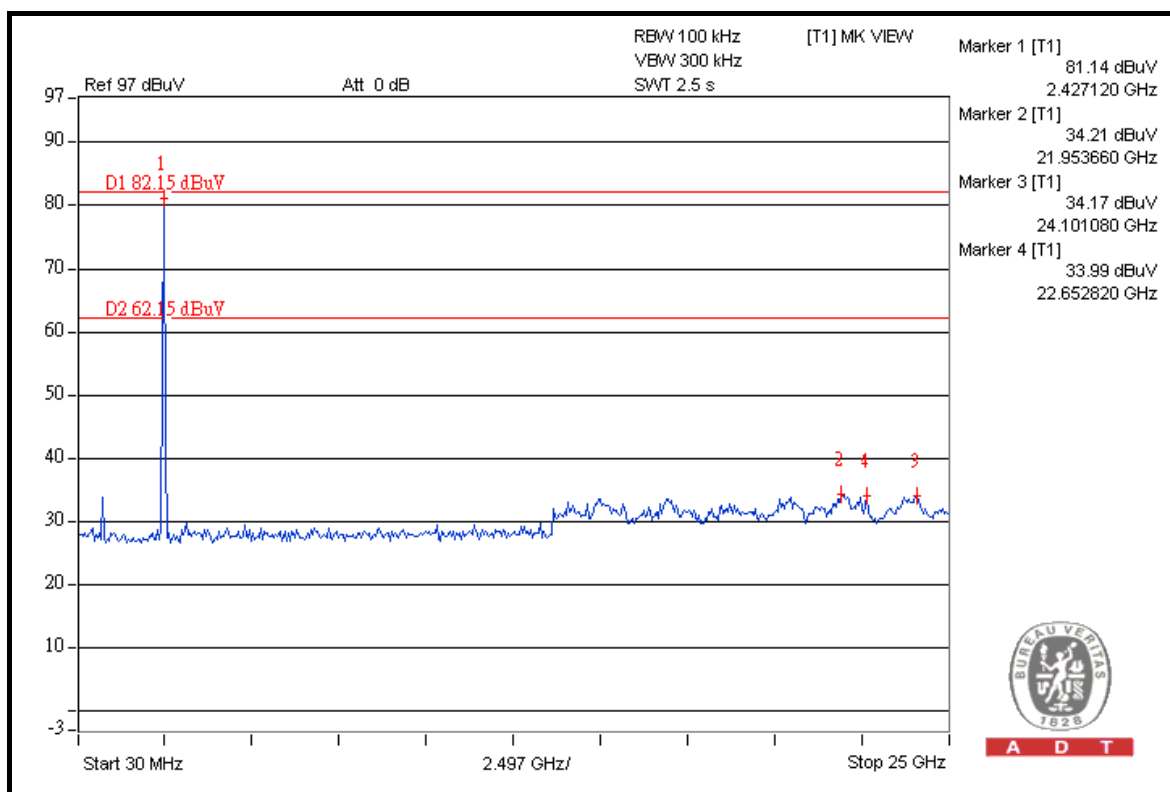
A D T



A D T



A D T



A D T

802.11g

RESTRICT BAND (2310 ~ 2390 MHz)

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2412.00 (PK)	110.6	42.73	67.87	74.00
2412.00 (AV)	100.2	50.02	50.18	54.00

RESTRICT BAND (2483.5 ~ 2500 MHz)

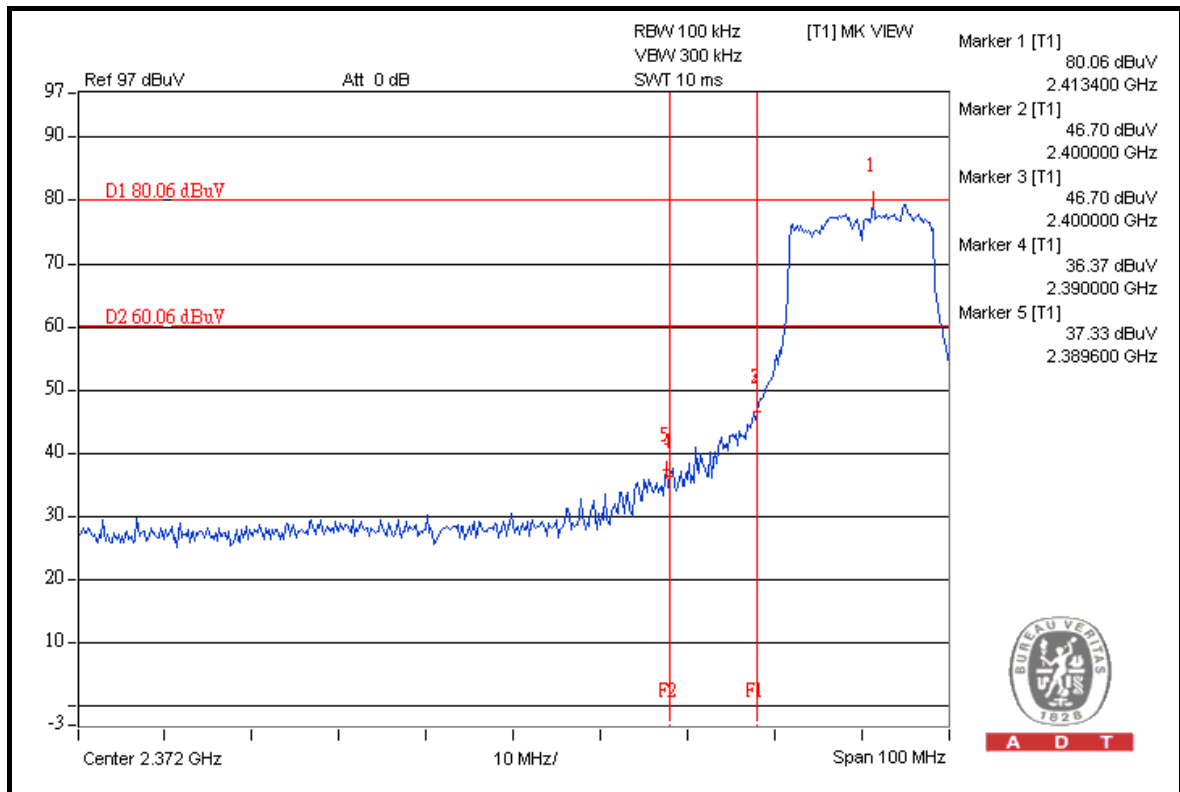
FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2462.00 (PK)	112.8	47.18	65.62	74.00
2462.00 (AV)	102.7	50.69	52.01	54.00

NOTE:

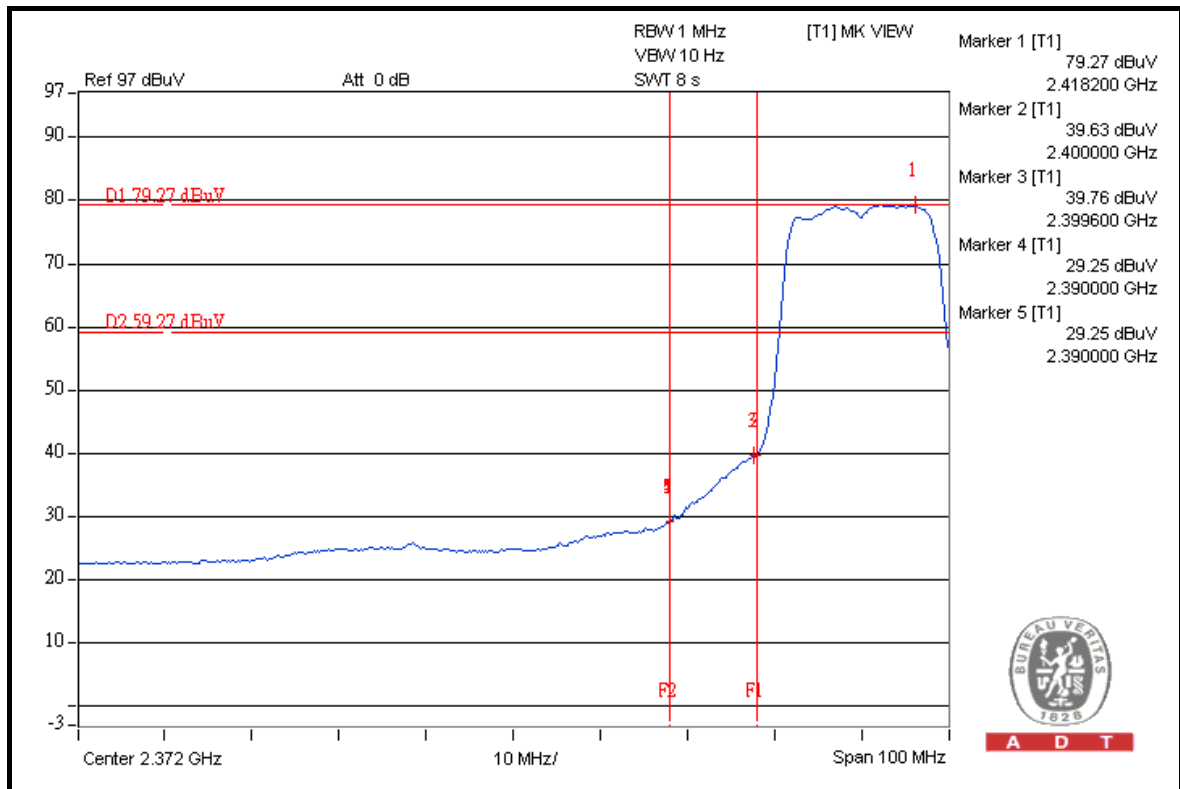
1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission. Please check following 3 pages.
2. Maximum field strength in restrict band = Fundamental emission – Delta.



A D T



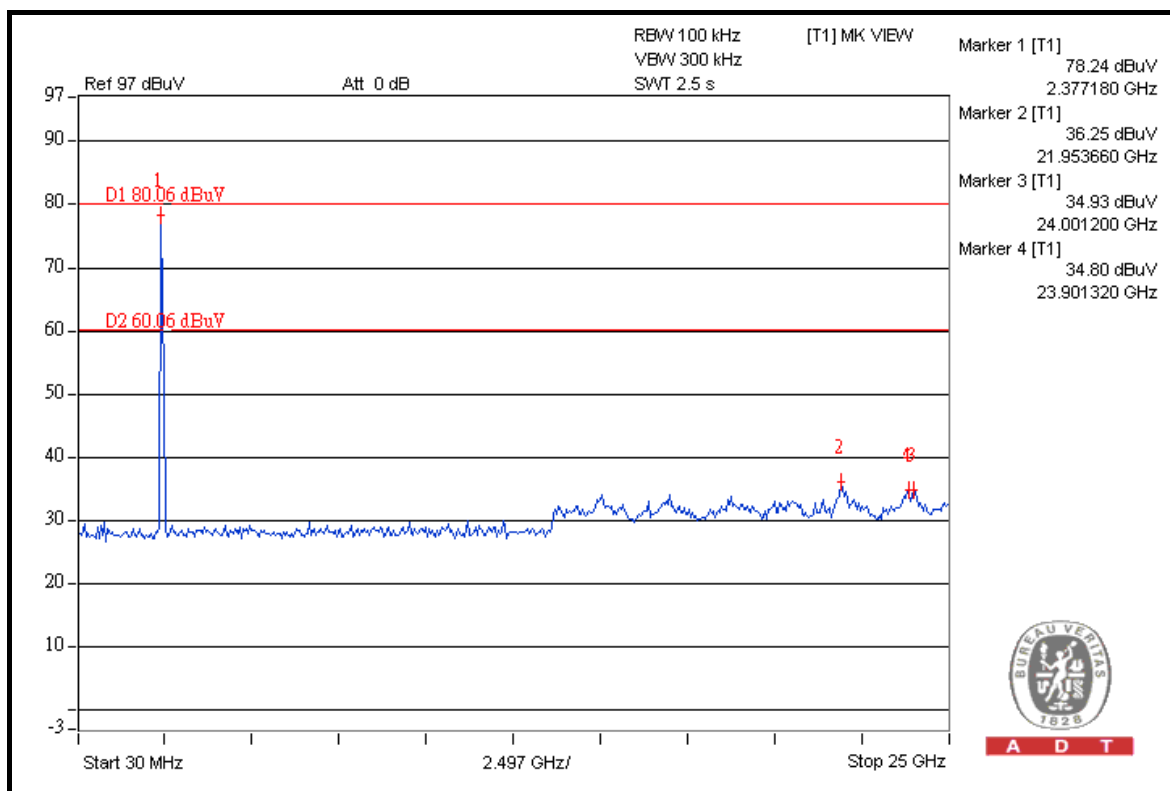
A D T



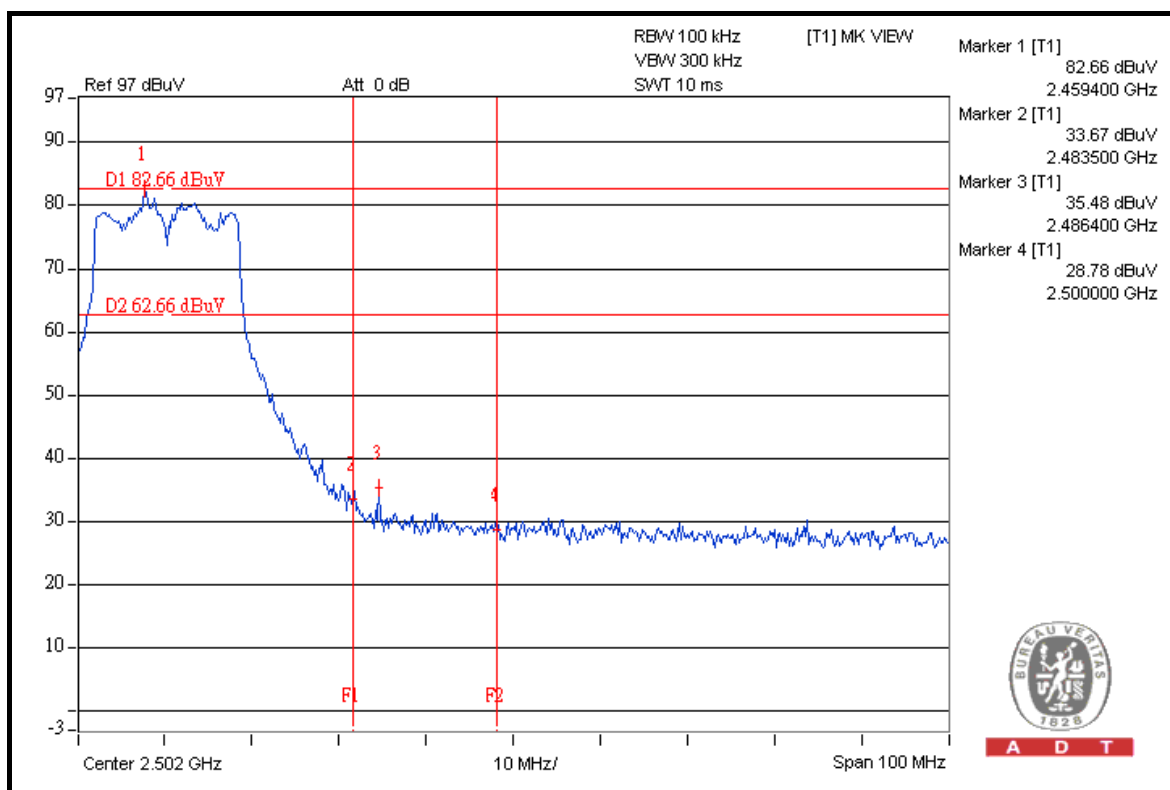
A D T



A D T



A D T



A D T



802.11n (20MHz)

RESTRICT BAND (2310 ~ 2390 MHz)

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2412.00 (PK)	111.0	49.67	61.33	74.00
2412.00 (AV)	100.9	51.25	49.65	54.00

RESTRICT BAND (2483.5 ~ 2500 MHz)

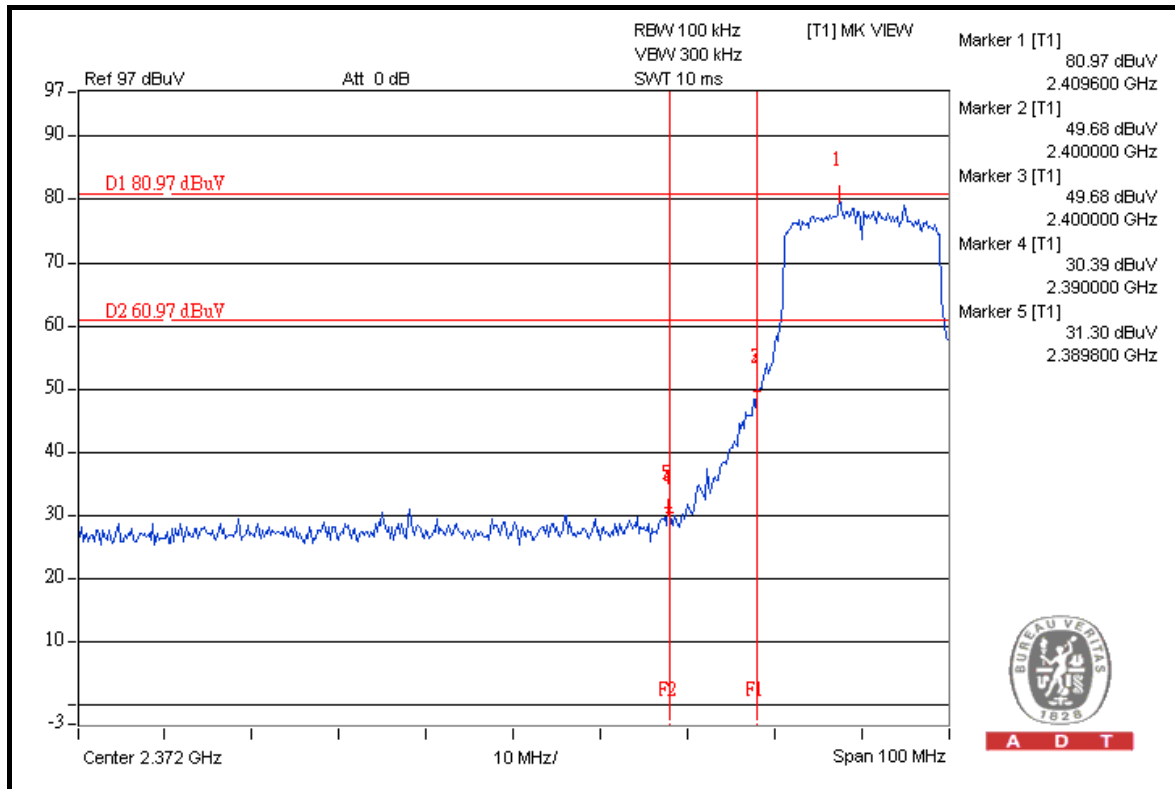
FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2462.00 (PK)	112.5	49.14	63.36	74.00
2462.00 (AV)	102.5	50.22	52.28	54.00

NOTE:

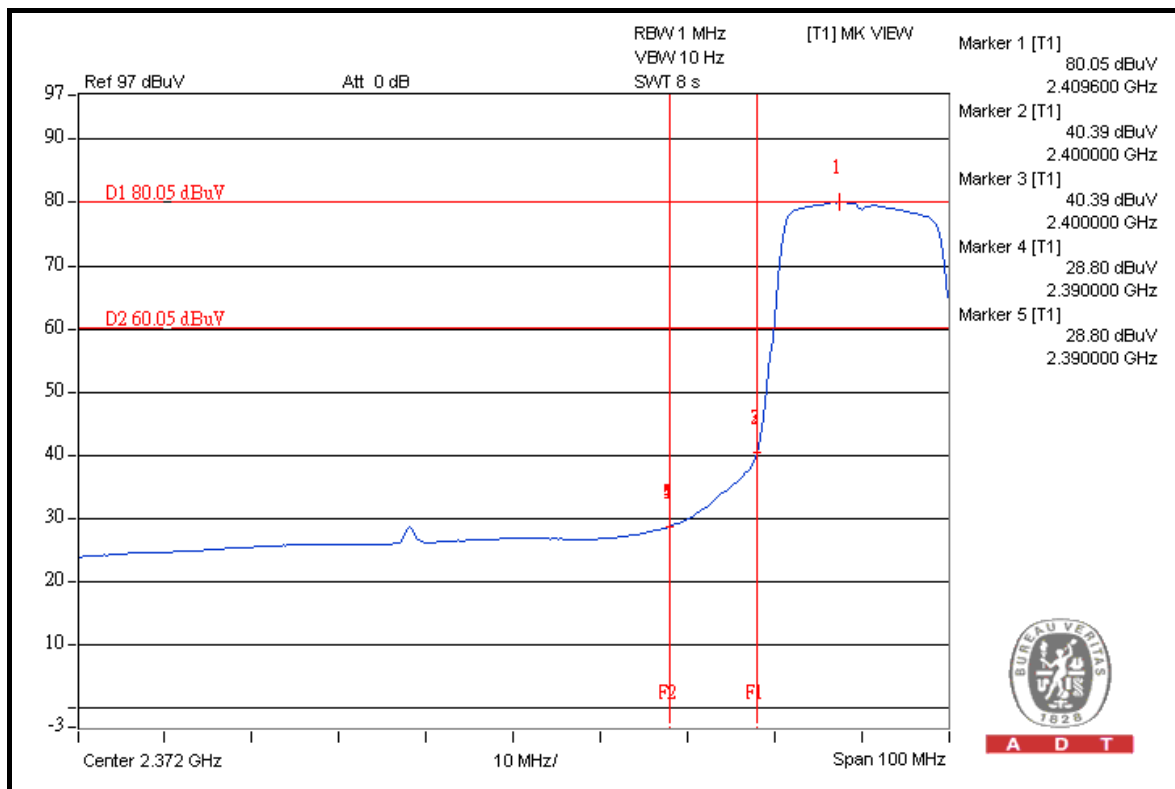
1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission. Please check following 3 pages.
2. Maximum field strength in restrict band = Fundamental emission – Delta.



A D T



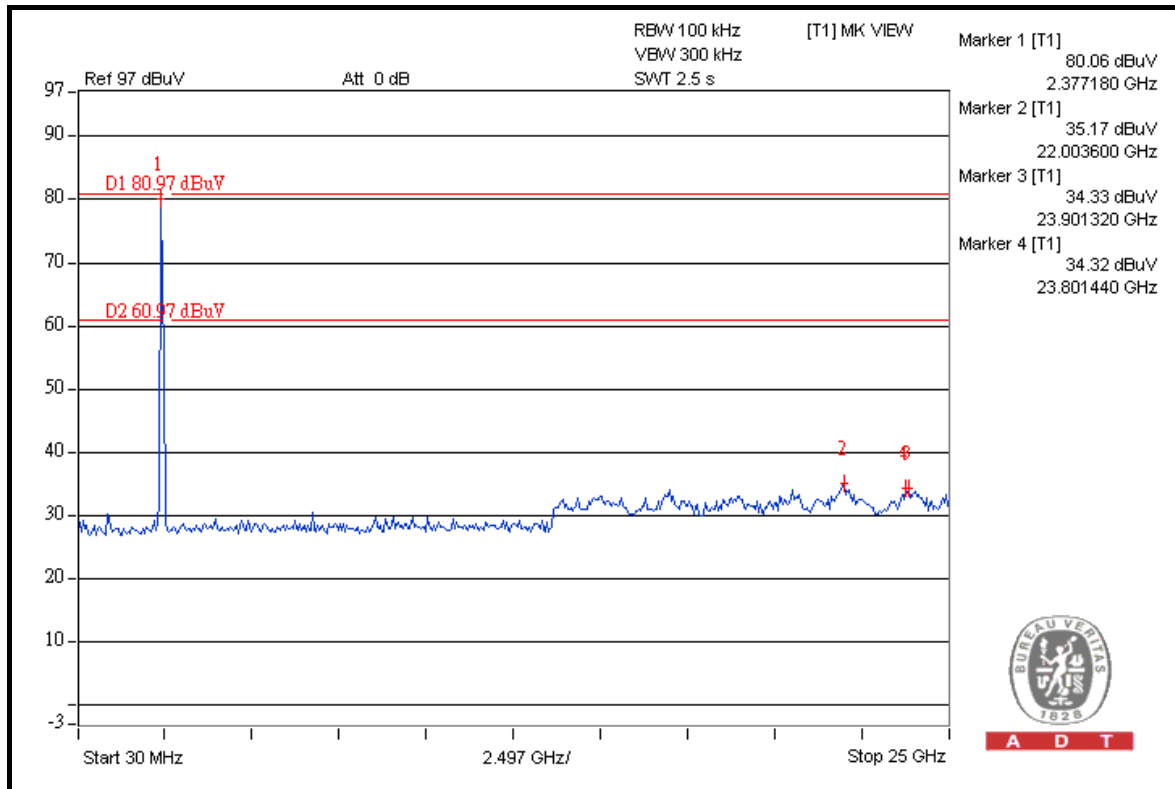
A D T



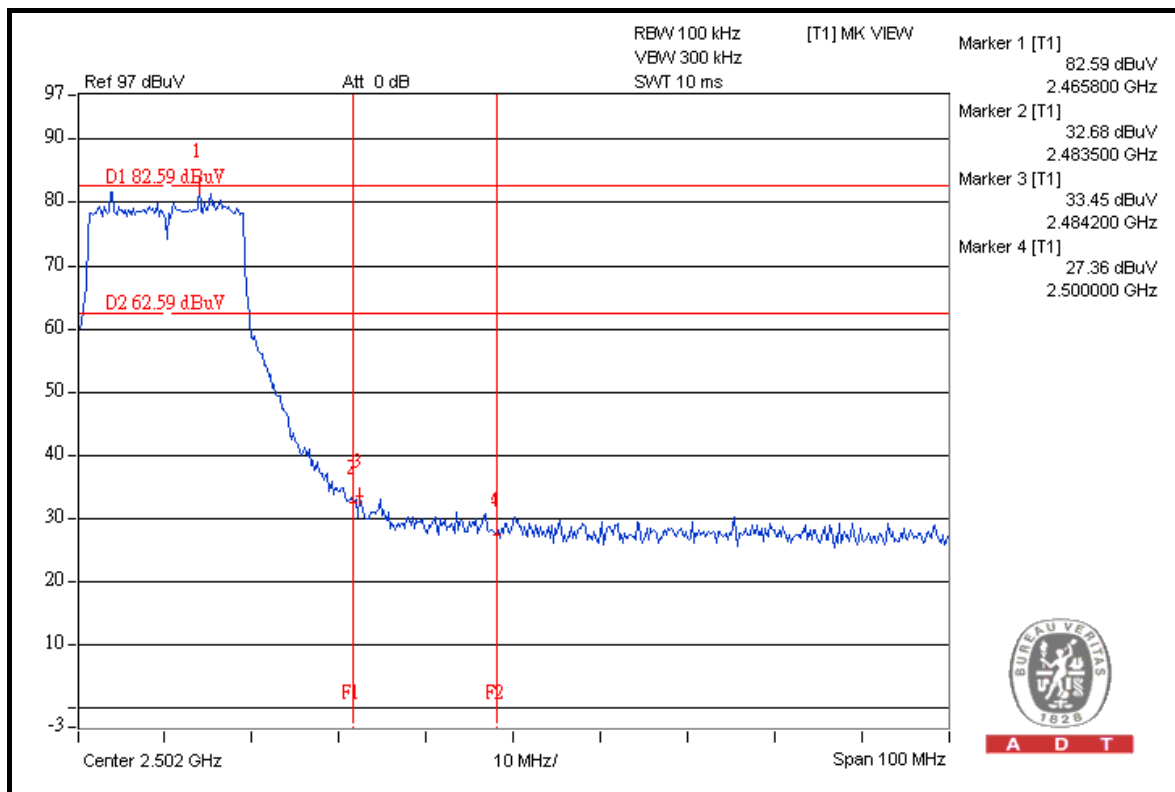
A D T



A D T



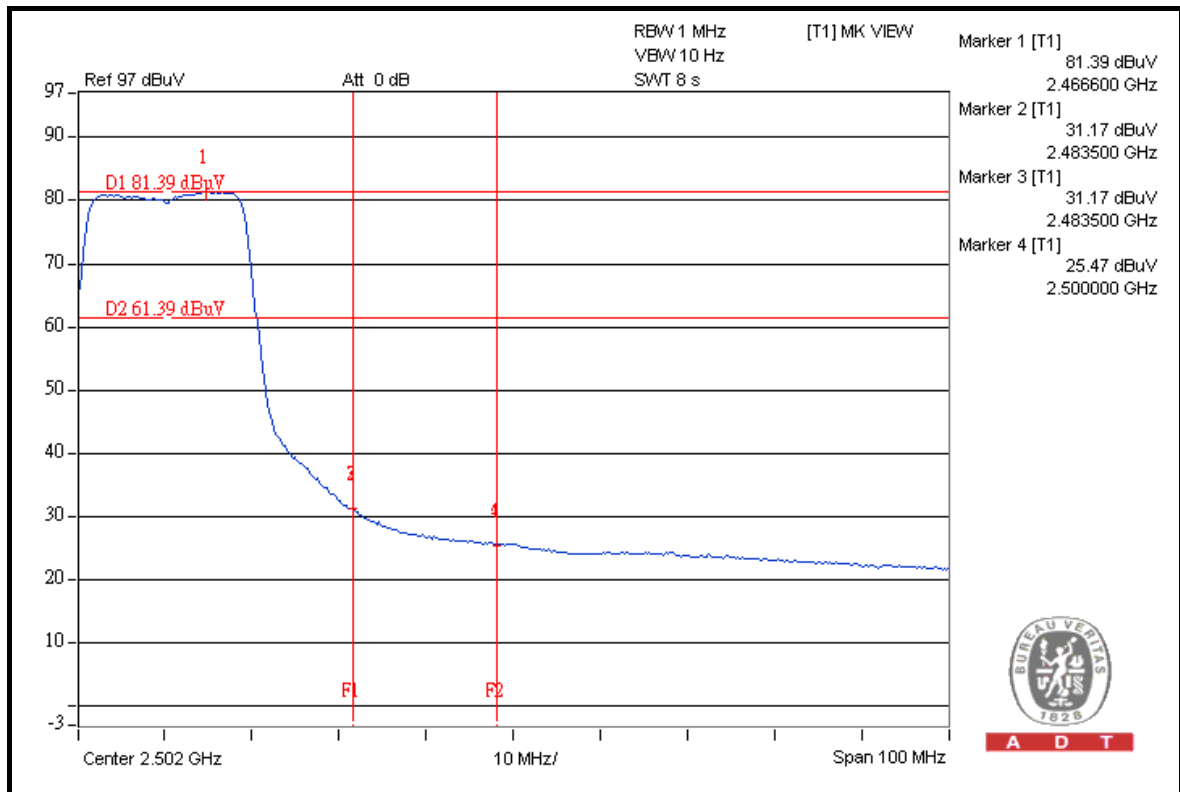
A D T



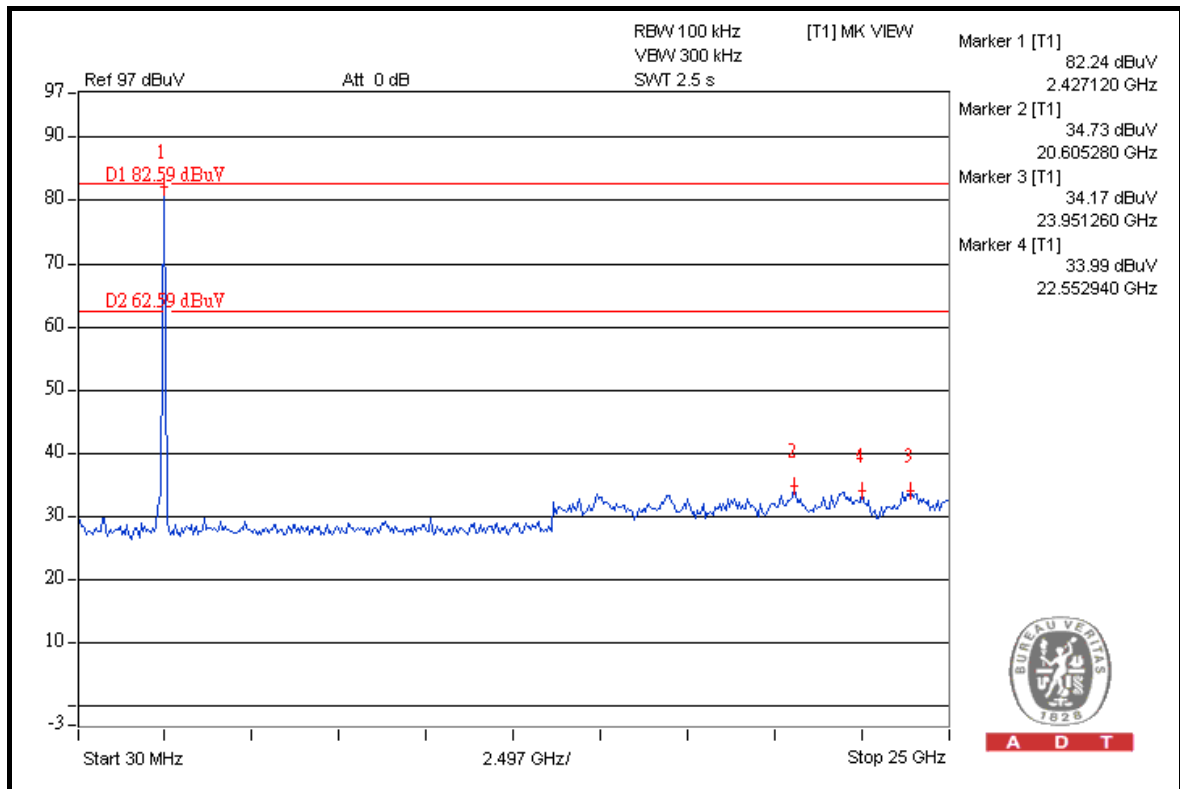
A D T



A D T



A D T



A D T

**A D T****802.11n (40MHz)****RESTRICT BAND (2310 ~ 2390 MHz)**

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2422.00 (PK)	103.8	41.51	62.29	74.00
2422.00 (AV)	94.9	43.57	51.33	54.00

RESTRICT BAND (2483.5 ~ 2500 MHz)

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2452.00 (PK)	106.1	43.12	62.98	74.00
2452.00 (AV)	97.0	45.63	51.37	54.00

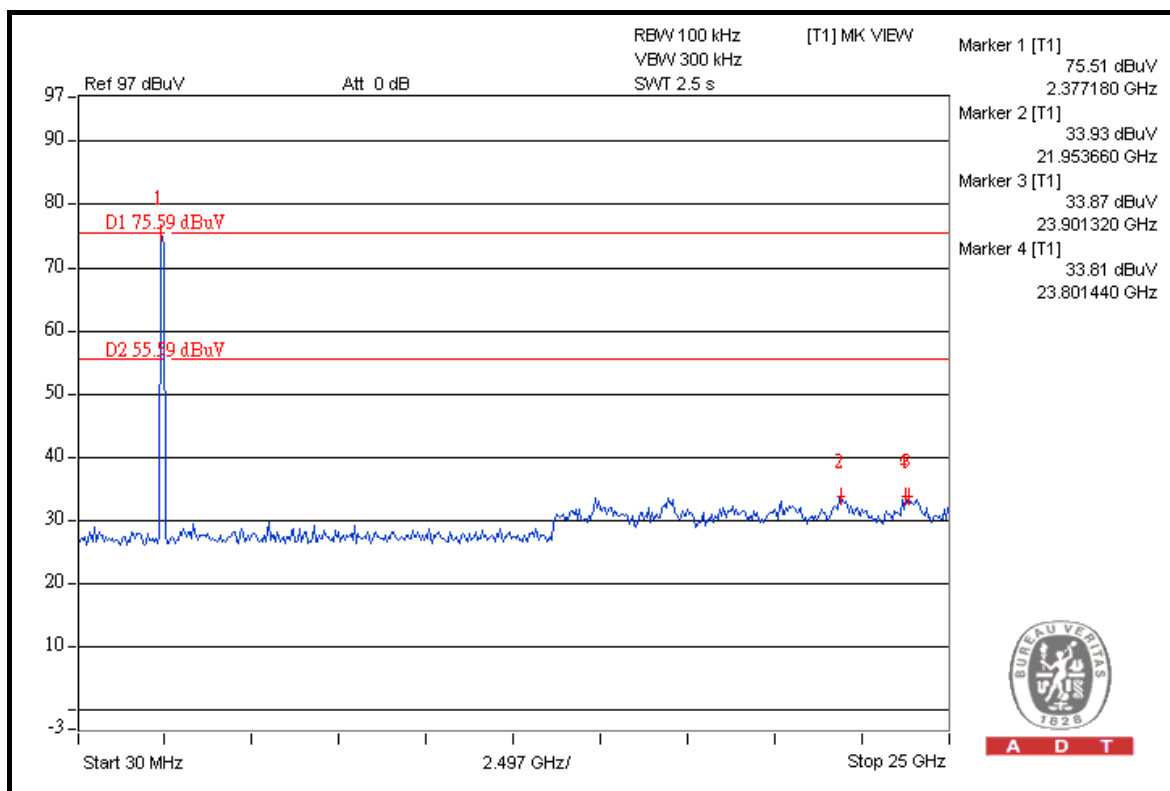
NOTE:

1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission. Please check following 3 pages.
2. Maximum field strength in restrict band = Fundamental emission – Delta.

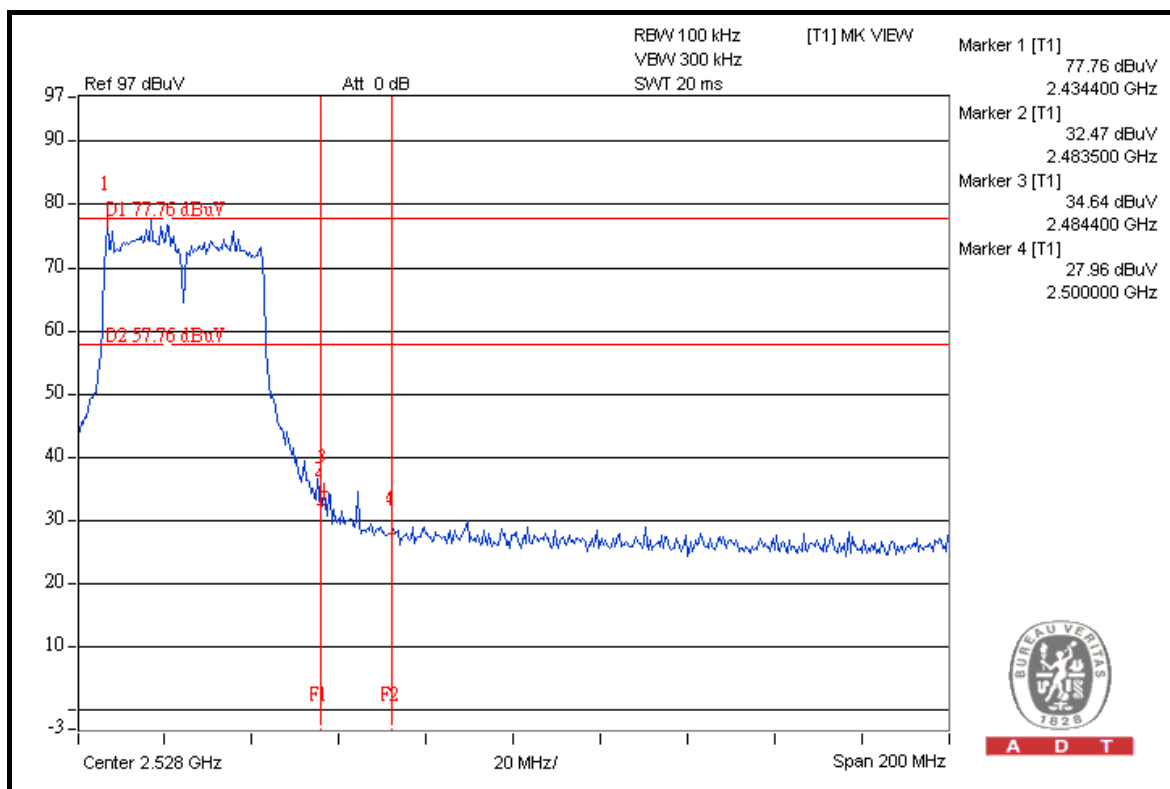




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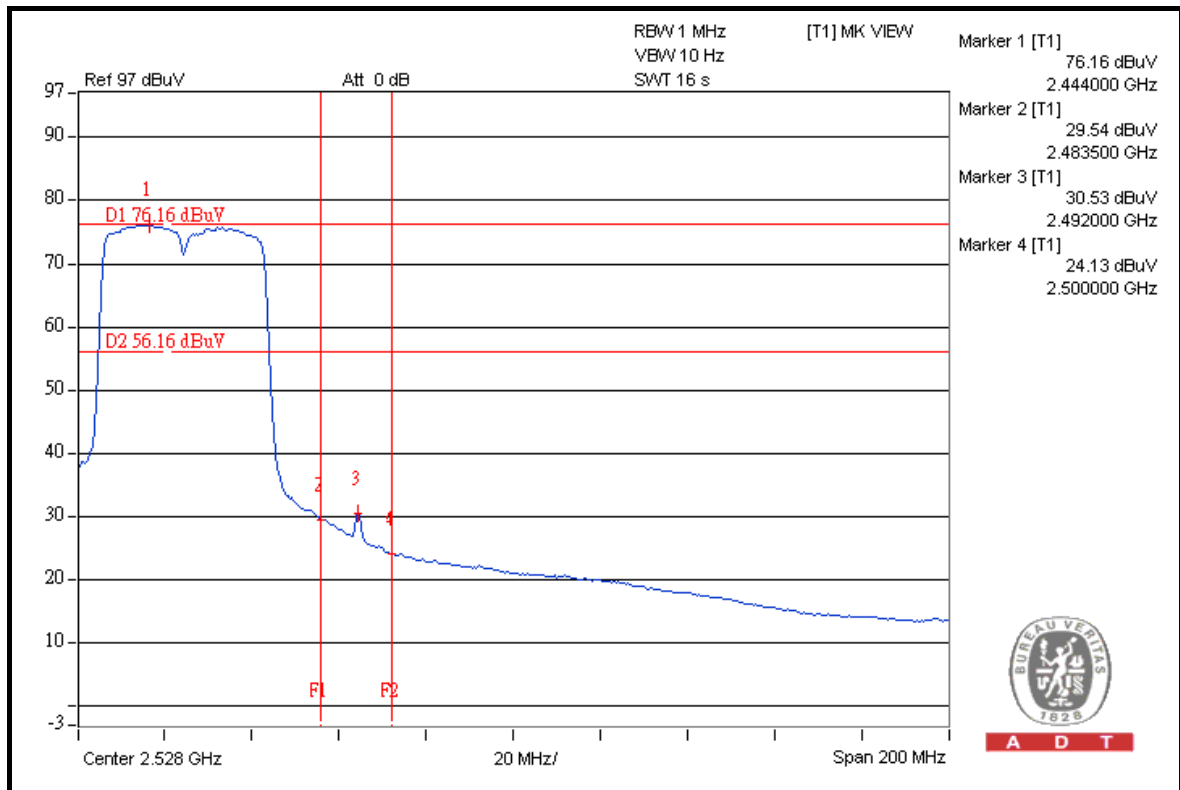
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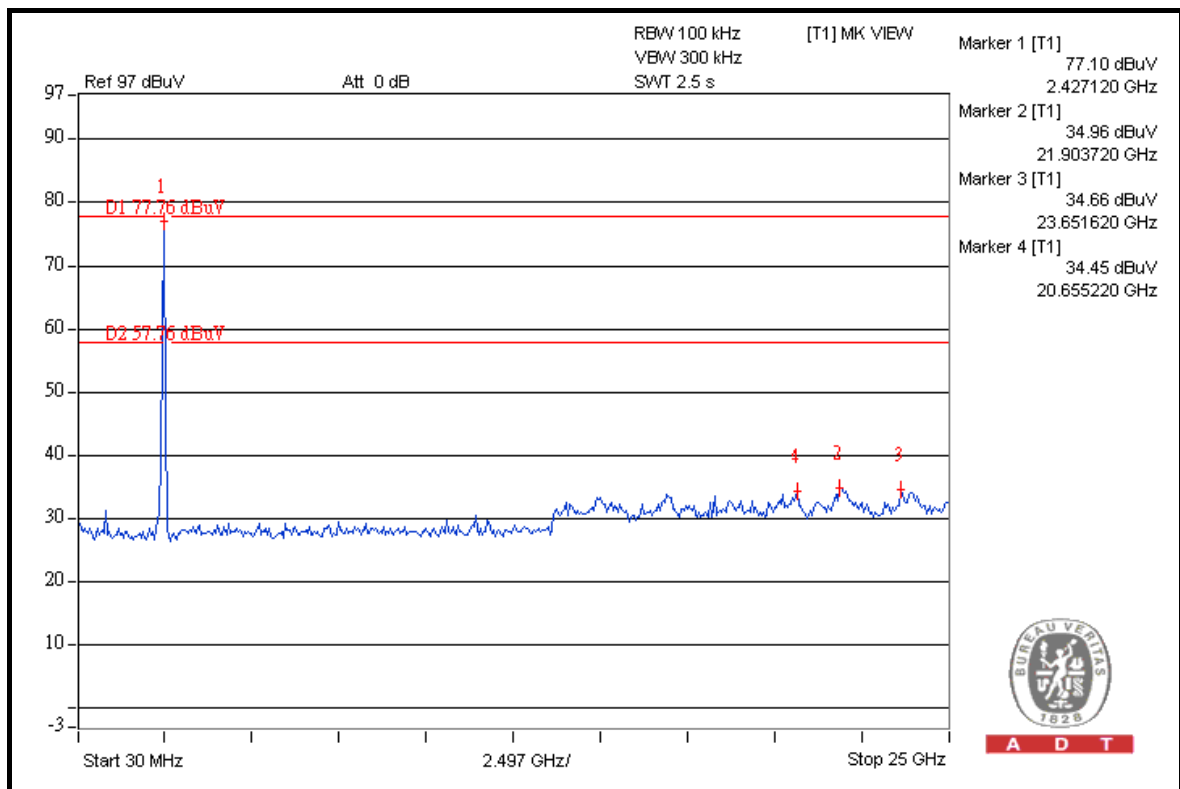
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5. TEST TYPES AND RESULTS (FOR 5.0GHz BAND)

5.1 RADIATED EMISSION MEASUREMENT

5.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

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. As shown in 15.35(b), 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.



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5.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100033	Jul. 29, 2010	Jul. 28, 2011
Spectrum Analyzer Agilent	E4446A	MY48250266	Aug. 11, 2010	Aug. 10, 2011
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Apr. 27, 2010	Apr. 26, 2011
HORN Antenna SCHWARZBECK	9120D	9120D-405	Feb. 03, 2010	Feb. 02, 2011
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 27, 2010	Dec. 26, 2011
Preamplifier Agilent	8447D	2944A10633	Nov. 02, 2010	Nov. 01, 2011
Preamplifier Agilent	8449B	3008A01964	Nov. 02, 2010	Nov. 01, 2011
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	238141/4	May 14, 2010	May 13, 2011
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	12738/6	May 14, 2010	May 13, 2011
Software ADT.	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table ADT.	TT100.	TT93021703	NA	NA
Turn Table Controller ADT.	SC100.	SC93021703	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	07026401	Aug. 25, 2010	Aug. 24, 2011

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Chamber 3.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 988962.
 5. The IC Site Registration No. is IC7450F-4.

5.1.3 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. The antenna is a broadband antenna, and its height 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.

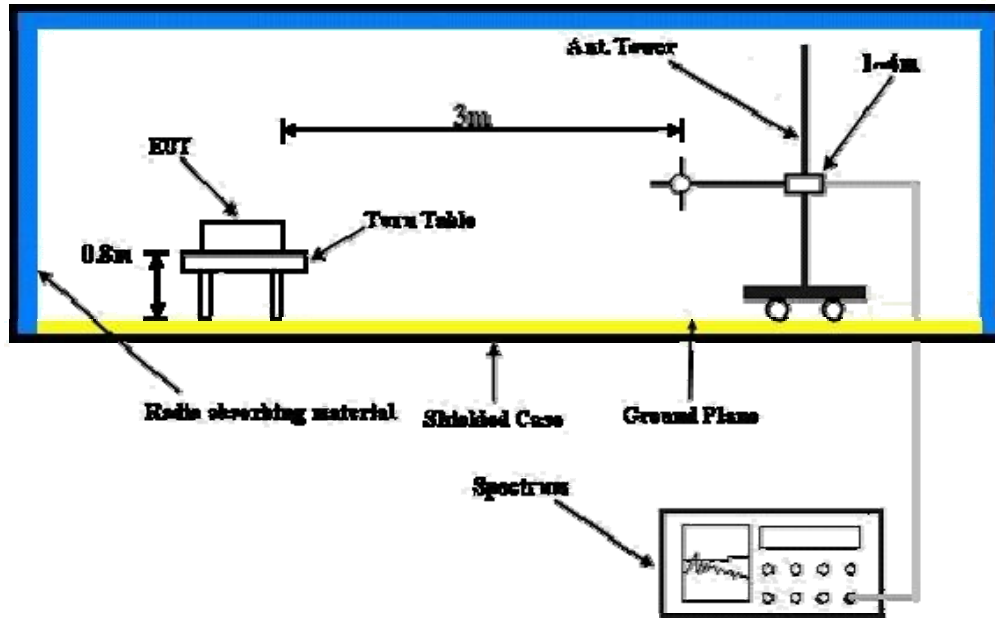
NOTE:

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 100kHz and video bandwidth is 300kHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

5.1.4 DEVIATION FROM TEST STANDARD

No deviation

5.1.5 TEST SETUP



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

5.1.6 EUT OPERATING CONDITIONS

Same as 4.1.6

5.1.7 TEST RESULTS

802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 60%RH 1020 hPa	TESTED BY	Sun Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	72.5 PK	82.7	-10.2	1.91 H	138	34.50	38.00
2	#5725.00	52.7 AV	72.0	-19.3	1.91 H	138	14.70	38.00
3	*5745.00	102.7 PK			1.68 H	143	64.70	38.00
4	*5745.00	92.0 AV			1.68 H	143	54.00	38.00
5	7660.00	53.5 PK	74.0	-20.5	1.02 H	132	10.20	43.30
6	7660.00	43.5 AV	54.0	-10.5	1.02 H	132	0.20	43.30
7	11490.00	57.6 PK	74.0	-16.4	1.29 H	99	9.60	48.00
8	11490.00	44.7 AV	54.0	-9.3	1.29 H	99	-3.30	48.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	85.5 PK	92.1	-6.6	1.18 V	201	47.50	38.00
2	#5725.00	63.3 AV	82.0	-18.7	1.18 V	201	25.30	38.00
3	*5745.00	112.1 PK			1.16 V	206	74.10	38.00
4	*5745.00	102.0 AV			1.16 V	206	64.00	38.00
5	7660.00	56.1 PK	74.0	-17.9	1.87 V	329	12.80	43.30
6	7660.00	48.8 AV	54.0	-5.2	1.87 V	329	5.50	43.30
7	11490.00	67.8 PK	74.0	-6.2	1.59 V	345	19.80	48.00
8	11490.00	52.8 AV	54.0	-1.2	1.59 V	345	4.80	48.00

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 60%RH 1020 hPa	TESTED BY	Sun Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	103.0 PK			1.00 H	304	65.00	38.00
2	*5785.00	92.4 AV			1.00 H	304	54.40	38.00
3	7713.00	53.4 PK	74.0	-20.6	1.12 H	352	10.00	43.40
4	7713.00	43.5 AV	54.0	-10.5	1.12 H	352	0.10	43.40
5	11570.00	58.4 PK	74.0	-15.6	1.26 H	102	10.50	47.90
6	11570.00	46.1 AV	54.0	-7.9	1.26 H	102	-1.80	47.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	112.5 PK			1.33 V	232	74.50	38.00
2	*5785.00	102.3 AV			1.33 V	232	64.30	38.00
3	7713.00	56.2 PK	74.0	-17.8	1.84 V	333	12.80	43.40
4	7713.00	49.3 AV	54.0	-4.7	1.84 V	333	5.90	43.40
5	11570.00	67.3 PK	74.0	-6.7	1.64 V	337	19.40	47.90
6	11570.00	52.8 AV	54.0	-1.2	1.64 V	337	4.90	47.90

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 60%RH 1020 hPa	TESTED BY	Sun Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	103.3 PK			1.65 H	140	65.20	38.10
2	*5825.00	92.7 AV			1.65 H	140	54.60	38.10
3	#5850.00	52.4 PK	83.3	-30.9	1.56 H	133	14.20	38.20
4	#5850.00	47.6 AV	72.7	-25.1	1.56 H	133	9.40	38.20
5	11650.00	58.1 PK	74.0	-15.9	1.26 H	110	10.40	47.70
6	11650.00	45.9 AV	54.0	-8.1	1.26 H	110	-1.80	47.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	112.7 PK			1.32 V	231	74.60	38.10
2	*5825.00	102.5 AV			1.32 V	231	64.40	38.10
3	#5850.00	67.8 PK	92.7	-24.9	1.32 V	231	29.60	38.20
4	#5850.00	56.4 AV	82.5	-26.1	1.32 V	231	18.20	38.20
5	11650.00	67.1 PK	74.0	-6.9	1.58 V	338	19.40	47.70
6	11650.00	52.5 AV	54.0	-1.5	1.58 V	338	4.80	47.70

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



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802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 60%RH 1020 hPa	TESTED BY	Sun Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	76.2 PK	85.0	-8.8	1.57 H	90	38.20	38.00
2	#5725.00	60.6 AV	74.9	-14.3	1.57 H	90	22.60	38.00
3	*5745.00	105.0 PK			1.47 H	99	67.00	38.00
4	*5745.00	94.9 AV			1.47 H	99	56.90	38.00
5	7660.00	53.8 PK	74.0	-20.2	1.08 H	152	10.50	43.30
6	7660.00	43.9 AV	54.0	-10.1	1.08 H	152	0.60	43.30
7	11490.00	63.2 PK	74.0	-10.8	1.14 H	264	15.20	48.00
8	11490.00	48.0 AV	54.0	-6.0	1.14 H	264	0.00	48.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	92.2 PK	95.6	-3.4	1.23 V	134	54.20	38.00
2	#5725.00	74.5 AV	84.3	-9.8	1.23 V	134	36.50	38.00
3	*5745.00	115.6 PK			1.13 V	133	77.60	38.00
4	*5745.00	104.3 AV			1.13 V	133	66.30	38.00
5	7660.00	56.2 PK	74.0	-17.8	1.75 V	332	12.90	43.30
6	7660.00	48.4 AV	54.0	-5.6	1.75 V	332	5.10	43.30
7	11490.00	69.9 PK	74.0	-4.1	1.61 V	338	21.90	48.00
8	11490.00	52.3 AV	54.0	-1.7	1.61 V	338	4.30	48.00

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 60%RH 1020 hPa	TESTED BY	Sun Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	105.3 PK			1.45 H	101	67.30	38.00
2	*5785.00	95.3 AV			1.45 H	101	57.30	38.00
3	7713.00	53.9 PK	74.0	-20.1	1.07 H	128	10.50	43.40
4	7713.00	43.5 AV	54.0	-10.5	1.07 H	128	0.10	43.40
5	11570.00	63.3 PK	74.0	-10.7	1.09 H	275	15.40	47.90
6	11570.00	48.1 AV	54.0	-5.9	1.09 H	275	0.20	47.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	115.9 PK			1.10 V	141	77.90	38.00
2	*5785.00	104.7 AV			1.10 V	141	66.70	38.00
3	7713.00	56.4 PK	74.0	-17.6	1.69 V	332	13.00	43.40
4	7713.00	49.2 AV	54.0	-4.8	1.69 V	332	5.80	43.40
5	11570.00	70.0 PK	74.0	-4.0	1.59 V	330	22.10	47.90
6	11570.00	52.5 AV	54.0	-1.5	1.59 V	330	4.60	47.90

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 60%RH 1020 hPa	TESTED BY	Sun Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	104.9 PK			1.45 H	100	66.80	38.10
2	*5825.00	95.0 AV			1.45 H	100	56.90	38.10
3	#5850.00	75.8 PK	84.9	-9.1	1.40 H	111	37.60	38.20
4	#5850.00	63.9 AV	75.0	-11.1	1.40 H	111	25.70	38.20
5	11650.00	63.8 PK	74.0	-10.2	1.10 H	280	16.10	47.70
6	11650.00	48.4 AV	54.0	-5.6	1.10 H	280	0.70	47.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	115.3 PK			1.11 V	133	77.20	38.10
2	*5825.00	104.2 AV			1.11 V	133	66.10	38.10
3	#5850.00	75.8 PK	95.3	-19.5	1.00 V	139	37.60	38.20
4	#5850.00	60.1 AV	84.2	-24.1	1.00 V	139	21.90	38.20
5	11650.00	67.6 PK	74.0	-6.4	1.38 V	352	19.90	47.70
6	11650.00	52.7 AV	54.0	-1.3	1.38 V	352	5.00	47.70

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



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802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 151	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 60%RH 1020 hPa	TESTED BY	Sun Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	75.4 PK	76.9	-1.5	1.53 H	92	37.40	38.00
2	#5725.00	65.5 AV	66.8	-1.3	1.53 H	92	27.50	38.00
3	*5755.00	96.9 PK			1.46 H	98	58.90	38.00
4	*5755.00	86.8 AV			1.46 H	98	48.80	38.00
5	7673.00	50.4 PK	74.0	-23.6	1.02 H	163	7.00	43.40
6	7673.00	41.4 AV	54.0	-12.6	1.02 H	163	-2.00	43.40
7	11510.00	63.7 PK	74.0	-10.3	1.11 H	272	15.70	48.00
8	11510.00	48.5 AV	54.0	-5.5	1.11 H	272	0.50	48.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	85.5 PK	87.0	-1.5	1.10 V	137	47.50	38.00
2	#5725.00	76.2 AV	77.8	-1.6	1.10 V	137	38.20	38.00
3	*5755.00	107.0 PK			1.22 V	137	69.00	38.00
4	*5755.00	97.8 AV			1.22 V	137	59.80	38.00
5	7673.00	56.1 PK	74.0	-17.9	1.88 V	325	12.70	43.40
6	7673.00	49.2 AV	54.0	-4.8	1.88 V	325	5.80	43.40
7	11510.00	66.4 PK	74.0	-7.6	1.54 V	337	18.40	48.00
8	11510.00	52.9 AV	54.0	-1.1	1.54 V	337	4.90	48.00

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 60%RH 1020 hPa	TESTED BY	Sun Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	96.7 PK			1.47 H	101	58.60	38.10
2	*5795.00	86.6 AV			1.47 H	101	48.50	38.10
3	#5850.00	61.8 PK	76.7	-14.9	1.40 H	120	23.60	38.20
4	#5850.00	50.7 AV	66.6	-15.9	1.40 H	120	12.50	38.20
5	7726.00	50.8 PK	74.0	-23.2	1.08 H	122	7.30	43.50
6	7726.00	42.0 AV	54.0	-12.0	1.08 H	122	-1.50	43.50
7	11590.00	63.2 PK	74.0	-10.8	1.09 H	289	15.30	47.90
8	11590.00	48.0 AV	54.0	-6.0	1.09 H	289	0.10	47.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	107.4 PK			1.21 V	137	69.30	38.10
2	*5795.00	97.2 AV			1.21 V	137	59.10	38.10
3	#5850.00	68.2 PK	87.4	-19.2	1.21 V	137	30.00	38.20
4	#5850.00	56.4 AV	77.2	-20.8	1.21 V	137	18.20	38.20
5	7726.00	56.3 PK	74.0	-17.7	1.85 V	317	12.80	43.50
6	7726.00	49.6 AV	54.0	-4.4	1.85 V	317	6.10	43.50
7	11590.00	65.2 PK	74.0	-8.8	1.59 V	339	17.30	47.90
8	11590.00	52.2 AV	54.0	-1.8	1.59 V	339	4.30	47.90

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



A D T

BELOW 1GHz WORST-CASE DATA : 802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	21deg. C, 60%RH 1020 hPa	TEST MODE	A
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	92.12	33.2 QP	43.5	-10.3	2.00 H	274	24.20	9.00
2	249.60	37.9 QP	46.0	-8.1	1.00 H	61	24.90	13.00
3	311.82	36.5 QP	46.0	-9.5	1.00 H	133	21.20	15.30
4	593.74	34.5 QP	46.0	-11.5	1.25 H	349	12.20	22.30
5	626.80	35.3 QP	46.0	-10.7	1.25 H	163	12.40	22.90
6	745.40	34.4 QP	46.0	-11.6	1.00 H	157	9.70	24.70
7	877.61	34.6 QP	46.0	-11.4	1.50 H	154	8.00	26.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	37.68	38.7 QP	40.0	-1.3	1.50 V	214	25.20	13.50
2	64.90	34.1 QP	40.0	-5.9	1.00 V	10	21.40	12.70
3	329.32	36.5 QP	46.0	-9.5	1.25 V	169	20.80	15.70
4	405.15	35.6 QP	46.0	-10.4	1.25 V	91	18.00	17.60
5	792.06	36.6 QP	46.0	-9.4	1.25 V	130	11.40	25.20
6	877.61	36.2 QP	46.0	-9.8	1.25 V	226	9.60	26.60

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	21deg. C, 60%RH 1020 hPa	TEST MODE	B
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	45.45	29.3 QP	40.0	-10.7	1.50 H	103	14.80	14.50
2	249.60	39.0 QP	46.0	-7.0	1.00 H	109	26.00	13.00
3	500.42	38.9 QP	46.0	-7.1	2.00 H	283	18.60	20.30
4	626.80	36.1 QP	46.0	-9.9	1.25 H	148	13.20	22.90
5	745.40	35.1 QP	46.0	-10.9	1.00 H	340	10.40	24.70
6	877.61	37.6 QP	46.0	-8.4	1.50 H	148	11.00	26.60
7	902.89	36.5 QP	46.0	-9.5	2.00 H	193	9.50	27.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	33.79	39.0 QP	40.0	-1.0	1.00 V	10	26.60	12.40
2	62.95	38.9 QP	40.0	-1.1	1.50 V	97	26.00	12.90
3	97.95	33.9 QP	43.5	-9.6	1.00 V	70	24.00	9.90
4	337.10	36.3 QP	46.0	-9.7	1.25 V	193	20.40	15.90
5	405.15	35.8 QP	46.0	-10.2	1.00 V	226	18.20	17.60
6	500.42	39.9 QP	46.0	-6.1	1.00 V	199	19.60	20.30
7	887.33	40.4 QP	46.0	-5.6	1.25 V	1	13.60	26.80

REMARKS: 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. 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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 23, 2010	Nov. 22, 2011
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 30, 2010	Dec. 29, 2011
LISN ROHDE & SCHWARZ	ESH3-Z5	100312	Jun. 28, 2010	Jun. 27, 2011
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Jul. 08, 2010	Jul. 07, 2011
V-LISN SCHWARZBECK	NNBL 8226-2	8226-142	Jul. 12, 2010	Jul. 11, 2011
Software ADT	ADT_Cond_ V7.3.7	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.

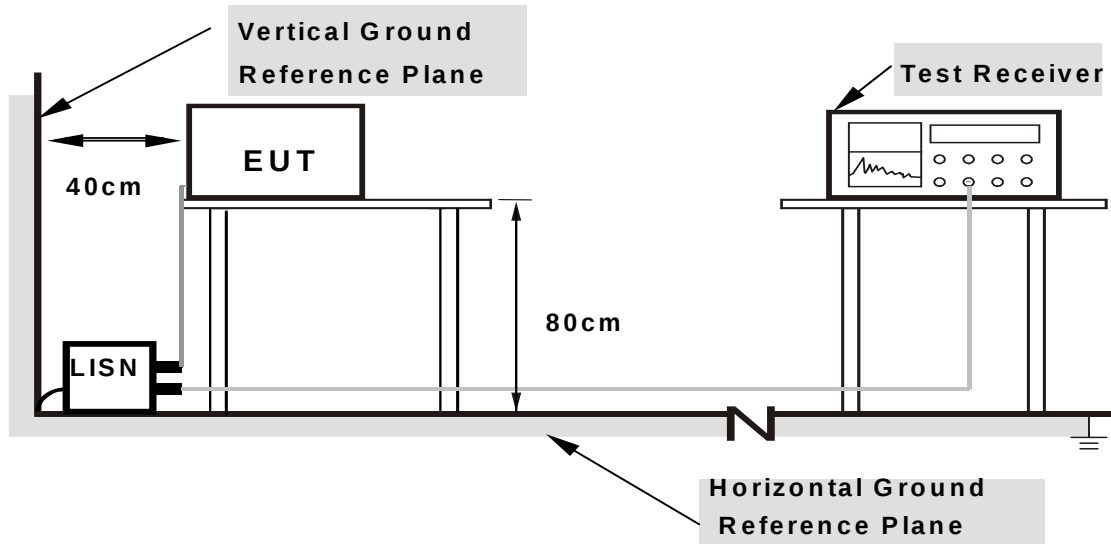
5.2.3 TEST PROCEDURES

- 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.

5.2.4 DEVIATION FROM TEST STANDARD

No deviation

5.2.5 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).

5.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

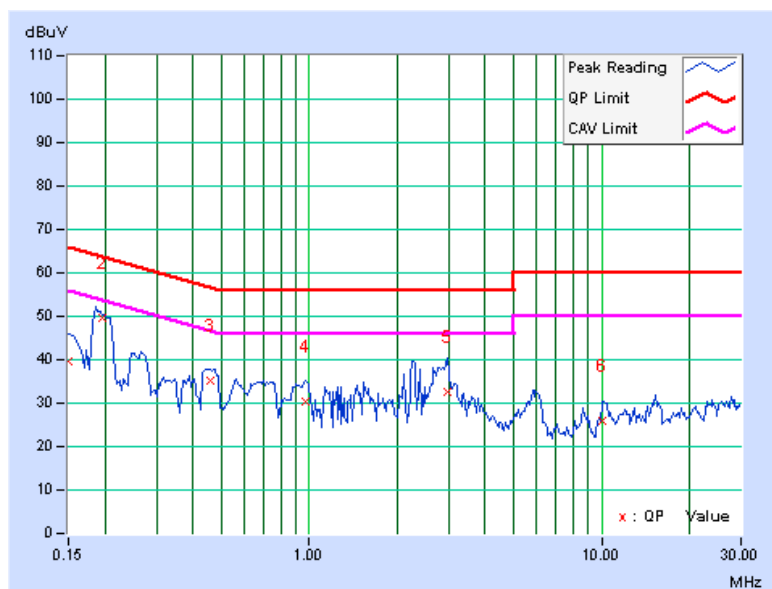
5.2.7 TEST RESULTS

CONDUCTED WORST-CASE DATA : 802.11n (20MHz)

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	A		

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	0.150	0.16	39.60	-	39.76	-	66.00	56.00	-26.24	-
2	0.197	0.16	49.32	-	49.48	-	63.74	53.74	-14.27	-
3	0.459	0.18	35.10	-	35.28	-	56.72	46.72	-21.43	-
4	0.974	0.23	29.98	-	30.21	-	56.00	46.00	-25.79	-
5	2.984	0.33	32.16	-	32.49	-	56.00	46.00	-23.51	-
6	10.031	0.35	25.50	-	25.85	-	60.00	50.00	-34.15	-

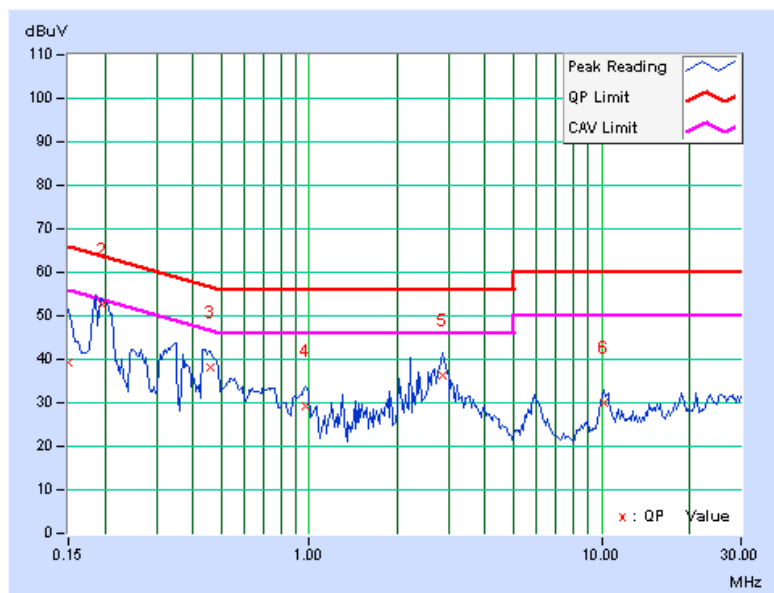
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	A		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.12	38.96	-	39.08	-	66.00	56.00	-26.92	-
2	0.197	0.13	52.36	-	52.49	-	63.74	53.74	-11.26	-
3	0.459	0.17	37.88	-	38.05	-	56.72	46.72	-18.67	-
4	0.970	0.22	29.00	-	29.22	-	56.00	46.00	-26.78	-
5	2.852	0.33	35.96	-	36.29	-	56.00	46.00	-19.71	-
6	10.230	0.45	29.44	-	29.89	-	60.00	50.00	-30.11	-

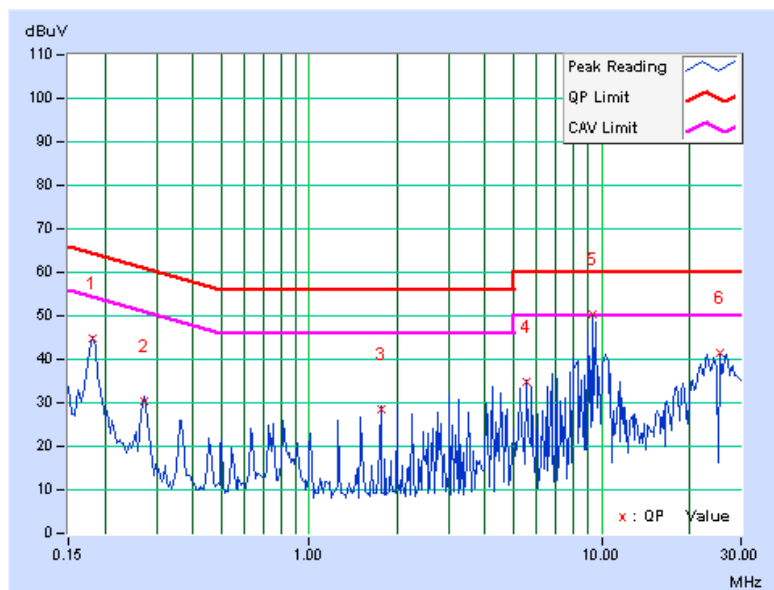
- REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	B		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.181	0.16	44.56	-	44.72	-	64.43	54.43	-19.71	-
2	0.271	0.17	30.24	-	30.41	-	61.08	51.08	-30.68	-
3	1.754	0.29	28.40	-	28.69	-	56.00	46.00	-27.31	-
4	5.516	0.35	34.54	-	34.89	-	60.00	50.00	-25.11	-
5	9.277	0.35	49.88	48.40	50.23	48.75	60.00	50.00	-9.77	-1.25
6	25.328	0.58	40.94	-	41.52	-	60.00	50.00	-18.48	-

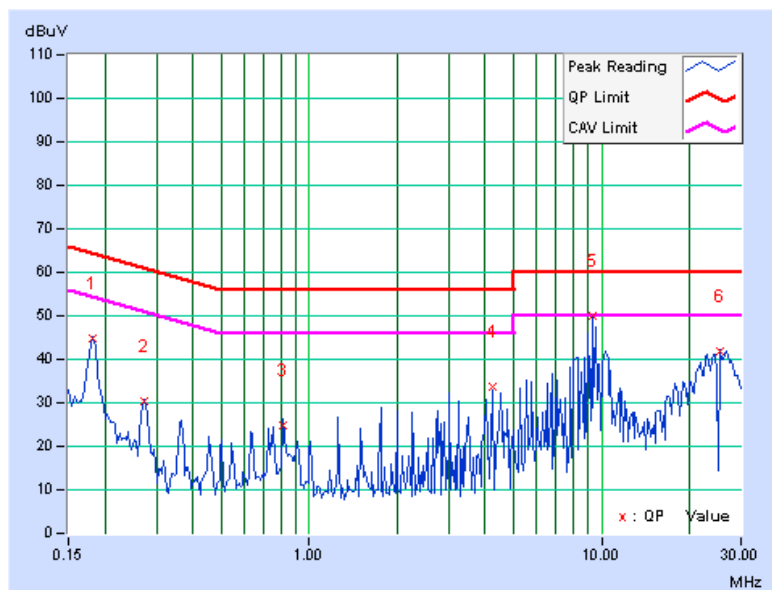
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	B		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.181	0.13	44.54	-	44.67	-	64.43	54.43	-19.76	-
2	0.271	0.14	30.16	-	30.30	-	61.08	51.08	-30.78	-
3	0.818	0.20	24.74	-	24.94	-	56.00	46.00	-31.06	-
4	4.262	0.36	33.20	-	33.56	-	56.00	46.00	-22.44	-
5	9.277	0.43	49.46	-	49.89	-	60.00	50.00	-10.11	-
6	25.578	0.85	40.94	-	41.79	-	60.00	50.00	-18.21	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. 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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
SPECTRUM ANALYZER R&S	FSP40	100039	Jul. 09, 2010	Jul. 08, 2011

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

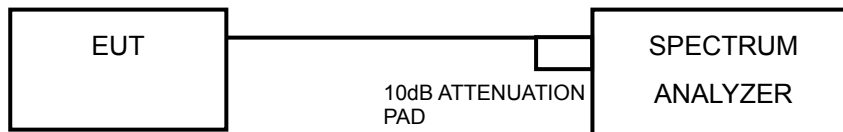
5.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 300kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP



5.3.6 EUT OPERATING CONDITIONS

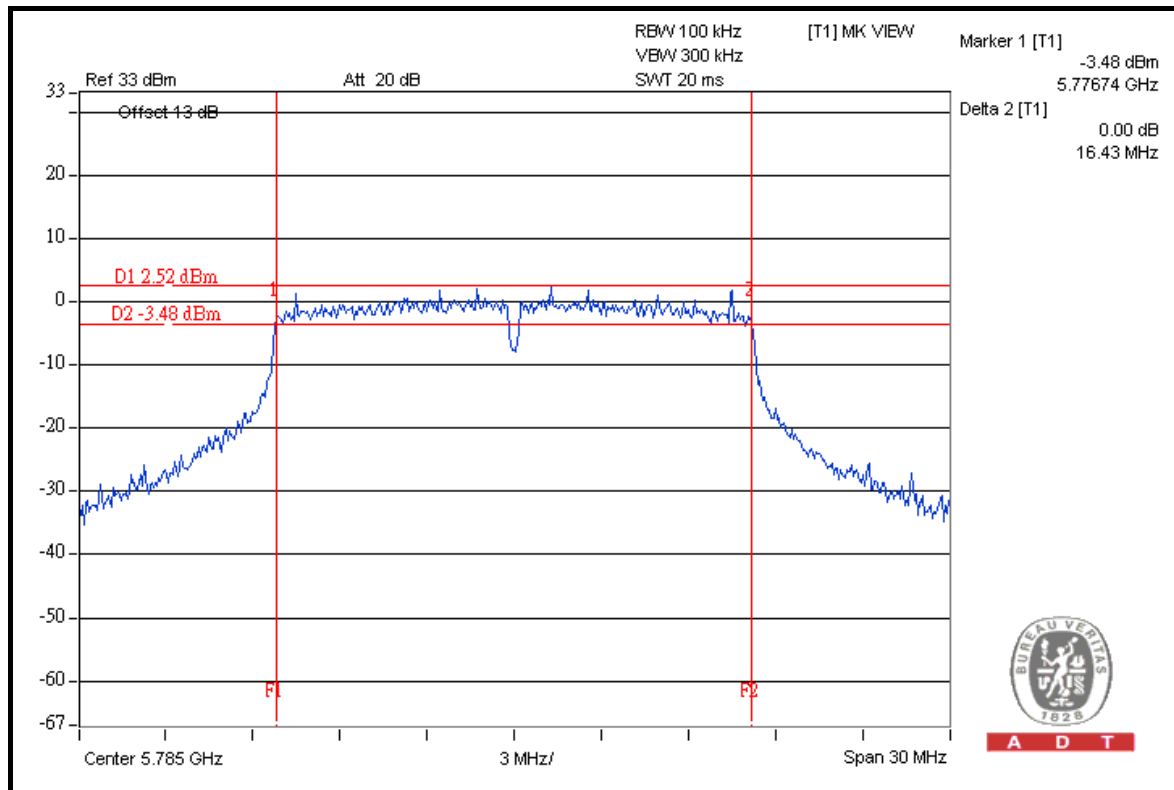
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

5.3.7 TEST RESULTS

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	16.39	16.40	0.5	PASS
157	5785	16.41	16.43	0.5	PASS
165	5825	16.41	16.42	0.5	PASS

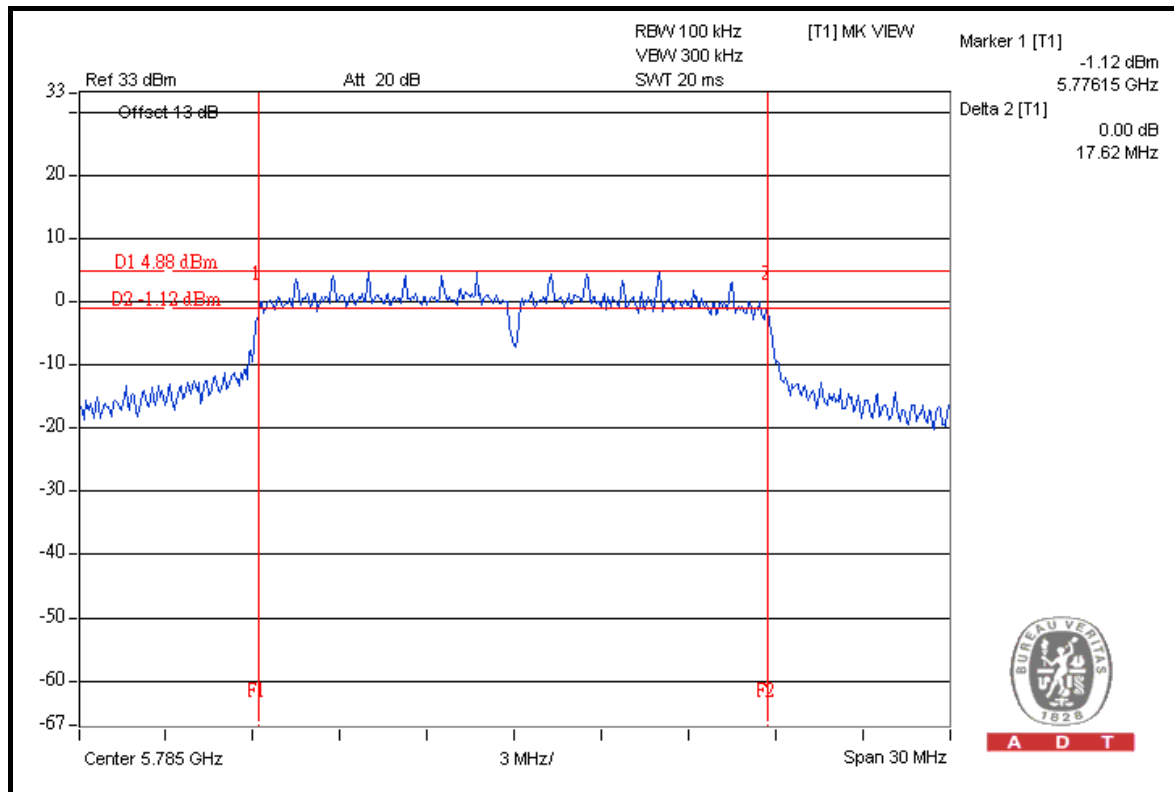
CHAIN 1: CH 157



802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	16.72	17.60	0.5	PASS
157	5785	17.62	17.37	0.5	PASS
165	5825	16.95	17.36	0.5	PASS

FOR CHAIN 0: CH 157



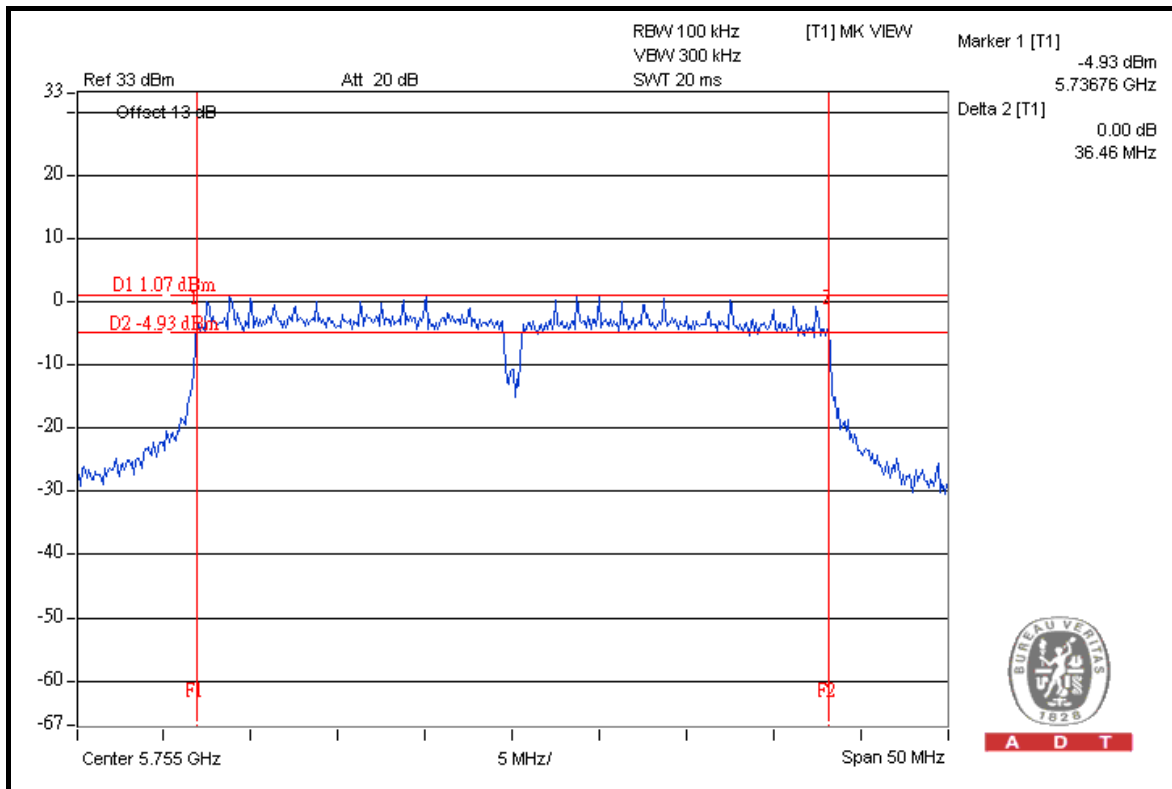


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802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
151	5755	36.12	36.46	0.5	PASS
159	5795	36.06	36.46	0.5	PASS

FOR CHAIN 1: CH 151



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5.4 MAXIMUM OUTPUT POWER

5.4.1 LIMITS OF MAXIMUM OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

5.4.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
High Speed Peak Power Meter	ML2495A	0842014	Apr. 21, 2010	Apr. 20, 2011
Power Sensor	MA2411B	0738404	Apr. 21, 2010	Apr. 20, 2011

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. Measurement Bandwidth of ML2495A is 65MHz greater than 6dB bandwidth of emission.

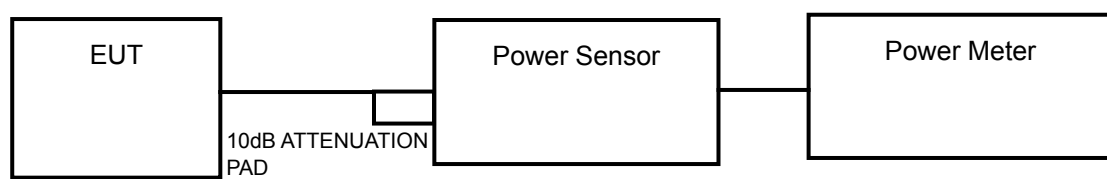
5.4.3 TEST PROCEDURES

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

5.4.4 DEVIATION FROM TEST STANDARD

No deviation

5.4.5 TEST SETUP



5.4.6 EUT OPERATING CONDITIONS

Same as Item 5.3.6

5.4.7 TEST RESULTS

802.11a

CHAN.	CHAN. FREQ. (MHz)	POWER OUTPUT (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	18.7	21.0	200.0	23.0	28.49	PASS
157	5785	18.9	21.3	212.5	23.3	28.49	PASS
165	5825	18.9	21.4	215.7	23.3	28.49	PASS

**Directional gain = $4.5\text{dBi} + 10\log(2) = 7.51\text{dBi} > 6\text{dBi}$, conducted power limit is reduced from 30dBm down to $30-(7.51-6)=28.49\text{dBm}$

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	POWER OUTPUT (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	19.2	21.5	224.4	23.5	30	PASS
157	5785	19.5	22.0	247.6	23.9	30	PASS
165	5825	19.7	22.4	267.1	24.3	30	PASS

802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	POWER OUTPUT (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
151	5755	19.1	21.3	216.2	23.3	30	PASS
159	5795	19.2	21.8	234.5	23.7	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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
SPECTRUM ANALYZER R&S	FSP40	100039	Jul. 09, 2010	Jul. 08, 2011

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

5.5.3 TEST PROCEDURE

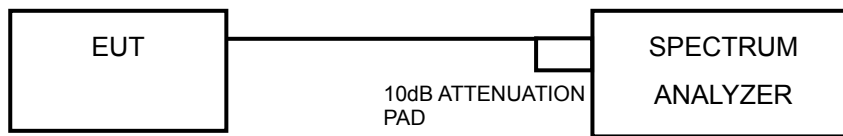
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

5.5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5.5 TEST SETUP



5.5.6 EUT OPERATING CONDITION

Same as Item 5.3.6

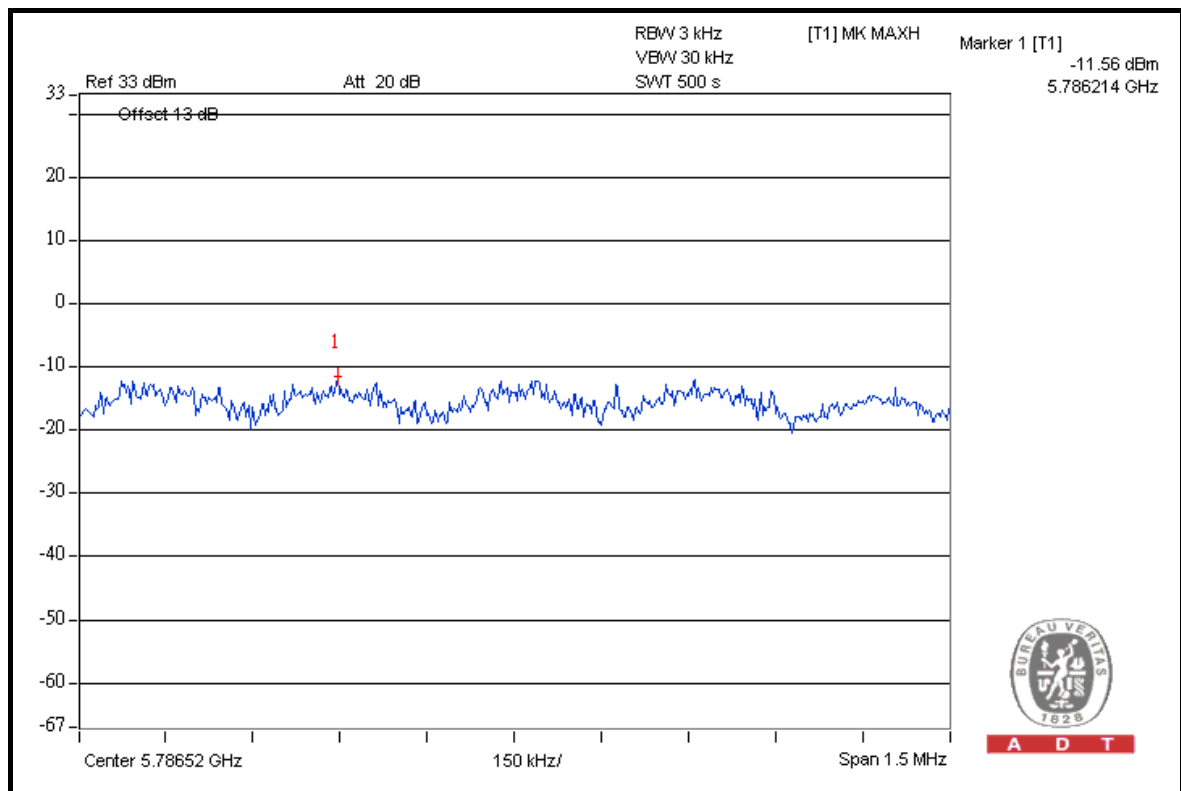
5.5.7 TEST RESULTS

802.11a

CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1			
149	5745	-13.6	-12.0	-9.7	6.49	PASS
157	5785	-13.6	-11.6	-9.5	6.49	PASS
165	5825	-13.6	-11.8	-9.6	6.49	PASS

**Directional gain = $4.5\text{dBi} + 10\log(2) = 7.51\text{dBi} > 6\text{dBi}$, Power Density limit is reduced from 8dBm down to $8 - (7.51 - 6) = 6.49\text{dBm}$

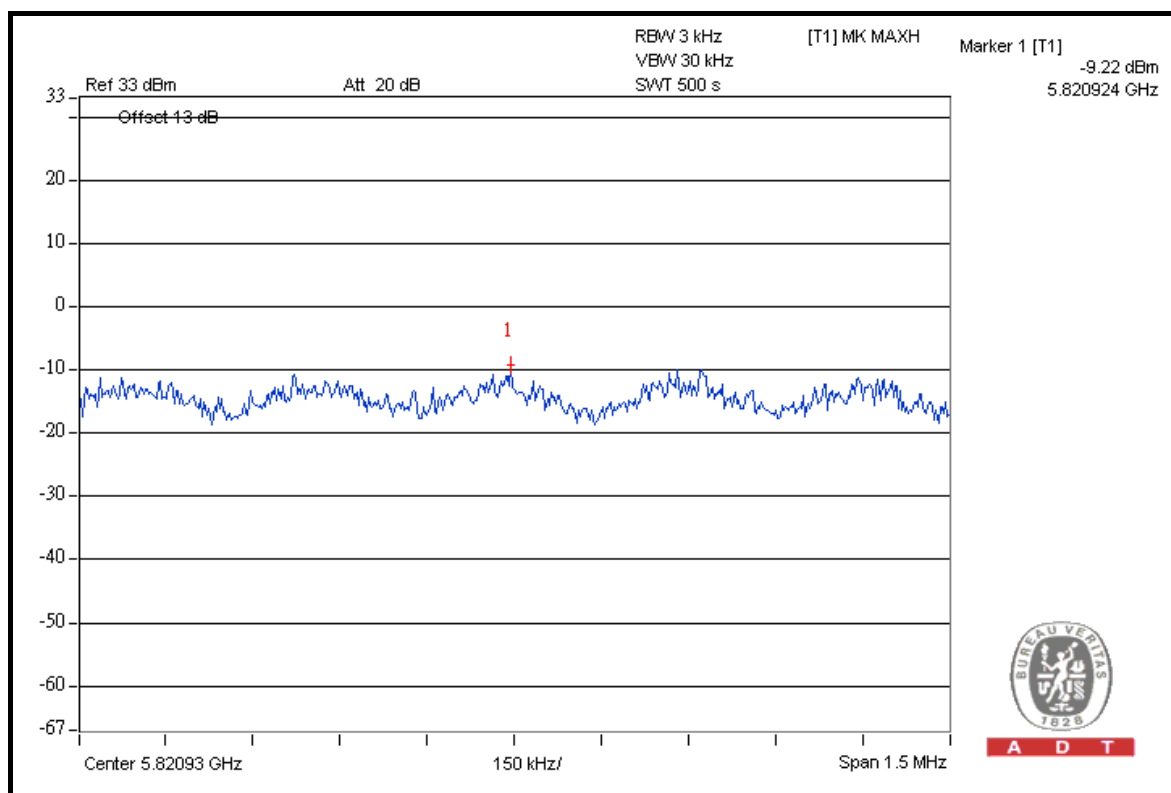
FOR CHAIN 1: CH 157



802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1			
149	5745	-10.7	-10.2	-7.4	8	PASS
157	5785	-10.3	-9.7	-7.0	8	PASS
165	5825	-10.0	-9.2	-6.6	8	PASS

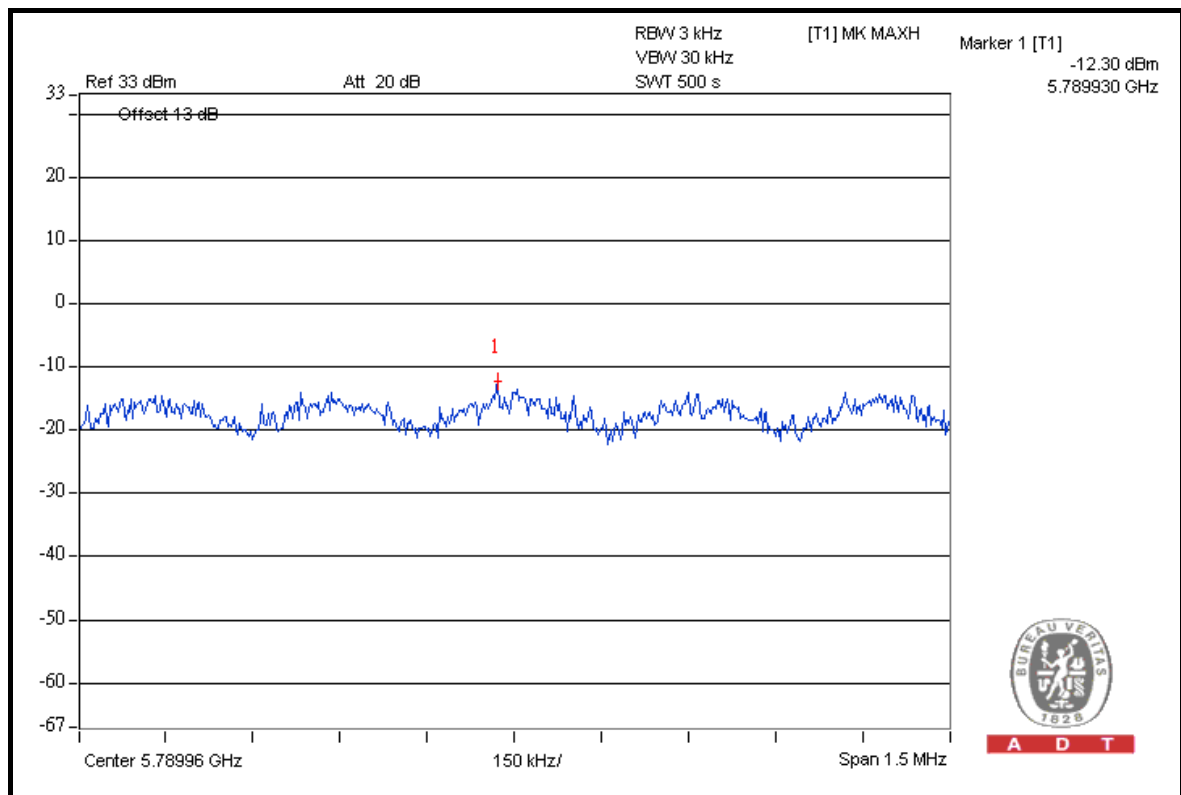
FOR CHAIN 1: CH 165



802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1			
151	5755	-13.0	-12.8	-9.9	8	PASS
159	5795	-13.0	-12.3	-9.6	8	PASS

FOR CHAIN 1: CH 159



5.6 BAND EDGES MEASUREMENT

5.6.1 LIMITS OF BAND EDGES MEASUREMENT

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

5.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100033	Jul. 29, 2010	Jul. 28, 2011
Spectrum Analyzer Agilent	E4446A	MY48250266	Aug. 11, 2010	Aug. 10, 2011
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Apr. 27, 2010	Apr. 26, 2011
HORN Antenna SCHWARZBECK	9120D	9120D-405	Feb. 03, 2010	Feb. 02, 2011
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 27, 2010	Dec. 26, 2011
Preamplifier Agilent	8447D	2944A10633	Nov. 02, 2010	Nov. 01, 2011
Preamplifier Agilent	8449B	3008A01964	Nov. 02, 2010	Nov. 01, 2011
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	238141/4	May 14, 2010	May 13, 2011
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	12738/6	May 14, 2010	May 13, 2011
Software ADT.	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table ADT.	TT100.	TT93021703	NA	NA
Turn Table Controller ADT.	SC100.	SC93021703	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	07026401	Aug. 25, 2010	Aug. 24, 2011

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

5.6.3 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter 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. The antenna is a broadband antenna, and its height 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. Set both RBW and VBW of spectrum analyzer to 100kHz and 300kHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

NOTE: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.



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5.6.4 DEVIATION FROM TEST STANDARD

No deviation

5.6.5 EUT OPERATING CONDITION

Same as Item 5.3.6

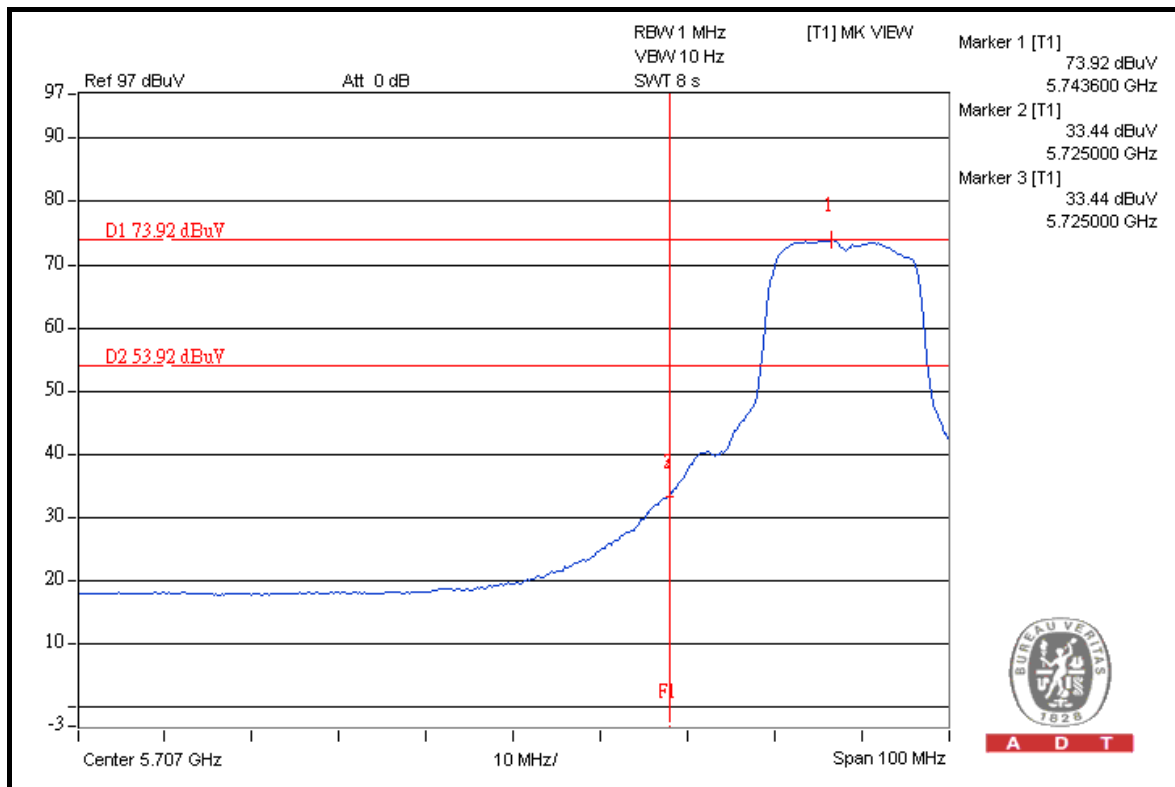
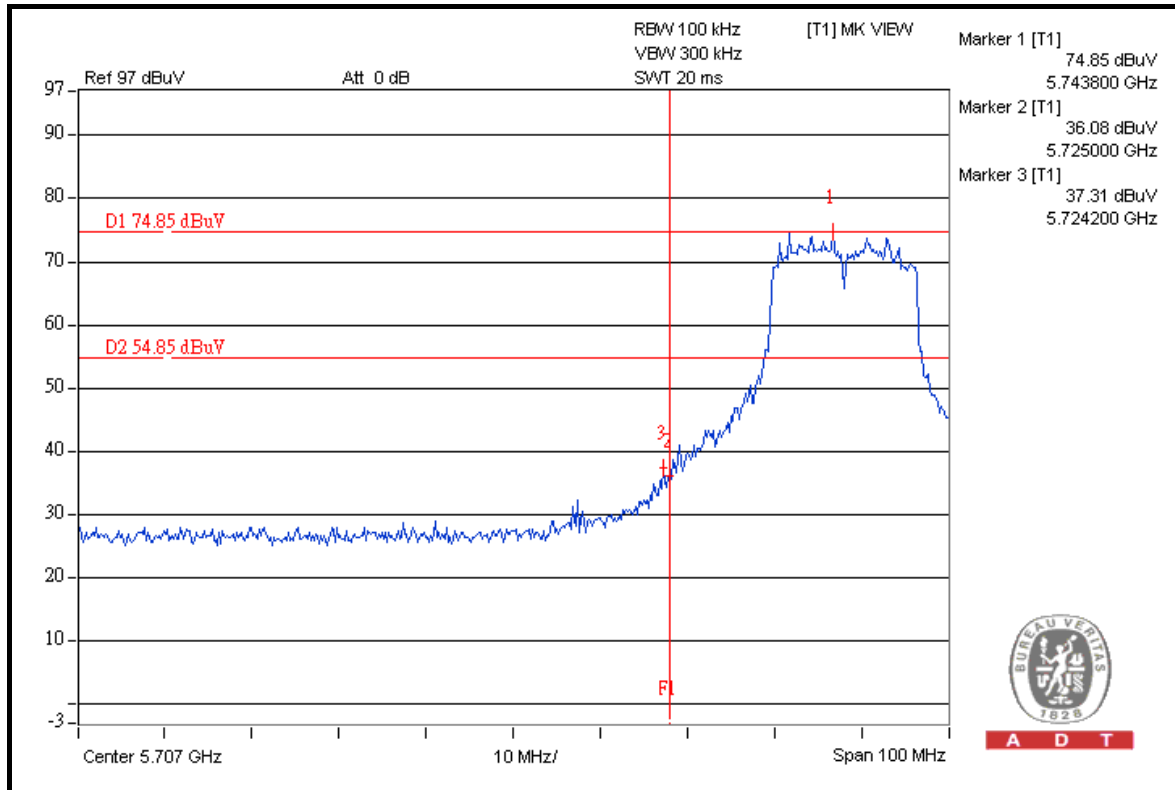
5.6.6 TEST RESULTS

The spectrum plots are attached on the following pages. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).



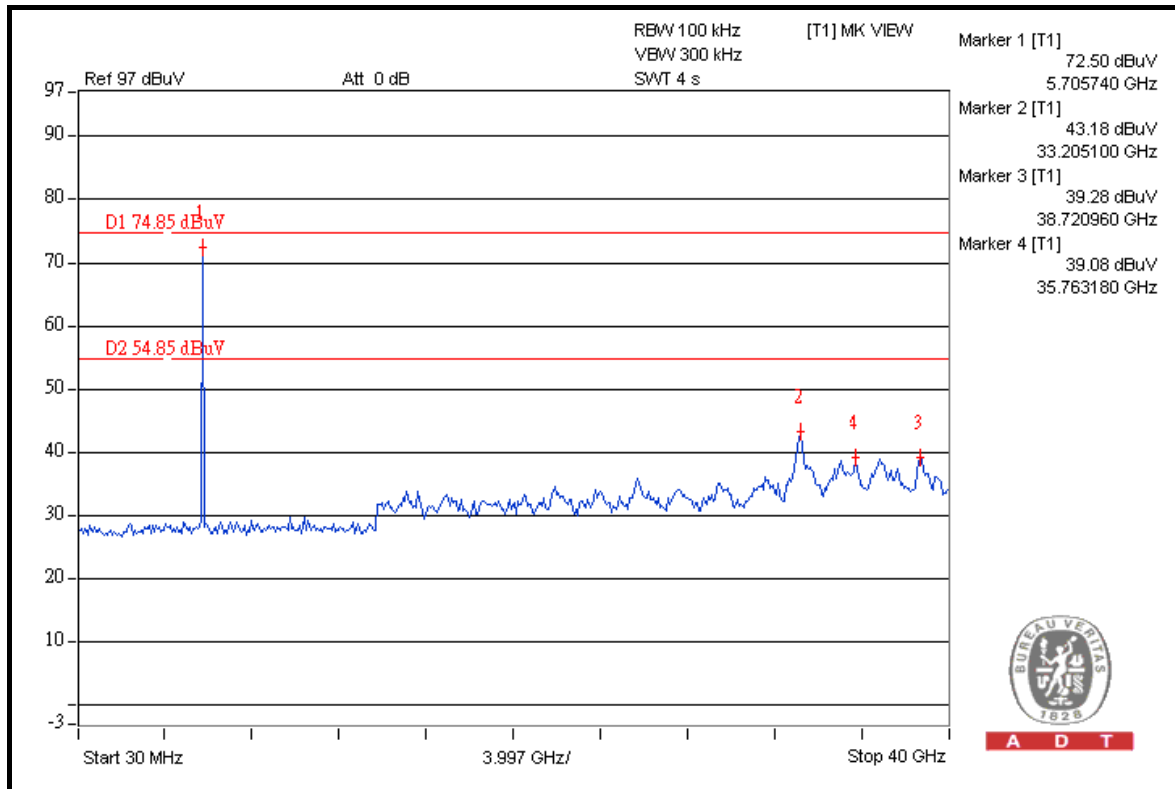
A D T

802.11a

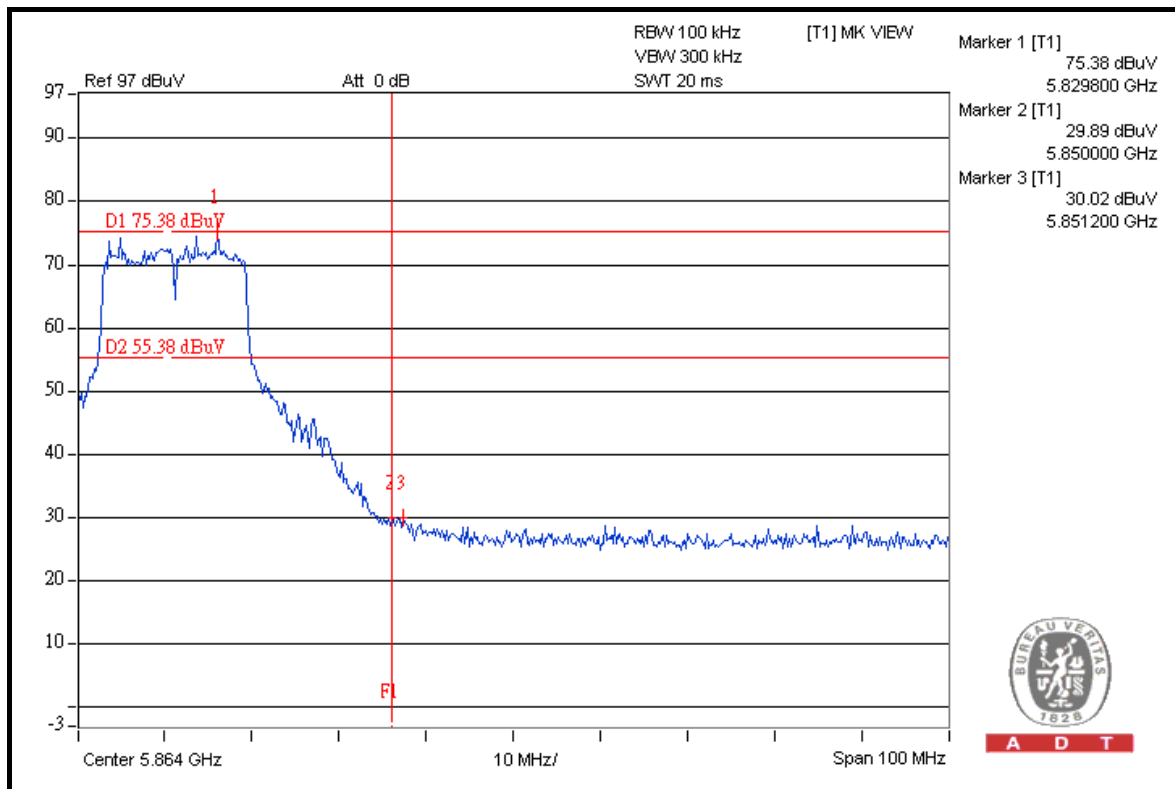




A D T



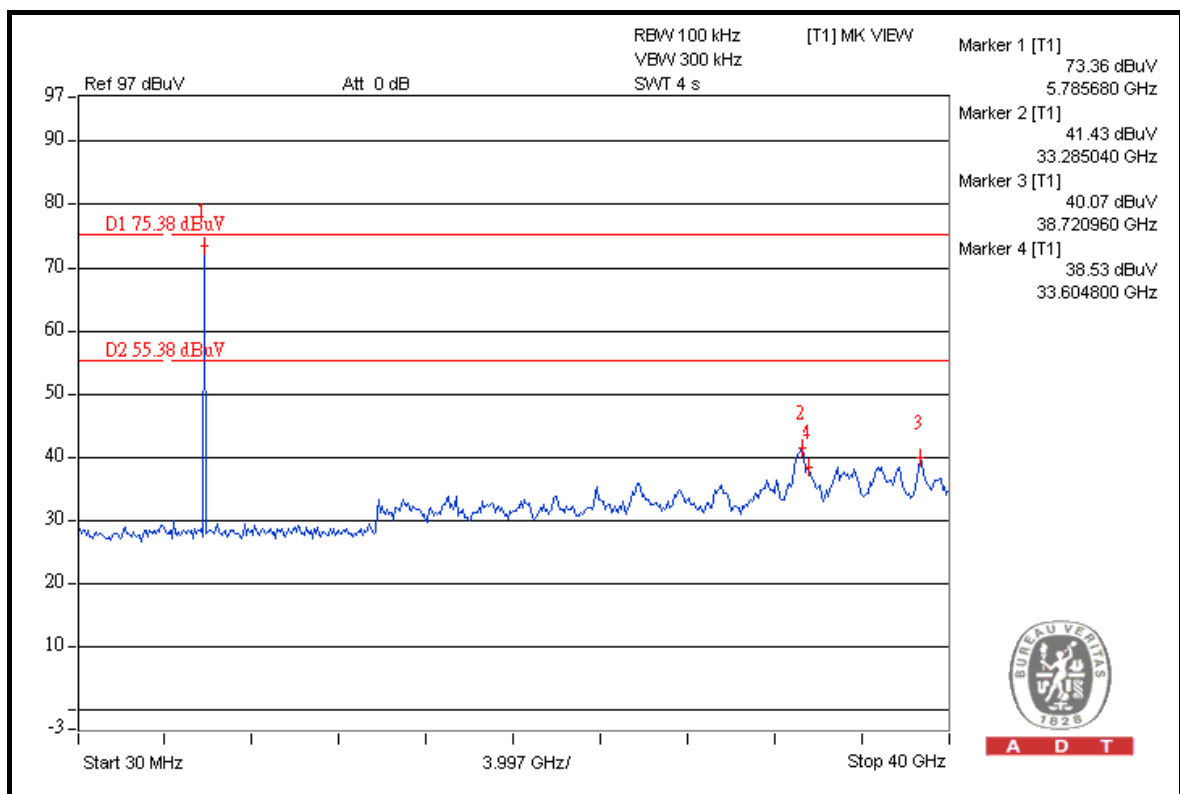
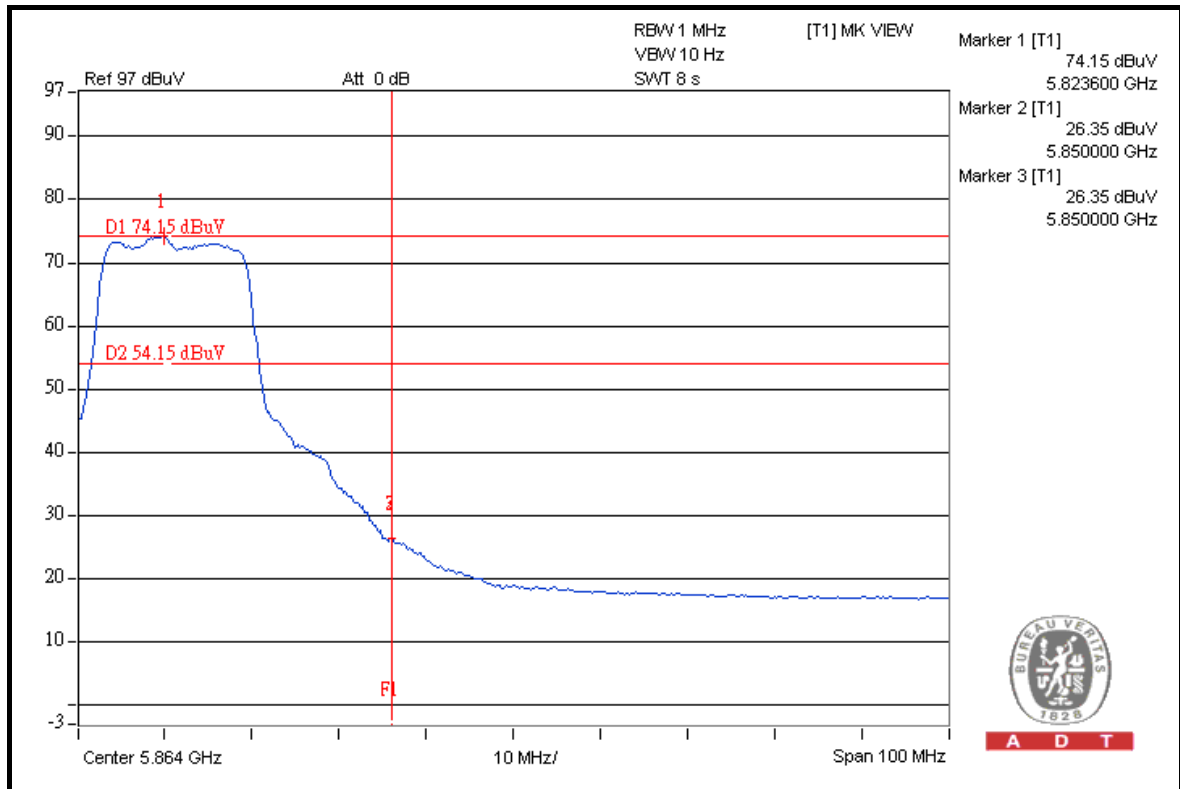
A D T



A D T



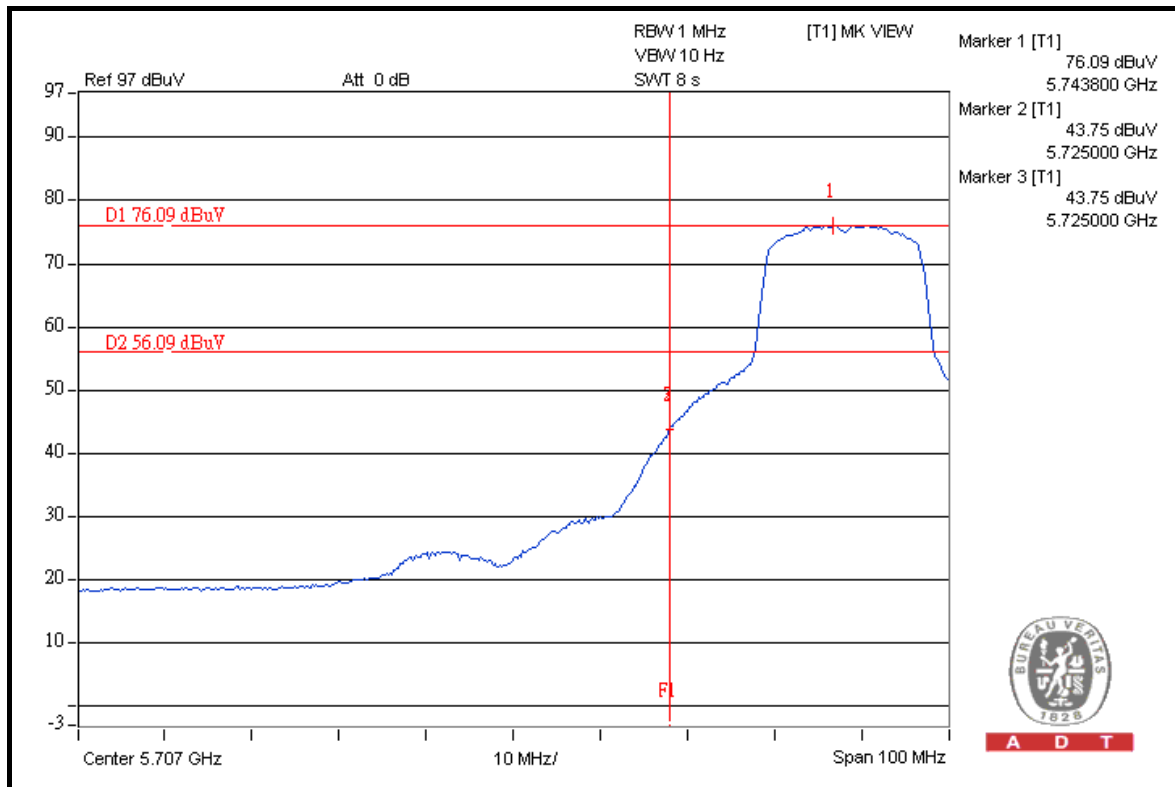
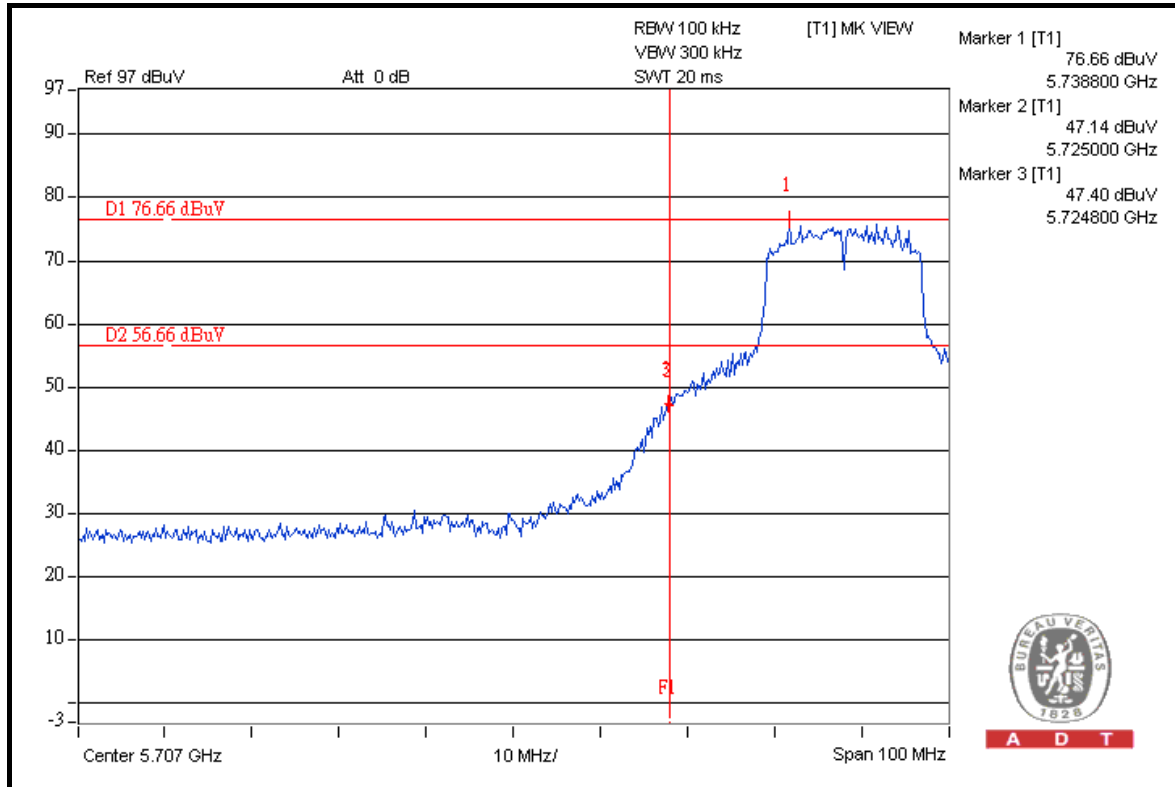
A D T





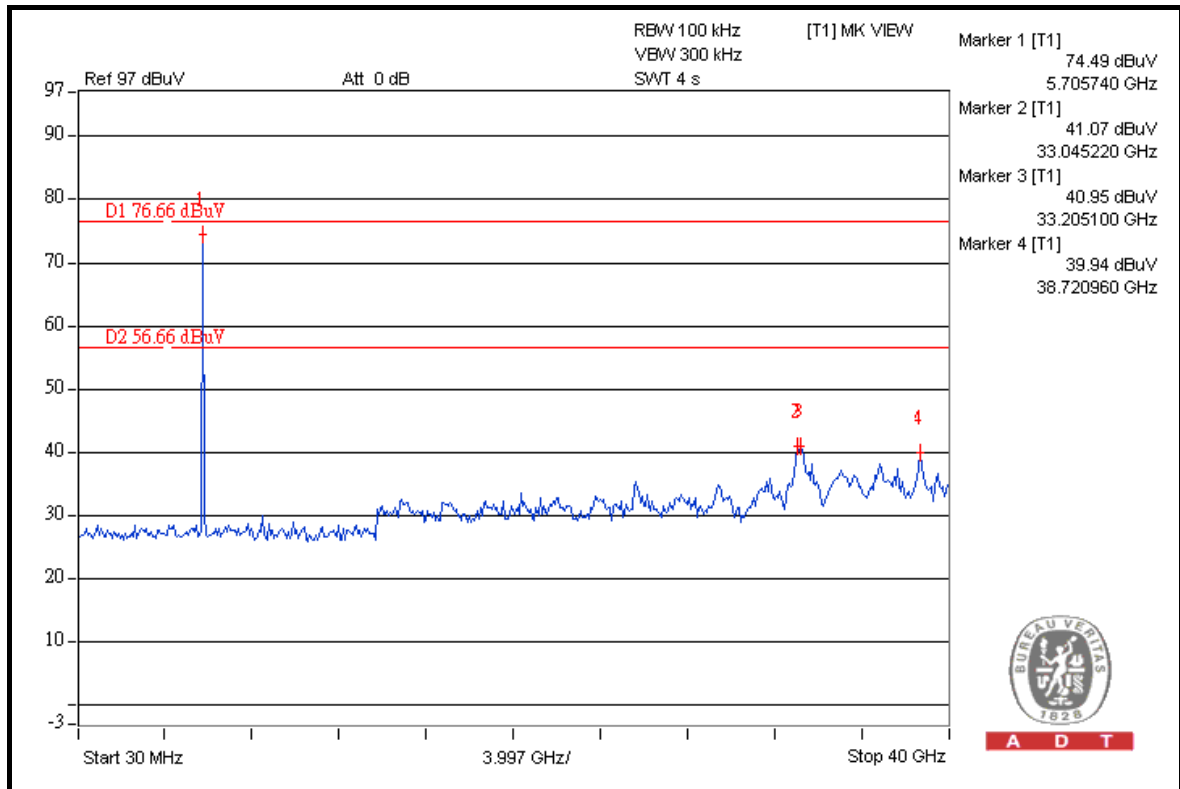
A D T

802.11n (20MHz)

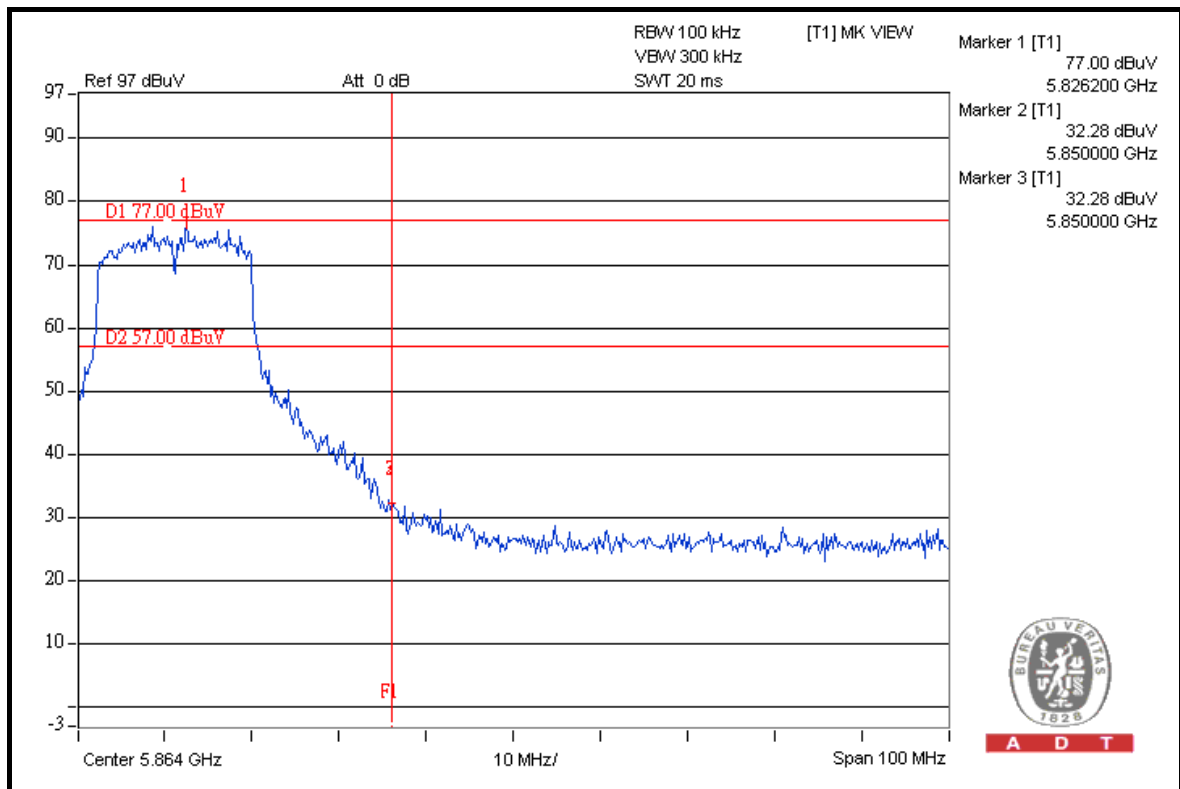




A D T



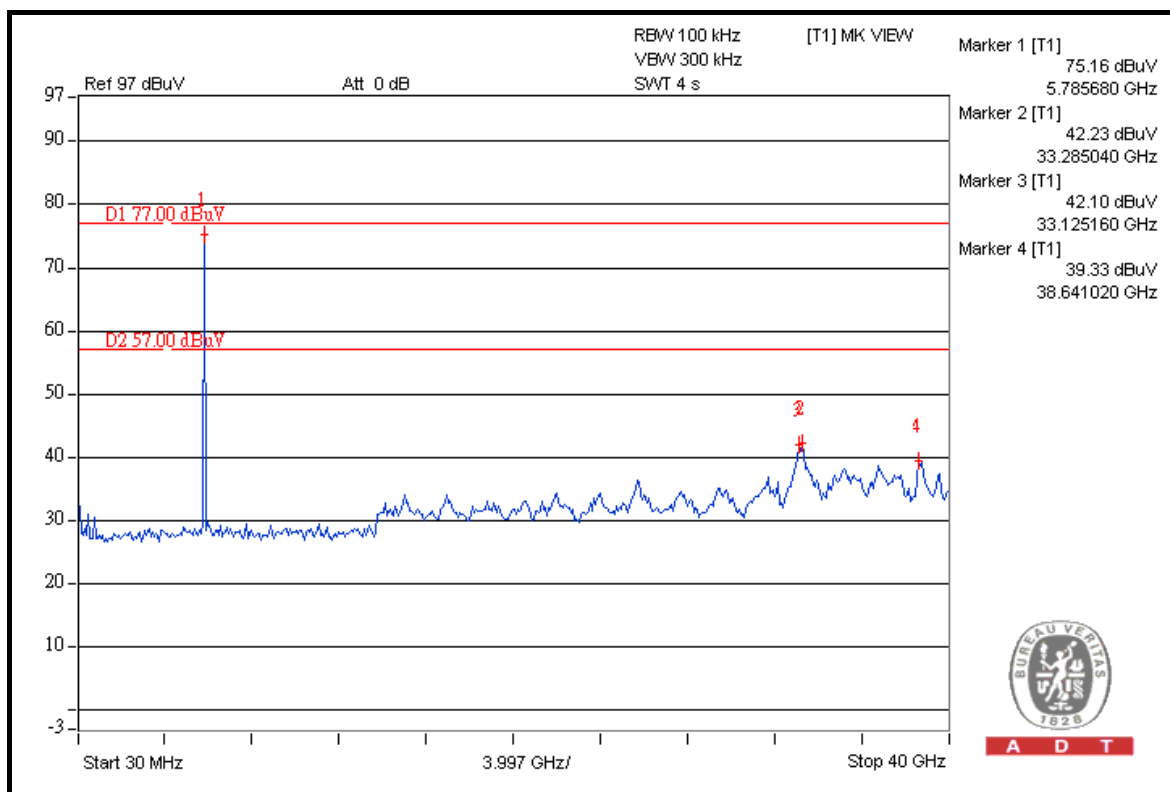
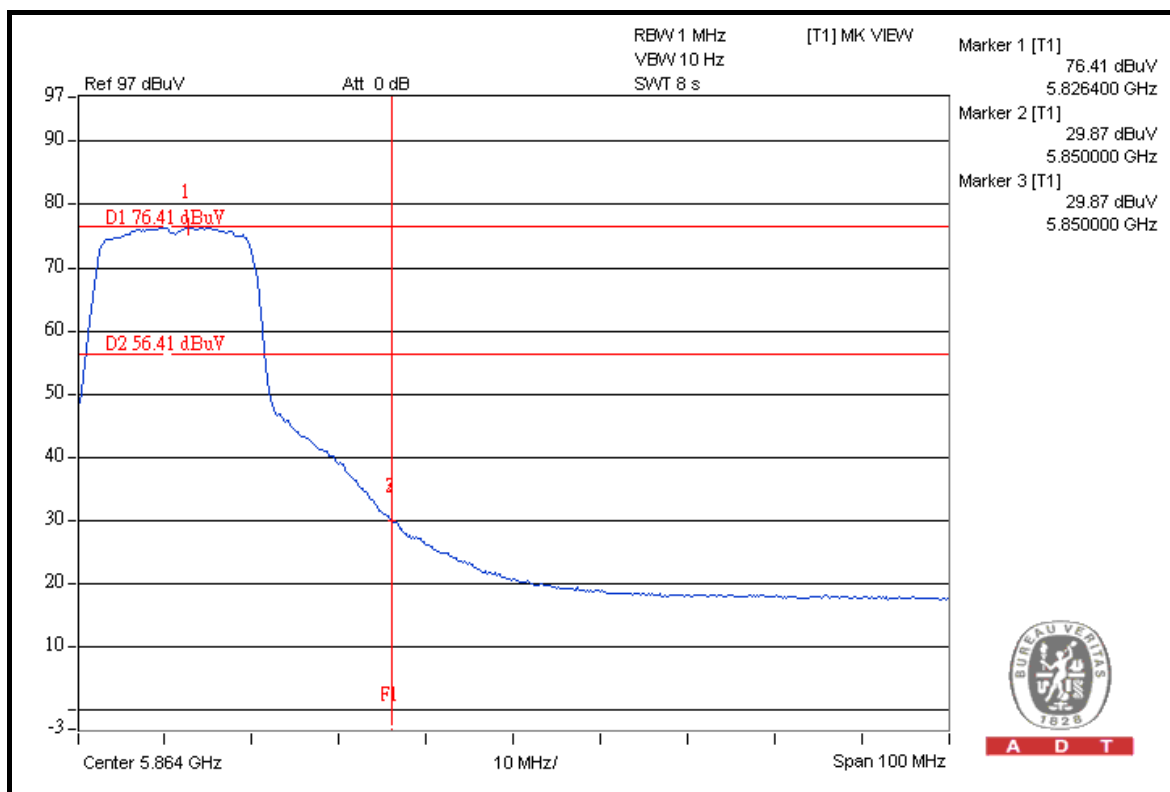
A D T



A D T



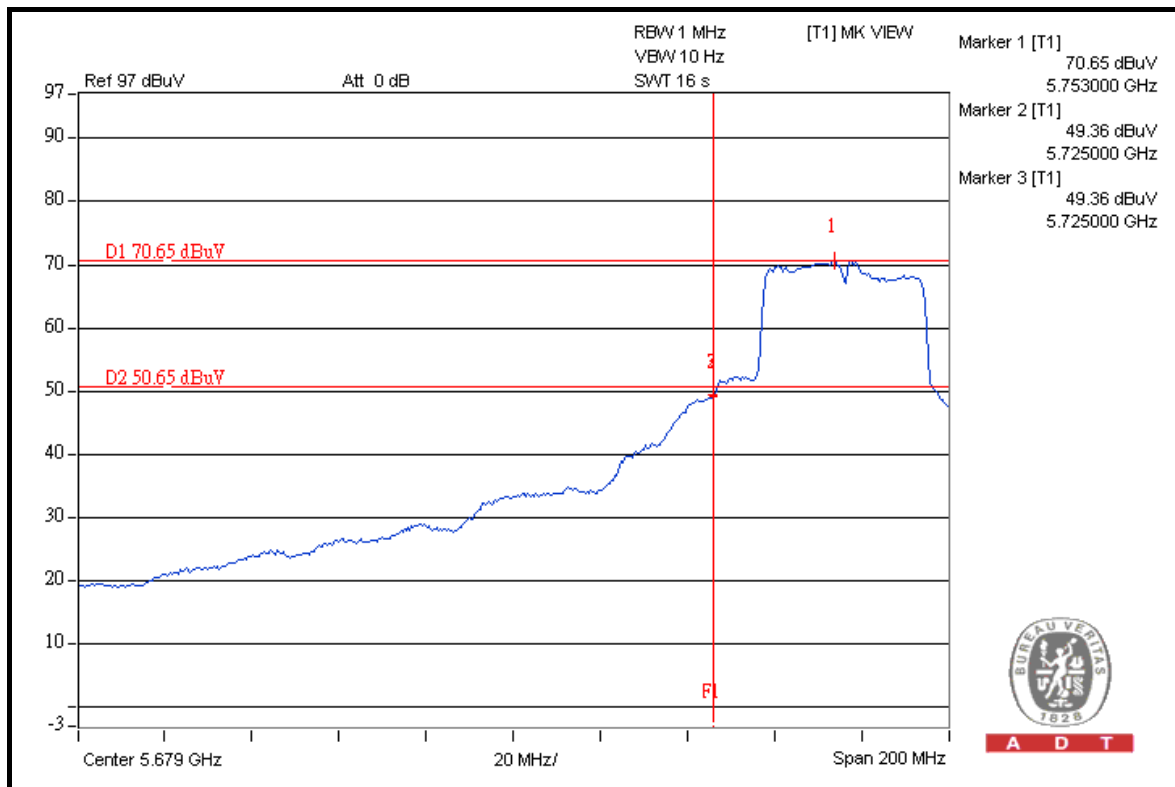
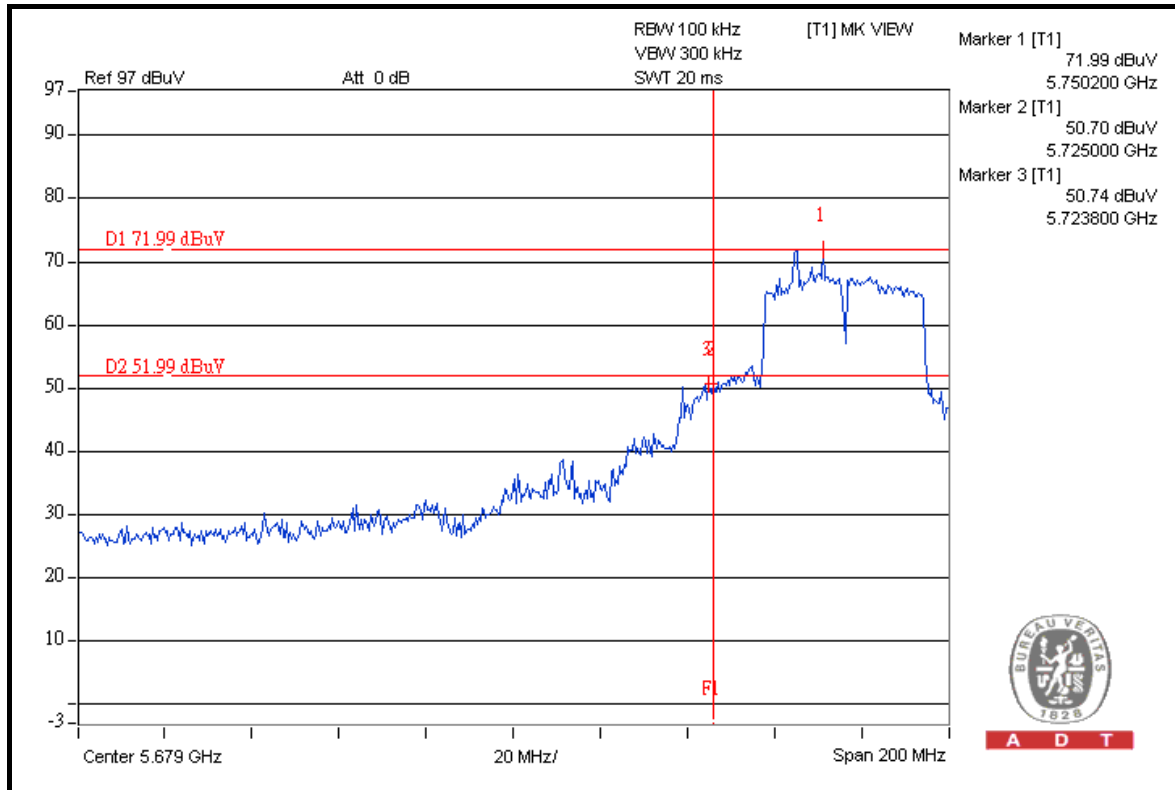
A D T





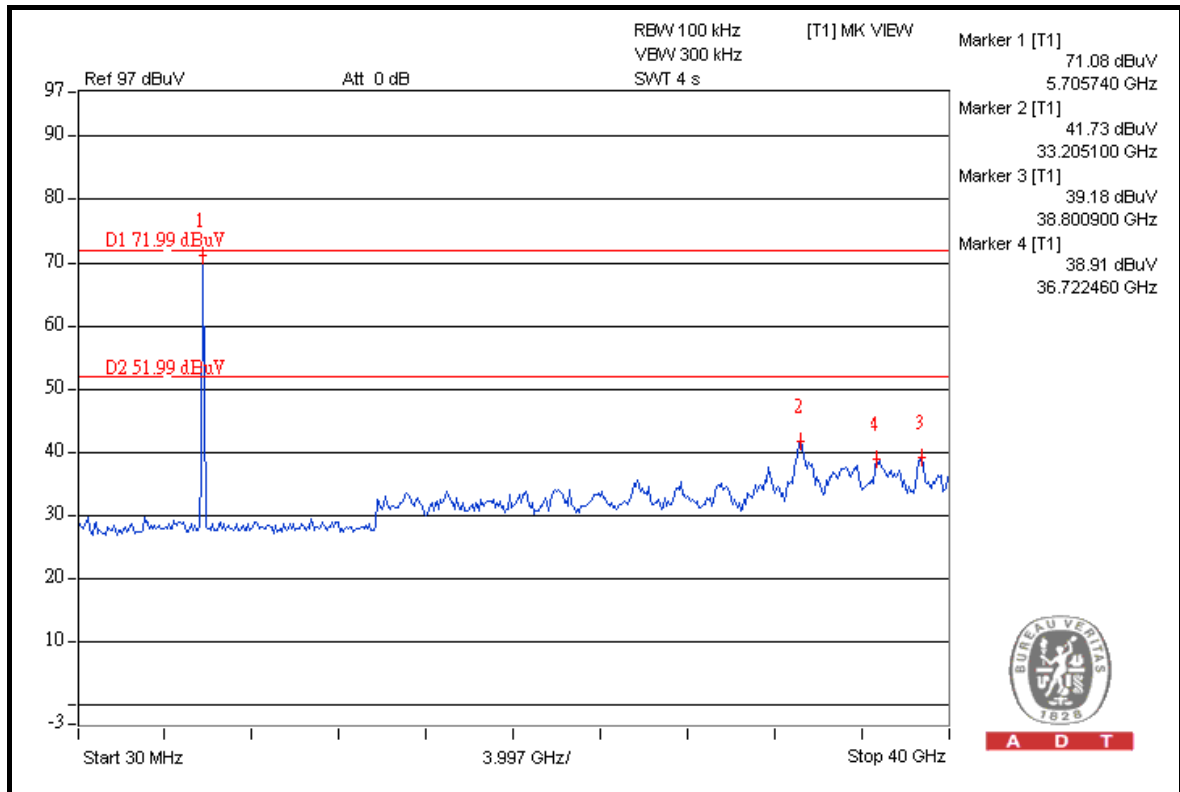
A D T

802.11n (40MHz)

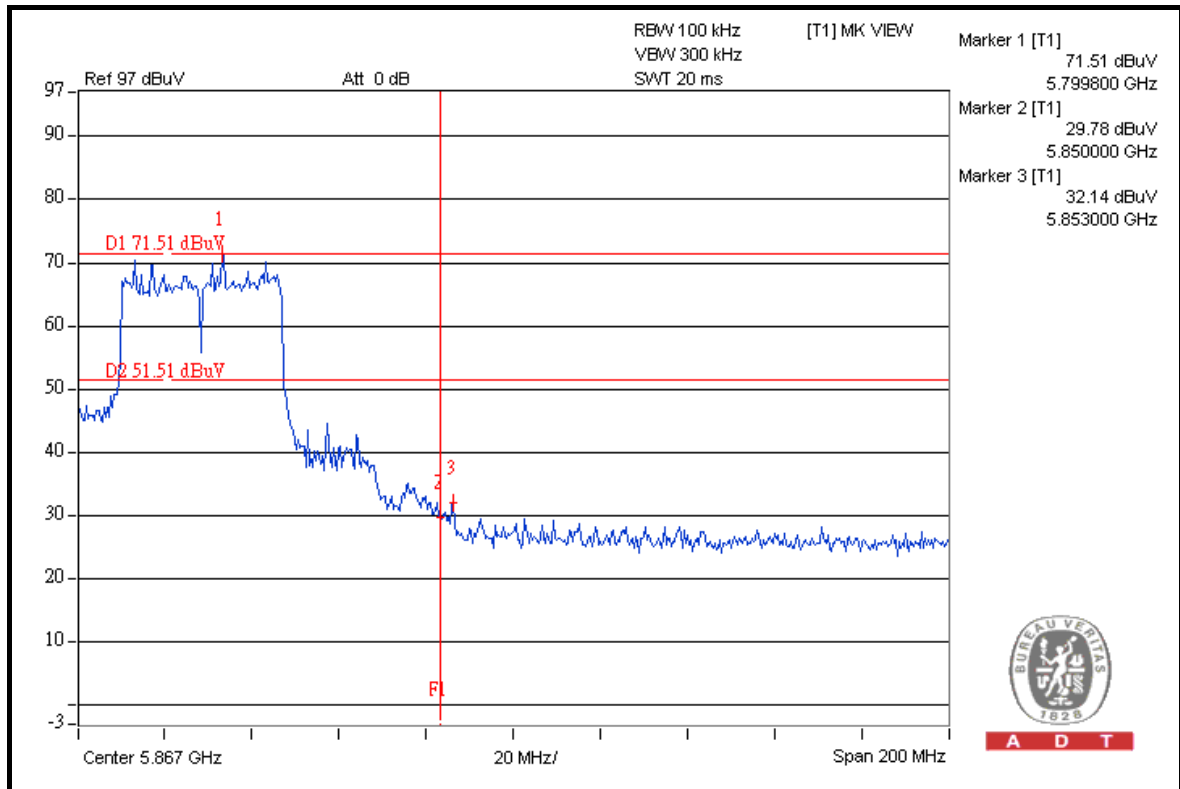




A D T



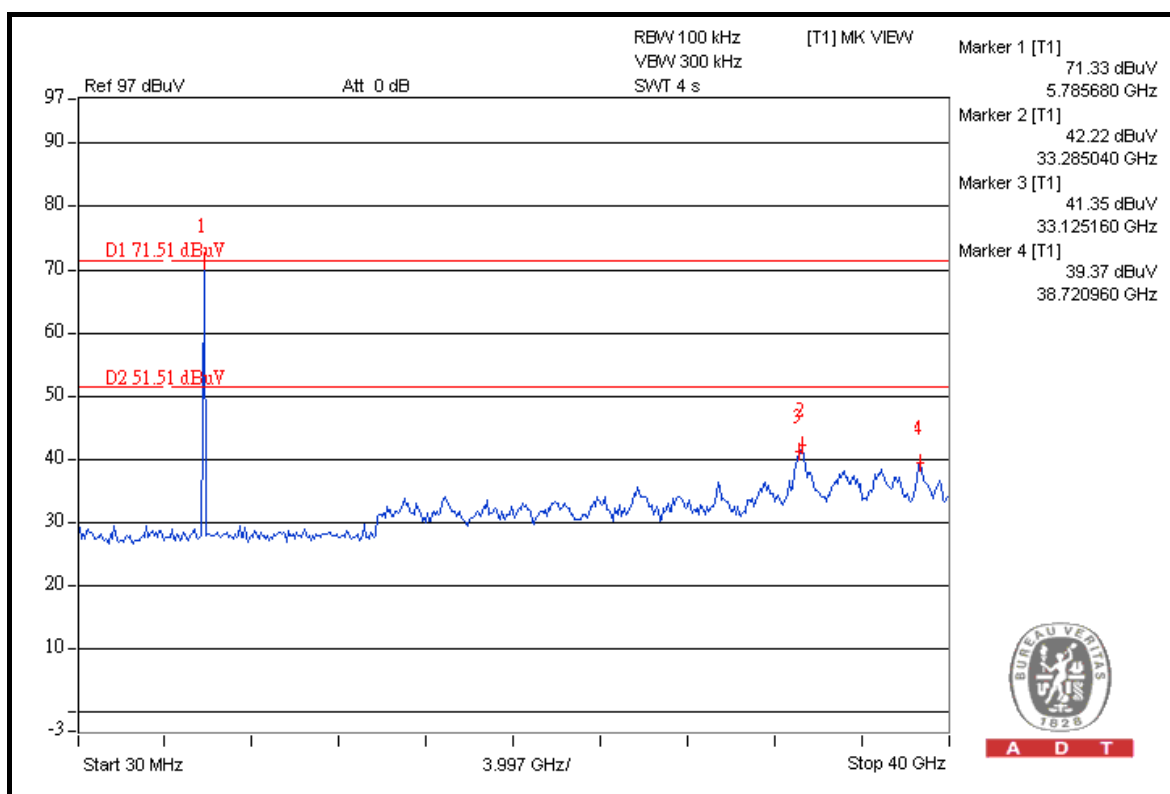
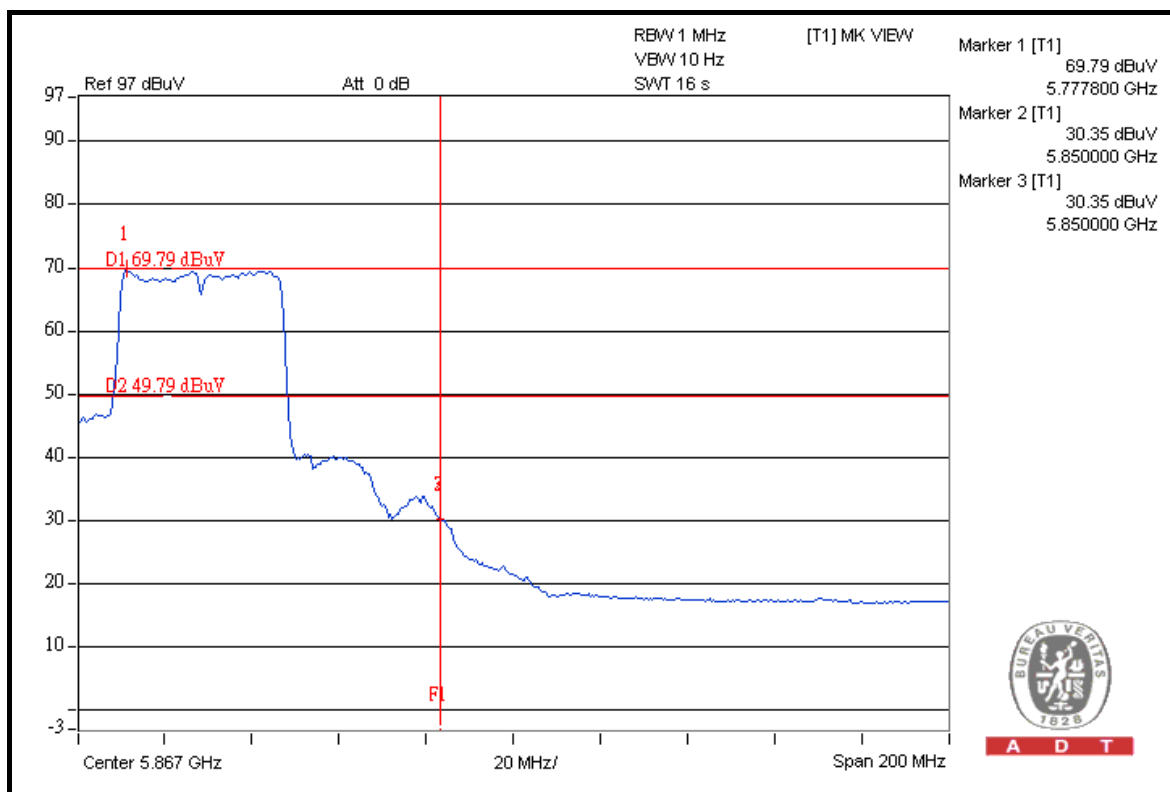
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6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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.

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site:

www.adt.com.tw/index.5/phtml. 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: 886-3-3185050

Web Site: www.adt.com.tw

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



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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---