

FCC TEST REPORT (15.247)

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MODEL NO.: C8

FCC ID: TE7C8

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ISSUED: Jul. 17, 2014

APPLICANT: TP-LINK TECHNOLOGIES CO., LTD.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF140514C03	Original release.	Jul. 17, 2014



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1. CERTIFICATION

PRODUCT: AC1750 Wireless Dual Band Gigabit Router

MODEL NO.: C8

BRAND: TP-LINK

APPLICANT: TP-LINK TECHNOLOGIES CO., LTD.

TESTED: Mar. 11 ~ Jul. 16, 2014

TEST SAMPLE: Prototype

STANDARDS: FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10-2009

The above equipment (model: C8) 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 : Sunt Lee , **DATE :** Jul. 17, 2014
Sunt Lee / Specialist

APPROVED BY : Ken Liu , **DATE :** Jul. 17, 2014
Ken Liu / Senior Manager

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -9.47dB at 0.19687MHz.
15.205 & 209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 11570.00MHz.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 2483.50MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is SMA Female Reverse 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 $k = 2$.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	AC1750 Wireless Dual Band Gigabit Router
MODEL NO.	C8
POWER SUPPLY	12Vdc (Adapter)
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: 11/5.5/2/1Mbps 802.11a/g: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 450Mbps 802.11ac: up to 1300Mbps
OPERATING FREQUENCY	2.4GHz: 2412 ~ 2462MHz 5.0GHz: 5745 ~ 5825MHz
NUMBER OF CHANNEL	2.4GHz: 802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7 5.0GHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 5 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1
OUTPUT POWER	2.4GHz: 525.133mW 5.0GHz: 530.542mW
ANTENNA TYPE	2.4GHz: Omni directional antenna with 0.6dBi gain 5.0GHz: Omni directional antenna with 2.3dBi gain
ANTENNA CONNECTOR	SMA Female Reverse
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	Adapter

NOTE:

1. The EUT incorporates a MIMO function. The EUT provides 3 completed transmitters and 3 receivers. This device supports chip beamforming.

MODULATION MODE	TX FUNCTION
802.11b	3TX
802.11g	3TX
802.11a	3TX
802.11n (HT20)	3TX
802.11n (HT40)	3TX
802.11ac (VHT80)	3TX

*The modulation and bandwidth are similar for 802.11n mode for 20MHz/40MHz and 802.11ac mode for 20MHz/40MHz, therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

2. The EUT consumes power from following adapter.

Brand	Ten Pao
Model	S048CU1200330
Input Power	100-240Vac, 50/60Hz, 1.5A Max.
Output Power	12.0Vdc, 3300mA
Power Line	1.5m cable without core attached on adapter

3. The above EUT information is 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, 802.11n (HT20):

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 (HT40):

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

FOR 5.0GHz (5745 ~ 5825MHz):

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (HT20):

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

2 channels are provided for 802.11n (HT40), 802.11ac (HT40):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

CHANNEL	FREQUENCY
155	5775MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

FOR 2.4GHz:

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

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

RADIATED EMISSION TEST (ABOVE 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
-	802.11n (HT40)	3 to 9	3, 6, 9	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)
-	802.11n (HT20)	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)
-	802.11n (HT20)	1 to 11	6	OFDM	BPSK	7.2

**A D T****BANDEDGE MEASUREMENT:**

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 11	1, 11	OFDM	BPSK	7.2
-	802.11n (HT40)	3 to 9	3, 9	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)
-	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 (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
-	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	15.0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	25deg. C, 65%RH	120Vac, 60Hz	Chris Lin
RE $<$ 1G	25deg. C, 65%RH	120Vac, 60Hz	Chris Lin
PLC	25deg. C, 68%RH	120Vac, 60Hz	Sun Lin
APCM	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui

FOR 5.0GHz (5745 ~ 5825MHz):

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

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

RADIATED EMISSION TEST (ABOVE 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
-	802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (VHT80)	155	155	OFDM	BPSK	87.8

RADIATED EMISSION TEST (BELOW 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11n (HT20)	149 to 165	149	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)
-	802.11n (HT20)	149 to 165	149	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)
-	802.11a	149 to 165	149, 165	OFDM	BPSK	6.0
-	802.11n (HT20)	149 to 165	149, 165	OFDM	BPSK	7.2
-	802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (VHT80)	155	155	OFDM	BPSK	87.8

ANTENNA PORT CONDUCTED MEASUREMENT:

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
-	802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (VHT80)	155	155	OFDM	BPSK	87.8

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	25deg. C, 65%RH	120Vac, 60Hz	Chris Lin
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Chris Lin
PLC	25deg. C, 68%RH	120Vac, 60Hz	Sun Lin
APCM	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui

3.3 DUTY CYCLE OF TEST SIGNAL

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

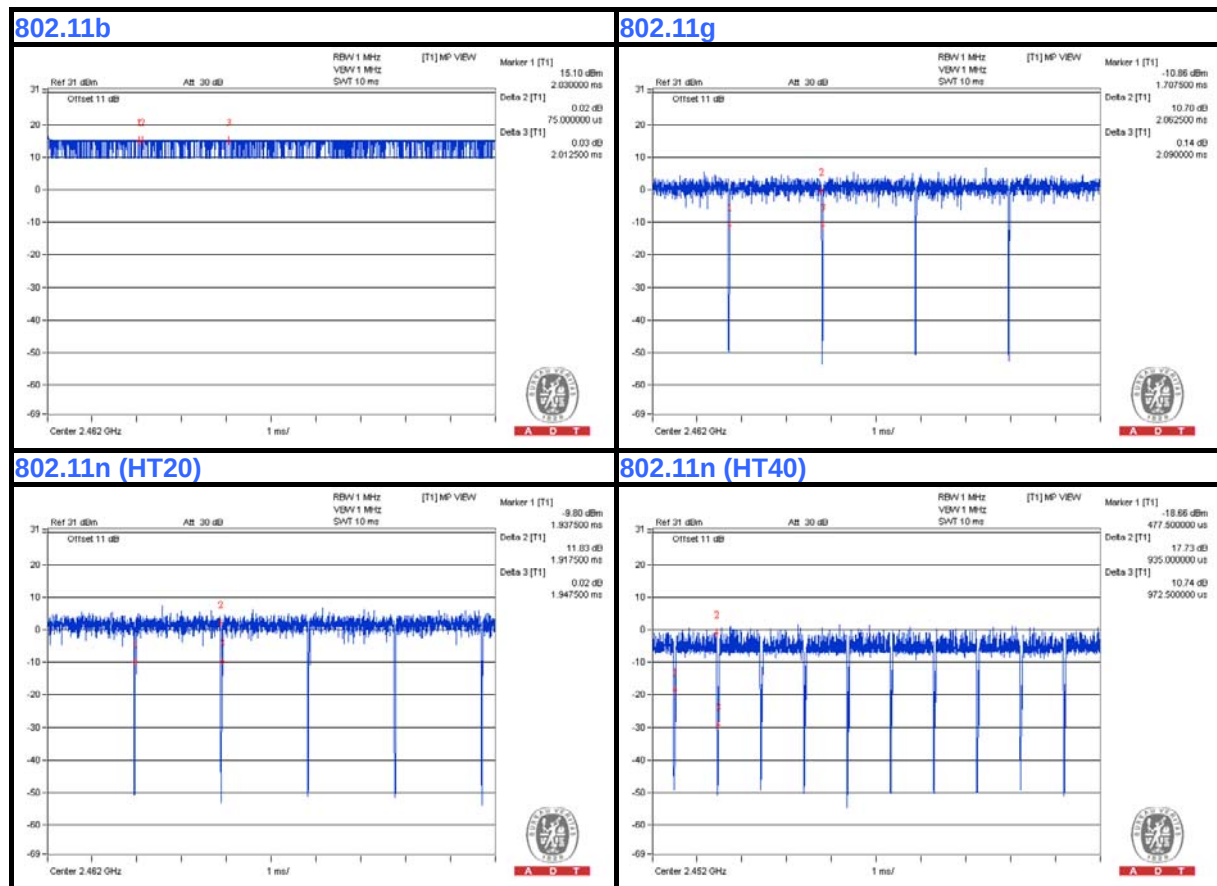
For 2.4GHz Band:

802.11b: Duty cycle of test signal is $> 98\%$

802.11g: Duty cycle = $2.06/2.09 = 0.986 > 98\%$

802.11n (HT20): Duty cycle = $1.91/1.94 = 0.985 > 98\%$

802.11n (HT40): Duty cycle = $0.935/0.972 = 0.962$, Duty factor = $10 * \log(1/0.962) = 0.17$



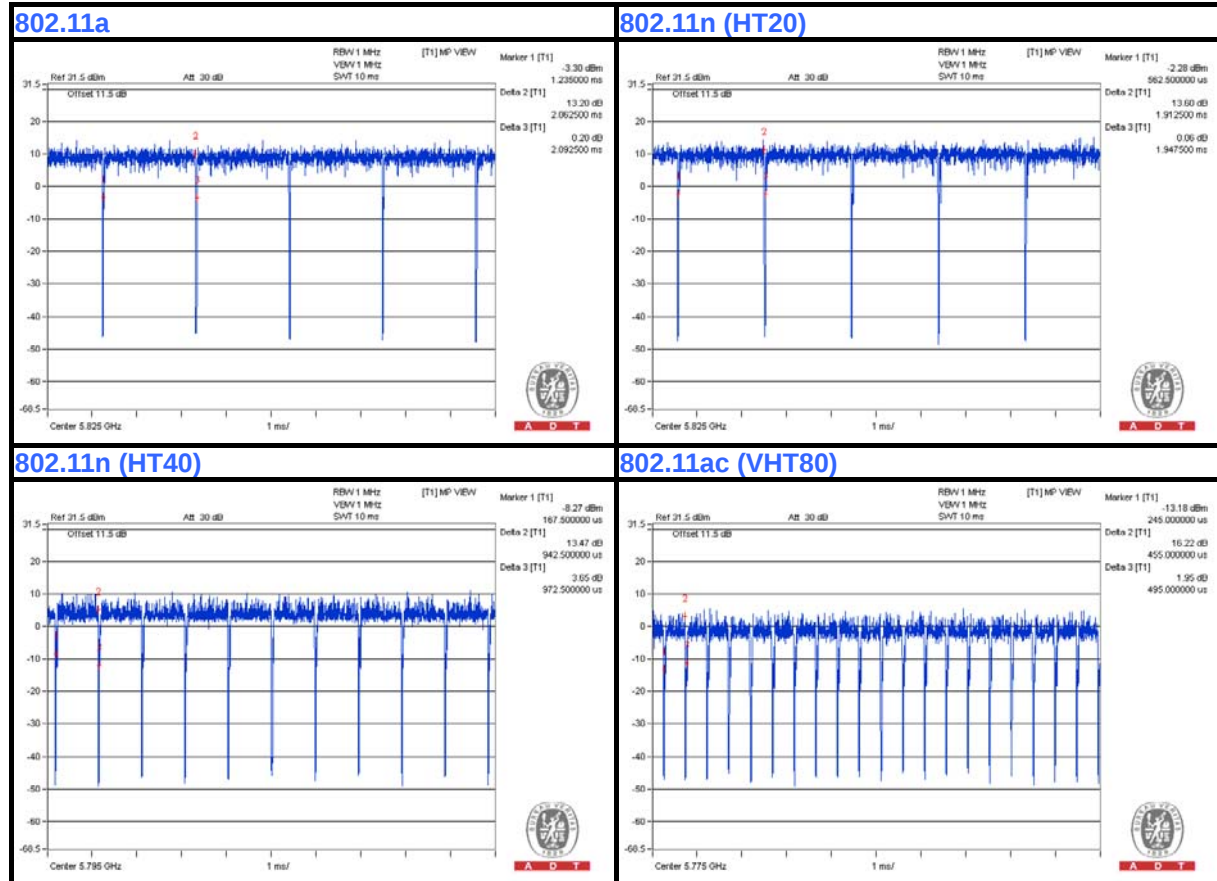
For 5GHz Band:

802.11a: Duty cycle = $2.06/2.09 = 0.986 > 98\%$

802.11n (HT20): Duty cycle = $1.91/1.94 = 0.985 > 98\%$

802.11n (HT40): Duty cycle = $0.942/0.972 = 0.969$, Duty factor = $10 * \log(1/0.969) = 0.14$

802.11ac (VHT80): Duty cycle = $0.455/0.495 = 0.919$, Duty factor = $10 * \log(1/0.919) = 0.37$



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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.

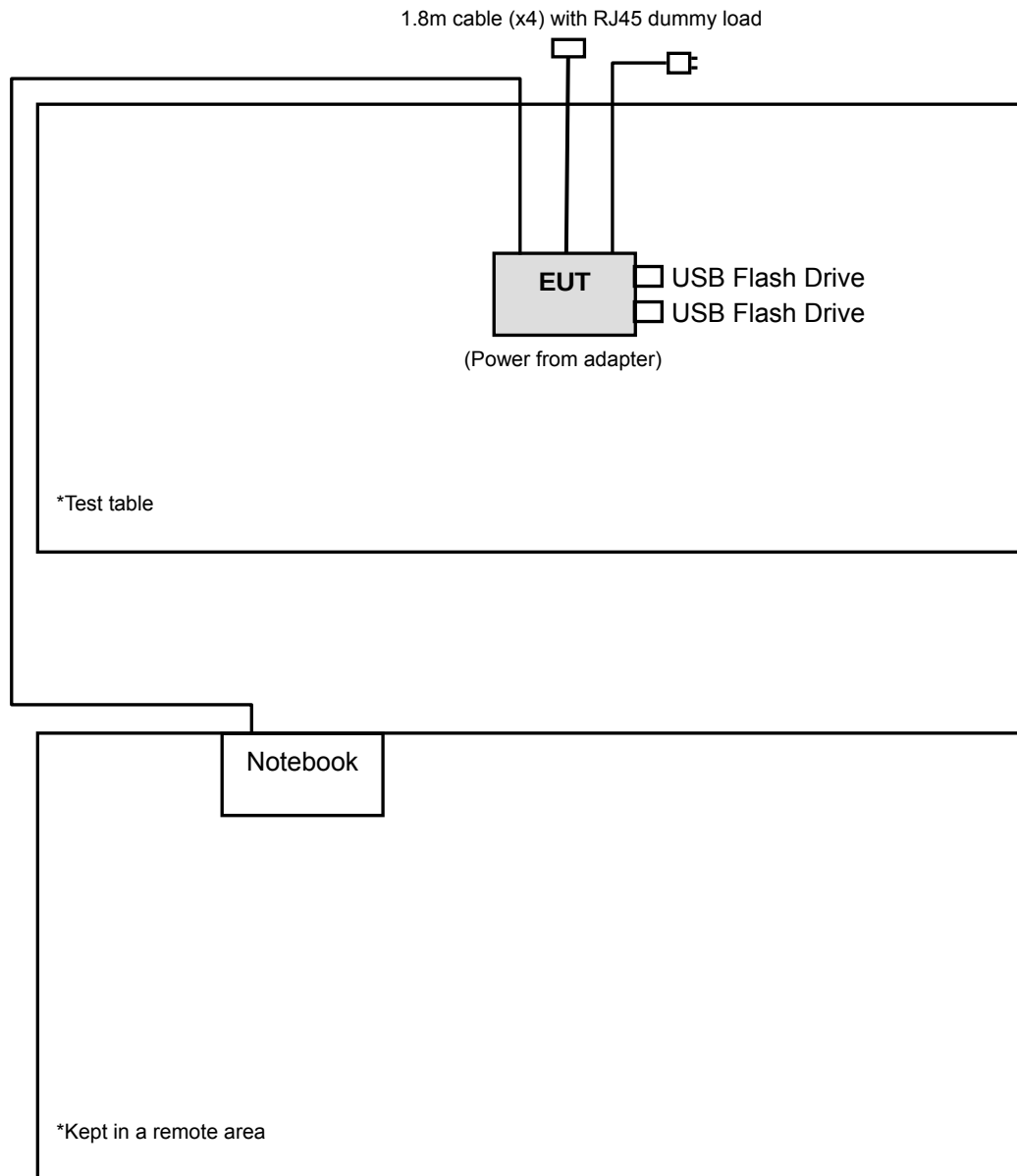
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	USB Flash Drive	SANDISK	SDCZ6-1024	NA	NA
2	USB Flash Drive	SANDISK	SDCZ2-128-A10	NA	NA
3	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	NA
3	3m RJ45 UTP cable

NOTE:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item 3 acted as a communication partner to transfer data.

3.4.1 CONFIGURATION OF SYSTEM UNDER TEST





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3.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart C (15.247)

558074 D01 DTS Meas Guidance v03r02

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2009

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

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

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

4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 30dB below the highest level of the desired power:

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

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 30dB under any condition of modulation.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	Jan. 02, 2014	Jan. 01, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Mar. 03, 2014	Mar. 02, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Feb. 26, 2014	Feb. 25, 2015
HORN Antenna SCHWARZBECK	9120D	209	Sep. 12, 2013	Sep. 11, 2014
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 17, 2014	Feb. 16, 2015
Preamplifier Agilent	8447D	2944A10633	Oct. 07, 2013	Oct. 06, 2014
Preamplifier Agilent	8449B	3008A01964	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	214378/4	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6 +309224/4	Aug. 26, 2013	Aug. 25, 2014
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2013	Oct. 17, 2014
High Speed Peak Power Meter	ML2495A	0824011	Jul. 29, 2013	Jul. 28, 2014
Power Sensor	MA2411B	0738171	Jul. 29, 2013	Jul. 28, 2014

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 3.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 988962.
5. The IC Site Registration No. is IC 7450F-3.

4.1.3 TEST PROCEDURES

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

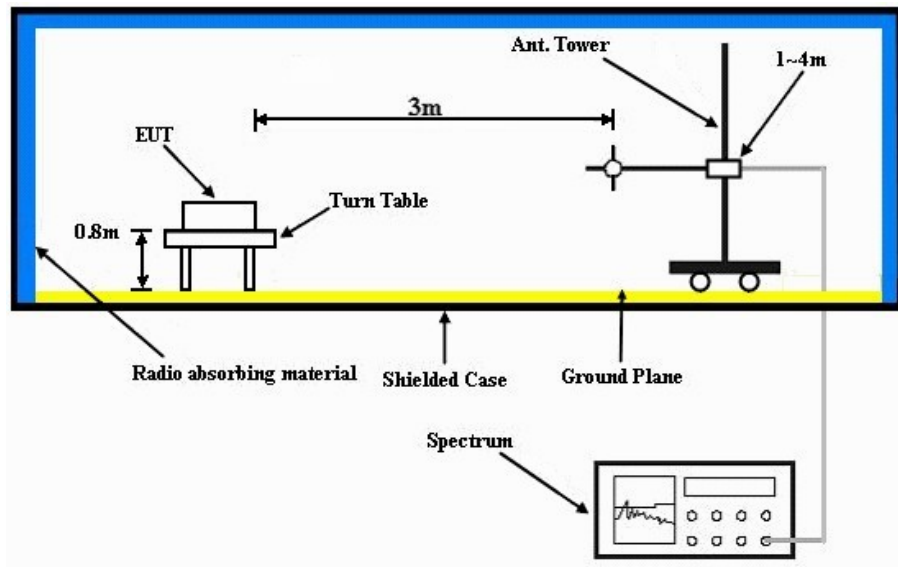
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution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

4.1.4 DEVIATION FROM TEST STANDARD

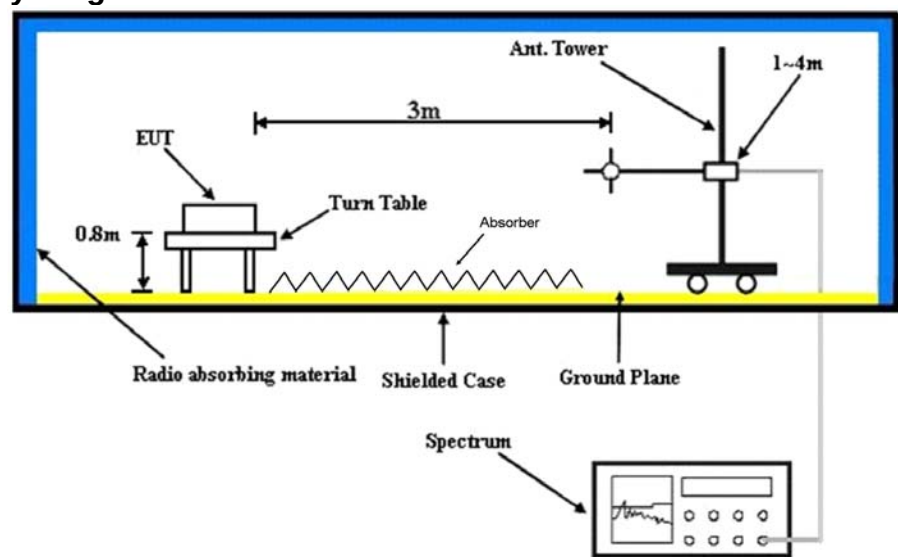
No deviation.

4.1.5 TEST SETUP

Frequency range 30MHz~1GHz



Frequency range above 1GHz



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

4.1.6 EUT OPERATING CONDITIONS

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



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4.1.7 TEST RESULTS

ABOVE 1GHz DATA :

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	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.7 PK	74.0	-16.3	1.23 H	358	26.70	31.00
2	2390.00	46.6 AV	54.0	-7.4	1.23 H	358	15.60	31.00
3	*2412.00	98.4 PK			1.17 H	209	67.30	31.10
4	*2412.00	94.6 AV			1.17 H	209	63.50	31.10
5	2500.00	56.4 PK	74.0	-17.6	1.16 H	5	24.90	31.50
6	2500.00	46.7 AV	54.0	-7.3	1.16 H	5	15.20	31.50
7	4824.00	48.5 PK	74.0	-25.5	1.30 H	91	43.60	4.90
8	4824.00	36.4 AV	54.0	-17.6	1.30 H	91	31.50	4.90
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	2390.00	61.3 PK	74.0	-12.7	1.04 V	195	30.30	31.00
2	2390.00	52.2 AV	54.0	-1.8	1.04 V	195	21.20	31.00
3	*2412.00	113.1 PK			1.00 V	100	82.00	31.10
4	*2412.00	109.8 AV			1.00 V	100	78.70	31.10
5	2500.00	60.7 PK	74.0	-13.3	1.01 V	157	29.20	31.50
6	2500.00	52.7 AV	54.0	-1.3	1.01 V	157	21.20	31.50
7	4824.00	50.9 PK	74.0	-23.1	1.13 V	162	46.00	4.90
8	4824.00	45.4 AV	54.0	-8.6	1.13 V	162	40.50	4.90

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)
– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



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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	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2357.00	55.4 PK	74.0	-18.6	1.09 H	351	24.50	30.90
2	2357.00	44.9 AV	54.0	-9.1	1.09 H	351	14.00	30.90
3	2390.00	54.0 PK	74.0	-20.0	1.00 H	312	23.00	31.00
4	2390.00	43.1 AV	54.0	-10.9	1.00 H	312	12.10	31.00
5	*2437.00	107.7 PK			1.00 H	313	76.50	31.20
6	*2437.00	104.0 AV			1.00 H	313	72.80	31.20
7	2483.50	56.4 PK	74.0	-17.6	1.03 H	315	25.00	31.40
8	2483.50	45.3 AV	54.0	-8.7	1.03 H	315	13.90	31.40
9	2500.00	60.5 PK	74.0	-13.5	1.00 H	190	29.00	31.50
10	2500.00	49.0 AV	54.0	-5.0	1.00 H	190	17.50	31.50
11	4874.00	53.7 PK	74.0	-20.3	1.23 H	11	48.70	5.00
12	4874.00	49.4 AV	54.0	-4.6	1.23 H	11	44.40	5.00
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	2357.00	61.3 PK	74.0	-12.7	1.04 V	189	30.40	30.90
2	2357.00	49.9 AV	54.0	-4.1	1.04 V	189	19.00	30.90
3	2390.00	62.5 PK	74.0	-11.5	1.10 V	192	31.50	31.00
4	2390.00	48.9 AV	54.0	-5.1	1.10 V	192	17.90	31.00
5	*2437.00	116.3 PK			1.00 V	311	85.10	31.20
6	*2437.00	112.5 AV			1.00 V	311	81.30	31.20
7	2483.50	59.3 PK	74.0	-14.7	1.00 V	181	27.90	31.40
8	2483.50	47.3 AV	54.0	-6.7	1.00 V	181	15.90	31.40
9	2500.00	62.5 PK	74.0	-11.5	1.00 V	170	31.00	31.50
10	2500.00	52.9 AV	54.0	-1.1	1.00 V	170	21.40	31.50
11	4874.00	52.8 PK	74.0	-21.2	1.00 V	142	47.80	5.00
12	4874.00	49.2 AV	54.0	-4.8	1.00 V	142	44.20	5.00

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)
– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



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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	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	102.4 PK			1.15 H	358	71.10	31.30
2	*2462.00	98.6 AV			1.15 H	358	67.30	31.30
3	2483.50	55.5 PK	74.0	-18.5	1.15 H	120	24.10	31.40
4	2483.50	44.7 AV	54.0	-9.3	1.15 H	120	13.30	31.40
5	2500.00	57.7 PK	74.0	-16.3	1.10 H	56	26.20	31.50
6	2500.00	46.6 AV	54.0	-7.4	1.10 H	56	15.10	31.50
7	4924.00	51.8 PK	74.0	-22.2	1.46 H	109	46.60	5.20
8	4924.00	46.7 AV	54.0	-7.3	1.46 H	109	41.50	5.20
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	113.7 PK			1.01 V	195	82.40	31.30
2	*2462.00	110.0 AV			1.01 V	195	78.70	31.30
3	2483.50	59.4 PK	74.0	-14.6	1.00 V	190	28.00	31.40
4	2483.50	48.8 AV	54.0	-5.2	1.00 V	190	17.40	31.40
5	2500.00	61.9 PK	74.0	-12.1	1.00 V	164	30.40	31.50
6	2500.00	53.0 AV	54.0	-1.0	1.00 V	164	21.50	31.50
7	4924.00	48.8 PK	74.0	-25.2	1.00 V	203	43.60	5.20
8	4924.00	40.7 AV	54.0	-13.3	1.00 V	203	35.50	5.20

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)
– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



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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	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.0 PK	74.0	-15.0	1.10 H	209	28.00	31.00
2	2390.00	47.9 AV	54.0	-6.1	1.10 H	209	16.90	31.00
3	*2412.00	106.0 PK			1.17 H	17	74.90	31.10
4	*2412.00	96.3 AV			1.17 H	17	65.20	31.10
5	2500.00	55.6 PK	74.0	-18.4	1.12 H	296	24.10	31.50
6	2500.00	44.5 AV	54.0	-9.5	1.12 H	296	13.00	31.50
7	4824.00	49.6 PK	74.0	-24.4	1.23 H	111	44.70	4.90
8	4824.00	36.6 AV	54.0	-17.4	1.23 H	111	31.70	4.90
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	2390.00	67.2 PK	74.0	-6.8	1.03 V	130	36.20	31.00
2	2390.00	52.6 AV	54.0	-1.4	1.03 V	130	21.60	31.00
3	*2412.00	116.0 PK			1.01 V	152	84.90	31.10
4	*2412.00	106.2 AV			1.01 V	152	75.10	31.10
5	2500.00	61.2 PK	74.0	-12.8	1.00 V	159	29.70	31.50
6	2500.00	53.0 AV	54.0	-1.0	1.00 V	159	21.50	31.50
7	4824.00	46.9 PK	74.0	-27.1	1.15 V	93	42.00	4.90
8	4824.00	33.9 AV	54.0	-20.1	1.15 V	93	29.00	4.90

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)
– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



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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	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.6 PK	74.0	-16.4	1.05 H	203	26.60	31.00
2	2390.00	46.2 AV	54.0	-7.8	1.05 H	203	15.20	31.00
3	*2437.00	107.9 PK			1.17 H	9	76.70	31.20
4	*2437.00	99.8 AV			1.17 H	9	68.60	31.20
5	2500.00	58.6 PK	74.0	-15.4	1.08 H	192	27.10	31.50
6	2500.00	48.0 AV	54.0	-6.0	1.08 H	192	16.50	31.50
7	4874.00	50.0 PK	74.0	-24.0	1.25 H	305	45.00	5.00
8	4874.00	36.0 AV	54.0	-18.0	1.25 H	305	31.00	5.00
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	2390.00	60.6 PK	74.0	-13.4	1.25 V	183	29.60	31.00
2	2390.00	49.1 AV	54.0	-4.9	1.25 V	183	18.10	31.00
3	*2437.00	117.9 PK			1.00 V	169	86.70	31.20
4	*2437.00	108.8 AV			1.00 V	169	77.60	31.20
5	2500.00	62.6 PK	74.0	-11.4	1.01 V	172	31.10	31.50
6	2500.00	52.9 AV	54.0	-1.1	1.01 V	172	21.40	31.50
7	4874.00	47.0 PK	74.0	-27.0	1.33 V	225	42.00	5.00
8	4874.00	33.5 AV	54.0	-20.5	1.33 V	225	28.50	5.00

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)
– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



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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	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	102.6 PK			1.12 H	3	71.30	31.30
2	*2462.00	93.1 AV			1.12 H	3	61.80	31.30
3	2483.50	60.4 PK	74.0	-13.6	1.15 H	281	29.00	31.40
4	2483.50	49.8 AV	54.0	-4.2	1.15 H	281	18.40	31.40
5	2500.00	58.2 PK	74.0	-15.8	1.15 H	277	26.70	31.50
6	2500.00	46.9 AV	54.0	-7.1	1.15 H	277	15.40	31.50
7	4924.00	49.7 PK	74.0	-24.3	1.23 H	111	44.50	5.20
8	4924.00	36.1 AV	54.0	-17.9	1.23 H	111	30.90	5.20
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	112.6 PK			1.00 V	153	81.30	31.30
2	*2462.00	103.1 AV			1.00 V	153	71.80	31.30
3	2483.50	64.4 PK	74.0	-9.6	1.00 V	181	33.00	31.40
4	2483.50	52.6 AV	54.0	-1.4	1.00 V	181	21.20	31.40
5	2500.00	61.2 PK	74.0	-12.8	1.00 V	170	29.70	31.50
6	2500.00	52.1 AV	54.0	-1.9	1.00 V	170	20.60	31.50
7	4924.00	47.7 PK	74.0	-26.3	1.33 V	65	42.50	5.20
8	4924.00	33.8 AV	54.0	-20.2	1.33 V	65	28.60	5.20

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)
– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



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802.11n (HT20)

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	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.8 PK	74.0	-15.2	1.21 H	186	27.80	31.00
2	2390.00	47.4 AV	54.0	-6.6	1.21 H	186	16.40	31.00
3	*2412.00	103.5 PK			1.24 H	151	72.40	31.10
4	*2412.00	94.2 AV			1.24 H	151	63.10	31.10
5	2500.00	56.6 PK	74.0	-17.4	1.15 H	239	25.10	31.50
6	2500.00	45.7 AV	54.0	-8.3	1.15 H	239	14.20	31.50
7	4824.00	48.5 PK	74.0	-25.5	1.25 H	48	43.60	4.90
8	4824.00	35.4 AV	54.0	-18.6	1.25 H	48	30.50	4.90
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	2390.00	64.0 PK	74.0	-10.0	1.25 V	172	33.00	31.00
2	2390.00	52.6 AV	54.0	-1.4	1.25 V	172	21.60	31.00
3	*2412.00	112.3 PK			1.01 V	169	81.20	31.10
4	*2412.00	103.4 AV			1.01 V	169	72.30	31.10
5	2500.00	60.3 PK	74.0	-13.7	1.00 V	166	28.80	31.50
6	2500.00	52.0 AV	54.0	-2.0	1.00 V	166	20.50	31.50
7	4824.00	47.5 PK	74.0	-26.5	1.33 V	148	42.60	4.90
8	4824.00	33.3 AV	54.0	-20.7	1.33 V	148	28.40	4.90

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)
– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



A D T

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	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.9 PK	74.0	-18.1	1.14 H	0	24.90	31.00
2	2390.00	44.4 AV	54.0	-9.6	1.14 H	0	13.40	31.00
3	*2437.00	106.8 PK			1.15 H	132	75.60	31.20
4	*2437.00	96.8 AV			1.15 H	132	65.60	31.20
5	2483.50	57.2 PK	74.0	-16.8	1.11 H	305	25.80	31.40
6	2483.50	45.9 AV	54.0	-8.1	1.11 H	305	14.50	31.40
7	2500.00	56.1 PK	74.0	-17.9	1.16 H	133	24.60	31.50
8	2500.00	45.0 AV	54.0	-9.0	1.16 H	133	13.50	31.50
9	4874.00	48.8 PK	74.0	-25.2	1.20 H	6	43.80	5.00
10	4874.00	35.6 AV	54.0	-18.4	1.20 H	6	30.60	5.00
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	2390.00	58.8 PK	74.0	-15.2	1.26 V	188	27.80	31.00
2	2390.00	47.9 AV	54.0	-6.1	1.26 V	188	16.90	31.00
3	*2437.00	116.3 PK			1.00 V	169	85.10	31.20
4	*2437.00	106.6 AV			1.00 V	169	75.40	31.20
5	2483.50	58.1 PK	74.0	-15.9	1.00 V	177	26.70	31.40
6	2483.50	47.1 AV	54.0	-6.9	1.00 V	177	15.70	31.40
7	2500.00	61.3 PK	74.0	-12.7	1.00 V	172	29.80	31.50
8	2500.00	52.9 AV	54.0	-1.1	1.00 V	172	21.40	31.50
9	4874.00	46.6 PK	74.0	-27.4	1.07 V	45	41.60	5.00
10	4874.00	33.4 AV	54.0	-20.6	1.07 V	45	28.40	5.00

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)
– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



A D T

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	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	103.3 PK			1.21 H	188	72.00	31.30
2	*2462.00	94.2 AV			1.21 H	188	62.90	31.30
3	2483.50	58.4 PK	74.0	-15.6	1.12 H	178	27.00	31.40
4	2483.50	47.9 AV	54.0	-6.1	1.12 H	178	16.50	31.40
5	2500.00	59.6 PK	74.0	-14.4	1.11 H	180	28.10	31.50
6	2500.00	49.4 AV	54.0	-4.6	1.11 H	180	17.90	31.50
7	4924.00	49.3 PK	74.0	-24.7	1.25 H	308	44.10	5.20
8	4924.00	35.8 AV	54.0	-18.2	1.25 H	308	30.60	5.20
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	113.3 PK			1.01 V	168	82.00	31.30
2	*2462.00	104.2 AV			1.01 V	168	72.90	31.30
3	2483.50	64.6 PK	74.0	-9.4	1.00 V	178	33.20	31.40
4	2483.50	53.0 AV	54.0	-1.0	1.00 V	178	21.60	31.40
5	2500.00	61.6 PK	74.0	-12.4	1.00 V	170	30.10	31.50
6	2500.00	52.4 AV	54.0	-1.6	1.00 V	170	20.90	31.50
7	4924.00	47.7 PK	74.0	-26.3	1.30 V	258	42.50	5.20
8	4924.00	33.6 AV	54.0	-20.4	1.30 V	258	28.40	5.20

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)
– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



A D T

802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	22.9 PK	74.0	-51.1	1.20 H	151	25.30	-2.40
2	2390.00	12.6 AV	54.0	-41.4	1.20 H	151	15.00	-2.40
3	*2422.00	98.6 PK			1.20 H	148	67.40	31.20
4	*2422.00	89.5 AV			1.20 H	148	58.30	31.20
5	2500.00	55.5 PK	74.0	-18.5	1.18 H	149	24.00	31.50
6	2500.00	45.6 AV	54.0	-8.4	1.18 H	149	14.10	31.50
7	4844.00	47.9 PK	74.0	-26.1	1.26 H	30	42.90	5.00
8	4844.00	34.7 AV	54.0	-19.3	1.26 H	30	29.70	5.00
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	2390.00	65.1 PK	74.0	-8.9	1.02 V	186	34.10	31.00
2	2390.00	52.4 AV	54.0	-1.6	1.02 V	186	21.40	31.00
3	*2422.00	107.6 PK			1.02 V	170	76.40	31.20
4	*2422.00	98.2 AV			1.02 V	170	67.00	31.20
5	2500.00	59.3 PK	74.0	-14.7	1.00 V	166	27.80	31.50
6	2500.00	51.3 AV	54.0	-2.7	1.00 V	166	19.80	31.50
7	4844.00	46.6 PK	74.0	-27.4	1.14 V	87	41.60	5.00
8	4844.00	33.6 AV	54.0	-20.4	1.14 V	87	28.60	5.00

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)
– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



A D T

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	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.4 PK	74.0	-15.6	1.16 H	149	27.40	31.00
2	2390.00	47.8 AV	54.0	-6.2	1.16 H	149	16.80	31.00
3	*2437.00	102.9 PK			1.15 H	133	71.70	31.20
4	*2437.00	93.2 AV			1.15 H	133	62.00	31.20
5	2483.50	57.4 PK	74.0	-16.6	1.13 H	140	26.00	31.40
6	2483.50	46.7 AV	54.0	-7.3	1.13 H	140	15.30	31.40
7	2500.00	57.6 PK	74.0	-16.4	1.20 H	189	26.10	31.50
8	2500.00	47.2 AV	54.0	-6.8	1.20 H	189	15.70	31.50
9	4874.00	48.7 PK	74.0	-25.3	1.20 H	359	43.70	5.00
10	4874.00	35.8 AV	54.0	-18.2	1.20 H	359	30.80	5.00
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	2390.00	65.1 PK	74.0	-8.9	1.26 V	182	34.10	31.00
2	2390.00	53.0 AV	54.0	-1.0	1.26 V	182	22.00	31.00
3	*2437.00	114.1 PK			1.00 V	166	82.90	31.20
4	*2437.00	104.4 AV			1.00 V	166	73.20	31.20
5	2483.50	64.6 PK	74.0	-9.4	1.00 V	177	33.20	31.40
6	2483.50	51.8 AV	54.0	-2.2	1.00 V	177	20.40	31.40
7	2500.00	62.4 PK	74.0	-11.6	1.00 V	170	30.90	31.50
8	2500.00	52.6 AV	54.0	-1.4	1.00 V	170	21.10	31.50
9	4874.00	48.1 PK	74.0	-25.9	1.29 V	269	43.10	5.00
10	4874.00	34.6 AV	54.0	-19.4	1.29 V	269	29.60	5.00

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)
– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



A D T

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	100.0 PK			1.16 H	145	68.70	31.30
2	*2452.00	90.8 AV			1.16 H	145	59.50	31.30
3	2483.50	59.9 PK	74.0	-14.1	1.16 H	144	28.50	31.40
4	2483.50	49.2 AV	54.0	-4.8	1.16 H	144	17.80	31.40
5	2500.00	59.7 PK	74.0	-14.3	1.15 H	139	28.20	31.50
6	2500.00	48.7 AV	54.0	-5.3	1.15 H	139	17.20	31.50
7	4904.00	47.6 PK	74.0	-26.4	1.23 H	8	42.50	5.10
8	4904.00	34.5 AV	54.0	-19.5	1.23 H	8	29.40	5.10
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	*2452.00	109.8 PK			1.00 V	169	78.50	31.30
2	*2452.00	100.9 AV			1.00 V	169	69.60	31.30
3	2483.50	66.7 PK	74.0	-7.3	1.00 V	180	35.30	31.40
4	2483.50	53.0 AV	54.0	-1.0	1.00 V	180	21.60	31.40
5	2500.00	63.0 PK	74.0	-11.0	1.00 V	169	31.50	31.50
6	2500.00	52.5 AV	54.0	-1.5	1.00 V	169	21.00	31.50
7	4904.00	47.0 PK	74.0	-27.0	1.33 V	208	41.90	5.10
8	4904.00	33.2 AV	54.0	-20.8	1.33 V	208	28.10	5.10

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)
– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



A D T

BELOW 1GHz WORST-CASE DATA : 802.11n (HT20)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	57.12	32.0 QP	40.0	-8.0	2.00 H	67	46.60	-14.60
2	103.78	26.9 QP	43.5	-16.6	2.00 H	101	45.00	-18.10
3	140.72	29.5 QP	43.5	-14.0	2.00 H	244	43.90	-14.40
4	284.60	33.1 QP	46.0	-12.9	1.00 H	211	45.70	-12.60
5	393.48	28.9 QP	46.0	-17.1	2.00 H	346	39.40	-10.50
6	776.51	29.3 QP	46.0	-16.7	2.00 H	137	31.70	-2.40
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	41.57	34.8 QP	40.0	-5.2	1.00 V	12	38.10	-3.30
2	57.12	35.2 QP	40.0	-4.8	1.50 V	13	38.40	-3.20
3	88.23	38.0 QP	43.5	-5.5	1.00 V	88	41.00	-3.00
4	218.50	36.9 QP	46.0	-9.1	1.00 V	12	38.60	-1.70
5	284.60	37.7 QP	46.0	-8.3	1.50 V	86	38.90	-1.20
6	512.08	36.5 QP	46.0	-9.5	1.00 V	216	38.10	-1.60

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)
– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

4.2 CONDUCTED EMISSION MEASUREMENT

4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (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	100288	Apr. 24, 2014	Apr. 23, 2015
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 27, 2013	Dec. 26, 2014
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Dec. 23, 2013	Dec. 22, 2014
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 08, 2013	Jul. 07, 2014
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

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

4.2.3 TEST PROCEDURES

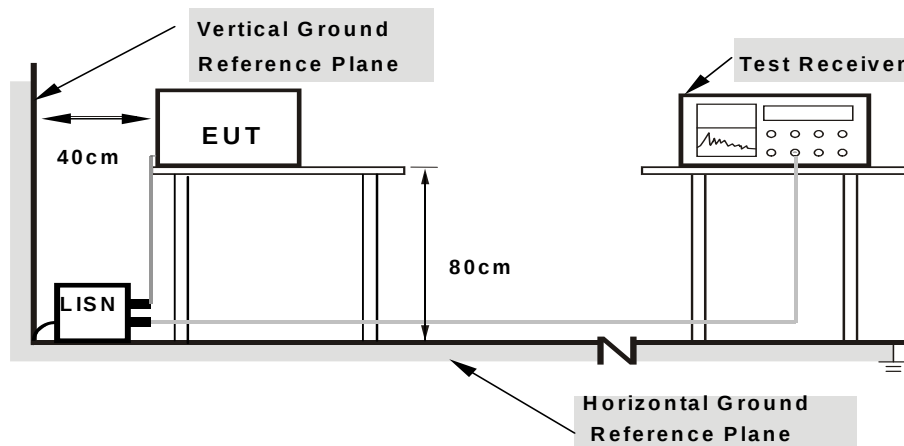
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- 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:**
- Support units were connected to second LISN.
 - 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

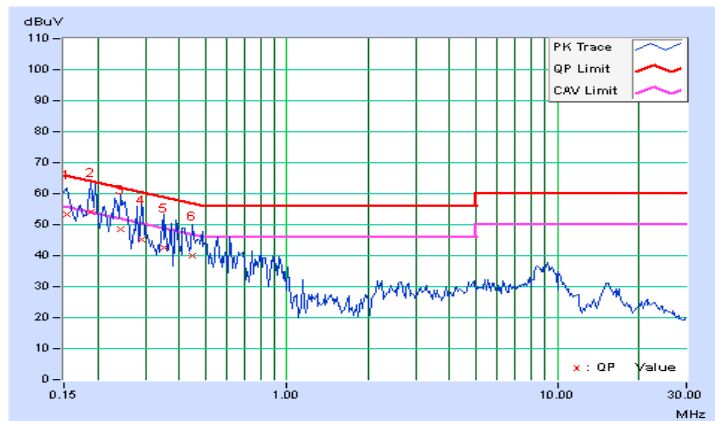
CONDUCTED WORST-CASE DATA : 802.11n (HT20)

PHASE	Line 1	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	0.27	52.96	37.38	53.23	37.65	65.79	55.79	-12.56	-18.14
2	0.18906	0.28	53.73	33.46	54.01	33.74	64.08	54.08	-10.07	-20.34
3	0.24375	0.28	48.17	31.79	48.45	32.07	61.97	51.97	-13.51	-19.89
4	0.29063	0.29	45.00	30.40	45.29	30.69	60.51	50.51	-15.22	-19.82
5	0.34922	0.29	42.23	25.35	42.52	25.64	58.98	48.98	-16.46	-23.34
6	0.44688	0.30	39.83	27.99	40.13	28.29	56.93	46.93	-16.80	-18.64

REMARKS:

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

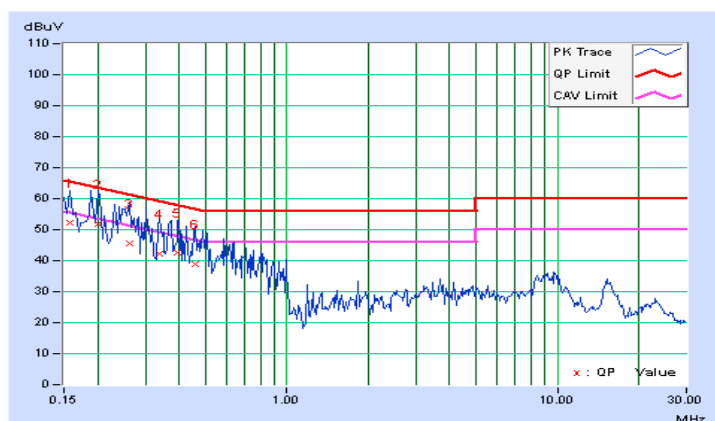


PHASE	Line 2	6dB BANDWIDTH	9kHz
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No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	0.27	51.93	35.07	52.20	35.34	65.58	55.58	-13.38	-20.24
2	0.20078	0.28	51.55	33.44	51.83	33.72	63.58	53.58	-11.75	-19.86
3	0.26328	0.29	45.39	28.03	45.68	28.32	61.33	51.33	-15.65	-23.01
4	0.33750	0.29	41.75	26.50	42.04	26.79	59.26	49.26	-17.22	-22.47
5	0.39609	0.30	42.16	27.04	42.46	27.34	57.93	47.93	-15.48	-20.60
6	0.45859	0.30	38.49	29.00	38.79	29.30	56.72	46.72	-17.92	-17.41

REMARKS:

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

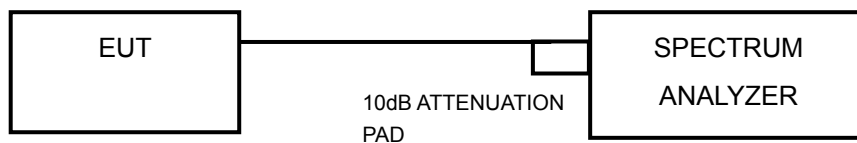


4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST SETUP



4.3.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.3.4 TEST PROCEDURE

558074 D01 DTS Meas Guidance v03r02 section 8.1

- Set RBW = 100 kHz.
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

4.3.5 DEVIATION FROM TEST STANDARD

No deviation.

4.3.6 EUT OPERATING CONDITIONS

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

4.3.7 TEST RESULTS

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	8.09	8.09	8.08	0.5	PASS
6	2437	8.09	8.08	8.08	0.5	PASS
11	2462	8.07	8.55	8.07	0.5	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	16.40	16.43	16.40	0.5	PASS
6	2437	16.42	15.47	16.42	0.5	PASS
11	2462	16.39	16.42	16.49	0.5	PASS

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	17.59	17.65	17.61	0.5	PASS
6	2437	17.61	16.57	15.15	0.5	PASS
11	2462	17.58	17.63	17.64	0.5	PASS

802.11n (HT40)

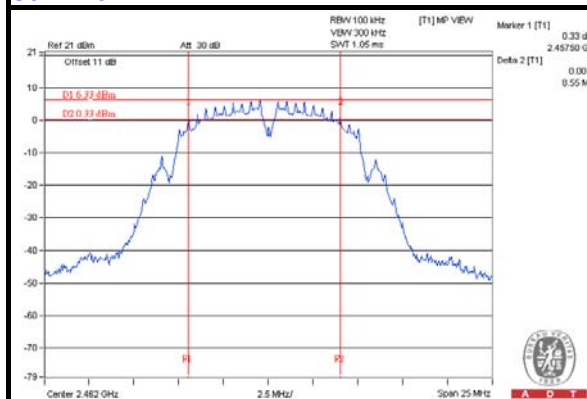
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
3	2422	36.40	36.41	36.14	0.5	PASS
6	2437	36.35	36.38	36.23	0.5	PASS
9	2452	36.39	36.39	35.61	0.5	PASS



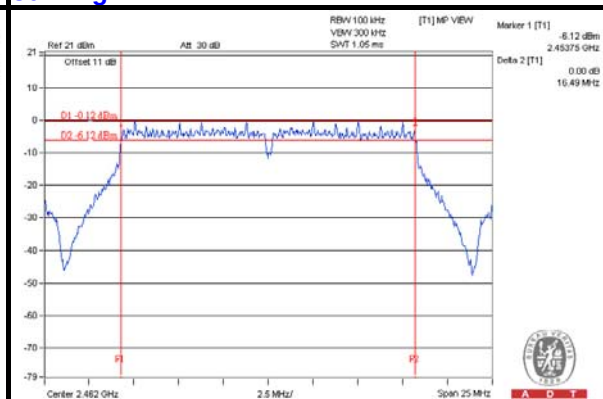
A D T

SPECTRUM PLOT OF WORST VALUE

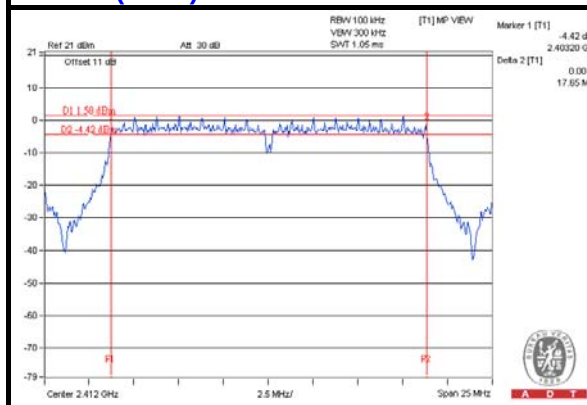
802.11b



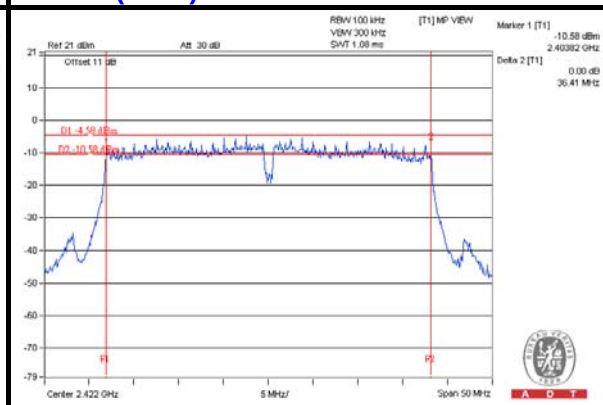
802.11g



802.11n (HT20)



802.11n (HT40)



4.4 CONDUCTED OUTPUT POWER

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

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

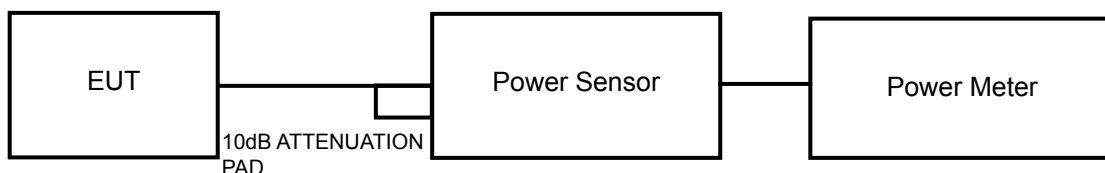
Array Gain = 0 dB (i.e., no array gain) for $NANT \leq 4$;

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

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

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

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.4.4 TEST PROCEDURES

558074 D01 DTS Meas Guidance v03r02 section 9.2.3.2

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

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.

4.4.7 TEST RESULTS

FOR AVERAGE POWER

802.11b

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	17.11	17.61	16.95	158.626	22.00	30	PASS
6	2437	19.96	20.07	19.22	284.268	24.54	30	PASS
11	2462	17.87	18.05	17.17	177.180	22.48	30	PASS

802.11g

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	15.51	15.71	15.11	105.236	20.22	30	PASS
6	2437	21.59	21.71	21.21	424.594	26.28	30	PASS
11	2462	11.17	12.31	12.22	46.786	16.70	30	PASS

802.11n (HT20)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	12.54	13.52	12.81	59.537	17.75	30	PASS
6	2437	22.53	22.61	22.14	525.133	27.20	30	PASS
11	2462	12.74	13.66	13.19	62.865	17.98	30	PASS

802.11n (HT40)

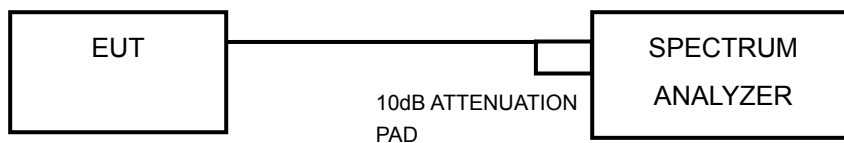
CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
3	2422	7.85	9.99	9.69	25.383	14.05	30	PASS
6	2437	14.31	15.34	14.72	90.823	19.58	30	PASS
9	2452	10.39	12.61	12.53	47.085	16.73	30	PASS

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST SETUP



4.5.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.5.4 TEST PROCEDURE

558074 D01 DTS Meas Guidance v03r02 section 10.3

- Set instrument center frequency to DTS channel center frequency.
- Set span to at least 1.5 times the OBW.
- Set RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set VBW $\geq 3 \times \text{RBW}$.
- Detector = power averaging (RMS) or sample detector (when RMS not available).
- Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span/RBW}$.
- Sweep time = auto couple.
- Employ trace averaging (RMS) mode over a minimum of 100 traces.
- Use the peak marker function to determine the maximum amplitude level.

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6.

4.5.7 TEST RESULTS

802.11b

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-16.83	4.77	-12.06	8	PASS
	6	2437	-11.40	4.77	-6.63	8	PASS
	11	2462	-15.75	4.77	-10.98	8	PASS
1	1	2412	-16.04	4.77	-11.27	8	PASS
	6	2437	-13.14	4.77	-8.37	8	PASS
	11	2462	-17.44	4.77	-12.67	8	PASS
2	1	2412	-17.54	4.77	-12.77	8	PASS
	6	2437	-14.00	4.77	-9.23	8	PASS
	11	2462	-17.89	4.77	-13.12	8	PASS

NOTE: Directional gain = 0.6dBi + 10log(3) = 5.37dBi < 6dBi, so the limit no need to reduced.

802.11g

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-20.15	4.77	-15.38	8	PASS
	6	2437	-17.33	4.77	-12.56	8	PASS
	11	2462	-24.35	4.77	-19.58	8	PASS
1	1	2412	-19.27	4.77	-14.50	8	PASS
	6	2437	-17.28	4.77	-12.51	8	PASS
	11	2462	-22.74	4.77	-17.97	8	PASS
2	1	2412	-19.76	4.77	-14.99	8	PASS
	6	2437	-17.16	4.77	-12.39	8	PASS
	11	2462	-23.19	4.77	-18.42	8	PASS

NOTE: Directional gain = 0.6dBi + 10log(3) = 5.37dBi < 6dBi, so the limit no need to reduced.

802.11n (HT20)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-22.94	4.77	-18.17	8	PASS
	6	2437	-19.07	4.77	-14.30	8	PASS
	11	2462	-22.54	4.77	-17.77	8	PASS
1	1	2412	-21.44	4.77	-16.67	8	PASS
	6	2437	-19.39	4.77	-14.62	8	PASS
	11	2462	-21.84	4.77	-17.07	8	PASS
2	1	2412	-22.13	4.77	-17.36	8	PASS
	6	2437	-19.78	4.77	-15.01	8	PASS
	11	2462	-22.12	4.77	-17.35	8	PASS

NOTE: Directional gain = 0.6dBi + 10log(3) = 5.37dBi < 6dBi, so the limit no need to reduced.

802.11n (HT40)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD without Duty Factor (dBm/3kHz)	Duty Factor	Total PSD with Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	3	2422	-28.98	4.77	-24.21	0.17	-24.04	8	PASS
	6	2437	-22.70	4.77	-17.93	0.17	-17.76	8	PASS
	9	2452	-26.23	4.77	-21.46	0.17	-21.29	8	PASS
1	3	2422	-26.83	4.77	-22.06	0.17	-21.89	8	PASS
	6	2437	-20.71	4.77	-15.94	0.17	-15.77	8	PASS
	9	2452	-24.42	4.77	-19.65	0.17	-19.48	8	PASS
2	3	2422	-27.05	4.77	-22.28	0.17	-22.11	8	PASS
	6	2437	-21.80	4.77	-17.03	0.17	-16.86	8	PASS
	9	2452	-24.48	4.77	-19.71	0.17	-19.54	8	PASS

NOTE:

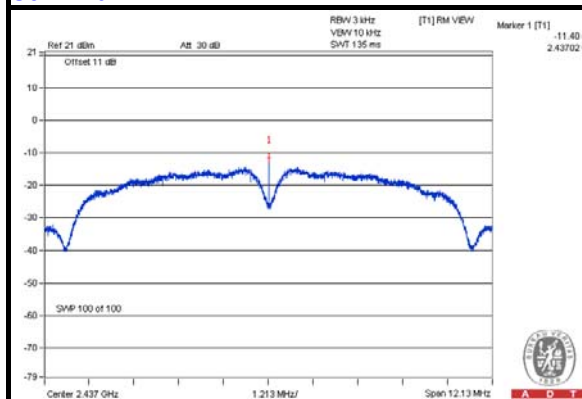
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 0.6dBi + 10log(3) = 5.37dBi < 6dBi, so the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.



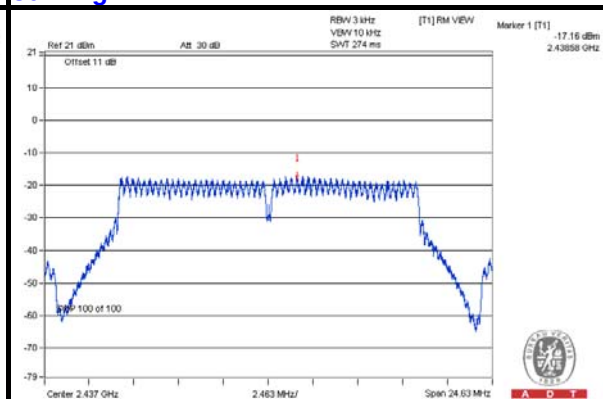
A D T

SPECTRUM PLOT OF WORST VALUE

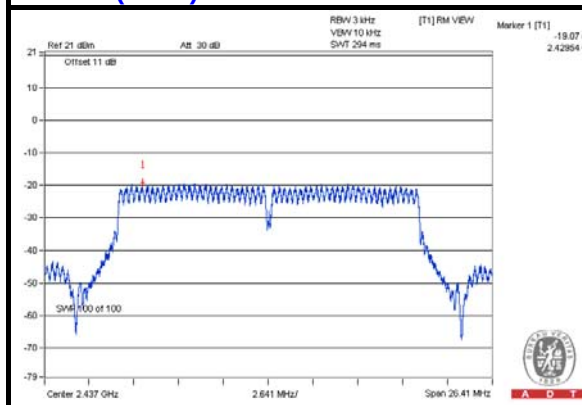
802.11b



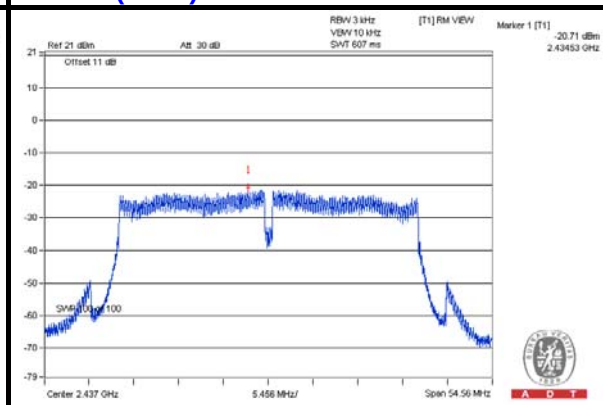
802.11g



802.11n (HT20)



802.11n (HT40)

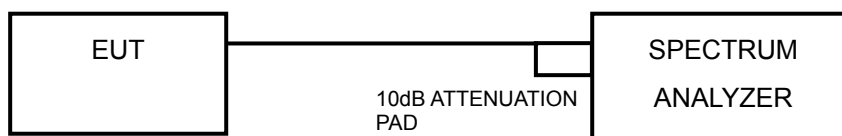


4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

Below -30dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 TEST SETUP



4.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.6.4 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

558074 D01 DTS Meas Guidance v03r02 section 11.2

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

MEASUREMENT PROCEDURE OOB

558074 D01 DTS Meas Guidance v03r02 section 11.3

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

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.6.7 TEST RESULTS

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

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

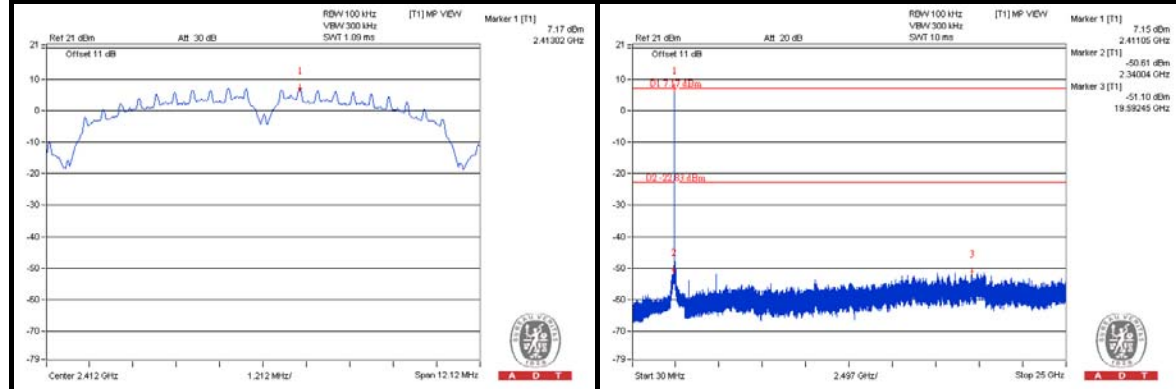


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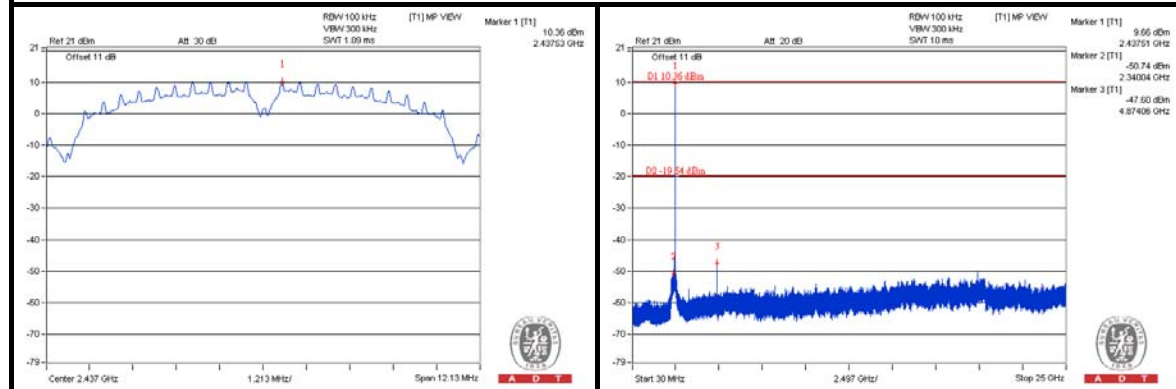
802.11b

CHAIN 0

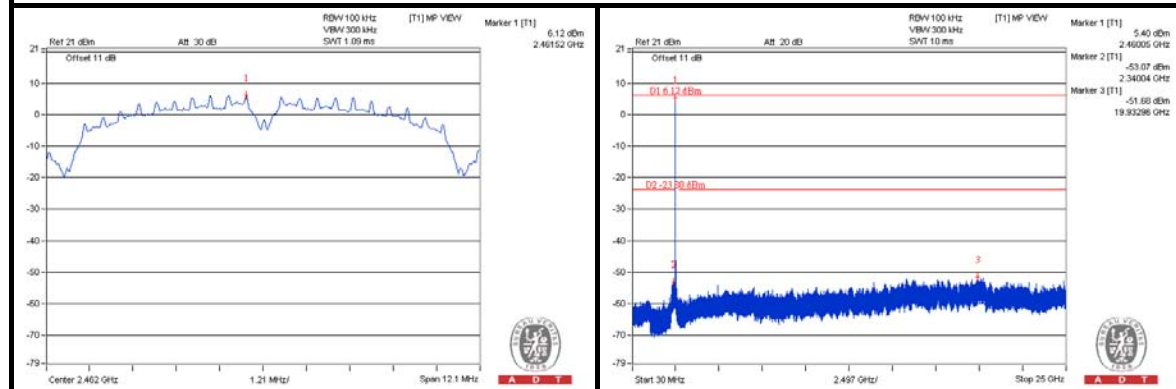
CH 1



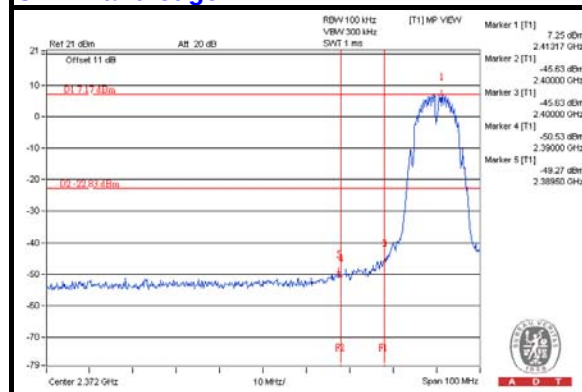
CH 6



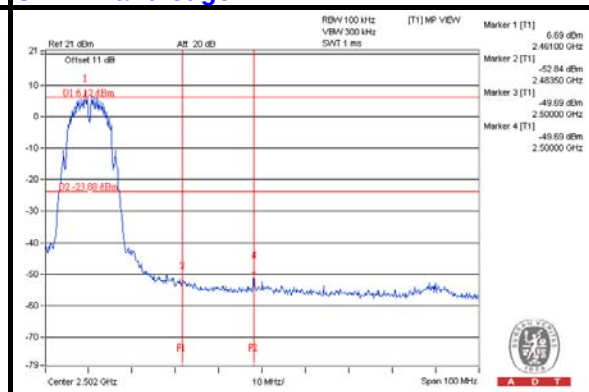
CH 11



CH 1 Band edge



CH 11 Band edge

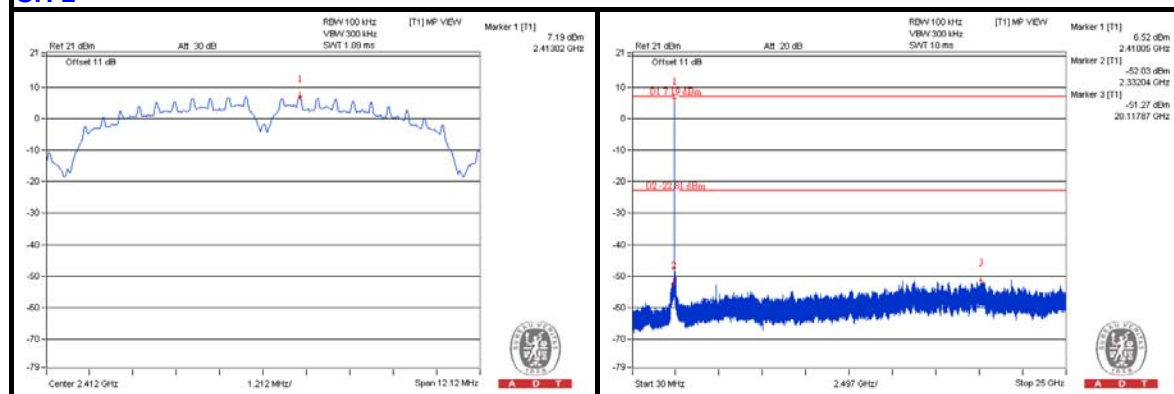




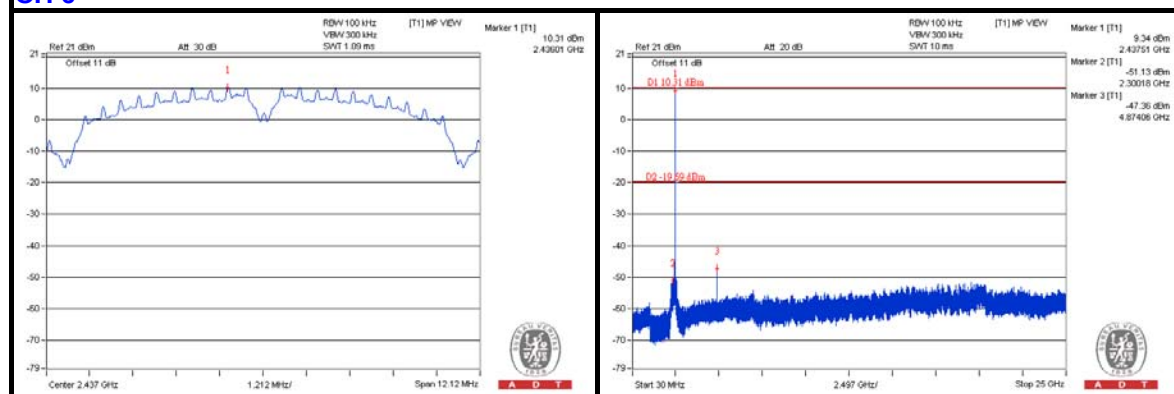
A D T

CHAIN 1

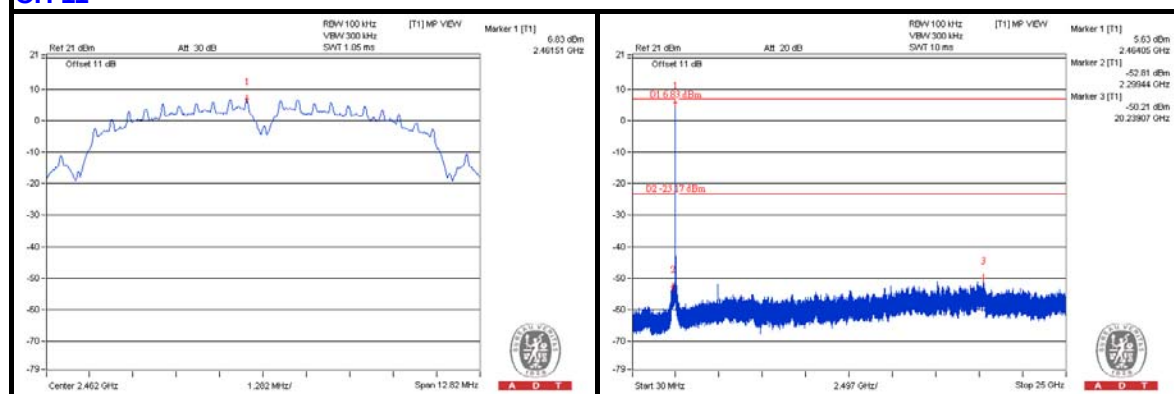
CH 1



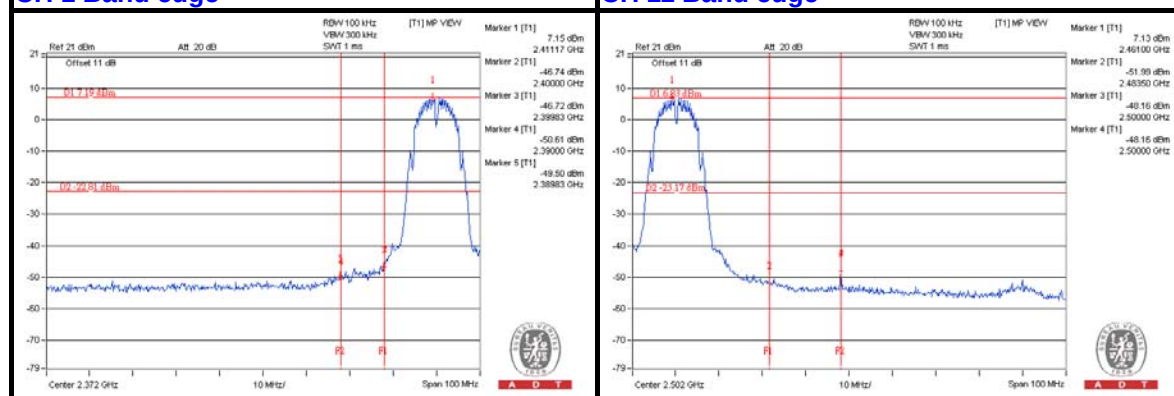
CH 6



CH 11



CH 1 Band edge

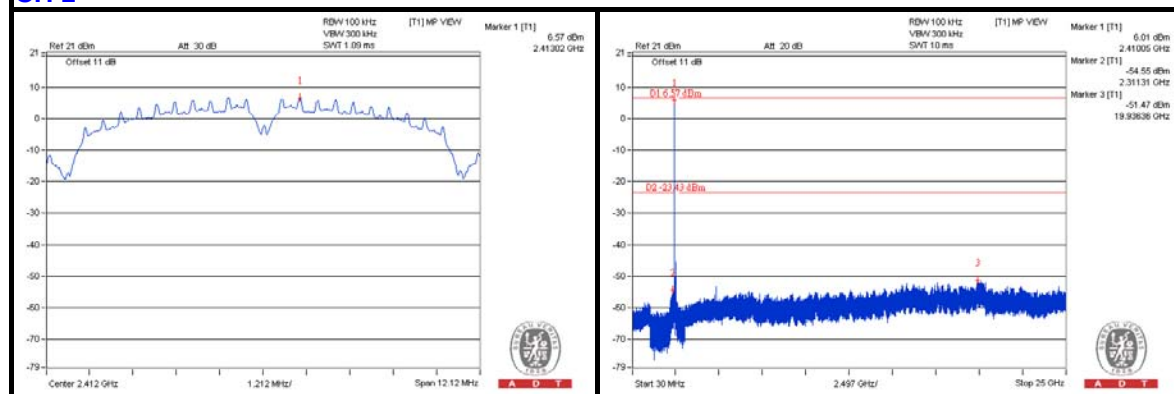




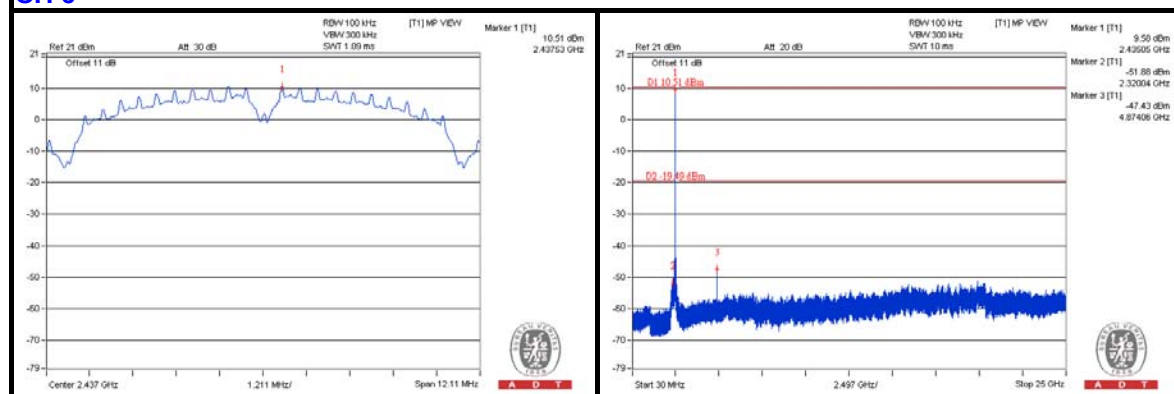
A D T

CHAIN 2

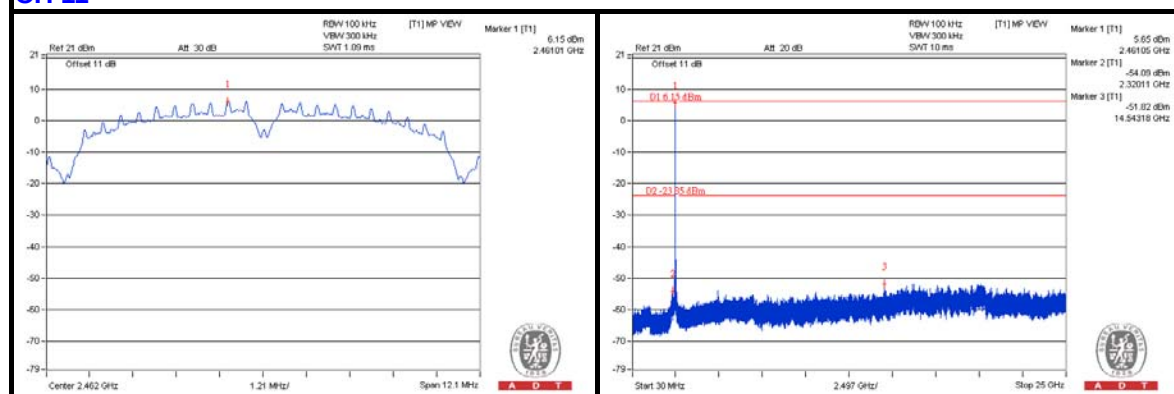
CH 1



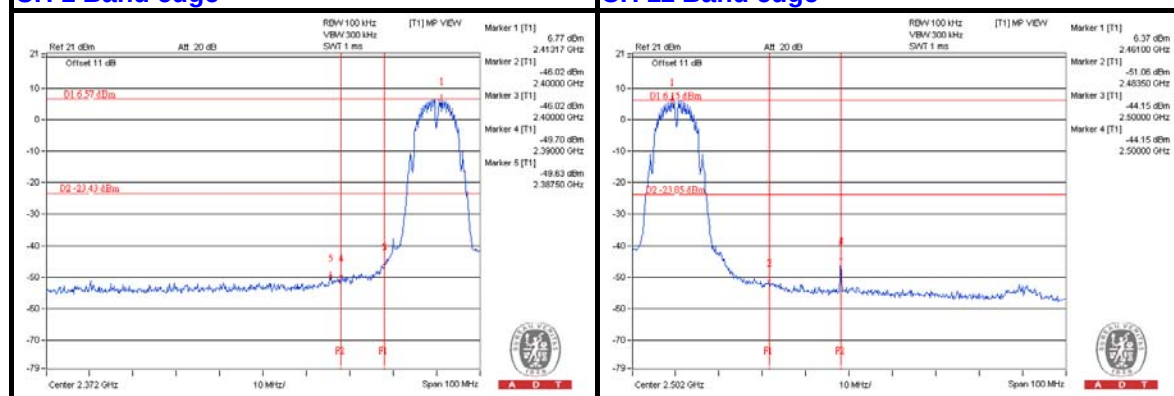
CH 6



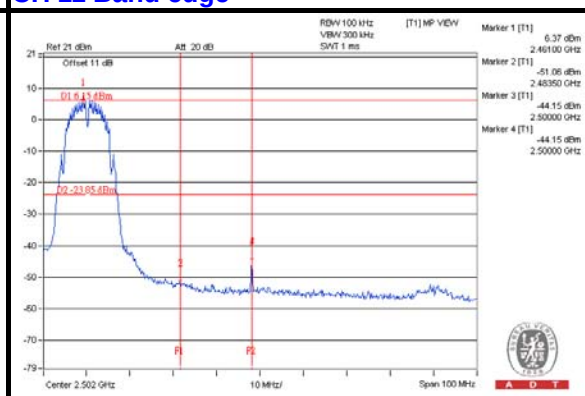
CH 11



CH 1 Band edge



CH 11 Band edge

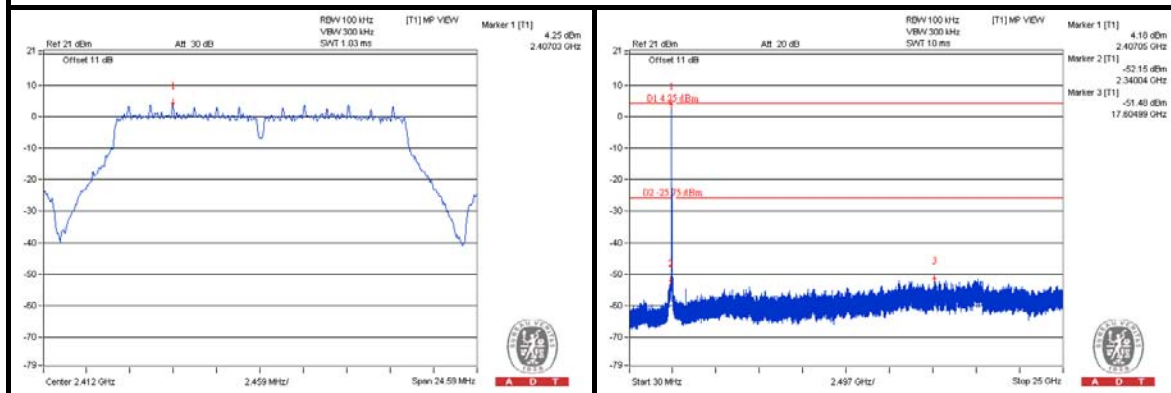




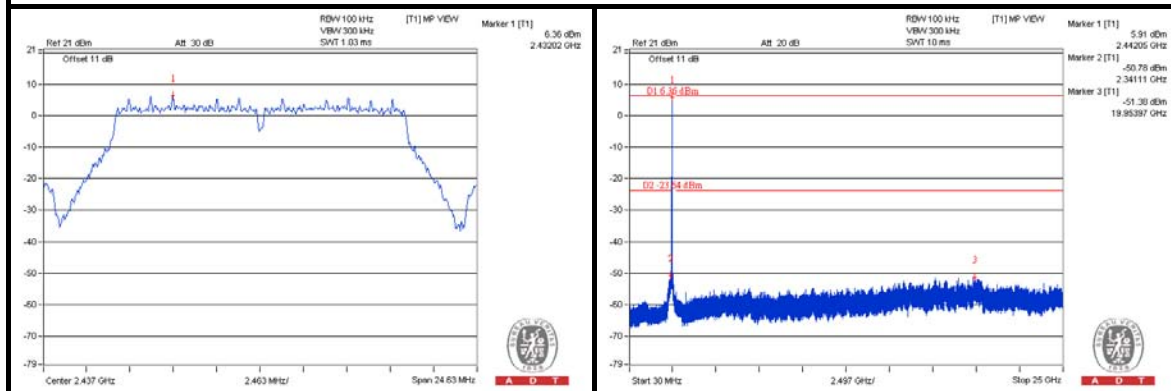
A D T

802.11g CHAIN 0

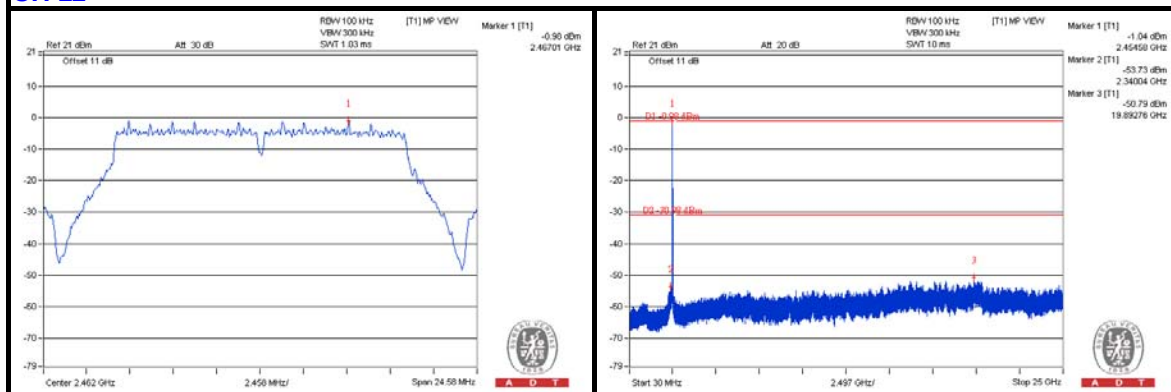
CH 1



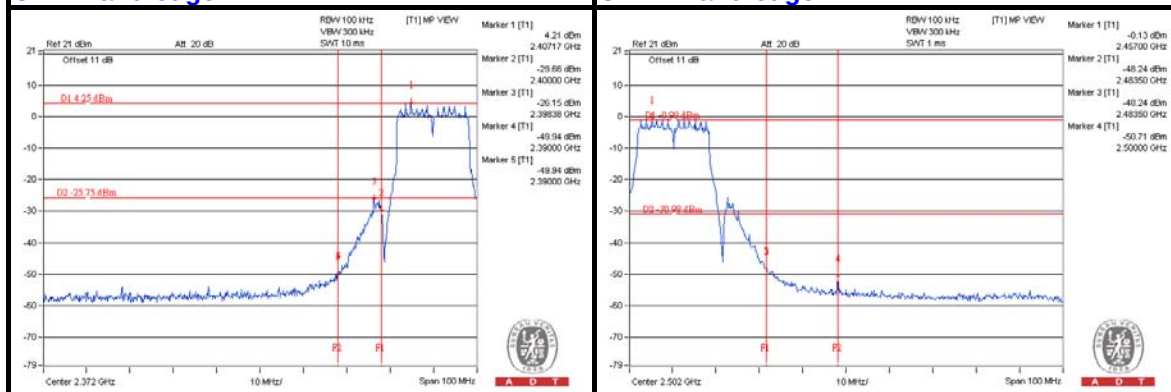
CH 6



CH 11



CH 1 Band edge

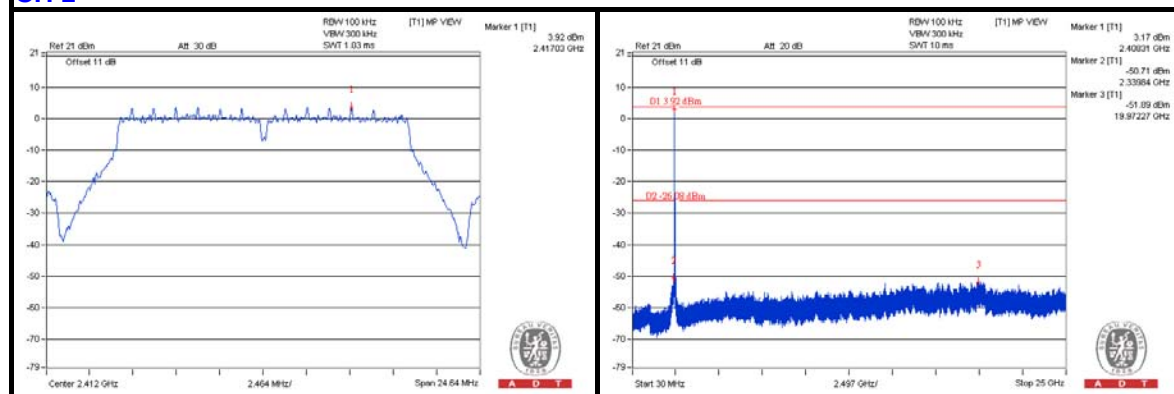




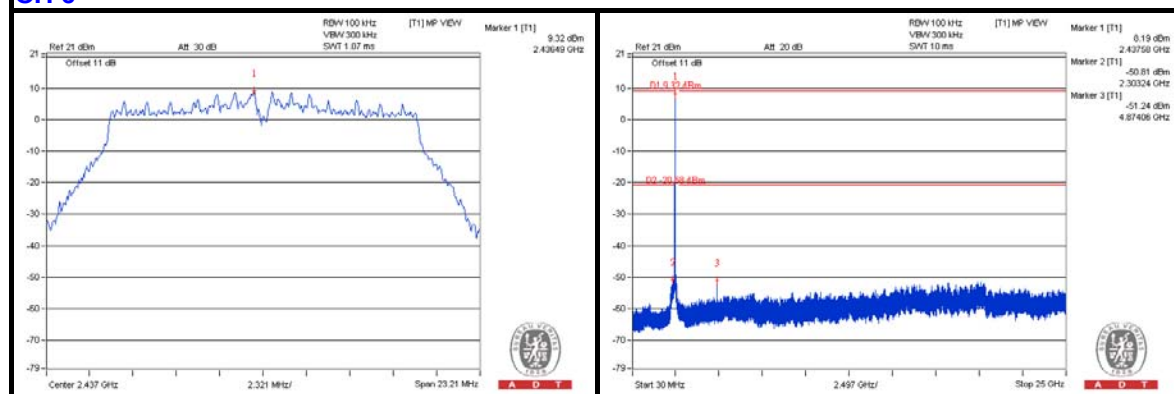
A D T

CHAIN 1

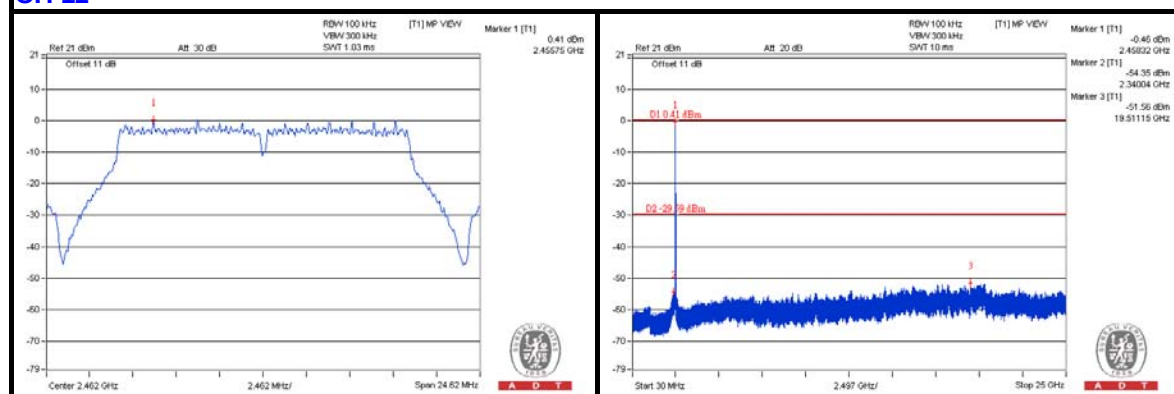
CH 1



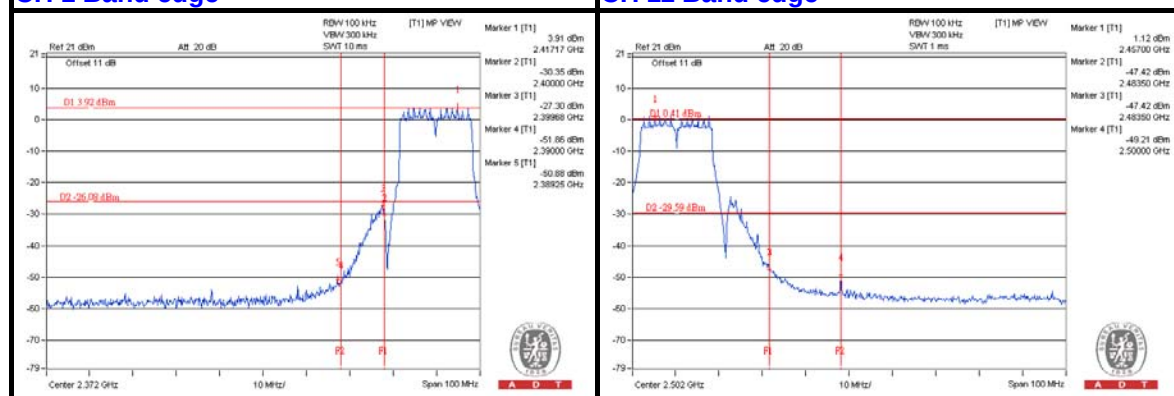
CH 6



CH 11



CH 1 Band edge

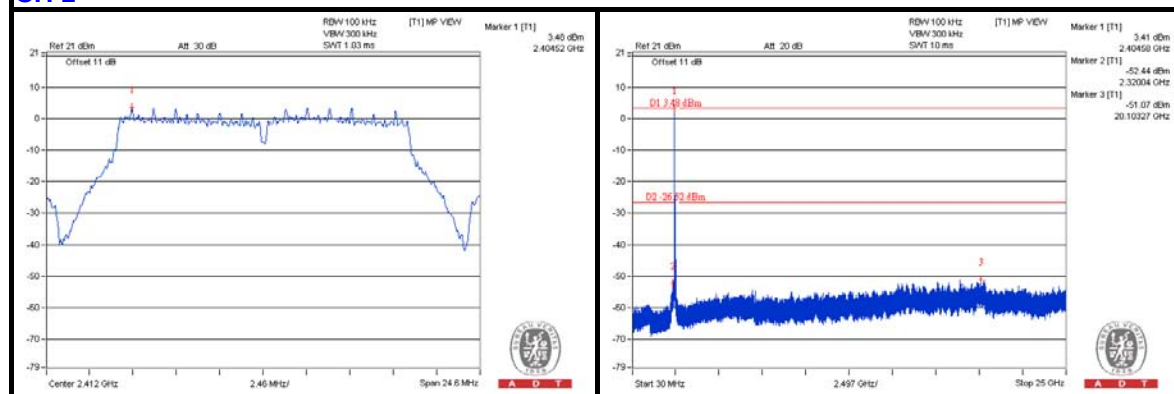




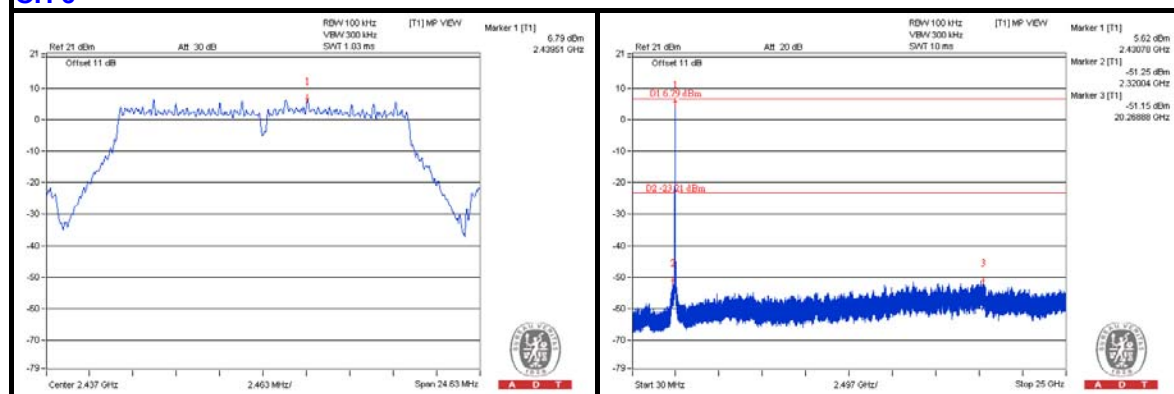
A D T

CHAIN 2

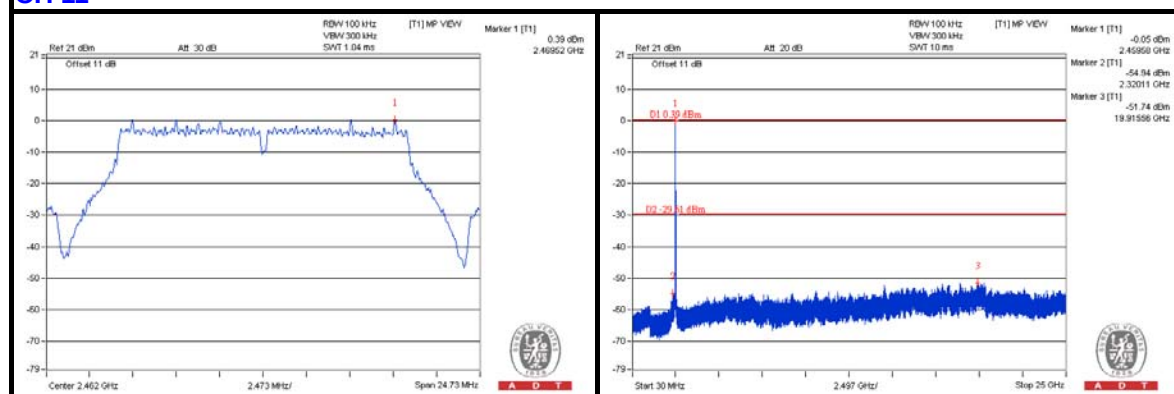
CH 1



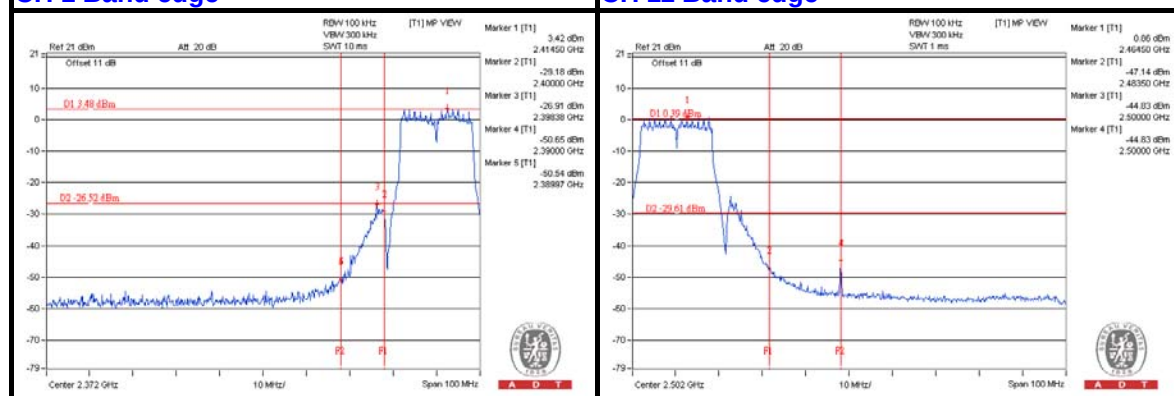
CH 6



CH 11



CH 1 Band edge



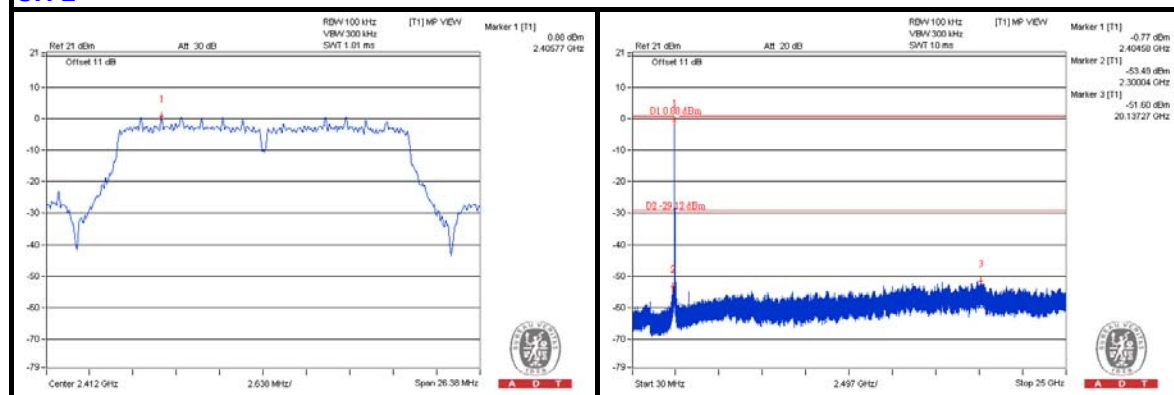


A D T

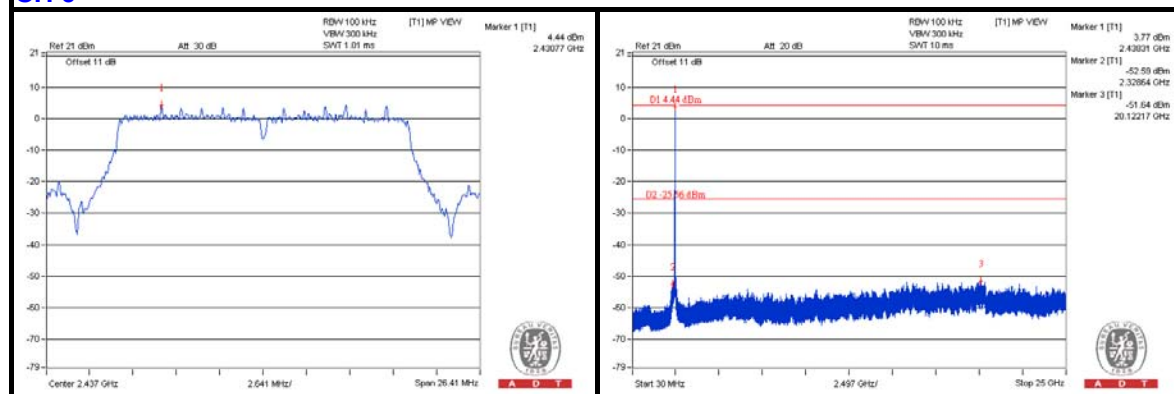
802.11n (HT20)

CHAIN 0

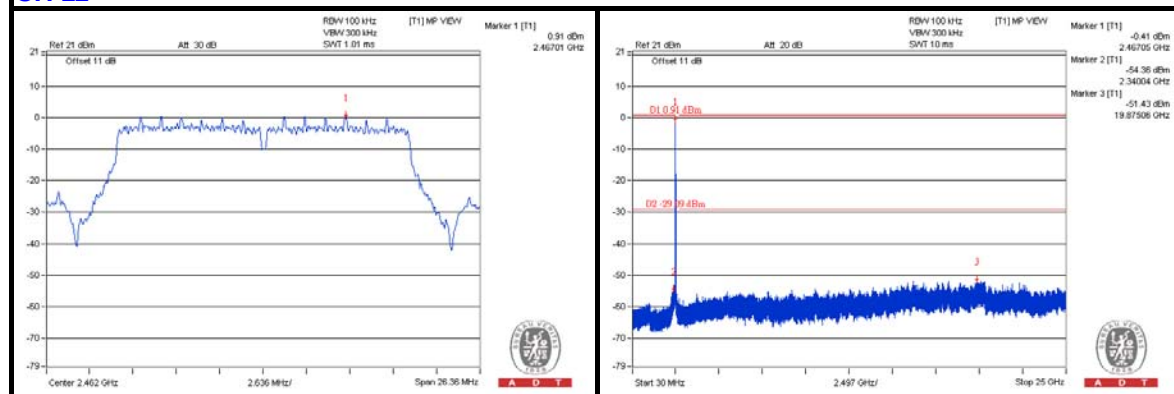
CH 1



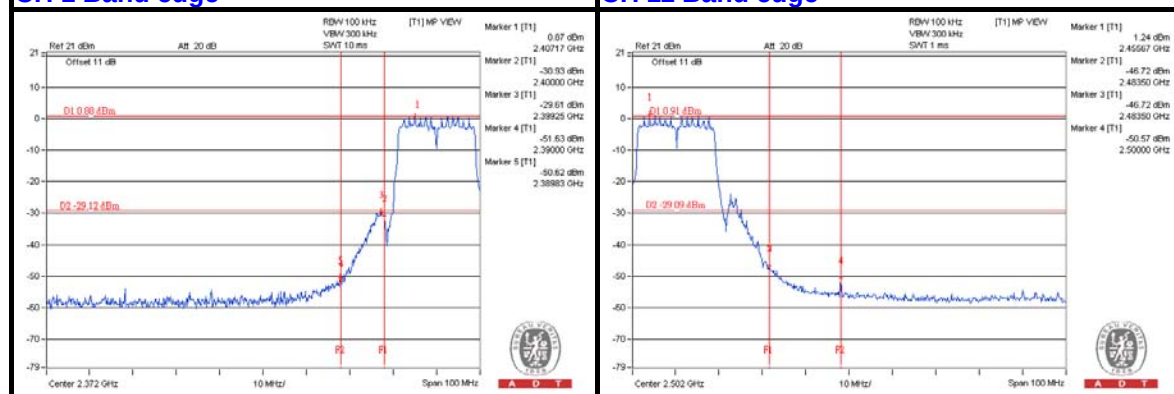
CH 6



CH 11



CH 1 Band edge

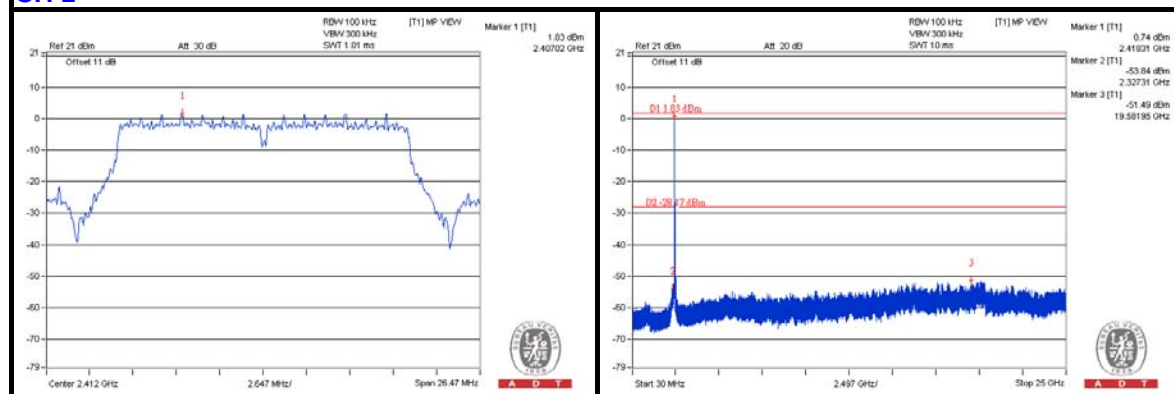




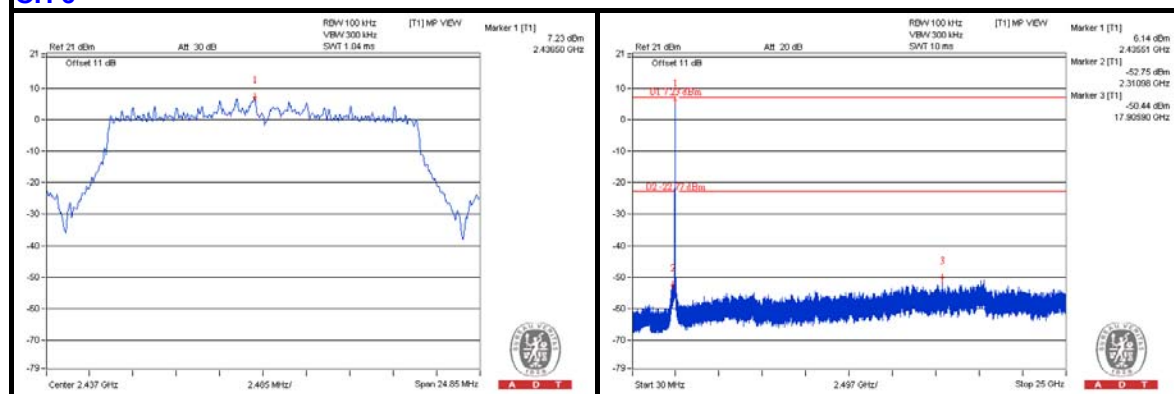
A D T

CHAIN 1

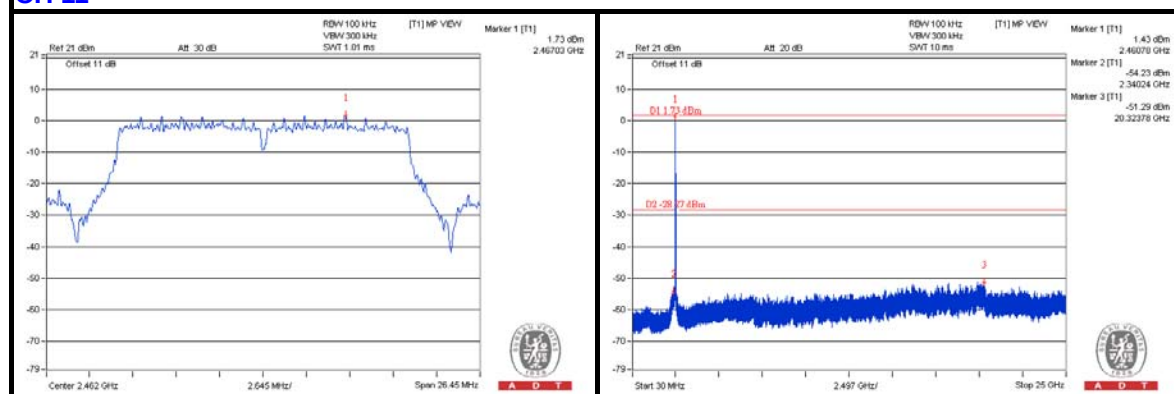
CH 1



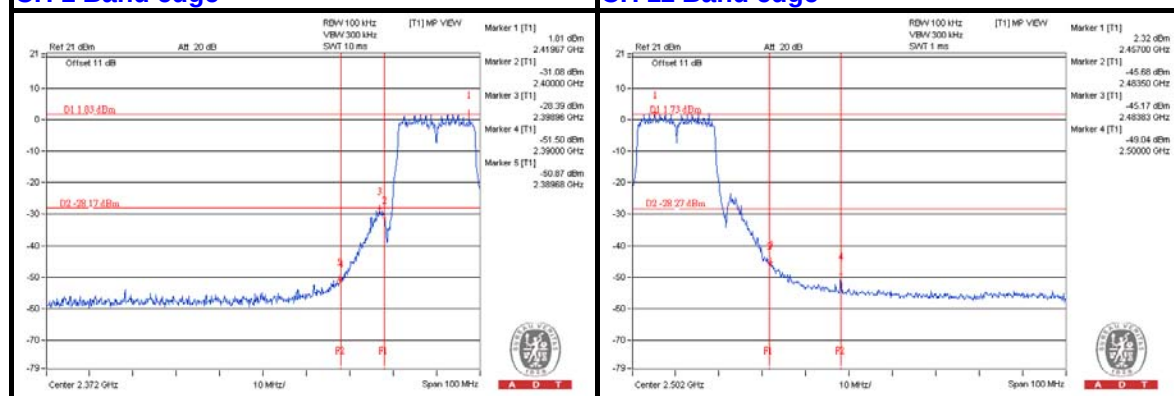
CH 6



CH 11



CH 1 Band edge

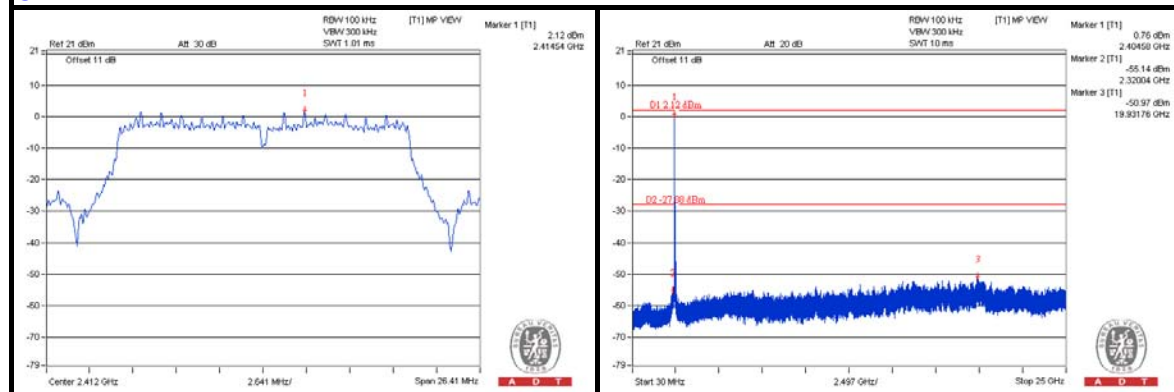




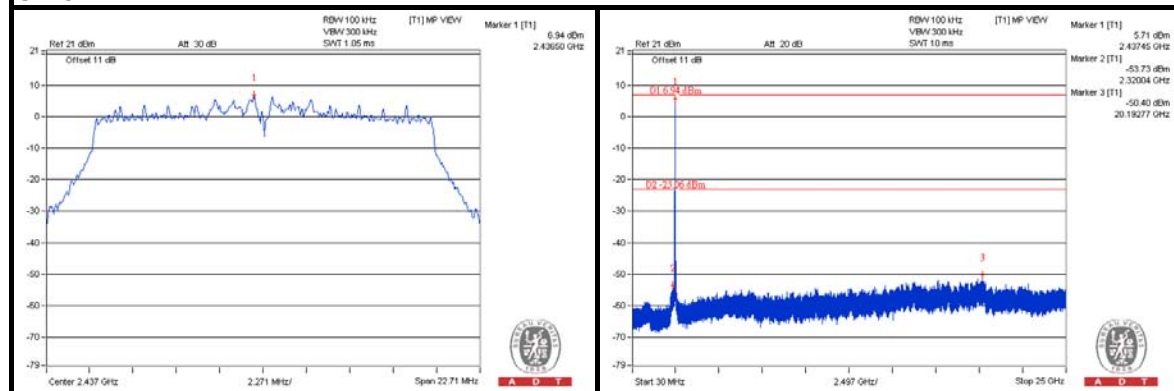
A D T

CHAIN 2

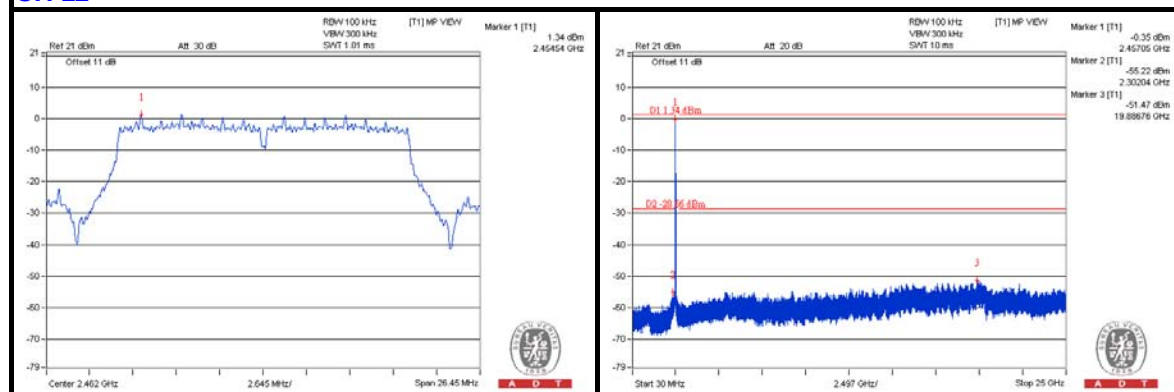
CH 1



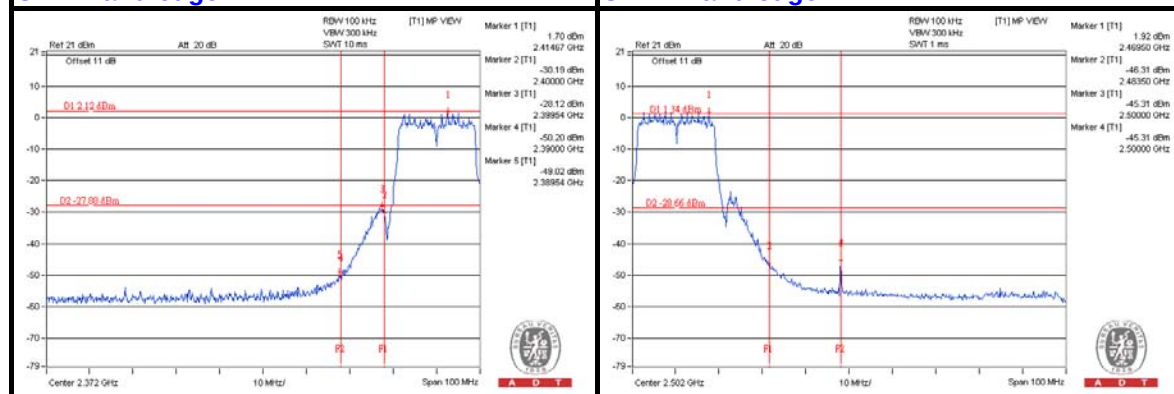
CH 6



CH 11



CH 1 Band edge



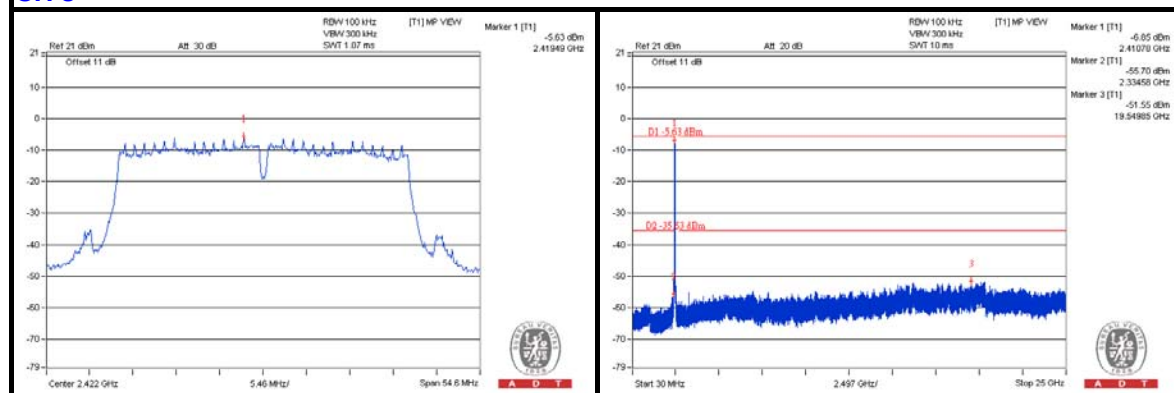


A D T

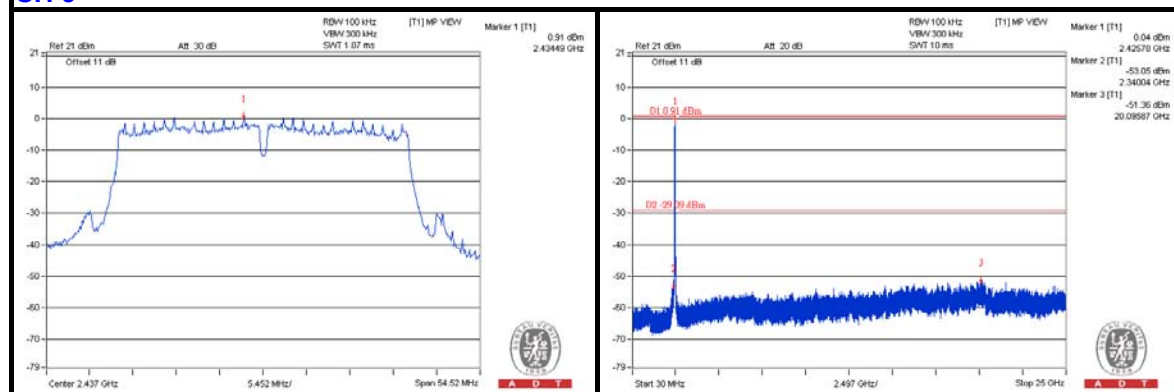
802.11n (HT40)

CHAIN 0

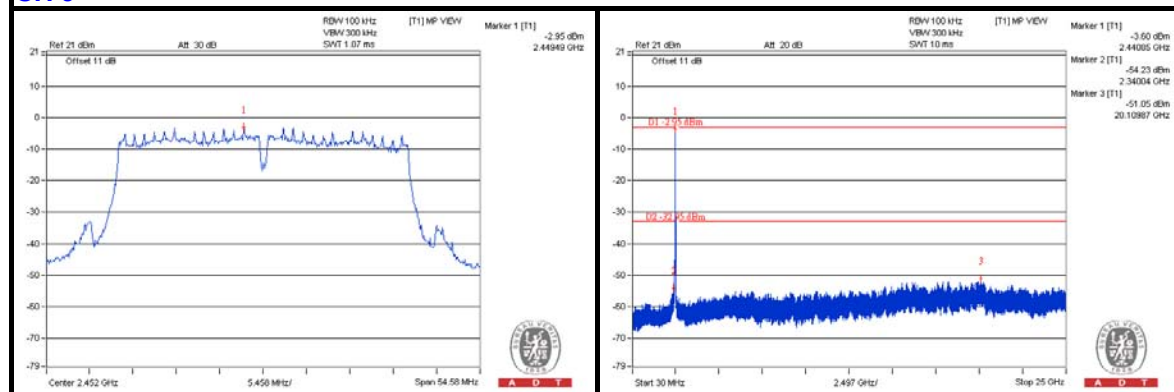
CH 3



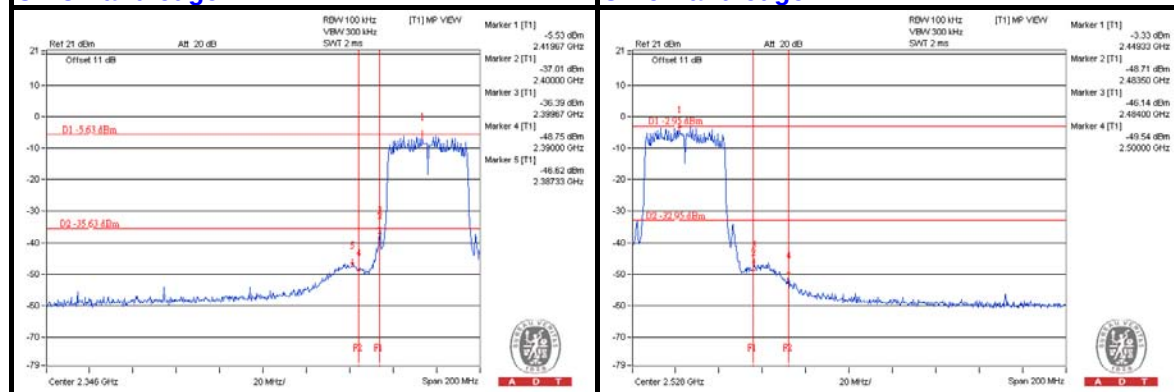
CH 6



CH 9



CH 3 Band edge

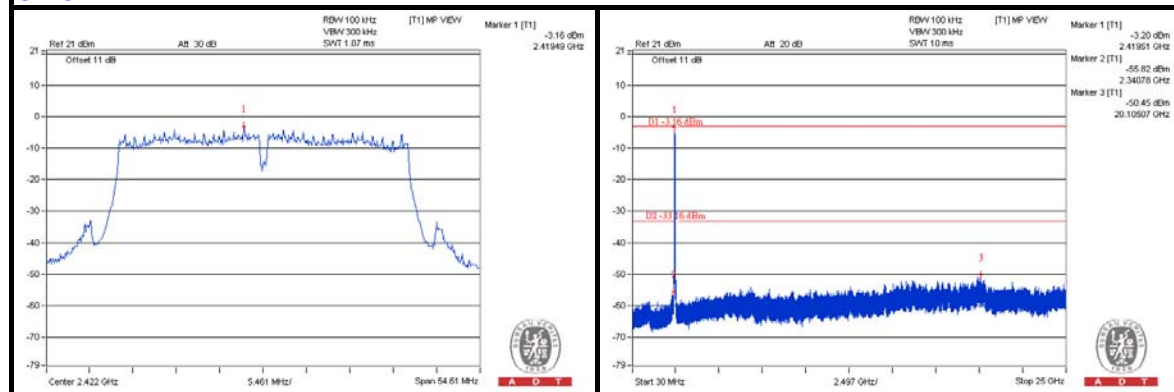




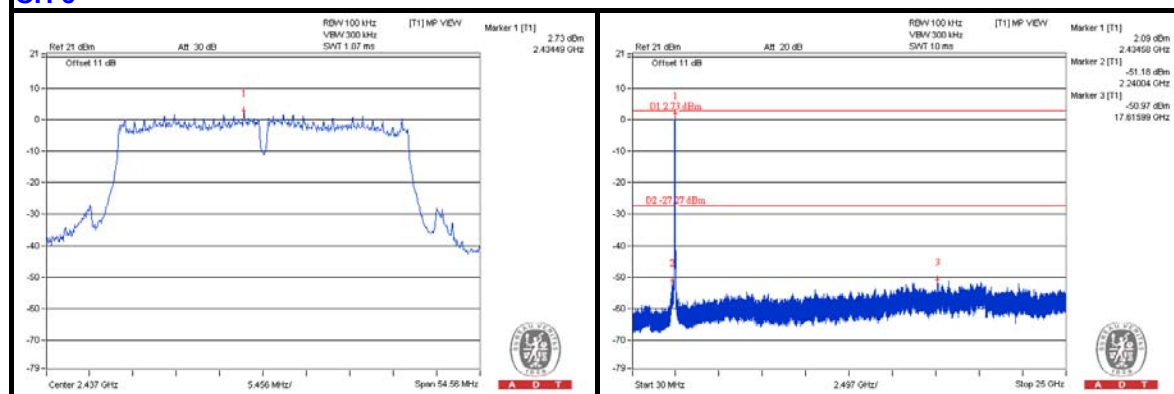
A D T

CHAIN 1

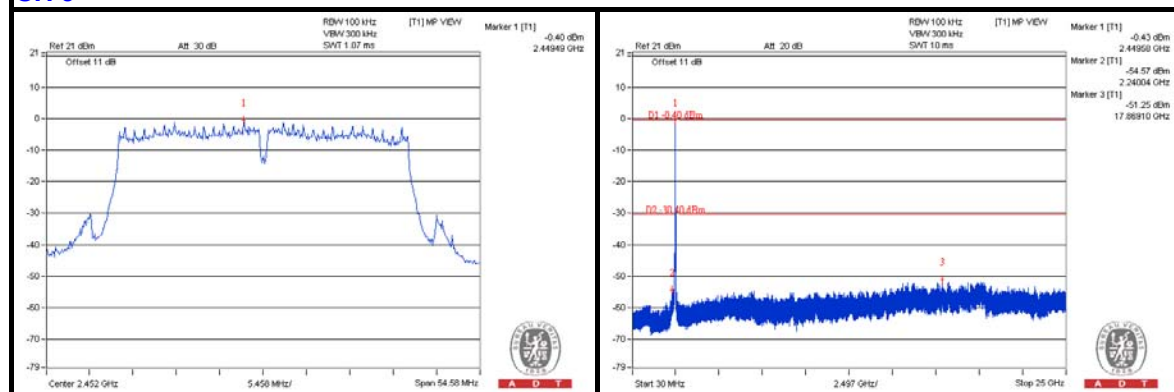
CH 3



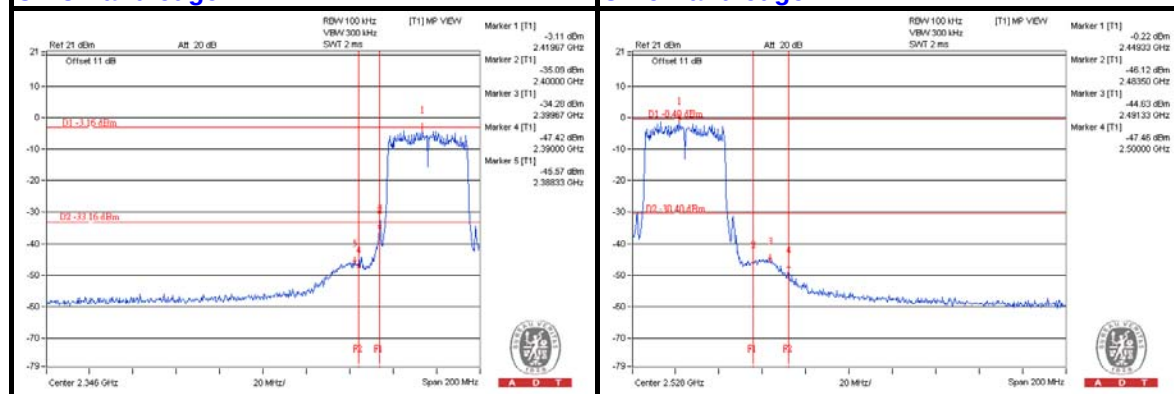
CH 6



CH 9



CH 3 Band edge

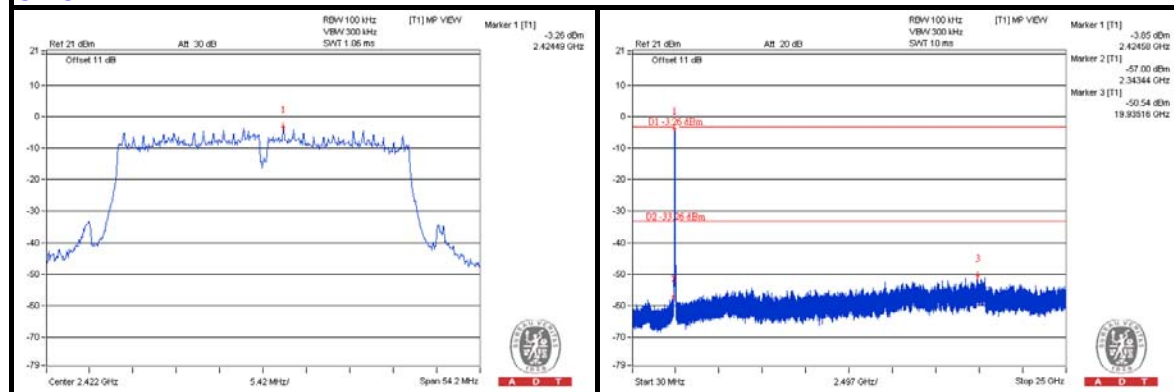




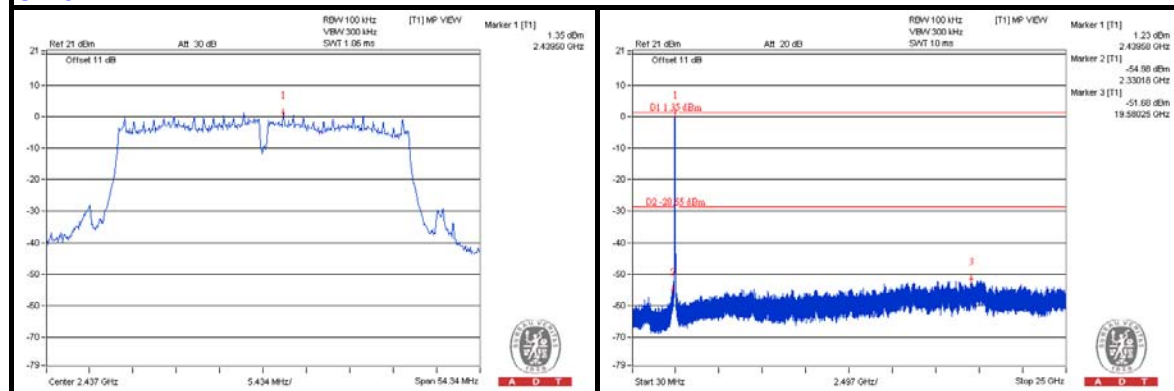
A D T

CHAIN 2

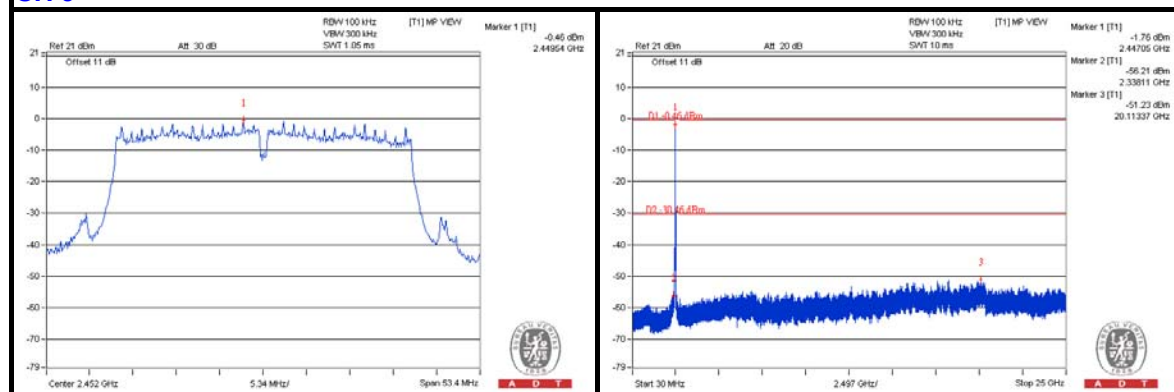
CH 3



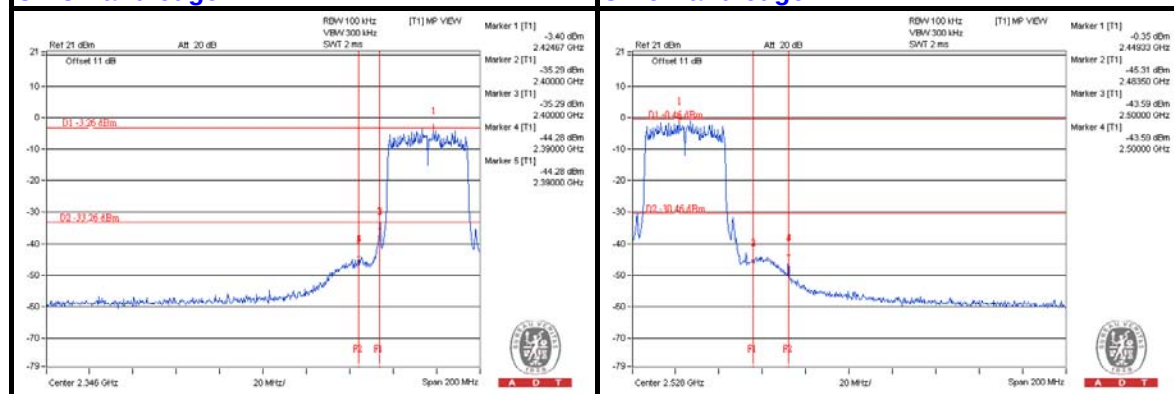
CH 6



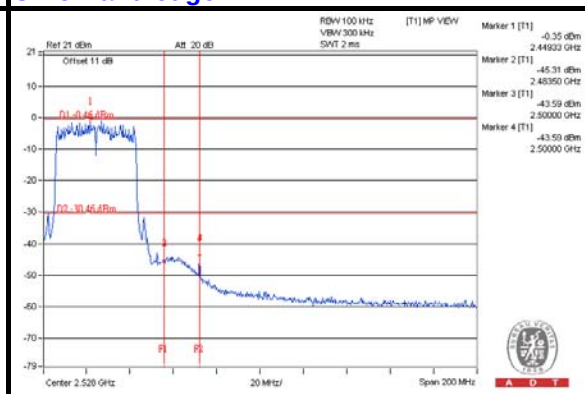
CH 9



CH 3 Band edge



CH 9 Band edge



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

5.1 RADIATED EMISSION MEASUREMENT

5.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 30dB below the highest level of the desired power:

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

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 30dB under any condition of modulation.



A D T

5.1.2 TEST INSTRUMENTS

Same as item 4.1.2.

5.1.3 TEST PROCEDURES

Same as item 4.1.3.

5.1.4 DEVIATION FROM TEST STANDARD

No deviation.

5.1.5 TEST SETUP

Same as item 4.1.5.

5.1.6 EUT OPERATING CONDITIONS

Same as item 4.1.6.



A D T

5.1.7 TEST RESULTS

ABOVE 1GHz DATA :

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	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	71.7 PK	79.7	-8.0	1.00 H	277	65.70	6.00
2	#5725.00	62.5 AV	70.5	-8.0	1.00 H	277	56.50	6.00
3	*5745.00	109.7 PK			1.00 H	277	71.20	38.50
4	*5745.00	100.5 AV			1.00 H	277	62.00	38.50
5	11490.00	63.9 PK	74.0	-10.1	1.48 H	150	43.50	20.40
6	11490.00	50.7 AV	54.0	-3.3	1.48 H	150	30.30	20.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	84.2 PK	92.2	-8.0	1.23 V	163	78.20	6.00
2	#5725.00	74.8 AV	82.8	-8.0	1.23 V	163	68.80	6.00
3	*5745.00	122.2 PK			1.23 V	163	83.70	38.50
4	*5745.00	112.8 AV			1.23 V	163	74.30	38.50
5	11490.00	67.9 PK	74.0	-6.1	1.00 V	223	47.50	20.40
6	11490.00	53.5 AV	54.0	-0.5	1.00 V	223	33.10	20.40

REMARKS:

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



A D T

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	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	110.0 PK			1.14 H	257	71.40	38.60
2	*5785.00	100.3 AV			1.14 H	257	61.70	38.60
3	11570.00	63.2 PK	74.0	-10.8	1.49 H	209	42.80	20.40
4	11570.00	49.9 AV	54.0	-4.1	1.49 H	209	29.50	20.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	121.5 PK			1.22 V	163	82.90	38.60
2	*5785.00	112.5 AV			1.22 V	163	73.90	38.60
3	11570.00	67.4 PK	74.0	-6.6	1.06 V	192	47.00	20.40
4	11570.00	53.9 AV	54.0	-0.1	1.06 V	192	33.50	20.40

REMARKS:

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



A D T

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	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	110.4 PK			1.13 H	266	71.70	38.70
2	*5825.00	100.3 AV			1.13 H	266	61.60	38.70
3	#5850.00	65.4 PK	80.4	-15.0	1.13 H	266	59.20	6.20
4	#5850.00	55.3 AV	70.3	-15.0	1.13 H	266	49.10	6.20
5	11650.00	62.9 PK	74.0	-11.1	1.45 H	155	42.60	20.30
6	11650.00	49.8 AV	54.0	-4.2	1.45 H	155	29.50	20.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	119.7 PK			1.30 V	164	81.00	38.70
2	*5825.00	110.4 AV			1.30 V	164	71.70	38.70
3	#5850.00	74.7 PK	89.7	-15.0	1.30 V	164	68.50	6.20
4	#5850.00	65.4 AV	80.4	-15.0	1.30 V	164	59.20	6.20
5	11650.00	66.9 PK	74.0	-7.1	1.15 V	165	46.60	20.30
6	11650.00	53.8 AV	54.0	-0.2	1.15 V	165	33.50	20.30

REMARKS:

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



A D T

802.11n (HT20)

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	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	75.1 PK	80.1	-5.0	1.16 H	265	69.10	6.00
2	#5725.00	65.6 AV	70.6	-5.0	1.16 H	265	59.60	6.00
3	*5745.00	110.1 PK			1.16 H	265	71.60	38.50
4	*5745.00	100.6 AV			1.16 H	265	62.10	38.50
5	11490.00	67.1 PK	74.0	-6.9	1.12 H	164	46.70	20.40
6	11490.00	53.5 AV	54.0	-0.5	1.12 H	164	33.10	20.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	86.1 PK	91.1	-5.0	1.13 V	167	80.10	6.00
2	#5725.00	76.5 AV	81.5	-5.0	1.13 V	167	70.50	6.00
3	*5745.00	121.1 PK			1.13 V	167	82.60	38.50
4	*5745.00	111.5 AV			1.13 V	167	73.00	38.50
5	11490.00	67.1 PK	74.0	-6.9	1.12 V	164	46.70	20.40
6	11490.00	53.5 AV	54.0	-0.5	1.12 V	164	33.10	20.40

REMARKS:

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



A D T

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	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	109.2 PK			1.06 H	268	70.60	38.60
2	*5785.00	99.8 AV			1.06 H	268	61.20	38.60
3	11570.00	63.6 PK	74.0	-10.4	1.49 H	208	43.20	20.40
4	11570.00	50.7 AV	54.0	-3.3	1.49 H	208	30.30	20.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	120.7 PK			1.20 V	310	82.10	38.60
2	*5785.00	111.3 AV			1.20 V	310	72.70	38.60
3	11570.00	67.4 PK	74.0	-6.6	1.12 V	171	47.00	20.40
4	11570.00	53.8 AV	54.0	-0.2	1.12 V	171	33.40	20.40

REMARKS:

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



A D T

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	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	109.0 PK			1.17 H	277	70.30	38.70
2	*5825.00	99.2 AV			1.17 H	277	60.50	38.70
3	#5850.00	64.0 PK	79.0	-15.0	1.17 H	277	57.80	6.20
4	#5850.00	54.2 AV	69.2	-15.0	1.17 H	277	48.00	6.20
5	11650.00	63.7 PK	74.0	-10.3	1.51 H	170	43.40	20.30
6	11650.00	50.4 AV	54.0	-3.6	1.51 H	170	30.10	20.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	120.0 PK			1.21 V	180	81.30	38.70
2	*5825.00	110.2 AV			1.21 V	180	71.50	38.70
3	#5850.00	77.0 PK	90.0	-13.0	1.21 V	171	70.80	6.20
4	#5850.00	67.2 AV	80.2	-13.0	1.21 V	171	61.00	6.20
5	11650.00	66.8 PK	74.0	-7.2	1.21 V	170	46.50	20.30
6	11650.00	53.7 AV	54.0	-0.3	1.21 V	170	33.40	20.30

REMARKS:

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



A D T

802.11n (HT40)

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	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	76.3 PK	76.9	-0.6	1.15 H	271	70.30	6.00
2	#5725.00	66.6 AV	67.1	-0.5	1.15 H	271	60.60	6.00
3	*5755.00	106.9 PK			1.15 H	271	68.30	38.60
4	*5755.00	97.1 AV			1.15 H	271	58.50	38.60
5	11510.00	62.7 PK	74.0	-11.3	1.50 H	159	42.30	20.40
6	11510.00	49.6 AV	54.0	-4.4	1.50 H	159	29.20	20.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	89.3 PK	89.8	-0.5	1.14 V	171	83.30	6.00
2	#5725.00	78.9 AV	79.4	-0.5	1.14 V	171	72.90	6.00
3	*5755.00	119.8 PK			1.14 V	171	81.20	38.60
4	*5755.00	109.4 AV			1.14 V	171	70.80	38.60
5	11510.00	63.7 PK	74.0	-10.3	1.00 V	189	43.30	20.40
6	11510.00	51.6 AV	54.0	-2.4	1.00 V	189	31.20	20.40

REMARKS:

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



A D T

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	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	107.7 PK			1.13 H	170	69.10	38.60
2	*5795.00	97.8 AV			1.13 H	170	59.20	38.60
3	#5850.00	67.7 PK	77.7	-10.0	1.13 H	170	61.50	6.20
4	#5850.00	57.8 AV	67.8	-10.0	1.13 H	170	51.60	6.20
5	11590.00	63.0 PK	74.0	-11.0	1.50 H	203	42.60	20.40
6	11590.00	50.5 AV	54.0	-3.5	1.50 H	203	30.10	20.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	118.7 PK			1.13 V	170	80.10	38.60
2	*5795.00	108.8 AV			1.13 V	170	70.20	38.60
3	#5850.00	78.7 PK	88.7	-10.0	1.13 V	170	72.50	6.20
4	#5850.00	68.8 AV	78.8	-10.0	1.13 V	170	62.60	6.20
5	11590.00	66.0 PK	74.0	-8.0	1.10 V	165	45.60	20.40
6	11590.00	53.5 AV	54.0	-0.5	1.10 V	163	33.10	20.40

REMARKS:

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



A D T

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	73.5 PK	74.0	-0.5	1.13 H	266	67.50	6.00
2	#5725.00	63.8 AV	64.3	-0.5	1.13 H	266	57.80	6.00
3	*5775.00	104.0 PK			1.13 H	266	65.40	38.60
4	*5775.00	94.3 AV			1.13 H	266	55.70	38.60
5	#5825.00	69.0 PK	74.0	-5.0	1.13 H	266	62.80	6.20
6	#5825.00	59.3 AV	64.3	-5.0	1.13 H	266	53.10	6.20
7	11550.00	61.3 PK	74.0	-12.7	1.12 H	103	40.90	20.40
8	11550.00	50.3 AV	54.0	-3.7	1.12 H	103	29.90	20.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	84.8 PK	85.3	-0.5	1.13 V	171	78.80	6.00
2	#5725.00	75.4 AV	75.9	-0.5	1.13 V	171	69.40	6.00
3	*5775.00	115.3 PK			1.13 V	171	76.70	38.60
4	*5775.00	105.9 AV			1.13 V	171	67.30	38.60
5	#5850.00	80.3 PK	85.3	-5.0	1.13 V	171	74.10	6.20
6	#5850.00	70.9 AV	75.9	-5.0	1.13 V	171	64.70	6.20
7	11550.00	62.1 PK	74.0	-11.9	1.02 V	203	41.70	20.40
8	11550.00	51.3 AV	54.0	-2.7	1.02 V	203	30.90	20.40

REMARKS:

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



A D T

BELOW 1GHz WORST-CASE DATA : 802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	57.12	32.7 QP	40.0	-7.3	2.00 H	210	47.30	-14.60
2	140.72	29.4 QP	43.5	-14.1	2.00 H	233	43.80	-14.40
3	288.49	31.8 QP	46.0	-14.2	1.01 H	233	44.40	-12.60
4	364.32	30.1 QP	46.0	-15.9	1.01 H	337	41.10	-11.00
5	512.08	28.8 QP	46.0	-17.2	1.01 H	16	36.90	-8.10
6	776.51	28.6 QP	46.0	-17.4	2.00 H	144	31.00	-2.40
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	45.64	38.5 QP	40.0	-1.5	1.00 V	348	41.80	-3.30
2	92.12	39.3 QP	43.5	-4.2	1.00 V	140	42.30	-3.00
3	115.45	39.6 QP	43.5	-3.9	1.00 V	78	42.30	-2.70
4	132.95	37.7 QP	43.5	-5.8	1.00 V	5	40.20	-2.50
5	222.38	37.4 QP	46.0	-8.6	1.00 V	134	39.10	-1.70
6	512.08	36.6 QP	46.0	-9.4	1.00 V	260	38.20	-1.60

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)
– Pre-Amplifier 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 (dBμV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

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

5.2.2 TEST INSTRUMENTS

Same as item 4.2.2.

5.2.3 TEST PROCEDURES

Same as item 4.2.3.

5.2.4 DEVIATION FROM TEST STANDARD

No deviation.

5.2.5 TEST SETUP

Same as item 4.2.5.

5.2.6 EUT OPERATING CONDITIONS

Same as item 4.1.6.

5.2.7 TEST RESULTS

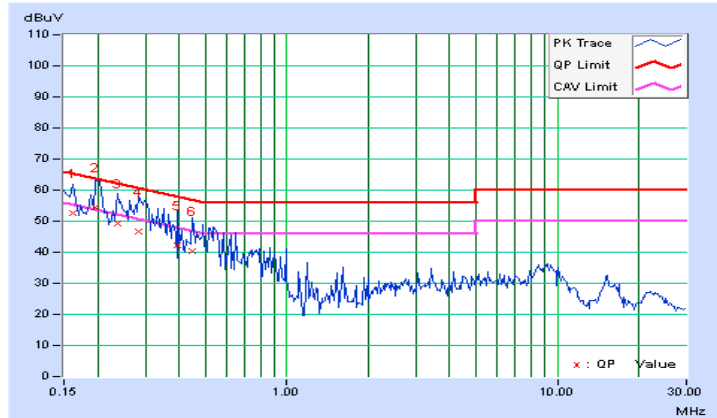
CONDUCTED WORST-CASE DATA : 802.11n (HT20)

PHASE	Line 1	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	0.27	52.42	31.08	52.69	31.35	65.38	55.38	-12.69	-24.03
2	0.19687	0.28	53.99	32.07	54.27	32.35	63.74	53.74	-9.47	-21.39
3	0.23594	0.28	48.85	30.77	49.13	31.05	62.24	52.24	-13.10	-21.18
4	0.28281	0.29	46.55	30.18	46.84	30.47	60.73	50.73	-13.89	-20.26
5	0.39609	0.30	41.89	28.01	42.19	28.31	57.93	47.93	-15.75	-19.63
6	0.44688	0.30	39.97	28.27	40.27	28.57	56.93	46.93	-16.66	-18.36

REMARKS:

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

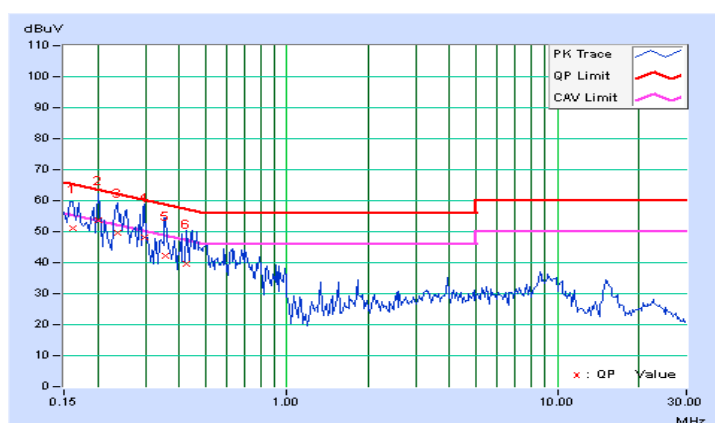


PHASE	Line 2	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	0.27	50.83	33.09	51.10	33.36	65.38	55.38	-14.28	-22.02
2	0.20078	0.28	53.38	33.24	53.66	33.52	63.58	53.58	-9.92	-20.06
3	0.23594	0.28	49.25	29.91	49.53	30.19	62.24	52.24	-12.70	-22.04
4	0.29844	0.29	48.03	28.61	48.32	28.90	60.29	50.29	-11.97	-21.39
5	0.35703	0.30	41.83	24.98	42.13	25.28	58.80	48.80	-16.67	-23.52
6	0.42344	0.30	39.17	29.34	39.47	29.64	57.38	47.38	-17.91	-17.74

REMARKS:

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



5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

5.3.2 TEST SETUP

Same as item 4.3.2.

5.3.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.3.4 TEST PROCEDURE

Same as item 4.3.4.

5.3.5 DEVIATION FROM TEST STANDARD

No deviation.

5.3.6 EUT OPERATING CONDITIONS

Same as item 4.3.6.

5.3.7 TEST RESULTS

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	16.39	16.35	16.43	0.5	PASS
157	5785	16.38	16.38	16.41	0.5	PASS
165	5825	16.40	16.39	16.42	0.5	PASS

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	17.64	17.66	17.67	0.5	PASS
157	5785	17.65	17.65	17.66	0.5	PASS
165	5825	17.65	17.66	17.64	0.5	PASS

802.11n (HT40)

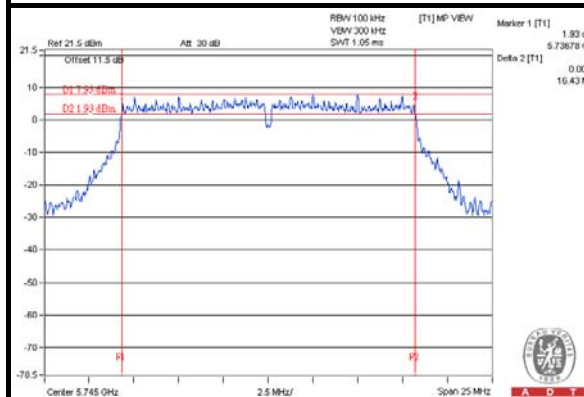
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
151	5755	36.41	36.41	36.43	0.5	PASS
159	5795	36.36	36.37	36.38	0.5	PASS

802.11ac (VHT80)

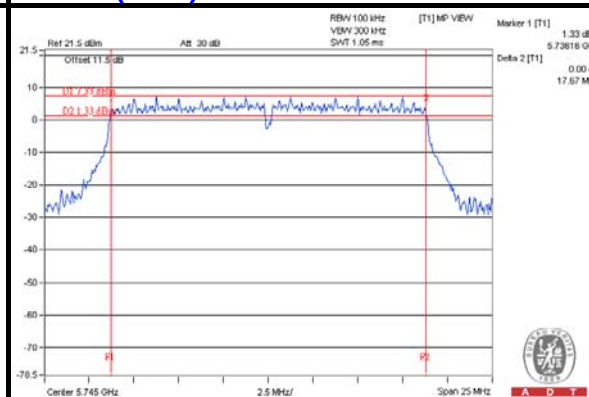
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
155	5775	76.31	75.82	76.16	0.5	PASS

SPECTRUM PLOT OF WORST VALUE

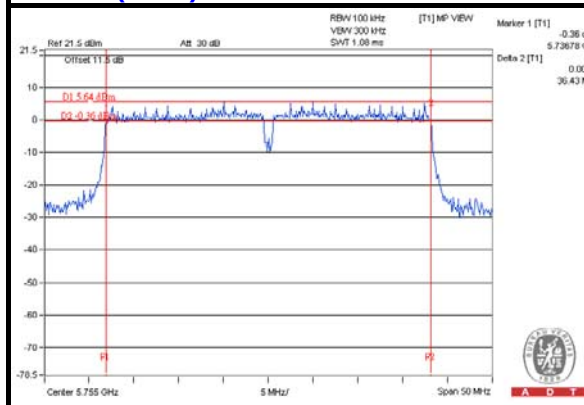
802.11a



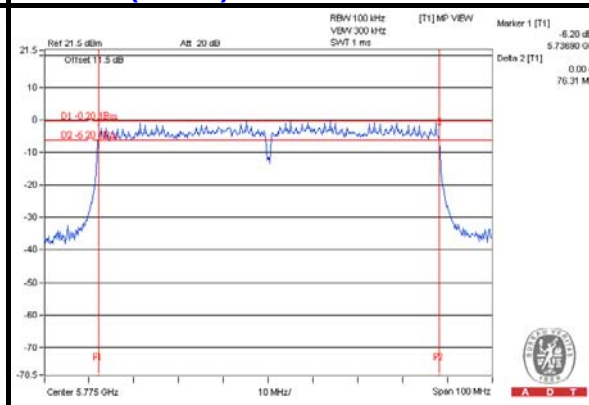
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



5.4 CONDUCTED OUTPUT POWER

5.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

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

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

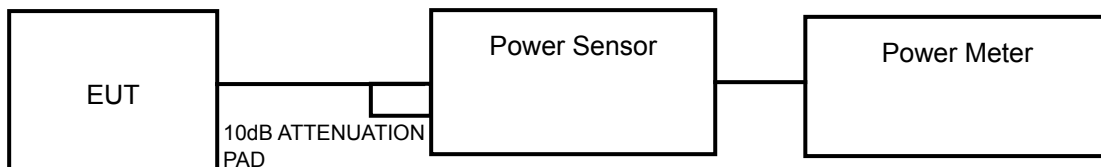
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;

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

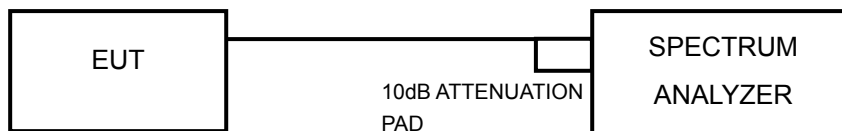
For power measurements on all other devices: Array Gain = $10 \log(NANT/NSS)$ dB.

5.4.2 TEST SETUP

For 802.11a, 802.11n (HT20), 802.11n (HT40)



For 802.11ac (VHT80)



5.4.3 INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.4.4 TEST PROCEDURES

For 802.11a, 802.11n (HT20), 802.11n (HT40)

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

For 802.11ac (VHT80)

This procedure may be used when the maximum available RBW of the measurement instrument is less than the DTS bandwidth.

- 1) Set the RBW = 1 MHz.
- 2) Set the VBW $\geq$ 3 RBW.
- 3) Set the span $\geq$ 1.5 x DTS bandwidth.
- 4) Detector = peak.
- 5) Sweep time = auto couple.
- 6) Trace mode = max hold.
- 7) Allow trace to fully stabilize.
- 8) Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some instruments, this may require a manual override to select peak detector). If the instrument does not have a band power function, sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the DTS bandwidth.

5.4.5 DEVIATION FROM TEST STANDARD

No deviation.

5.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.

5.4.7 TEST RESULTS

FOR AVERAGE POWER

802.11a

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
149	5745	21.64	21.52	22.71	474.425	26.76	30	PASS
157	5785	21.70	21.50	22.99	488.232	26.89	30	PASS
165	5825	20.61	20.65	21.95	387.900	25.89	30	PASS

802.11n (HT20)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
149	5745	21.89	21.47	23.00	494.332	26.94	30	PASS
157	5785	21.50	21.40	22.66	463.794	26.66	30	PASS
165	5825	20.35	20.43	21.55	361.690	25.58	30	PASS

802.11n (HT40)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
151	5755	21.74	21.42	22.81	478.940	26.80	30	PASS
159	5795	22.16	21.53	23.50	530.542	27.25	30	PASS

802.11ac (VHT80)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
155	5775	20.73	20.60	22.22	399.844	26.02	30	PASS

5.5 POWER SPECTRAL DENSITY MEASUREMENT

5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.5.2 TEST SETUP

Same as item 4.5.2.

5.5.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.5.4 TEST PROCEDURE.

Same as item 4.5.4.

5.5.5 DEVIATION FROM TEST STANDARD

No deviation.

5.5.6 EUT OPERATING CONDITION

Same as item 4.3.6.

5.5.7 TEST RESULTS

802.11a

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-13.80	4.77	-9.03	6.93	PASS
	157	5785	-13.76	4.77	-8.99	6.93	PASS
	165	5825	-14.90	4.77	-10.13	6.93	PASS
1	149	5745	-13.51	4.77	-8.74	6.93	PASS
	157	5785	-13.19	4.77	-8.42	6.93	PASS
	165	5825	-14.44	4.77	-9.67	6.93	PASS
2	149	5745	-13.39	4.77	-8.62	6.93	PASS
	157	5785	-12.66	4.77	-7.89	6.93	PASS
	165	5825	-14.09	4.77	-9.32	6.93	PASS

NOTE: Directional gain = 2.3dBi + 10log(3) = 7.07dBi > 6dBi, so the power density limit shall be reduced to 8-(7.07-6) = 6.93dBm.

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-15.42	4.77	-10.65	6.93	PASS
	157	5785	-15.80	4.77	-11.03	6.93	PASS
	165	5825	-15.26	4.77	-10.49	6.93	PASS
1	149	5745	-15.10	4.77	-10.33	6.93	PASS
	157	5785	-14.92	4.77	-10.15	6.93	PASS
	165	5825	-14.17	4.77	-9.40	6.93	PASS
2	149	5745	-14.94	4.77	-10.17	6.93	PASS
	157	5785	-15.17	4.77	-10.40	6.93	PASS
	165	5825	-15.05	4.77	-10.28	6.93	PASS

NOTE: Directional gain = 2.3dBi + 10log(3) = 7.07dBi > 6dBi, so the power density limit shall be reduced to 8-(7.07-6) = 6.93dBm.

802.11n (HT40)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD without Duty Factor (dBm/3kHz)	Duty Factor	Total PSD with Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	151	5755	-16.56	4.77	-11.79	0.14	-11.65	6.93	PASS
	159	5795	-16.67	4.77	-11.90	0.14	-11.76	6.93	PASS
1	151	5755	-15.95	4.77	-11.18	0.14	-11.04	6.93	PASS
	159	5795	-15.30	4.77	-10.53	0.14	-10.39	6.93	PASS
2	151	5755	-15.96	4.77	-11.19	0.14	-11.05	6.93	PASS
	159	5795	-15.92	4.77	-11.15	0.14	-11.01	6.93	PASS

NOTE:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2.3dBi + 10log(3) = 7.07dBi > 6dBi, so the power density limit shall be reduced to 8-(7.07-6) = 6.93dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD without Duty Factor (dBm/3kHz)	Duty Factor	Total PSD with Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	155	5775	-21.17	4.77	-16.40	0.37	-16.03	6.93	PASS
1	155	5775	-19.39	4.77	-14.62	0.37	-14.25	6.93	PASS
2	155	5775	-20.09	4.77	-15.32	0.37	-14.95	6.93	PASS

NOTE:

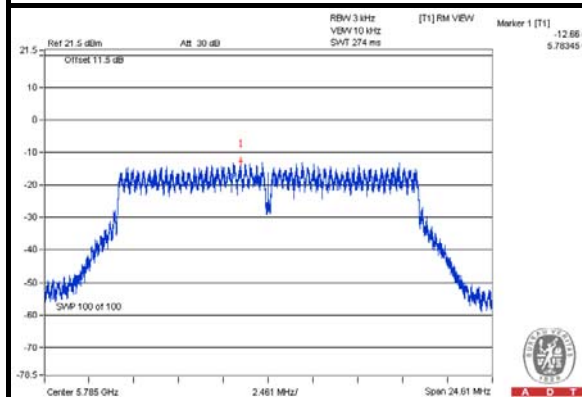
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2.3dBi + 10log(3) = 7.07dBi > 6dBi, so the power density limit shall be reduced to 8-(7.07-6) = 6.93dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.



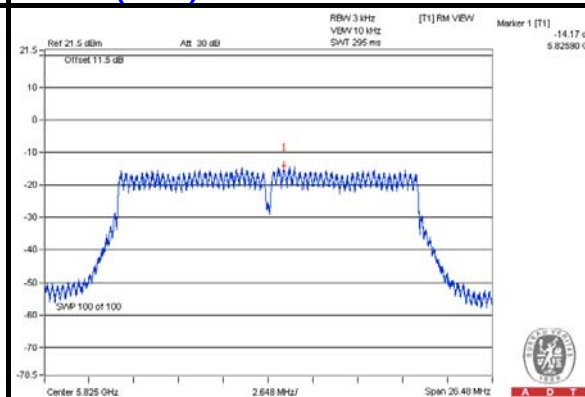
A D T

SPECTRUM PLOT OF WORST VALUE

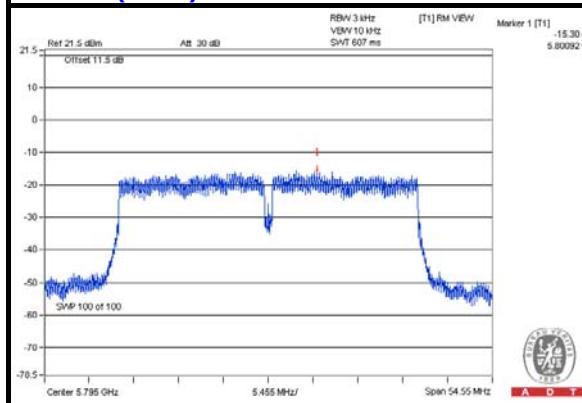
802.11a



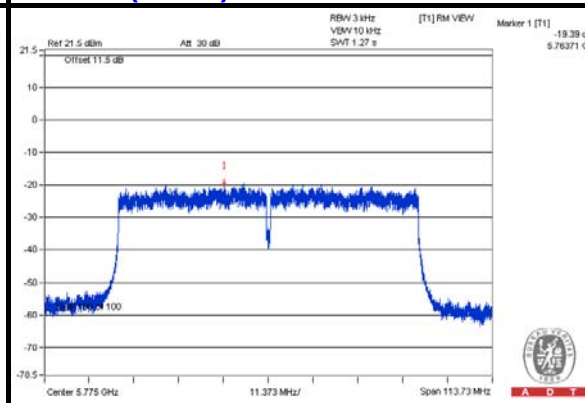
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



5.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

5.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

Below -30dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

5.6.2 TEST SETUP

Same as Item 4.6.2.

5.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.6.4 TEST PROCEDURE

Same as Item 4.6.4.

5.6.5 DEVIATION FROM TEST STANDARD

No deviation.

5.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6.

5.6.7 TEST RESULTS

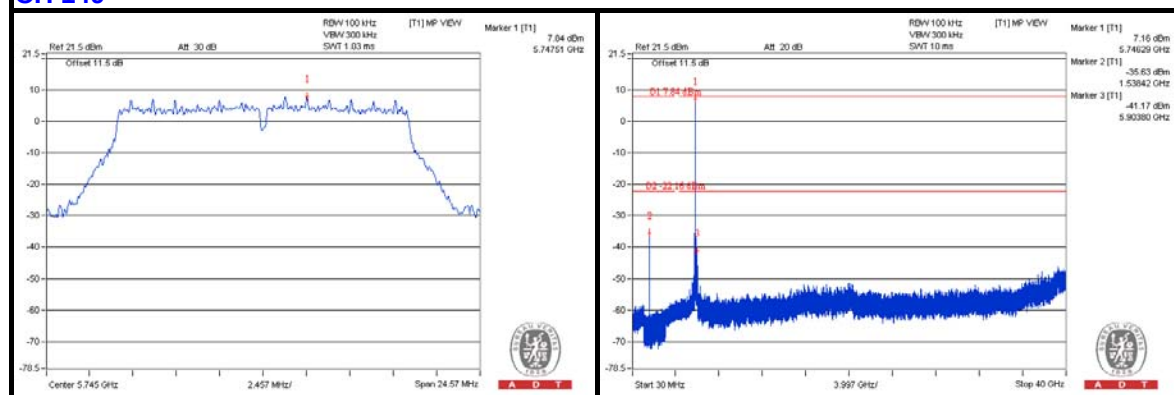
The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.

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

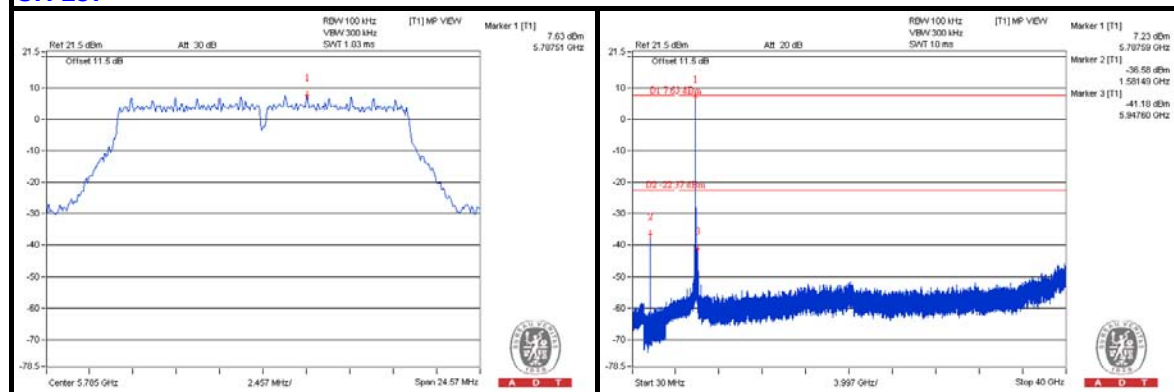


A D T

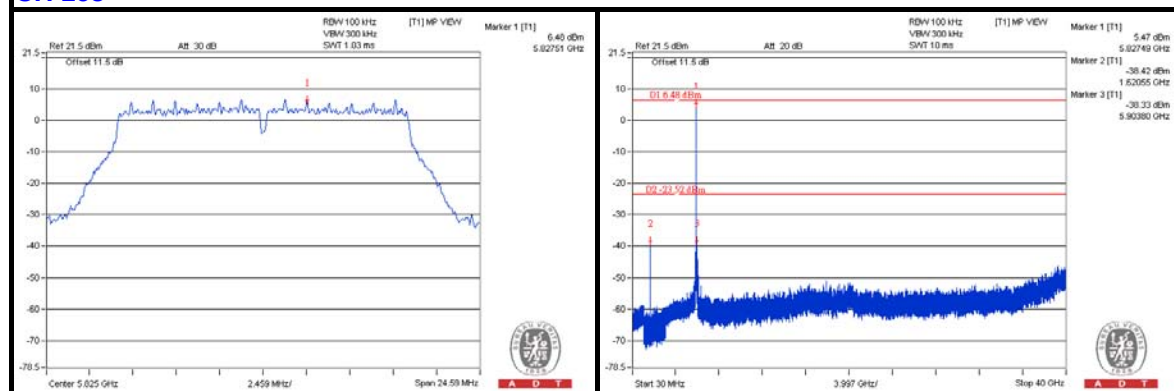
802.11a
CHAIN 0
CH 149



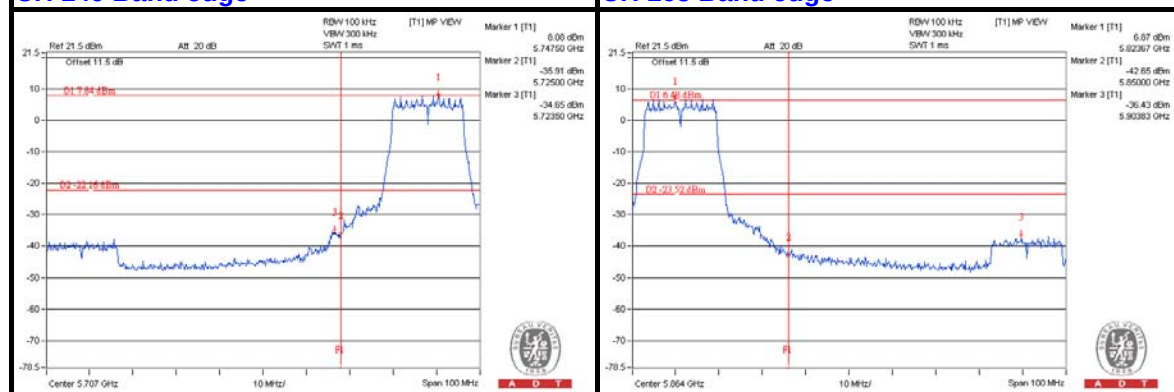
CH 157



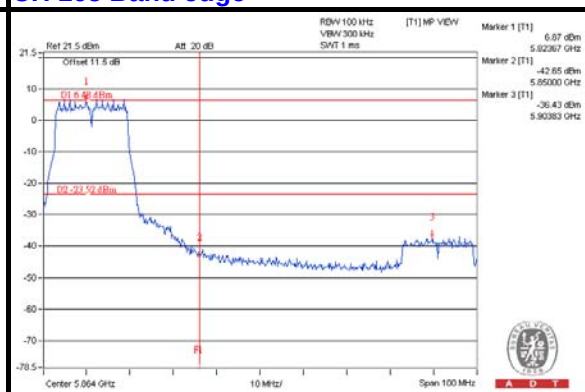
CH 165



CH 149 Band edge



CH 165 Band edge

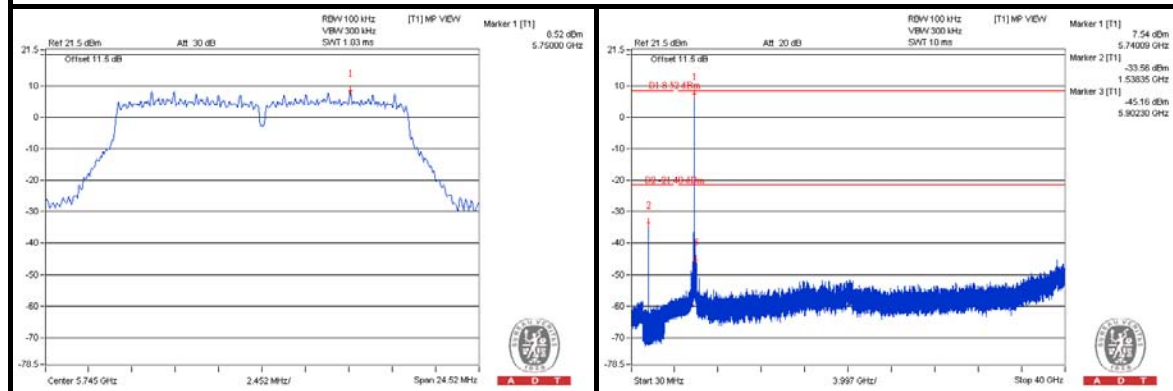




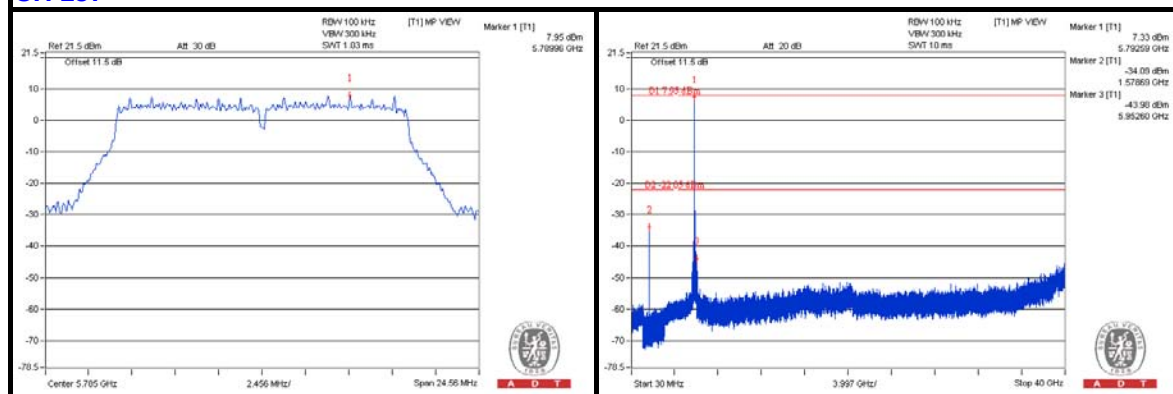
A D T

CHAIN 1

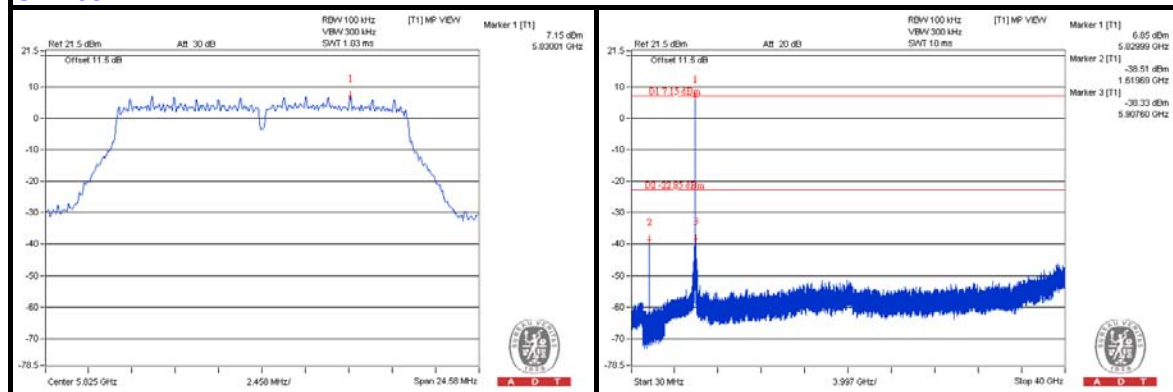
CH 149



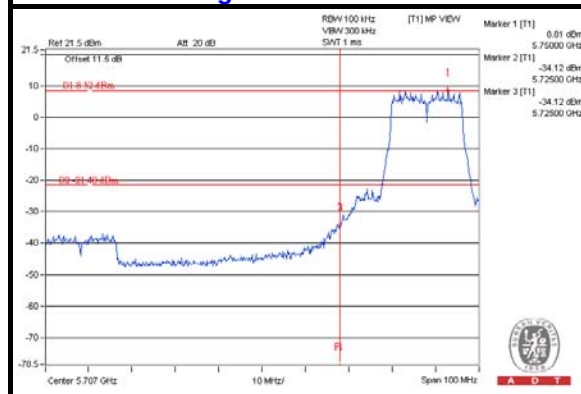
CH 157



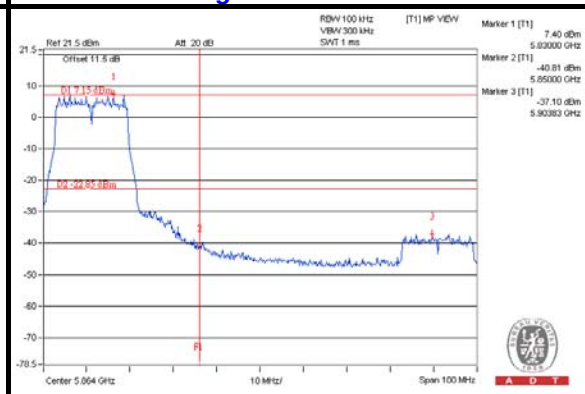
CH 165



CH 149 Band edge



CH 165 Band edge

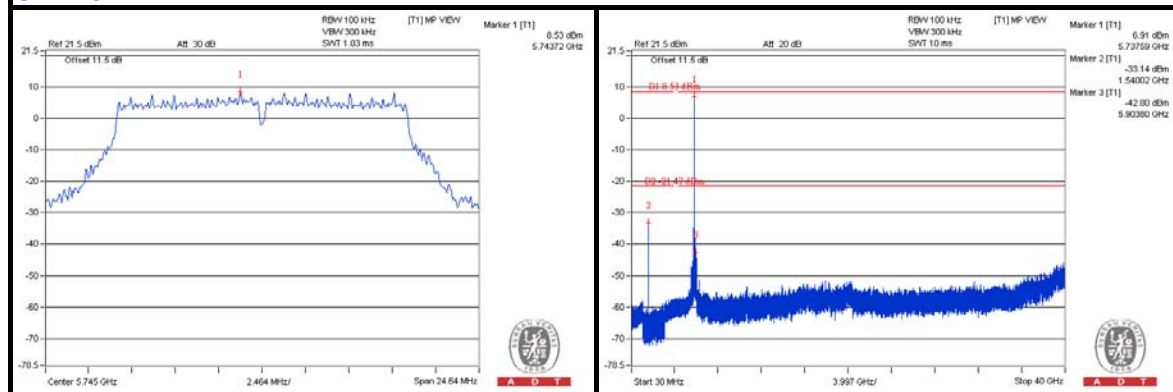




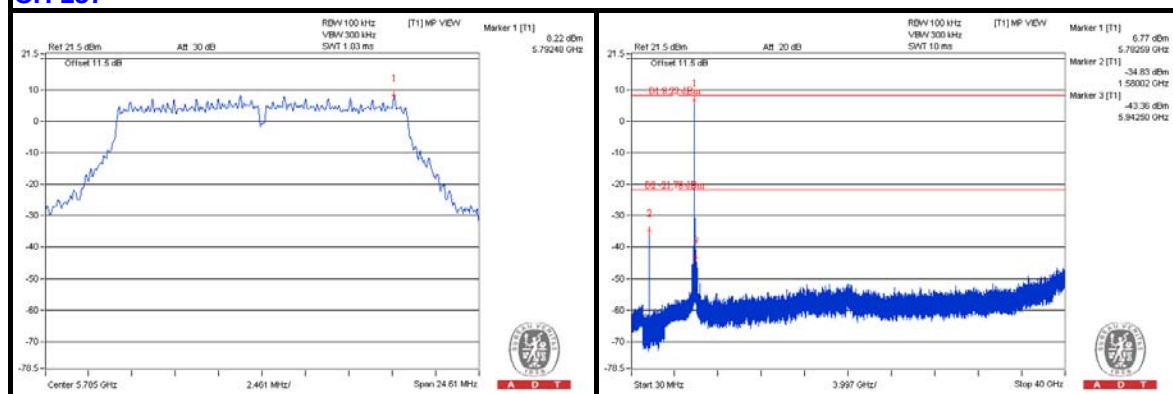
A D T

CHAIN 2

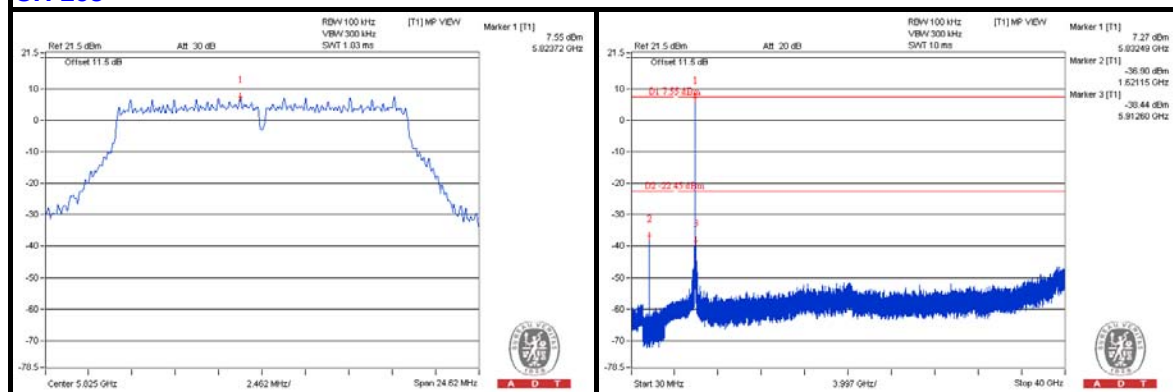
CH 149



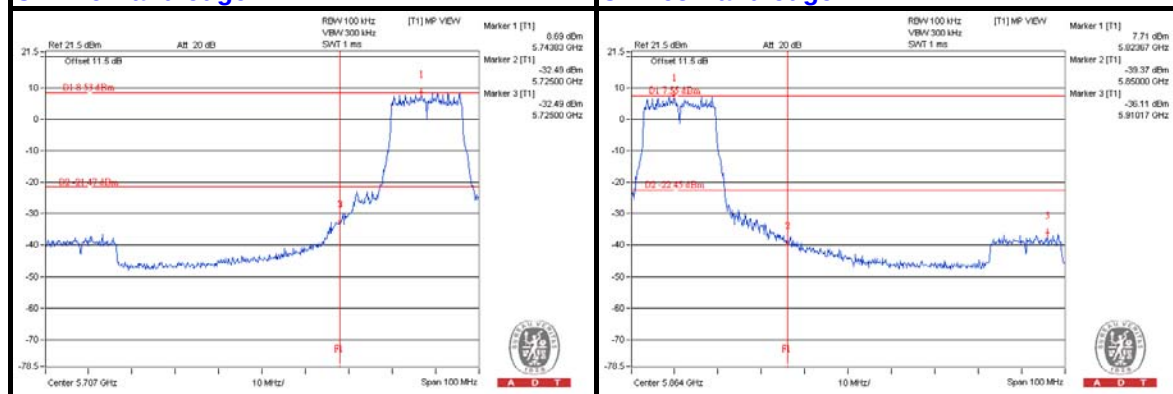
CH 157



CH 165



CH 149 Band edge

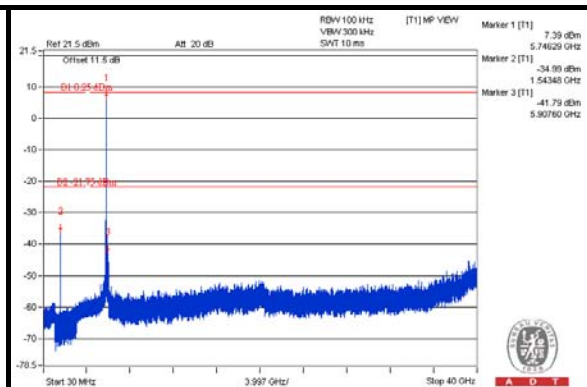
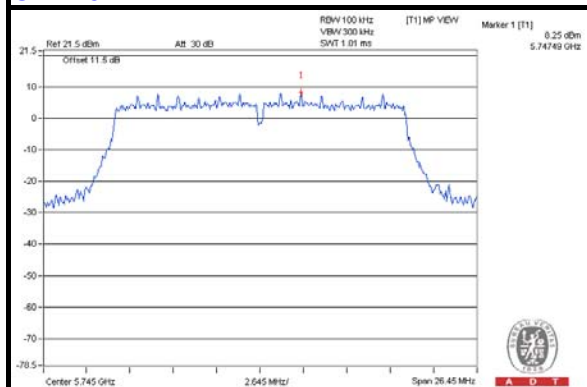




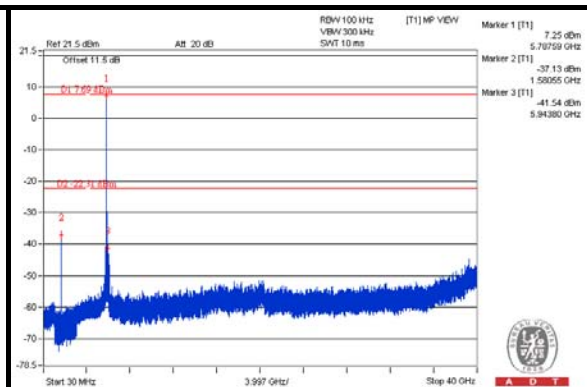
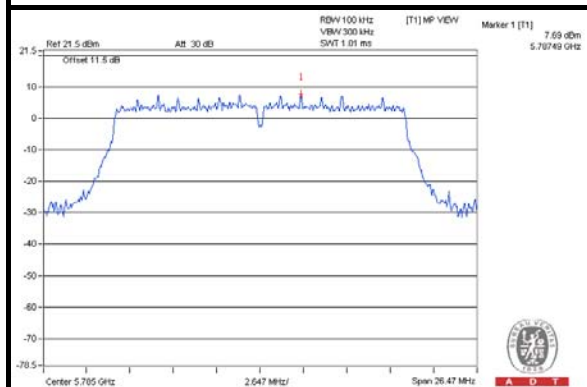
A D T

802.11n (HT20) CHAIN 0

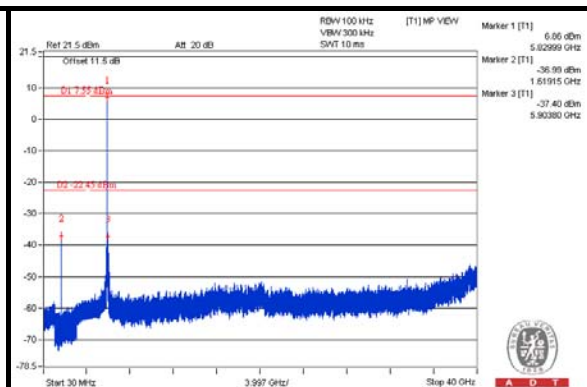
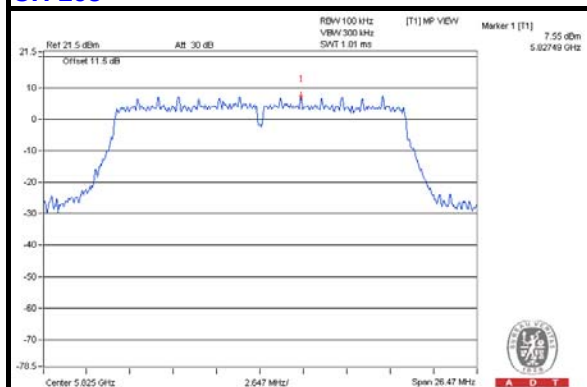
CH 149



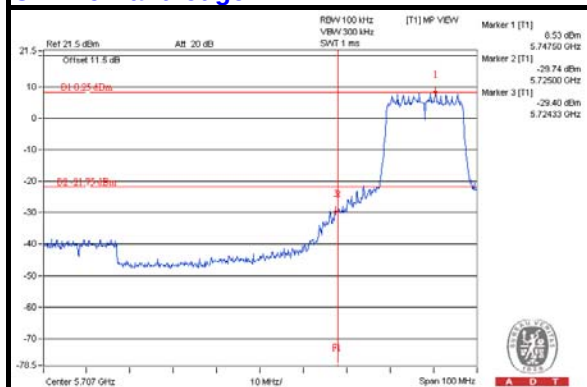
CH 157



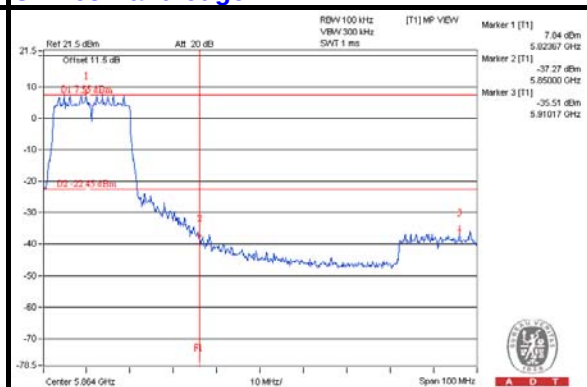
CH 165



CH 149 Band edge



CH 165 Band edge

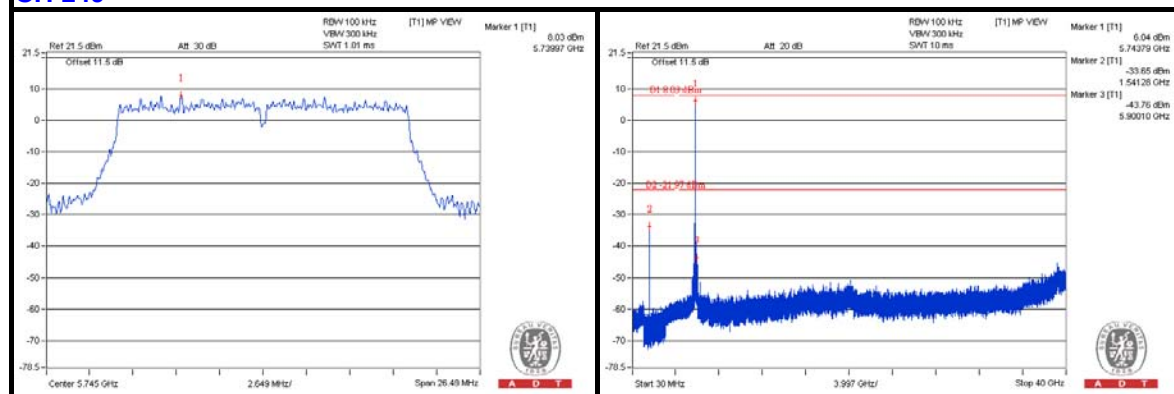




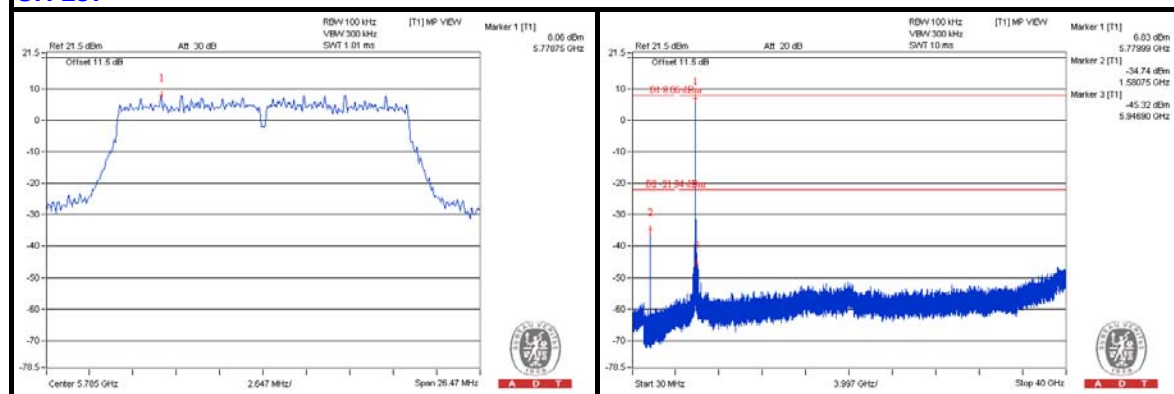
A D T

CHAIN 1

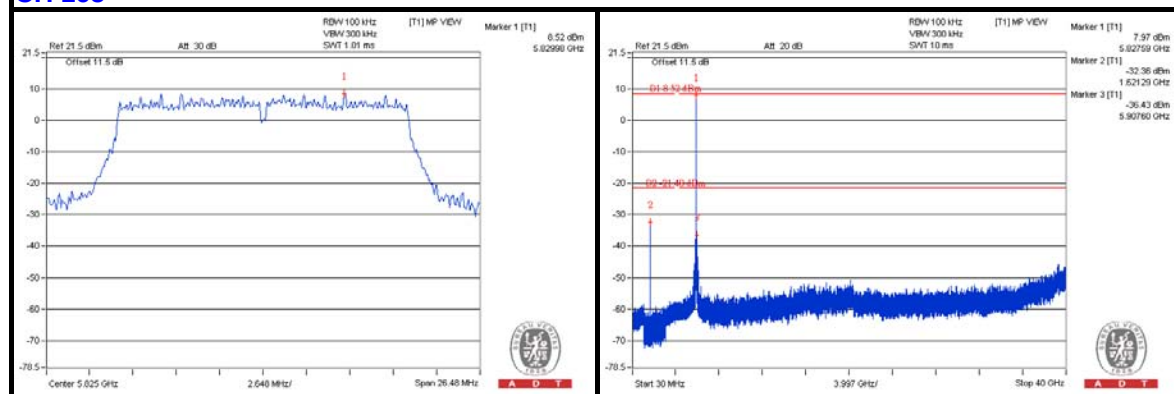
CH 149



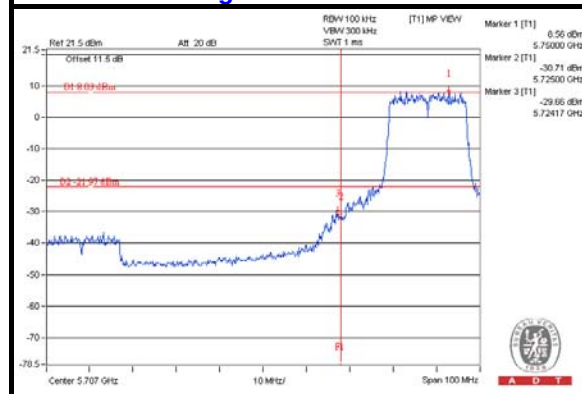
CH 157



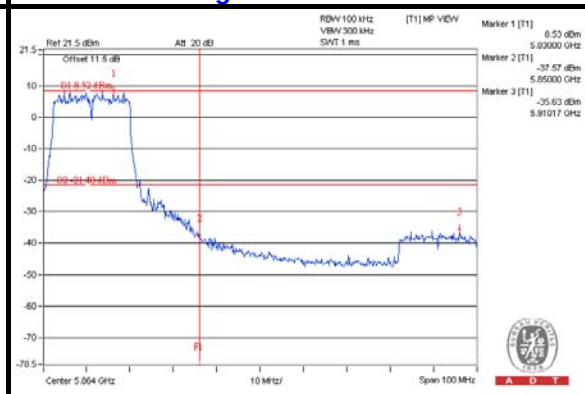
CH 165



CH 149 Band edge



CH 165 Band edge

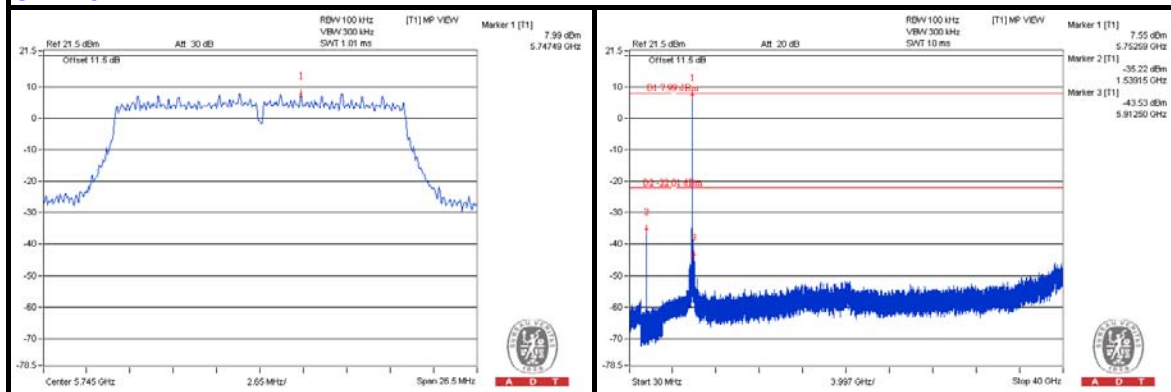




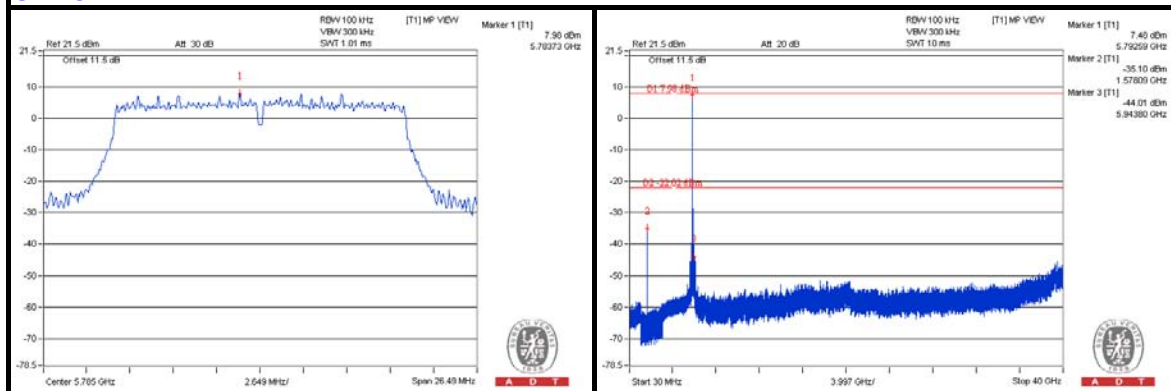
A D T

CHAIN 2

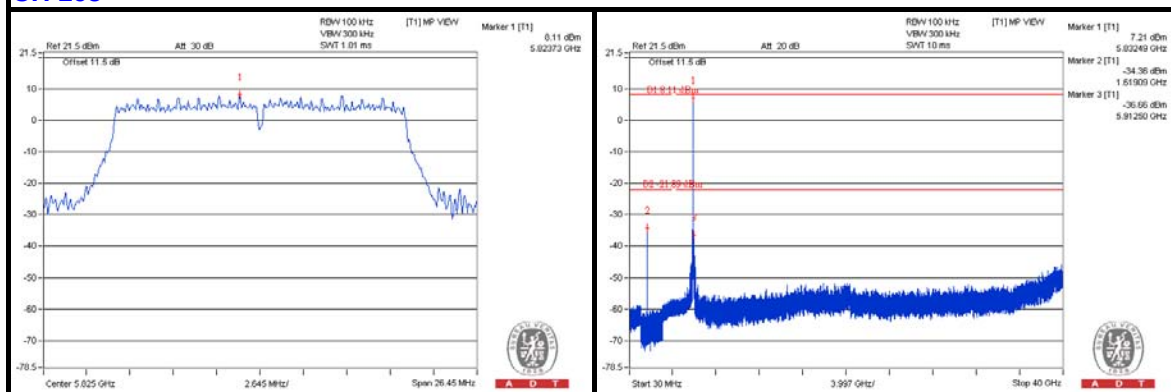
CH 149



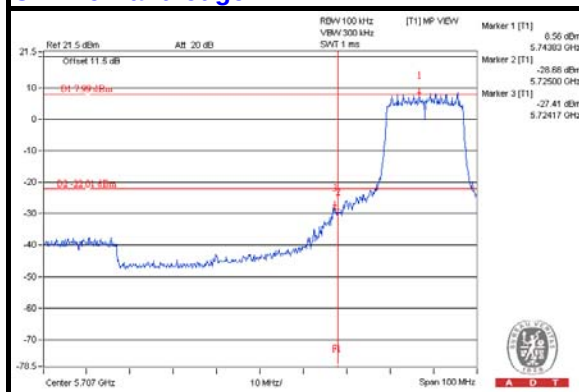
CH 157



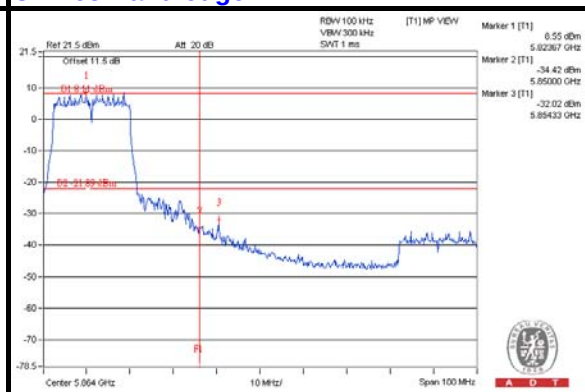
CH 165



CH 149 Band edge



CH 165 Band edge

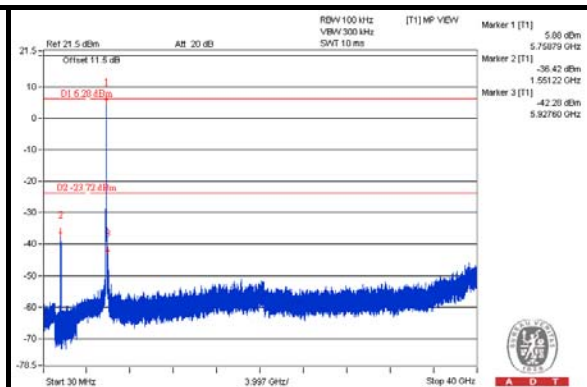
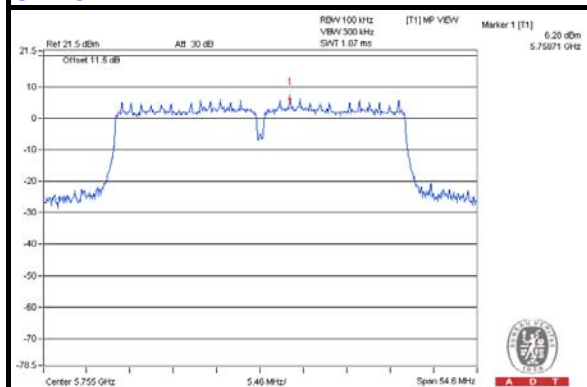




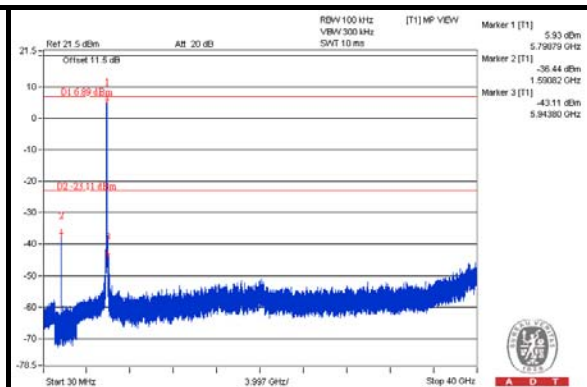
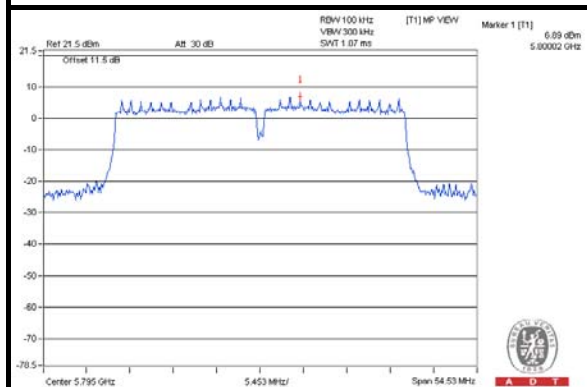
A D T

802.11n (HT40) CHAIN 0

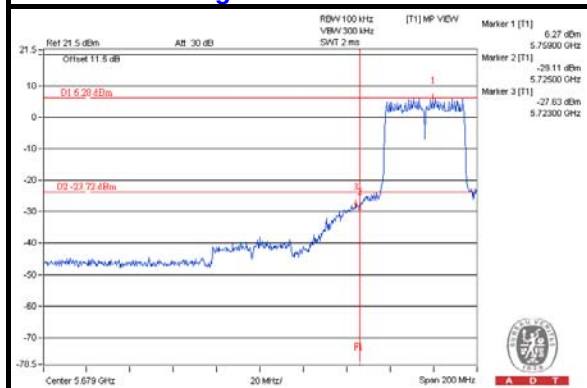
CH 151



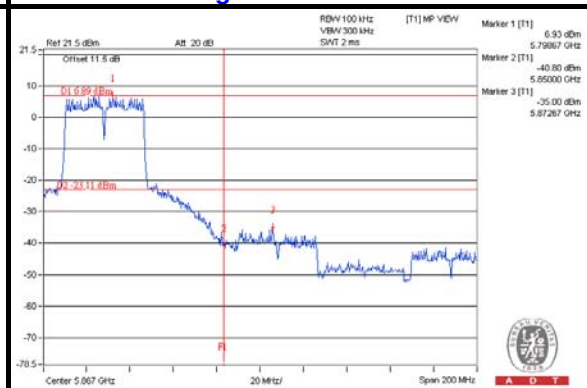
CH 159



CH 151 Band edge



CH 159 Band edge

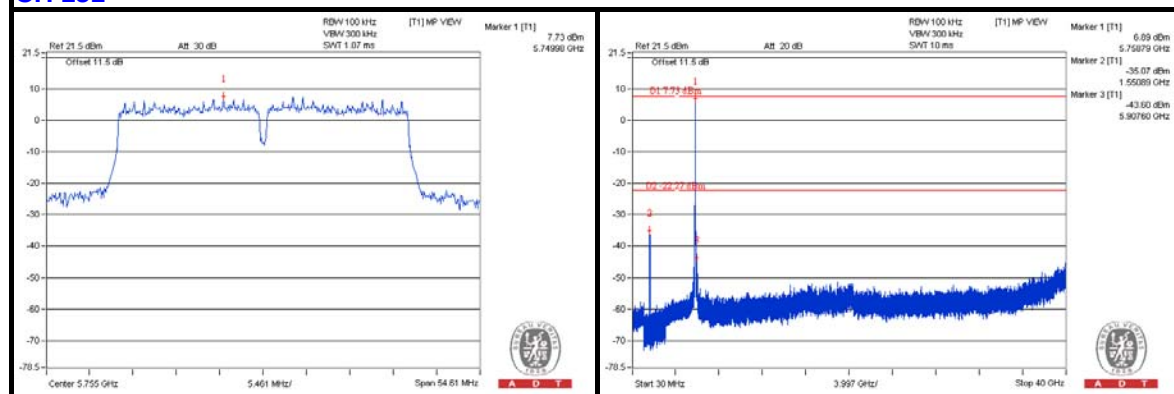




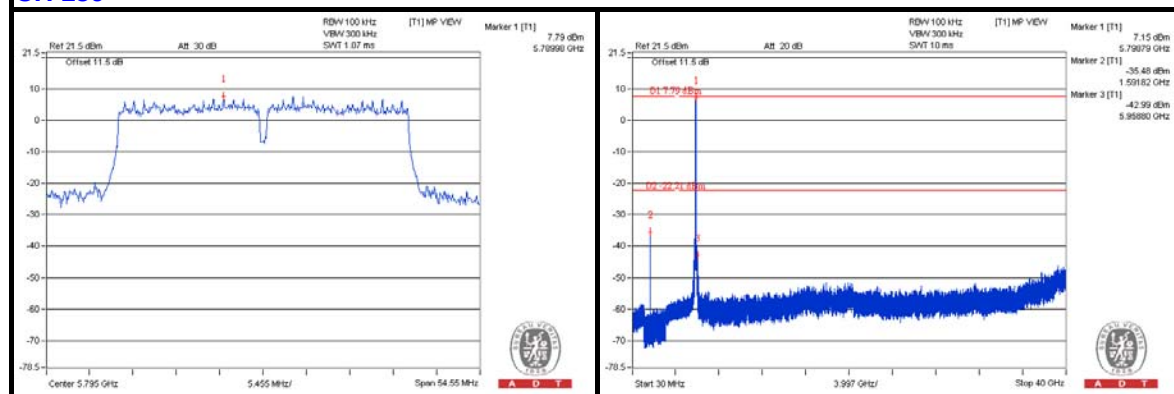
A D T

CHAIN 1

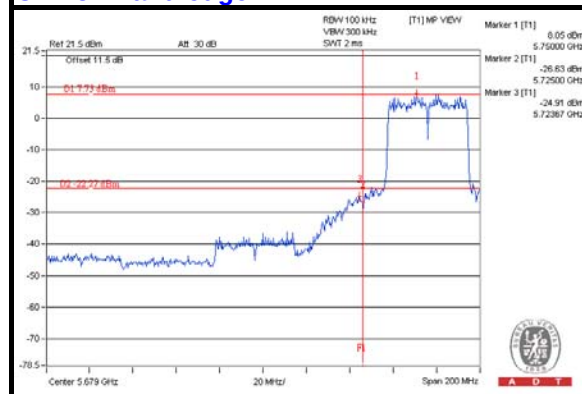
CH 151



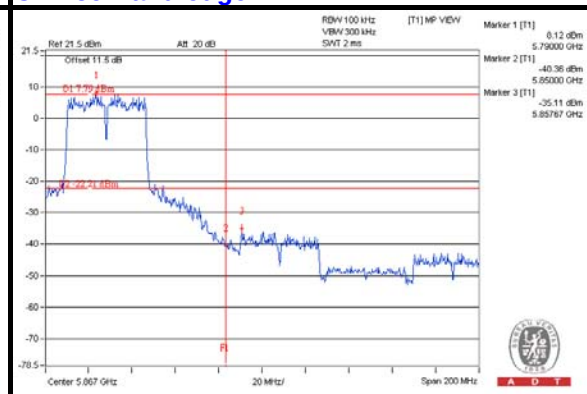
CH 159



CH 151 Band edge



CH 159 Band edge

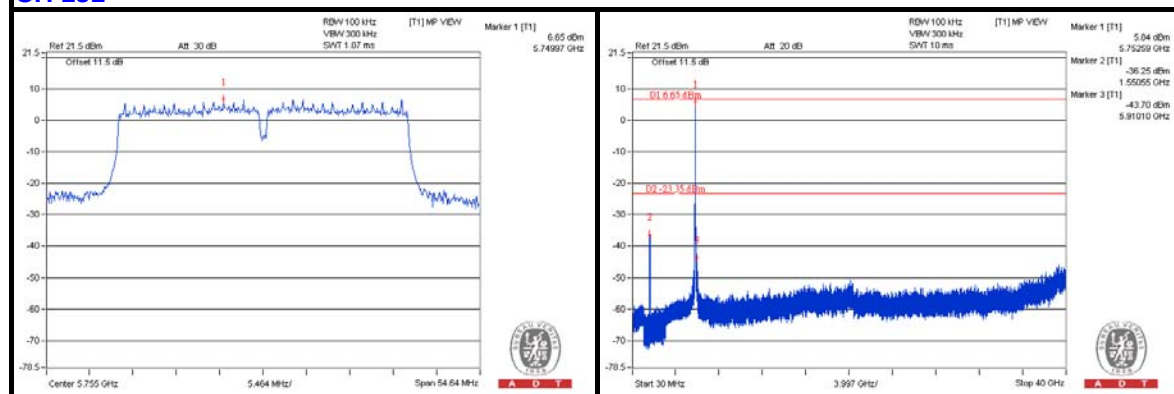




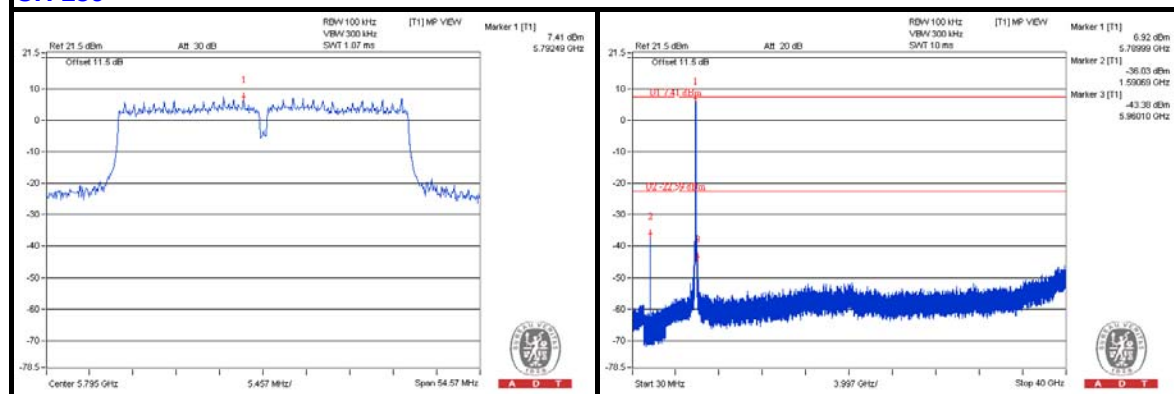
A D T

CHAIN 2

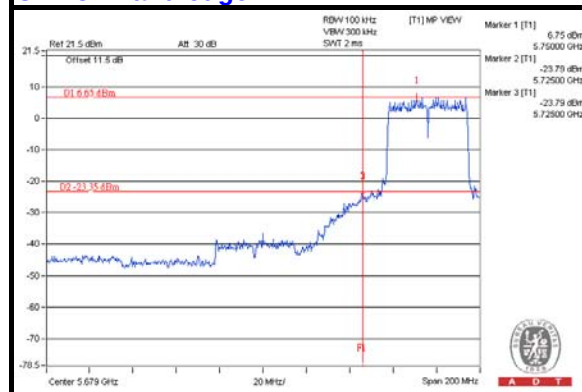
CH 151



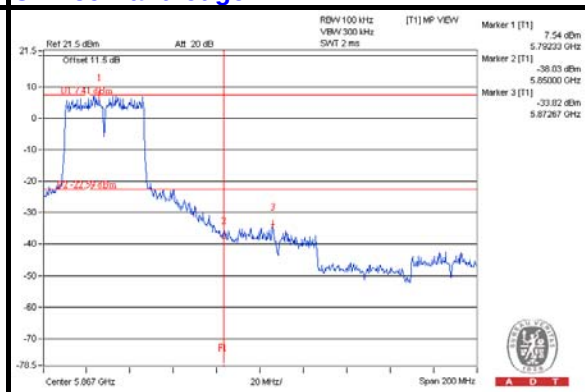
CH 159



CH 151 Band edge



CH 159 Band edge



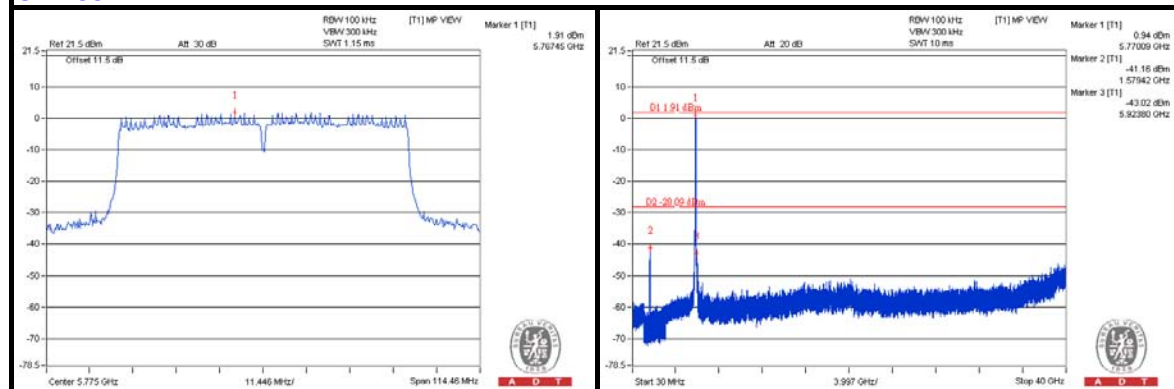


A D T

802.11ac (VHT80)

CHAIN 0

CH 155



CH 155 Band edge

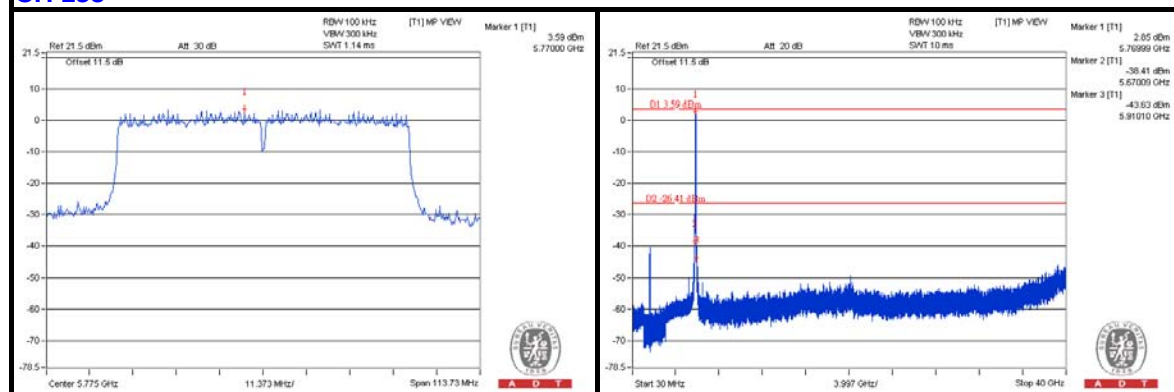




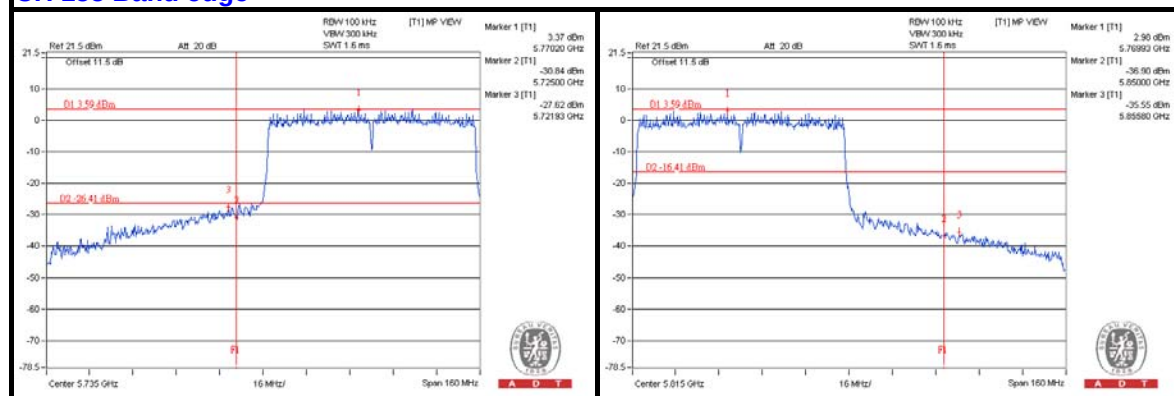
A D T

CHAIN 1

CH 155



CH 155 Band edge

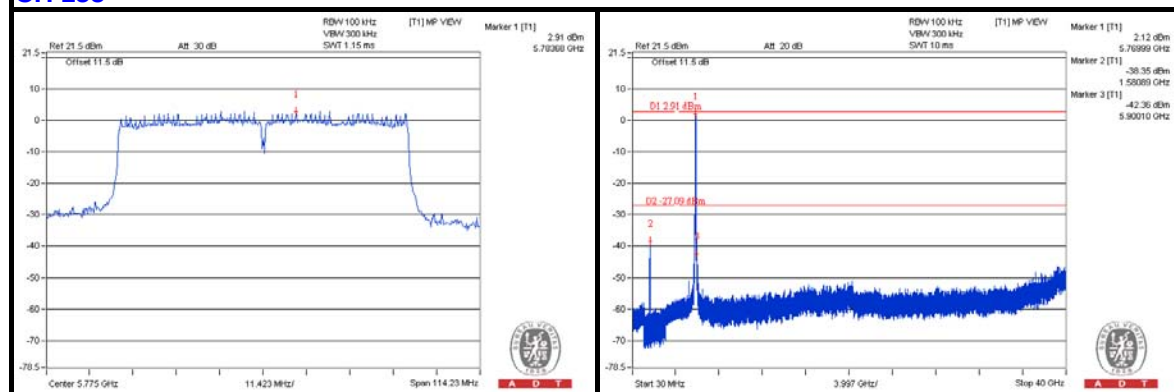




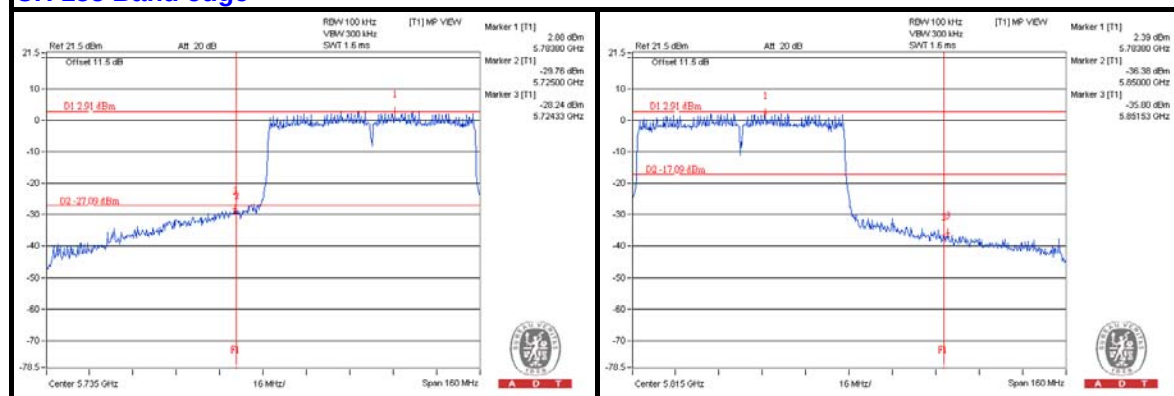
A D T

CHAIN 2

CH 155



CH 155 Band edge





A D T

6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



A D T

7. INFORMATION ON THE TESTING LABORATORIES

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

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

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF Lab

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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



A D T

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

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

---END---