FCC TEST REPORT
(15.247)

REPORT NO.: RF141007C29

MODEL NO.: WNDR4500v3

FCC ID: PY314200277

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TESTED: Oct. 14 ~ Dec. 26, 2014

ISSUED: Dec. 27, 2014

APPLICANT: NETGEAR INC.

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

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TEST LOCATION: No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF141007C29	Original release	Dec. 27, 2014

1. CERTIFICATION

PRODUCT:	N900 Wireless Dual Band Gigabit Router
MODEL NO.:	WNDR4500v3
BRAND:	Netgear
APPLICANT:	NETGEAR INC.
TESTED:	Oct. 14 ~ Dec. 26, 2014
TEST SAMPLE:	ENGINEERING SAMPLE
STANDARDS:	**FCC Part 15, Subpart C (Section 15.247)**

The above equipment (model: WNDR4500v3) 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 : Celine Chou **, DATE :** Dec. 27, 2014

Celine Chou / Specialist

APPROVED BY : Ken Liu **, DATE :** Dec. 27, 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 -1.27dB at 0.42370MHz.
15.205 & 209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.2dB at 2483.50MHz.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.2dB 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 I-PEX(MHF) 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	3.59 dB
	200MHz ~1000MHz	3.60 dB
	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 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	N900 Wireless Dual Band Gigabit Router
MODEL NO.	WNDR4500v3
POWER SUPPLY	12Vdc (Adapter)
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b:11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 450.0Mbps
OPERATING FREQUENCY	**2.4GHz:** 2412 ~ 2462MHz **5.0GHz:** 5745 ~ 5825MHz
NUMBER OF CHANNEL	**2.4GHz:** 11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz) **5.0GHz:** 5 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
OUTPUT POWER	609.607mW for 2412 ~ 2462MHz 605.614mW for 5745 ~ 5825MHz
ANTENNA TYPE	Refer to Note
ANTENNA CONNECTOR	Refer to Note
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	Adapter

NOTE:

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

MODULATION MODE	TX FUNCTION
802.11b	3TX
802.11g	3TX
802.11a	3TX
802.11n (20MHz)	3TX
802.11n (40MHz)	3TX

2. The EUT consumes power from the following adapter.

ADAPTER 1	
BRAND	NETGEAR
MODEL	MU30-5120250-A1
PART NO.	332-10234-01
INPUT POWER	100-240Vac, 50/60Hz, 0.8A
OUTPUT POWER	12Vdc, 2.5A
POWER LINE	1.8m cable without core attached on adapter

ADAPTER 2	
BRAND	NETGEAR
MODEL	P030WF120B 11200-6LF
PART NO.	332-10200-02
INPUT POWER	100-240Vac, 50/60Hz, 1.0A
OUTPUT POWER	12Vdc, 2.5A
POWER LINE	1.8m cable without core attached on adapter

ADAPTER 3	
BRAND	NETGEAR
MODEL	SAS030F1 NA
PART NO.	332-10451-01
INPUT POWER	100-120Vac, 47-63Hz, 0.9A
OUTPUT POWER	12Vdc, 2.5A
POWER LINE	1.8m cable without core attached on adapter

3. The following antennas were provided to the EUT.

Ant. NO.	Brand	Model	Ant. Type	Connecter Type	Antenna Gain(dBi) Including cable loss	
					2.4GHz	5.0GHz
1, 2	Master Wave Technology Co., Ltd.	98P2LPIPF000	PCB	i-pex(MHF)	3.37	3.03
3	Master Wave Technology Co., Ltd.	98P2LPIPF001	PCB	i-pex(MHF)	2.64	3.31

4. 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 and 802.11n (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

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

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

FOR 5.0GHz (5745 ~ 5825MHz):

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

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

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755MHz	159	5795MHz

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	
A	-	√	√	-	Adapter 1
B	√	√	√	√	Adapter 2
C	-	√	√	-	Adapter 3

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

NOTE:
1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**.
2. "-"means no effect.

RADIATED EMISSION TEST (ABOVE 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
B	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
B	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
B	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
B	802.11n (40MHz)	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)
A, B, C	802.11b	1 to 11	1	DSSS	DBPSK	1.0

POWER LINE CONDUCTED EMISSION TEST:

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B, C	802.11b	1 to 11	1	DSSS	DBPSK	1.0

BANDEDGE MEASUREMENT:

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
B	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
B	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
B	802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	7.2
B	802.11n (40MHz)	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)
B	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
B	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
B	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
B	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	15.0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	22deg. C, 63%RH	120Vac, 60Hz	Brad Tung
RE<1G	25deg. C, 64%RH	120Vac, 60Hz	Alan Wu
PLC	25deg. C, 60%RH	120Vac, 60Hz	Tank Wu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jun Wu

FOR 5.0GHz (5745 ~ 5825MHz):

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
A	-	√	√	-	Adapter 1
B	√	√	√	√	Adapter 2
C	-	√	√	-	Adapter 3

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

NOTE:
1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**.
2. "-"means no effect.

RADIATED EMISSION TEST (ABOVE 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
B	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
B	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
B	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0

RADIATED EMISSION TEST (BELOW 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B, C	802.11a	149 to 165	149	OFDM	BPSK	6.0

POWER LINE CONDUCTED EMISSION TEST:

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B, C	802.11a	149 to 165	149	OFDM	BPSK	6.0

BANDEDGE MEASUREMENT:

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
B	802.11a	149 to 165	149, 165	OFDM	BPSK	6.0
B	802.11n (20MHz)	149 to 165	149, 165	OFDM	BPSK	7.2
B	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0

ANTENNA PORT CONDUCTED MEASUREMENT:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
B	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
B	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
B	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	22deg. C, 63%RH	120Vac, 60Hz	Brad Tung
RE<1G	25deg. C, 64%RH	120Vac, 60Hz	Alan Wu
PLC	25deg. C, 60%RH	120Vac, 60Hz	Tank Wu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Nick Chen

3.3 DUTY CYCLE OF TEST SIGNAL

2.4GHz Band:

802.11b: Duty cycle of test signal is > 98 %, duty factor is not required.

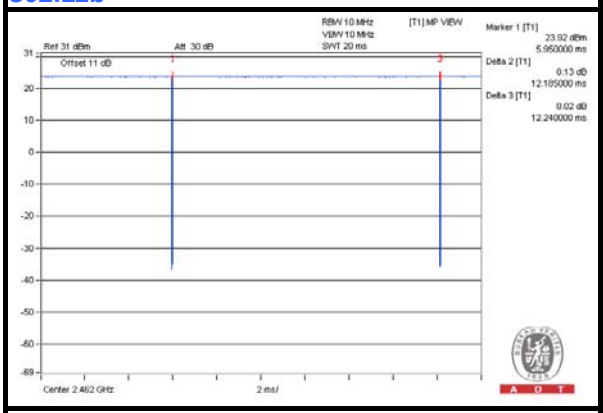
802.11g, 802.11n (20MHz), 802.11n (40MHz): Duty cycle is < 98%, duty factor shall be considered.

802.11g: Duty cycle = 2.023/2.079 = 0.973, Duty factor = 10 * log(1/0.973) = 0.12

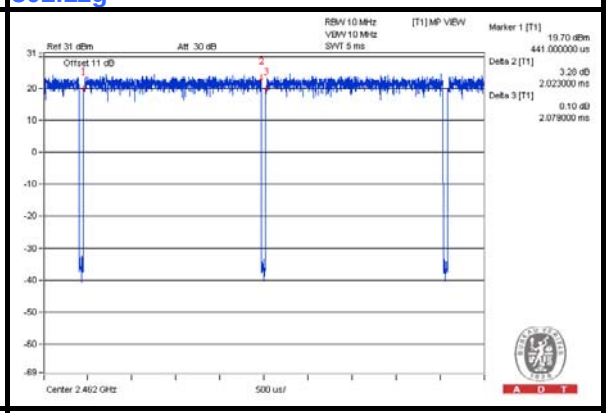
802.11n (20MHz): Duty cycle = 1.887/1.943 = 0.971, Duty factor = 10 * log(1/0.971) = 0.13

802.11n (40MHz): Duty cycle = 0.921/0.965 = 0.954, Duty factor = 10 * log(1/0.954) = 0.20

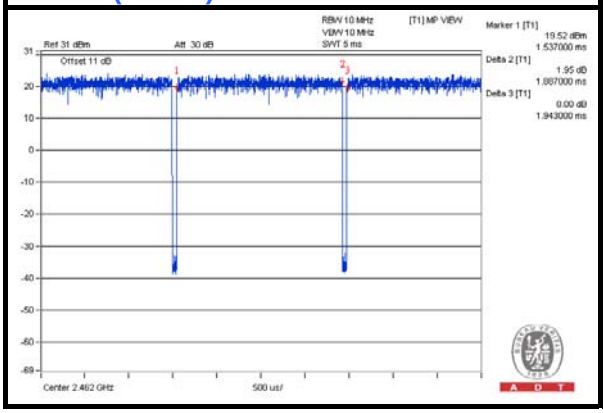
802.11b



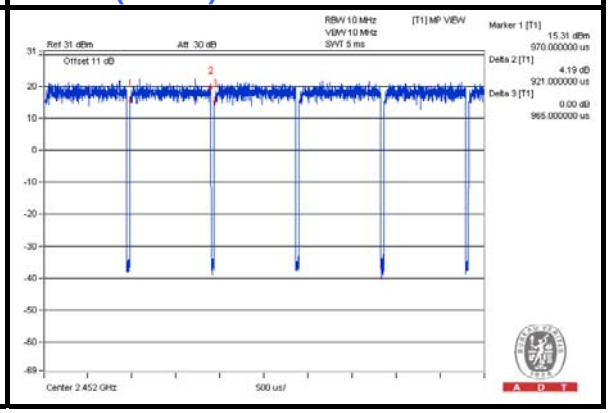
802.11g



802.11n (20MHz)



802.11n (40MHz)



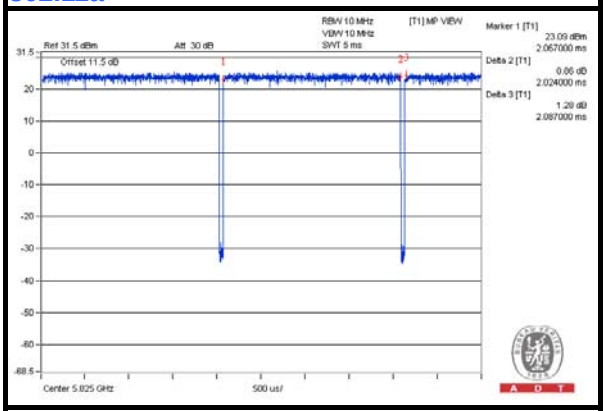
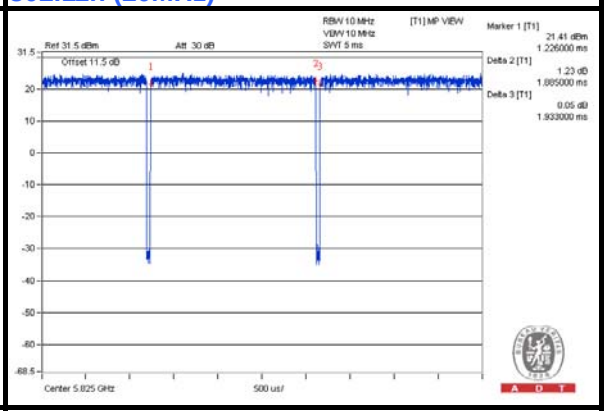
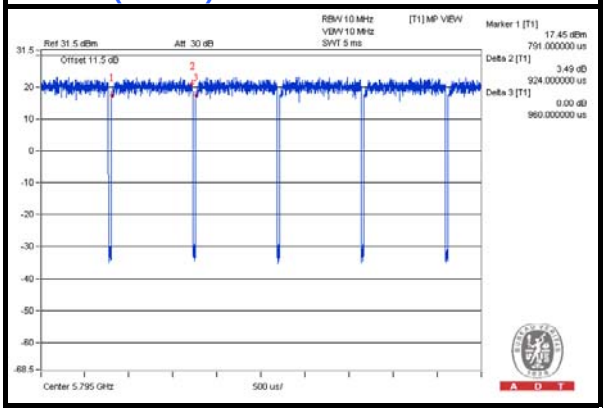
5.0GHz Band:

Duty cycle of test signal is < 98 %, duty factor is required.

802.11a: Duty cycle = 2.024/2.087 = 0.970, Duty factor = 10 * log(1/0.970) = 0.13

802.11n (20MHz): Duty cycle = 1.885/1.933 = 0.975, Duty factor = 10 * log(1/0.975) = 0.11

802.11n (40MHz): Duty cycle = 0.924/0.960 = 0.963, Duty factor = 10 * log(1/0.963) = 0.17

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

3.4 DESCRIPTION OF SUPPORT UNITS

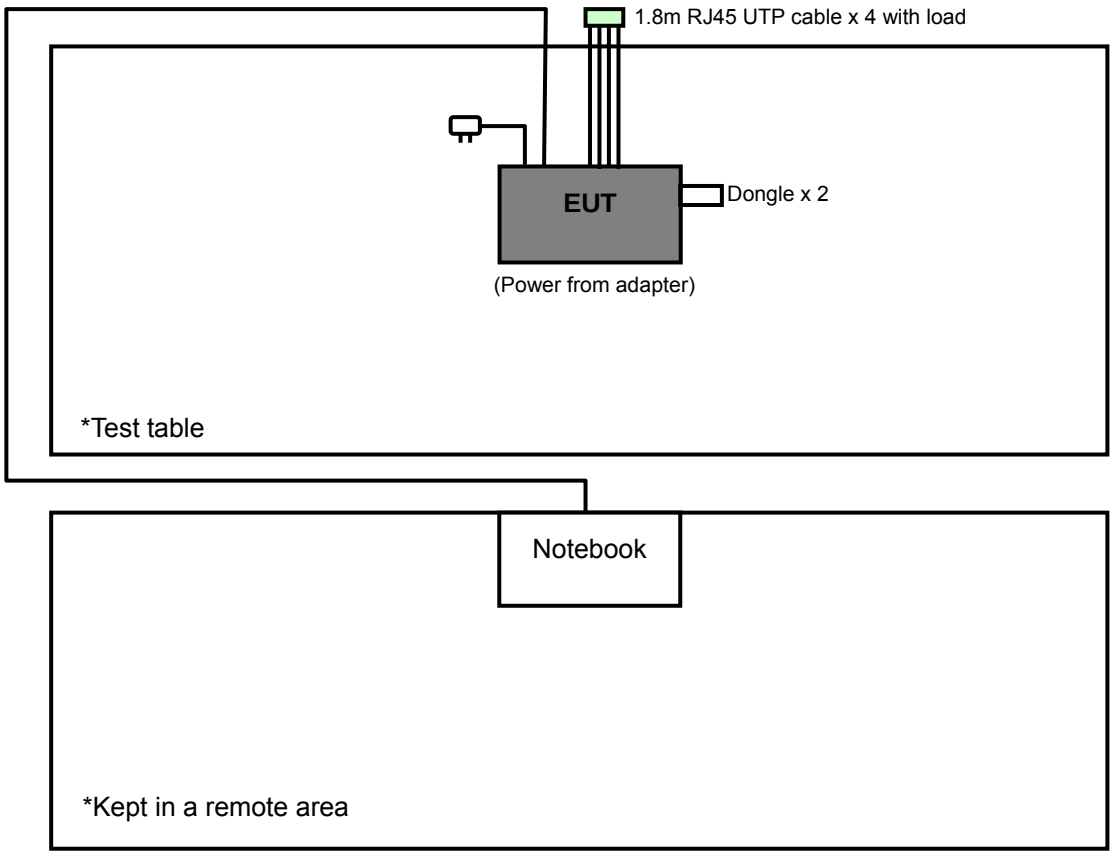
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook	DELL	E5420	BPQ8MQ1	FCC DoC Approved
2	Dongle	SANDISK	SDCZ6-1024	NA	NA
3	Dongle	SANDISK	SDCZ6-1024	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	10m RJ45 cable
2	NA
3	NA

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

3.4.1 CONFIGURATION OF SYSTEM UNDER TEST



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	ESCI	100424	Oct. 06, 2014	Oct. 05, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSU 43	100115	Dec. 18, 2013	Dec. 17, 2014
			Dec. 18, 2014	Dec. 17, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Feb. 26, 2014	Feb. 25, 2015
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-404	Jan. 05, 2014	Jan. 04, 2015
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 17, 2014	Feb. 16, 2015
Preamplifier Agilent	8449B	3008A01961	Oct. 28, 2013	Oct. 27, 2014
			Oct. 18, 2014	Oct. 17, 2015
Preamplifier Agilent	8447D	2944A10738	Oct. 28, 2013	Oct. 27, 2014
			Oct. 18, 2014	Oct. 17, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309220/4	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250724/4	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Aug. 09, 2014	Aug. 08, 2015
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA	NA
Turn Table BV ADT	TT100.	TT93021704	NA	NA
Turn Table Controller BV ADT	SC100.	SC93021704	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2013	Oct. 17, 2014
			Oct. 18, 2014	Oct. 17, 2015
High Speed Peak Power Meter	ML2495A	0824011	Jul. 26, 2014	Jul. 25, 2015
Power Sensor	MA2411B	0738171	Jul. 26, 2014	Jul. 25, 2015

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

2. The test was performed in HwaYa Chamber 4.

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 460141.

5. The IC Site Registration No. is IC7450F-4.

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:

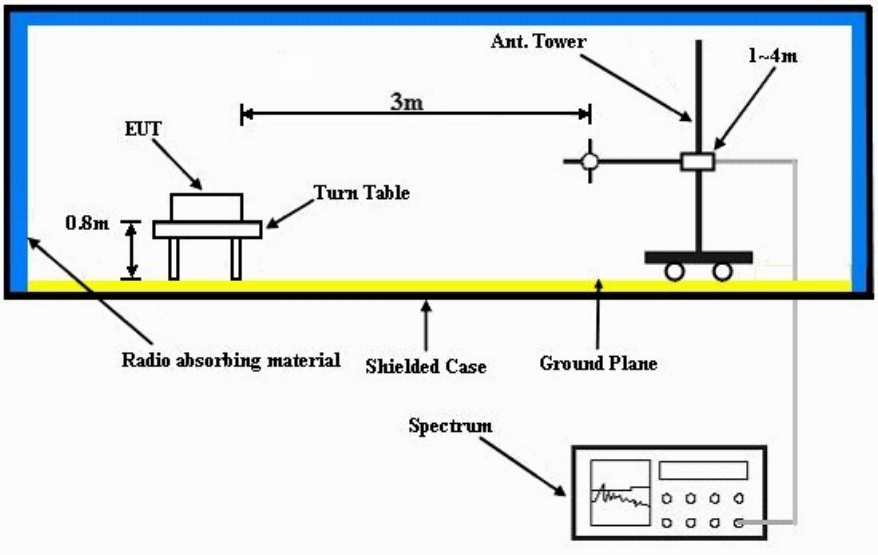
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution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

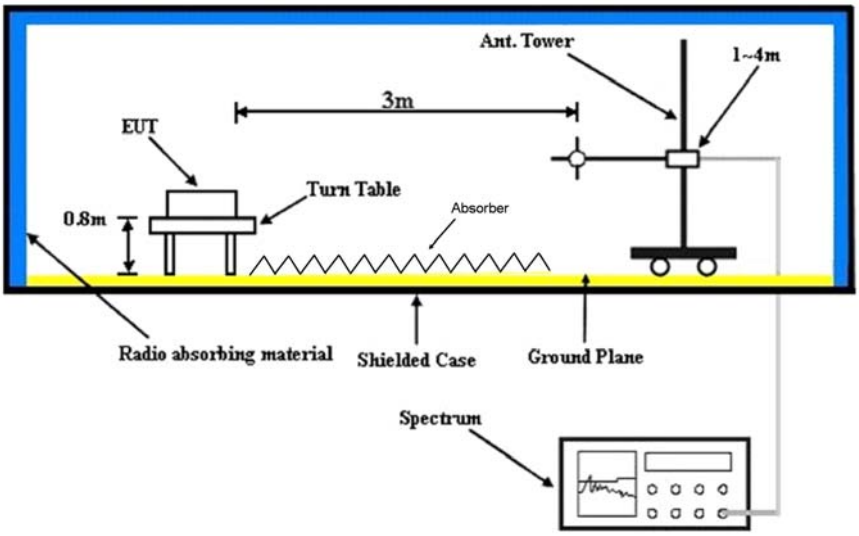
No deviation.

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 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 partner sent data to EUT by command "PING".
e. The necessary accessories enabled the system in full functions.

4.1.7 TEST RESULTS

ABOVE 1GHz DATA：

802.11b

CHANNEL	TX Channel 1	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	63.4 PK	74.0	-10.6	1.32 H	95	31.20	32.20
2	2390.00	53.6 AV	54.0	-0.4	1.32 H	95	21.40	32.20
3	*2412.00	116.2 PK			1.32 H	95	84.00	32.20
4	*2412.00	112.5 AV			1.32 H	95	80.30	32.20
5	4824.00	52.2 PK	74.0	-21.8	1.08 H	39	46.90	5.30
6	4824.00	45.5 AV	54.0	-8.5	1.08 H	39	40.20	5.30
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	2390.00	62.1 PK	74.0	-11.9	1.00 V	273	29.90	32.20
2	2390.00	52.8 AV	54.0	-1.2	1.00 V	273	20.60	32.20
3	*2412.00	116.5 PK			1.00 V	273	84.30	32.20
4	*2412.00	112.9 AV			1.00 V	273	80.70	32.20
5	4824.00	48.4 PK	74.0	-25.6	1.00 V	169	43.10	5.30
6	4824.00	38.0 AV	54.0	-16.0	1.00 V	169	32.70	5.30

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	117.8 PK			1.32 H	264	85.60	32.20
2	*2437.00	114.4 AV			1.32 H	264	82.20	32.20
3	4874.00	56.5 PK	74.0	-17.5	1.58 H	80	51.20	5.30
4	4874.00	52.6 AV	54.0	-1.4	1.58 H	80	47.30	5.30
5	7311.00	61.1 PK	74.0	-12.9	1.60 H	92	49.20	11.90
6	7311.00	53.7 AV	54.0	-0.3	1.60 H	92	41.80	11.90
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	59.7 PK	74.0	-14.3	1.00 V	255	27.50	32.20
2	2390.00	47.7 AV	54.0	-6.3	1.00 V	255	15.50	32.20
3	*2437.00	116.0 PK			1.00 V	255	83.80	32.20
4	*2437.00	112.9 AV			1.00 V	255	80.70	32.20
5	7311.00	55.9 PK	74.0	-18.1	1.00 V	166	44.00	11.90
6	7311.00	44.2 AV	54.0	-9.8	1.00 V	166	32.30	11.90
7	12185.00	62.0 PK	74.0	-12.0	1.00 V	230	44.90	17.10
8	12185.00	52.6 AV	54.0	-1.4	1.00 V	230	35.50	17.10

REMARKS:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	117.0 PK			1.39 H	262	84.70	32.30
2	*2462.00	113.1 AV			1.39 H	262	80.80	32.30
3	2483.50	64.5 PK	74.0	-9.5	1.39 H	262	32.10	32.40
4	**2483.50**	**53.8 AV**	**54.0**	**-0.2**	**1.39 H**	**262**	**21.40**	**32.40**
5	4924.00	52.4 PK	74.0	-21.6	1.27 H	60	46.90	5.50
6	4924.00	46.7 AV	54.0	-7.3	1.27 H	60	41.20	5.50
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	114.3 PK			1.00 V	131	82.00	32.30
2	*2462.00	110.1 AV			1.00 V	131	77.80	32.30
3	2483.50	64.1 PK	74.0	-9.9	1.00 V	131	31.70	32.40
4	2483.50	53.6 AV	54.0	-0.4	1.00 V	131	21.20	32.40
5	4924.00	48.6 PK	74.0	-25.4	1.00 V	196	43.10	5.50
6	4924.00	38.3 AV	54.0	-15.7	1.00 V	196	32.80	5.50

REMARKS:

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

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	72.1 PK	74.0	-1.9	1.13 H	259	39.90	32.20
2	2390.00	53.1 AV	54.0	-0.9	1.13 H	259	20.90	32.20
3	*2412.00	113.3 PK			1.13 H	259	81.10	32.20
4	*2412.00	103.2 AV			1.13 H	259	71.00	32.20
5	4824.00	51.6 PK	74.0	-22.4	1.15 H	66	46.30	5.30
6	4824.00	38.1 AV	54.0	-15.9	1.15 H	66	32.80	5.30
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	2390.00	72.9 PK	74.0	-1.1	1.40 V	118	40.70	32.20
2	2390.00	53.2 AV	54.0	-0.8	1.40 V	118	21.00	32.20
3	*2412.00	116.0 PK			1.40 V	118	83.80	32.20
4	*2412.00	105.0 AV			1.40 V	118	72.80	32.20
5	4824.00	49.8 PK	74.0	-24.2	1.00 V	145	44.50	5.30
6	4824.00	35.8 AV	54.0	-18.2	1.00 V	145	30.50	5.30

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	116.1 PK			1.44 H	243	83.90	32.20
2	*2437.00	105.3 AV			1.44 H	243	73.10	32.20
3	2483.50	68.5 PK	74.0	-5.5	1.44 H	243	36.10	32.40
4	2483.50	51.7 AV	54.0	-2.3	1.44 H	243	19.30	32.40
5	4874.00	52.5 PK	74.0	-21.5	1.16 H	55	47.20	5.30
6	4874.00	39.5 AV	54.0	-14.5	1.16 H	55	34.20	5.30
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	*2437.00	118.1 PK			1.00 V	192	85.90	32.20
2	*2437.00	107.2 AV			1.00 V	192	75.00	32.20
3	2483.50	70.5 PK	74.0	-3.5	1.00 V	292	38.10	32.40
4	**2483.50**	**53.8 AV**	**54.0**	**-0.2**	**1.00 V**	**292**	**21.40**	**32.40**
5	4874.00	50.5 PK	74.0	-23.5	1.00 V	143	45.20	5.30
6	4874.00	37.0 AV	54.0	-17.0	1.00 V	143	31.70	5.30

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	114.8 PK			1.35 H	260	82.50	32.30
2	*2462.00	103.5 AV			1.35 H	260	71.20	32.30
3	2483.50	73.5 PK	74.0	-0.5	1.35 H	260	41.10	32.40
4	2483.50	52.7 AV	54.0	-1.3	1.35 H	260	20.30	32.40
5	4924.00	51.3 PK	74.0	-22.7	1.13 H	65	45.80	5.50
6	4924.00	37.8 AV	54.0	-16.2	1.13 H	65	32.30	5.50
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	113.5 PK			1.00 V	279	81.20	32.30
2	*2462.00	103.1 AV			1.00 V	279	70.80	32.30
3	**2483.50**	**73.8 PK**	**74.0**	**-0.2**	**1.00 V**	**279**	**41.40**	**32.40**
4	2483.50	52.4 AV	54.0	-1.6	1.00 V	279	20.00	32.40
5	4924.00	49.3 PK	74.0	-24.7	1.00 V	153	43.80	5.50
6	4924.00	35.4 AV	54.0	-18.6	1.00 V	153	29.90	5.50

REMARKS:

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

802.11n (20MHz)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	73.2 PK	74.0	-0.8	1.34 H	254	41.00	32.20
2	2390.00	53.2 AV	54.0	-0.8	1.34 H	254	21.00	32.20
3	*2412.00	115.6 PK			1.34 H	254	83.40	32.20
4	*2412.00	103.0 AV			1.34 H	254	70.80	32.20
5	4824.00	51.1 PK	74.0	-22.9	1.11 H	62	45.80	5.30
6	4824.00	37.8 AV	54.0	-16.2	1.11 H	62	32.50	5.30
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	2390.00	73.5 PK	74.0	-0.5	1.00 V	98	41.30	32.20
2	2390.00	53.4 AV	54.0	-0.6	1.00 V	98	21.20	32.20
3	*2412.00	116.1 PK			1.00 V	98	83.90	32.20
4	*2412.00	103.8 AV			1.00 V	98	71.60	32.20
5	4824.00	49.7 PK	74.0	-24.3	1.00 V	147	44.40	5.30
6	4824.00	35.7 AV	54.0	-18.3	1.00 V	147	30.40	5.30

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	67.4 PK	74.0	-6.6	1.08 H	256	35.20	32.20
2	2390.00	53.0 AV	54.0	-1.0	1.08 H	256	20.80	32.20
3	*2437.00	116.6 PK			1.08 H	256	84.40	32.20
4	*2437.00	105.0 AV			1.08 H	256	72.80	32.20
5	4874.00	53.6 PK	74.0	-20.4	1.16 H	49	48.30	5.30
6	4874.00	39.5 AV	54.0	-14.5	1.16 H	49	34.20	5.30
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	2390.00	68.1 PK	74.0	-5.9	1.00 V	151	35.90	32.20
2	2390.00	53.3 AV	54.0	-0.7	1.00 V	151	21.10	32.20
3	*2437.00	117.1 PK			1.00 V	151	84.90	32.20
4	*2437.00	105.2 AV			1.00 V	151	73.00	32.20
5	4874.00	50.1 PK	74.0	-23.9	1.00 V	141	44.80	5.30
6	4874.00	36.7 AV	54.0	-17.3	1.00 V	141	31.40	5.30

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	115.3 PK			1.53 H	265	83.00	32.30
2	*2462.00	102.3 AV			1.53 H	265	70.00	32.30
3	2483.50	73.6 PK	74.0	-0.4	1.53 H	265	41.20	32.40
4	2483.50	53.4 AV	54.0	-0.6	1.53 H	265	21.00	32.40
5	4924.00	50.8 PK	74.0	-23.2	1.12 H	51	45.30	5.50
6	4924.00	37.5 AV	54.0	-16.5	1.12 H	51	32.00	5.50
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	114.1 PK			1.00 V	257	81.80	32.30
2	*2462.00	102.0 AV			1.00 V	257	69.70	32.30
3	**2483.50**	**73.8 PK**	**74.0**	**-0.2**	**1.00 V**	**257**	**41.40**	**32.40**
4	2483.50	53.6 AV	54.0	-0.4	1.00 V	257	21.20	32.40
5	4924.00	48.9 PK	74.0	-25.1	1.00 V	157	43.40	5.50
6	4924.00	35.2 AV	54.0	-18.8	1.00 V	157	29.70	5.50

REMARKS:

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

802.11n (40MHz)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	72.2 PK	74.0	-1.8	1.33 H	274	40.00	32.20
2	2390.00	53.4 AV	54.0	-0.6	1.33 H	274	21.20	32.20
3	*2422.00	112.3 PK			1.33 H	274	80.00	32.30
4	*2422.00	98.5 AV			1.33 H	274	66.20	32.30
5	4844.00	50.5 PK	74.0	-23.5	1.10 H	63	45.10	5.40
6	4844.00	36.8 AV	54.0	-17.2	1.10 H	63	31.40	5.40
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	2390.00	71.0 PK	74.0	-3.0	1.00 V	125	38.80	32.20
2	2390.00	53.3 AV	54.0	-0.7	1.00 V	125	21.10	32.20
3	*2422.00	111.2 PK			1.00 V	125	78.90	32.30
4	*2422.00	98.2 AV			1.00 V	125	65.90	32.30
5	4844.00	48.3 PK	74.0	-25.7	1.00 V	152	42.90	5.40
6	4844.00	34.4 AV	54.0	-19.6	1.00 V	152	29.00	5.40

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	115.2 PK			1.32 H	261	83.00	32.20
2	*2437.00	102.3 AV			1.32 H	261	70.10	32.20
3	2483.50	67.1 PK	74.0	-6.9	1.32 H	261	34.70	32.40
4	2483.50	53.4 AV	54.0	-0.6	1.32 H	261	21.00	32.40
5	4874.00	52.7 PK	74.0	-21.3	1.15 H	47	47.40	5.30
6	4874.00	38.4 AV	54.0	-15.6	1.15 H	47	33.10	5.30
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	*2437.00	113.2 PK			1.00 V	342	81.00	32.20
2	*2437.00	100.3 AV			1.00 V	342	68.10	32.20
3	2483.50	64.3 PK	74.0	-9.7	1.00 V	342	31.90	32.40
4	2483.50	51.6 AV	54.0	-2.4	1.00 V	342	19.20	32.40
5	4874.00	49.5 PK	74.0	-24.5	1.00 V	124	44.20	5.30
6	4874.00	35.7 AV	54.0	-18.3	1.00 V	124	30.40	5.30

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	112.2 PK			1.33 H	260	79.90	32.30
2	*2452.00	99.8 AV			1.33 H	260	67.50	32.30
3	2483.50	72.3 PK	74.0	-1.7	1.33 H	260	39.90	32.40
4	2483.50	53.3 AV	54.0	-0.7	1.33 H	260	20.90	32.40
5	4904.00	49.8 PK	74.0	-24.2	1.16 H	60	44.40	5.40
6	4904.00	36.7 AV	54.0	-17.3	1.16 H	60	31.30	5.40
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	*2452.00	109.9 PK			1.00 V	270	77.60	32.30
2	*2452.00	97.4 AV			1.00 V	270	65.10	32.30
3	2483.50	70.4 PK	74.0	-3.6	1.00 V	270	38.00	32.40
4	2483.50	51.9 AV	54.0	-2.1	1.00 V	270	19.50	32.40
5	4904.00	47.8 PK	74.0	-26.2	1.00 V	170	42.40	5.40
6	4904.00	34.6 AV	54.0	-19.4	1.00 V	170	29.20	5.40

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

BELOW 1GHz WORST-CASE DATA

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	A

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	45.42	27.2 QP	40.0	-12.8	1.00 H	130	41.40	-14.20
2	150.20	27.7 QP	43.5	-15.8	1.26 H	244	41.30	-13.60
3	216.18	29.0 QP	46.0	-17.0	2.00 H	88	45.30	-16.30
4	427.68	30.3 QP	46.0	-15.7	1.26 H	108	40.40	-10.10
5	749.79	26.6 QP	46.0	-19.4	1.00 H	144	30.20	-3.60
6	802.18	29.0 QP	46.0	-17.0	1.26 H	152	32.00	-3.00
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	45.42	36.8 QP	40.0	-3.2	1.00 V	164	51.00	-14.20
2	101.69	28.3 QP	43.5	-15.2	1.00 V	68	46.40	-18.10
3	295.73	25.9 QP	46.0	-20.1	1.24 V	11	38.50	-12.60
4	427.68	34.6 QP	46.0	-11.4	1.24 V	147	44.70	-10.10
5	722.62	26.5 QP	46.0	-19.5	3.00 V	3	31.30	-4.80
6	778.89	27.3 QP	46.0	-18.7	1.00 V	166	30.60	-3.30

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	B

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	39.60	25.5 QP	40.0	-14.5	1.24 H	75	40.10	-14.60
2	88.11	30.6 QP	43.5	-12.9	2.00 H	109	50.10	-19.50
3	128.86	35.5 QP	43.5	-8.0	2.00 H	251	50.80	-15.30
4	427.68	26.7 QP	46.0	-19.3	2.00 H	12	36.80	-10.10
5	450.97	30.8 QP	46.0	-15.2	1.00 H	228	40.40	-9.60
6	782.78	28.7 QP	46.0	-17.3	1.00 H	8	31.80	-3.10
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	41.54	36.9 QP	40.0	-3.1	1.24 V	153	51.40	-14.50
2	88.11	35.7 QP	43.5	-7.8	1.00 V	343	55.20	-19.50
3	128.86	36.3 QP	43.5	-7.2	1.49 V	217	51.60	-15.30
4	324.84	26.0 QP	46.0	-20.0	1.49 V	259	37.80	-11.80
5	427.68	32.2 QP	46.0	-13.8	1.00 V	8	42.30	-10.10
6	778.89	29.5 QP	46.0	-16.5	1.00 V	223	32.80	-3.30

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	C

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	39.60	24.9 QP	40.0	-15.1	1.00 H	167	39.50	-14.60
2	88.11	28.9 QP	43.5	-14.6	1.99 H	143	48.40	-19.50
3	121.10	31.9 QP	43.5	-11.6	1.99 H	260	47.90	-16.00
4	437.38	28.6 QP	46.0	-17.4	1.25 H	33	38.50	-9.90
5	749.79	26.9 QP	46.0	-19.1	1.00 H	55	30.50	-3.60
6	802.18	30.7 QP	46.0	-15.3	1.00 H	90	33.70	-3.00
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	39.60	36.7 QP	40.0	-3.3	1.00 V	177	51.30	-14.60
2	53.18	33.3 QP	40.0	-6.7	1.00 V	235	47.30	-14.00
3	121.10	30.8 QP	43.5	-12.7	1.24 V	218	46.80	-16.00
4	293.79	25.5 QP	46.0	-20.5	1.24 V	342	38.20	-12.70
5	431.56	29.1 QP	46.0	-16.9	2.00 V	41	39.10	-10.00
6	802.18	28.5 QP	46.0	-17.5	1.49 V	319	31.50	-3.00

REMARKS:

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

4.2 CONDUCTED EMISSION MEASUREMENT

4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

NOTE: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100612	Sep. 30, 2014	Sep. 29, 2015
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 27, 2013	Dec. 26, 2014
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 13, 2014	Feb. 12, 2015
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 21, 2014	Jul. 20, 2015
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

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

2. The test was performed in HwaYa Shielded Room 1.

3. The VCCI Site Registration No. is C-2040.

4.2.3 TEST PROCEDURES

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

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

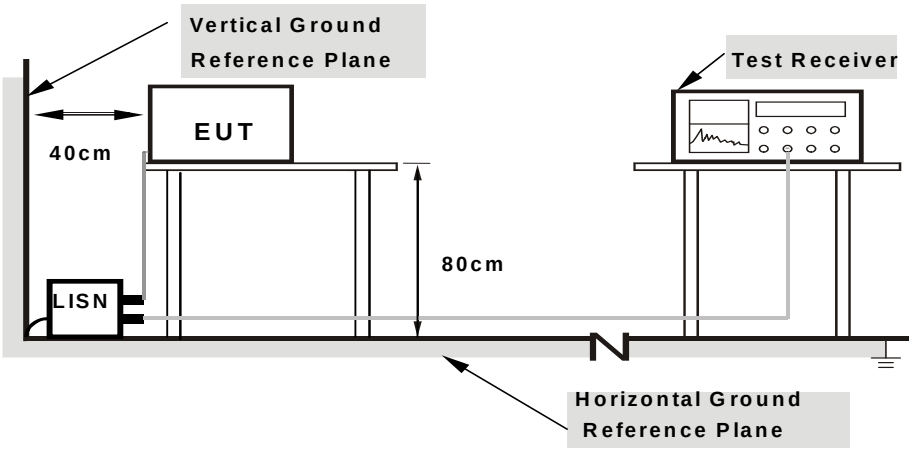
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



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

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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

4.2.7 TEST RESULTS

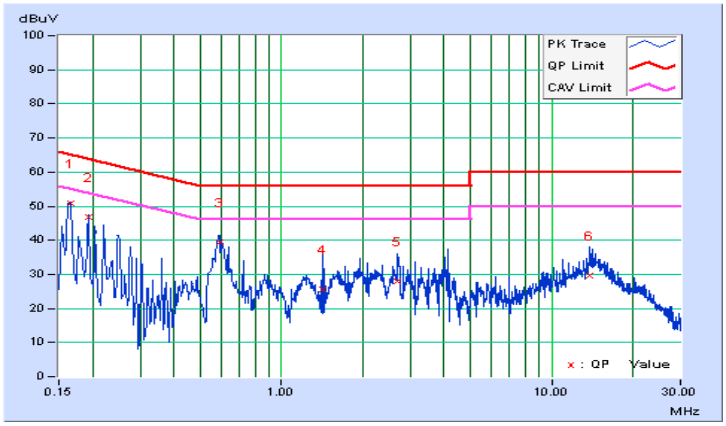
CONDUCTED WORST-CASE DATA：802.11b

PHASE	Line 1	**6dB BANDWIDTH**	9kHz
TEST MODE	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16526	0.08	50.70	39.82	50.78	39.90	65.20	55.20	-14.42	-15.30
2	0.19305	0.07	46.80	35.61	46.87	35.68	63.90	53.90	-17.03	-18.22
3	0.58792	0.09	39.45	28.65	39.54	28.74	56.00	46.00	-16.46	-17.26
4	1.41293	0.13	25.56	12.04	25.69	12.17	56.00	46.00	-30.31	-33.83
5	2.69932	0.18	27.87	20.82	28.05	21.00	56.00	46.00	-27.95	-25.00
6	13.78417	0.71	29.03	22.32	29.74	23.03	60.00	50.00	-30.26	-26.97

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

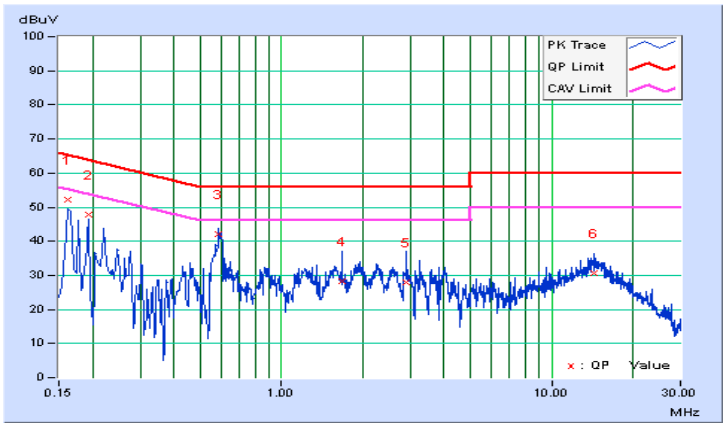


PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16181	0.05	52.16	40.92	52.21	40.97	65.37	55.37	-13.16	-14.40
2	0.19305	0.05	47.78	37.99	47.83	38.04	63.90	53.90	-16.07	-15.86
3	0.58401	0.08	41.86	31.49	41.94	31.57	56.00	46.00	-14.06	-14.43
4	1.67881	0.12	28.29	21.06	28.41	21.18	56.00	46.00	-27.59	-24.82
5	2.90655	0.17	27.82	21.18	27.99	21.35	56.00	46.00	-28.01	-24.65
6	14.42932	0.65	30.03	23.24	30.68	23.89	60.00	50.00	-29.32	-26.11

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

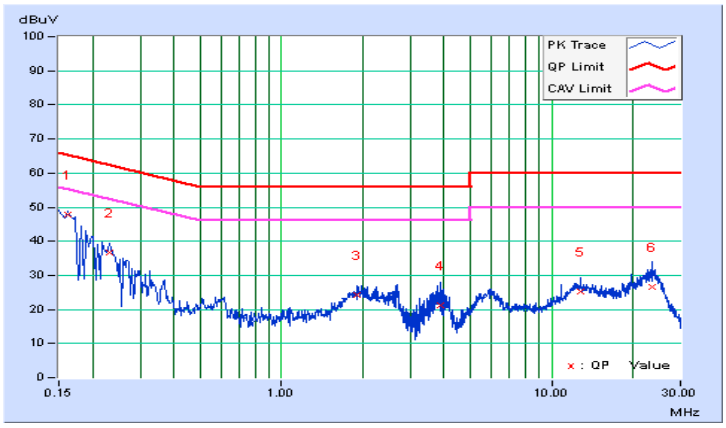


PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16139	0.08	47.59	33.84	47.67	33.92	65.39	55.39	-17.72	-21.47
2	0.23155	0.07	36.58	24.54	36.65	24.61	62.39	52.39	-25.74	-27.78
3	1.89386	0.15	23.98	18.66	24.13	18.81	56.00	46.00	-31.87	-27.19
4	3.87623	0.23	21.01	11.16	21.24	11.39	56.00	46.00	-34.76	-34.61
5	12.77930	0.66	24.56	19.39	25.22	20.05	60.00	50.00	-34.78	-29.95
6	23.45751	1.14	25.44	19.92	26.58	21.06	60.00	50.00	-33.42	-28.94

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

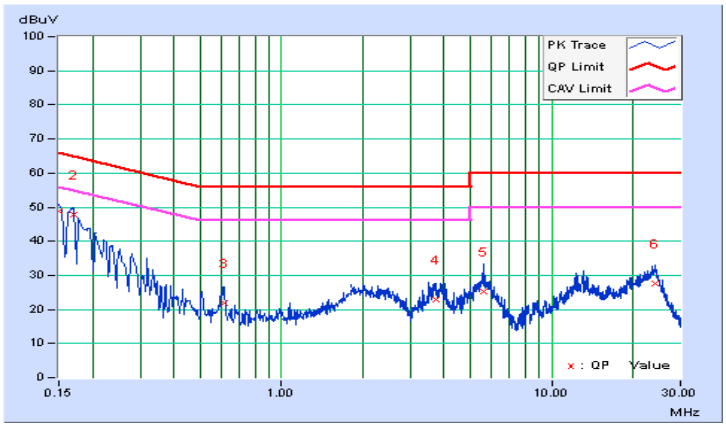


PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.05	48.86	36.11	48.91	36.16	66.00	56.00	-17.09	-19.84
2	0.16955	0.05	47.66	34.21	47.71	34.26	64.98	54.98	-17.27	-20.72
3	0.61138	0.08	21.74	14.75	21.82	14.83	56.00	46.00	-34.18	-31.17
4	3.75130	0.20	22.63	15.49	22.83	15.69	56.00	46.00	-33.17	-30.31
5	5.57708	0.27	24.82	20.54	25.09	20.81	60.00	50.00	-34.91	-29.19
6	24.30207	1.00	26.53	21.20	27.53	22.20	60.00	50.00	-32.47	-27.80

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

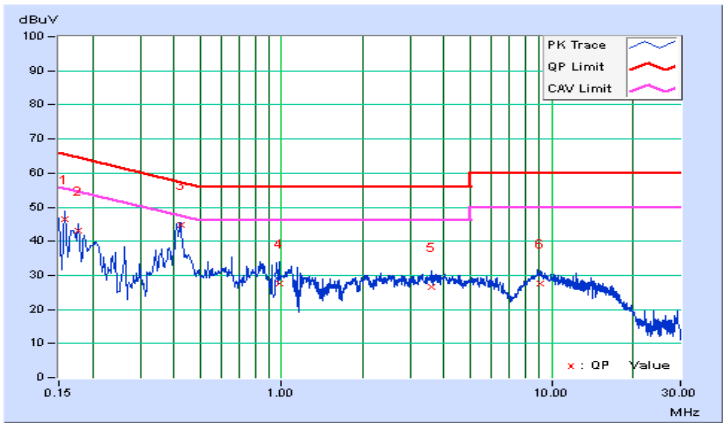


PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	C		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15782	0.08	46.35	34.06	46.43	34.14	65.58	55.58	-19.15	-21.44
2	0.17744	0.07	43.04	31.48	43.11	31.55	64.60	54.60	-21.49	-23.05
3	0.42334	0.08	44.75	39.65	44.83	39.73	57.38	47.38	-12.55	-7.65
4	0.97892	0.11	27.51	18.51	27.62	18.62	56.00	46.00	-28.38	-27.38
5	3.59862	0.21	26.44	20.44	26.65	20.65	56.00	46.00	-29.35	-25.35
6	9.13518	0.47	27.19	21.31	27.66	21.78	60.00	50.00	-32.34	-28.22

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

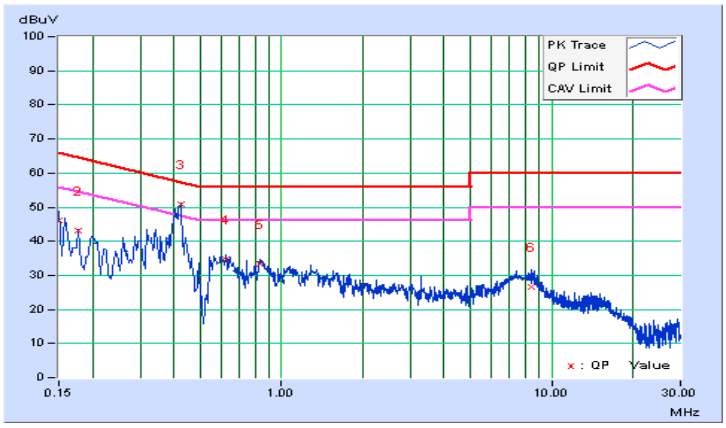


PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	C		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.05	46.22	30.23	46.27	30.28	66.00	56.00	-19.73	-25.72
2	0.17744	0.05	43.14	32.40	43.19	32.45	64.60	54.60	-21.41	-22.15
3	**0.42370**	**0.07**	**50.82**	**46.03**	**50.89**	**46.10**	**57.38**	**47.38**	**-6.48**	**-1.27**
4	0.62359	0.08	34.72	30.90	34.80	30.98	56.00	46.00	-21.20	-15.02
5	0.83106	0.08	33.41	27.66	33.49	27.74	56.00	46.00	-22.51	-18.26
6	8.39619	0.38	26.29	21.27	26.67	21.65	60.00	50.00	-33.33	-28.35

REMARKS:

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

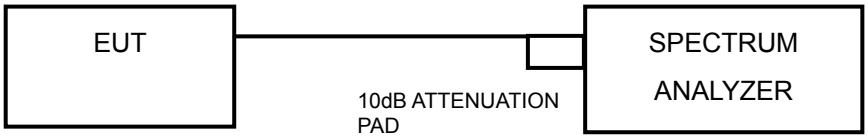


4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST SETUP



4.3.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.3.4 TEST PROCEDURE

a. Set resolution bandwidth (RBW) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.3.5 DEVIATION FROM TEST STANDARD

No deviation.

4.3.6 EUT OPERATING CONDITIONS

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

4.3.7 TEST RESULTS

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	7.08	7.07	7.06	0.5	PASS
6	2437	7.12	7.59	7.11	0.5	PASS
11	2462	7.11	7.09	7.08	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	15.16	15.17	15.16	0.5	PASS
6	2437	15.15	15.13	15.13	0.5	PASS
11	2462	15.15	15.14	15.12	0.5	PASS

802.11n (20MHz)

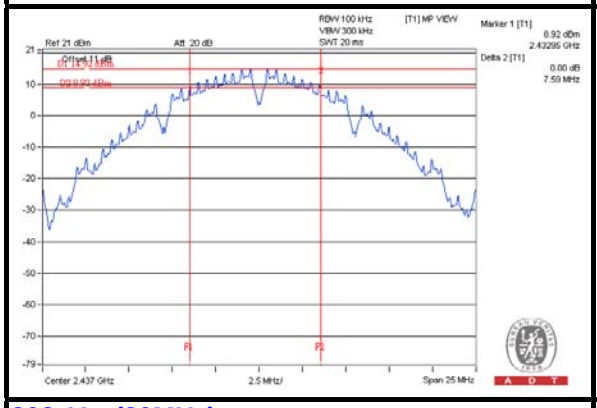
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	15.15	15.14	15.16	0.5	PASS
6	2437	15.16	15.15	15.14	0.5	PASS
11	2462	15.14	15.15	15.12	0.5	PASS

802.11n (40MHz)

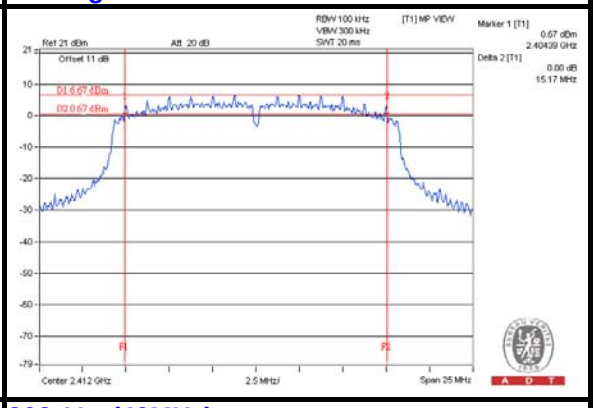
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
3	2422	33.82	31.36	31.37	0.5	PASS
6	2437	33.84	32.61	28.88	0.5	PASS
9	2452	32.62	28.86	31.38	0.5	PASS

SPECTRUM PLOT OF WORST VALUE

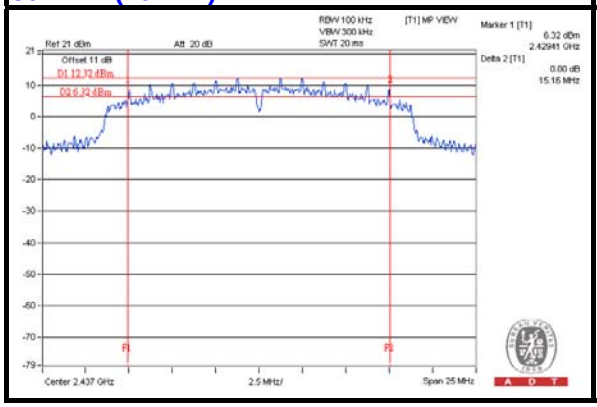
802.11b



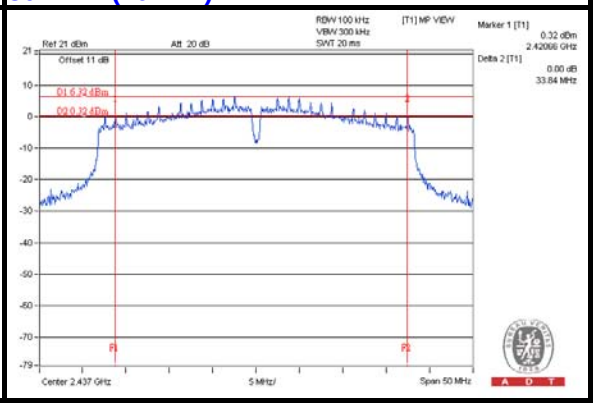
802.11g



802.11n (20MHz)



802.11n (40MHz)



4.4 CONDUCTED OUTPUT POWER

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

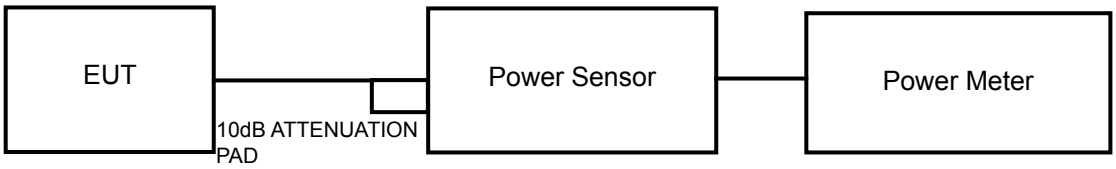
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 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 ≥ 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

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 peak power level.

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.

4.4.7 TEST RESULTS

FOR AVERAGE POWER

802.11b

CHAN.	CHAN. FREQ. (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	21.95	20.75	21.29	410.111	26.13	30	PASS
6	2437	22.92	23.03	23.28	**609.607**	27.85	30	PASS
11	2462	20.96	19.85	21.31	356.55	25.52	30	PASS

802.11g

CHAN.	CHAN. FREQ. (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	18.58	17.98	18.35	203.308	23.08	30	PASS
6	2437	22.03	21.83	22.15	476.052	26.78	30	PASS
11	2462	18.09	17.71	17.67	181.916	22.60	30	PASS

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	18.64	18.48	18.44	213.406	23.29	30	PASS
6	2437	21.80	22.10	22.13	476.842	26.78	30	PASS
11	2462	17.91	17.14	17.51	169.927	22.30	30	PASS

802.11n (40MHz)

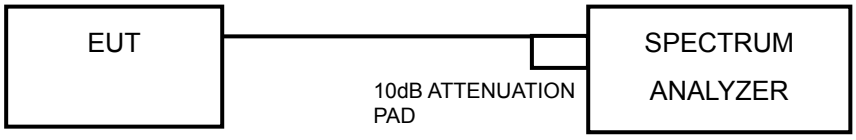
CHAN.	CHAN. FREQ. (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
3	2422	17.72	16.75	16.76	153.895	21.87	30	PASS
6	2437	18.69	18.57	18.83	222.29	23.47	30	PASS
9	2452	17.05	16.48	16.74	142.368	21.53	30	PASS

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST SETUP



4.5.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.5.4 TEST PROCEDURE

a) Set instrument center frequency to DTS channel center frequency.
b) Set span to at least 1.5 times the OBW.
c) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d) Set VBW ≥3 x RBW.
e) Detector = power averaging (RMS) or sample detector (when RMS not available).
f) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g) Sweep time = auto couple.
h) Employ trace averaging (RMS) mode over a minimum of 100 traces.
i) 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)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	PASS /FAIL
0	1	2412	-5.85	4.77	-1.08	6.10	PASS
	6	2437	-4.57	4.77	0.20	6.10	PASS
	11	2462	-5.96	4.77	-1.19	6.10	PASS
1	1	2412	-5.09	4.77	-0.32	6.10	PASS
	6	2437	-4.48	4.77	0.29	6.10	PASS
	11	2462	-6.61	4.77	-1.84	6.10	PASS
2	1	2412	-5.34	4.77	-0.57	6.10	PASS
	6	2437	-3.89	4.77	0.88	6.10	PASS
	11	2462	-5.43	4.77	-0.66	6.10	PASS

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/3$]= 7.90 > 6dBi, so the power density limit shall be reduced to 8-(7.90-6) = 6.10dBm.

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	PASS /FAIL
0	1	2412	-11.31	4.77	0.12	-6.42	6.10	PASS
	6	2437	-7.48	4.77	0.12	-2.59	6.10	PASS
	11	2462	-11.51	4.77	0.12	-6.62	6.10	PASS
1	1	2412	-12.39	4.77	0.12	-7.50	6.10	PASS
	6	2437	-8.40	4.77	0.12	-3.51	6.10	PASS
	11	2462	-12.32	4.77	0.12	-7.43	6.10	PASS
2	1	2412	-11.83	4.77	0.12	-6.94	6.10	PASS
	6	2437	-7.65	4.77	0.12	-2.76	6.10	PASS
	11	2462	-12.10	4.77	0.12	-7.21	6.10	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 = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/3$]= 7.90 > 6dBi, so the power density limit shall be reduced to 8-(7.90-6) = 6.10dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (20MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	PASS /FAIL
0	1	2412	-11.60	4.77	0.13	-6.70	6.10	PASS
	6	2437	-7.11	4.77	0.13	-2.21	6.10	PASS
	11	2462	-12.27	4.77	0.13	-7.37	6.10	PASS
1	1	2412	-11.28	4.77	0.13	-6.38	6.10	PASS
	6	2437	-7.97	4.77	0.13	-3.07	6.10	PASS
	11	2462	-12.92	4.77	0.13	-8.02	6.10	PASS
2	1	2412	-11.84	4.77	0.13	-6.94	6.10	PASS
	6	2437	-7.44	4.77	0.13	-2.54	6.10	PASS
	11	2462	-12.46	4.77	0.13	-7.56	6.10	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 = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/3$]= 7.90 > 6dBi, so the power density limit shall be reduced to 8-(7.90-6) = 6.10dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (40MHz)

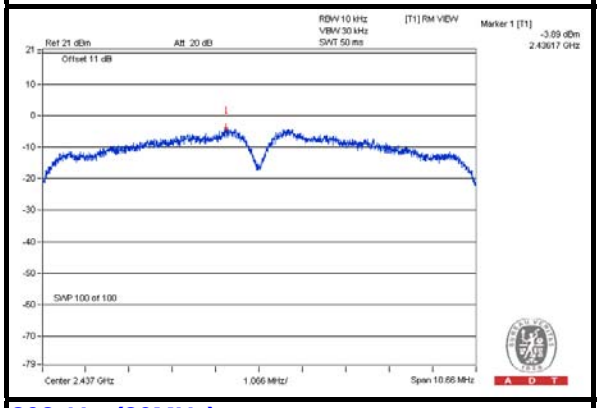
TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	PASS /FAIL
0	3	2422	-15.33	4.77	0.20	-10.36	6.10	PASS
	6	2437	-13.01	4.77	0.20	-8.04	6.10	PASS
	9	2452	-15.06	4.77	0.20	-10.09	6.10	PASS
1	3	2422	-15.46	4.77	0.20	-10.49	6.10	PASS
	6	2437	-13.79	4.77	0.20	-8.82	6.10	PASS
	9	2452	-16.06	4.77	0.20	-11.09	6.10	PASS
2	3	2422	-15.47	4.77	0.20	-10.50	6.10	PASS
	6	2437	-13.58	4.77	0.20	-8.61	6.10	PASS
	9	2452	-15.60	4.77	0.20	-10.63	6.10	PASS

NOTE:

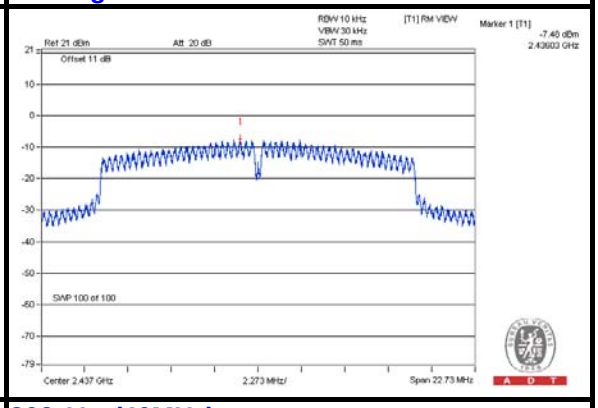
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/3$]= 7.90 > 6dBi, so the power density limit shall be reduced to 8-(7.90-6) = 6.10dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE

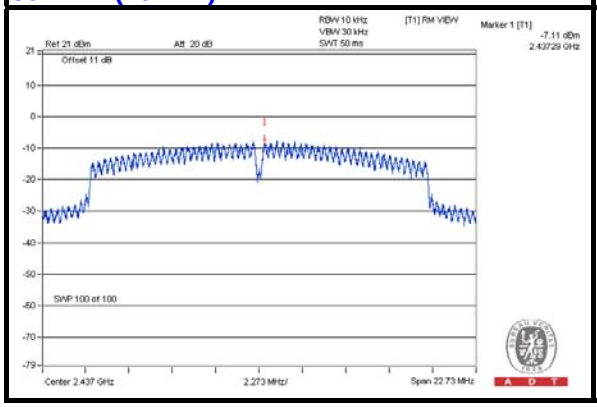
802.11b



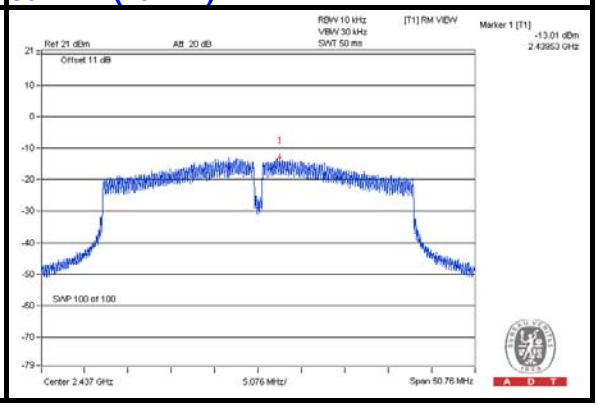
802.11g



802.11n (20MHz)



802.11n (40MHz)

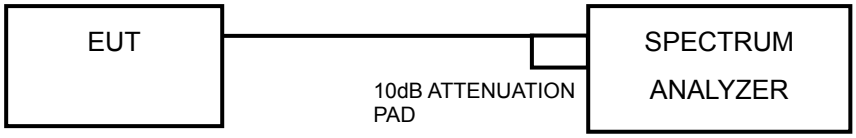


4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

Below -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

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

MEASUREMENT PROCEDURE OOBE

1. Set RBW = 100 kHz.
2. Set VBW ≥ 300 kHz.
3. 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

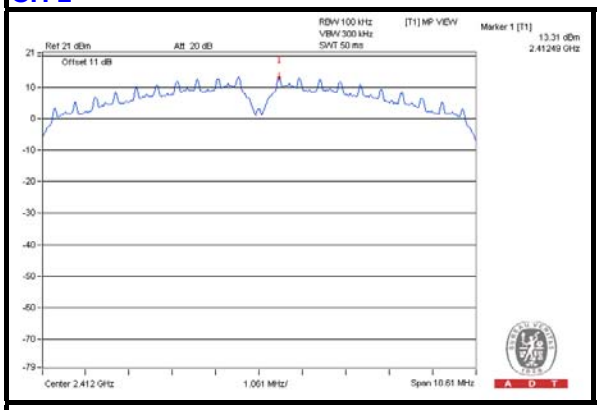
4.6.7 TEST RESULTS

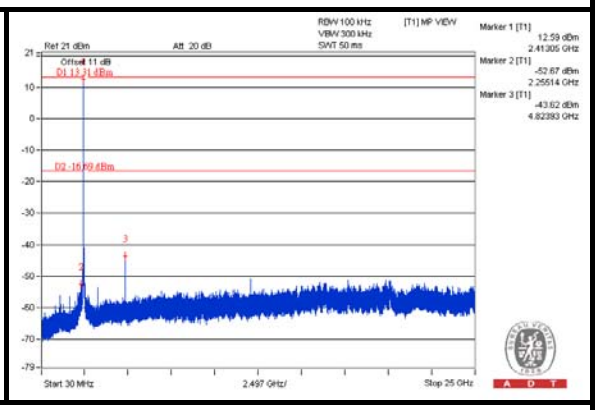
The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.

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.

802.11b
CHAIN 0

CH 1





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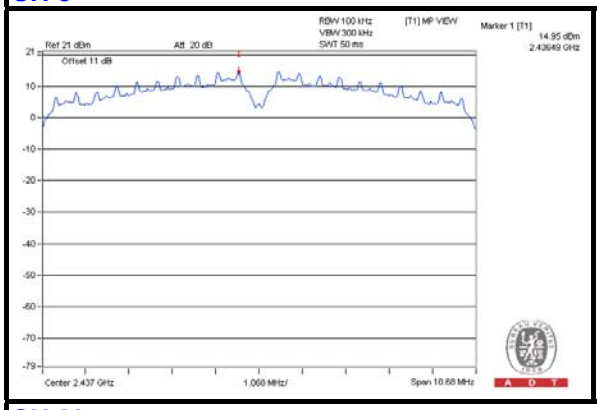
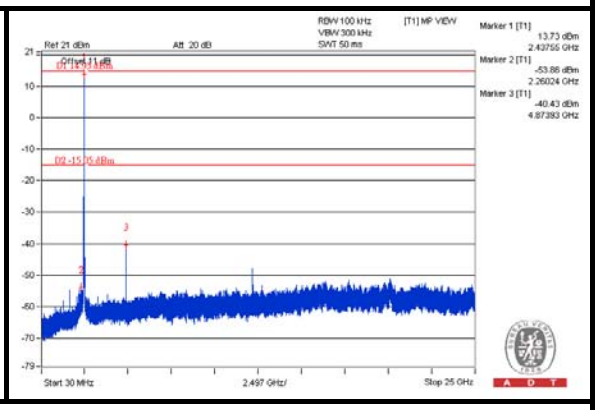
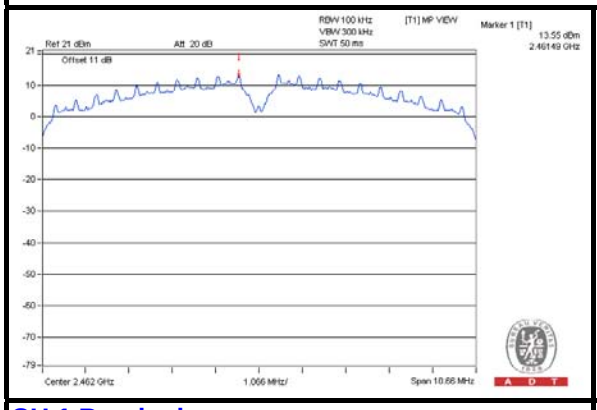
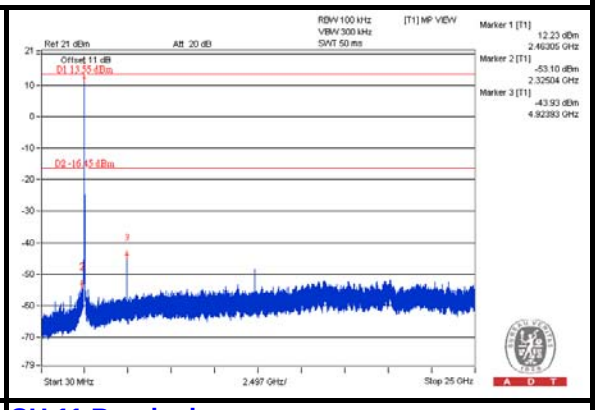


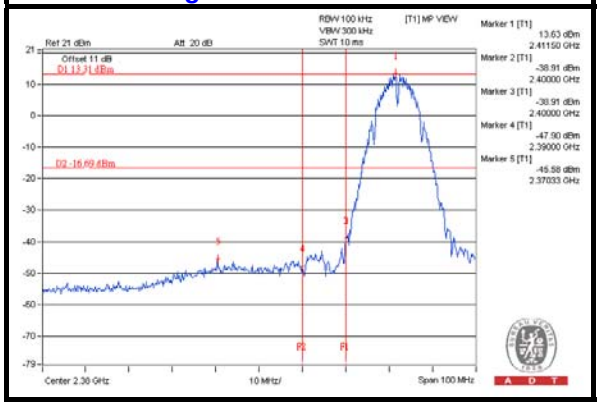


CH 11





CH 1 Band edge



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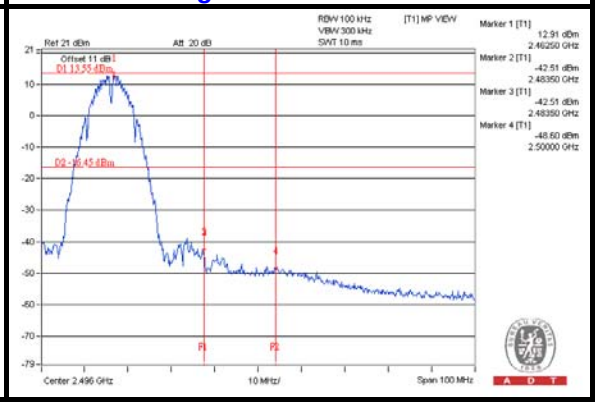
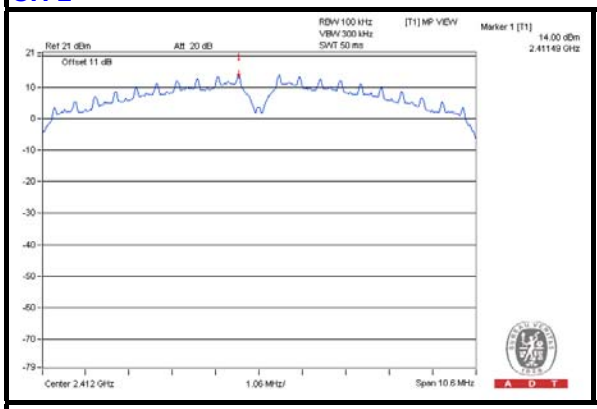
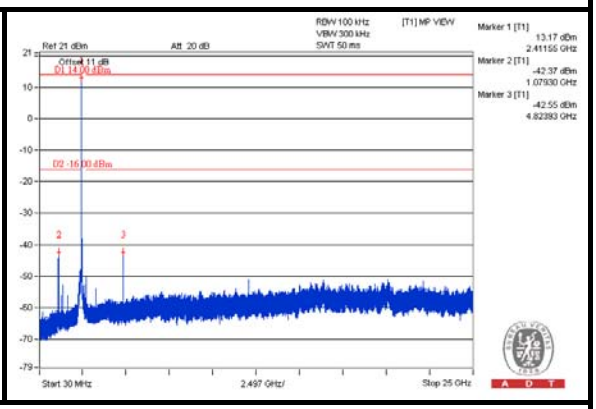


CHAIN 1

CH 1





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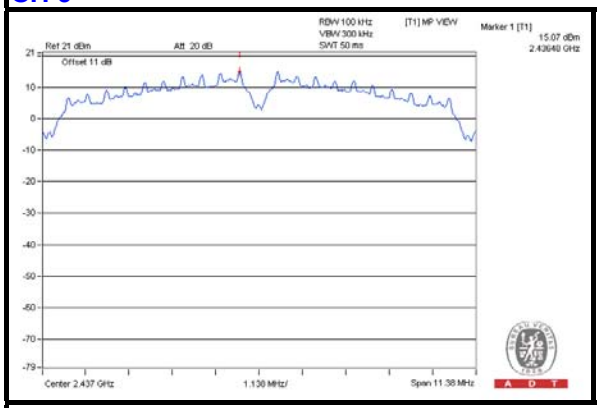

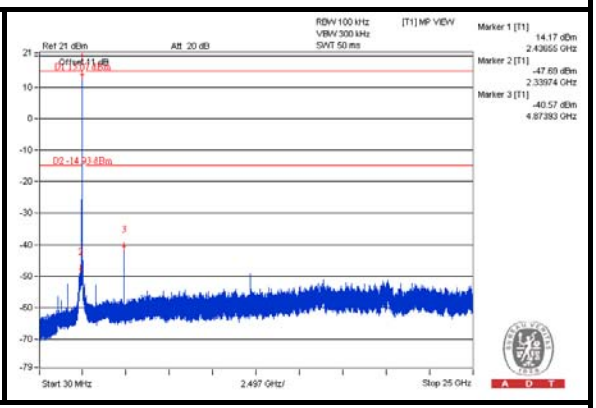

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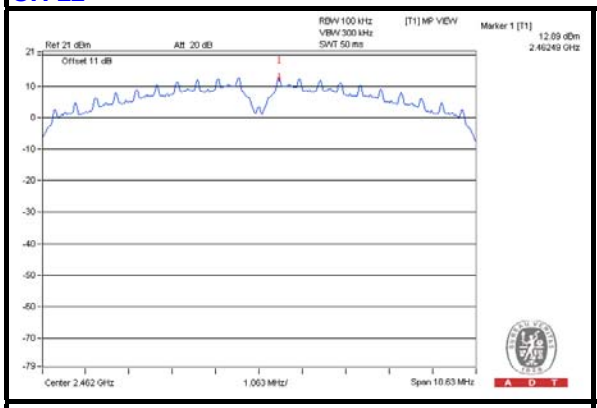

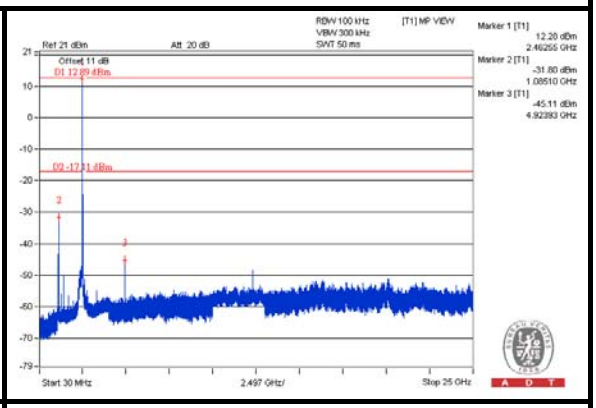

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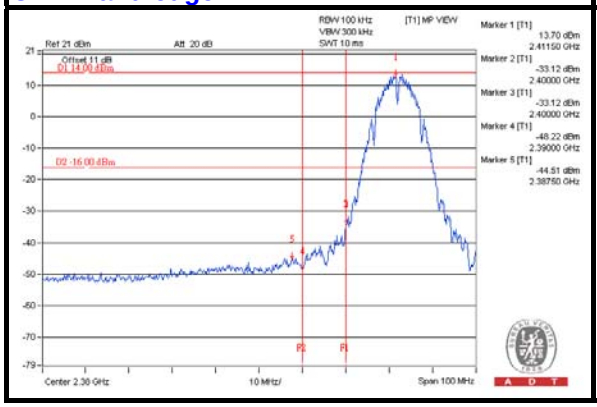

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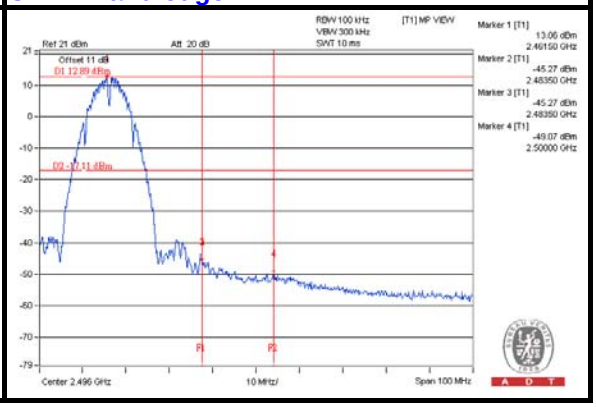
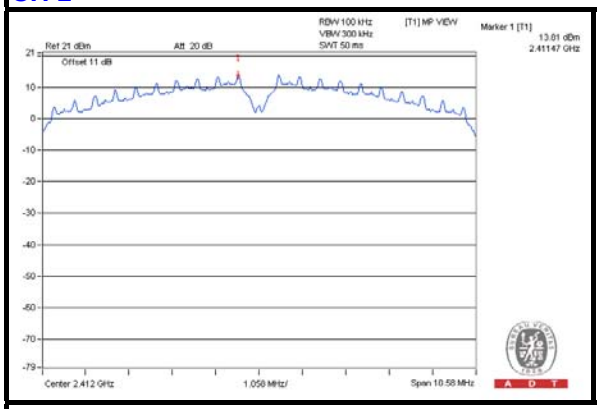
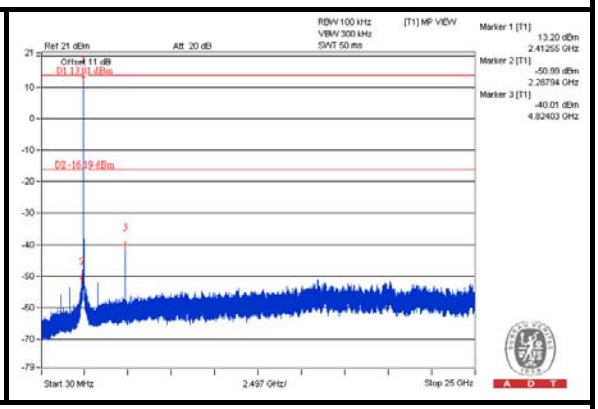


CHAIN 2

CH 1





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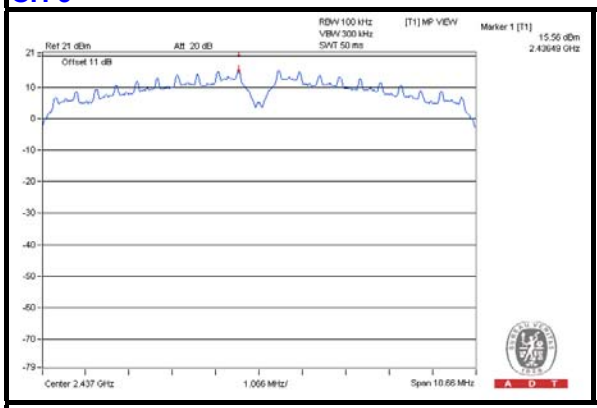

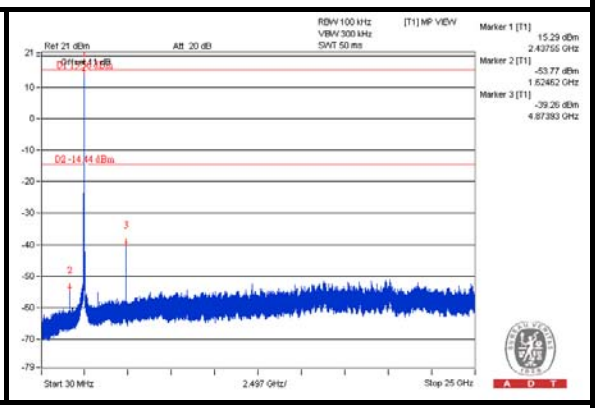

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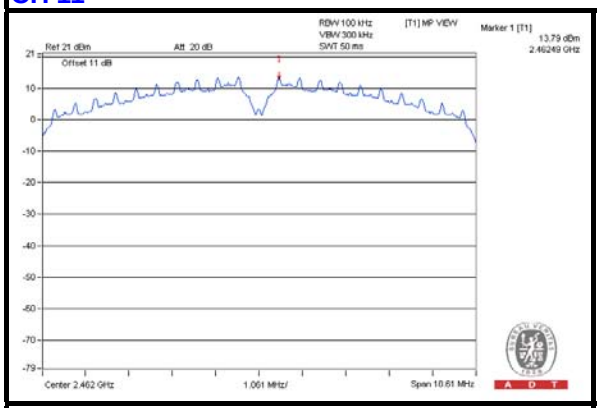

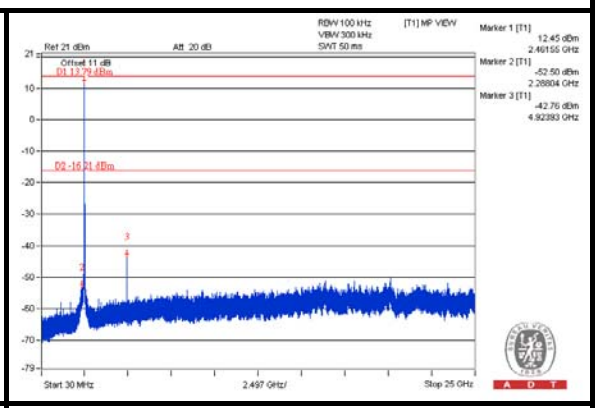

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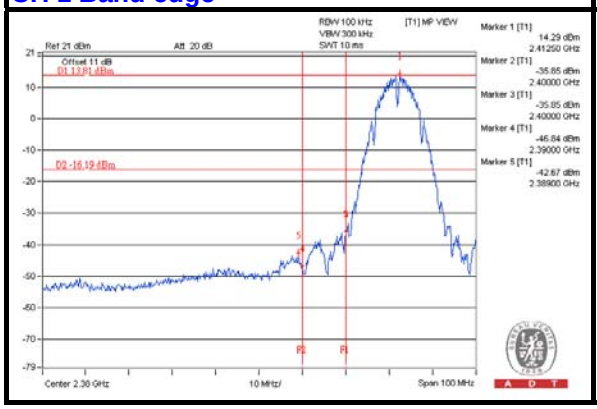

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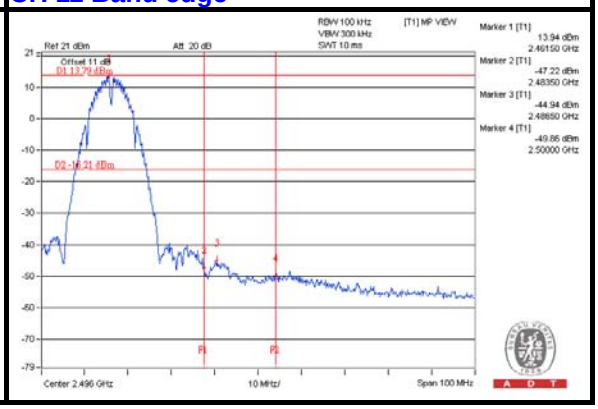
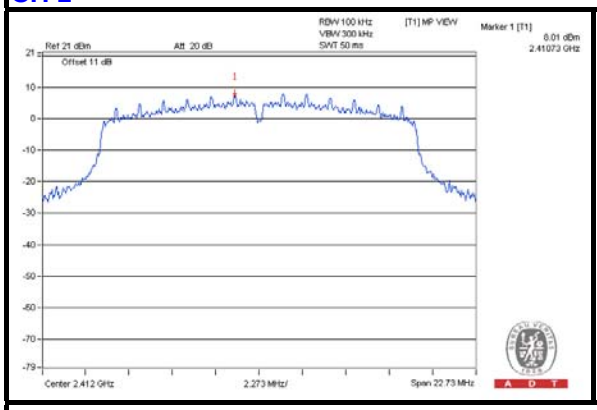
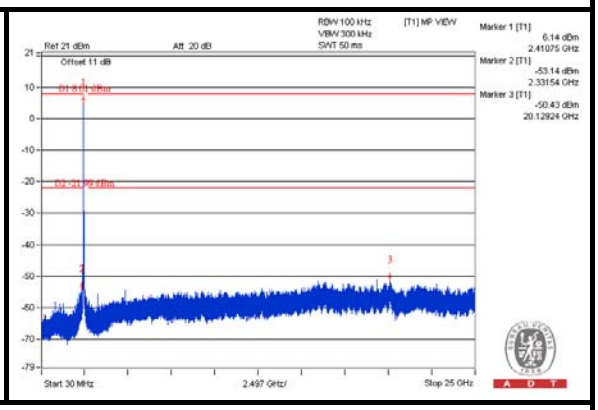


802.11g
CHAIN 0

CH 1





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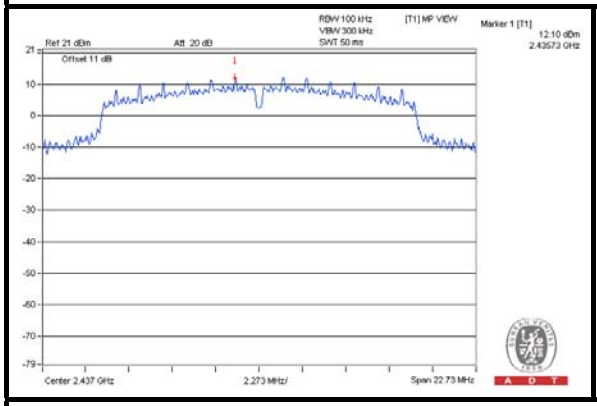

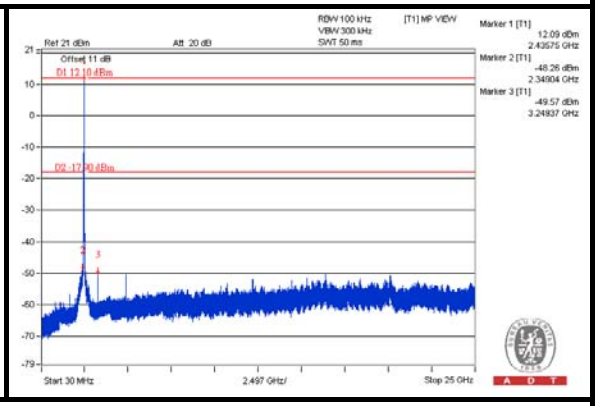

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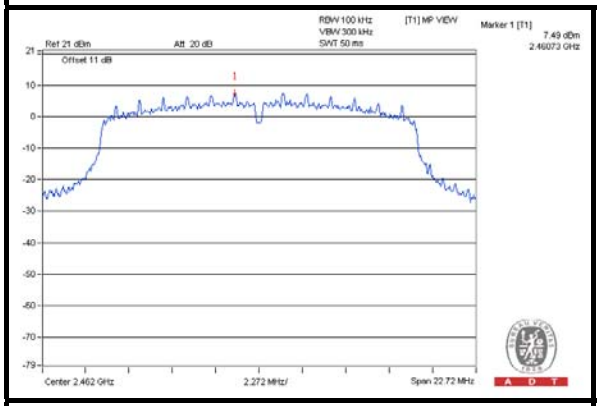
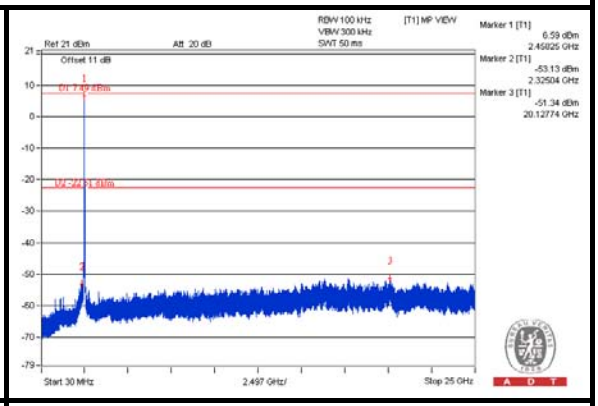
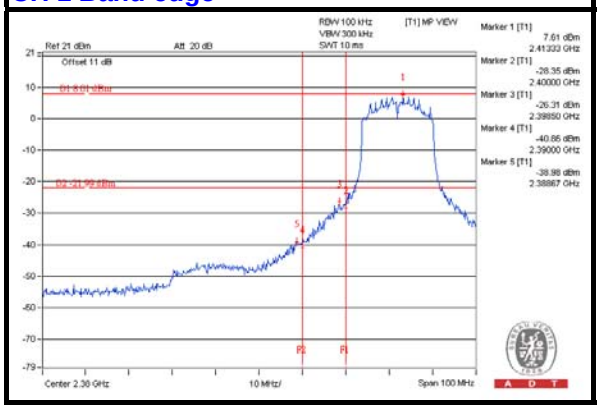




CH 1 Band edge



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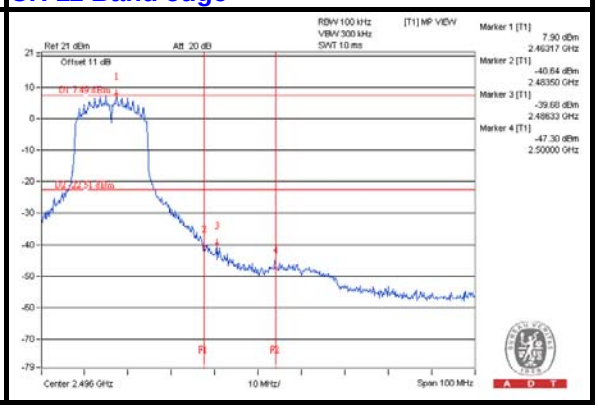
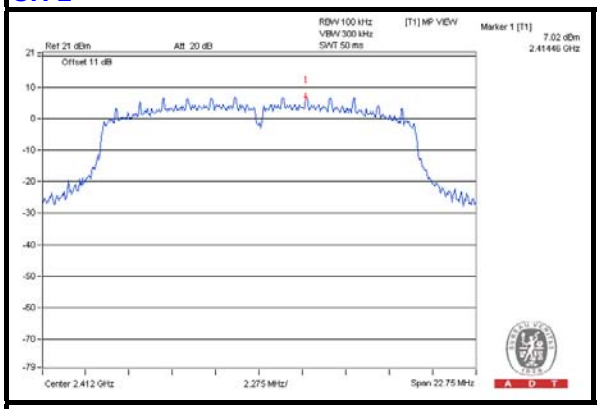
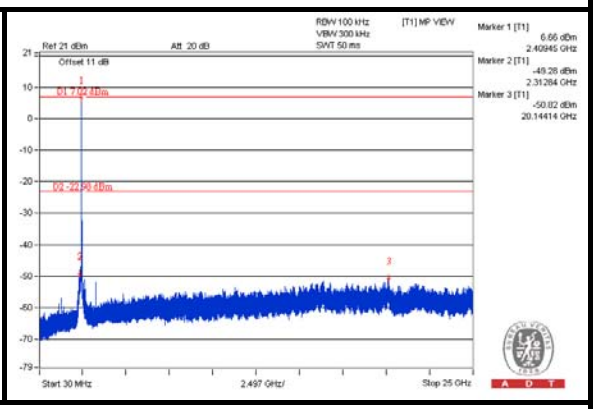


CHAIN 1

CH 1





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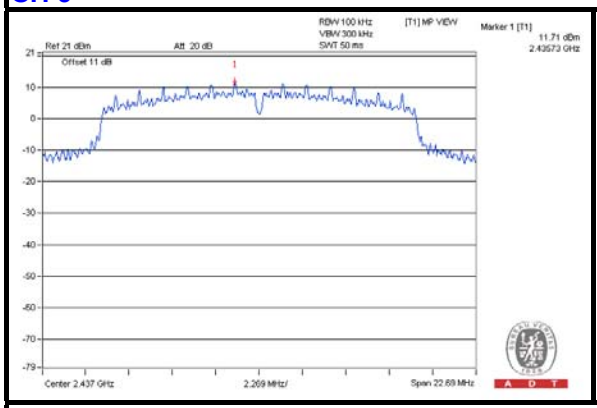

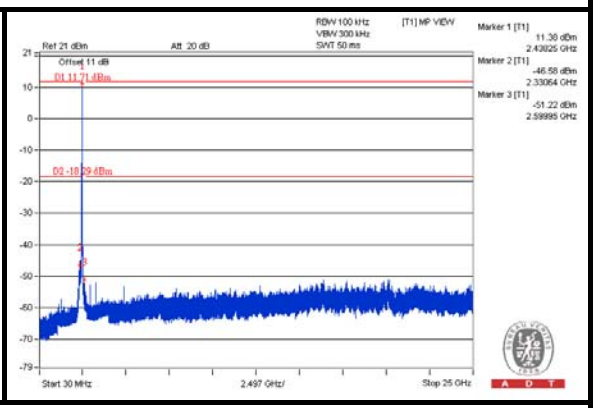

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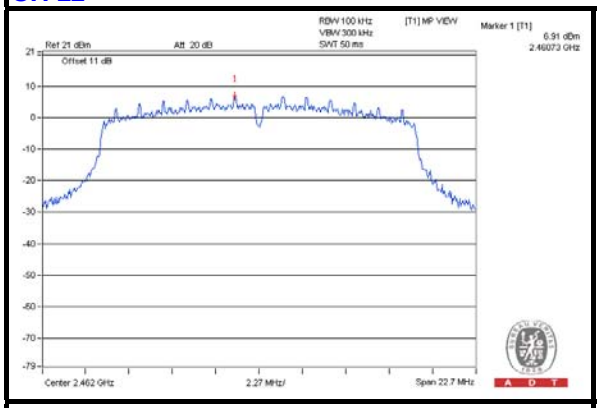
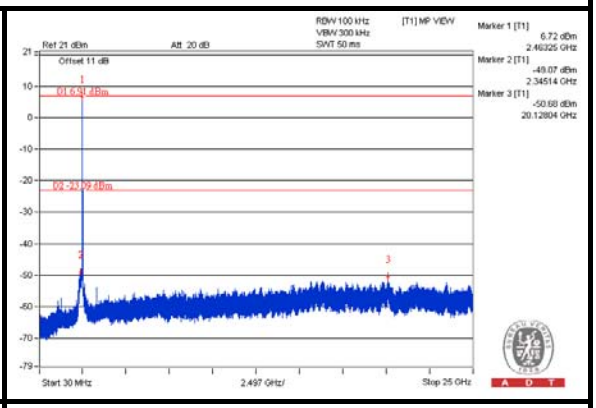
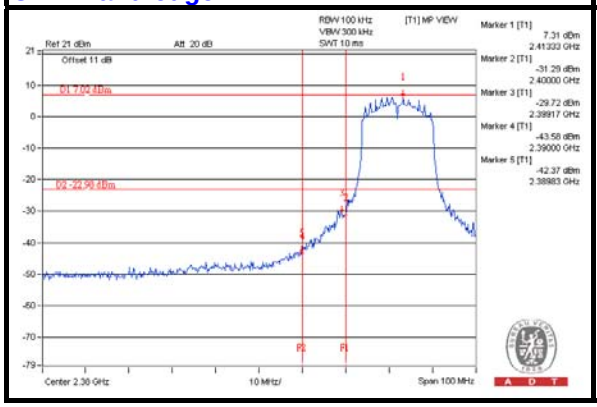
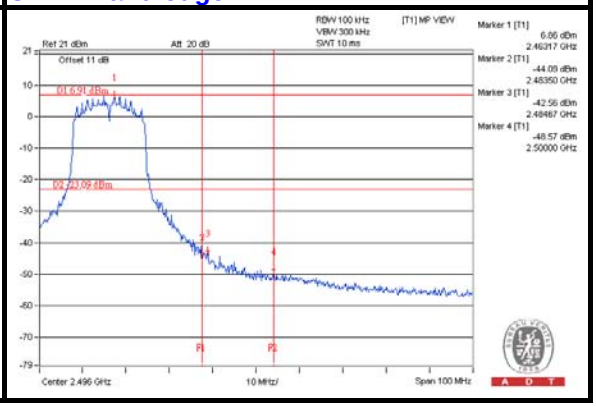




CH 1 Band edge

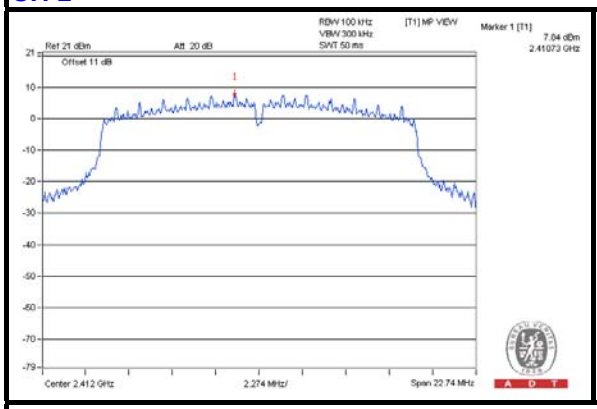


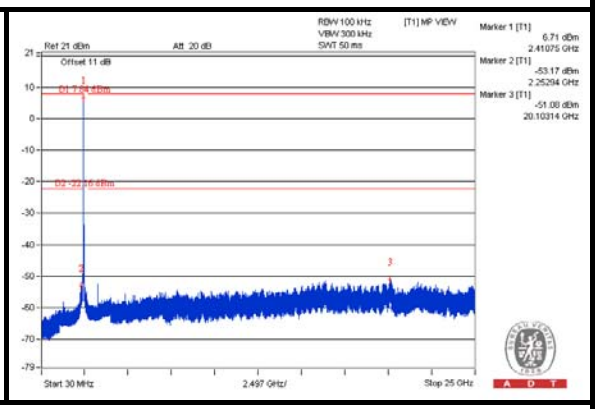
CH 11 Band edge



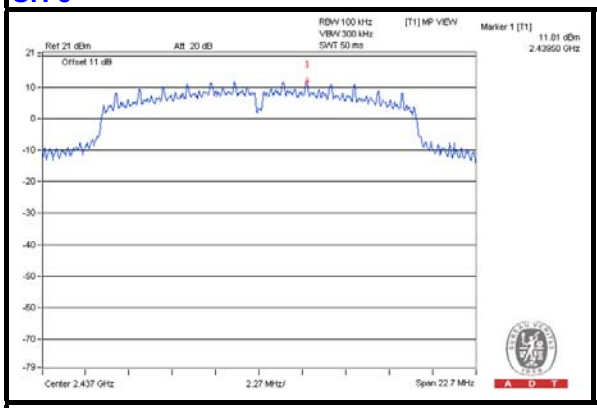
CHAIN 2

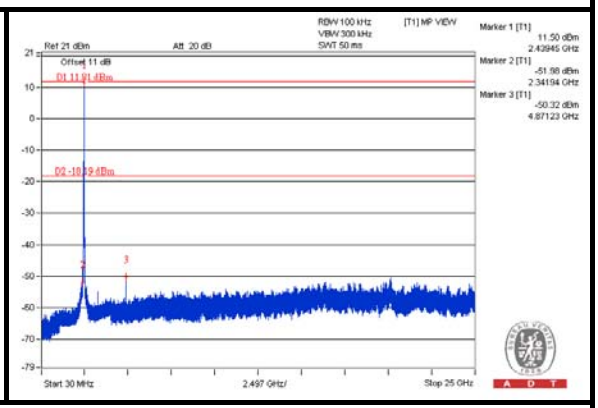
CH 1



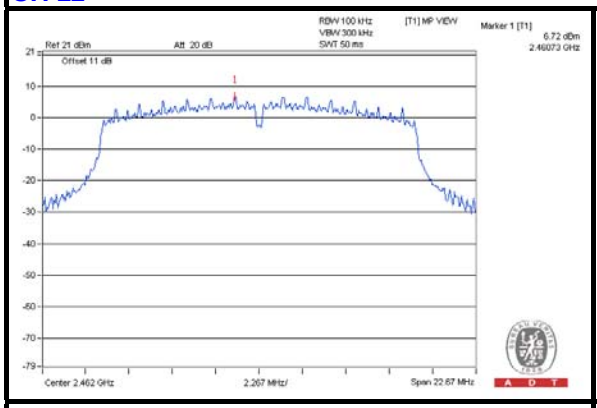


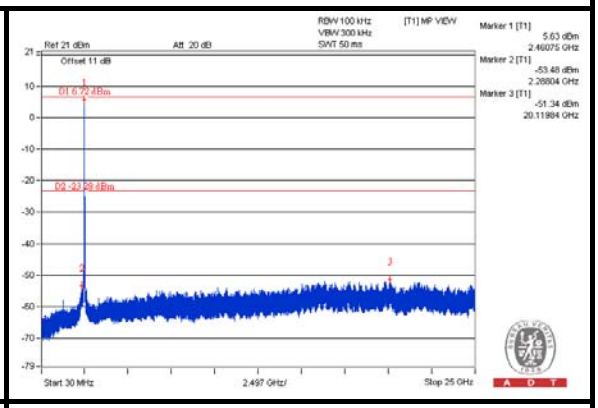
CH 6



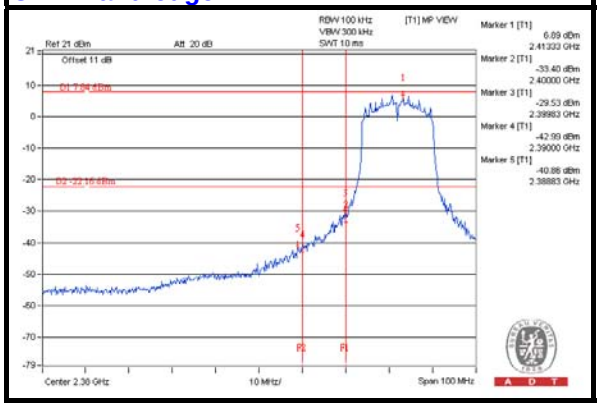


CH 11

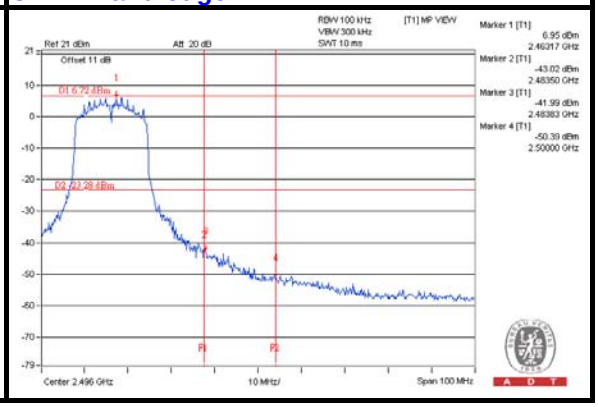




CH 1 Band edge



CH 11 Band edge



802.11n (20MHz)
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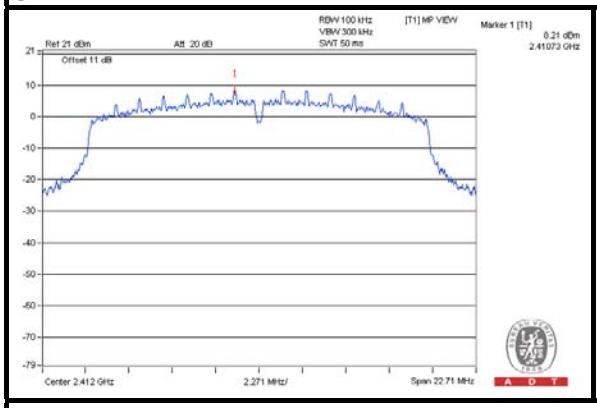

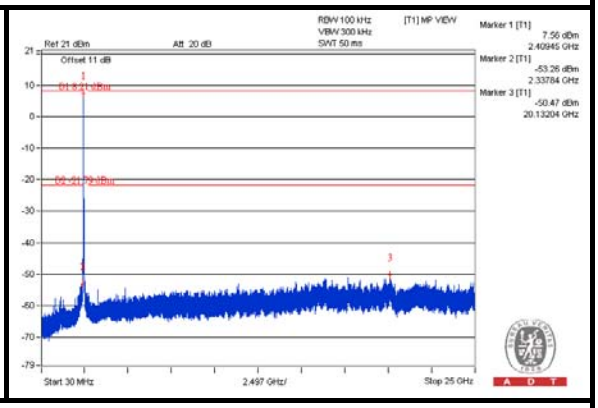

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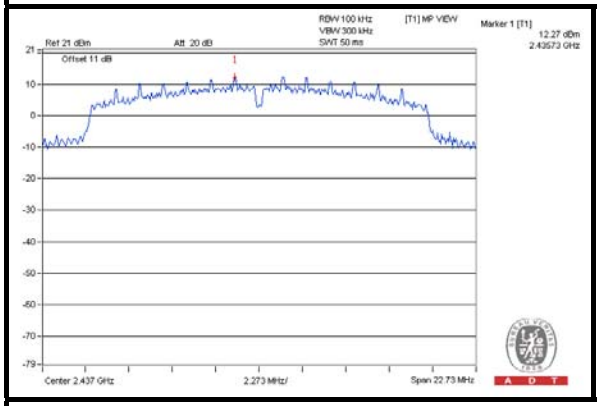

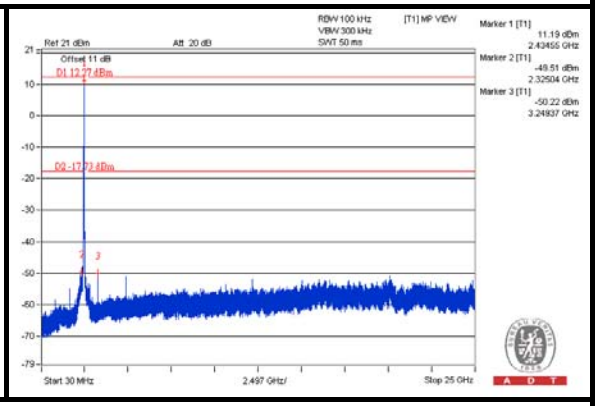

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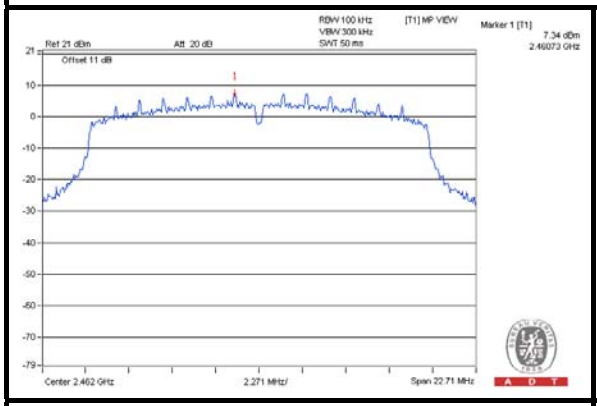

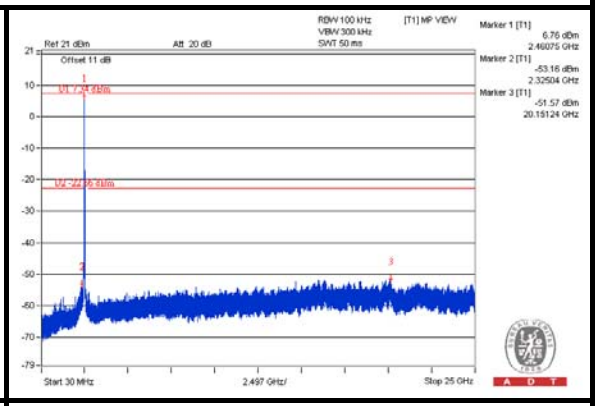

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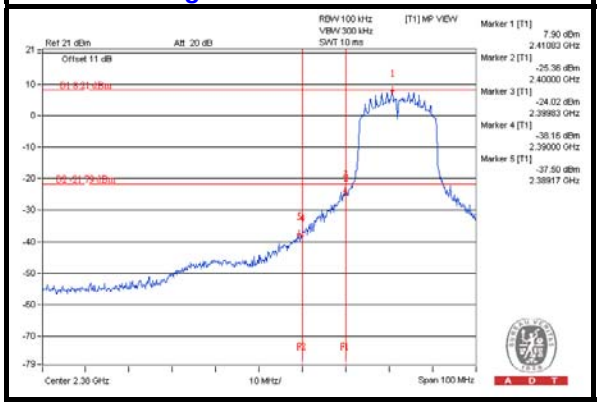

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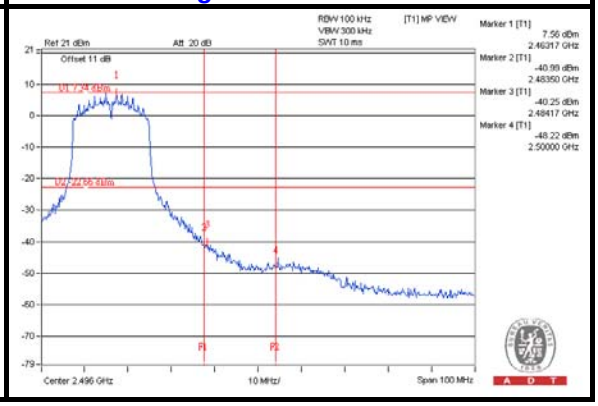
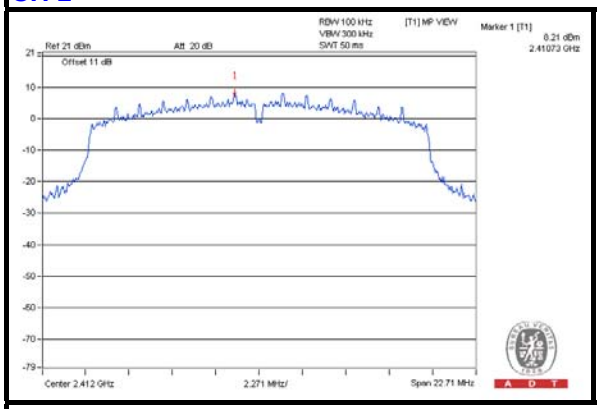
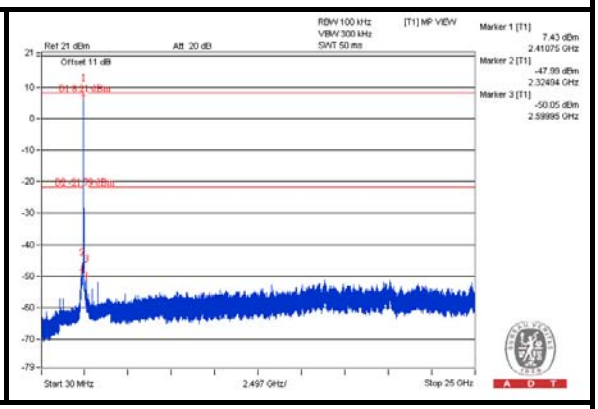


CHAIN 1

CH 1





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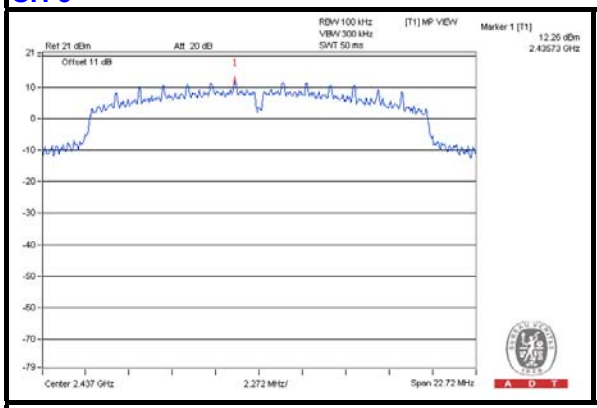

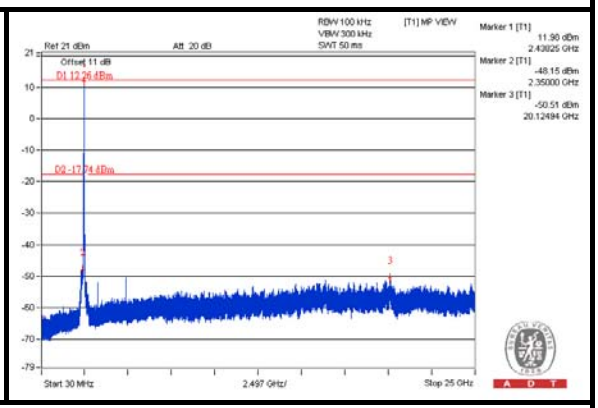

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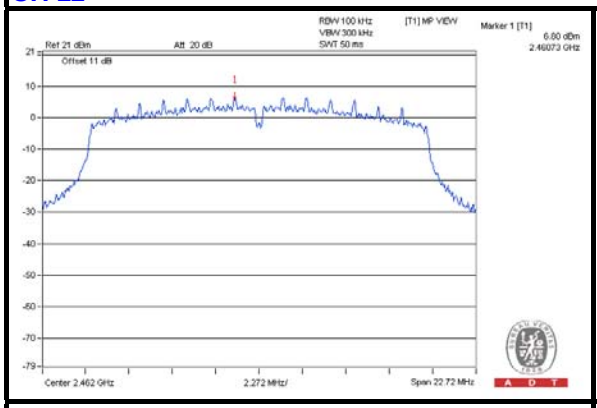
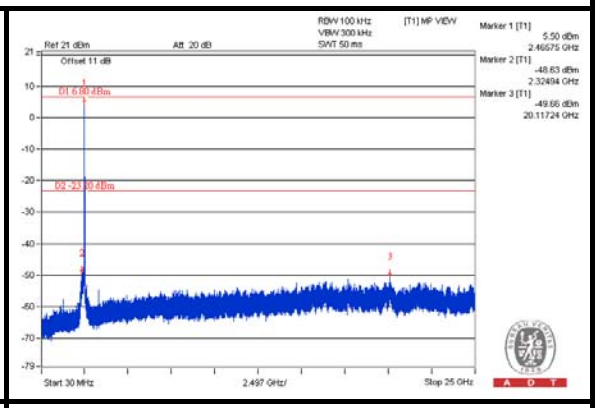
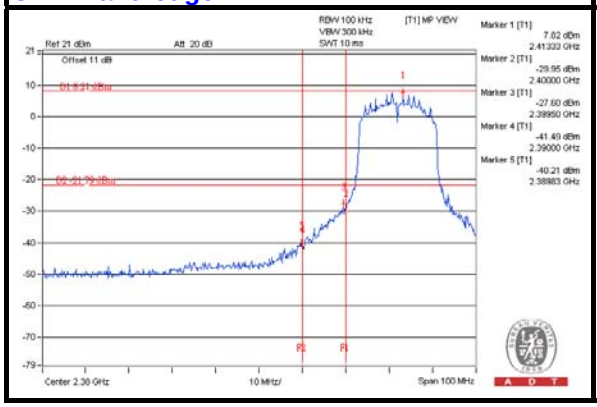




CH 1 Band edge



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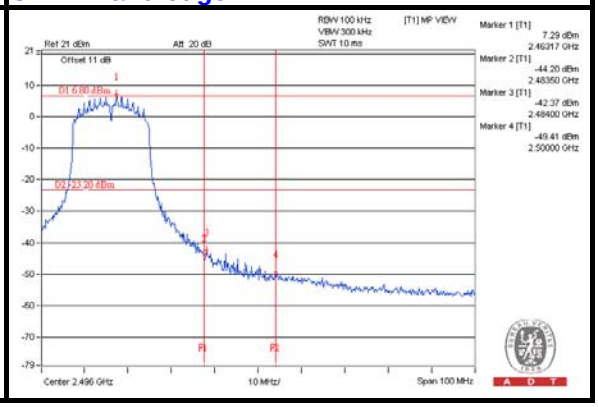
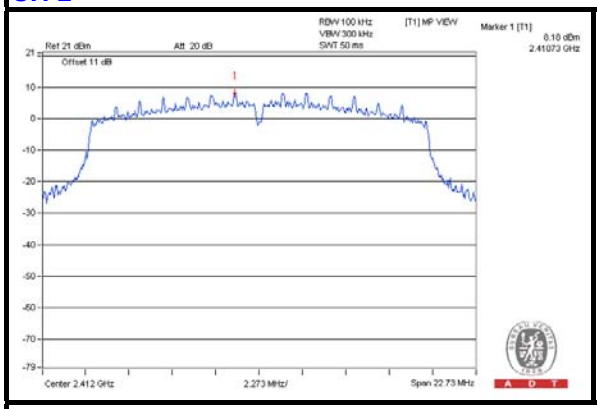
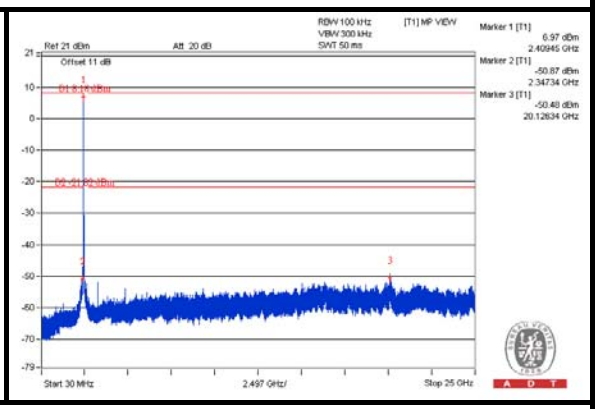


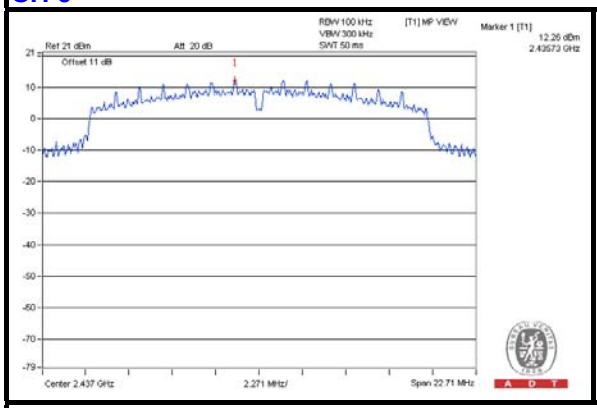
CHAIN 2

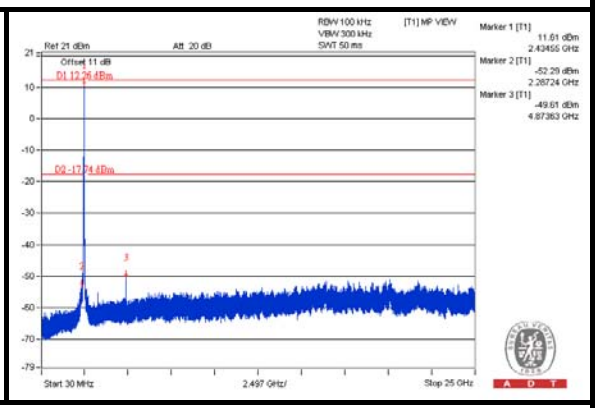
CH 1





CH 6





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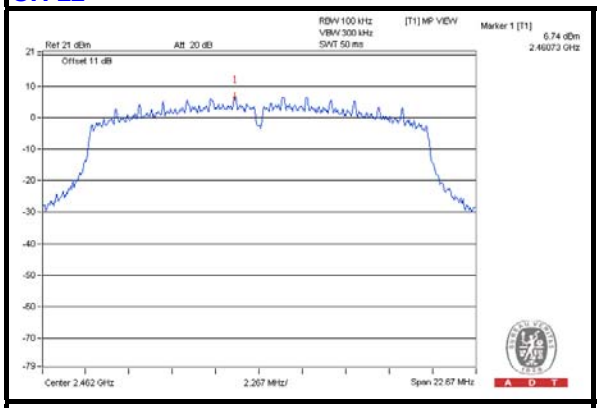

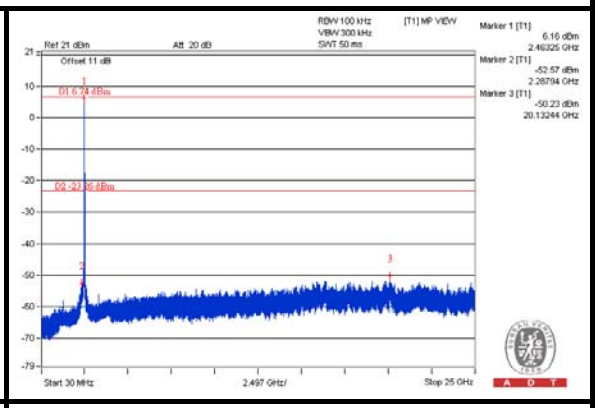

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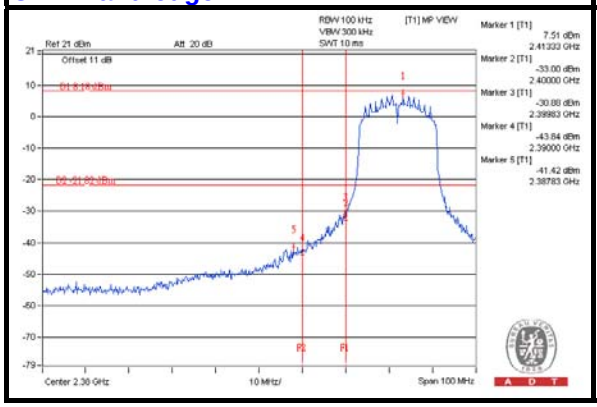

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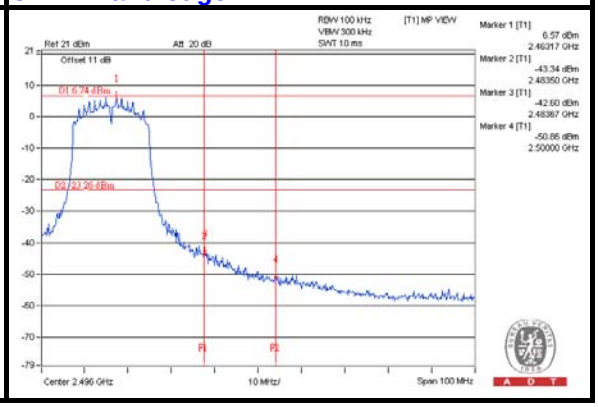
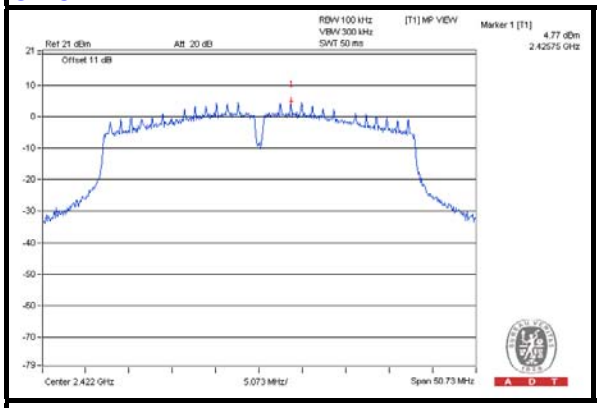
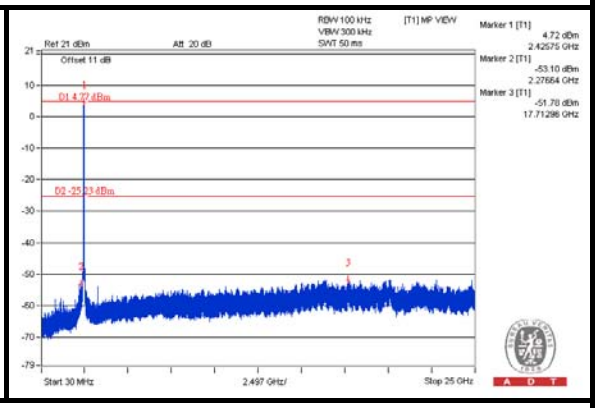


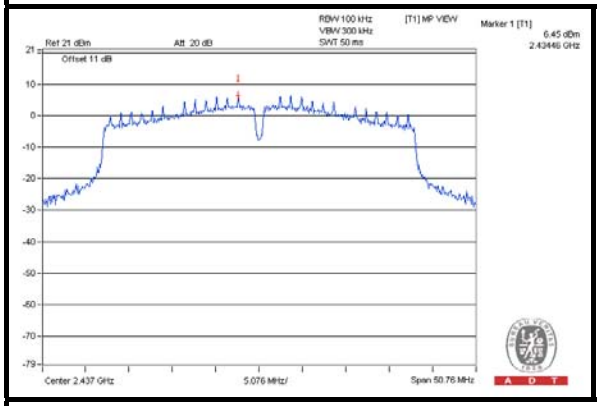
802.11n (40MHz)
CHAIN 0

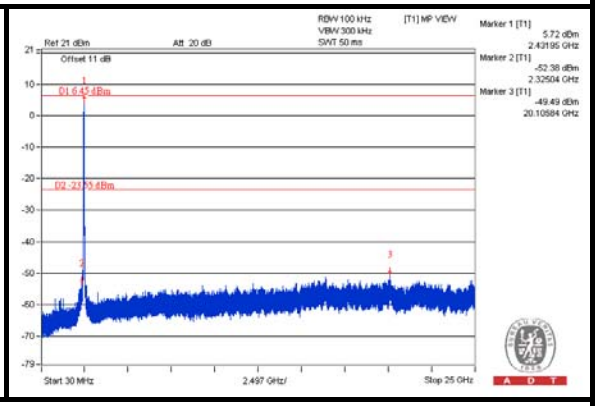
CH 3



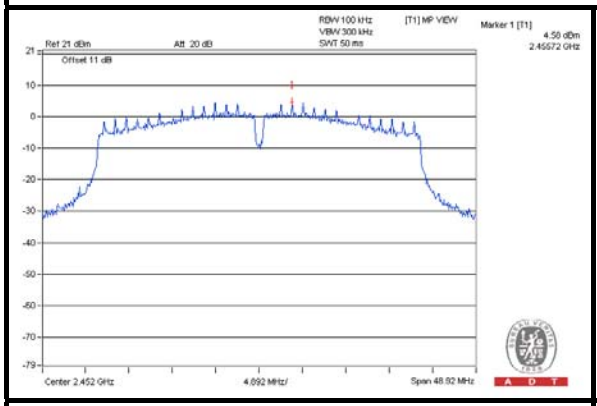


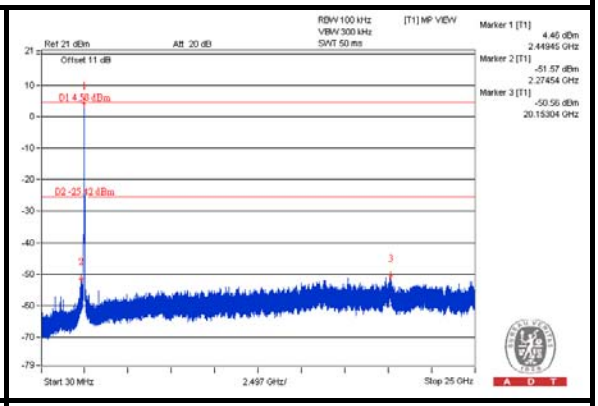
CH 6





CH 9





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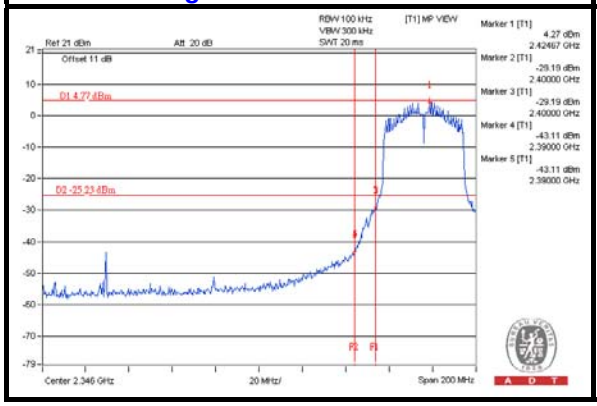

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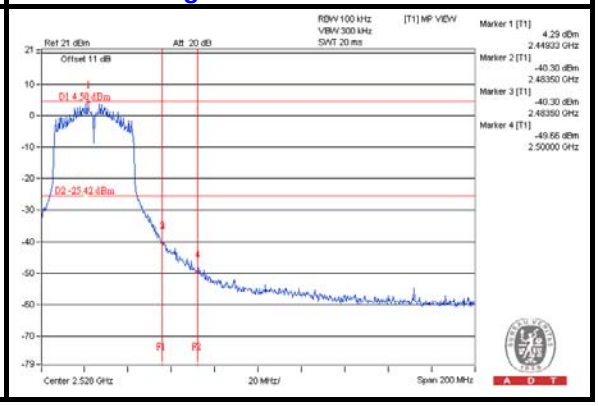
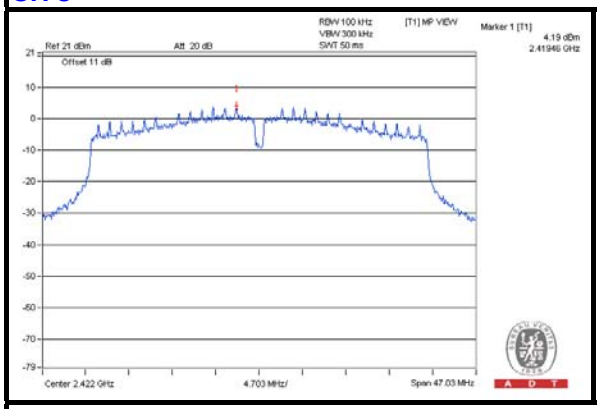
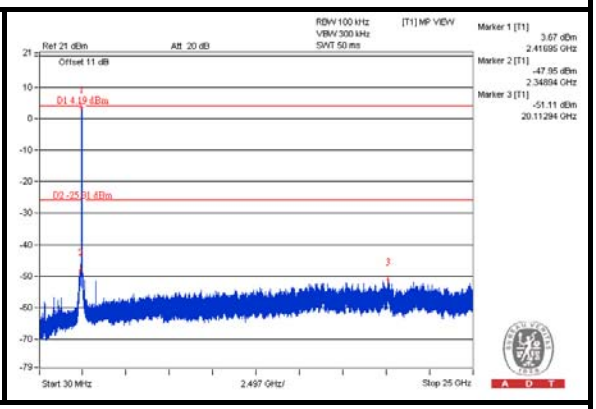


CHAIN 1

CH 3





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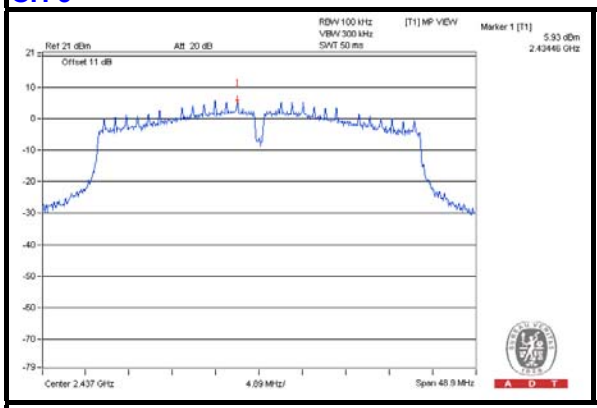
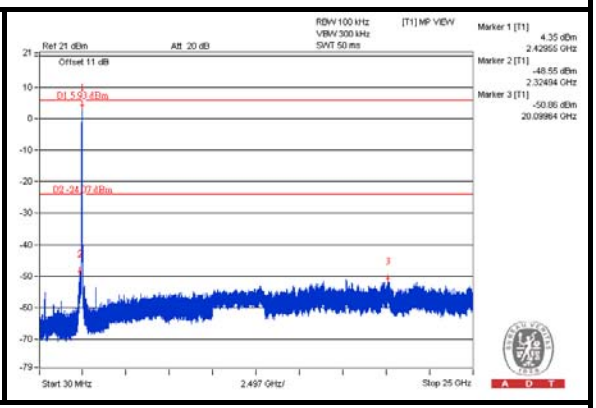
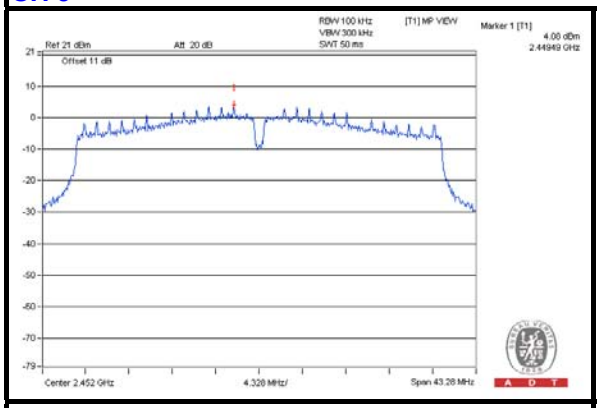
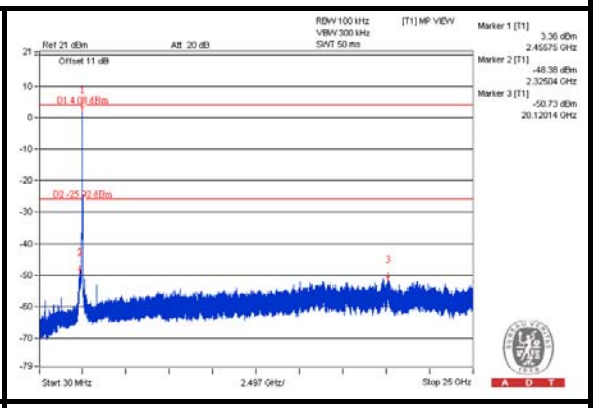


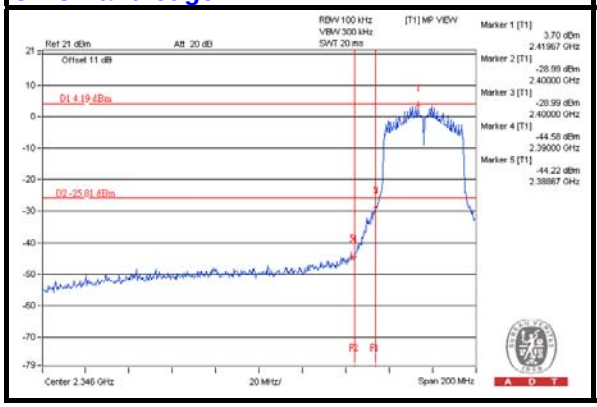


CH 9

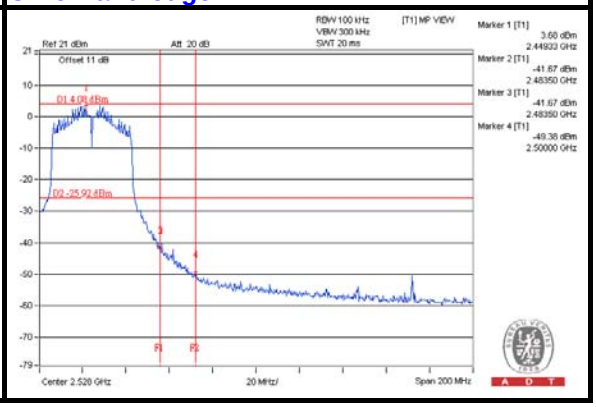




CH 3 Band edge

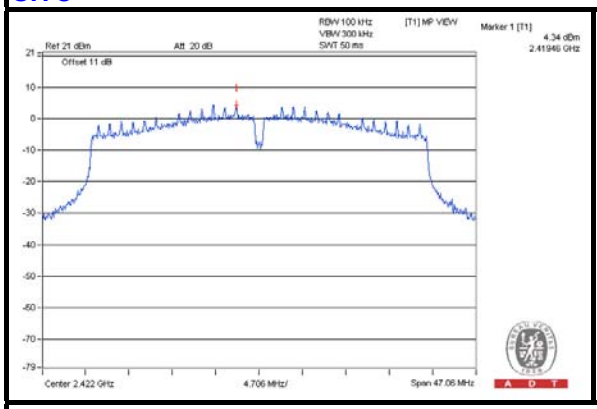


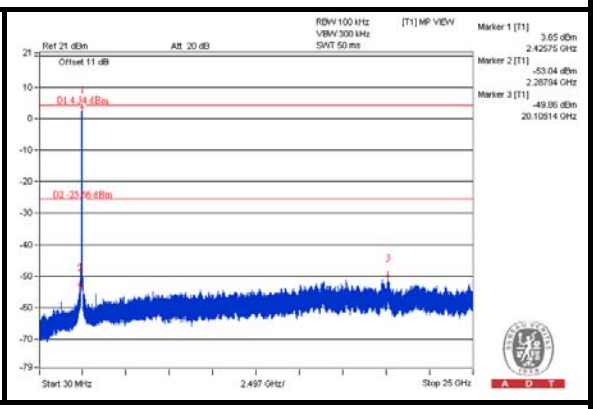
CH 9 Band edge



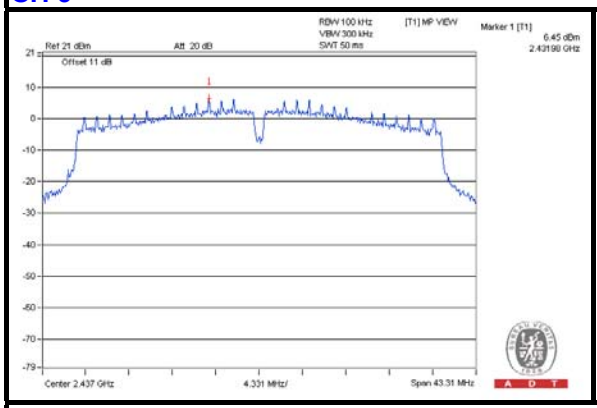
CHAIN 2

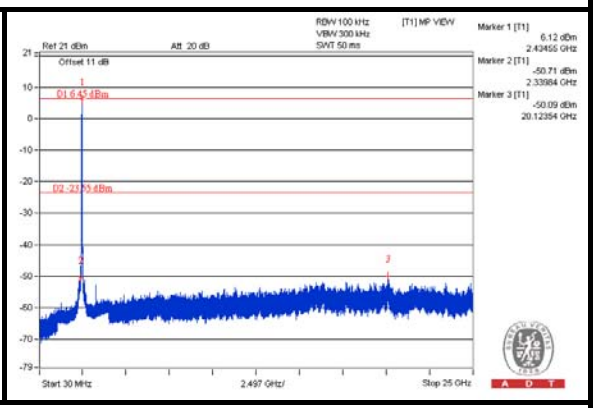
CH 3



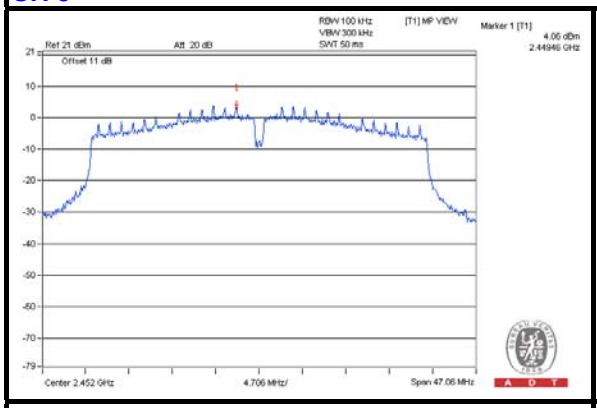


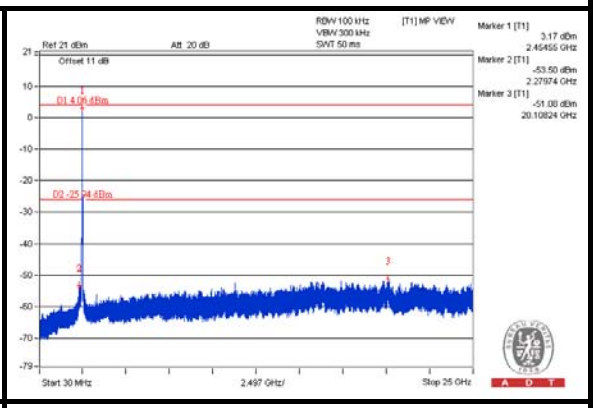
CH 6



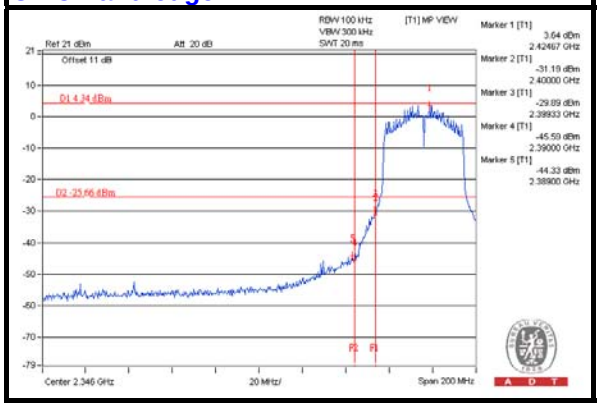


CH 9

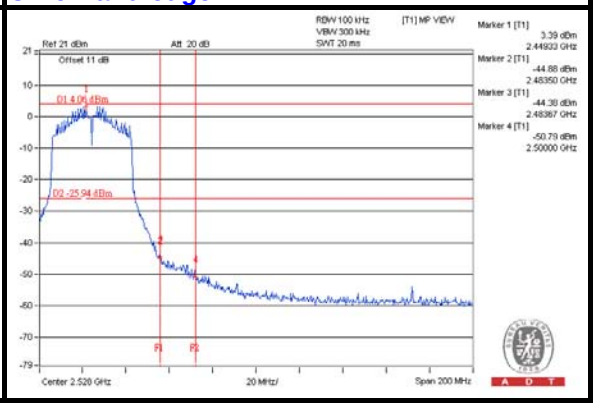




CH 3 Band edge



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.

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.

5.1.7 TEST RESULTS

ABOVE 1GHz DATA：

802.11a

CHANNEL	TX Channel 149	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5440.00	64.6 PK	74.0	-9.4	1.51 H	253	58.60	6.00
2	5440.00	53.2 AV	54.0	-0.8	1.51 H	253	47.20	6.00
3	#5725.00	84.1 PK	87.1	-3.0	1.68 H	282	77.60	6.50
4	#5725.00	72.5 AV	75.5	-3.0	1.68 H	282	66.00	6.50
5	*5745.00	117.1 PK			1.68 H	282	76.70	40.40
6	*5745.00	105.5 AV			1.68 H	282	65.10	40.40
7	11490.00	64.4 PK	74.0	-9.6	1.00 H	341	46.60	17.80
8	11490.00	51.7 AV	54.0	-2.3	1.00 H	341	33.90	17.80
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	5000.00	58.6 PK	74.0	-15.4	1.00 V	13	53.20	5.40
2	5000.00	47.3 AV	54.0	-6.7	1.00 V	13	41.90	5.40
3	5440.00	64.4 PK	74.0	-9.6	1.00 V	173	58.40	6.00
4	5440.00	51.5 AV	54.0	-2.5	1.00 V	173	45.50	6.00
5	#5725.00	92.9 PK	93.6	-0.7	1.00 V	265	86.40	6.50
6	#5725.00	82.8 AV	83.5	-0.7	1.00 V	265	76.30	6.50
7	*5745.00	123.6 PK			1.00 V	265	83.20	40.40
8	*5745.00	113.5 AV			1.00 V	265	73.10	40.40
9	11490.00	62.4 PK	74.0	-11.6	1.64 V	236	44.60	17.80
10	11490.00	49.6 AV	54.0	-4.4	1.64 V	236	31.80	17.80

REMARKS:

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

CHANNEL	TX Channel 157	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5440.00	64.5 PK	74.0	-9.5	1.40 H	258	58.50	6.00
2	5440.00	53.4 AV	54.0	-0.6	1.40 H	258	47.40	6.00
3	*5785.00	116.6 PK			1.56 H	250	76.00	40.60
4	*5785.00	105.2 AV			1.56 H	250	64.60	40.60
5	11570.00	64.5 PK	74.0	-9.5	1.00 H	352	46.80	17.70
6	11570.00	51.8 AV	54.0	-2.2	1.00 H	352	34.10	17.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	5440.00	66.1 PK	74.0	-7.9	1.00 V	177	60.10	6.00
2	5440.00	53.7 AV	54.0	-0.3	1.00 V	177	47.70	6.00
3	*5785.00	125.0 PK			1.00 V	263	84.40	40.60
4	*5785.00	114.7 AV			1.00 V	263	74.10	40.60
5	11570.00	62.6 PK	74.0	-11.4	1.56 V	244	44.90	17.70
6	11570.00	49.9 AV	54.0	-4.1	1.56 V	244	32.20	17.70

REMARKS:

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

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5440.00	64.8 PK	74.0	-9.2	1.50 H	257	58.80	6.00
2	5440.00	53.7 AV	54.0	-0.3	1.50 H	257	47.70	6.00
3	*5825.00	116.9 PK			1.43 H	249	76.20	40.70
4	*5825.00	105.7 AV			1.43 H	249	65.00	40.70
5	#5850.00	74.9 PK	86.9	-12.0	1.43 H	249	68.10	6.80
6	#5850.00	63.7 AV	75.7	-12.0	1.43 H	249	56.90	6.80
7	11650.00	64.4 PK	74.0	-9.6	1.00 H	320	46.20	18.20
8	11650.00	51.5 AV	54.0	-2.5	1.00 H	320	33.30	18.20
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	5440.00	66.1 PK	74.0	-7.9	1.00 V	178	60.10	6.00
2	5440.00	53.4 AV	54.0	-0.6	1.00 V	178	47.40	6.00
3	*5825.00	124.8 PK			1.00 V	272	84.10	40.70
4	*5825.00	115.0 AV			1.00 V	272	74.30	40.70
5	#5850.00	85.5 PK	94.8	-9.3	1.00 V	272	78.70	6.80
6	#5850.00	75.7 AV	85.0	-9.3	1.00 V	272	68.90	6.80
7	11650.00	66.4 PK	74.0	-7.6	1.49 V	103	48.20	18.20
8	11650.00	52.1 AV	54.0	-1.9	1.49 V	103	33.90	18.20

REMARKS:

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

802.11n (20MHz)

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

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	5000.00	60.6 PK	74.0	-13.4	1.00 H	106	55.20	5.40
2	5000.00	50.8 AV	54.0	-3.2	1.00 H	106	45.40	5.40
3	#5725.00	84.2 PK	86.2	-2.0	1.53 H	254	77.70	6.50
4	#5725.00	73.8 AV	75.8	-2.0	1.53 H	254	67.30	6.50
5	*5745.00	116.2 PK			1.53 H	254	75.80	40.40
6	*5745.00	105.8 AV			1.53 H	254	65.40	40.40
7	11490.00	63.0 PK	74.0	-11.0	1.00 H	314	45.20	17.80
8	11490.00	50.2 AV	54.0	-3.8	1.00 H	314	32.40	17.80

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	5000.00	59.1 PK	74.0	-14.9	1.00 V	7	53.70	5.40
2	5000.00	48.3 AV	54.0	-5.7	1.00 V	7	42.90	5.40
3	5440.00	64.9 PK	74.0	-9.1	1.00 V	176	58.90	6.00
4	5440.00	51.9 AV	54.0	-2.1	1.00 V	176	45.90	6.00
5	#5725.00	93.8 PK	94.4	-0.6	1.00 V	265	87.30	6.50
6	#5725.00	83.7 AV	84.3	-0.6	1.00 V	265	77.20	6.50
7	*5745.00	124.4 PK			1.00 V	265	84.00	40.40
8	*5745.00	114.3 AV			1.00 V	265	73.90	40.40
9	11490.00	63.8 PK	74.0	-10.2	1.58 V	234	46.00	17.80
10	11490.00	49.9 AV	54.0	-4.1	1.58 V	234	32.10	17.80

REMARKS:

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

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5000.00	60.2 PK	74.0	-13.8	1.00 H	101	54.80	5.40
2	5000.00	50.6 AV	54.0	-3.4	1.00 H	101	45.20	5.40
3	*5785.00	116.6 PK			1.50 H	253	76.00	40.60
4	*5785.00	106.4 AV			1.50 H	253	65.80	40.60
5	11570.00	62.7 PK	74.0	-11.3	1.00 H	325	45.00	17.70
6	11570.00	49.9 AV	54.0	-4.1	1.00 H	325	32.20	17.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5440.00	65.4 PK	74.0	-8.6	1.00 V	176	59.40	6.00
2	5440.00	53.5 AV	54.0	-0.5	1.00 V	176	47.50	6.00
3	*5785.00	124.5 PK			1.00 V	266	83.90	40.60
4	*5785.00	114.7 AV			1.00 V	266	74.10	40.60
5	11570.00	62.9 PK	74.0	-11.1	1.74 V	107	45.20	17.70
6	11570.00	49.9 AV	54.0	-4.1	1.74 V	107	32.20	17.70

REMARKS:

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

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5000.00	60.0 PK	74.0	-14.0	1.00 H	105	54.60	5.40
2	5000.00	50.0 AV	54.0	-4.0	1.00 H	105	44.60	5.40
3	*5825.00	114.7 PK			1.51 H	247	74.00	40.70
4	*5825.00	104.4 AV			1.51 H	247	63.70	40.70
5	#5850.00	66.7 PK	84.7	-18.0	1.51 H	247	59.90	6.80
6	#5850.00	56.4 AV	74.4	-18.0	1.51 H	247	49.60	6.80
7	11650.00	62.6 PK	74.0	-11.4	1.00 H	302	44.40	18.20
8	11650.00	49.6 AV	54.0	-4.4	1.00 H	302	31.40	18.20
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	5440.00	66.6 PK	74.0	-7.4	1.00 V	178	60.60	6.00
2	5440.00	53.3 AV	54.0	-0.7	1.00 V	178	47.30	6.00
3	*5825.00	123.8 PK			1.00 V	231	83.10	40.70
4	*5825.00	113.9 AV			1.00 V	231	73.20	40.70
5	#5850.00	85.8 PK	93.8	-8.0	1.00 V	231	79.00	6.80
6	#5850.00	75.9 AV	83.9	-8.0	1.00 V	231	69.10	6.80
7	11650.00	64.0 PK	74.0	-10.0	1.07 V	41	45.80	18.20
8	11650.00	50.8 AV	54.0	-3.2	1.07 V	41	32.60	18.20

REMARKS:

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

802.11n (40MHz)

CHANNEL	TX Channel 151	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	81.3 PK	81.8	-0.5	1.52 H	255	74.80	6.50
2	#5725.00	71.2 AV	71.7	-0.5	1.52 H	255	64.70	6.50
3	*5755.00	111.8 PK			1.52 H	255	71.30	40.50
4	*5755.00	101.7 AV			1.52 H	255	61.20	40.50
5	11510.00	60.4 PK	74.0	-13.6	1.00 H	301	42.60	17.80
6	11510.00	46.9 AV	54.0	-7.1	1.00 H	301	29.10	17.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	85.5 PK	86.0	-0.5	1.00 V	177	79.00	6.50
2	#5725.00	75.9 AV	76.4	-0.5	1.00 V	177	69.40	6.50
3	*5755.00	116.0 PK			1.00 V	177	75.50	40.50
4	*5755.00	106.4 AV			1.00 V	177	65.90	40.50
5	11510.00	61.5 PK	74.0	-12.5	1.50 V	263	43.70	17.80
6	11510.00	47.6 AV	54.0	-6.4	1.50 V	263	29.80	17.80

REMARKS:

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

CHANNEL	TX Channel 159	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5000.00	59.4 PK	74.0	-14.6	1.00 H	103	54.00	5.40
2	5000.00	49.5 AV	54.0	-4.5	1.00 H	103	44.10	5.40
3	*5795.00	112.7 PK			1.51 H	254	72.10	40.60
4	*5795.00	102.8 AV			1.51 H	254	62.20	40.60
5	#5850.00	67.6 PK	82.7	-15.1	1.51 H	254	60.80	6.80
6	#5850.00	57.7 AV	72.8	-15.1	1.51 H	254	50.90	6.80
7	11590.00	61.2 PK	74.0	-12.8	1.00 H	305	43.40	17.80
8	11590.00	48.1 AV	54.0	-5.9	1.00 H	305	30.30	17.80
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	5440.00	66.8 PK	74.0	-7.2	1.00 V	177	60.80	6.00
2	5440.00	53.7 AV	54.0	-0.3	1.00 V	177	47.70	6.00
3	*5795.00	121.7 PK			1.00 V	270	81.10	40.60
4	*5795.00	112.1 AV			1.00 V	270	71.50	40.60
5	#5850.00	81.2 PK	91.7	-10.5	1.00 V	270	74.40	6.80
6	#5850.00	71.6 AV	82.1	-10.5	1.00 V	270	64.80	6.80
7	11590.00	64.0 PK	74.0	-10.0	1.16 V	95	46.20	17.80
8	11590.00	50.5 AV	54.0	-3.5	1.16 V	95	32.70	17.80

REMARKS:

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

BELOW 1GHz WORST-CASE DATA

802.11a

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	A

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	45.42	26.9 QP	40.0	-13.1	1.24 H	110	41.10	-14.20
2	150.20	28.9 QP	43.5	-14.6	1.24 H	232	42.50	-13.60
3	208.42	27.5 QP	43.5	-16.0	1.24 H	119	43.90	-16.40
4	427.68	24.3 QP	46.0	-21.7	1.00 H	8	34.40	-10.10
5	749.79	27.6 QP	46.0	-18.4	1.00 H	142	31.20	-3.60
6	802.18	28.0 QP	46.0	-18.0	1.75 H	12	31.00	-3.00
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	45.42	36.4 QP	40.0	-3.6	1.00 V	197	50.60	-14.20
2	88.11	26.7 QP	43.5	-16.8	1.24 V	12	46.20	-19.50
3	150.20	26.0 QP	43.5	-17.5	1.00 V	192	39.60	-13.60
4	437.38	26.8 QP	46.0	-19.2	1.24 V	290	36.70	-9.90
5	499.48	25.3 QP	46.0	-20.7	1.00 V	137	34.20	-8.90
6	790.54	27.4 QP	46.0	-18.6	1.00 V	261	30.50	-3.10

REMARKS:

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

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	B

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	39.60	24.6 QP	40.0	-15.4	1.00 H	126	39.20	-14.60
2	88.11	25.6 QP	43.5	-17.9	1.26 H	150	45.10	-19.50
3	130.80	33.7 QP	43.5	-9.8	1.00 H	260	48.90	-15.20
4	286.03	24.3 QP	46.0	-21.7	1.50 H	349	37.00	-12.70
5	625.60	25.8 QP	46.0	-20.2	1.26 H	56	32.00	-6.20
6	782.78	28.6 QP	46.0	-17.4	1.26 H	271	31.70	-3.10
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	41.54	36.7 QP	40.0	-3.3	1.00 V	8	51.20	-14.50
2	86.17	34.2 QP	40.0	-5.8	1.00 V	32	53.50	-19.30
3	128.86	35.5 QP	43.5	-8.0	1.00 V	218	50.80	-15.30
4	286.03	27.3 QP	46.0	-18.7	1.00 V	319	40.00	-12.70
5	499.48	24.5 QP	46.0	-21.5	1.75 V	112	33.40	-8.90
6	722.62	28.8 QP	46.0	-17.2	1.24 V	12	33.60	-4.80

REMARKS:

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

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	C

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	39.60	24.1 QP	40.0	-15.9	1.00 H	109	38.70	-14.60
2	121.10	30.0 QP	43.5	-13.5	1.25 H	296	46.00	-16.00
3	208.42	28.7 QP	43.5	-14.8	1.25 H	85	45.10	-16.40
4	437.38	35.8 QP	46.0	-10.2	1.25 H	65	45.70	-9.90
5	749.79	29.1 QP	46.0	-16.9	1.00 H	149	32.70	-3.60
6	784.72	29.6 QP	46.0	-16.4	1.00 H	249	32.70	-3.10
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	39.60	36.1 QP	40.0	-3.9	1.24 V	354	50.70	-14.60
2	53.18	34.2 QP	40.0	-5.8	1.24 V	12	48.20	-14.00
3	121.10	30.7 QP	43.5	-12.8	1.24 V	201	46.70	-16.00
4	295.73	24.8 QP	46.0	-21.2	1.50 V	12	37.40	-12.60
5	375.29	25.2 QP	46.0	-20.8	1.24 V	110	36.30	-11.10
6	778.89	29.0 QP	46.0	-17.0	1.00 V	66	32.30	-3.30

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)
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

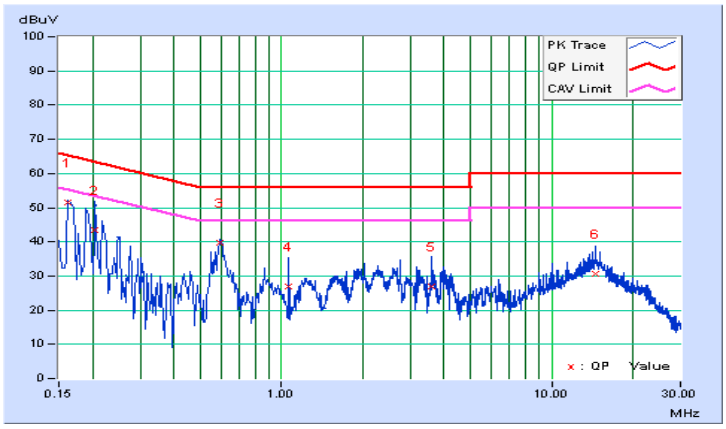
CONDUCTED WORST-CASE DATA：802.11a

PHASE	Line 1	**6dB BANDWIDTH**	9kHz
TEST MODE	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16181	0.08	51.54	40.15	51.62	40.23	65.37	55.37	-13.75	-15.14
2	0.20474	0.07	43.43	17.06	43.50	17.13	63.42	53.42	-19.92	-36.29
3	0.59183	0.09	39.51	32.78	39.60	32.87	56.00	46.00	-16.40	-13.13
4	1.06182	0.11	26.99	11.56	27.10	11.67	56.00	46.00	-28.90	-34.33
5	3.60253	0.21	26.66	18.91	26.87	19.12	56.00	46.00	-29.13	-26.88
6	14.53098	0.75	29.77	23.37	30.52	24.12	60.00	50.00	-29.48	-25.88

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

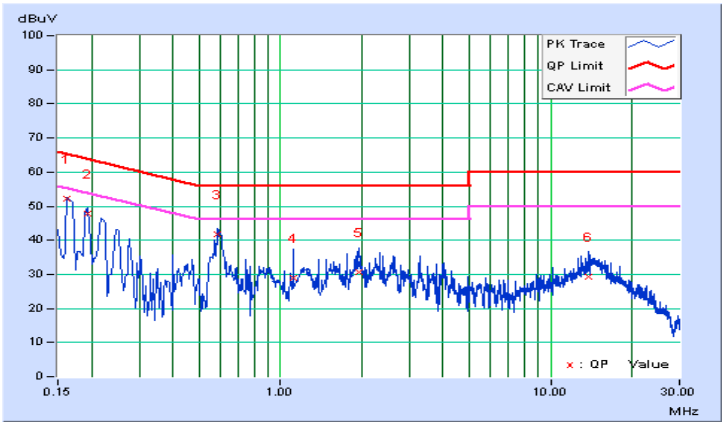


PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16181	0.05	52.21	41.10	52.26	41.15	65.37	55.37	-13.11	-14.22
2	0.19255	0.05	47.86	37.88	47.91	37.93	63.93	53.93	-16.02	-16.00
3	0.58401	0.08	41.64	30.53	41.72	30.61	56.00	46.00	-14.28	-15.39
4	1.11577	0.10	28.81	18.27	28.91	18.37	56.00	46.00	-27.09	-27.63
5	1.96424	0.14	30.56	24.01	30.70	24.15	56.00	46.00	-25.30	-21.85
6	13.74116	0.62	28.57	22.08	29.19	22.70	60.00	50.00	-30.81	-27.30

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

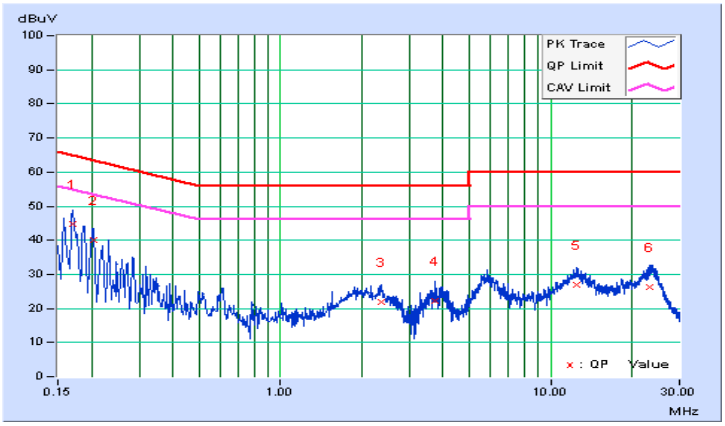


PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16955	0.08	44.66	31.45	44.74	31.53	64.98	54.98	-20.25	-23.46
2	0.20474	0.07	39.95	25.02	40.02	25.09	63.42	53.42	-23.40	-28.33
3	2.37088	0.16	21.82	17.22	21.98	17.38	56.00	46.00	-34.02	-28.62
4	3.72374	0.22	21.99	11.70	22.21	11.92	56.00	46.00	-33.79	-34.08
5	12.48214	0.64	26.16	20.61	26.80	21.25	60.00	50.00	-33.20	-28.75
6	23.33630	1.14	25.03	19.56	26.17	20.70	60.00	50.00	-33.83	-29.30

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

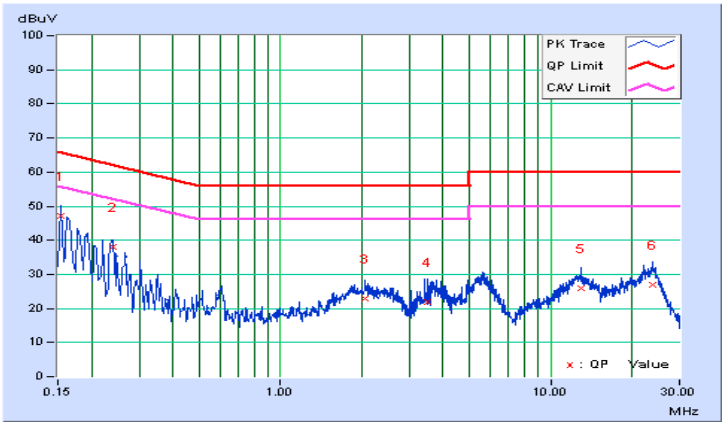


PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	0.05	46.98	32.42	47.03	32.47	65.79	55.79	-18.76	-23.32
2	0.23898	0.05	37.86	22.85	37.91	22.90	62.13	52.13	-24.22	-29.23
3	2.06590	0.14	22.79	18.02	22.93	18.16	56.00	46.00	-33.07	-27.84
4	3.48914	0.19	21.60	13.56	21.79	13.75	56.00	46.00	-34.21	-32.25
5	12.99826	0.58	25.39	19.77	25.97	20.35	60.00	50.00	-34.03	-29.65
6	23.78204	0.99	25.86	20.49	26.85	21.48	60.00	50.00	-33.15	-28.52

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

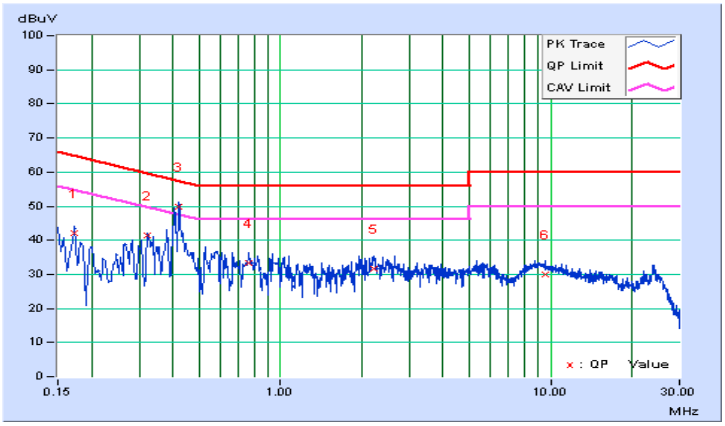


PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	C		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17328	0.08	42.07	30.81	42.15	30.89	64.80	54.80	-22.66	-23.92
2	0.32204	0.08	41.36	37.05	41.44	37.13	59.65	49.65	-18.22	-12.53
3	0.42000	0.08	49.90	44.85	49.98	44.93	57.45	47.45	-7.47	-2.52
4	0.76386	0.10	33.11	28.75	33.21	28.85	56.00	46.00	-22.79	-17.15
5	2.21839	0.16	31.39	25.37	31.55	25.53	56.00	46.00	-24.45	-20.47
6	9.54182	0.49	29.60	24.04	30.09	24.53	60.00	50.00	-29.91	-25.47

REMARKS:

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

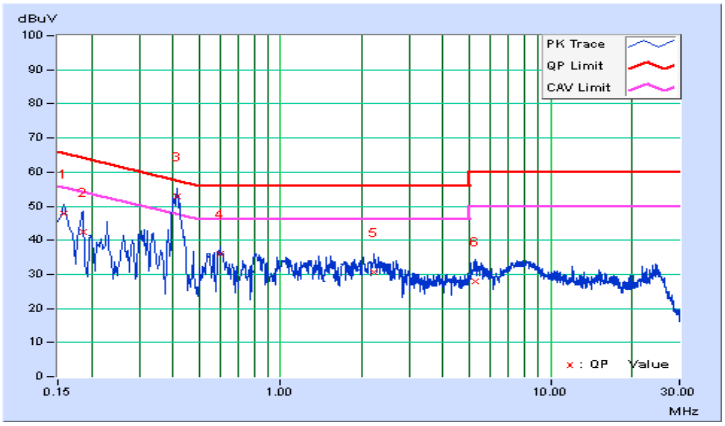


PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	C		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15782	0.05	47.90	38.02	47.95	38.07	65.58	55.58	-17.63	-17.51
2	0.18508	0.05	42.24	32.73	42.29	32.78	64.25	54.25	-21.96	-21.47
3	0.41197	0.07	52.91	44.23	52.98	44.30	57.61	47.61	-4.63	-3.31
4	0.59574	0.08	36.04	27.79	36.12	27.87	56.00	46.00	-19.88	-18.13
5	2.21448	0.15	30.58	23.39	30.73	23.54	56.00	46.00	-25.27	-22.46
6	5.22909	0.26	27.78	20.08	28.04	20.34	60.00	50.00	-31.96	-29.66

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	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	16.34	15.78	15.76	0.5	PASS
157	5785	16.31	15.76	16.35	0.5	PASS
165	5825	16.39	15.77	16.36	0.5	PASS

802.11n (20MHz)

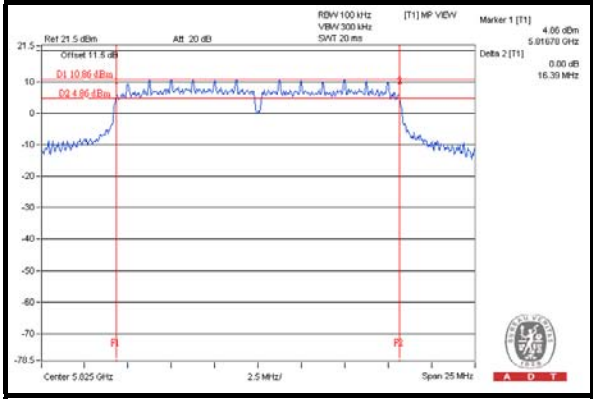
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	17.17	16.32	16.99	0.5	PASS
157	5785	17.18	15.48	17.15	0.5	PASS
165	5825	17.19	16.14	16.91	0.5	PASS

802.11n (40MHz)

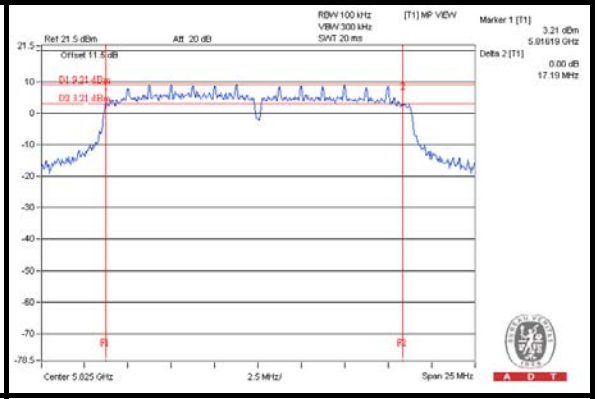
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
151	5755	35.78	35.58	35.87	0.5	PASS
159	5795	35.88	35.26	35.47	0.5	PASS

SPECTRUM PLOT OF WORST VALUE

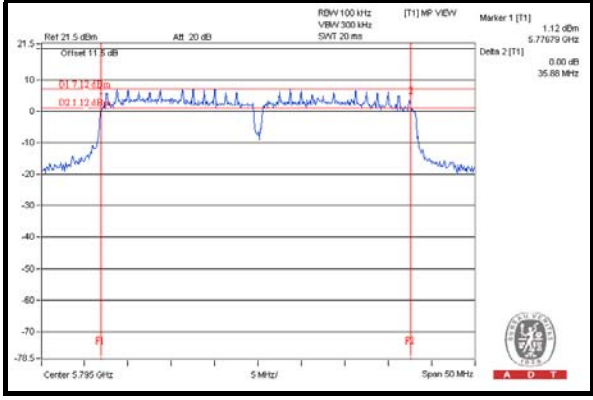
802.11a



802.11n (20MHz)



802.11n (40MHz)



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 ≤ 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 ≥ 5.

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

5.4.2 TEST SETUP

Same as Item 4.4.2.

5.4.3 INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.4.4 TEST PROCEDURES

Same as Item 4.4.4.

5.4.5 DEVIATION FROM TEST STANDARD

No deviation.

5.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.

5.4.7 TEST RESULTS

FOR AVERAGE POWER

802.11a

CHAN.	FREQ. (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
149	5745	22.61	21.59	22.11	489.157	26.89	30	PASS
157	5785	21.92	21.17	21.49	427.444	26.31	30	PASS
165	5825	23.17	22.15	22.72	558.618	27.47	30	PASS

802.11n (20MHz)

CHAN.	FREQ. (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
149	5745	22.89	21.67	22.19	507.006	27.05	30	PASS
157	5785	23.11	22.42	23.10	583.400	27.66	30	PASS
165	5825	22.93	22.84	22.86	581.842	27.65	30	PASS

802.11n (40MHz)

CHAN.	FREQ. (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
151	5755	18.86	17.26	17.75	189.690	22.78	30	PASS
159	5795	23.38	22.77	22.98	**605.614**	27.82	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)	10 log (N=3) dB	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	PASS /FAIL
0	149	5745	-9.25	4.77	0.13	-4.35	6.10	PASS
	157	5785	-9.50	4.77	0.13	-4.60	6.10	PASS
	165	5825	-9.36	4.77	0.13	-4.46	6.10	PASS
1	149	5745	-8.64	4.77	0.13	-3.74	6.10	PASS
	157	5785	-8.49	4.77	0.13	-3.59	6.10	PASS
	165	5825	-9.02	4.77	0.13	-4.12	6.10	PASS
2	149	5745	-8.20	4.77	0.13	-3.30	6.10	PASS
	157	5785	-8.74	4.77	0.13	-3.84	6.10	PASS
	165	5825	-9.07	4.77	0.13	-4.17	6.10	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 = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/3$]= 7.90 dBi > 6dBi, so the power density limit shall be reduced to 8-(7.90-6) = 6.10dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (20MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	PASS /FAIL
0	149	5745	-9.72	4.77	0.11	-4.84	6.10	PASS
	157	5785	-9.99	4.77	0.11	-5.11	6.10	PASS
	165	5825	-11.01	4.77	0.11	-6.13	6.10	PASS
1	149	5745	-10.04	4.77	0.11	-5.16	6.10	PASS
	157	5785	-10.69	4.77	0.11	-5.81	6.10	PASS
	165	5825	-10.37	4.77	0.11	-5.49	6.10	PASS
2	149	5745	-8.71	4.77	0.11	-3.83	6.10	PASS
	157	5785	-9.15	4.77	0.11	-4.27	6.10	PASS
	165	5825	-10.53	4.77	0.11	-5.65	6.10	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 = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/3$]= 7.90 dBi > 6dBi, so the power density limit shall be reduced to 8-(7.90-6) = 6.10dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (40MHz)

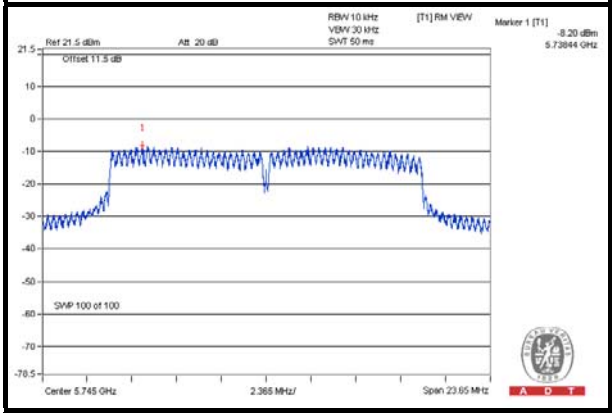
TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	PASS /FAIL
0	151	5755	-15.20	4.77	0.17	-10.26	6.10	PASS
	159	5795	-13.38	4.77	0.17	-8.44	6.10	PASS
1	151	5755	-14.46	4.77	0.17	-9.52	6.10	PASS
	159	5795	-12.90	4.77	0.17	-7.96	6.10	PASS
2	151	5755	-14.89	4.77	0.17	-9.95	6.10	PASS
	159	5795	-12.28	4.77	0.17	-7.34	6.10	PASS

NOTE:

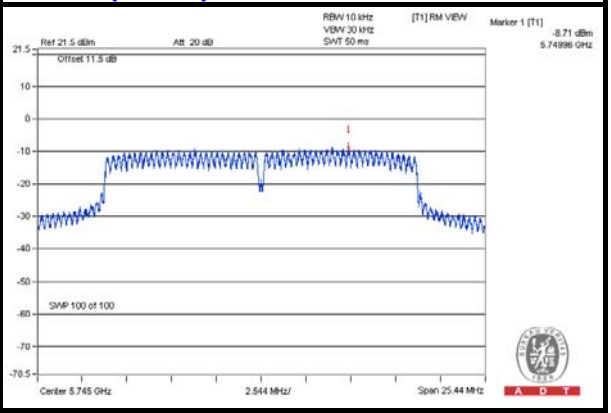
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/3]$= 7.90 dBi > 6dBi, so the power density limit shall be reduced to 8-(7.90-6) = 6.10dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE

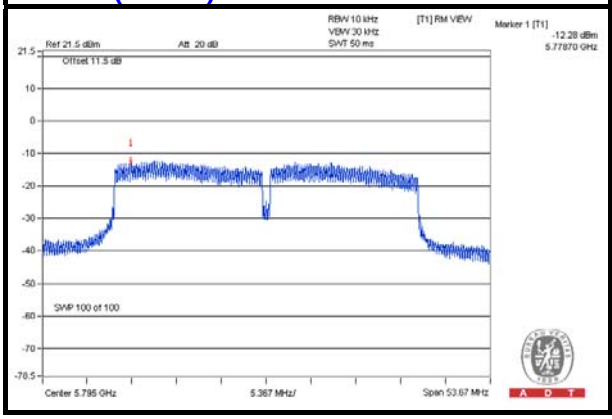
802.11a



802.11n (20MHz)



802.11n (40MHz)



5.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

5.6.1 LIMITS OF 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

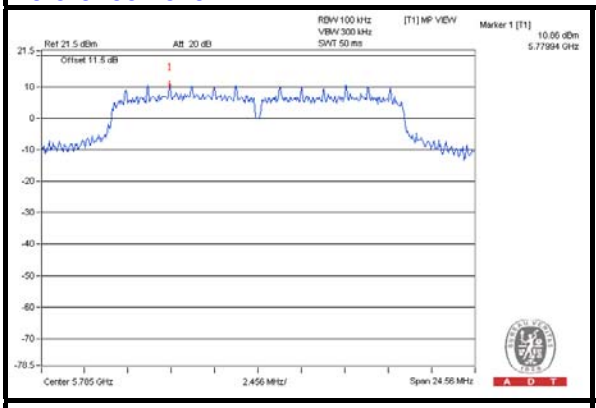
5.6.7 TEST RESULTS

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.

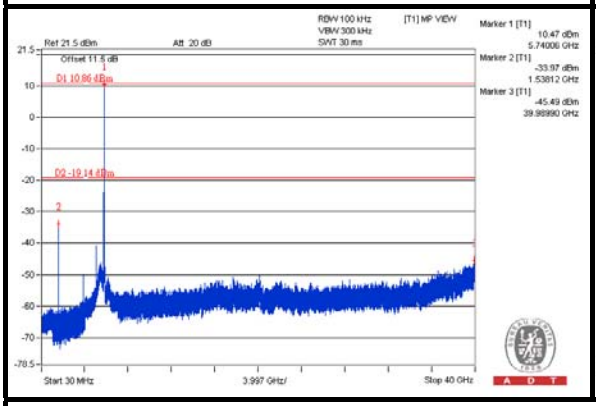
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

802.11a
CHAIN 0

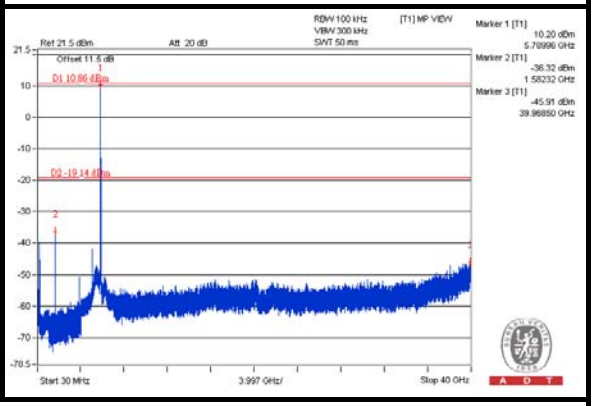
Reference Level



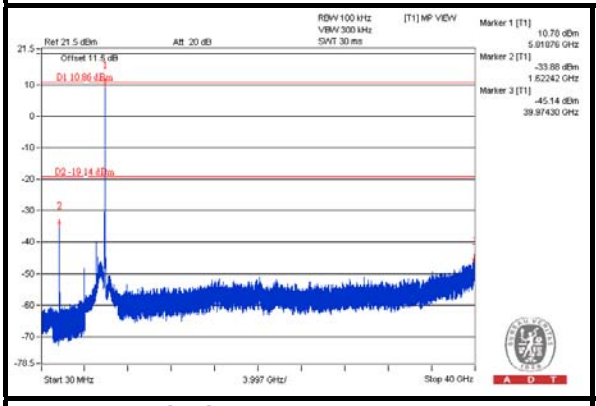
CH 149



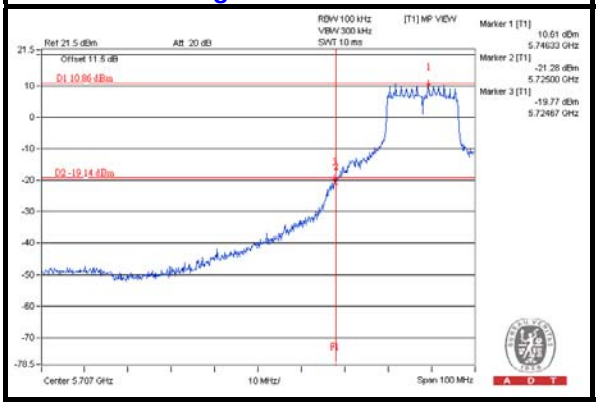
CH 157



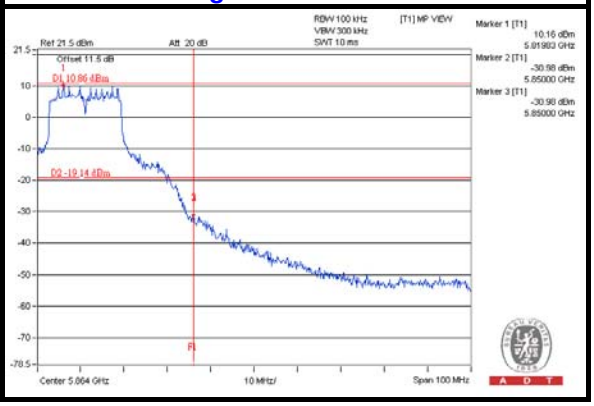
CH 165



CH 149 Band edge

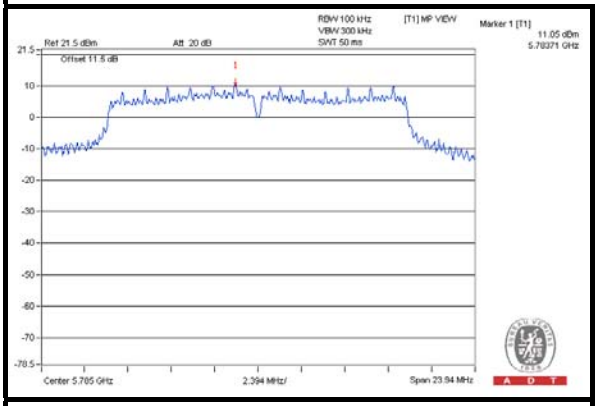


CH 165 Band edge

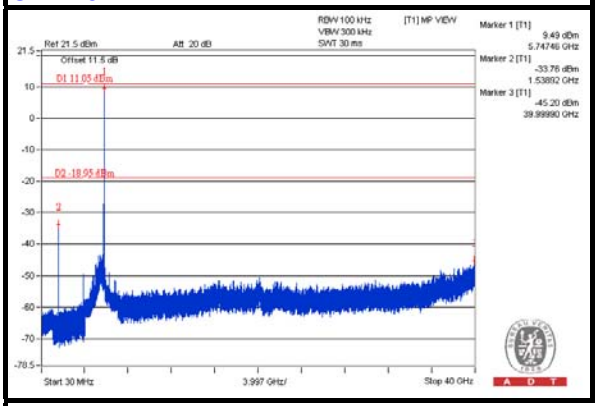


CHAIN 1

Reference Level



CH 149



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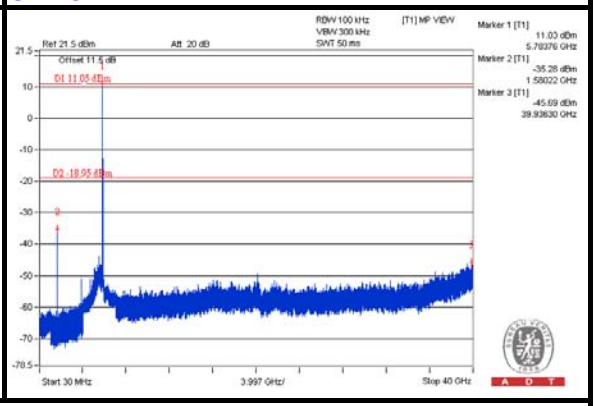

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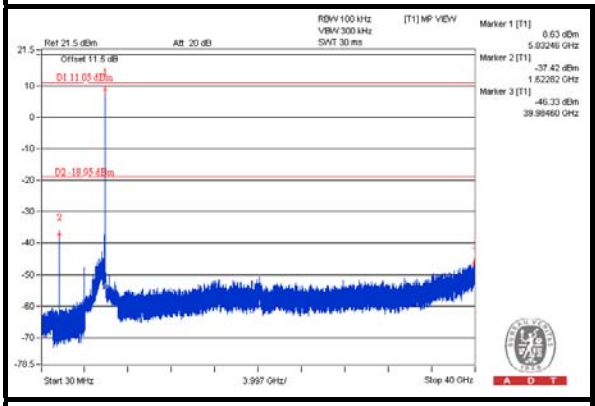
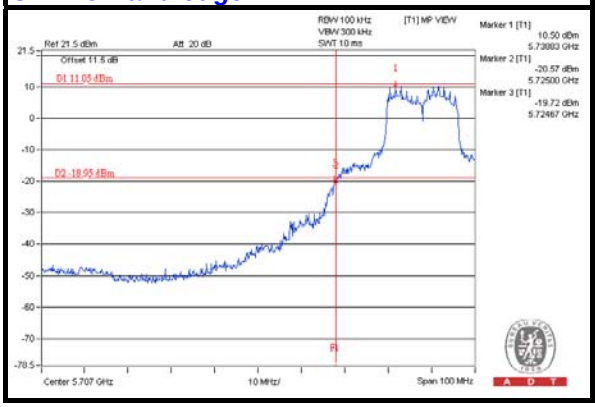
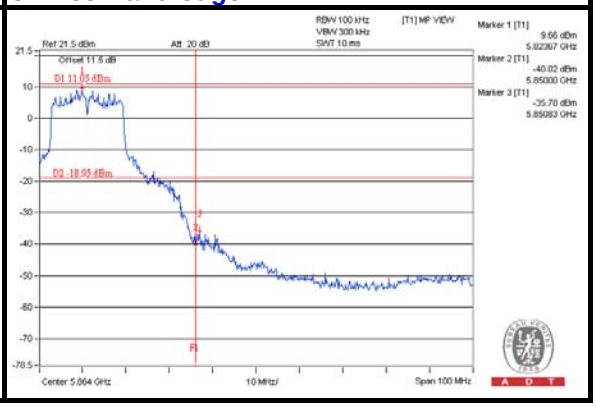


CH 149 Band edge

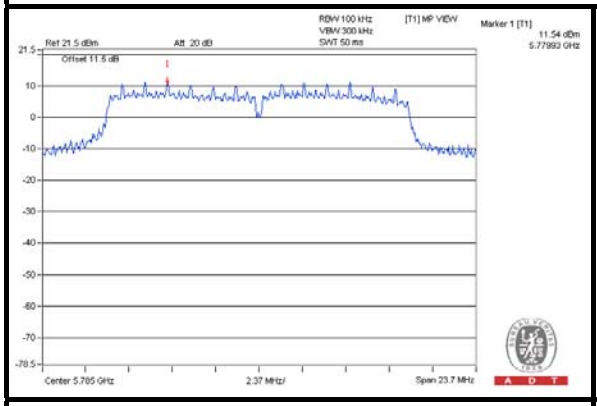


CH 165 Band edge

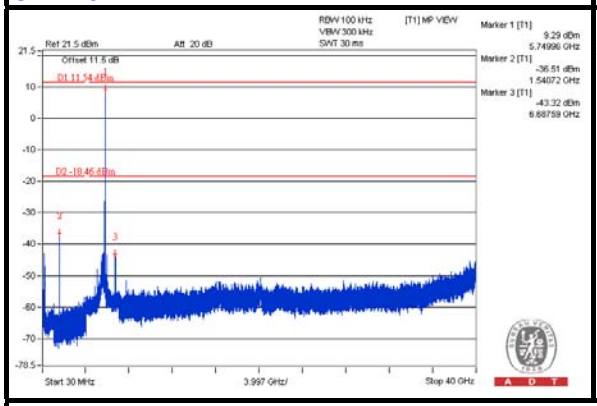


CHAIN 2

Reference Level



CH 149



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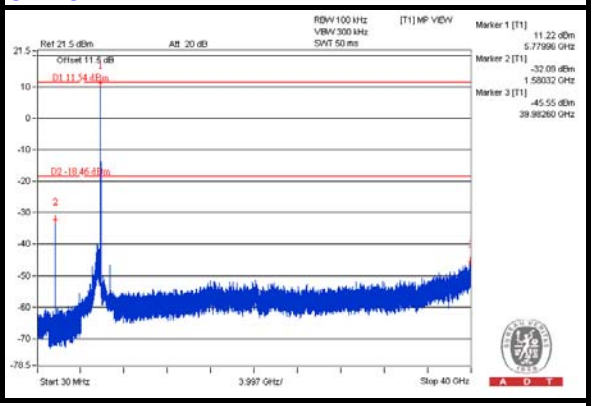

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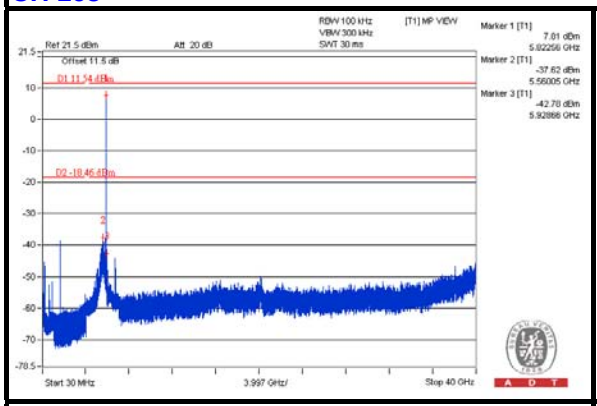
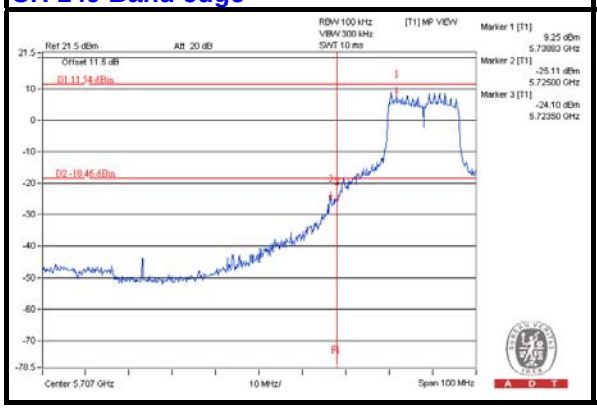
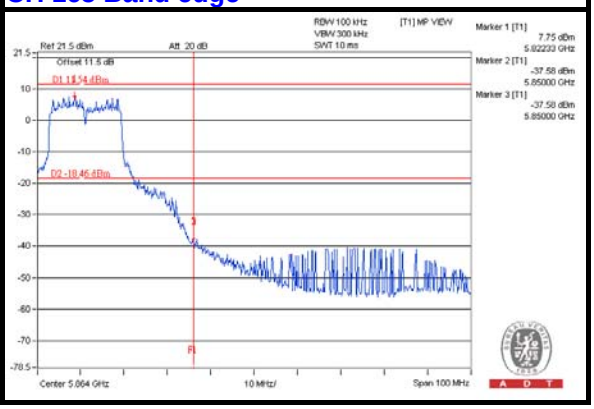


CH 149 Band edge

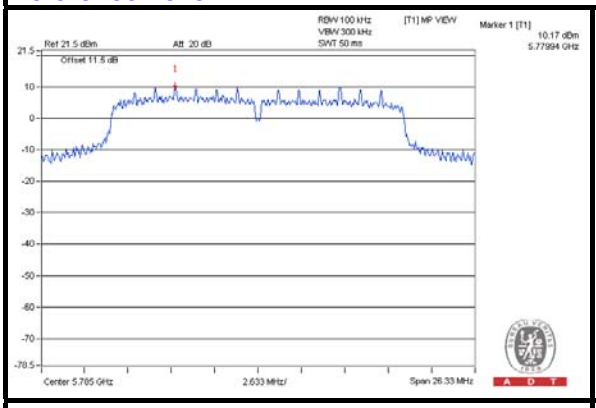


CH 165 Band edge



802.11n (20MHz)
CHAIN 0

Reference Level



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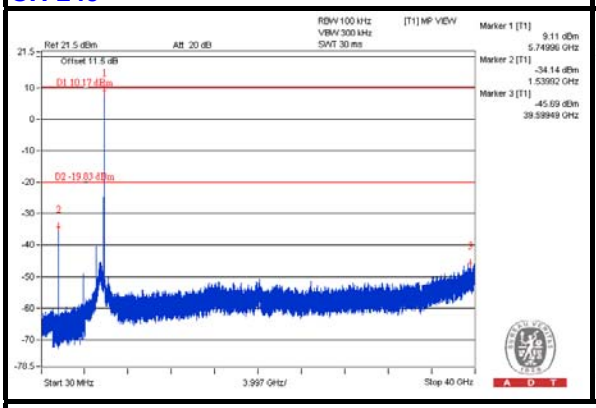

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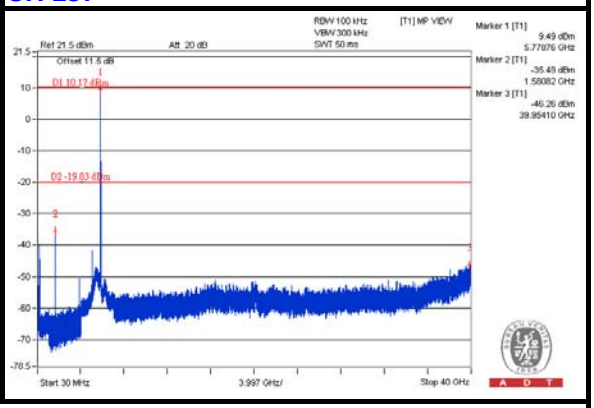

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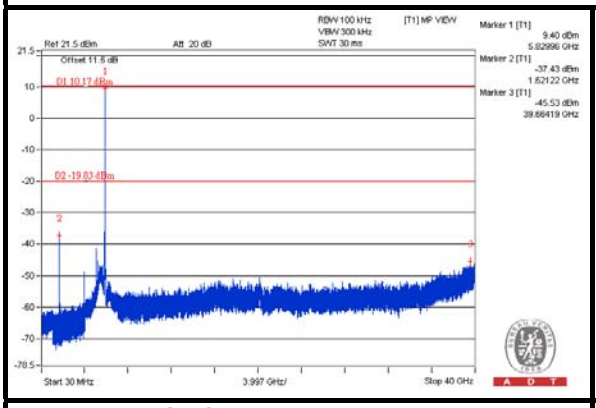
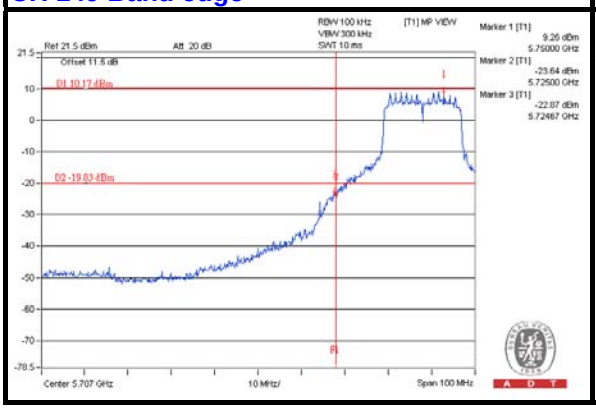
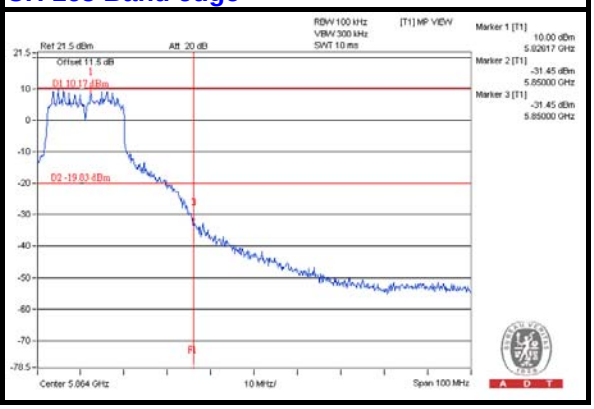


CH 149 Band edge

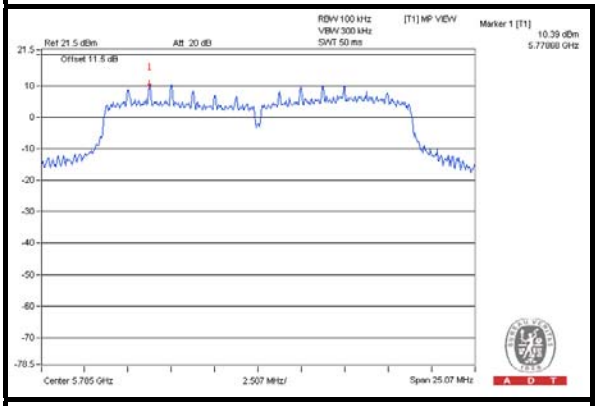


CH 165 Band edge

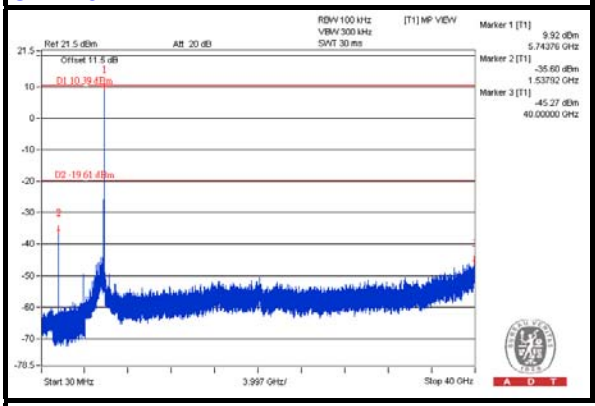


CHAIN 1

Reference Level



CH 149



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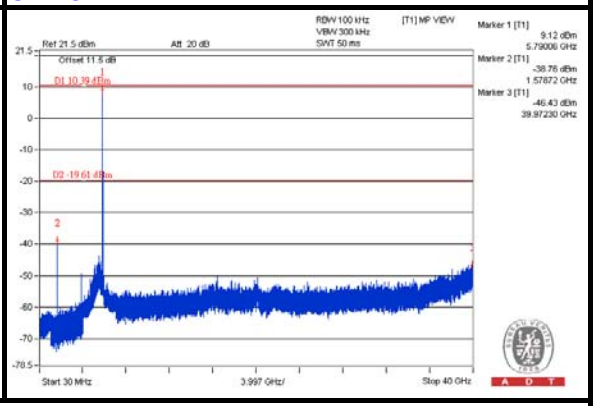

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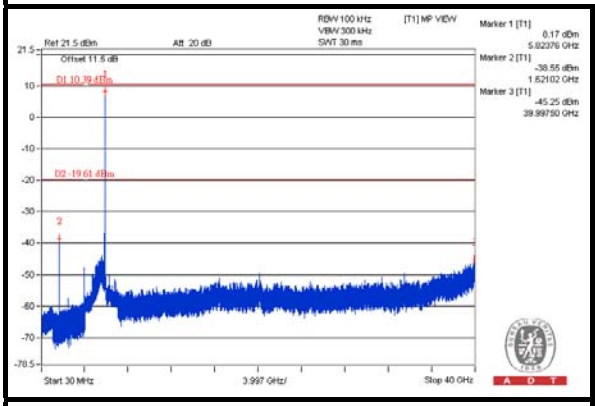
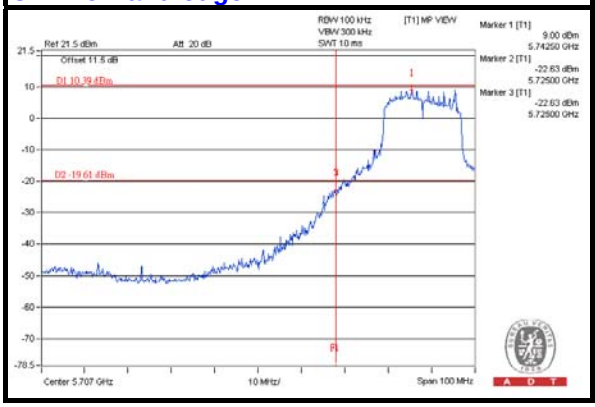
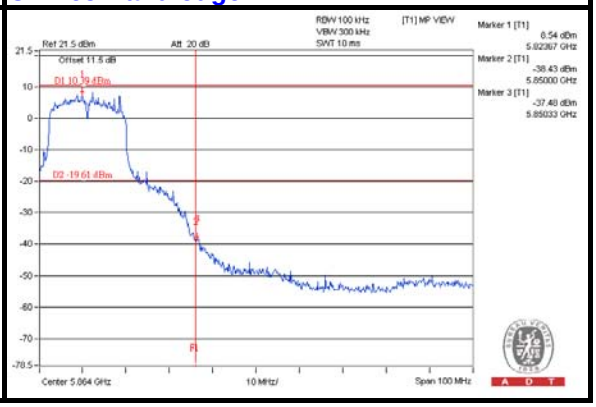


CH 149 Band edge

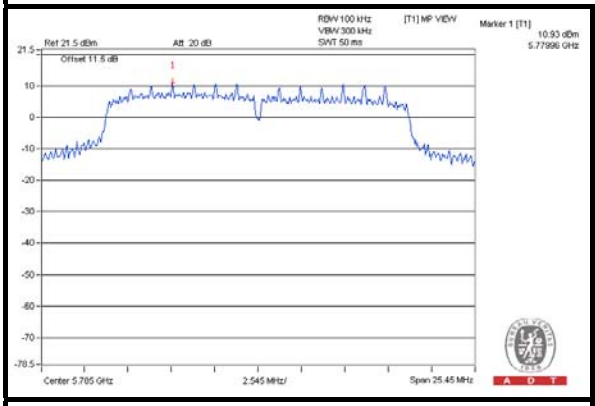


CH 165 Band edge

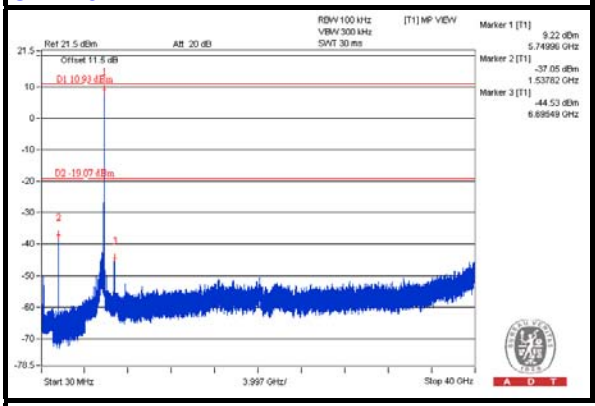


CHAIN 2

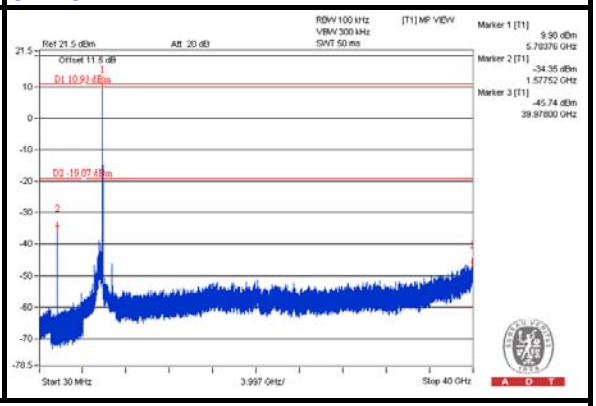
Reference Level



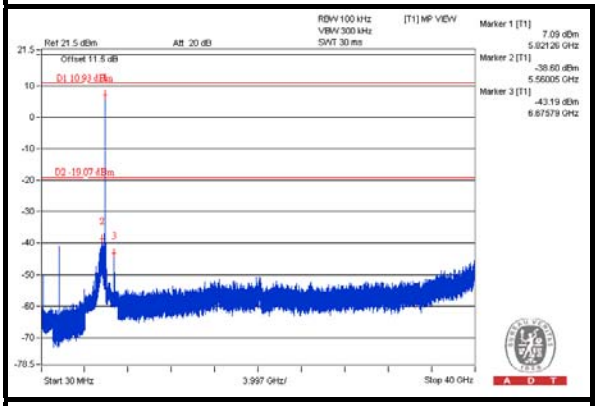
CH 149



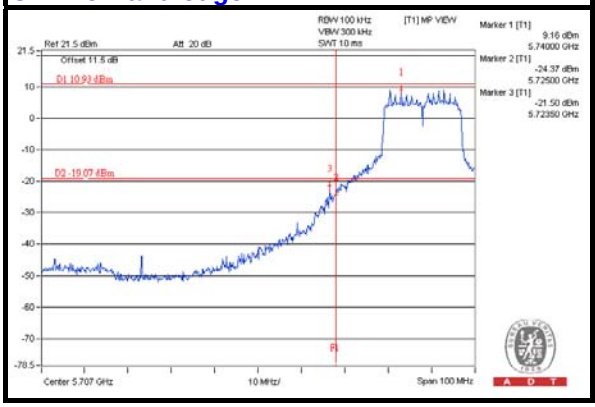
CH 157



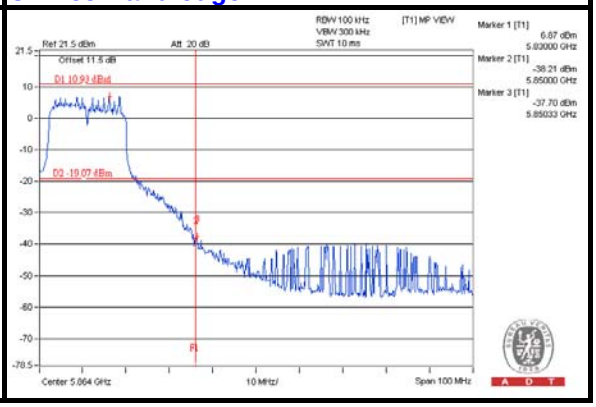
CH 165



CH 149 Band edge

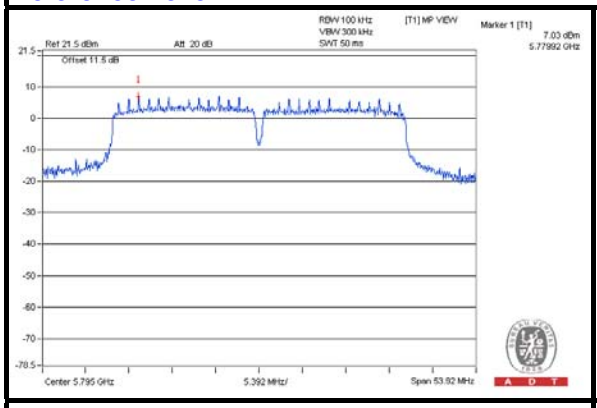


CH 165 Band edge

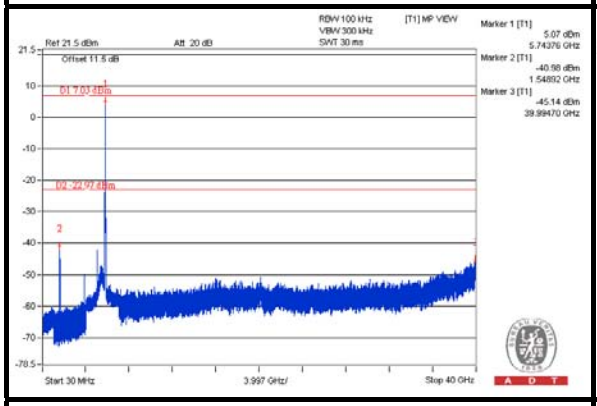


802.11n (40MHz)
CHAIN 0

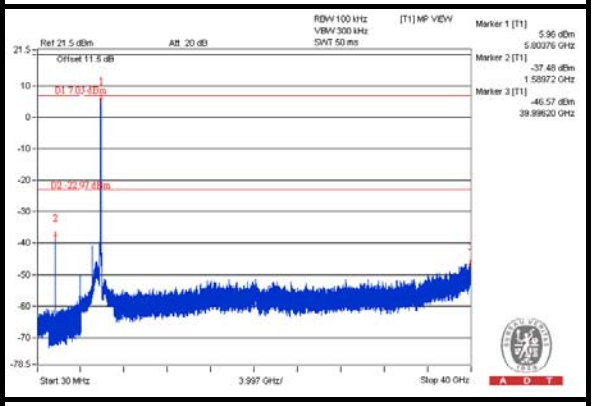
Reference Level



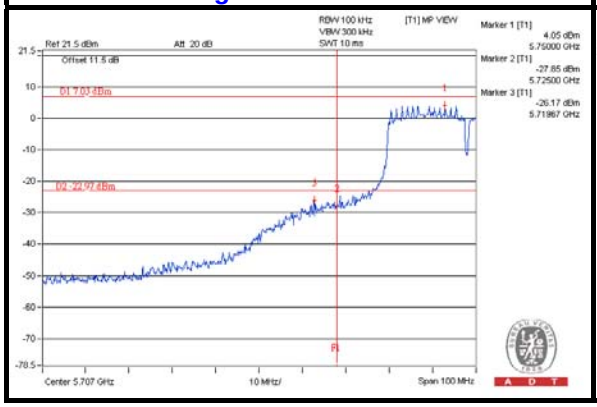
CH 151



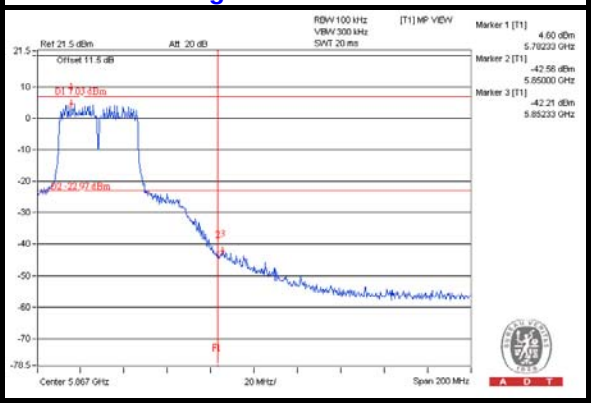
CH 159



CH 151 Band edge

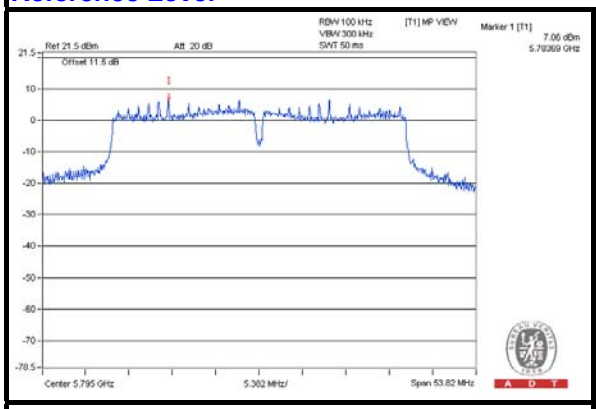


CH 159 Band edge

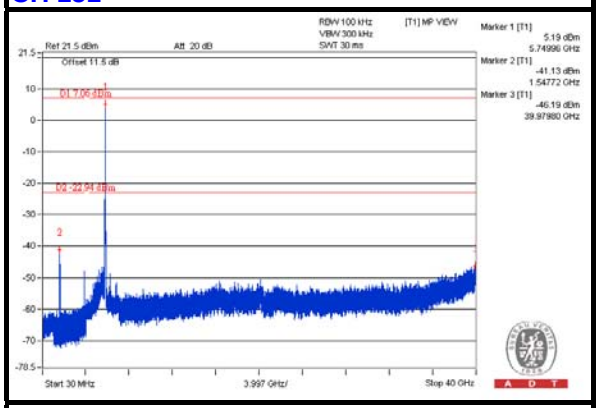


CHAIN 1

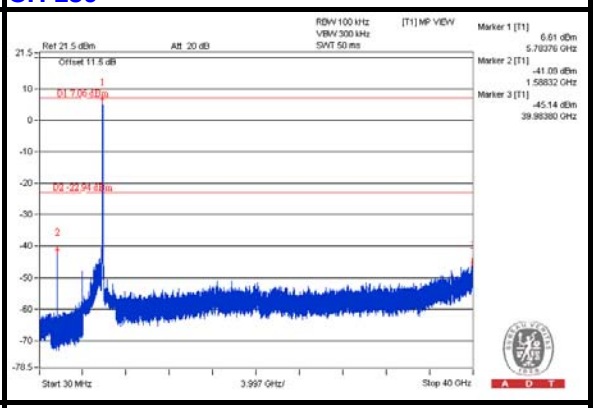
Reference Level



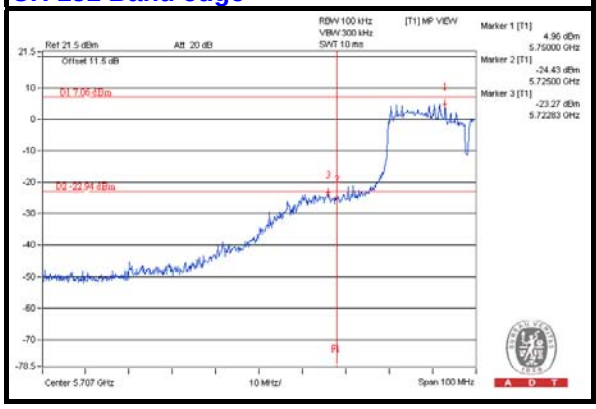
CH 151



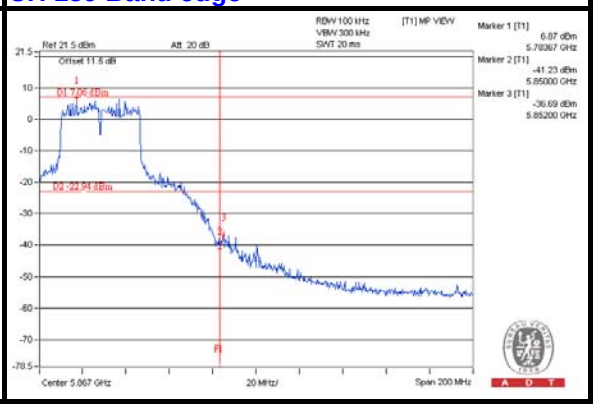
CH 159



CH 151 Band edge

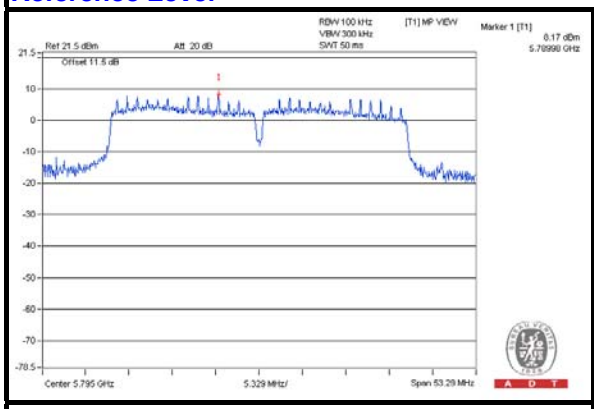


CH 159 Band edge

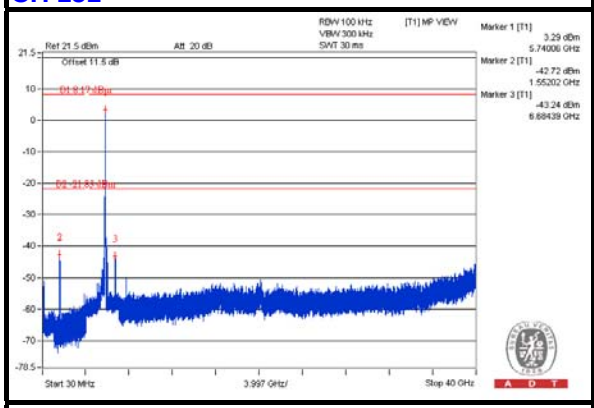


CHAIN 2

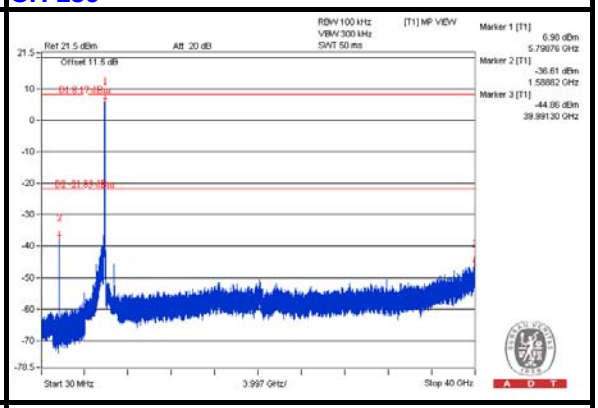
Reference Level



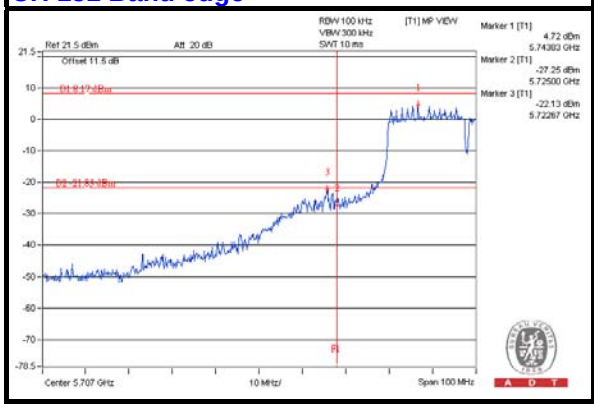
CH 151



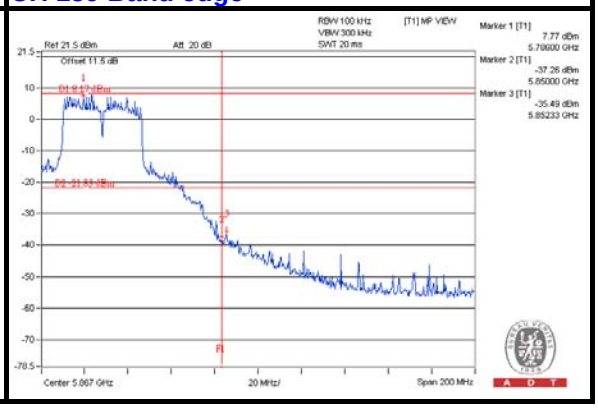
CH 159



CH 151 Band edge



CH 159 Band edge



6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

7. INFORMATION ON THE TESTING LABORATORIES

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

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

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Web Site: www.bureauveritas-adt.com

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

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

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

---END---