FCC Test Report

Report No.: RF140224C17H

FCC ID: 2AGZF-WE2520

Test Model: SWE2520

Received Date: Feb. 24, 2014

Test Date: Mar. 13 ~ Mar. 20, 2014

Issued Date: Dec. 22, 2015

Applicant: Siselectron Technology Ltd.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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Release Control Record

Issue No.	Description	Date Issued
RF140224C17H	Original release.	Dec. 22, 2015

1 Certificate of Conformity

Product: Dual Band AC1750 Access Point

Brand: Siselectron

Test Model: SWE2520

Sample Status: Engineering sample

Applicant: Siselectron Technology Ltd.

Test Date: Mar. 13 ~ Mar. 20, 2014

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10:2009

The above equipment 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 : _____ , **Date:** Dec. 22, 2015
Ivy Lin / Specialist

Approved by : _____ , **Date:** Dec. 22, 2015
Ken Liu / Senior Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -2.01dB at 0.47422MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.0dB at 2483.50MHz.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	Pass	Meet the requirement of limit.
15.247(b)	Conducted power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is IPEX 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	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.19 dB
	200MHz ~1000MHz	3.21 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Dual Band AC1750 Access Point
Brand	Siselectron
Test Model	SWE2520
Sample Status	Engineering sample
Power Supply Rating	12Vdc from adapter 48Vdc from PoE
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b:11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 450Mbps
Operating Frequency	2412 ~ 2462MHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
Output Power	739.930mW
Antenna Type	PIFA antenna with 4.0dBi gain
Antenna Connector	IPEX
Accessory Device	Adapter
Data Cable Supplied	N/A

Note:

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

Modulation Mode	TX Function
802.11b	3TX
802.11g	3TX
802.11n (HT20) MCS 0-7	3TX
802.11n (HT20) MCS 8-15	3TX
802.11n (HT20) MCS 16-23	3TX
802.11n (HT40) MCS 0-7	3TX
802.11n (HT40) MCS 8-15	3TX
802.11n (HT40) MCS 16-23	3TX

2. The EUT consumes power from the following adapter & PoE.

Adapter	
Brand	Powertron Electronics Corp.
Model	PA1024-2HUB PA1024-2HU PA1024-120HUB200
Input Power	100-240Vac, 50-60Hz, 0.6A
Output Power	12Vdc, 2.0A, 24W Max
Power Line	1.50m non-shielded cable with one core

PoE (Support unit only)	
Brand	Siselectron
Model	PoE Injector
Rating	48Vdc, 0.5A

Adapter of PoE (Support unit only)	
Brand	Powertron Electronics Corp.
Model	PA1024-480DUB050
Input Power	100-240V~50-60Hz 0.6A
Output Power	48Vdc, 0.5A, 24W Max
Power Line	1.55m non-shielded cable without core

3.2 Description of Test Modes

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20):

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

7 channels are provided for 802.11n (HT40):

Channel	Frequency	Channel	Frequency
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

3.2.1 Test Mode Applicability and Tested Channel Detail

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

Where **RE≥1G:** Radiated Emission above 1GHz & Bandedge Measurement **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)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
A	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	15.0

Radiated Emission Test (Below 1GHz):

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B	802.11g	1 to 11	6	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	802.11g	1 to 11	6	OFDM	BPSK	6.0

Antenna Port Conducted Measurement:

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

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

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

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

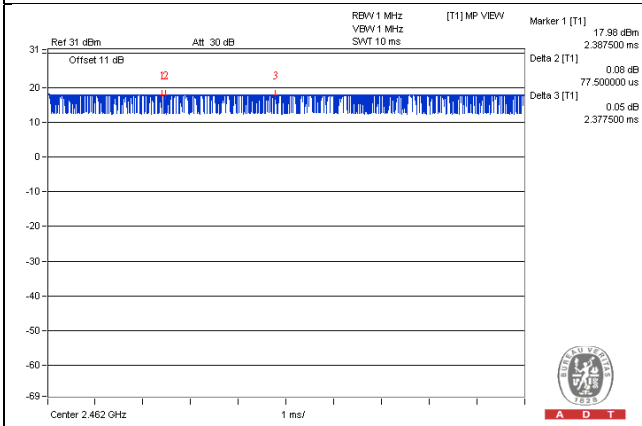
Test Condition:

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

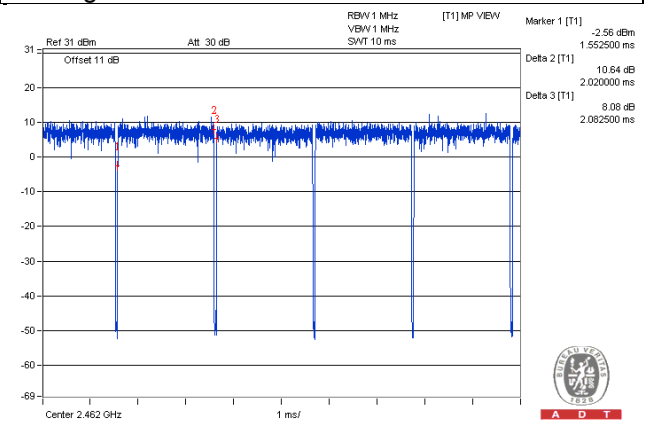
3.3 Duty Cycle of Test Signal

802.11b: Duty cycle of test signal is > 98 %
802.11g, 802.11n (HT20), 802.11n (HT40): Duty cycle of test signal is < 98%
802.11g: Duty cycle = 2.02/2.08 = 0.971, Duty factor = 10 * log(1/0.971) = 0.13
802.11n (HT20): Duty cycle = 1.88/1.93 = 0.974, Duty factor = 10 * log(1/0.974) = 0.11
802.11n (HT40): Duty cycle = 0.922/1 = 0.922, Duty factor = 10 * log(1/0.922) = 0.35

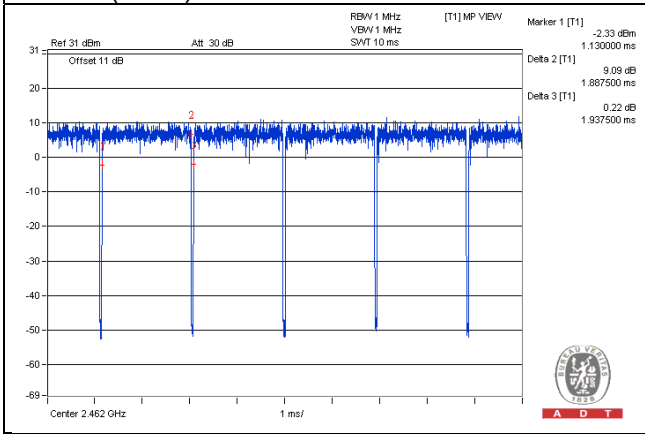
802.11b



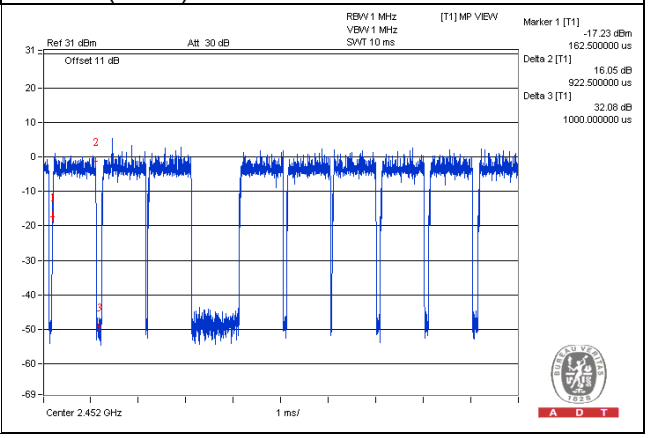
802.11g



802.11n (HT20)



802.11n (HT40)



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.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved	-
B.	POE	Siselectron	PoE Injector	NA	NA	-
C.	ADAPTER	Powertron Electronics Corp.	PA1024-480DUB050	NA	NA	-

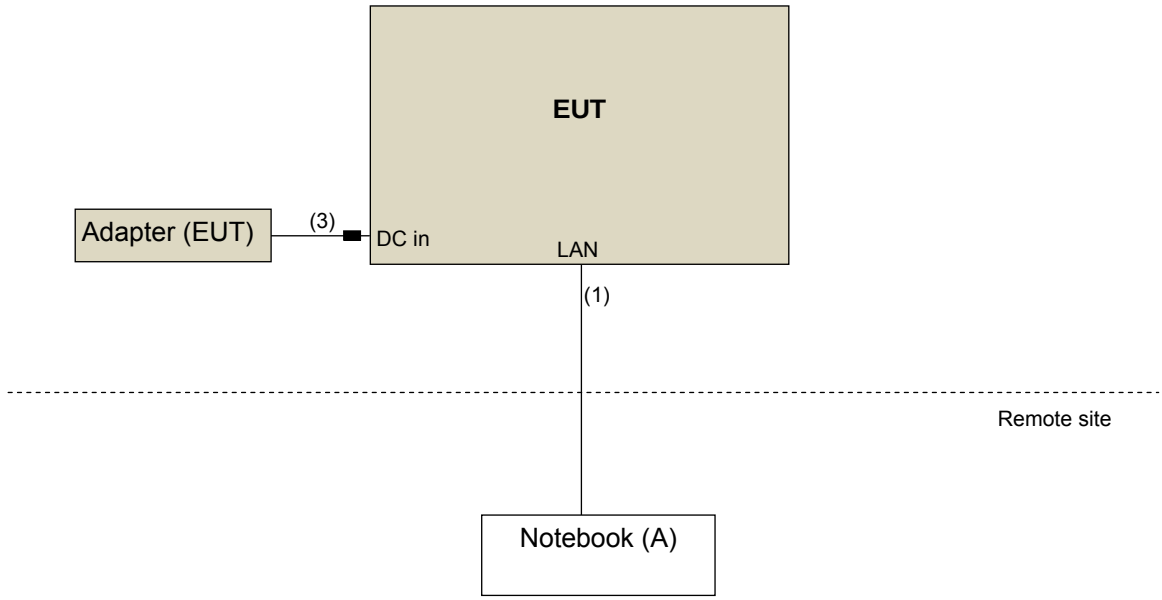
Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Items A acted as communication partners to transfer data.

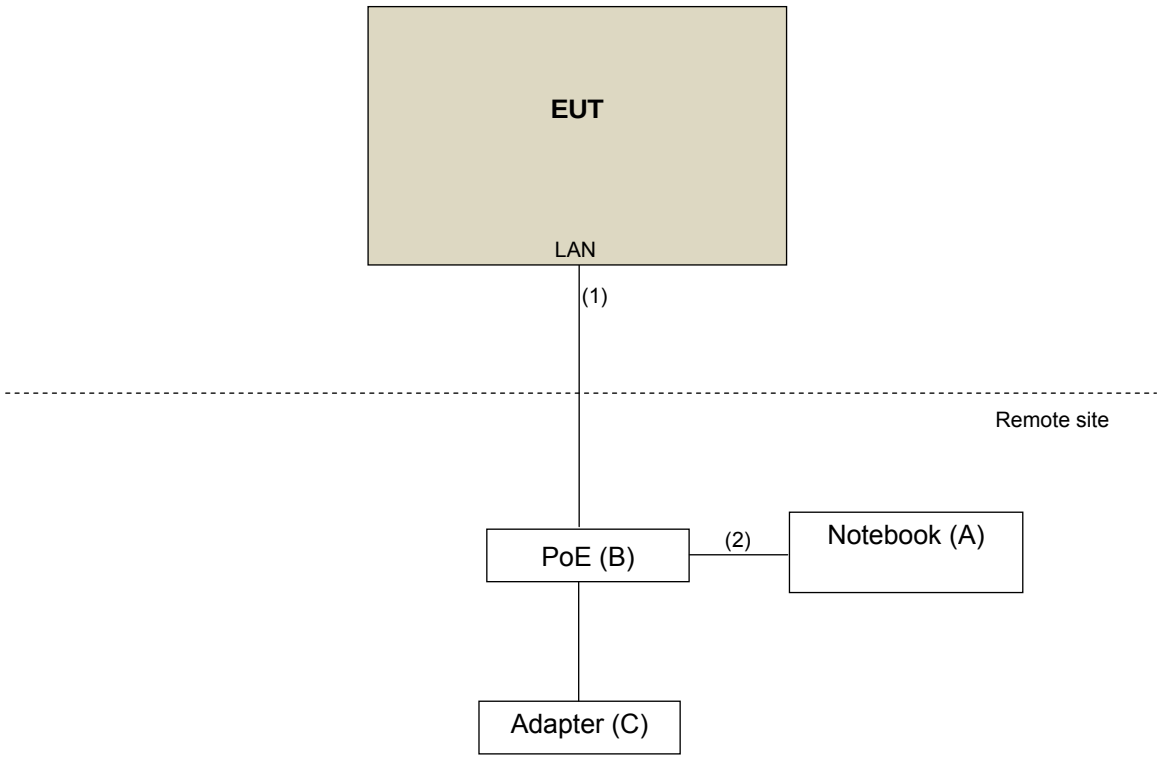
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN cable	1	10	N	0	Cat5e
2.	LAN cable	1	1.8	N	0	Cat5e

3.4.1 Configuration of System under Test

<Adapter Mode>



<PoE Mode>



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 v03r04

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

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.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Sep. 09, 2013	Sep. 08, 2014
Spectrum Analyzer ROHDE & SCHWARZ	FSU 43	100115	Dec. 18, 2013	Dec. 17, 2014
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	148	Jul. 15, 2013	Jul. 14, 2014
Preamplifier Agilent	8449B	3008A01961	Oct. 28, 2013	Oct. 27, 2014
Preamplifier Agilent	8447D	2944A10738	Oct. 18, 2013	Oct. 17, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309220/4	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250724/4	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Aug. 26, 2013	Aug. 25, 2014
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	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
High Speed Peak Power Meter	ML2495A	0824011	Jul. 29, 2013	Jul. 28, 2014
Power Sensor	MA2411B	0738171	Jul. 29, 2013	Jul. 28, 2014

Note:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 4.
3. The horn antenna and 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 3 meter chamber room for test. 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 height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

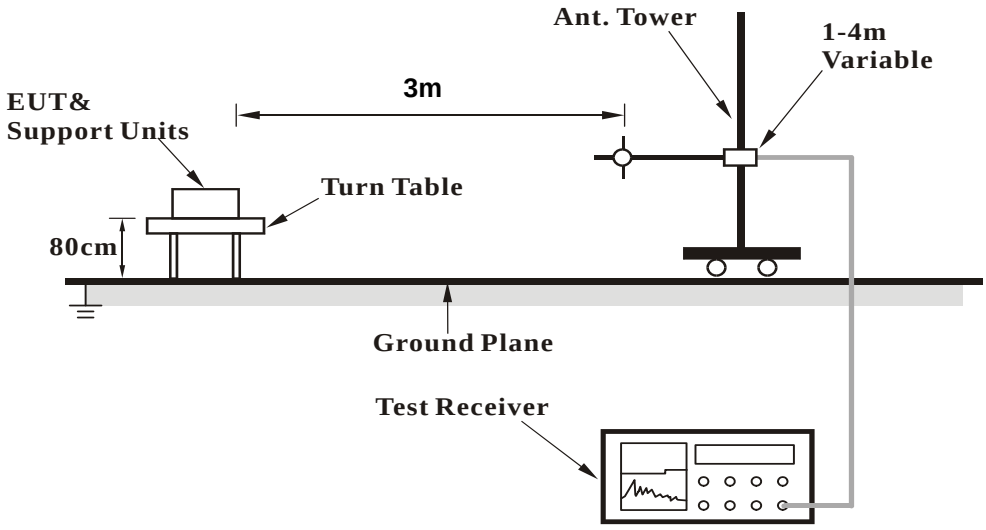
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (10 log(1/duty cycle)).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

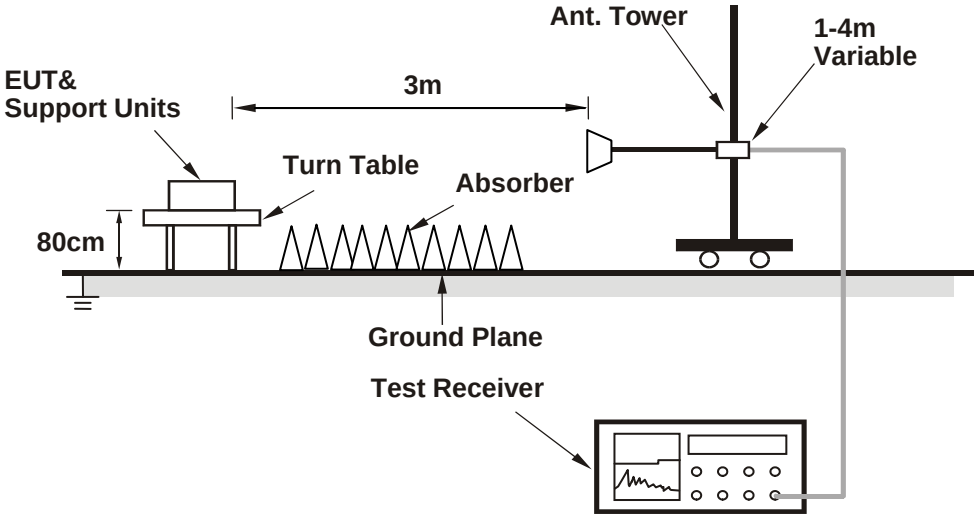
No deviation.

4.1.5 Test Set Up

<Frequency Range below 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 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".

4.1.7 Test Results

Above 1GHz worst-case 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	60.2 PK	74.0	-13.8	1.00 H	329	29.20	31.00
2	2390.00	52.2 AV	54.0	-1.8	1.00 H	329	21.20	31.00
3	*2412.00	119.2 PK			1.00 H	39	88.10	31.10
4	*2412.00	115.5 AV			1.00 H	39	84.40	31.10
5	4824.00	48.0 PK	74.0	-26.0	1.01 H	196	43.10	4.90
6	4824.00	39.6 AV	54.0	-14.4	1.01 H	196	34.70	4.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.5 PK	74.0	-14.5	1.08 V	54	28.50	31.00
2	2390.00	51.6 AV	54.0	-2.4	1.08 V	54	20.60	31.00
3	*2412.00	117.4 PK			1.07 V	53	86.30	31.10
4	*2412.00	113.8 AV			1.07 V	53	82.70	31.10
5	4824.00	48.6 PK	74.0	-25.4	1.14 V	322	43.70	4.90
6	4824.00	41.4 AV	54.0	-12.6	1.14 V	322	36.50	4.90

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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	2390.00	61.3 PK	74.0	-12.7	1.26 H	305	30.30	31.00
2	2390.00	47.1 AV	54.0	-6.9	1.26 H	305	16.10	31.00
3	*2437.00	120.7 PK			1.05 H	345	89.50	31.20
4	*2437.00	117.0 AV			1.05 H	345	85.80	31.20
5	4874.00	49.0 PK	74.0	-25.0	1.14 H	290	44.00	5.00
6	4874.00	40.9 AV	54.0	-13.1	1.14 H	290	35.90	5.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	62.7 PK	74.0	-11.3	1.94 V	19	31.70	31.00
2	2390.00	46.0 AV	54.0	-8.0	1.94 V	19	15.00	31.00
3	*2437.00	121.0 PK			1.36 V	16	89.80	31.20
4	*2437.00	117.3 AV			1.36 V	16	86.10	31.20
5	4874.00	49.4 PK	74.0	-24.6	1.12 V	341	44.40	5.00
6	4874.00	42.4 AV	54.0	-11.6	1.12 V	341	37.40	5.00

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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	119.4 PK			1.93 H	58	88.10	31.30
2	*2462.00	116.0 AV			1.93 H	58	84.70	31.30
3	2483.50	64.0 PK	74.0	-10.0	1.00 H	330	32.60	31.40
4	2483.50	52.6 AV	54.0	-1.4	1.00 H	330	21.20	31.40
5	4924.00	48.1 PK	74.0	-25.9	1.20 H	326	42.90	5.20
6	4924.00	37.3 AV	54.0	-16.7	1.20 H	326	32.10	5.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	113.3 PK			1.54 V	36	82.00	31.30
2	*2462.00	110.0 AV			1.54 V	36	78.70	31.30
3	2483.50	59.6 PK	74.0	-14.4	1.06 V	55	28.20	31.40
4	2483.50	52.0 AV	54.0	-2.0	1.06 V	55	20.60	31.40
5	4924.00	48.3 PK	74.0	-25.7	1.00 V	189	43.10	5.20
6	4924.00	39.6 AV	54.0	-14.4	1.00 V	189	34.40	5.20

Remarks:

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

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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	72.5 PK	74.0	-1.5	1.94 H	324	41.50	31.00
2	2390.00	52.5 AV	54.0	-1.5	1.94 H	324	21.50	31.00
3	*2412.00	117.2 PK			1.01 H	323	86.10	31.10
4	*2412.00	107.3 AV			1.01 H	323	76.20	31.10
5	4824.00	46.5 PK	74.0	-27.5	1.15 H	96	41.60	4.90
6	4824.00	33.3 AV	54.0	-20.7	1.15 H	96	28.40	4.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.8 PK	74.0	-7.2	1.32 V	12	35.80	31.00
2	2390.00	51.5 AV	54.0	-2.5	1.32 V	12	20.50	31.00
3	*2412.00	113.3 PK			1.62 V	18	82.20	31.10
4	*2412.00	104.7 AV			1.62 V	18	73.60	31.10
5	4824.00	45.5 PK	74.0	-28.5	1.15 V	96	40.60	4.90
6	4824.00	33.3 AV	54.0	-20.7	1.15 V	96	28.40	4.90

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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	2390.00	71.7 PK	74.0	-2.3	1.03 H	318	40.70	31.00
2	2390.00	51.5 AV	54.0	-2.5	1.03 H	318	20.50	31.00
3	*2437.00	120.1 PK			1.00 H	319	88.90	31.20
4	*2437.00	110.5 AV			1.00 H	319	79.30	31.20
5	2483.50	69.8 PK	74.0	-4.2	1.02 H	338	38.40	31.40
6	2483.50	52.9 AV	54.0	-1.1	1.02 H	338	21.50	31.40
7	4874.00	47.8 PK	74.0	-26.2	1.20 H	139	42.80	5.00
8	4874.00	34.3 AV	54.0	-19.7	1.20 H	139	29.30	5.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.9 PK	74.0	-5.1	1.11 V	19	37.90	31.00
2	2390.00	49.7 AV	54.0	-4.3	1.11 V	19	18.70	31.00
3	*2437.00	119.9 PK			1.33 V	20	88.70	31.20
4	*2437.00	110.5 AV			1.33 V	20	79.30	31.20
5	2483.50	70.9 PK	74.0	-3.1	1.08 V	35	39.50	31.40
6	2483.50	51.7 AV	54.0	-2.3	1.08 V	35	20.30	31.40
7	4874.00	47.5 PK	74.0	-26.5	1.10 V	339	42.50	5.00
8	4874.00	33.9 AV	54.0	-20.1	1.10 V	339	28.90	5.00

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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	115.9 PK			1.02 H	333	84.60	31.30
2	*2462.00	105.6 AV			1.02 H	333	74.30	31.30
3	2483.50	72.4 PK	74.0	-1.6	1.00 H	332	41.00	31.40
4	2483.50	51.6 AV	54.0	-2.4	1.00 H	332	20.20	31.40
5	4874.00	48.0 PK	74.0	-26.0	1.10 H	255	43.00	5.00
6	4874.00	34.4 AV	54.0	-19.6	1.10 H	255	29.40	5.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	113.3 PK			1.05 V	54	82.00	31.30
2	*2462.00	103.6 AV			1.05 V	54	72.30	31.30
3	2483.50	66.9 PK	74.0	-7.1	1.53 V	19	35.50	31.40
4	2483.50	48.7 AV	54.0	-5.3	1.53 V	19	17.30	31.40
5	4874.00	47.1 PK	74.0	-26.9	1.00 V	302	42.10	5.00
6	4874.00	34.0 AV	54.0	-20.0	1.00 V	302	29.00	5.00

Remarks:

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

802.11n (HT20)

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	72.2 PK	74.0	-1.8	1.01 H	307	41.20	31.00
2	2390.00	52.4 AV	54.0	-1.6	1.01 H	307	21.40	31.00
3	*2412.00	115.8 PK			1.03 H	336	84.70	31.10
4	*2412.00	106.2 AV			1.03 H	336	75.10	31.10
5	4824.00	47.2 PK	74.0	-26.8	1.21 H	217	42.30	4.90
6	4824.00	34.5 AV	54.0	-19.5	1.21 H	217	29.60	4.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	70.0 PK	74.0	-4.0	1.45 V	23	39.00	31.00
2	2390.00	51.1 AV	54.0	-2.9	1.45 V	23	20.10	31.00
3	*2412.00	114.2 PK			1.38 V	7	83.10	31.10
4	*2412.00	104.3 AV			1.38 V	7	73.20	31.10
5	4824.00	46.6 PK	74.0	-27.4	1.01 V	110	41.70	4.90
6	4824.00	34.1 AV	54.0	-19.9	1.01 V	110	29.20	4.90

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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	2388.00	68.1 PK	74.0	-5.9	1.04 H	329	37.10	31.00
2	2388.00	50.0 AV	54.0	-4.0	1.04 H	329	19.00	31.00
3	*2437.00	120.0 PK			1.03 H	322	88.80	31.20
4	*2437.00	110.3 AV			1.03 H	322	79.10	31.20
5	2483.50	71.9 PK	74.0	-2.1	1.00 H	328	40.50	31.40
6	2483.50	52.8 AV	54.0	-1.2	1.00 H	328	21.40	31.40
7	4874.00	47.7 PK	74.0	-26.3	1.22 H	252	42.70	5.00
8	4874.00	34.4 AV	54.0	-19.6	1.22 H	252	29.40	5.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.5 PK	74.0	-9.5	1.12 V	11	33.50	31.00
2	2390.00	48.5 AV	54.0	-5.5	1.12 V	11	17.50	31.00
3	*2437.00	119.4 PK			1.12 V	28	88.20	31.20
4	*2437.00	110.1 AV			1.12 V	28	78.90	31.20
5	2483.50	65.0 PK	74.0	-9.0	1.09 V	33	33.60	31.40
6	2483.50	50.3 AV	54.0	-3.7	1.09 V	33	18.90	31.40
7	4874.00	47.3 PK	74.0	-26.7	1.02 V	352	42.30	5.00
8	4874.00	34.0 AV	54.0	-20.0	1.02 V	352	29.00	5.00

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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	115.5 PK			1.00 H	336	84.20	31.30
2	*2462.00	105.6 AV			1.00 H	336	74.30	31.30
3	2483.50	72.1 PK	74.0	-1.9	1.00 H	339	40.70	31.40
4	2483.50	51.7 AV	54.0	-2.3	1.00 H	339	20.30	31.40
5	4924.00	47.1 PK	74.0	-26.9	1.09 H	291	41.90	5.20
6	4924.00	34.7 AV	54.0	-19.3	1.09 H	291	29.50	5.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	113.6 PK			1.08 V	37	82.30	31.30
2	*2462.00	103.6 AV			1.08 V	37	72.30	31.30
3	**2483.50**	**73.0 PK**	**74.0**	**-1.0**	**1.15 V**	**44**	**41.60**	**31.40**
4	2483.50	51.7 AV	54.0	-2.3	1.15 V	44	20.30	31.40
5	4924.00	46.7 PK	74.0	-27.3	1.00 V	201	41.50	5.20
6	4924.00	33.9 AV	54.0	-20.1	1.00 V	201	28.70	5.20

Remarks:

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

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CHANNEL	TX Channel 3	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	68.7 PK	74.0	-5.3	1.02 H	328	37.70	31.00
2	2390.00	52.6 AV	54.0	-1.4	1.02 H	328	21.60	31.00
3	*2422.00	108.8 PK			1.01 H	339	77.60	31.20
4	*2422.00	99.5 AV			1.01 H	339	68.30	31.20
5	4844.00	47.0 PK	74.0	-27.0	1.11 H	283	42.00	5.00
6	4844.00	33.4 AV	54.0	-20.6	1.11 H	283	28.40	5.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.0 PK	74.0	-7.0	1.10 V	27	36.00	31.00
2	2390.00	48.7 AV	54.0	-5.3	1.10 V	27	17.70	31.00
3	*2422.00	108.3 PK			1.34 V	33	77.10	31.20
4	*2422.00	98.5 AV			1.34 V	33	67.30	31.20
5	4844.00	46.7 PK	74.0	-27.3	1.01 V	303	41.70	5.00
6	4844.00	33.2 AV	54.0	-20.8	1.01 V	303	28.20	5.00

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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	2390.00	68.2 PK	74.0	-5.8	1.00 H	301	37.20	31.00
2	2390.00	51.4 AV	54.0	-2.6	1.00 H	301	20.40	31.00
3	*2437.00	113.2 PK			1.01 H	332	82.00	31.20
4	*2437.00	103.7 AV			1.01 H	332	72.50	31.20
5	2483.50	72.4 PK	74.0	-1.6	1.00 H	331	41.00	31.40
6	2483.50	51.4 AV	54.0	-2.6	1.00 H	331	20.00	31.40
7	4874.00	46.9 PK	74.0	-27.1	1.10 H	17	41.90	5.00
8	4874.00	33.3 AV	54.0	-20.7	1.10 H	17	28.30	5.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.3 PK	74.0	-7.7	1.10 V	19	35.30	31.00
2	2390.00	47.8 AV	54.0	-6.2	1.10 V	19	16.80	31.00
3	*2437.00	110.0 PK			1.12 V	10	78.80	31.20
4	*2437.00	101.2 AV			1.12 V	10	70.00	31.20
5	2483.50	65.9 PK	74.0	-8.1	1.12 V	13	34.50	31.40
6	2483.50	50.3 AV	54.0	-3.7	1.12 V	13	18.90	31.40
7	4874.00	46.2 PK	74.0	-27.8	1.00 V	273	41.20	5.00
8	4874.00	33.0 AV	54.0	-21.0	1.00 V	273	28.00	5.00

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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) 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	*2452.00	110.8 PK			1.00 H	332	79.50	31.30
2	*2452.00	100.9 AV			1.00 H	332	69.60	31.30
3	2483.50	68.8 PK	74.0	-5.2	1.00 H	336	37.40	31.40
4	2483.50	52.6 AV	54.0	-1.4	1.00 H	336	21.20	31.40
5	4904.00	46.4 PK	74.0	-27.6	1.03 H	146	41.30	5.10
6	4904.00	33.1 AV	54.0	-20.9	1.03 H	146	28.00	5.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	108.0 PK			1.06 V	35	76.70	31.30
2	*2452.00	98.0 AV			1.06 V	35	66.70	31.30
3	2483.50	66.7 PK	74.0	-7.3	1.03 V	46	35.30	31.40
4	2483.50	50.4 AV	54.0	-3.6	1.03 V	46	19.00	31.40
5	4904.00	46.1 PK	74.0	-27.9	1.00 V	206	41.00	5.10
6	4904.00	32.9 AV	54.0	-21.1	1.00 V	206	27.80	5.10

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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: 802.11g

CHANNEL	TX Channel 6	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	97.95	32.9 QP	43.5	-10.6	1.25 H	149	51.90	-19.00
2	148.50	36.2 QP	43.5	-7.3	1.00 H	277	50.10	-13.90
3	391.54	38.6 QP	46.0	-7.4	1.50 H	277	49.10	-10.50
4	718.18	38.0 QP	46.0	-8.0	1.00 H	340	42.00	-4.00
5	762.90	38.1 QP	46.0	-7.9	1.50 H	163	40.80	-2.70
6	900.94	38.8 QP	46.0	-7.2	1.50 H	240	39.20	-0.40
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	146.56	33.9 QP	43.5	-9.6	1.00 V	349	47.90	-14.00
2	385.70	41.5 QP	46.0	-4.5	1.49 V	295	52.00	-10.50
3	572.36	34.3 QP	46.0	-11.7	1.25 V	312	41.40	-7.10
4	663.74	37.8 QP	46.0	-8.2	1.49 V	149	42.90	-5.10
5	708.46	43.1 QP	46.0	-2.9	1.25 V	159	47.40	-4.30
6	745.40	41.5 QP	46.0	-4.5	1.50 V	328	44.90	-3.40

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

CHANNEL	TX Channel 6	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	57.12	29.2 QP	40.0	-10.8	1.50 H	16	43.80	-14.60
2	249.60	28.9 QP	46.0	-17.1	1.00 H	239	43.10	-14.20
3	374.04	30.4 QP	46.0	-15.6	1.00 H	162	41.10	-10.70
4	624.85	31.7 QP	46.0	-14.3	1.50 H	210	37.20	-5.50
5	751.23	32.2 QP	46.0	-13.8	1.00 H	11	35.20	-3.00
6	902.89	41.0 QP	46.0	-5.0	2.00 H	182	41.40	-0.40
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	57.12	29.4 QP	40.0	-10.6	1.50 V	288	44.00	-14.60
2	150.45	27.8 QP	43.5	-15.7	1.00 V	267	41.60	-13.80
3	374.04	27.5 QP	46.0	-18.5	1.25 V	47	38.20	-10.70
4	500.42	27.0 QP	46.0	-19.0	1.25 V	5	35.30	-8.30
5	624.85	30.1 QP	46.0	-15.9	1.99 V	96	35.60	-5.50
6	760.95	29.1 QP	46.0	-16.9	1.25 V	109	31.80	-2.70

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	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.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Nov. 17, 2013	Nov. 16, 2014
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 27, 2013	Dec. 26, 2014
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Dec. 23, 2013	Dec. 22, 2014
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 08, 2013	Jul. 07, 2014
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

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

4.2.3 Test Procedures

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.

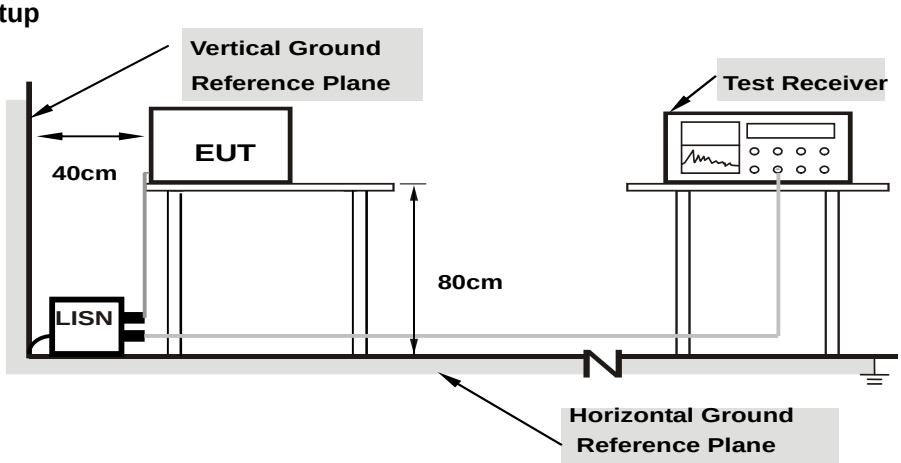
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

Note: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

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

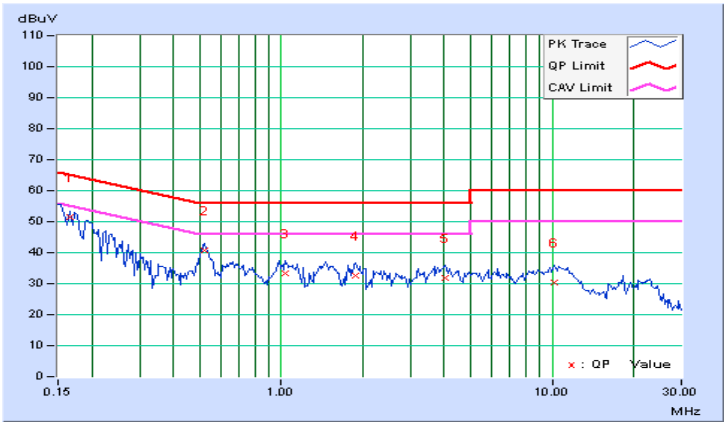
Worst-case data: 802.11g

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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	0.16562	0.22	51.27	33.63	51.49	33.85	65.18	55.18	-13.68	-21.32
2	0.52109	0.24	40.55	33.60	40.79	33.84	56.00	46.00	-15.21	-12.16
3	1.03906	0.30	33.05	26.87	33.35	27.17	56.00	46.00	-22.65	-18.83
4	1.88672	0.36	32.22	26.91	32.58	27.27	56.00	46.00	-23.42	-18.73
5	4.01172	0.44	31.38	25.24	31.82	25.68	56.00	46.00	-24.18	-20.32
6	10.25000	0.51	29.98	23.84	30.49	24.35	60.00	50.00	-29.51	-25.65

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.

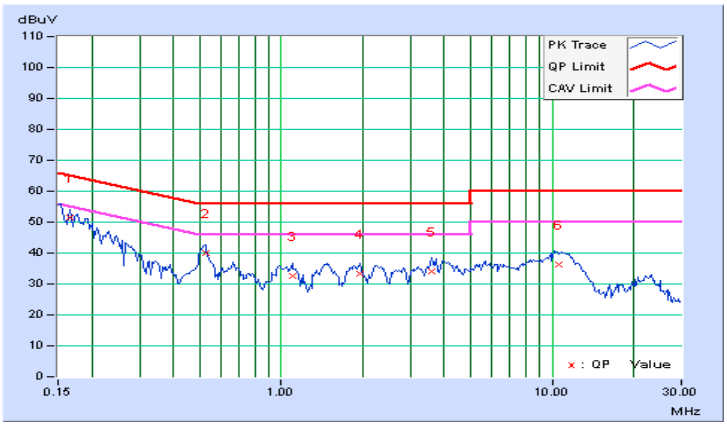


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

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	0.16562	0.23	51.21	34.02	51.44	34.25	65.18	55.18	-13.74	-20.93
2	0.52500	0.30	39.75	32.26	40.05	32.56	56.00	46.00	-15.95	-13.44
3	1.10547	0.30	32.33	26.22	32.63	26.52	56.00	46.00	-23.37	-19.48
4	1.95313	0.39	32.91	25.85	33.30	26.24	56.00	46.00	-22.70	-19.76
5	3.60156	0.47	33.64	27.55	34.11	28.02	56.00	46.00	-21.89	-17.98
6	10.52734	0.59	35.86	31.21	36.45	31.80	60.00	50.00	-23.55	-18.20

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.

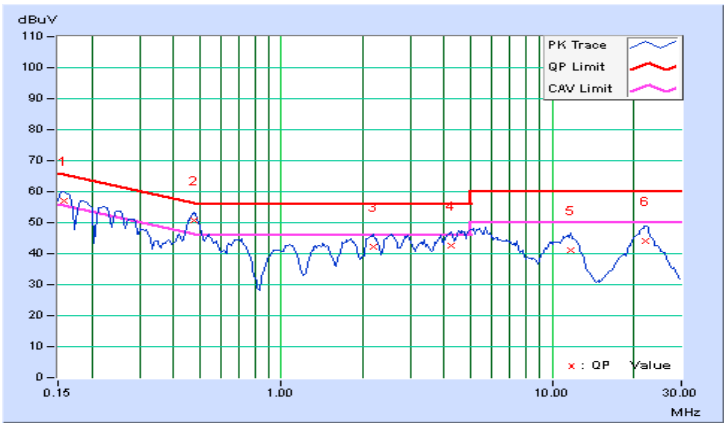


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

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	0.15781	0.22	56.97	48.84	57.19	49.06	65.58	55.58	-8.39	-6.52
2	**0.47422**	**0.23**	**50.63**	**44.20**	**50.86**	**44.43**	**56.44**	**46.44**	**-5.58**	**-2.01**
3	2.19531	0.38	41.94	37.59	42.32	37.97	56.00	46.00	-13.68	-8.03
4	4.24609	0.44	42.14	36.35	42.58	36.79	56.00	46.00	-13.42	-9.21
5	11.74609	0.54	40.43	36.00	40.97	36.54	60.00	50.00	-19.03	-13.46
6	22.13281	0.67	43.30	38.74	43.97	39.41	60.00	50.00	-16.03	-10.59

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.

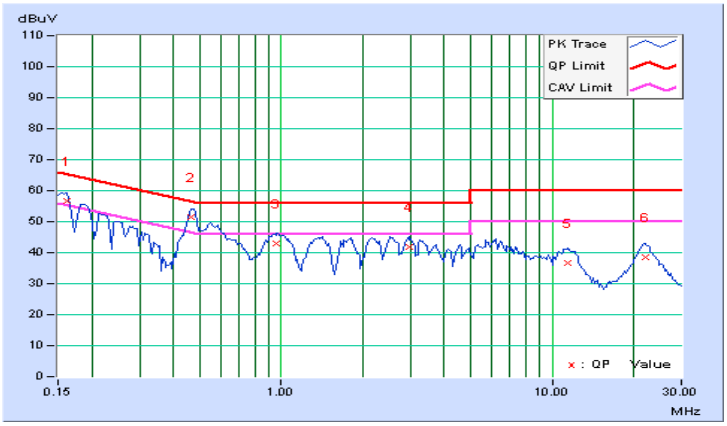


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

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	0.16172	0.23	56.27	47.87	56.50	48.10	65.38	55.38	-8.88	-7.28
2	0.46641	0.30	51.23	43.70	51.53	44.00	56.58	46.58	-5.05	-2.58
3	0.95469	0.29	42.72	37.85	43.01	38.14	56.00	46.00	-12.99	-7.86
4	2.95313	0.44	41.29	37.18	41.73	37.62	56.00	46.00	-14.27	-8.38
5	11.35156	0.60	36.23	31.11	36.83	31.71	60.00	50.00	-23.17	-18.29
6	22.03906	0.77	37.74	33.30	38.51	34.07	60.00	50.00	-21.49	-15.93

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.

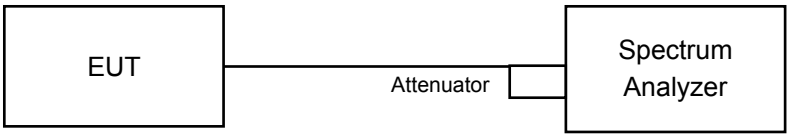


4.3 6dB Bandwidth Measurement

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 fromTest 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 Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	7.59	7.12	7.09	0.5	Pass
6	2437	7.09	7.10	7.07	0.5	Pass
11	2462	7.11	7.09	7.01	0.5	Pass

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	16.46	16.49	16.42	0.5	Pass
6	2437	16.39	16.37	16.41	0.5	Pass
11	2462	16.39	16.40	16.41	0.5	Pass

802.11n (HT20)

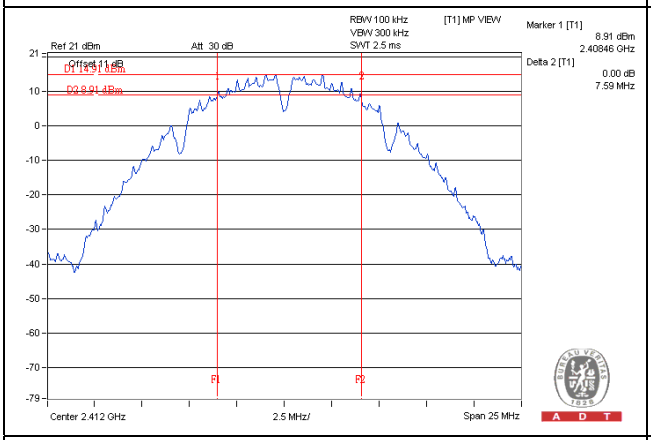
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	17.66	17.73	17.68	0.5	Pass
6	2437	17.60	17.36	17.60	0.5	Pass
11	2462	17.61	17.63	17.61	0.5	Pass

802.11n (HT40)

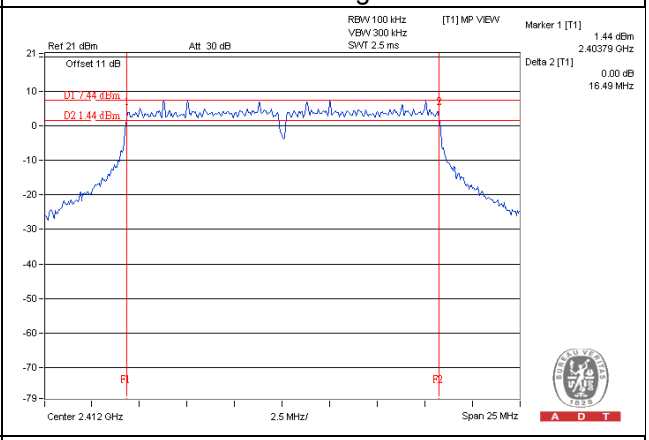
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
3	2422	36.14	36.10	36.19	0.5	Pass
6	2437	36.13	36.44	36.41	0.5	Pass
9	2452	35.80	36.41	36.33	0.5	Pass

Spectrum Plot of Worst Value

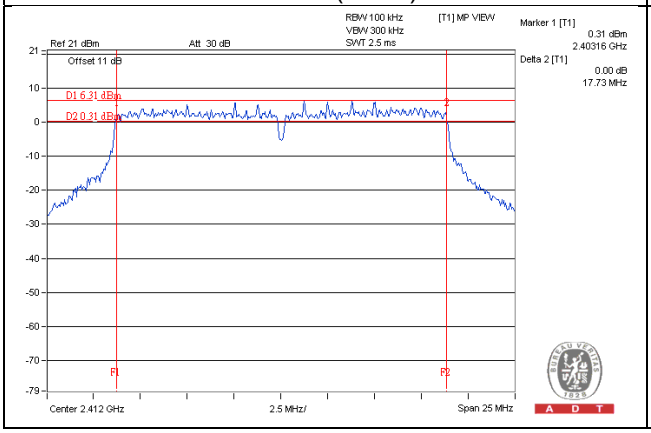
802.11b



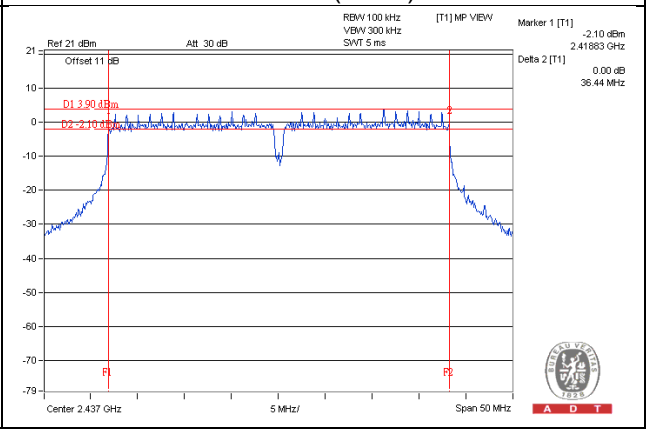
802.11g



802.11n (HT20)



802.11n (HT40)



4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

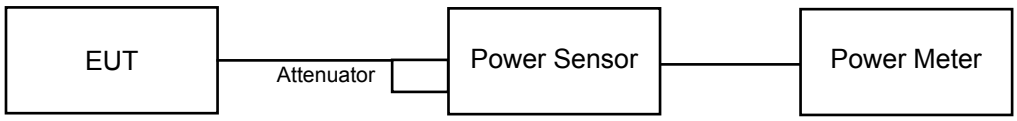
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

Per KDB 662911 D01 Multiple Transmitter Output 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 power level.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

802.11b

Channel	Frequency (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	23.57	22.93	23.44	644.646	28.09	30	Pass
6	2437	23.81	24.37	23.52	738.868	28.69	30	Pass
11	2462	23.04	24.76	23.79	**739.930**	28.69	30	Pass

802.11g

Channel	Frequency (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	18.80	19.33	18.90	239.187	23.79	30	Pass
6	2437	23.29	23.60	23.17	649.882	28.13	30	Pass
11	2462	16.65	16.88	16.72	141.980	21.52	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	17.64	18.18	17.94	186.072	22.70	30	Pass
6	2437	23.19	23.51	22.91	628.271	27.98	30	Pass
11	2462	16.71	17.12	16.70	145.178	21.62	30	Pass

802.11n (HT40)

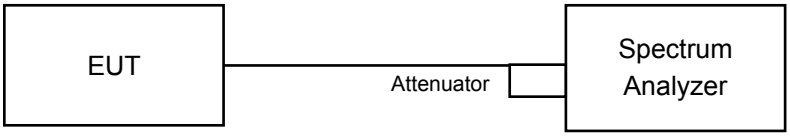
Channel	Frequency (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
3	2422	14.51	15.07	14.26	87.055	19.40	30	Pass
6	2437	17.06	17.08	16.90	150.844	21.79	30	Pass
9	2452	13.94	14.14	13.66	73.943	18.69	30	Pass

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

For AVG. power (duty cycle ≥ 98%)
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.

For AVG. power (duty cycle < 98%)
a) Measure the duty cycle (x).
b) Set instrument center frequency to DTS channel center frequency.
c) Set span to at least 1.5 times the OBW.
d) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz..
e) Set VBW ≥3 x RBW.
f) Detector = power averaging (RMS) or sample detector (when RMS not available).
g) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
h) Sweep time = auto couple.
i) Do not use sweep triggering. Allow sweep to “free run”.
j) Employ trace averaging (RMS) mode over a minimum of 100 traces.
k) Use the peak marker function to determine the maximum amplitude level.
l) Add 10 log (1/x), where x is the duty cycle measured in step (a, to the measured PSD to compute the average PSD during the actual transmission time.

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	Frequency (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass / Fail
0	1	2412	-6.17	4.77	-1.40	5.23	Pass
	6	2437	-6.07	4.77	-1.30	5.23	Pass
	11	2462	-7.11	4.77	-2.34	5.23	Pass
1	1	2412	-6.87	4.77	-2.10	5.23	Pass
	6	2437	-5.60	4.77	-0.83	5.23	Pass
	11	2462	-5.21	4.77	-0.44	5.23	Pass
2	1	2412	-5.53	4.77	-0.76	5.23	Pass
	6	2437	-6.47	4.77	-1.70	5.23	Pass
	11	2462	-5.16	4.77	-0.39	5.23	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 = 4dBi + 10log(3) = 8.77dBi > 6dBi , so the power density limit shall be reduced to 8-(8.77-6) = 5.23dBm.

802.11g

TX chain	Channel	Frequency (MHz)	PSD (dBm)	10 log (N=3) dB	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	Pass / Fail
0	1	2412	-14.11	4.77	0.13	-9.21	5.23	Pass
	6	2437	-9.97	4.77	0.13	-5.07	5.23	Pass
	11	2462	-16.65	4.77	0.13	-11.75	5.23	Pass
1	1	2412	-13.51	4.77	0.13	-8.61	5.23	Pass
	6	2437	-9.22	4.77	0.13	-4.32	5.23	Pass
	11	2462	-15.25	4.77	0.13	-10.35	5.23	Pass
2	1	2412	-13.84	4.77	0.13	-8.94	5.23	Pass
	6	2437	-10.46	4.77	0.13	-5.56	5.23	Pass
	11	2462	-16.69	4.77	0.13	-11.79	5.23	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 = 4dBi + 10log(3) = 8.77dBi > 6dBi , so the power density limit shall be reduced to 8-(8.77-6) = 5.23dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

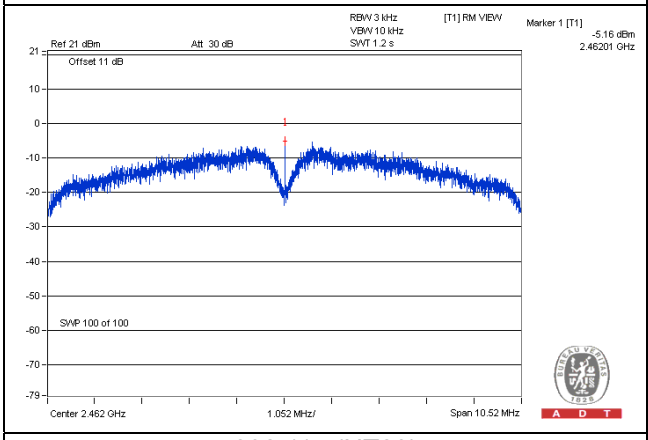
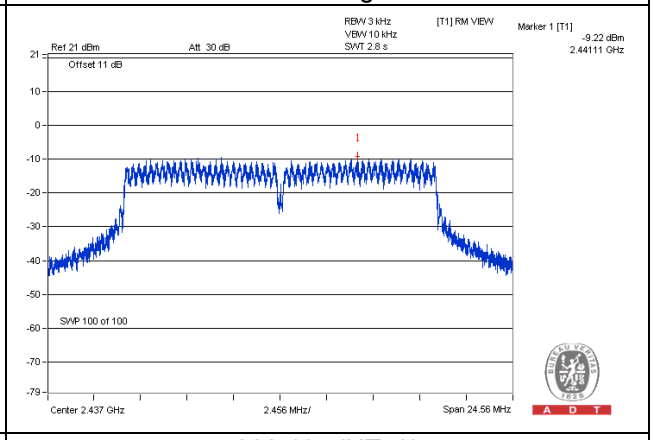
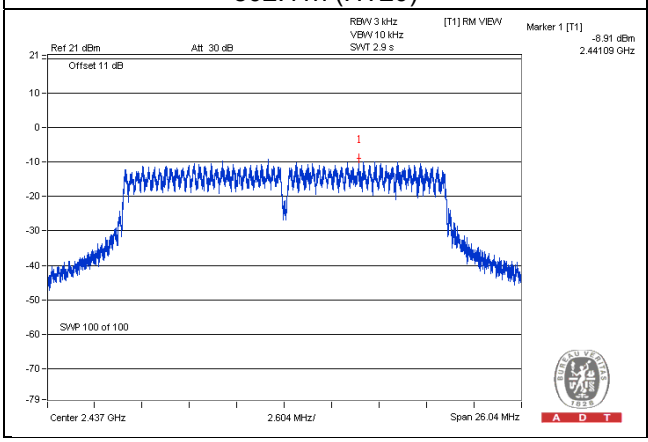
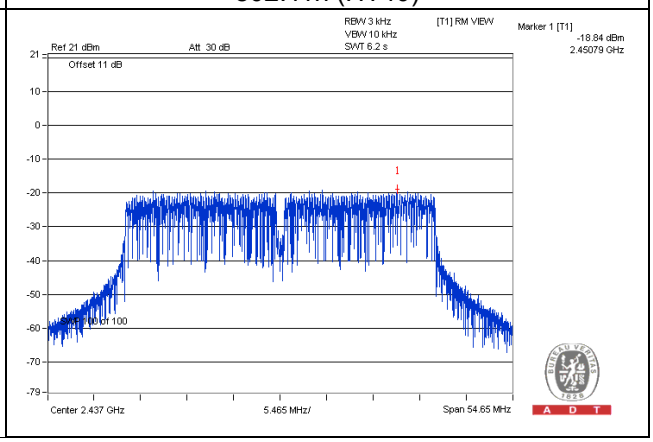
TX chain	Channel	Frequency (MHz)	PSD (dBm)	10 log (N=3) dB	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	Pass / Fail
0	1	2412	-10.80	4.77	0.11	-5.92	5.23	Pass
	6	2437	-10.20	4.77	0.11	-5.32	5.23	Pass
	11	2462	-14.03	4.77	0.11	-9.15	5.23	Pass
1	1	2412	-14.63	4.77	0.11	-9.75	5.23	Pass
	6	2437	-8.91	4.77	0.11	-4.03	5.23	Pass
	11	2462	-16.04	4.77	0.11	-11.16	5.23	Pass
2	1	2412	-15.19	4.77	0.11	-10.31	5.23	Pass
	6	2437	-10.56	4.77	0.11	-5.68	5.23	Pass
	11	2462	-17.03	4.77	0.11	-12.15	5.23	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 = 4dBi + 10log(3) = 8.77dBi > 6dBi , so the power density limit shall be reduced to 8-(8.77-6) = 5.23dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

TX chain	Channel	Frequency (MHz)	PSD (dBm)	10 log (N=3) dB	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	Pass / Fail
0	3	2422	-22.33	4.77	0.35	-17.21	5.23	Pass
	6	2437	-19.86	4.77	0.35	-14.74	5.23	Pass
	9	2452	-24.05	4.77	0.35	-18.93	5.23	Pass
1	3	2422	-21.32	4.77	0.35	-16.20	5.23	Pass
	6	2437	-18.84	4.77	0.35	-13.72	5.23	Pass
	9	2452	-22.45	4.77	0.35	-17.33	5.23	Pass
2	3	2422	-21.74	4.77	0.35	-16.62	5.23	Pass
	6	2437	-19.38	4.77	0.35	-14.26	5.23	Pass
	9	2452	-22.36	4.77	0.35	-17.24	5.23	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 = 4dBi + 10log(3) = 8.77dBi > 6dBi , so the power density limit shall be reduced to 8-(8.77-6) = 5.23dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

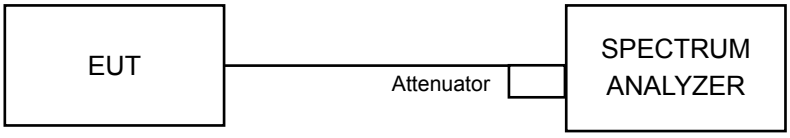
Spectrum Plot of Worst Value	
802.11b	802.11g
	
802.11n (HT20)	802.11n (HT40)
	

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

a. Set the RBW = 100 kHz.

b. Set the VBW ≥ 300 kHz.

c. Detector = average.

d. Sweep time = auto couple.

e. Trace mode = max hold.

f. Allow trace to fully stabilize.

g. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

a. Set RBW = 100 kHz.

b. Set VBW ≥ 300 kHz.

c. Ensure that the number of measurement points ≥ span/RBW

d. According to measurement points to set differ measurement span.

e. Detector = peak.

f. Trace Mode = max hold.

g. Sweep = auto couple.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

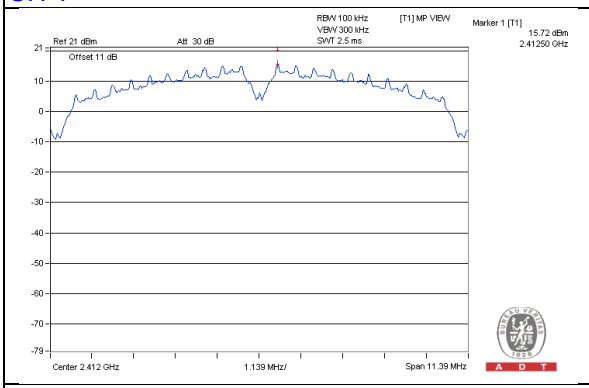
Same as Item 4.3.6

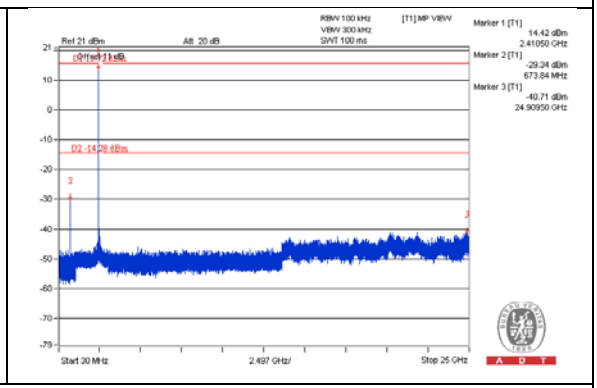
4.6.7 Test Results

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

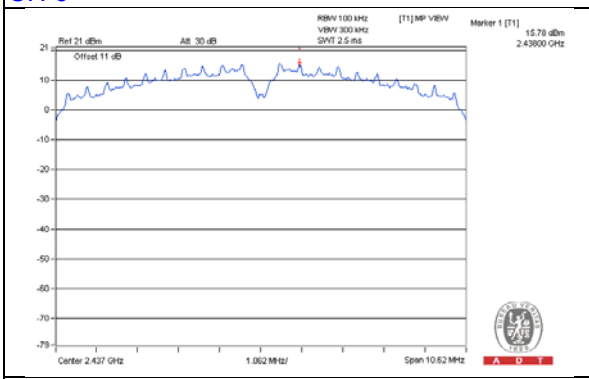
802.11b
CHAIN 0

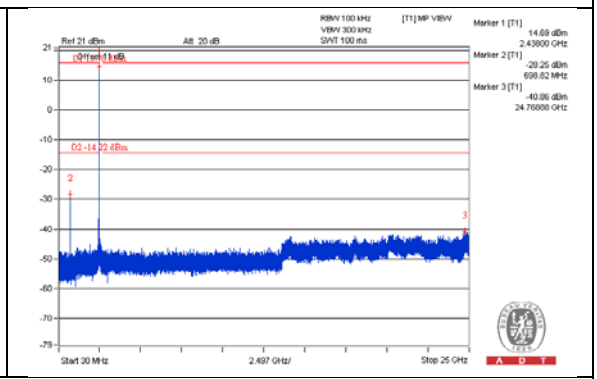
CH 1



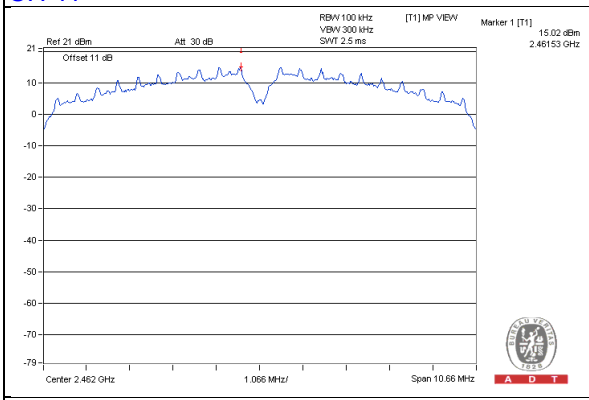


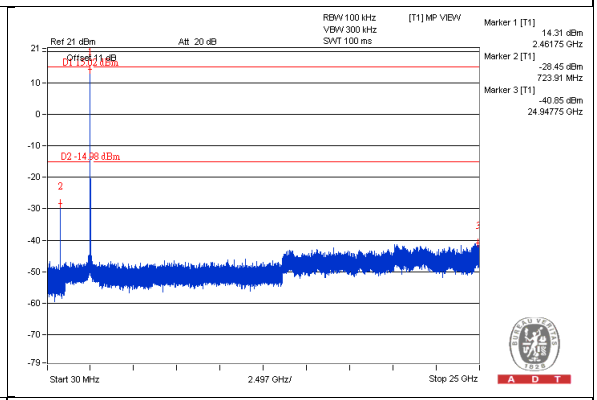
CH 6



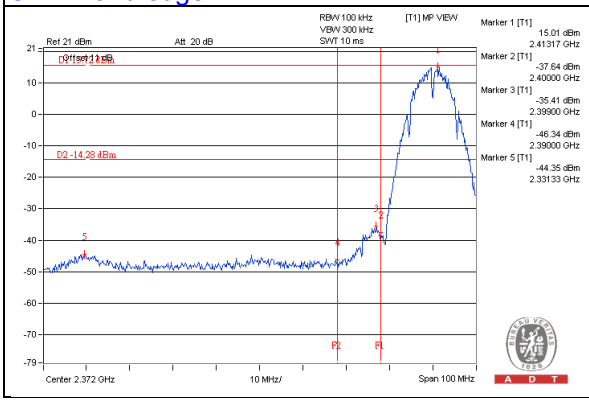


CH 11

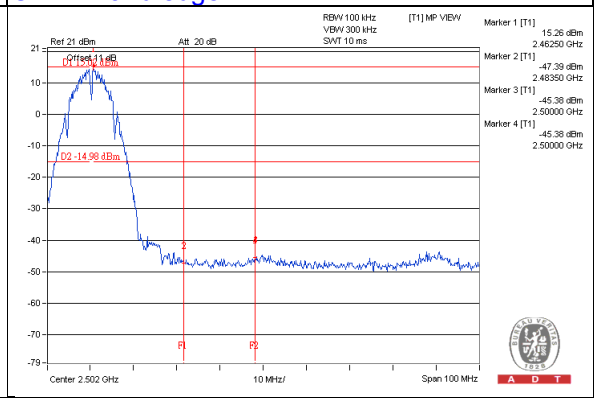




CH 1 Band edge

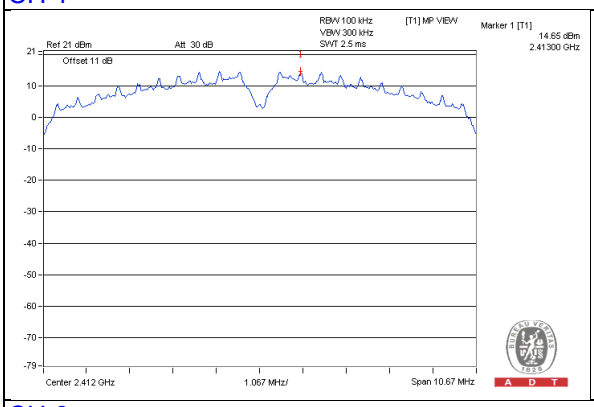


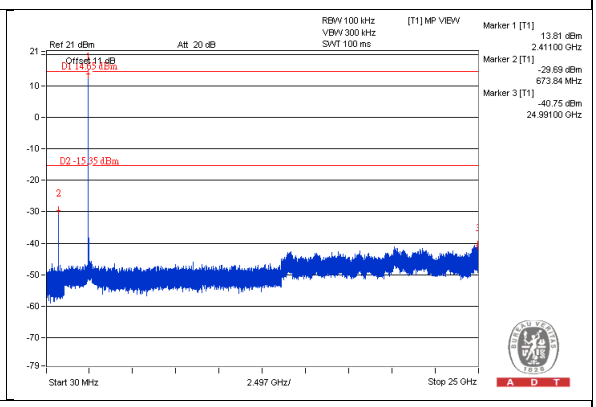
CH 11 Band edge



CHAIN 1

CH 1





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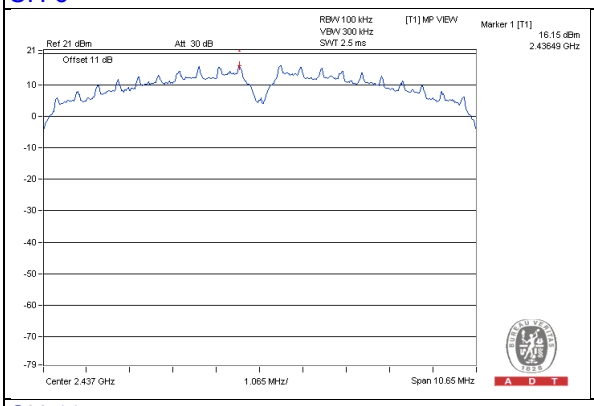
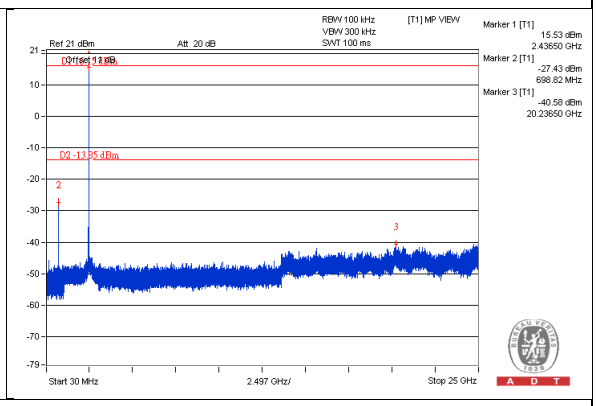
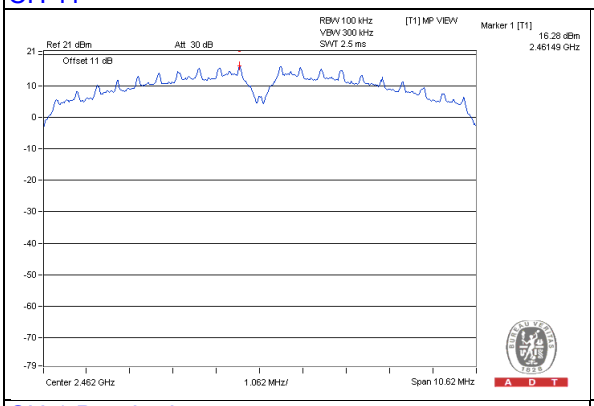
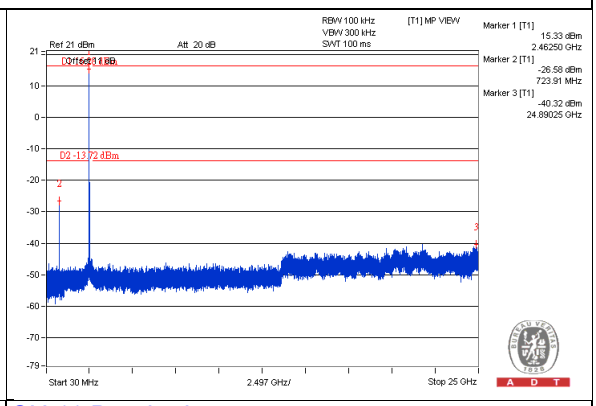


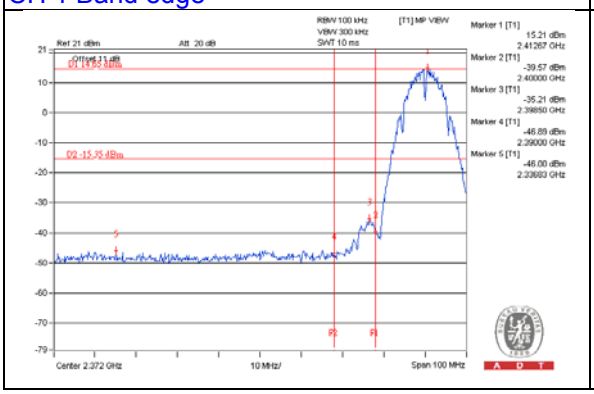


CH 11

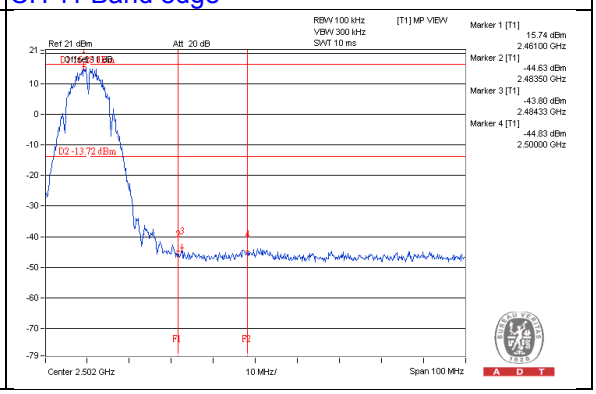




CH 1 Band edge

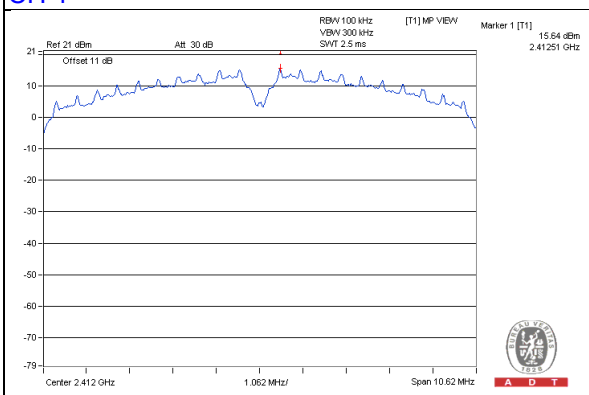


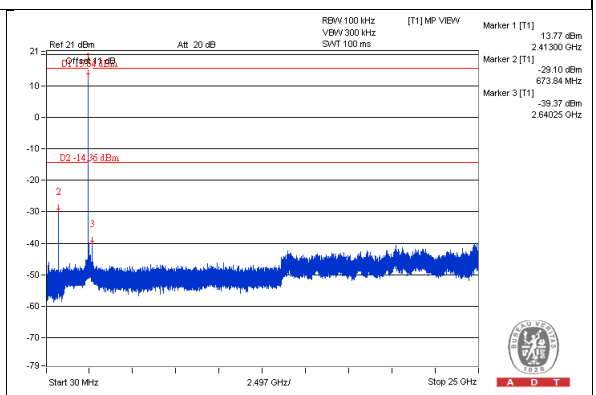
CH 11 Band edge



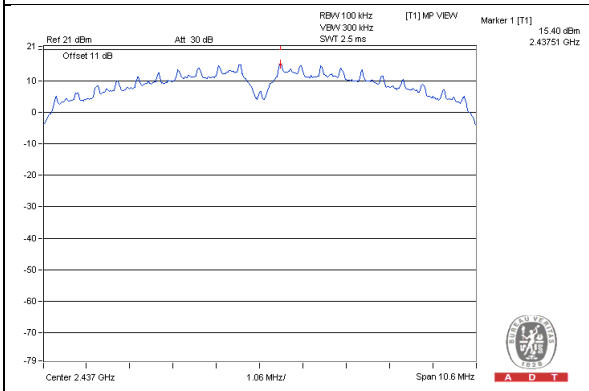
CHAIN 2

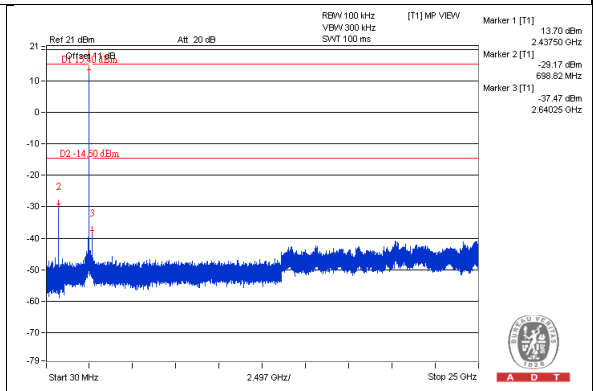
CH 1



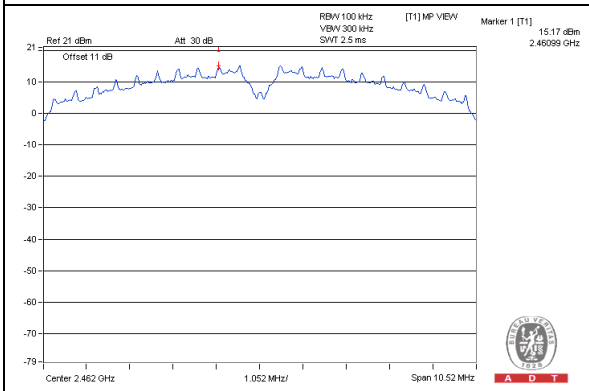


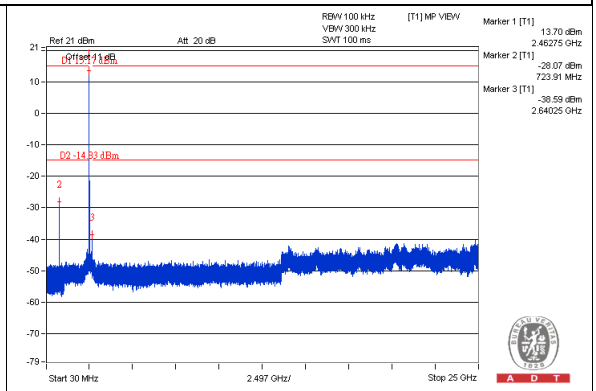
CH 6



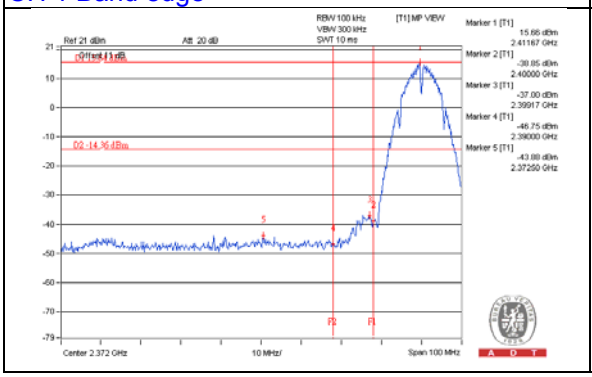


CH 11

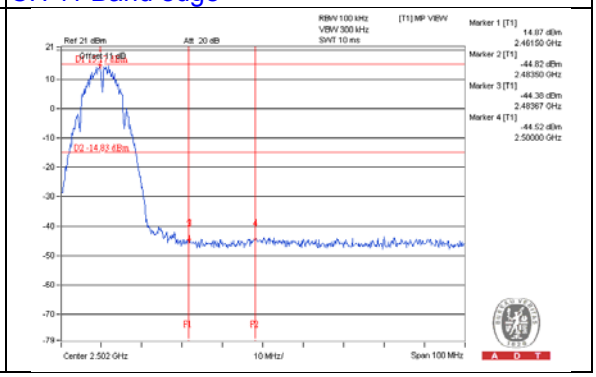




CH 1 Band edge



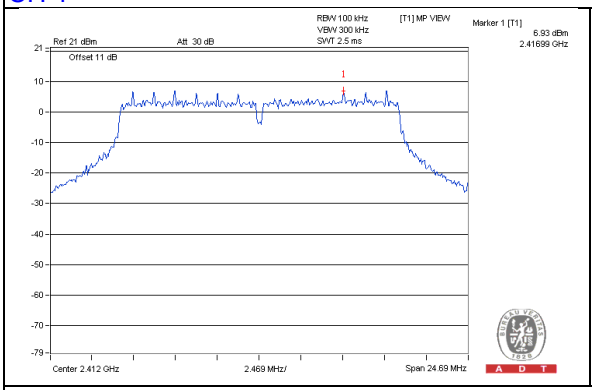
CH 11 Band edge

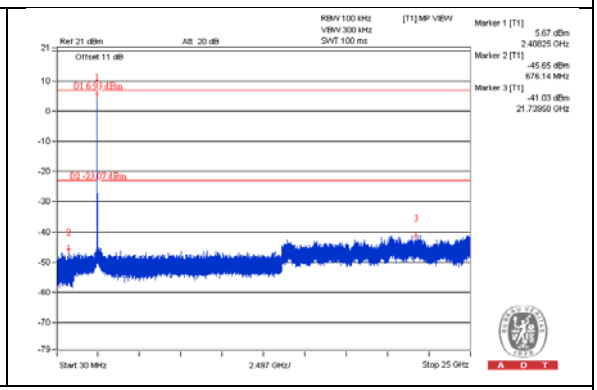


802.11g

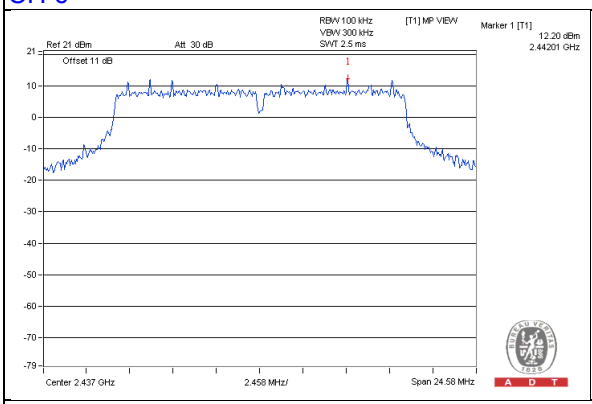
CHAIN 0

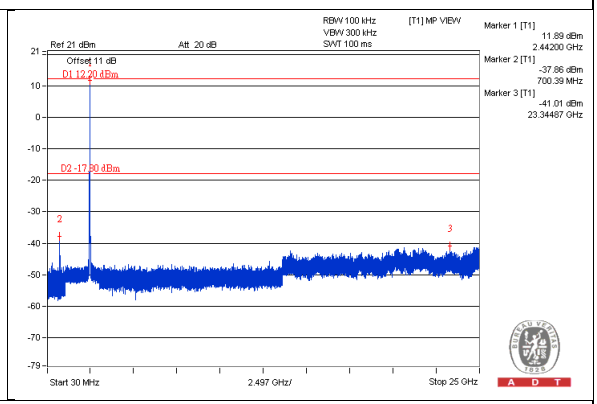
CH 1



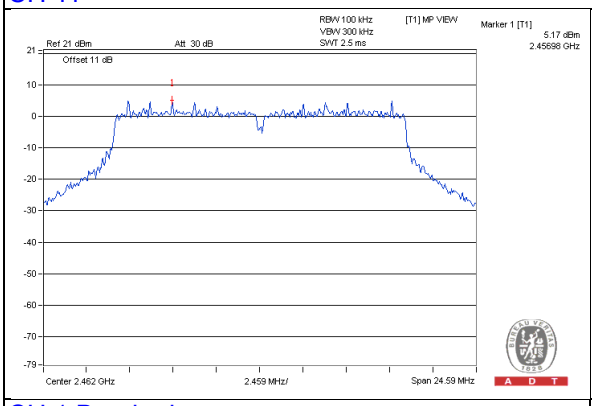


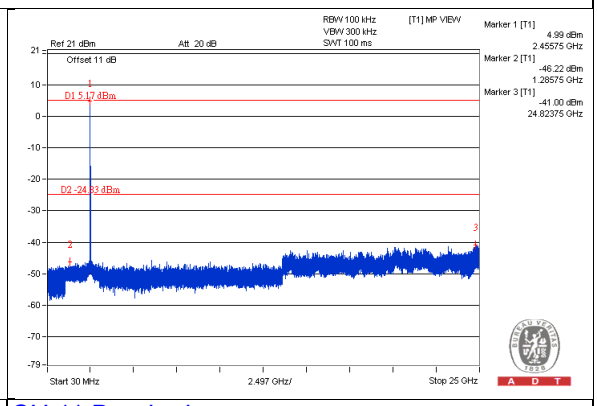
CH 6



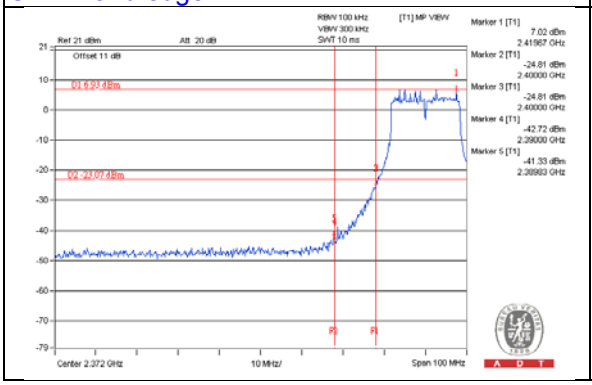


CH 11

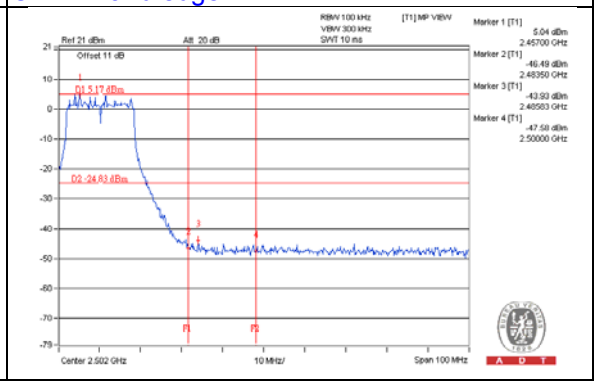




CH 1 Band edge

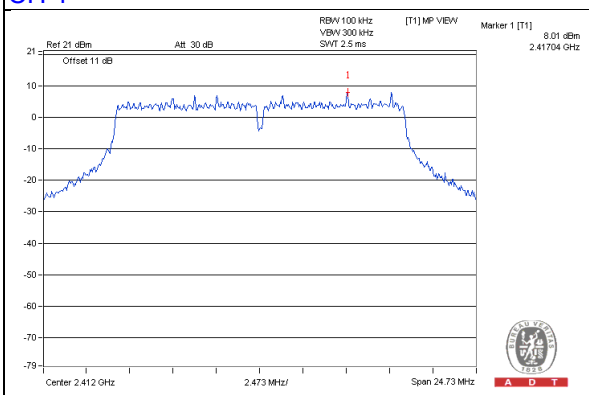


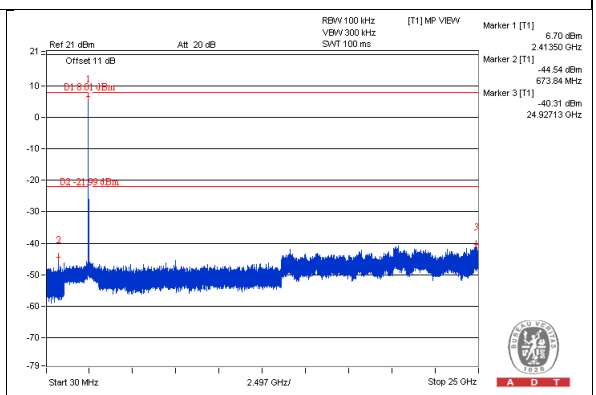
CH 11 Band edge



CHAIN 1

CH 1





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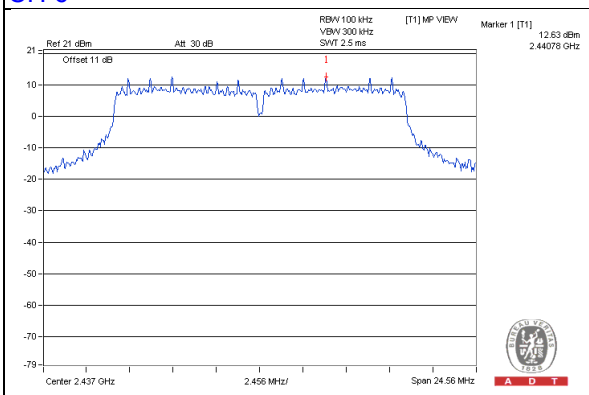

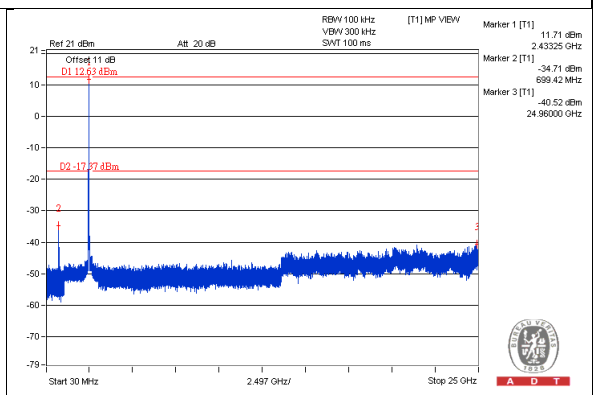

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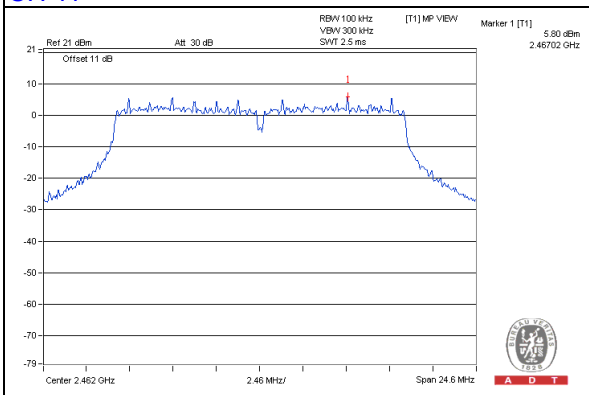

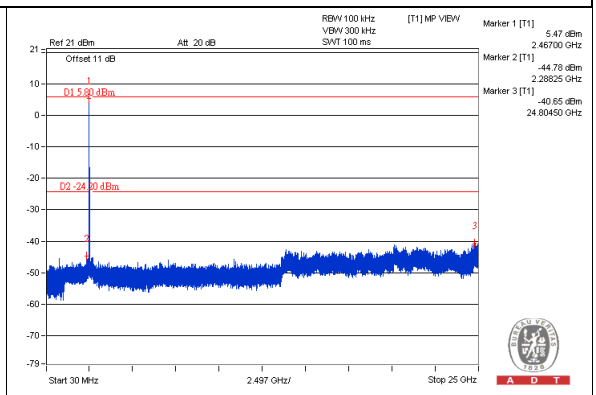

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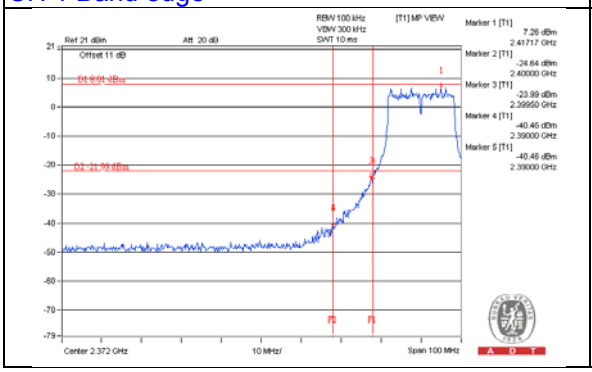

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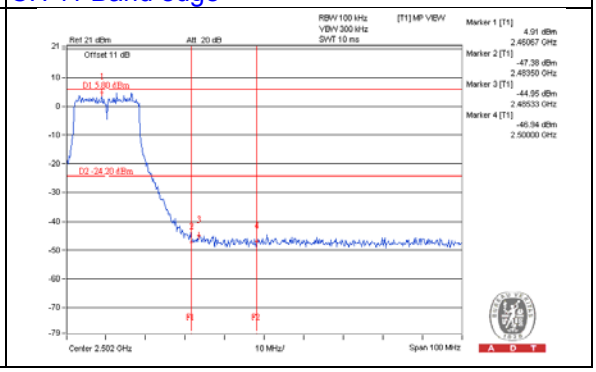

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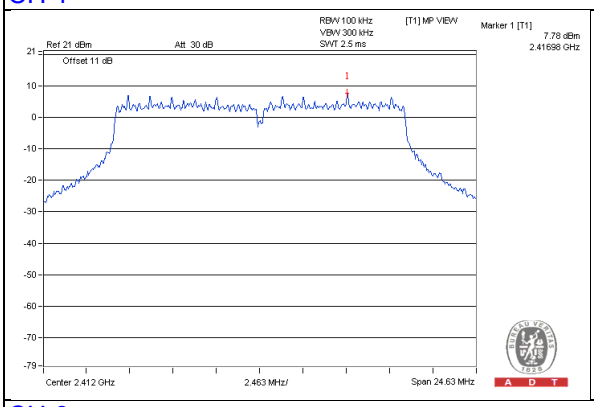

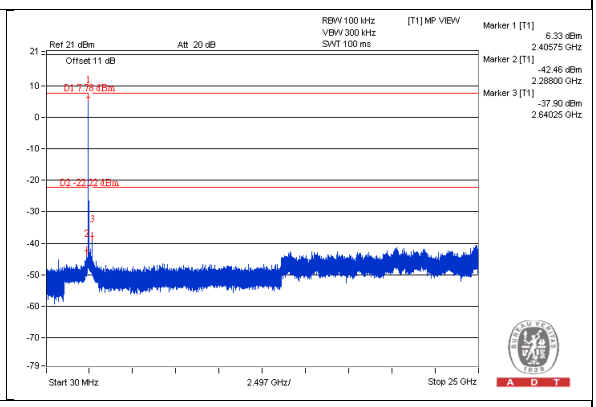

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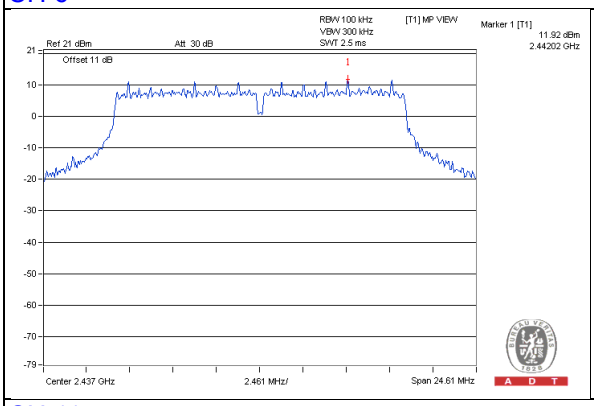

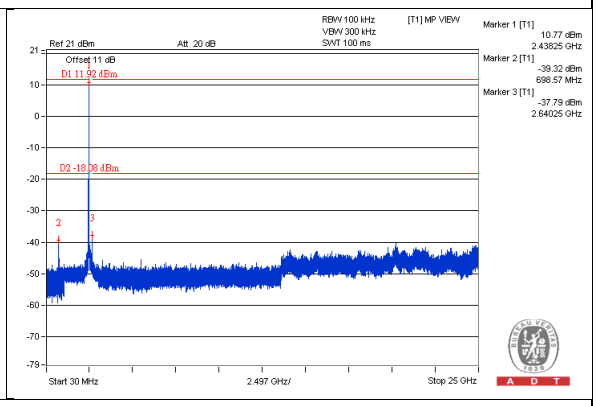

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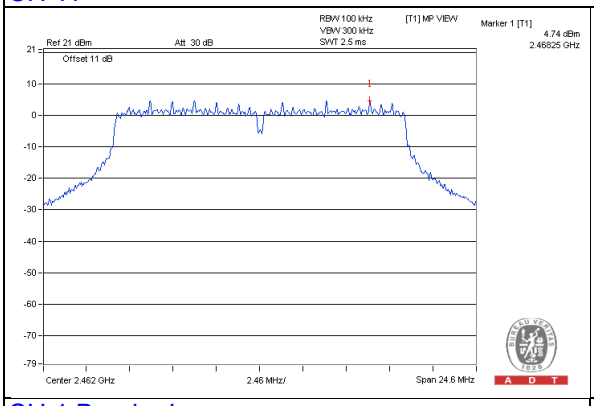

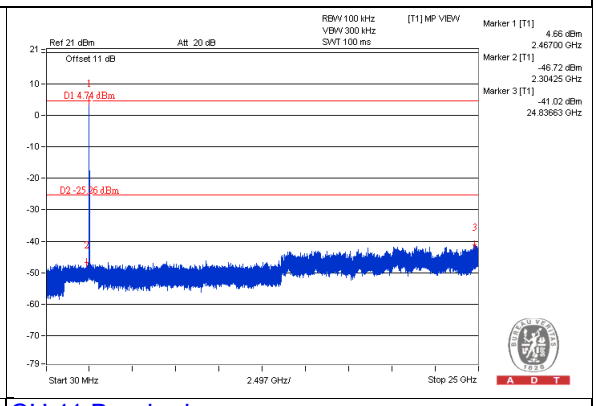

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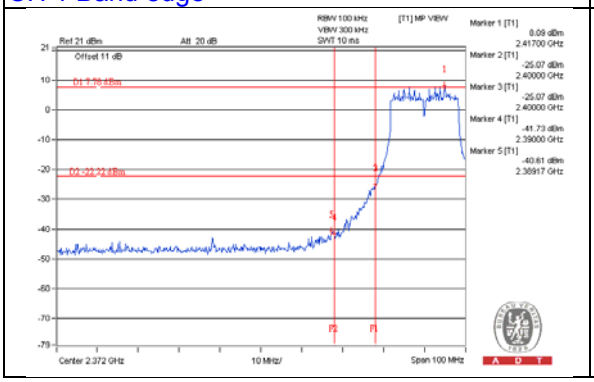

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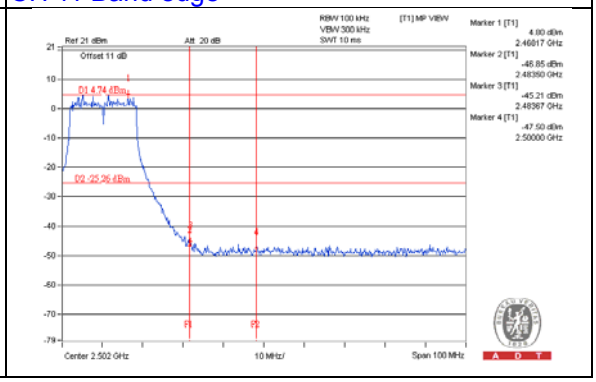

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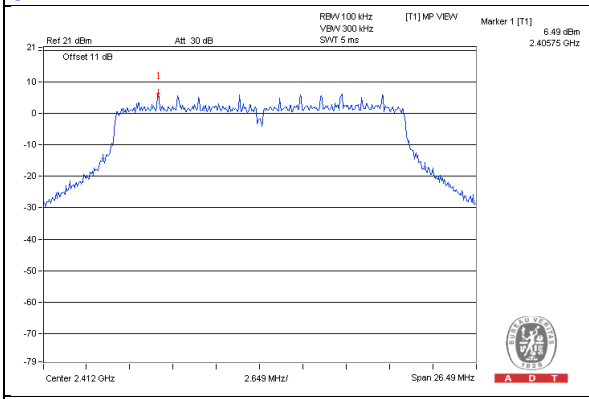

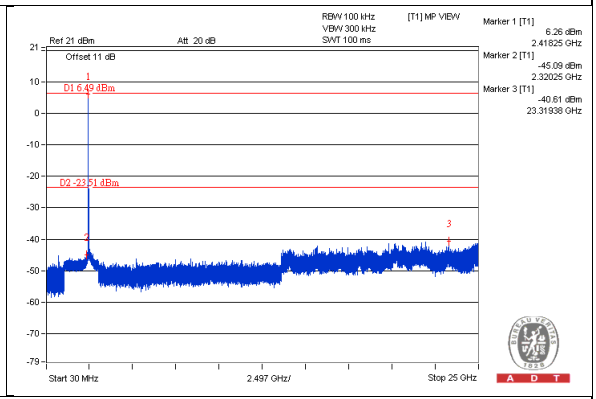

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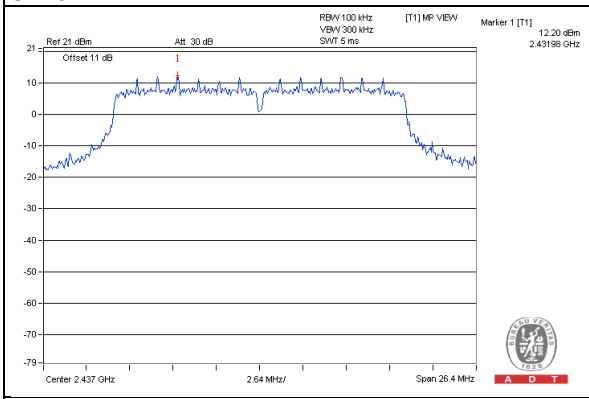

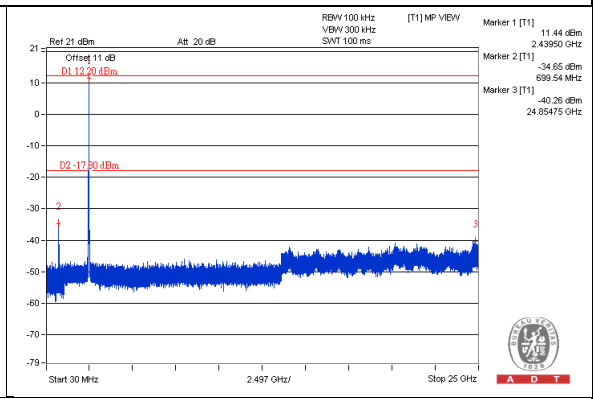

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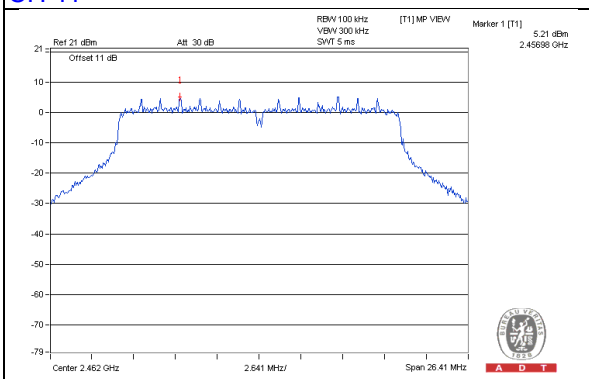

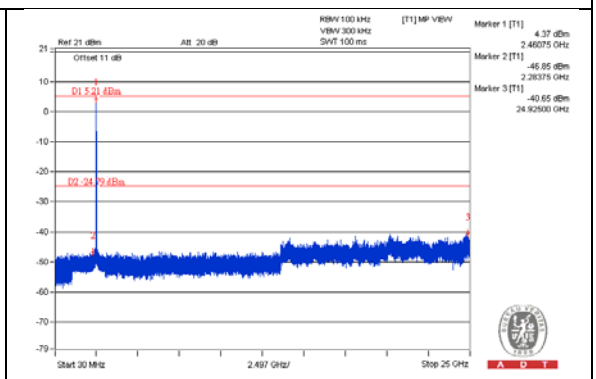

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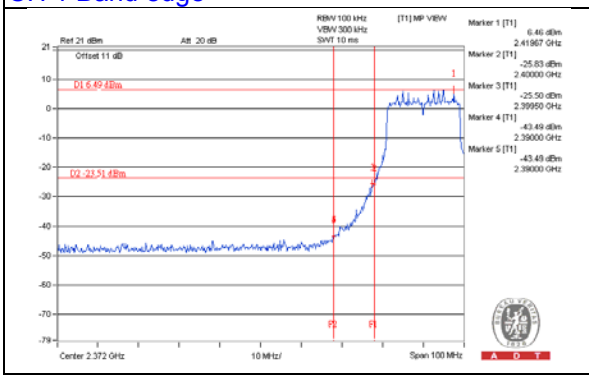

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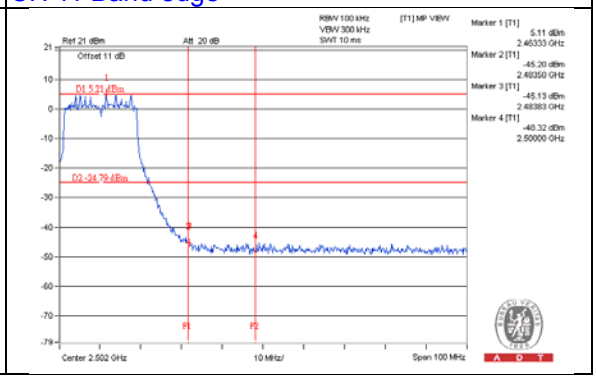
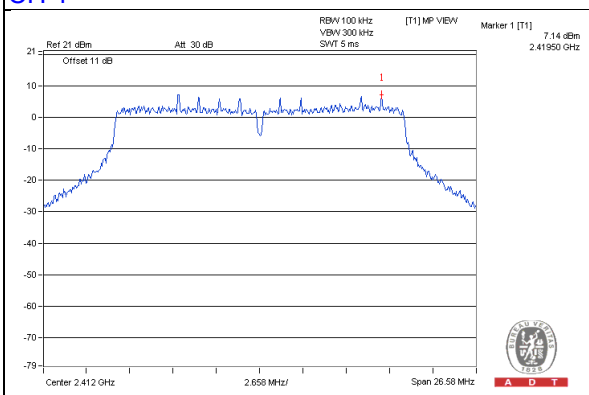
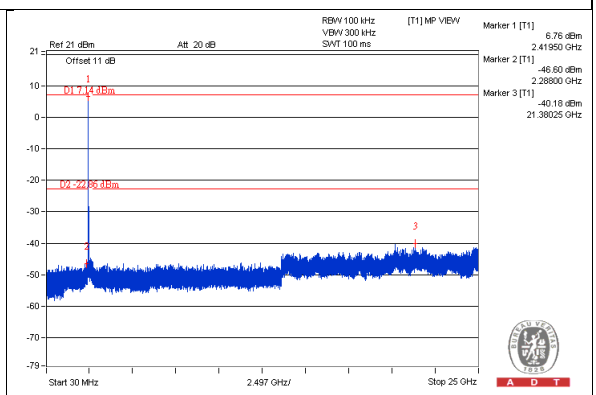


CHAIN 1

CH 1





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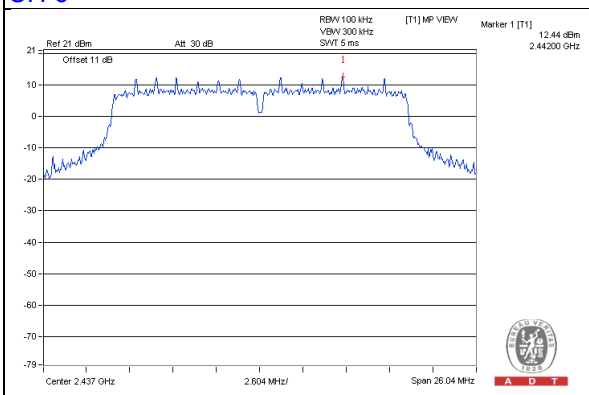

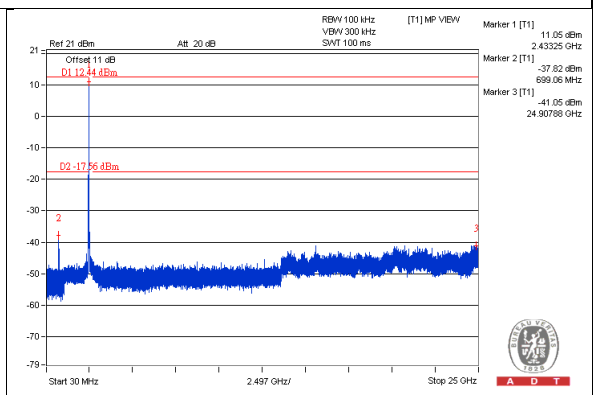

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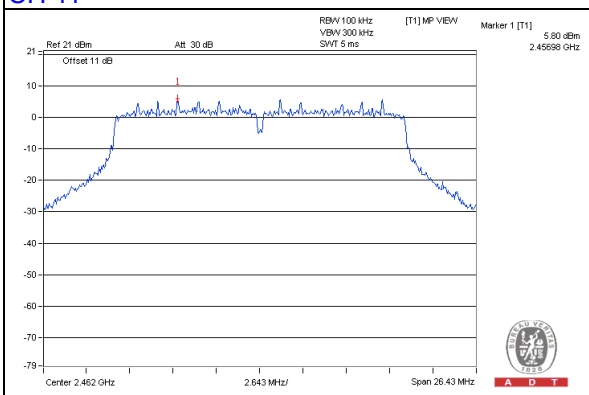

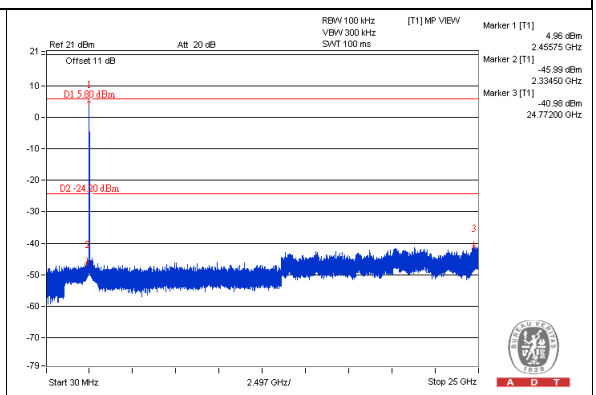

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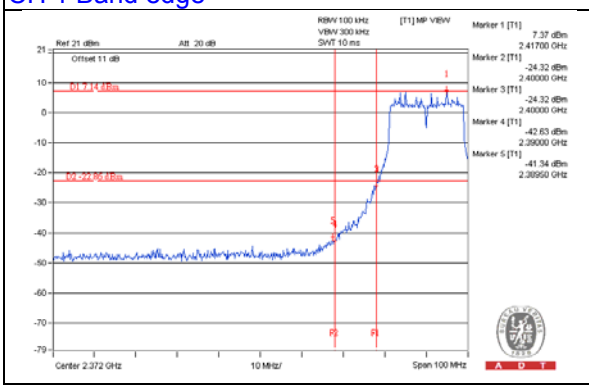

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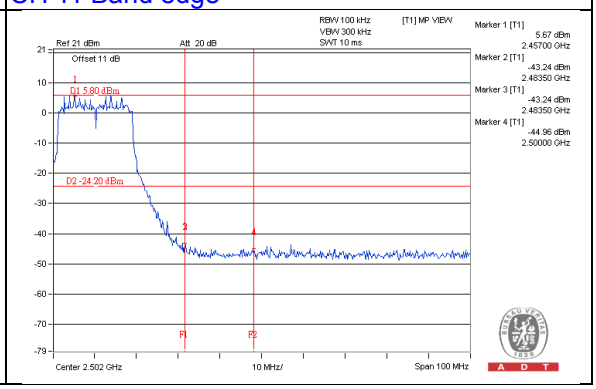
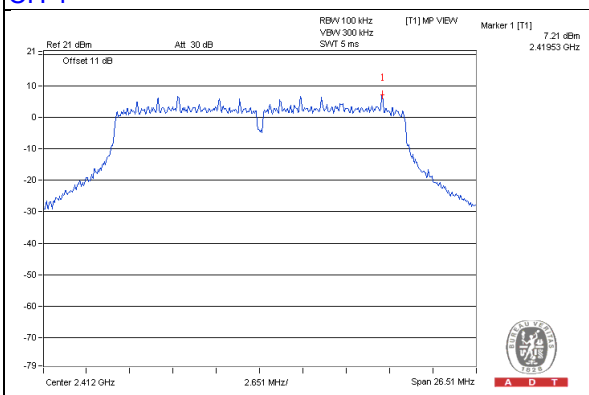
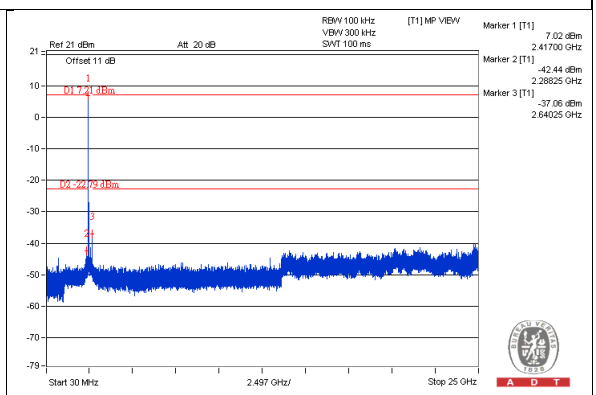


CHAIN 2

CH 1





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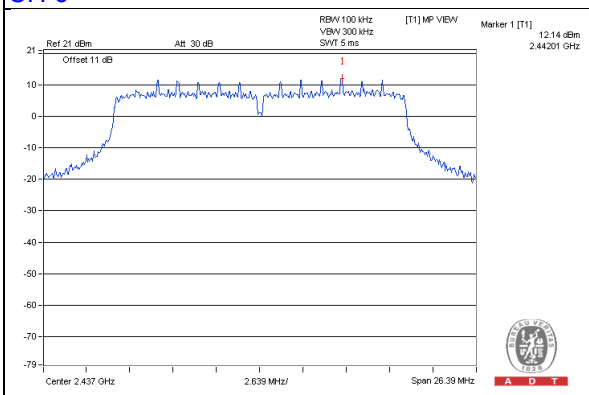

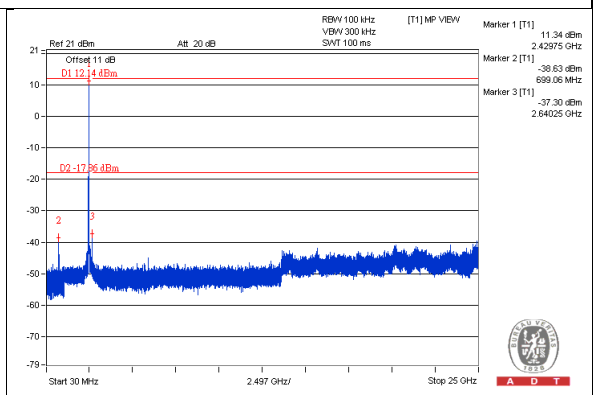

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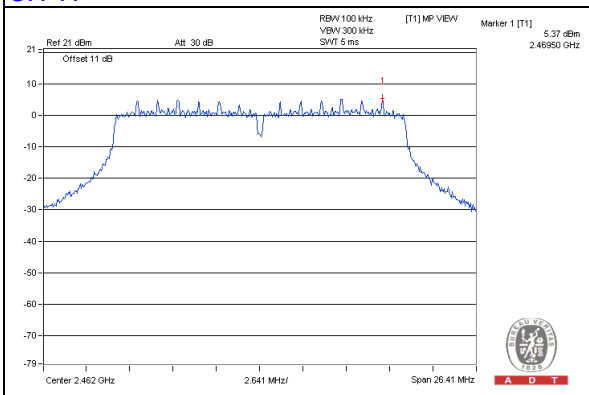
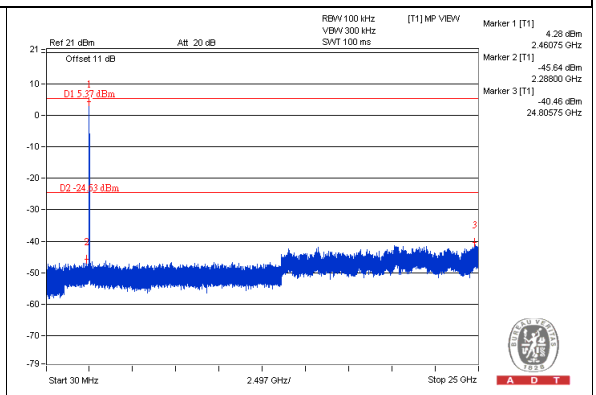
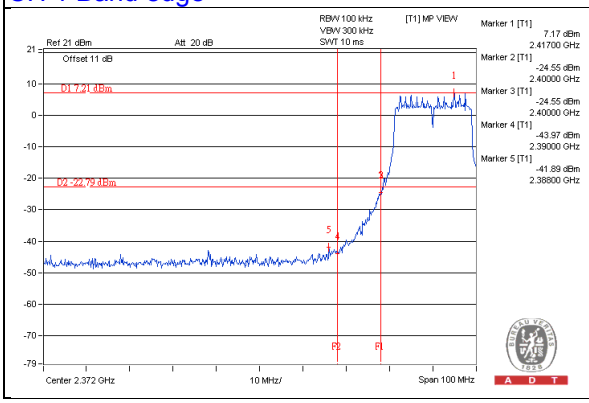




CH 1 Band edge



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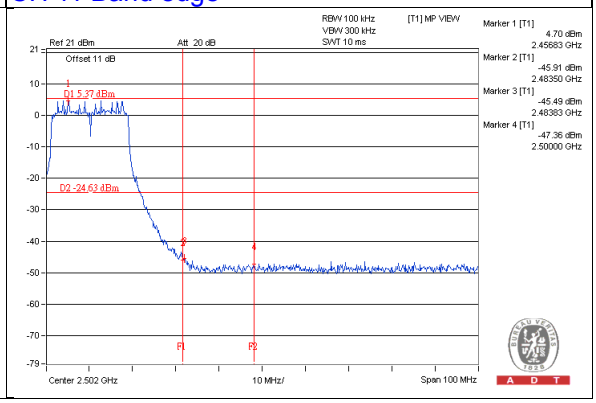

802.11n (HT40)

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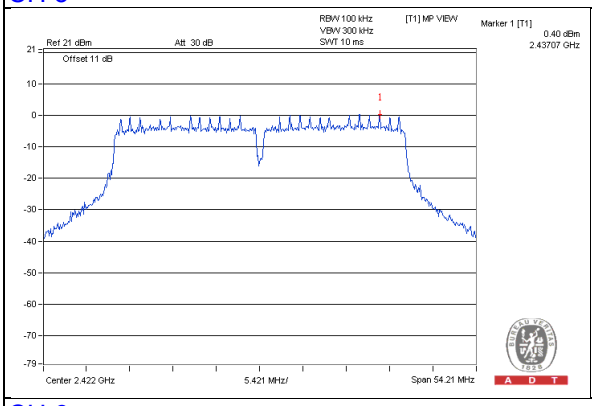
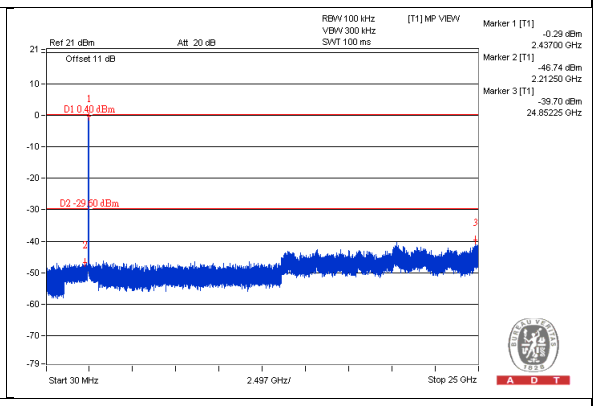
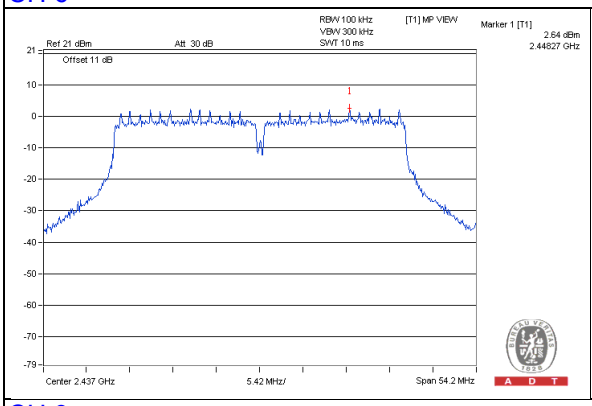
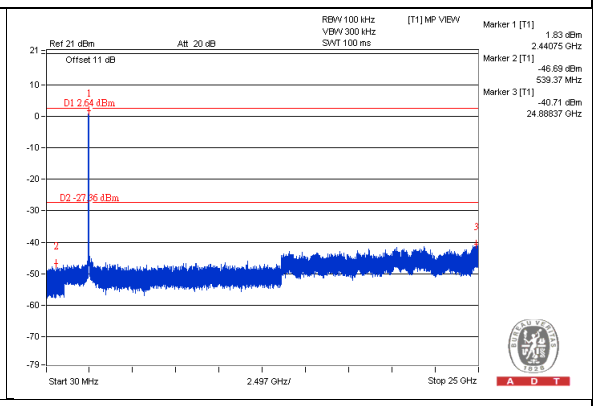




CH 6





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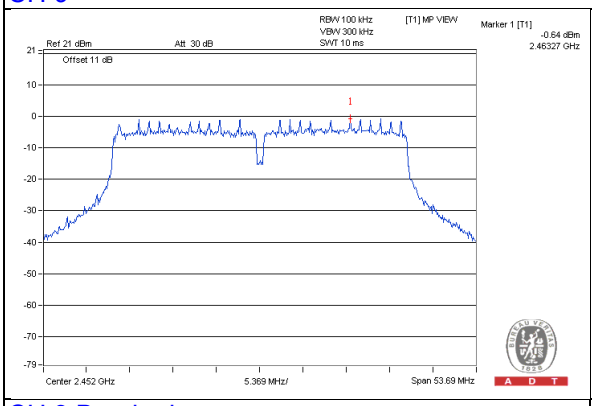
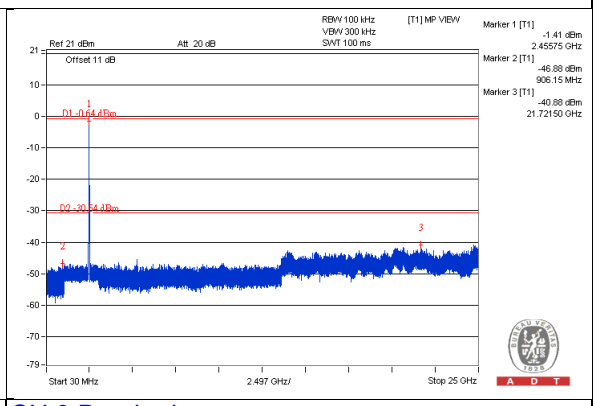
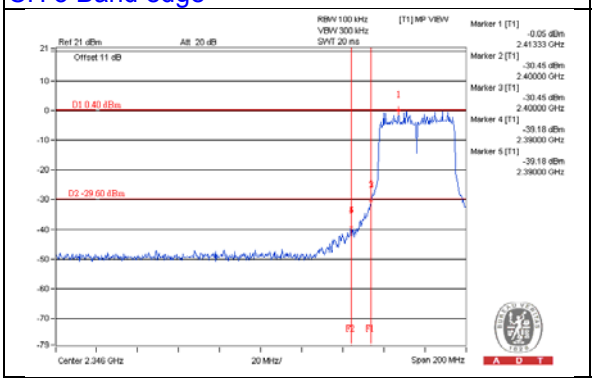
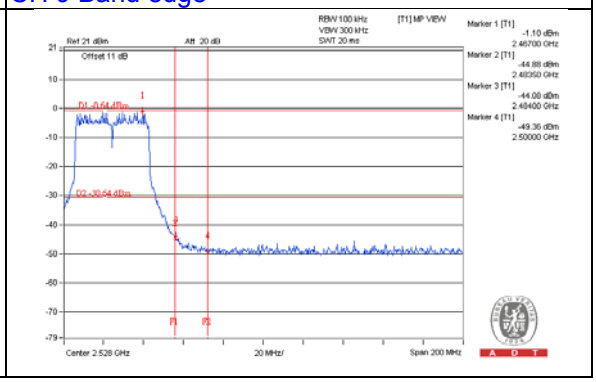




CH 3 Band edge

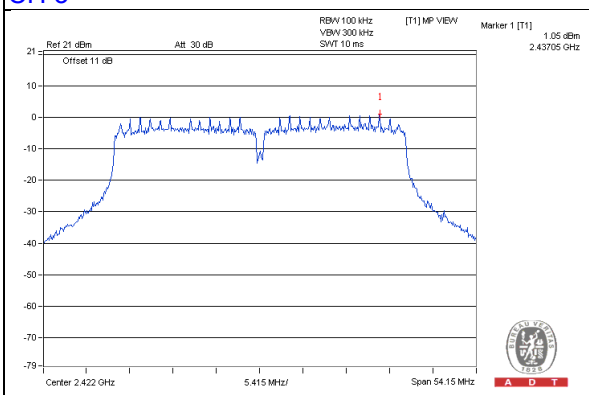


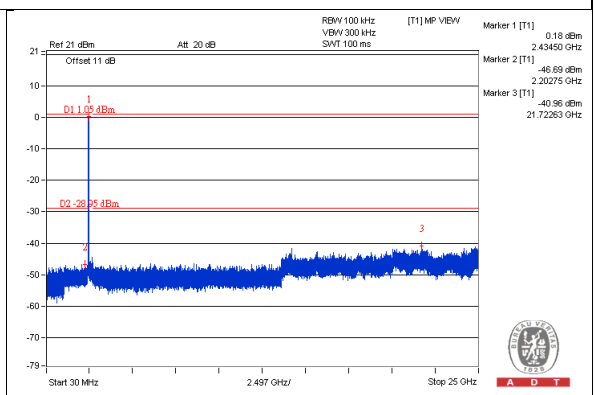
CH 9 Band edge



CHAIN 1

CH 3





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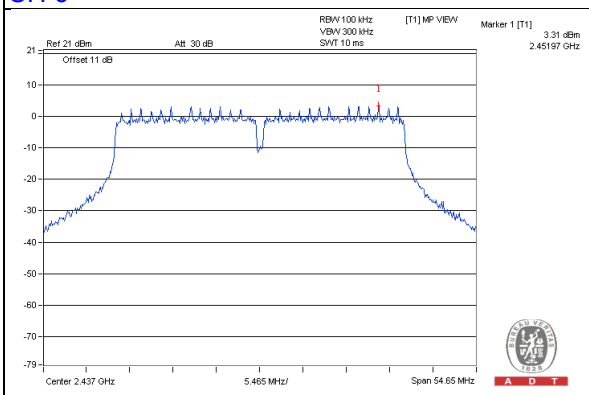

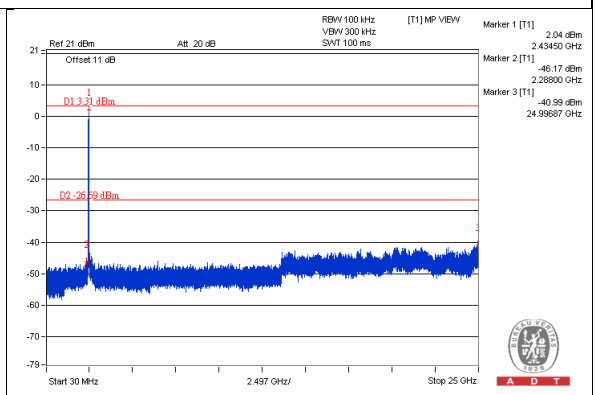

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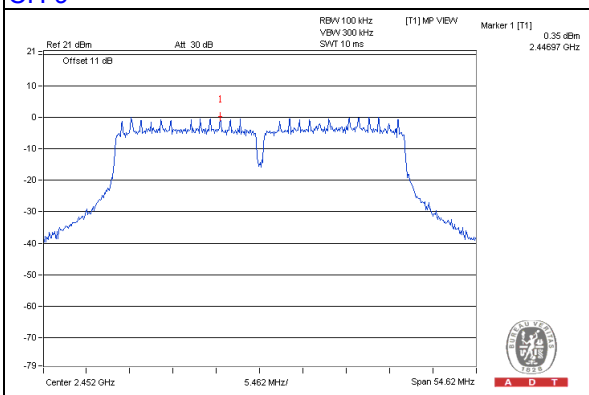
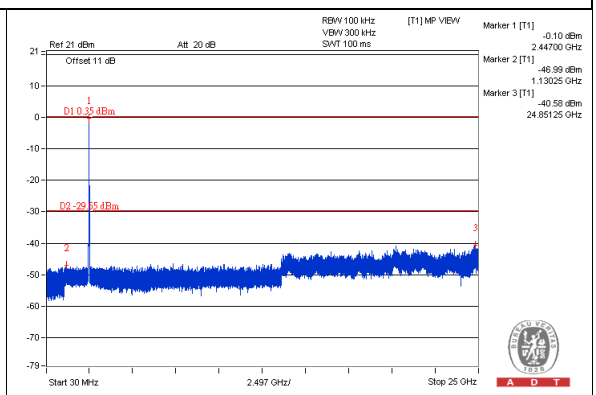
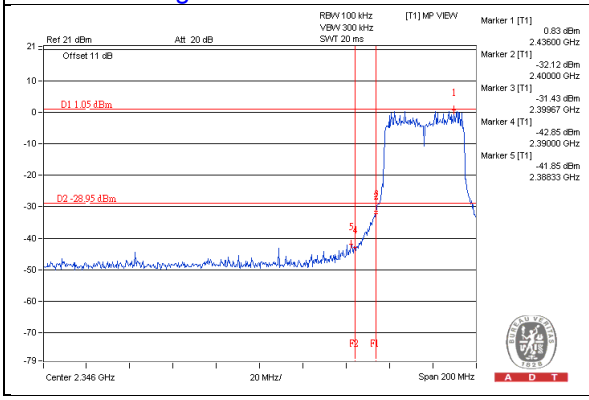
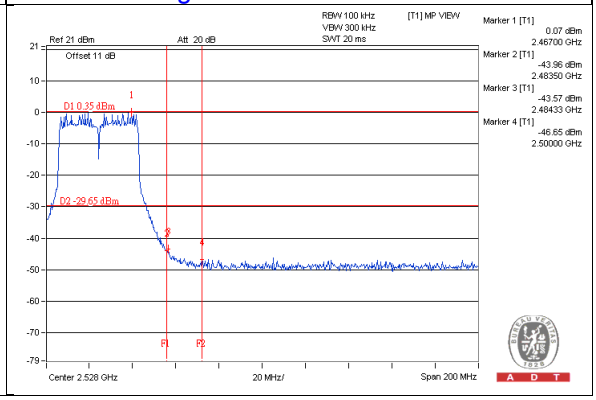




CH 3 Band edge

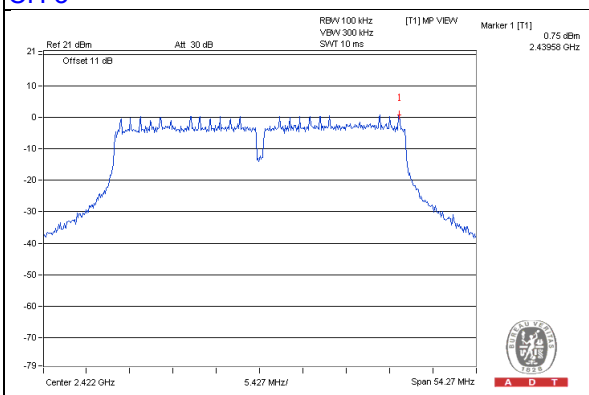


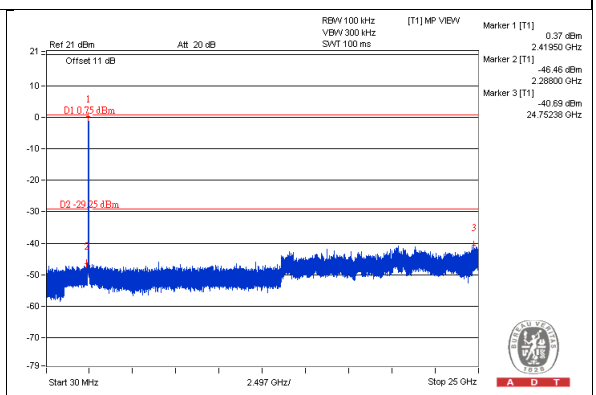
CH 9 Band edge



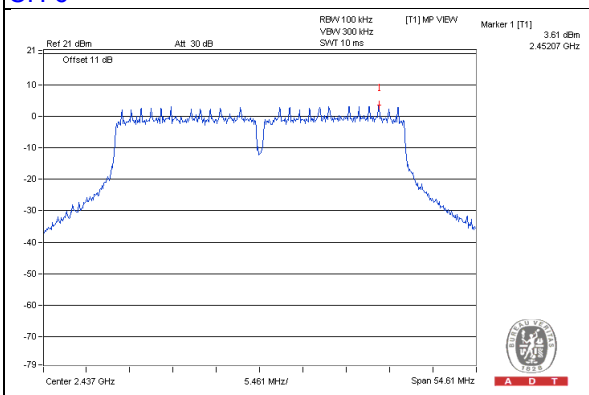
CHAIN 2

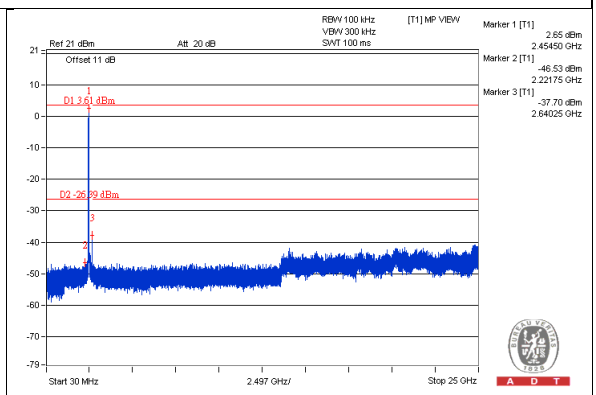
CH 3



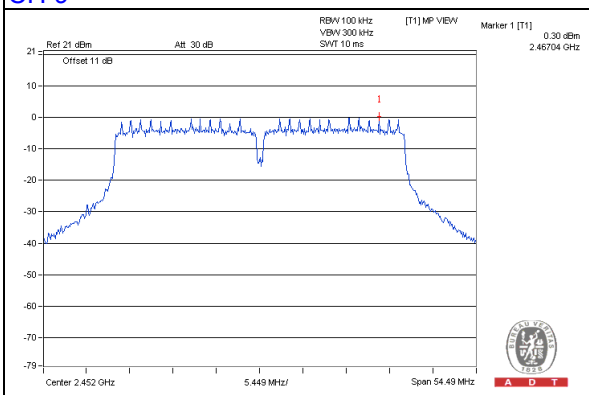


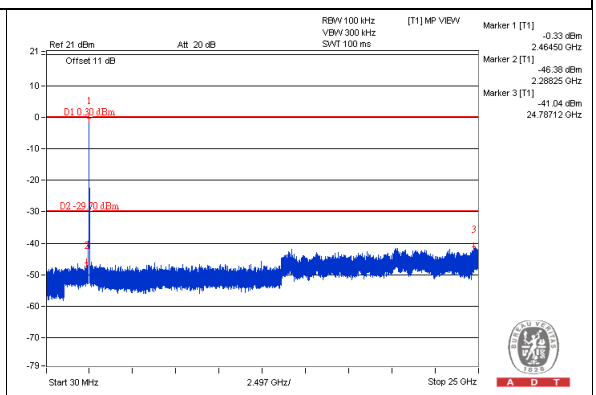
CH 6





CH 9





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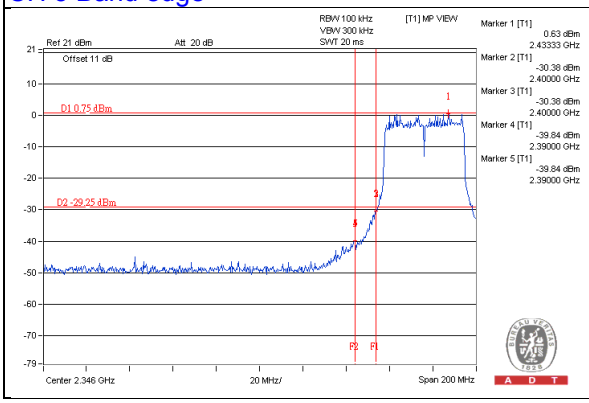

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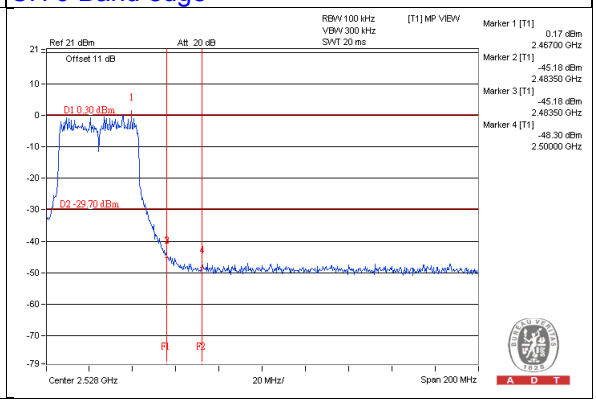

5 Pictures of Test Arrangements

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

Appendix – 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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Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

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