FCC TEST REPORT (15.247)

REPORT NO.:	RF140311C18
MODEL NO.:	ENH900EXT
FCC ID:	A8J-ENH900EXTA
RECEIVED:	Jul. 30, 2013
TESTED:	Aug. 06 ~ Oct. 25, 2013 (Conducted Emission and radiated emissions below 1GHz tests) Feb.13 ~Mar. 25, 2014 (all tests, except conducted Emission and radiated emissions below 1GHz tests)
ISSUED:	Apr. 14, 2014
APPLICANT:	EnGenius Technologies
ADDRESS:	1580 Scenic Avenue, Costa Mesa, CA92626
ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
LAB ADDRESS:	No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.
TEST LOCATION:	No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF140311C18	Original release	Apr. 14, 2014

1. CERTIFICATION

PRODUCT:	Wireless Access Point
MODEL NO.:	ENH900EXT
BRAND:	EnGenius
APPLICANT:	EnGenius Technologies
TESTED:	Aug. 06 ~ Oct. 25, 2013 (Conducted Emission and radiated emissions below 1GHz tests) Feb.13 ~Mar. 25, 2014 (all tests, except conducted Emission and radiated emissions below 1GHz tests)
TEST SAMPLE:	ENGINEERING SAMPLE
STANDARDS:	**FCC Part 15, Subpart C (Section 15.247)** ANSI C63.10-2009

The above equipment (model: ENH900EXT) 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 :** Apr. 14, 2014

Polly Chien / Specialist

APPROVED BY : _____ **, DATE :** Apr. 14, 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 -2.68dB at 0.50547MHz.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 2288.00MHz, 2483.50MHz, 5040.00MHz, 5360.00MHz.
15.247(d)	Band Edge Measurement	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 N-Type. (The device is professionally installed)

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	3.19 dB
	200MHz ~1000MHz	3.21 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Wireless Access Point
MODEL NO.	ENH900EXT
POWER SUPPLY	48Vdc (POE)
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b:11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 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	816.408mW for 2412 ~ 2462MHz 660.164mW for 5745 ~ 5825MHz
ANTENNA TYPE	**2.4GHz:** Dipole antenna with 5dBi gain **5.0GHz:** Dipole antenna with 7dBi gain
ANTENNA CONNECTOR	N-Type (The device is professionally installed)
DATA CABLE	0.55m non-shielded RJ45 cable without core
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	POE, Adapter for POE used

NOTE:

1. The EUT is 3*3 MIMO with 11n beam forming function, in 802.11n (20MHz / 40MHz) MCS index is 16~23, the Nss=3.

MODULATION MODE	TX FUNCTION
802.11b	3TX
802.11g	3TX
802.11a	3TX
802.11n (20MHz)(MCS16~23 / Nss=3)	3TX
802.11n (40MHz)(MCS16~23 / Nss=3)	3TX

2. The EUT consumes power from the following adapter and POE.

POE	
BRAND:	EnGenius
MODEL:	EPE-48GR
OUTPUT:	48Vdc, 0.8A, 38.4W Max.

ADAPTER FOR POE	
BRAND:	Powertron Electronics Corp.
MODEL:	PA1040-480IB080
INPUT:	100-240Vac, 50-60Hz, 1.5A
OUTPUT:	48Vdc, 0.8A, 38.4W Max.
POWER LINE:	DC 1.6m power cable with one core attached on adapter

3. The above EUT information is declared by manufacturer and for more detailed feature 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	
-	√	√	√	√	-

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

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**.

RADIATED EMISSION TEST (ABOVE 1GHz):

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

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

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

RADIATED EMISSION TEST (BELOW 1GHz):

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

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

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

ANTENNA PORT CONDUCTED MEASUREMENT:

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

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

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

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

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (POE)	TESTED BY
RE≥1G	29deg. C, 69%RH	48Vdc	Chris Lin
RE<1G	27deg. C, 66%RH	48Vdc	Martin Lee
PLC	25deg. C, 68%RH	48Vdc	Leo Tsai
APCM	25deg. C, 60%RH	48Vdc	Jun Wu

FOR 5.0GHz (5745 ~ 5825MHz):

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

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

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**.

RADIATED EMISSION TEST (ABOVE 1GHz):

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

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

RADIATED EMISSION TEST (BELOW 1GHz):

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

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

ANTENNA PORT CONDUCTED MEASUREMENT:

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

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

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (POE)	TESTED BY
RE≥1G	27deg. C, 66%RH	48Vdc	Chris Lin
	29deg. C, 69%RH	48Vdc	Alan Wu
RE<1G	27deg. C, 66%RH	48Vdc	Martin Lee
PLC	25deg. C, 68%RH	48Vdc	Leo Tsai
APCM	24deg. C, 68%RH	48Vdc	Nick Chen

3.3 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.

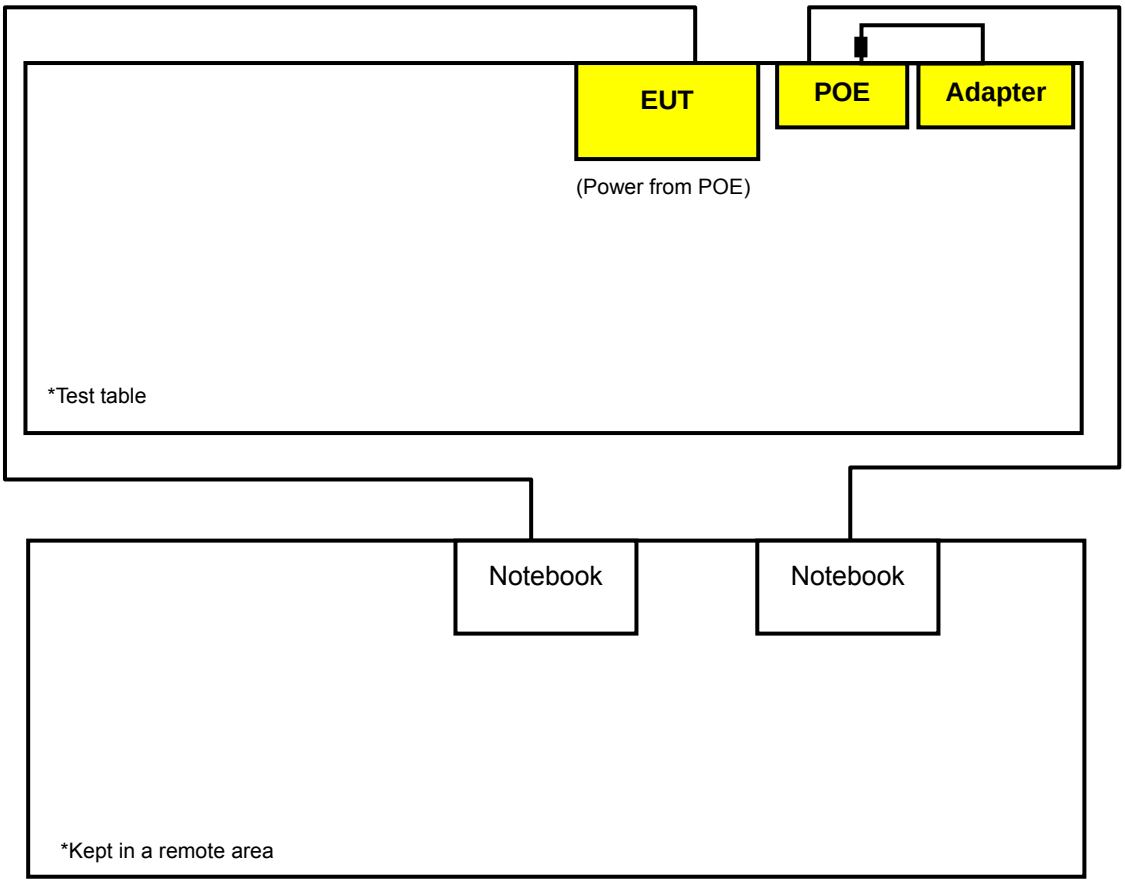
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	DELL	E5420	BPQ7MQ1	FCC Doc Approved
2	NOTEBOOK	DELL	E5520	8Y4DMQ1	FCC Doc Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	3m RJ45 Cable without core
2	3m RJ45 Cable without core

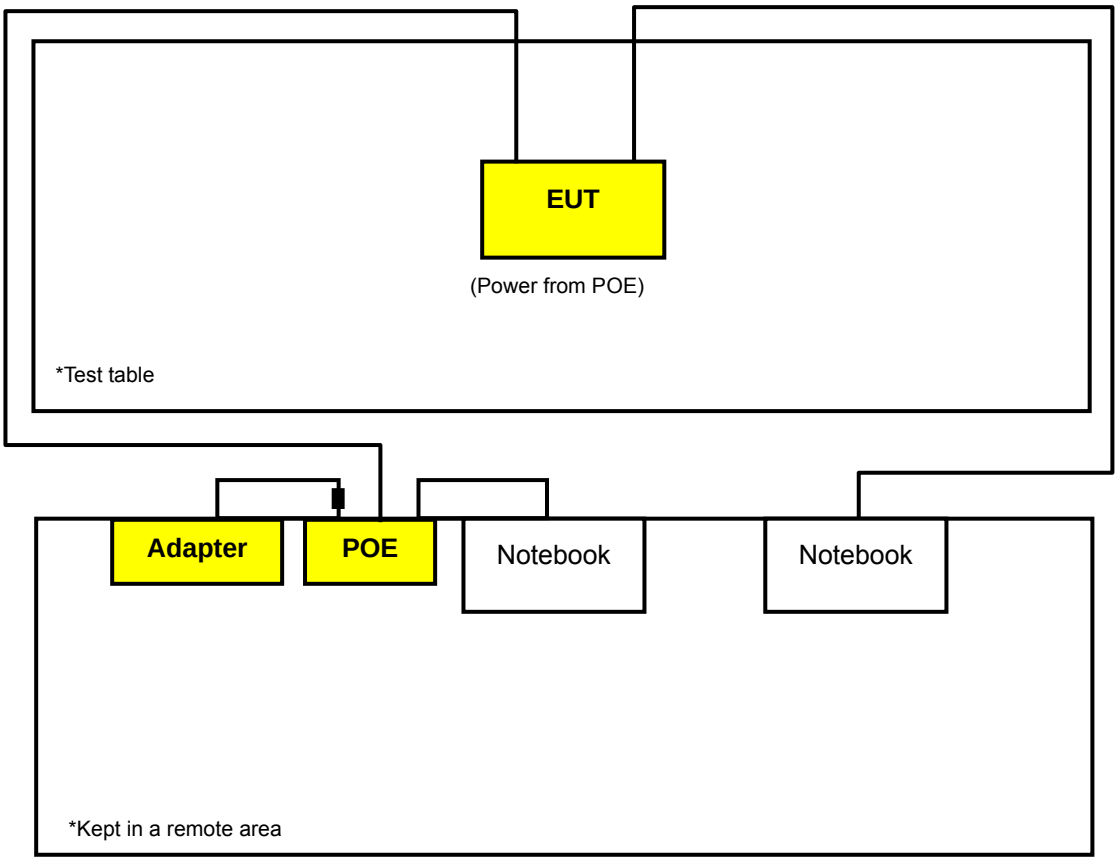
NOTE:
1. All power cords of the above support units are non-shielded (1.8m).
2. Item 1-2 acted as communication partners to transfer data.

3.3.1 CONFIGURATION OF SYSTEM UNDER TEST

For Conducted Emission Test



For Radiated Emissions Test



3.4 DUTY CYCLE OF TEST SIGNAL

2.4GHz Band:

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

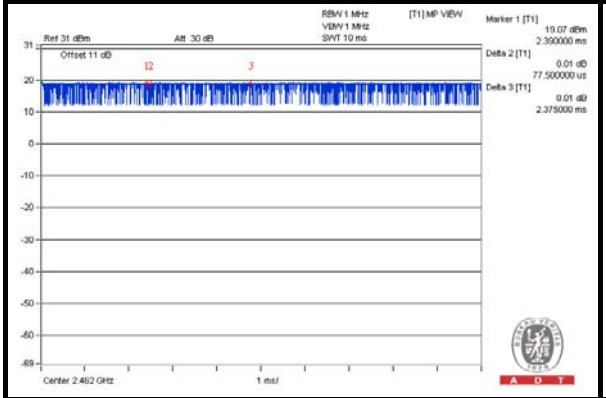
If duty cycle is < 98%, duty factor shall be considered.

802.11g: Duty cycle = 2.020/2.075 = 0.973, Duty factor = 10 * log(1/0.973) = 0.12

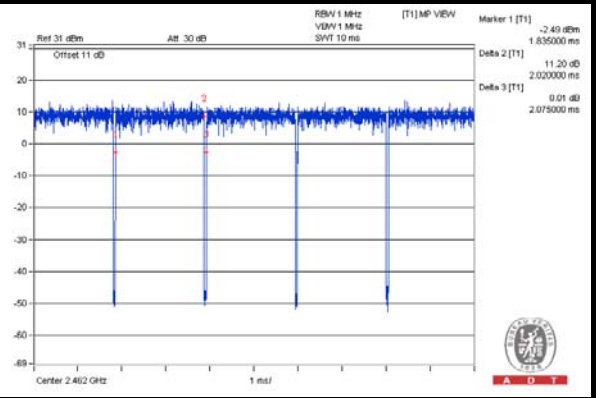
802.11n (20MHz): Duty cycle = 1.888/1.938 = 0.974, Duty factor = 10 * log(1/0.974) = 0.11

802.11n (40MHz): Duty cycle = 0.348/0.385 = 0.904, Duty factor = 10 * log(1/0.904) = 0.44

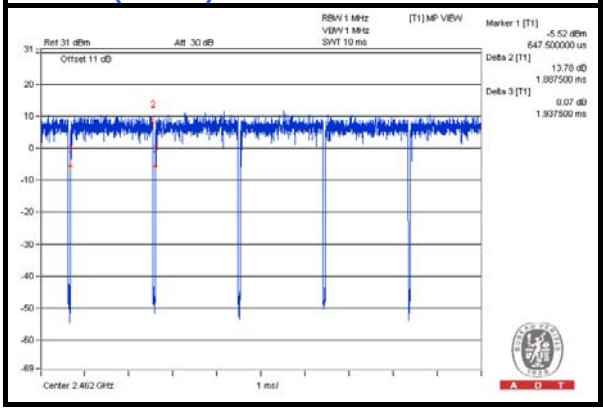
802.11b



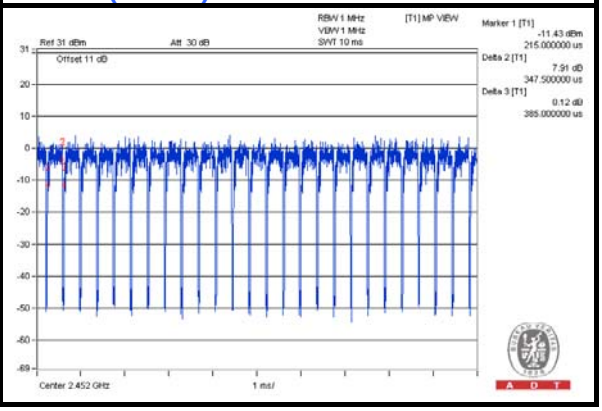
802.11g



802.11n (20MHz)



802.11n (40MHz)



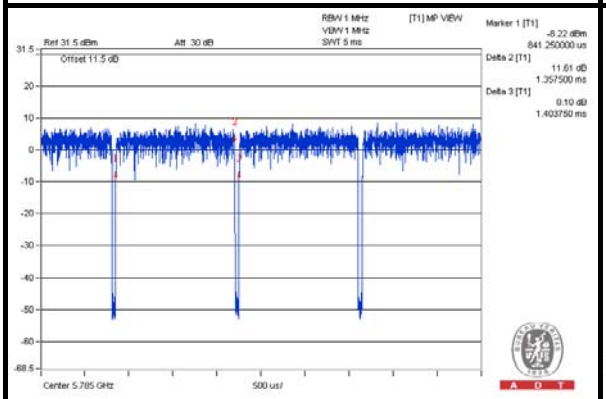
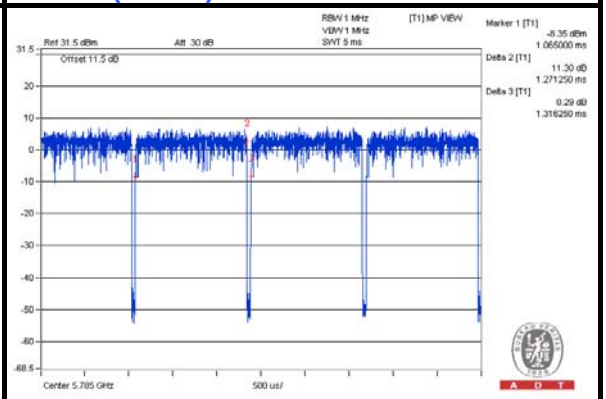
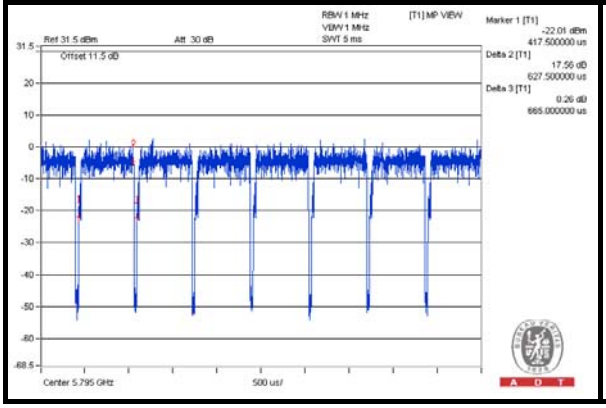
5GHz Band:

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

802.11a: Duty cycle = 1.358/1.404 = 0.967, Duty factor = 10 * log(1/0.967) = 0.15

802.11n (20MHz): Duty cycle = 1.271/1.316 = 0.966, Duty factor = 10 * log(1/0.966) = 0.15

802.11n (40MHz): Duty cycle = 0.628/0.665 = 0.944, Duty factor = 10 * log(1/0.944) = 0.25

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

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 v03r01
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

Tested date: Aug. 06, 2013

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Aug. 21, 2012	Aug. 20, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSU 43	100115	Oct. 25, 2012	Oct. 24, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Mar. 25, 2013	Mar. 24, 2014
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-404	Dec. 22, 2012	Dec. 21, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 15, 2013	Jul. 14, 2014
Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
Preamplifier Agilent	8449B	3008A01961	Oct. 25, 2012	Oct. 24, 2013
Preamplifier Agilent	8447D	2944A10738	Oct. 23, 2012	Oct. 22, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309220/4	Aug. 28, 2012	Aug. 27, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250724/4	Aug. 28, 2012	Aug. 27, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Aug. 28, 2012	Aug. 27, 2013
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. 25, 2012	Oct. 24, 2013
High Speed Peak Power Meter	ML2495A	0824012	Aug. 22, 2012	Aug. 21, 2013
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 calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.

3. The test was performed in HwaYa Chamber 4.

4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

5. The FCC Site Registration No. is 460141.

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

Tested date: Oct. 25, 2013

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Sep. 09, 2013	Sep. 08, 2014
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 17, 2012	Dec. 16, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Mar. 25, 2013	Mar. 24, 2014
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-404	Dec. 22, 2012	Dec. 21, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 15, 2013	Jul. 14, 2014
Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
Preamplifier Agilent	8449B	3008A01964	Aug. 26, 2013	Aug. 25, 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	0824012	Sep. 12, 2013	Sep. 11, 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 calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.

3. The test was performed in HwaYa Chamber 4.

4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

5. The FCC Site Registration No. is 460141.

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

Tested date: Feb. 13 ~ Mar. 25, 2014

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
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	Mar. 25, 2013	Mar. 24, 2014
			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	0824012	Sep. 12, 2013	Sep. 11, 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 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:

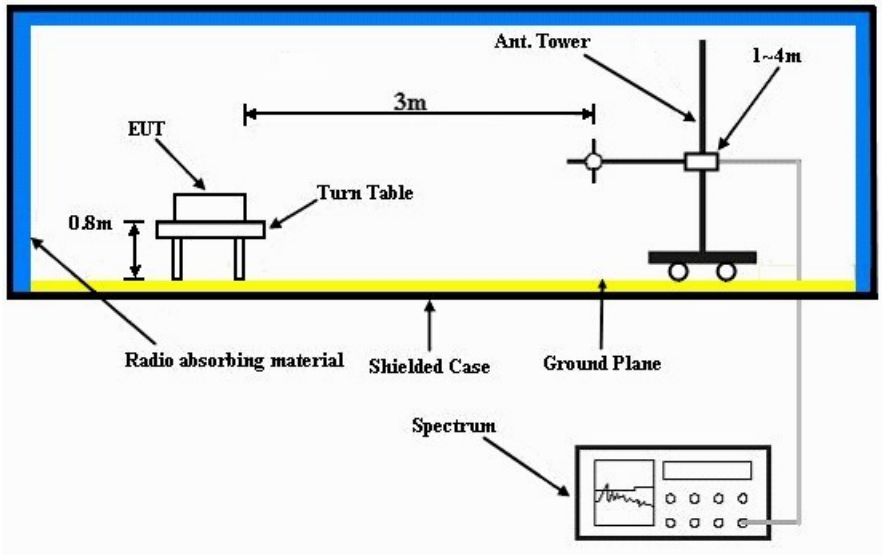
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution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

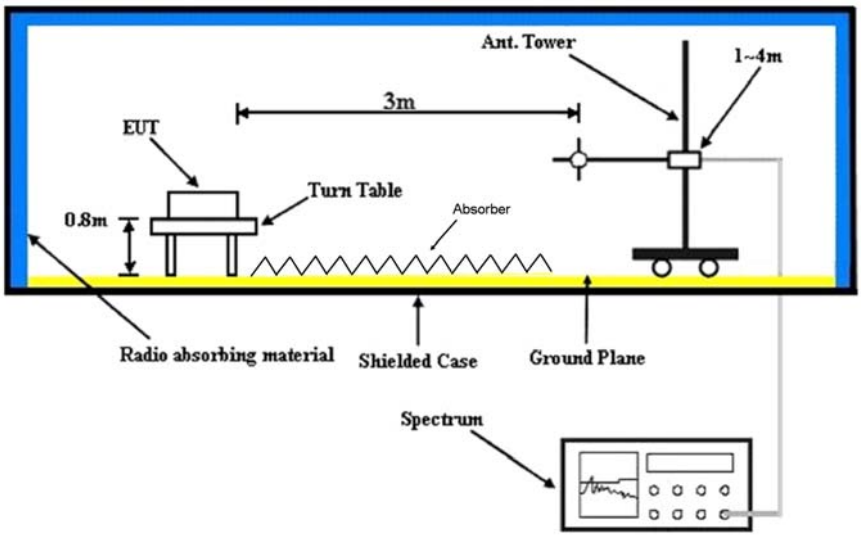
No deviation.

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 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 DATA：

802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 69%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2372.00	65.7 PK	74.0	-8.3	1.76 H	161	34.80	30.90
2	2372.00	52.8 AV	54.0	-1.2	1.76 H	161	21.90	30.90
3	2390.00	60.3 PK	74.0	-13.7	1.76 H	167	29.30	31.00
4	2390.00	49.9 AV	54.0	-4.1	1.76 H	167	18.90	31.00
5	*2412.00	121.5 PK			1.18 H	161	90.40	31.10
6	*2412.00	118.0 AV			1.18 H	161	86.90	31.10
7	4824.00	48.3 PK	74.0	-25.7	1.00 H	316	43.40	4.90
8	4824.00	39.9 AV	54.0	-14.1	1.00 H	316	35.00	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	2373.00	57.8 PK	74.0	-16.2	1.00 V	259	26.90	30.90
2	2373.00	47.2 AV	54.0	-6.8	1.00 V	259	16.30	30.90
3	2390.00	57.1 PK	74.0	-16.9	1.10 V	270	26.10	31.00
4	2390.00	46.6 AV	54.0	-7.4	1.10 V	270	15.60	31.00
5	*2412.00	115.7 PK			1.00 V	260	84.60	31.10
6	*2412.00	112.1 AV			1.00 V	260	81.00	31.10
7	4824.00	48.2 PK	74.0	-25.8	1.33 V	280	43.30	4.90
8	4824.00	36.9 AV	54.0	-17.1	1.33 V	280	32.00	4.90

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 69%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2360.00	70.2 PK	74.0	-3.8	1.00 H	355	39.30	30.90
2	2360.00	52.2 AV	54.0	-1.8	1.00 H	355	21.30	30.90
3	2390.00	62.6 PK	74.0	-11.4	1.05 H	340	31.60	31.00
4	2390.00	51.0 AV	54.0	-3.0	1.05 H	340	20.00	31.00
5	*2437.00	125.0 PK			1.00 H	180	93.80	31.20
6	*2437.00	121.4 AV			1.00 H	180	90.20	31.20
7	2483.50	64.3 PK	74.0	-9.7	1.12 H	355	32.90	31.40
8	2483.50	52.2 AV	54.0	-1.8	1.12 H	355	20.80	31.40
9	4874.00	51.6 PK	74.0	-22.4	1.00 H	342	46.60	5.00
10	4874.00	47.2 AV	54.0	-6.8	1.00 H	342	42.20	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	2360.00	60.8 PK	74.0	-13.2	1.10 V	262	29.90	30.90
2	2360.00	45.4 AV	54.0	-8.6	1.10 V	262	14.50	30.90
3	2390.00	58.2 PK	74.0	-15.8	1.05 V	270	27.20	31.00
4	2390.00	45.9 AV	54.0	-8.1	1.05 V	270	14.90	31.00
5	*2437.00	117.9 PK			1.00 V	260	86.70	31.20
6	*2437.00	114.2 AV			1.00 V	260	83.00	31.20
7	2483.50	58.3 PK	74.0	-15.7	1.10 V	74	26.90	31.40
8	2483.50	44.0 AV	54.0	-10.0	1.10 V	74	12.60	31.40
9	4874.00	50.8 PK	74.0	-23.2	1.00 V	210	45.80	5.00
10	4874.00	44.0 AV	54.0	-10.0	1.00 V	210	39.00	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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 69%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2288.00	60.0 PK	74.0	-14.0	1.24 H	169	60.10	-0.10
2	**2288.00**	**53.0 AV**	**54.0**	**-1.0**	**1.24 H**	**169**	**53.10**	**-0.10**
3	*2462.00	122.0 PK			1.04 H	166	90.70	31.30
4	*2462.00	118.5 AV			1.04 H	166	87.20	31.30
5	2483.50	64.4 PK	74.0	-9.6	1.10 H	200	33.00	31.40
6	2483.50	51.6 AV	54.0	-2.4	1.10 H	200	20.20	31.40
7	2500.00	64.9 PK	74.0	-9.1	1.03 H	355	33.40	31.50
8	2500.00	52.4 AV	54.0	-1.6	1.03 H	355	20.90	31.50
9	4924.00	49.2 PK	74.0	-24.8	1.36 H	136	44.00	5.20
10	4924.00	42.2 AV	54.0	-11.8	1.36 H	136	37.00	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	2288.00	48.2 PK	74.0	-25.8	1.00 V	251	48.30	-0.10
2	2288.00	40.9 AV	54.0	-13.1	1.00 V	251	41.00	-0.10
3	*2462.00	117.2 PK			1.83 V	262	85.90	31.30
4	*2462.00	113.5 AV			1.83 V	262	82.20	31.30
5	2483.50	59.6 PK	74.0	-14.4	1.00 V	259	28.20	31.40
6	2483.50	47.6 AV	54.0	-6.4	1.00 V	259	16.20	31.40
7	2500.00	59.0 PK	74.0	-15.0	1.10 V	270	27.50	31.50
8	2500.00	47.4 AV	54.0	-6.6	1.10 V	270	15.90	31.50
9	4924.00	50.6 PK	74.0	-23.4	1.28 V	276	45.40	5.20
10	4924.00	43.5 AV	54.0	-10.5	1.28 V	276	38.30	5.20

REMARKS:

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

802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 69%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.5 PK	74.0	-4.5	1.35 H	351	38.50	31.00
2	2390.00	52.8 AV	54.0	-1.2	1.35 H	351	21.80	31.00
3	*2412.00	115.9 PK			1.35 H	350	84.80	31.10
4	*2412.00	106.4 AV			1.35 H	350	75.30	31.10
5	4824.00	46.8 PK	74.0	-27.2	1.15 H	96	41.90	4.90
6	4824.00	33.5 AV	54.0	-20.5	1.15 H	96	28.60	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	59.7 PK	74.0	-14.3	1.53 V	266	28.70	31.00
2	2390.00	47.5 AV	54.0	-6.5	1.53 V	266	16.50	31.00
3	*2412.00	109.5 PK			1.01 V	259	78.40	31.10
4	*2412.00	100.6 AV			1.01 V	259	69.50	31.10
5	4824.00	46.2 PK	74.0	-27.8	1.28 V	96	41.30	4.90
6	4824.00	32.6 AV	54.0	-21.4	1.28 V	96	27.70	4.90

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 69%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2288.00	60.2 PK	74.0	-13.8	1.23 H	168	60.30	-0.10
2	2288.00	52.2 AV	54.0	-1.8	1.23 H	168	52.30	-0.10
3	2390.00	67.2 PK	74.0	-6.8	1.00 H	348	36.20	31.00
4	2390.00	52.4 AV	54.0	-1.6	1.00 H	348	21.40	31.00
5	*2437.00	124.4 PK			1.00 H	352	93.20	31.20
6	*2437.00	115.0 AV			1.00 H	352	83.80	31.20
7	2483.50	67.0 PK	74.0	-7.0	1.12 H	355	35.60	31.40
8	2483.50	52.5 AV	54.0	-1.5	1.12 H	355	21.10	31.40
9	4874.00	46.6 PK	74.0	-27.4	1.12 H	69	41.60	5.00
10	4874.00	32.9 AV	54.0	-21.1	1.12 H	69	27.90	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	2288.00	49.4 PK	74.0	-24.6	1.06 V	251	49.50	-0.10
2	2288.00	40.8 AV	54.0	-13.2	1.06 V	251	40.90	-0.10
3	2390.00	57.9 PK	74.0	-16.1	1.00 V	78	26.90	31.00
4	2390.00	47.7 AV	54.0	-6.3	1.00 V	78	16.70	31.00
5	*2437.00	118.5 PK			1.57 V	261	87.30	31.20
6	*2437.00	108.8 AV			1.57 V	261	77.60	31.20
7	2483.50	64.6 PK	74.0	-9.4	1.00 V	255	33.20	31.40
8	2483.50	49.4 AV	54.0	-4.6	1.00 V	255	18.00	31.40
9	4874.00	46.6 PK	74.0	-27.4	1.10 V	304	41.60	5.00
10	4874.00	33.0 AV	54.0	-21.0	1.10 V	304	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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 69%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	118.4 PK			1.00 H	354	87.00	31.40
2	*2462.00	109.1 AV			1.00 H	354	77.70	31.40
3	2483.50	67.1 PK	74.0	-6.9	1.00 H	356	35.60	31.50
4	**2483.50**	**53.0 AV**	**54.0**	**-1.0**	**1.00 H**	**356**	**21.50**	**31.50**
5	4924.00	46.5 PK	74.0	-27.5	1.19 H	204	41.60	4.90
6	4924.00	33.9 AV	54.0	-20.1	1.19 H	204	29.00	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	*2462.00	109.3 PK			1.00 V	257	78.00	31.30
2	*2462.00	100.4 AV			1.00 V	257	69.10	31.30
3	2483.50	62.3 PK	74.0	-11.7	1.00 V	256	30.90	31.40
4	2483.50	48.7 AV	54.0	-5.3	1.00 V	256	17.30	31.40
5	4924.00	46.4 PK	74.0	-27.6	1.30 V	258	41.20	5.20
6	4924.00	33.2 AV	54.0	-20.8	1.30 V	258	28.00	5.20

REMARKS:

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

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 69%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.8 PK	74.0	-6.2	1.04 H	354	36.80	31.00
2	2390.00	52.4 AV	54.0	-1.6	1.04 H	354	21.40	31.00
3	*2412.00	116.0 PK			1.00 H	349	84.90	31.10
4	*2412.00	106.7 AV			1.00 H	349	75.60	31.10
5	4824.00	47.8 PK	74.0	-26.2	1.06 H	98	42.90	4.90
6	4824.00	33.2 AV	54.0	-20.8	1.06 H	98	28.30	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	56.9 PK	74.0	-17.1	1.38 V	79	25.90	31.00
2	2390.00	47.3 AV	54.0	-6.7	1.38 V	79	16.30	31.00
3	*2412.00	109.2 PK			1.00 V	261	78.10	31.10
4	*2412.00	100.5 AV			1.00 V	261	69.40	31.10
5	4824.00	46.2 PK	74.0	-27.8	1.16 V	20	41.30	4.90
6	4824.00	33.3 AV	54.0	-20.7	1.16 V	20	28.40	4.90

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 69%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2288.00	60.1 PK	74.0	-13.9	1.21 H	168	60.20	-0.10
2	2288.00	52.4 AV	54.0	-1.6	1.21 H	168	52.50	-0.10
3	2390.00	66.5 PK	74.0	-7.5	1.00 H	159	35.50	31.00
4	2390.00	51.5 AV	54.0	-2.5	1.00 H	159	20.50	31.00
5	*2437.00	124.4 PK			1.38 H	348	93.20	31.20
6	*2437.00	114.4 AV			1.38 H	348	83.20	31.20
7	2483.50	69.0 PK	74.0	-5.0	1.00 H	354	37.60	31.40
8	**2483.50**	**53.0 AV**	**54.0**	**-1.0**	**1.00 H**	**354**	**21.60**	**31.40**
9	4874.00	46.5 PK	74.0	-27.5	1.13 H	69	41.50	5.00
10	4874.00	33.3 AV	54.0	-20.7	1.13 H	69	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	2288.00	48.9 PK	74.0	-25.1	1.33 V	97	49.00	-0.10
2	2288.00	40.8 AV	54.0	-13.2	1.33 V	97	40.90	-0.10
3	2390.00	59.5 PK	74.0	-14.5	1.25 V	257	28.50	31.00
4	2390.00	48.4 AV	54.0	-5.6	1.25 V	257	17.40	31.00
5	*2437.00	116.6 PK			1.00 V	257	85.40	31.20
6	*2437.00	107.8 AV			1.00 V	257	76.60	31.20
7	2483.50	62.8 PK	74.0	-11.2	1.00 V	255	31.40	31.40
8	2483.50	48.7 AV	54.0	-5.3	1.00 V	255	17.30	31.40
9	4874.00	46.2 PK	74.0	-27.8	1.23 V	69	41.20	5.00
10	4874.00	32.6 AV	54.0	-21.4	1.23 V	69	27.60	5.00

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 69%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	115.5 PK			1.00 H	354	84.20	31.30
2	*2462.00	106.1 AV			1.00 H	354	74.80	31.30
3	2483.50	69.3 PK	74.0	-4.7	1.00 H	354	37.90	31.40
4	**2483.50**	**53.0 AV**	**54.0**	**-1.0**	**1.00 H**	**354**	**21.60**	**31.40**
5	4924.00	47.8 PK	74.0	-26.2	1.00 H	96	42.60	5.20
6	4924.00	33.6 AV	54.0	-20.4	1.00 H	96	28.40	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	107.4 PK			1.00 V	257	76.10	31.30
2	*2462.00	98.0 AV			1.00 V	257	66.70	31.30
3	2483.50	60.4 PK	74.0	-13.6	1.00 V	253	29.00	31.40
4	2483.50	48.8 AV	54.0	-5.2	1.00 V	253	17.40	31.40
5	4924.00	46.8 PK	74.0	-27.2	1.23 V	20	41.60	5.20
6	4924.00	32.5 AV	54.0	-21.5	1.23 V	20	27.30	5.20

REMARKS:

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

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 69%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.4 PK	74.0	-4.6	1.03 H	346	38.40	31.00
2	2390.00	52.3 AV	54.0	-1.7	1.03 H	346	21.30	31.00
3	*2422.00	110.4 PK			1.00 H	354	79.20	31.20
4	*2422.00	100.7 AV			1.00 H	354	69.50	31.20
5	4844.00	47.7 PK	74.0	-26.3	1.15 H	20	42.70	5.00
6	4844.00	33.4 AV	54.0	-20.6	1.15 H	20	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	63.4 PK	74.0	-10.6	1.02 V	263	32.40	31.00
2	2390.00	50.0 AV	54.0	-4.0	1.02 V	263	19.00	31.00
3	*2422.00	103.5 PK			1.55 V	260	72.30	31.20
4	*2422.00	94.7 AV			1.55 V	260	63.50	31.20
5	4844.00	46.2 PK	74.0	-27.8	1.15 V	23	41.20	5.00
6	4844.00	32.4 AV	54.0	-21.6	1.15 V	23	27.40	5.00

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 69%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.1 PK	74.0	-4.9	1.00 H	354	38.10	31.00
2	2390.00	52.9 AV	54.0	-1.1	1.00 H	354	21.90	31.00
3	*2437.00	80.7 PK			1.00 H	354	82.90	-2.20
4	*2437.00	71.8 AV			1.00 H	354	74.00	-2.20
5	2483.50	66.7 PK	74.0	-7.3	1.02 H	181	35.30	31.40
6	2483.50	51.6 AV	54.0	-2.4	1.02 H	181	20.20	31.40
7	4874.00	47.6 PK	74.0	-26.4	1.35 H	98	42.60	5.00
8	4874.00	33.7 AV	54.0	-20.3	1.35 H	98	28.70	5.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.0 PK	74.0	-15.0	1.60 V	254	28.00	31.00
2	2390.00	47.3 AV	54.0	-6.7	1.60 V	254	16.30	31.00
3	*2437.00	108.6 PK			1.53 V	260	77.40	31.20
4	*2437.00	99.1 AV			1.53 V	260	67.90	31.20
5	2483.50	61.8 PK	74.0	-12.2	1.00 V	258	30.40	31.40
6	2483.50	48.0 AV	54.0	-6.0	1.00 V	258	16.60	31.40
7	4874.00	46.6 PK	74.0	-27.4	1.15 V	203	41.60	5.00
8	4874.00	33.4 AV	54.0	-20.6	1.15 V	203	28.40	5.00

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 9	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 69%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	111.3 PK			1.00 H	349	80.00	31.30
2	*2452.00	101.5 AV			1.00 H	349	70.20	31.30
3	2483.50	71.6 PK	74.0	-2.4	1.12 H	355	40.20	31.40
4	**2483.50**	**53.0 AV**	**54.0**	**-1.0**	**1.12 H**	**355**	**21.60**	**31.40**
5	4904.00	48.1 PK	74.0	-25.9	1.00 H	297	43.00	5.10
6	4904.00	33.8 AV	54.0	-20.2	1.00 H	297	28.70	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	104.4 PK			1.52 V	80	73.10	31.30
2	*2452.00	94.2 AV			1.52 V	80	62.90	31.30
3	2483.50	66.0 PK	74.0	-8.0	1.00 V	289	34.60	31.40
4	2483.50	50.9 AV	54.0	-3.1	1.00 V	289	19.50	31.40
5	4904.00	47.4 PK	74.0	-26.6	1.00 V	23	42.30	5.10
6	4904.00	33.3 AV	54.0	-20.7	1.00 V	23	28.20	5.10

REMARKS:

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

BELOW 1GHz WORST-CASE DATA：802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	27deg. C, 66%RH	TESTED BY	Martin Lee

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	121.10	41.9 QP	43.5	-1.6	1.05 H	265	58.40	-16.50
2	128.86	39.0 QP	43.5	-4.5	1.50 H	270	54.80	-15.80
3	171.55	39.8 QP	43.5	-3.7	1.50 H	265	54.40	-14.60
4	249.17	34.4 QP	46.0	-11.6	2.00 H	117	49.00	-14.60
5	375.29	34.8 QP	46.0	-11.2	1.26 H	222	46.20	-11.40
6	625.60	39.5 QP	46.0	-6.5	1.75 H	28	46.10	-6.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	51.24	35.6 QP	40.0	-4.4	1.50 V	347	50.10	-14.50
2	119.16	39.6 QP	43.5	-3.9	1.00 V	321	56.20	-16.60
3	375.29	36.5 QP	46.0	-9.5	1.75 V	3	47.90	-11.40
4	625.60	33.6 QP	46.0	-12.4	1.00 V	271	40.20	-6.60
5	749.79	32.4 QP	46.0	-13.6	2.04 V	69	36.70	-4.30
6	901.14	35.8 QP	46.0	-10.2	1.00 V	214	37.80	-2.00

REMARKS:

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

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

Tested date: Aug. 16, 2013

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 16, 2012	Nov. 15, 2013
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 28, 2012	Dec. 27, 2013
V-LISN SCHWARZBECK (Peripheral)	NNBL 8226-2	8226-142	Jun. 27, 2013	Jun. 26, 2014
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 04, 2013	Feb. 03, 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 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.

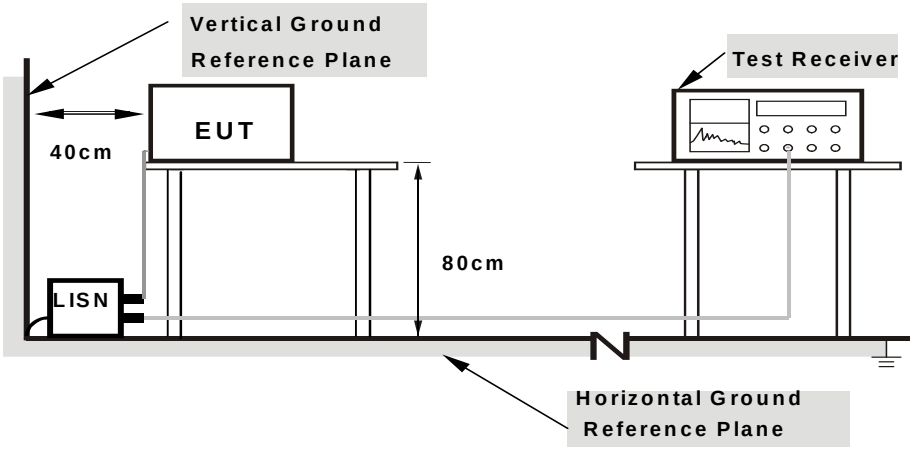
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

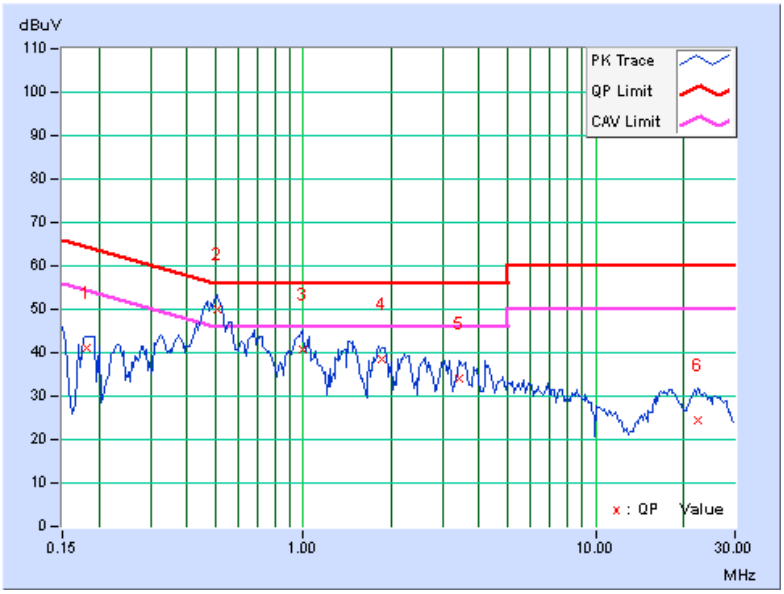
CONDUCTED WORST-CASE DATA：802.11b

PHASE	Line 1	6dB BANDWIDTH	9kHz

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	0.18125	0.16	41.13	35.53	41.29	35.69	64.43	54.43	-23.14	-18.74
2	**0.50547**	**0.23**	**49.85**	**43.09**	**50.08**	**43.32**	**56.00**	**46.00**	**-5.92**	**-2.68**
3	0.98984	0.25	40.39	33.63	40.64	33.88	56.00	46.00	-15.36	-12.12
4	1.85938	0.28	38.32	32.70	38.60	32.98	56.00	46.00	-17.40	-13.02
5	3.42578	0.37	33.58	27.64	33.95	28.01	56.00	46.00	-22.05	-17.99
6	22.25781	1.34	22.95	15.06	24.29	16.40	60.00	50.00	-35.71	-33.60

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

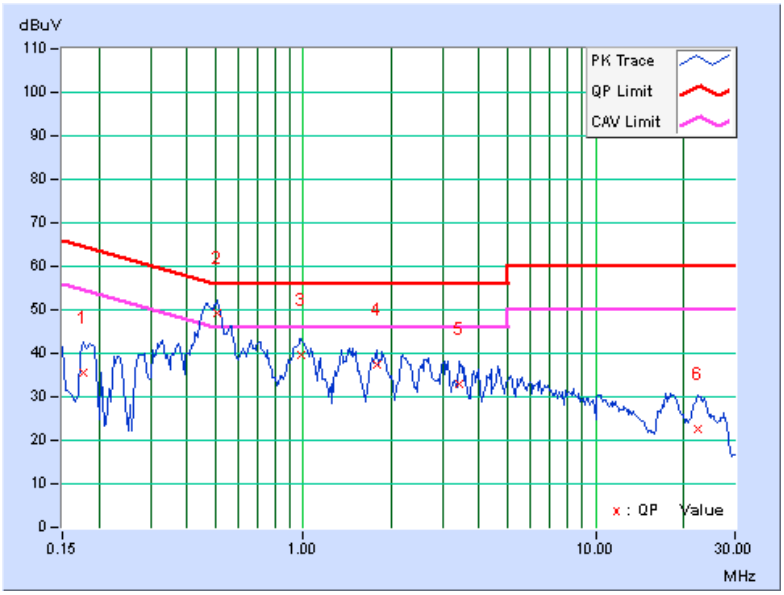


PHASE	Line 2	6dB BANDWIDTH	9kHz

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	0.17734	0.17	35.33	24.42	35.50	24.59	64.61	54.61	-29.11	-30.02
2	0.50547	0.24	49.00	42.12	49.24	42.36	56.00	46.00	-6.76	-3.64
3	0.98594	0.25	39.24	32.59	39.49	32.84	56.00	46.00	-16.51	-13.16
4	1.78516	0.27	37.23	31.10	37.50	31.37	56.00	46.00	-18.50	-14.63
5	3.39844	0.35	32.67	26.75	33.02	27.10	56.00	46.00	-22.98	-18.90
6	22.26953	1.01	21.50	13.74	22.51	14.75	60.00	50.00	-37.49	-35.25

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

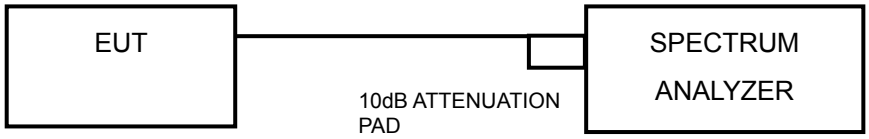


4.3 6dB BANDWIDTH MEASUREMENT

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	6.54	6.57	6.07	0.5	PASS
6	2437	6.07	6.08	6.04	0.5	PASS
11	2462	6.05	6.06	6.06	0.5	PASS

802.11g

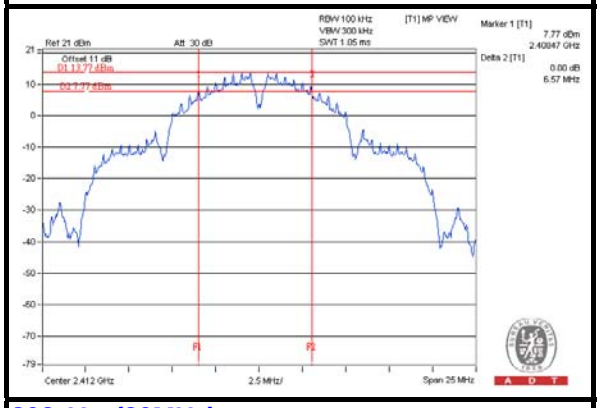
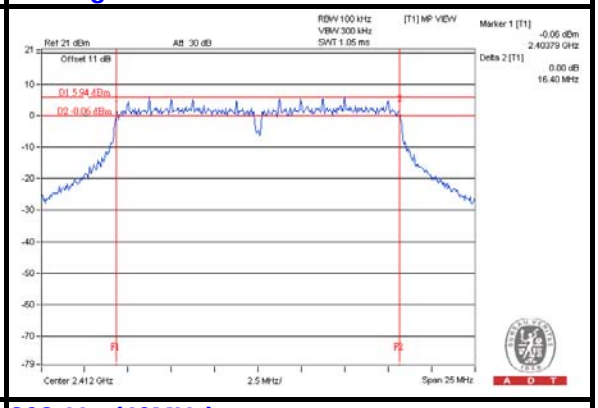
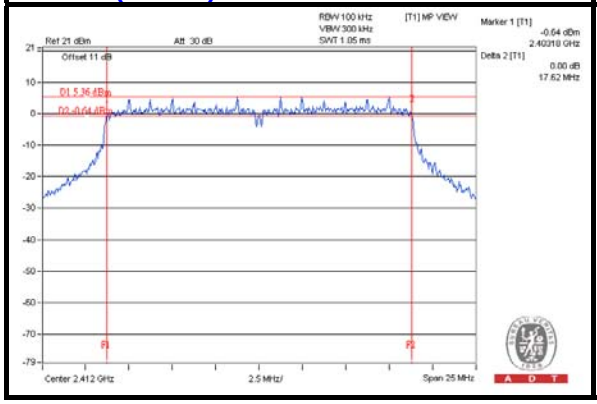
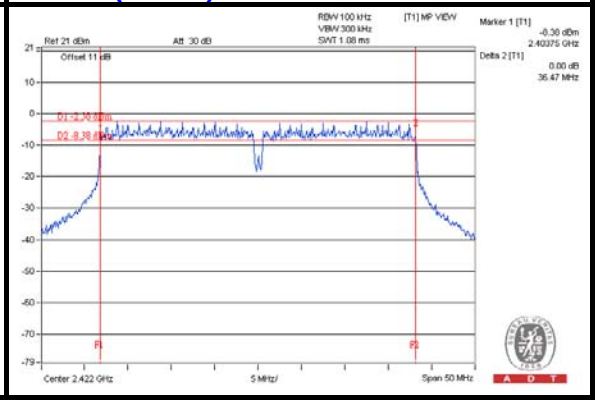
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	16.40	16.38	16.40	0.5	PASS
6	2437	16.34	16.36	16.35	0.5	PASS
11	2462	16.35	16.35	16.37	0.5	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	17.62	17.59	17.59	0.5	PASS
6	2437	17.57	17.58	17.57	0.5	PASS
11	2462	17.58	17.58	17.58	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	35.87	36.47	36.46	0.5	PASS
6	2437	35.70	36.43	36.44	0.5	PASS
9	2452	35.50	36.44	36.43	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

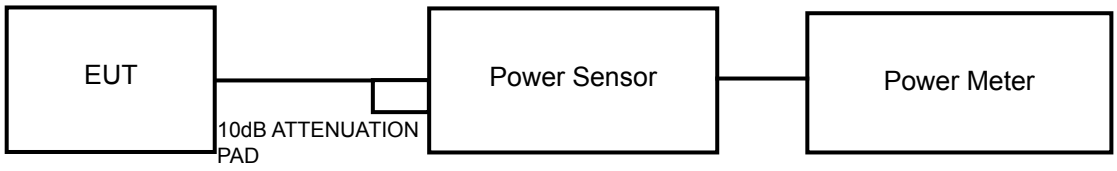
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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 20MHz 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

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	22.73	21.30	20.53	435.375	26.39	30	PASS
6	2437	25.04	23.89	24.02	**816.408**	29.12	30	PASS
11	2462	22.88	21.45	21.64	479.607	26.81	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	16.90	15.08	14.17	107.311	20.31	30	PASS
6	2437	24.51	22.90	23.01	677.458	28.31	30	PASS
11	2462	18.51	17.07	16.89	170.756	22.32	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	16.67	15.33	14.74	110.356	20.43	30	PASS
6	2437	24.48	22.84	23.11	677.496	28.31	30	PASS
11	2462	16.42	15.07	15.34	110.188	20.42	30	PASS

802.11n (40MHz)

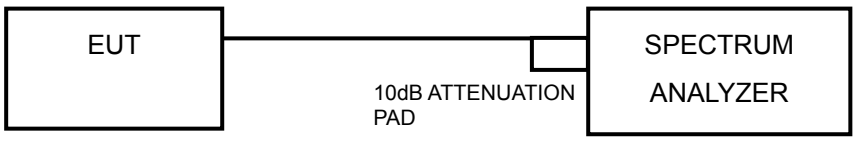
CHAN.	CHAN. FREQ. (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
3	2422	14.34	12.51	11.51	59.146	17.72	30	PASS
6	2437	18.71	16.48	16.65	165.003	22.17	30	PASS
9	2452	14.44	12.79	13.30	68.188	18.34	30	PASS

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 the RBW = 3 kHz, VBW =10 kHz, Detector = peak.
b. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
c. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.5.7 TEST RESULTS

802.11b

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-7.67	4.77	-2.90	4.23	PASS
	6	2437	-3.90	4.77	0.87	4.23	PASS
	11	2462	-7.30	4.77	-2.53	4.23	PASS
1	1	2412	-9.08	4.77	-4.31	4.23	PASS
	6	2437	-7.16	4.77	-2.39	4.23	PASS
	11	2462	-8.63	4.77	-3.86	4.23	PASS
2	1	2412	-10.33	4.77	-5.56	4.23	PASS
	6	2437	-6.69	4.77	-1.92	4.23	PASS
	11	2462	-9.29	4.77	-4.52	4.23	PASS

NOTE: Directional gain = 5dBi + 10log(3) = 9.77dBi > 6dBi , so the power density limit shall be reduced to 8-(9.77-6) = 4.23dBm.

802.11g

TX chain	Chan.	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD W/O DUTY FACTOR (dBm/3kHz)	DUTY FACTOR	Total PSD WITH DUTY FACTOR (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-17.47	4.77	-12.70	0.12	-12.58	4.23	PASS
	6	2437	-10.13	4.77	-5.36	0.12	-5.24	4.23	PASS
	11	2462	-16.17	4.77	-11.40	0.12	-11.28	4.23	PASS
1	1	2412	-13.13	4.77	-8.36	0.12	-8.24	4.23	PASS
	6	2437	-12.36	4.77	-7.59	0.12	-7.47	4.23	PASS
	11	2462	-17.20	4.77	-12.43	0.12	-12.31	4.23	PASS
2	1	2412	-20.85	4.77	-16.08	0.12	-15.96	4.23	PASS
	6	2437	-12.16	4.77	-7.39	0.12	-7.27	4.23	PASS
	11	2462	-18.04	4.77	-13.27	0.12	-13.15	4.23	PASS

NOTE: Directional gain = 5dBi + 10log(3) = 9.77dBi > 6dBi , so the power density limit shall be reduced to 8-(9.77-6) = 4.23dBm.

802.11n (20MHz)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD W/O DUTY FACTOR (dBm/3kHz)	DUTY FACTOR	Total PSD WITH DUTY FACTOR (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-13.68	4.77	-8.91	0.11	-8.80	8	PASS
	6	2437	-10.25	4.77	-5.48	0.11	-5.37	8	PASS
	11	2462	-14.37	4.77	-9.60	0.11	-9.49	8	PASS
1	1	2412	-16.55	4.77	-11.78	0.11	-11.67	8	PASS
	6	2437	-12.49	4.77	-7.72	0.11	-7.61	8	PASS
	11	2462	-12.97	4.77	-8.20	0.11	-8.09	8	PASS
2	1	2412	-21.09	4.77	-16.32	0.11	-16.21	8	PASS
	6	2437	-12.49	4.77	-7.72	0.11	-7.61	8	PASS
	11	2462	-14.62	4.77	-9.85	0.11	-9.74	8	PASS

NOTE: 802.11n (20MHz)(MCS16~23 / Nss=3)

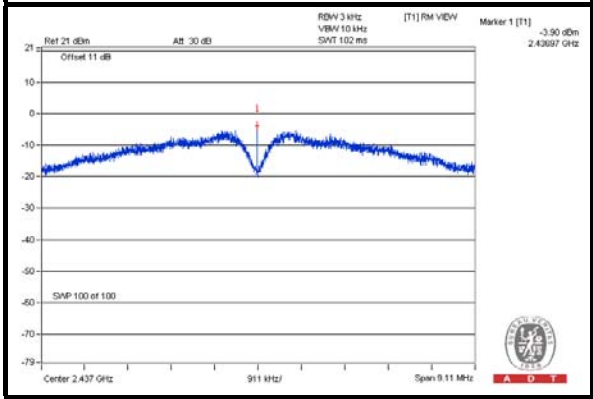
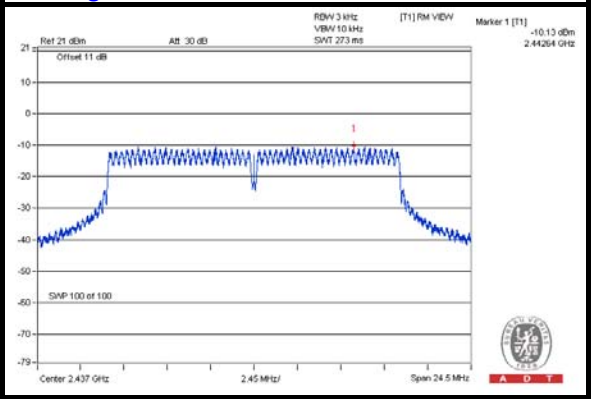
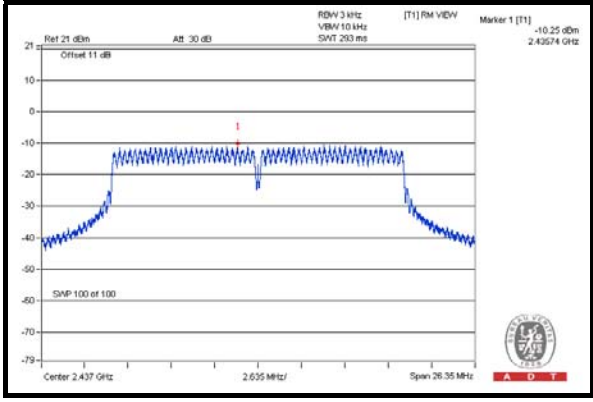
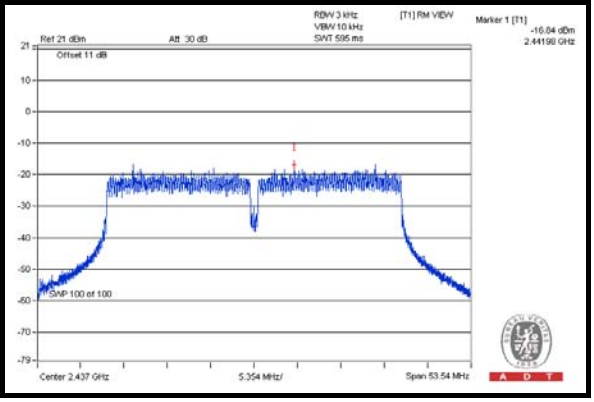
Directional gain = 5dBi + 10log(3/3) = 5dBi < 6dBi , so the power spectral density limit is not reduced.

802.11n (40MHz)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD W/O DUTY FACTOR (dBm/3kHz)	DUTY FACTOR	Total PSD WITH DUTY FACTOR (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	3	2422	-21.57	4.77	-16.80	0.44	-16.36	8	PASS
	6	2437	-16.84	4.77	-12.07	0.44	-11.63	8	PASS
	9	2452	-20.32	4.77	-15.55	0.44	-15.11	8	PASS
1	3	2422	-24.51	4.77	-19.74	0.44	-19.30	8	PASS
	6	2437	-20.03	4.77	-15.26	0.44	-14.82	8	PASS
	9	2452	-18.36	4.77	-13.59	0.44	-13.15	8	PASS
2	3	2422	-25.62	4.77	-20.85	0.44	-20.41	8	PASS
	6	2437	-19.35	4.77	-14.58	0.44	-14.14	8	PASS
	9	2452	-24.52	4.77	-19.75	0.44	-19.31	8	PASS

NOTE: 802.11n (40MHz)(MCS16~23 / Nss=3)

Directional gain = 5dBi + 10log(3/3) = 5dBi < 6dBi , so the power spectral density limit is not reduced.

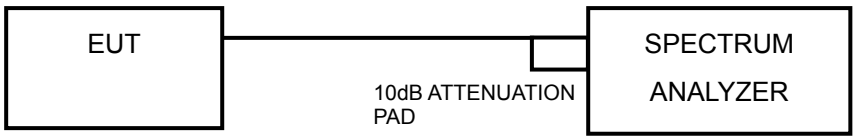
SPECTRUM PLOT OF WORST VALUE	
802.11b	802.11g
	
802.11n (20MHz)	802.11n (40MHz)
	

4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

Below -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. Ensure that the number of measurement points ≥ span/RBW
4. According to measurement points to set differ measurement span.
5. Detector = peak.
6. Trace Mode = max hold.
7. Sweep = auto couple.

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

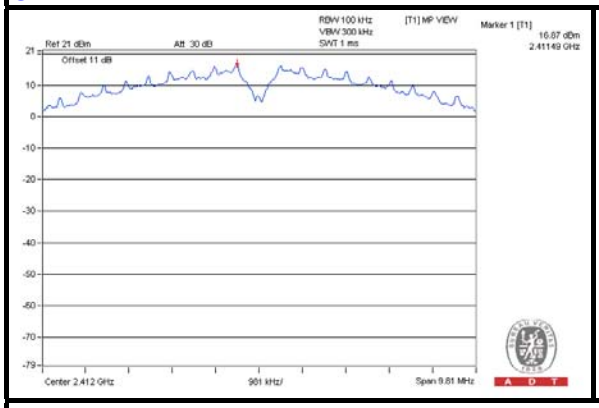
4.6.7 TEST RESULTS

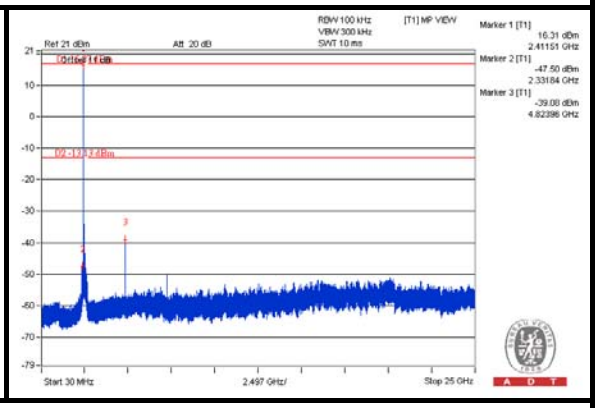
The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.

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.

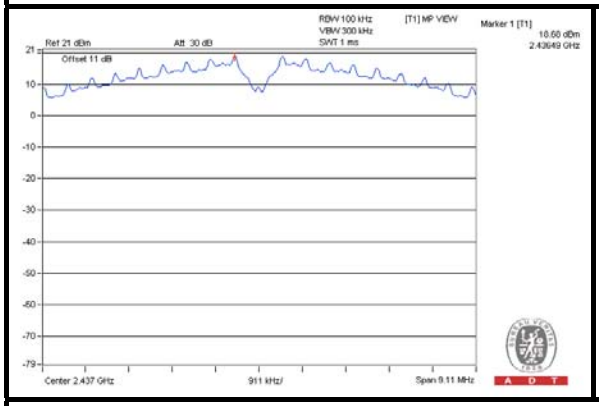
802.11b
CHAIN 0

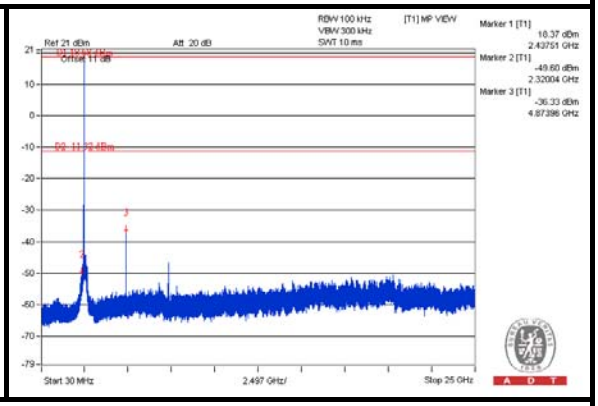
CH 1



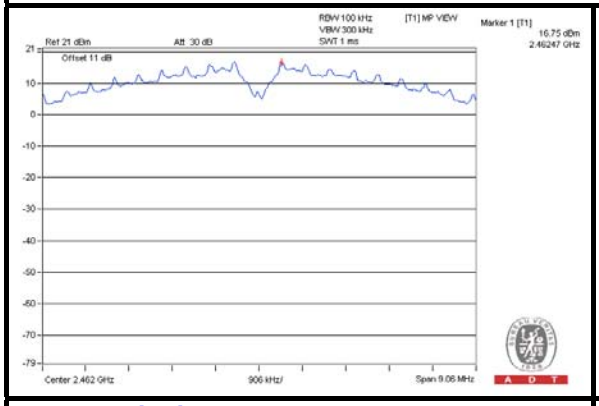


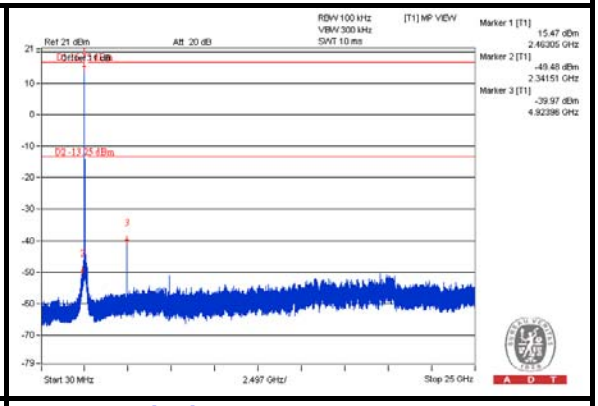
CH 6



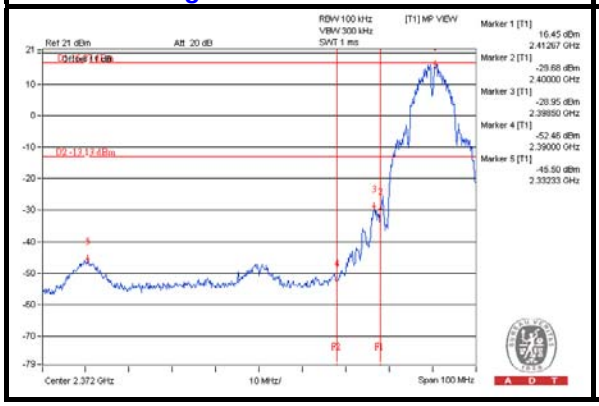


CH 11

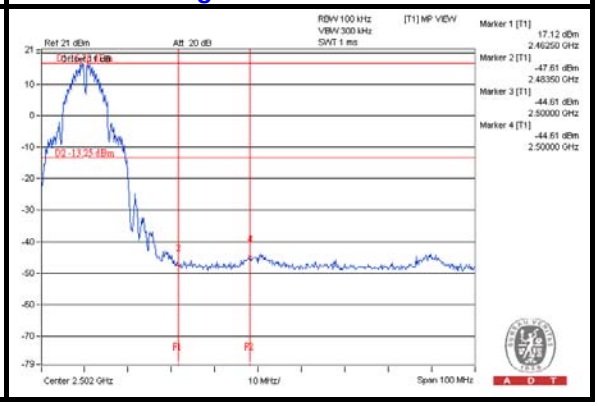




CH 1 Band edge

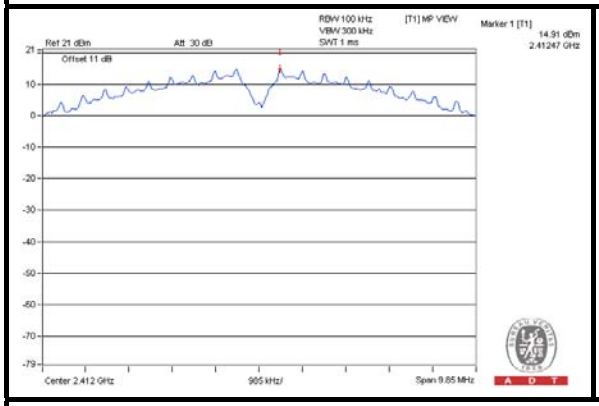


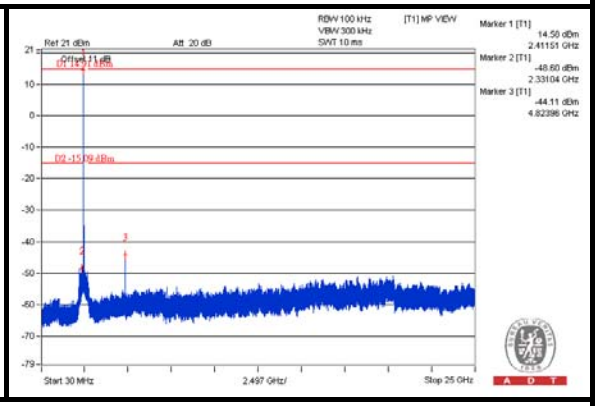
CH 11 Band edge



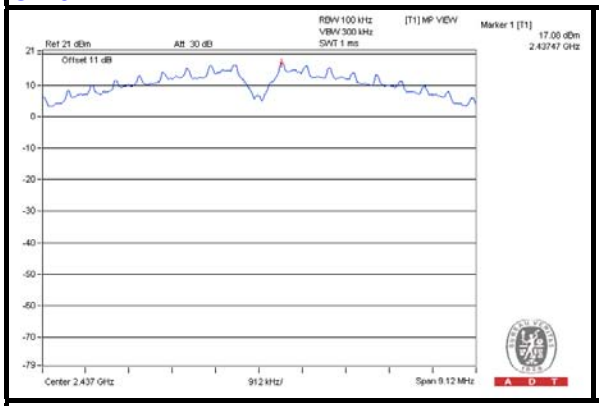
CHAIN 1

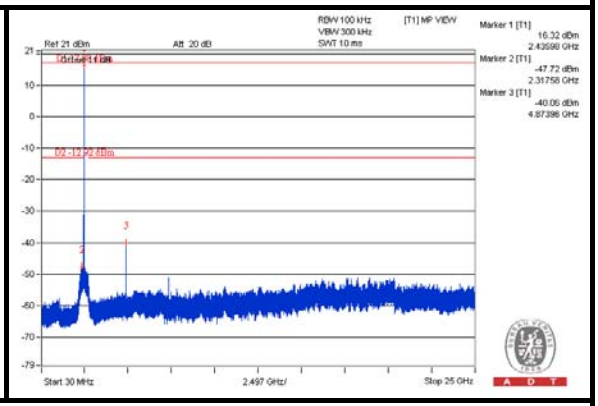
CH 1



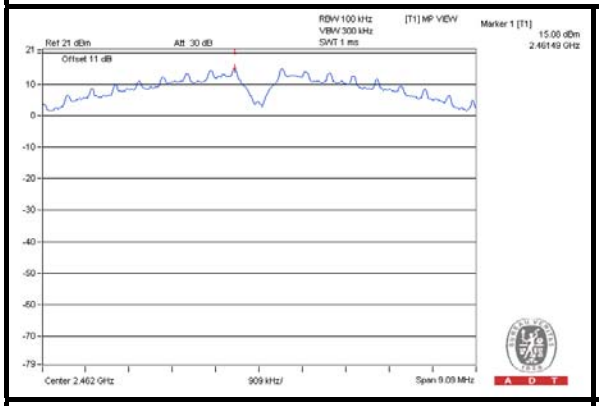


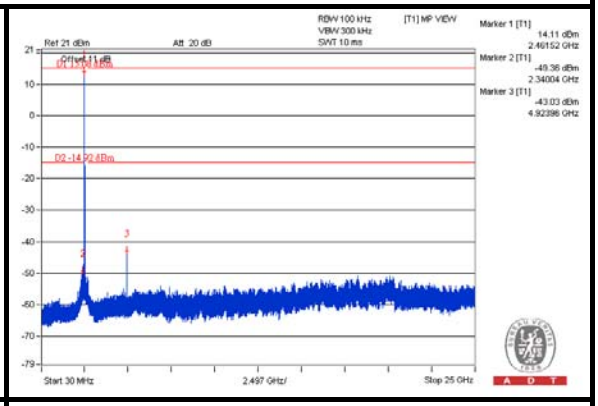
CH 6



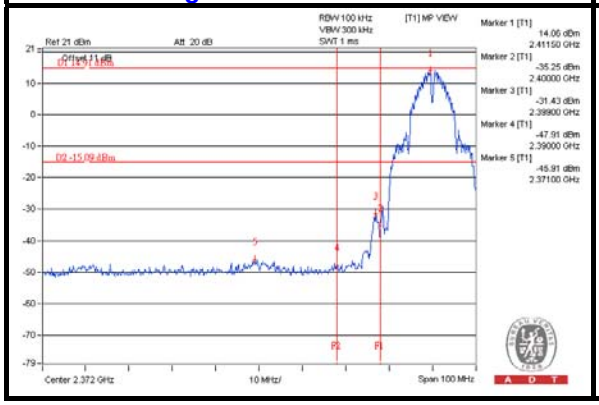


CH 11

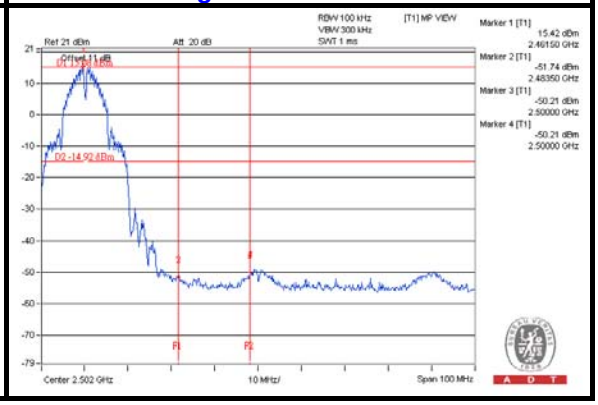




CH 1 Band edge

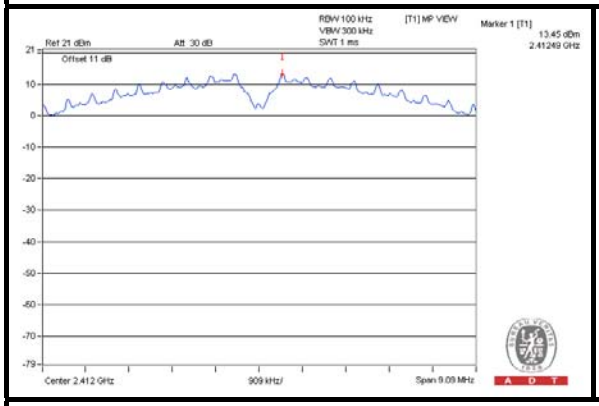


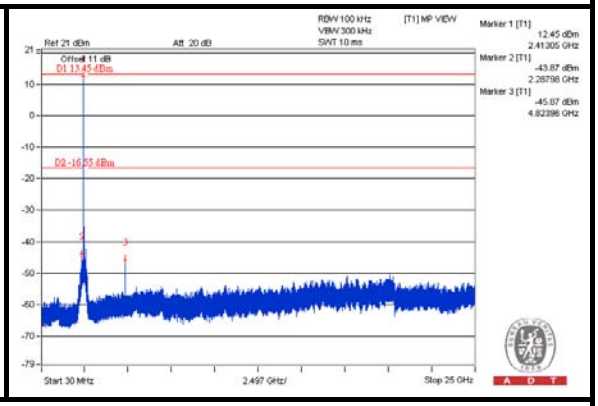
CH 11 Band edge



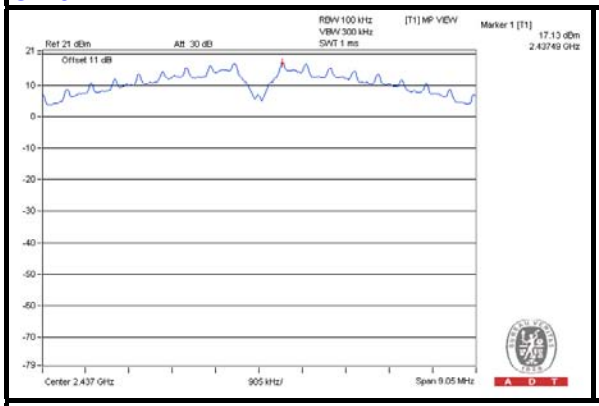
CHAIN 2

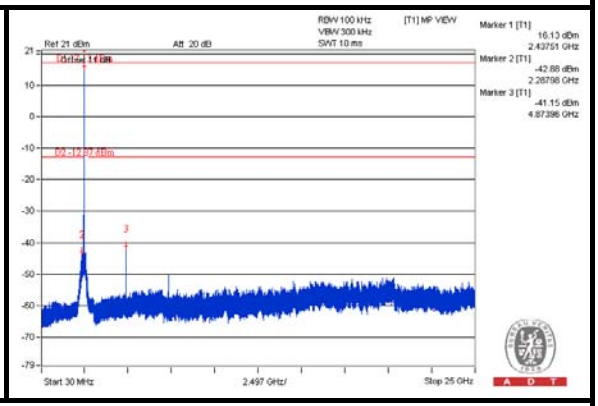
CH 1



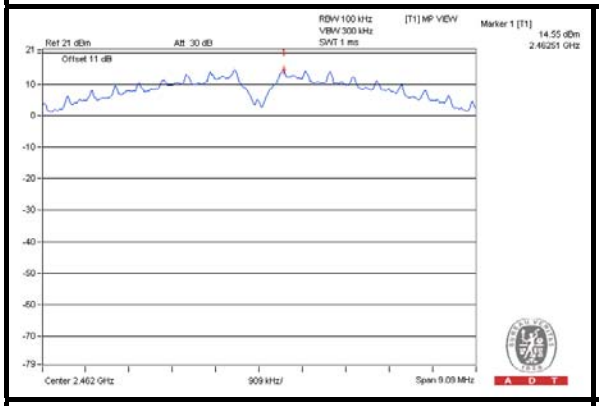


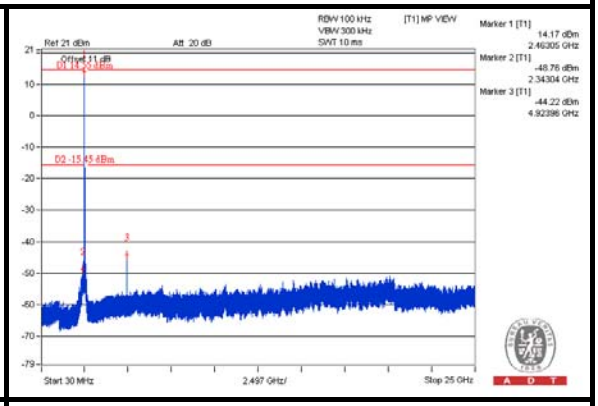
CH 6



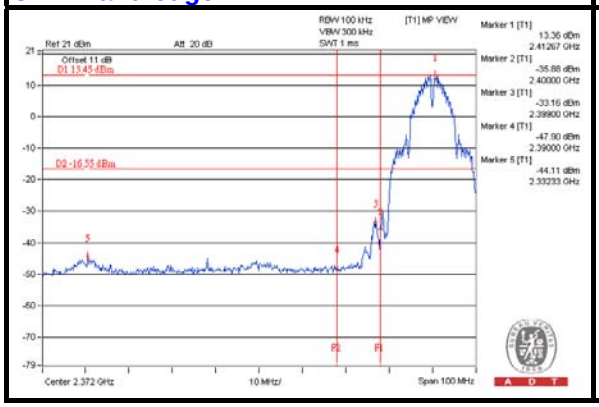


CH 11





CH 1 Band edge



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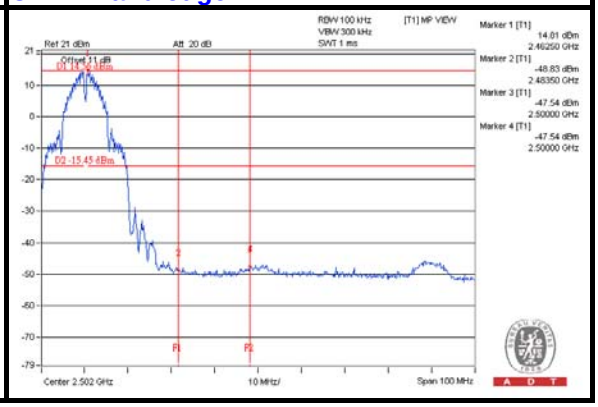

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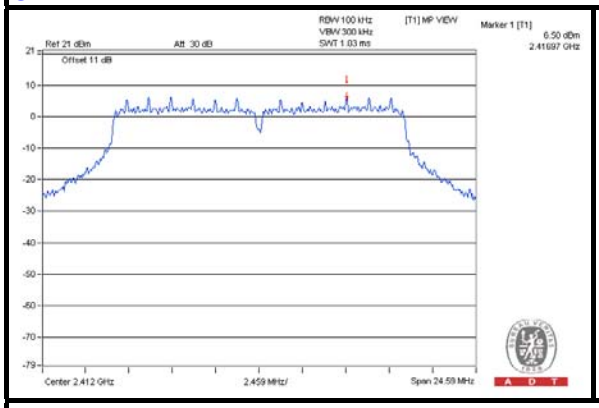
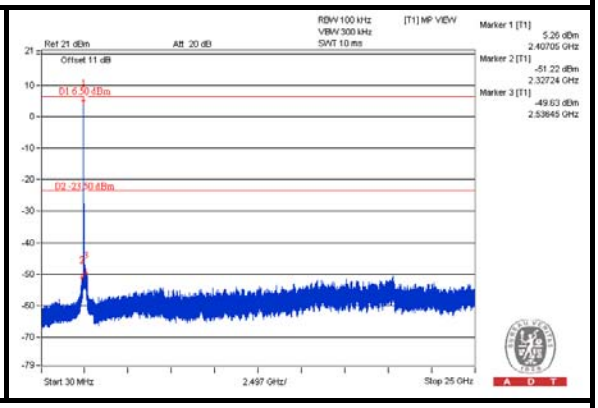
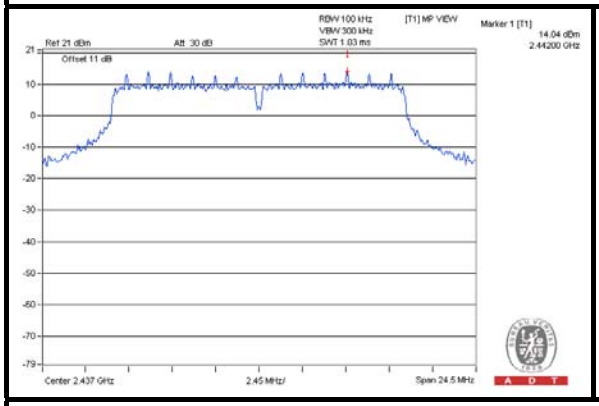
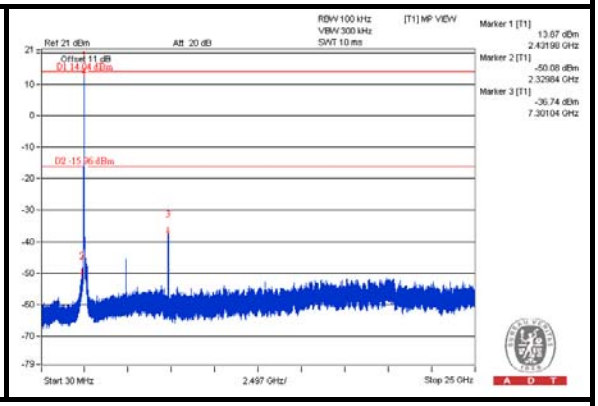
CH 1





CH 6





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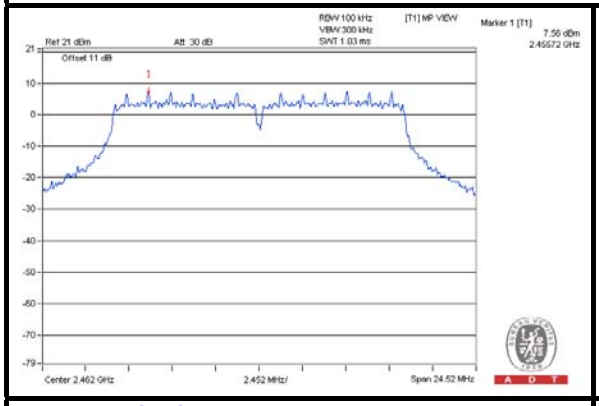
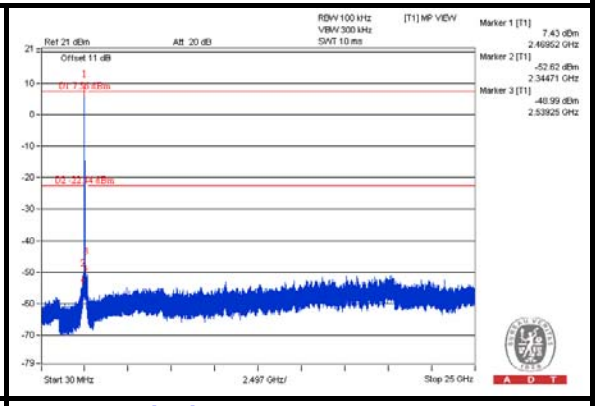
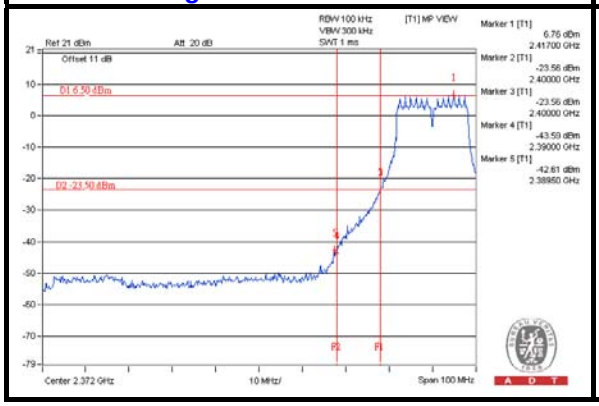
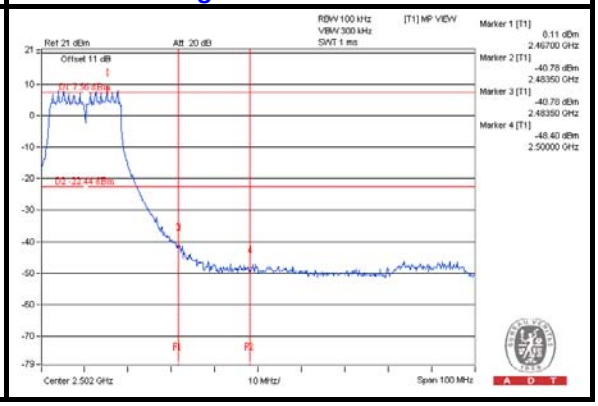




CH 1 Band edge

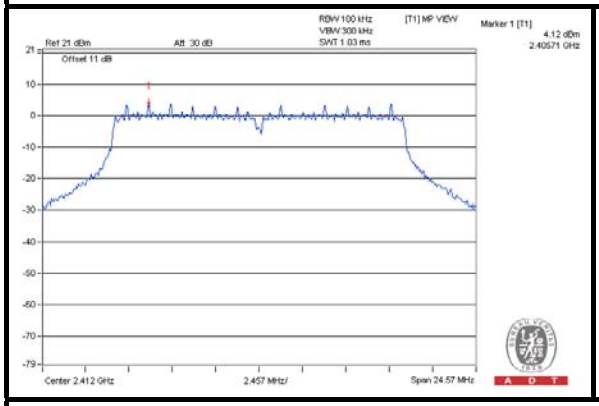


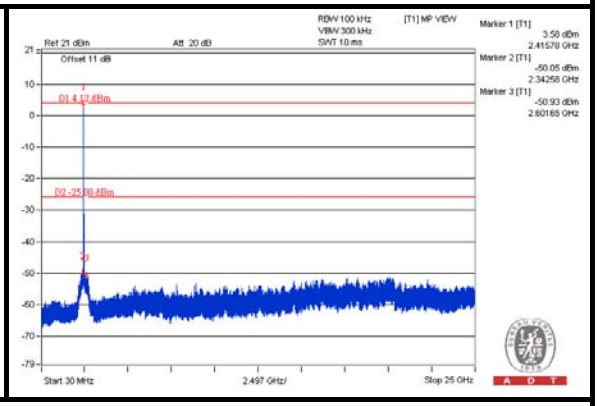
CH 11 Band edge



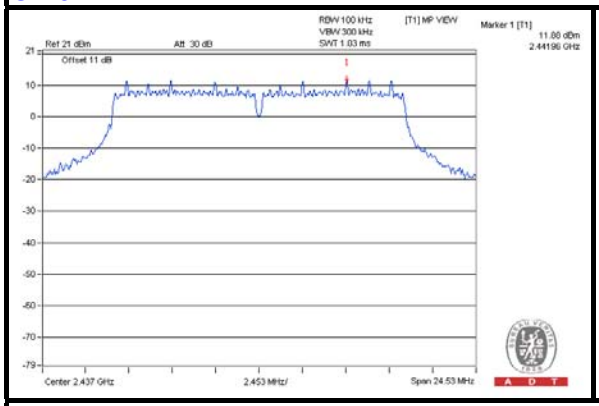
CHAIN 1

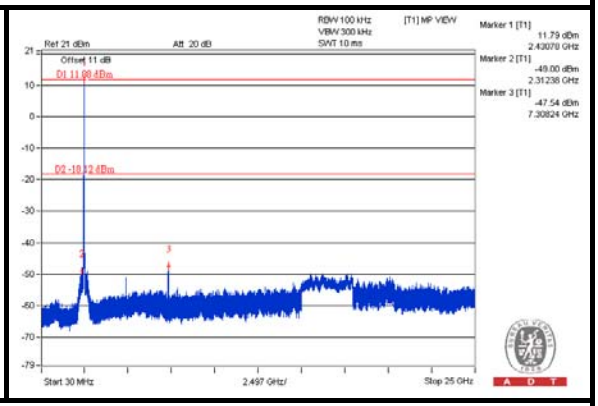
CH 1



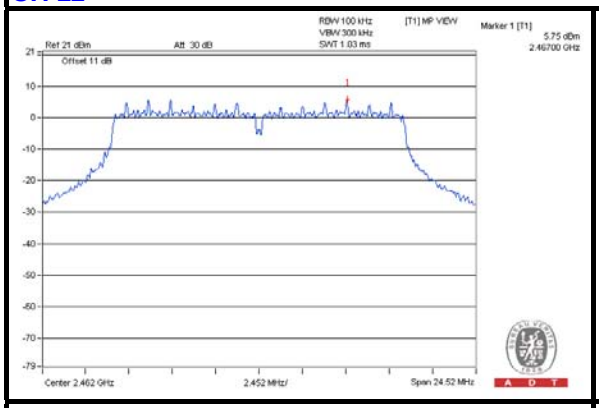


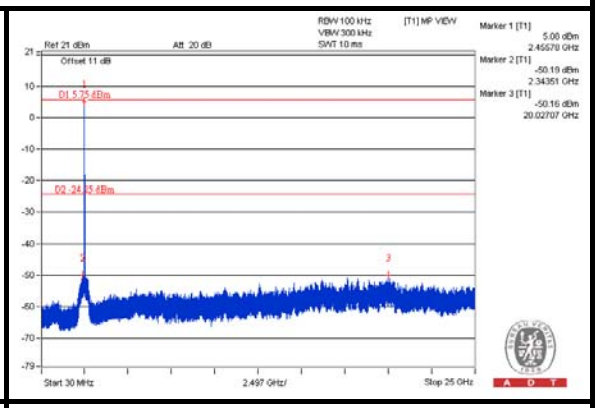
CH 6



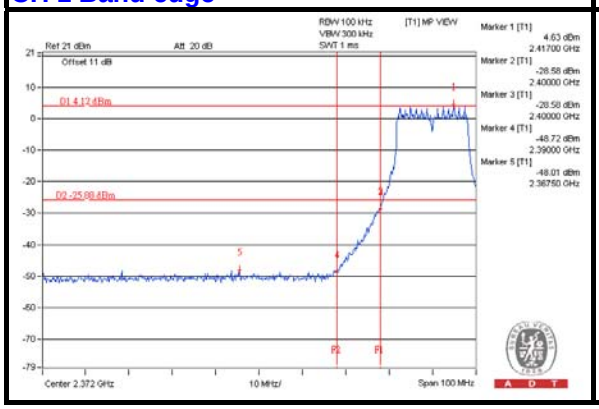


CH 11

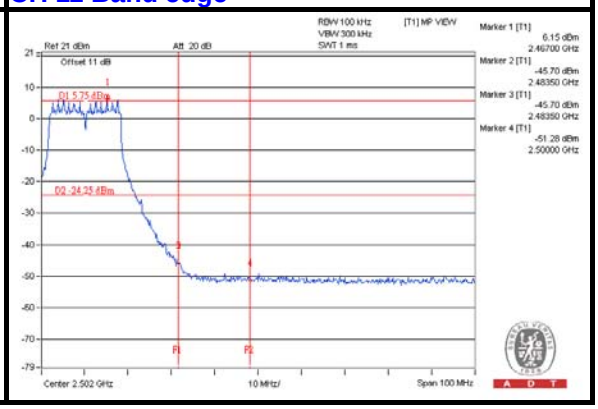




CH 1 Band edge

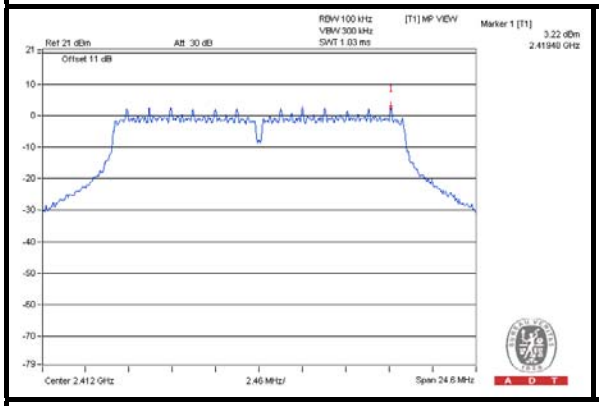


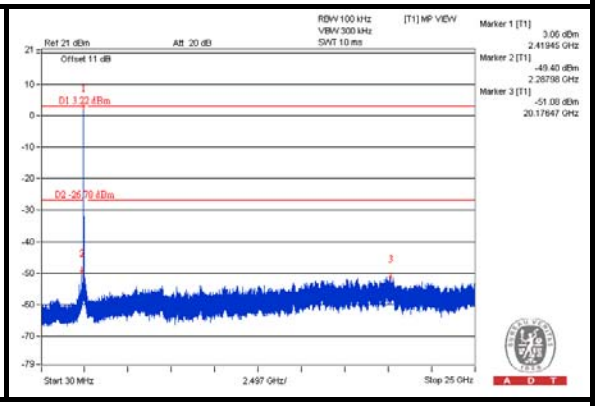
CH 11 Band edge



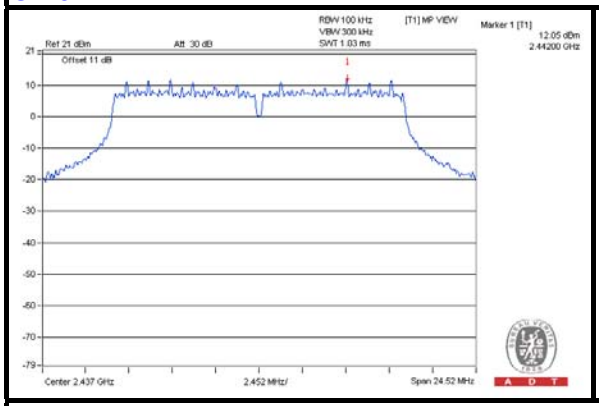
CHAIN 2

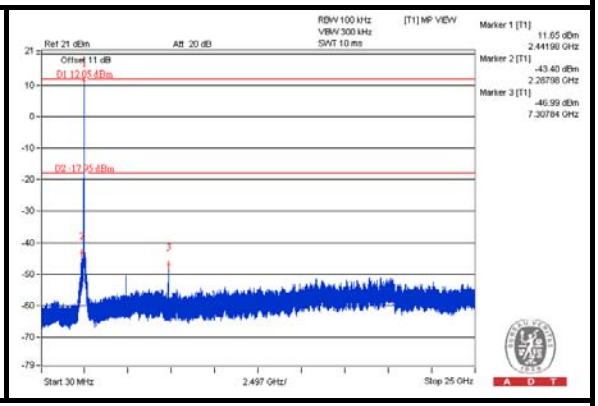
CH 1



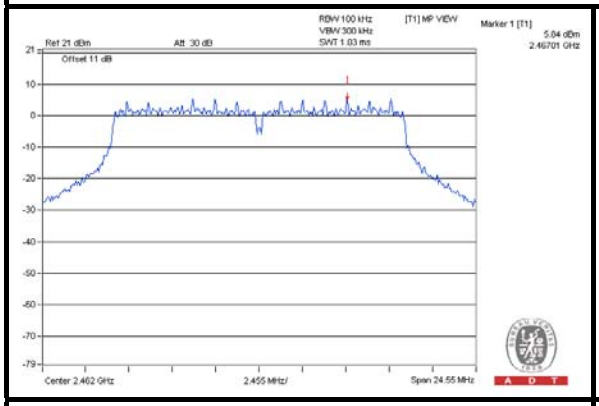


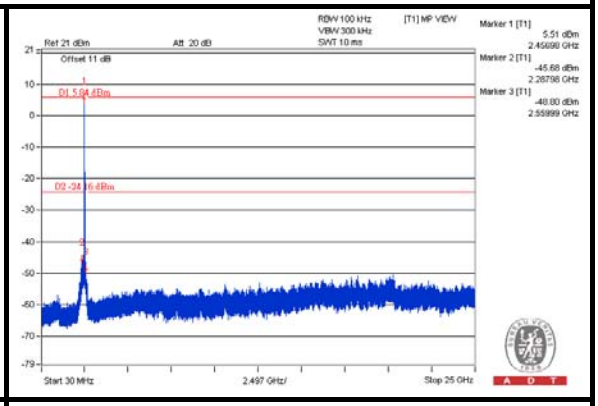
CH 6



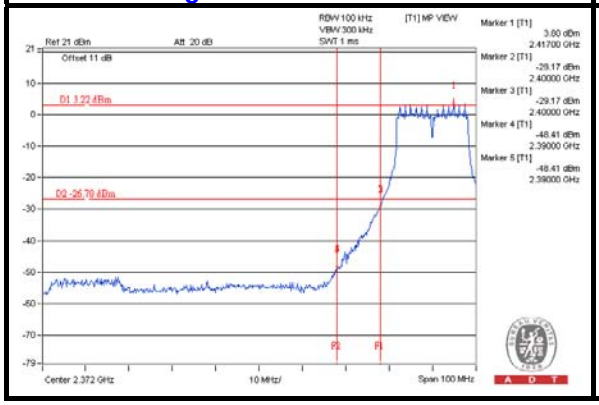


CH 11

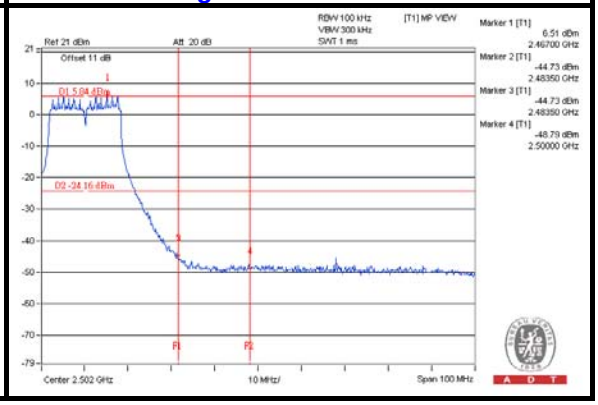




CH 1 Band edge



CH 11 Band edge



802.11n (20MHz)
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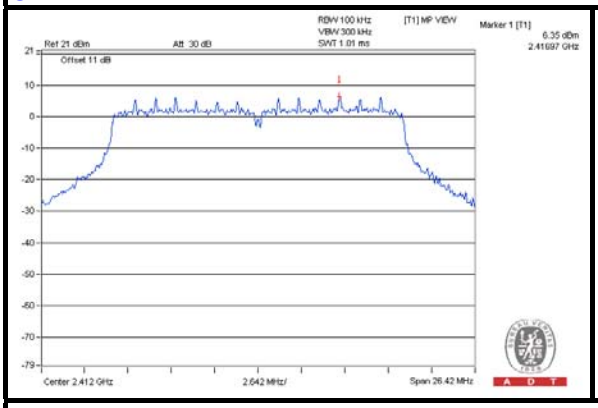
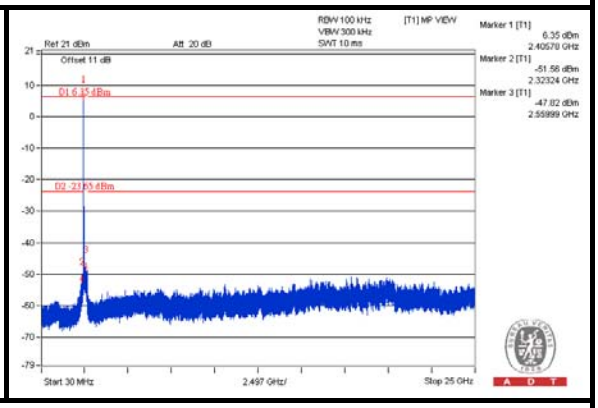
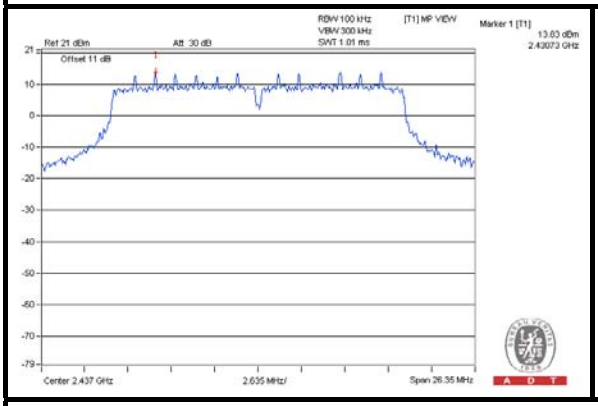
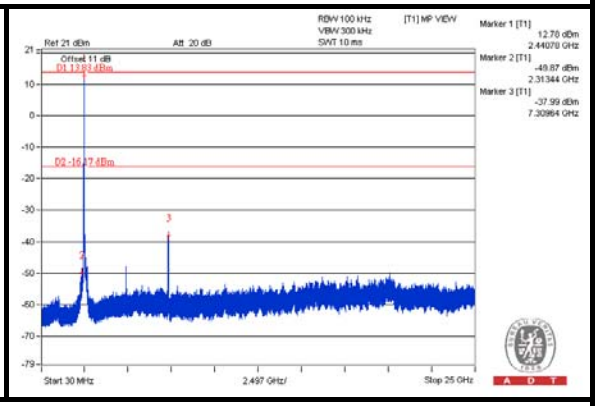


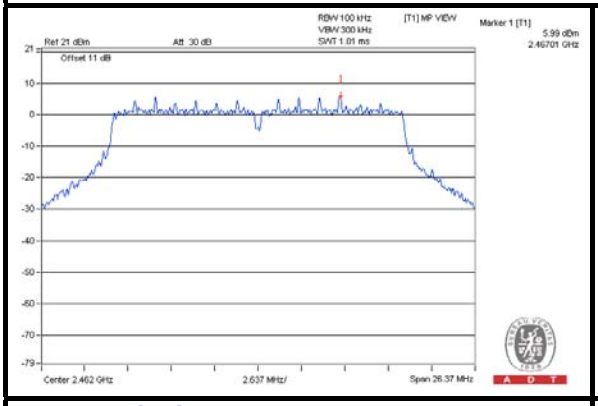


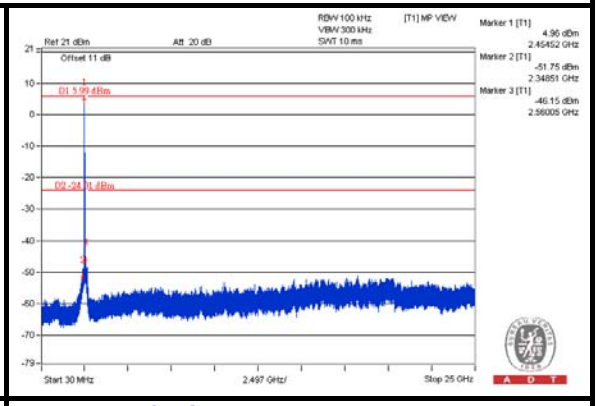
CH 6



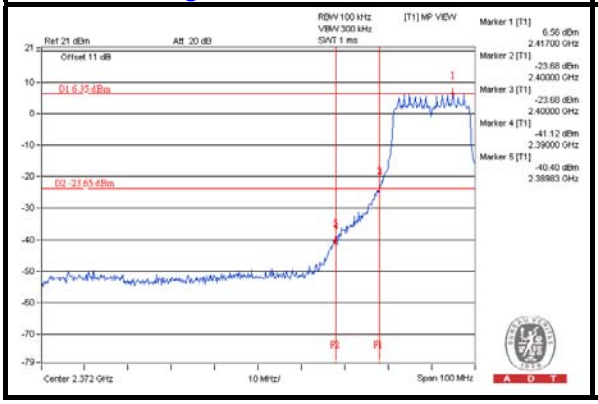


CH 11

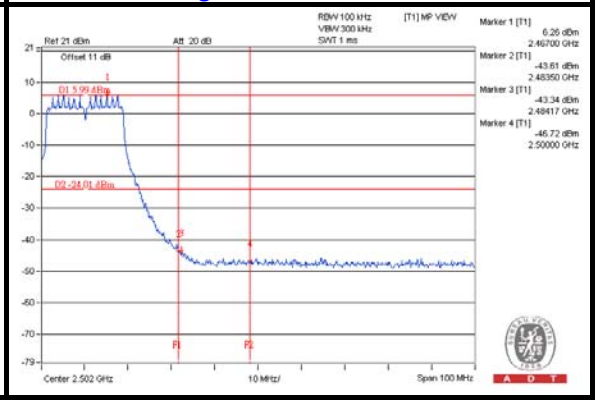




CH 1 Band edge

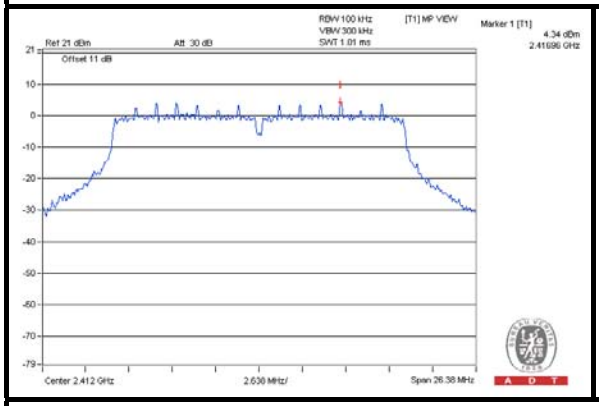


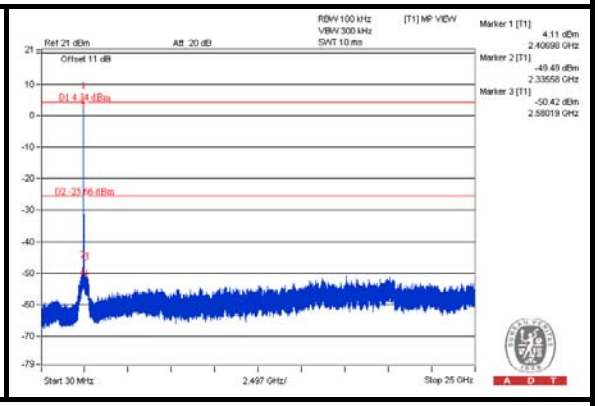
CH 11 Band edge



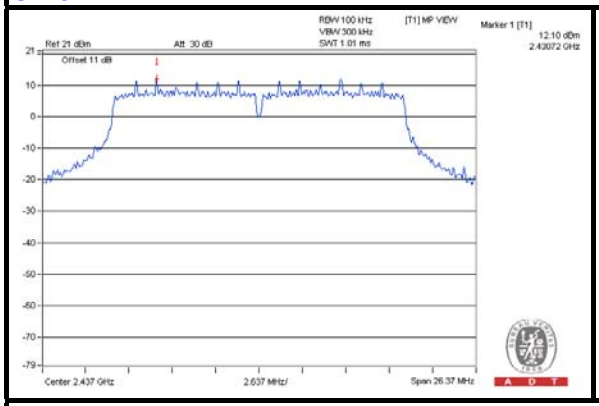
CHAIN 1

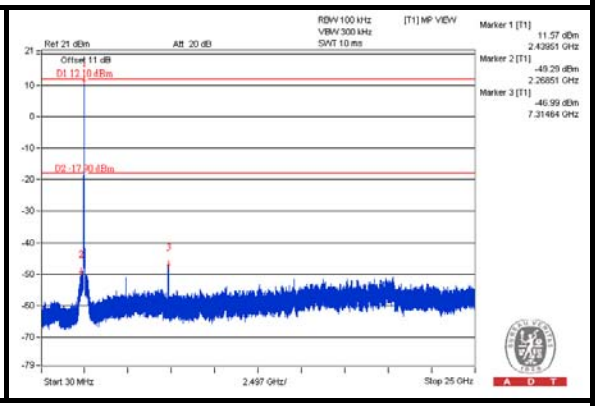
CH 1



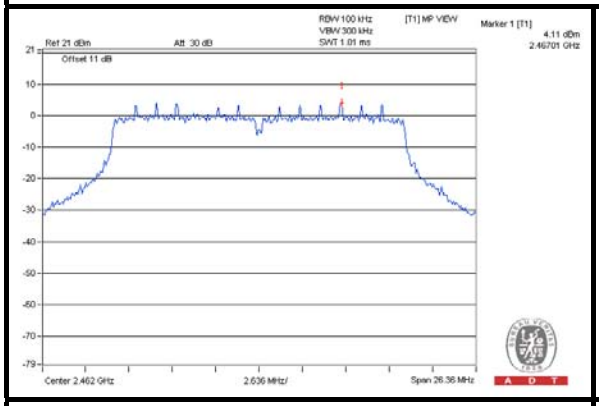


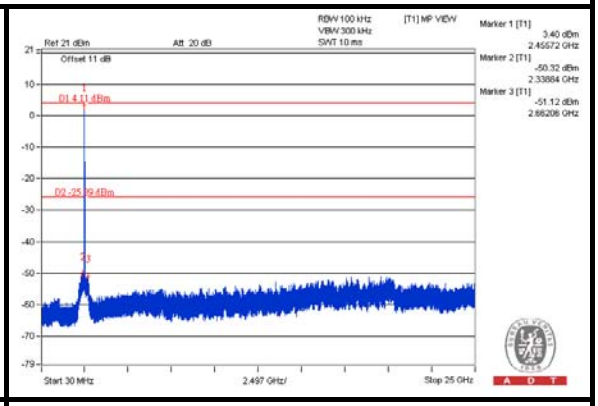
CH 6



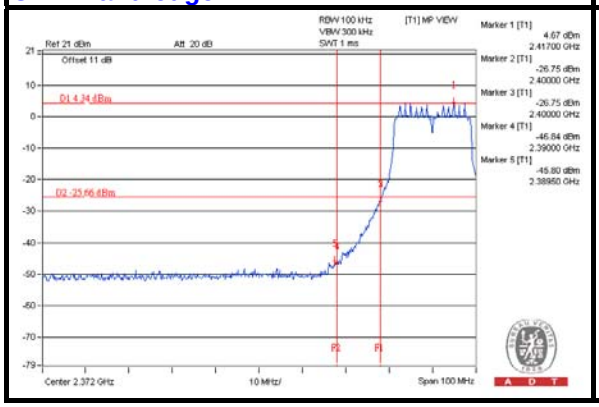


CH 11

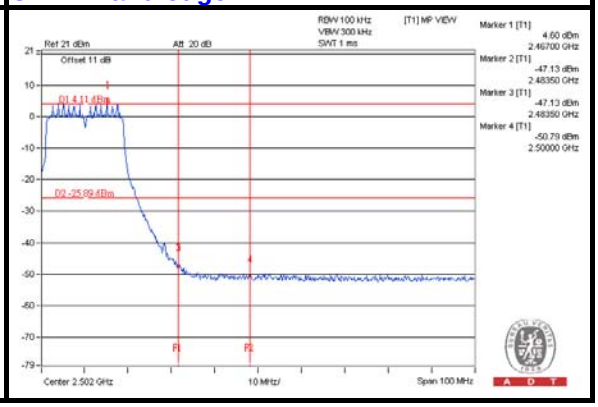




CH 1 Band edge

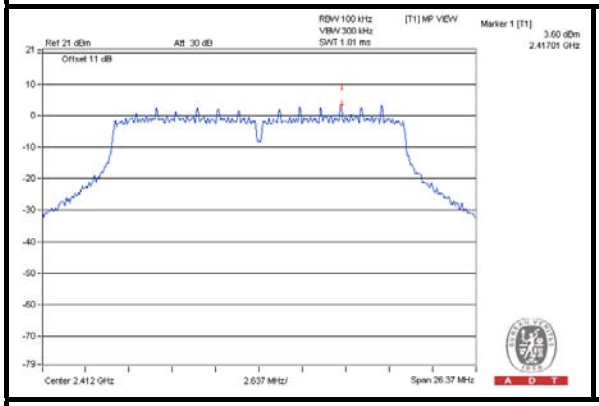


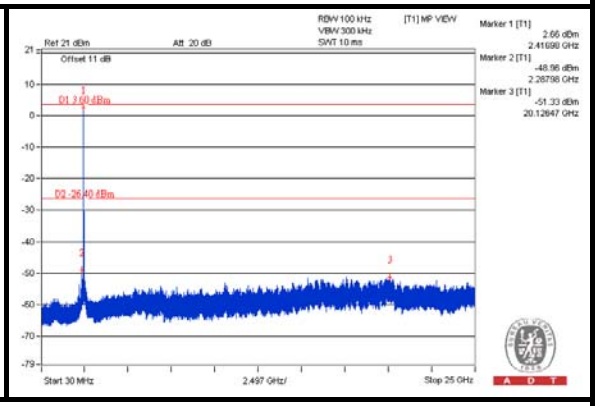
CH 11 Band edge



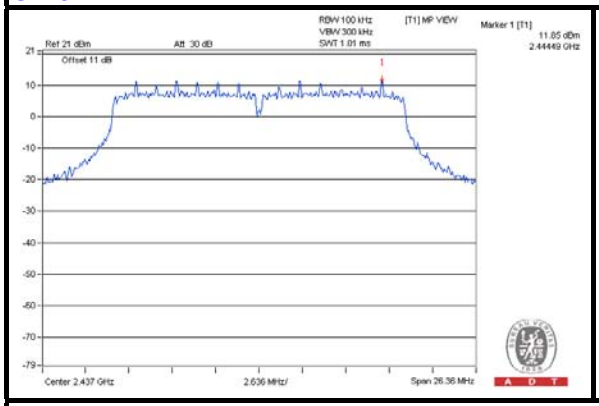
CHAIN 2

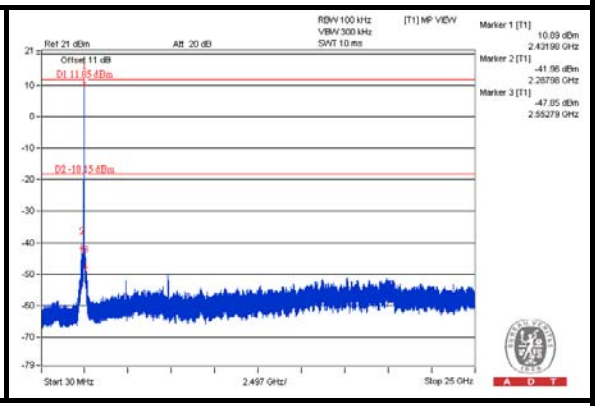
CH 1



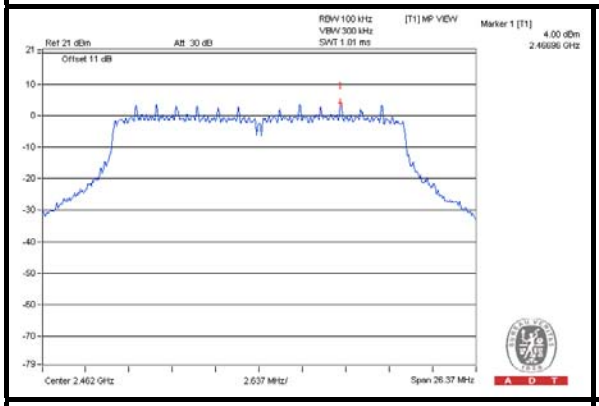


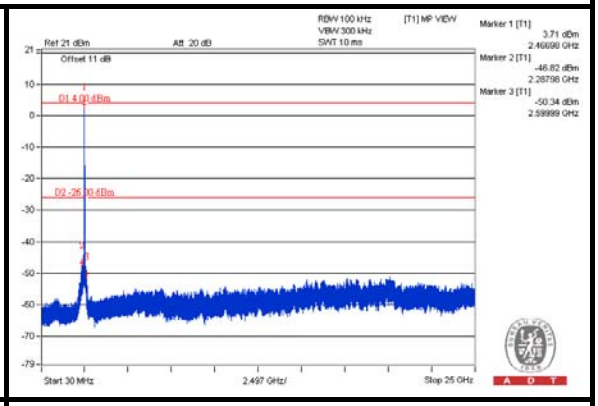
CH 6



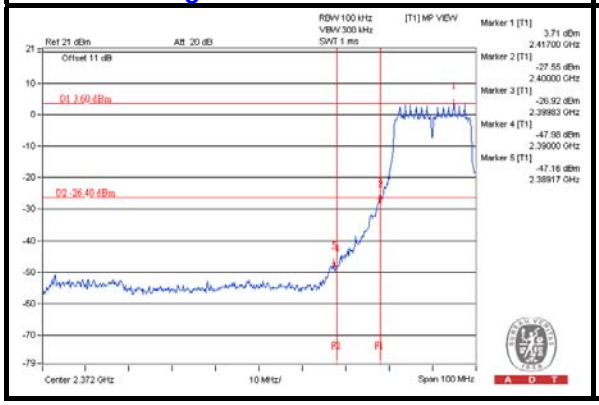


CH 11

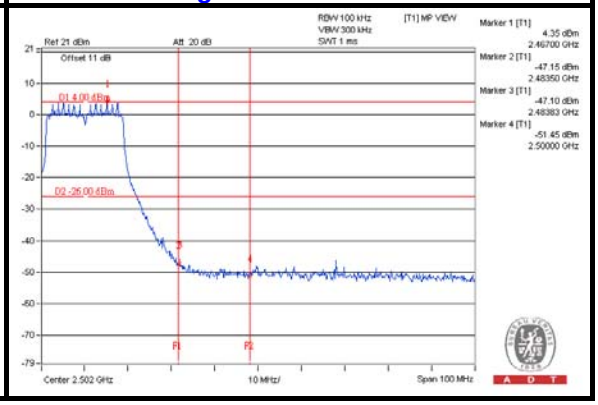




CH 1 Band edge

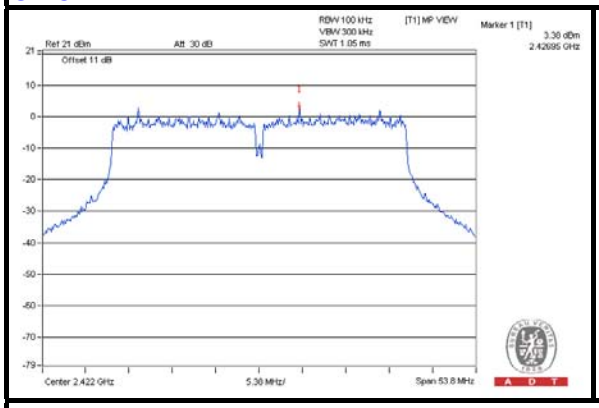


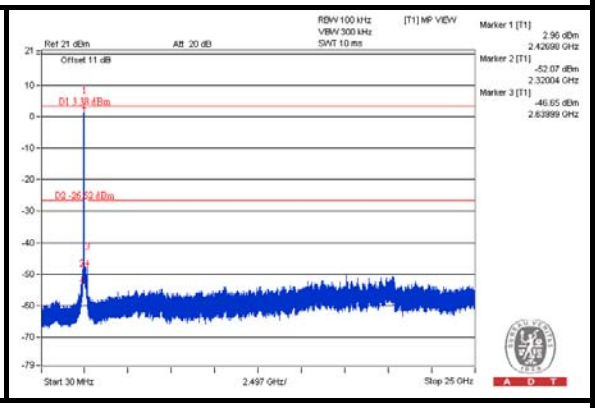
CH 11 Band edge



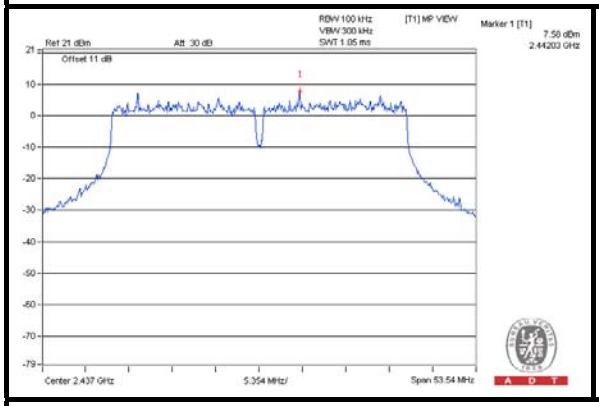
802.11n (40MHz)
CHAIN 0

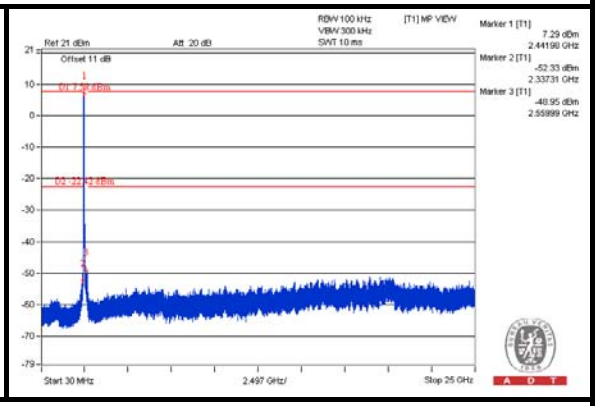
CH 3



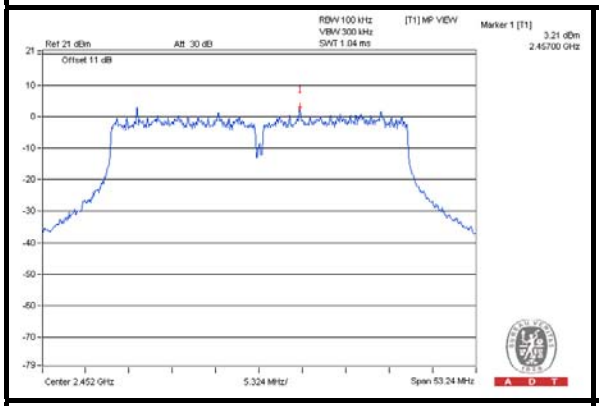


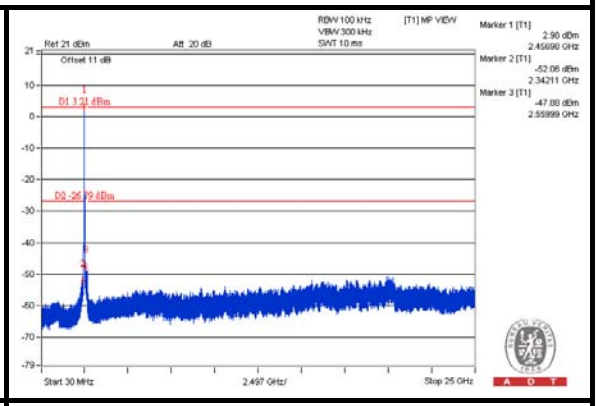
CH 6



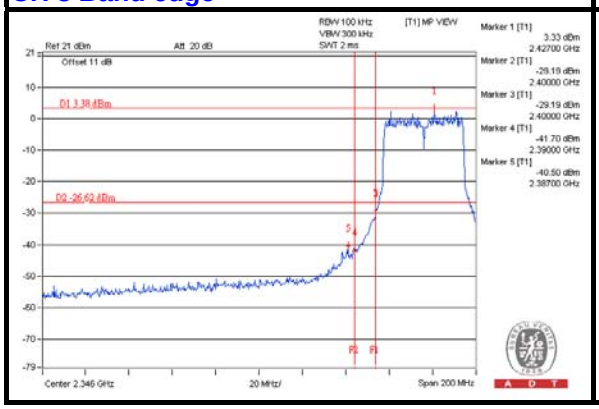


CH 9

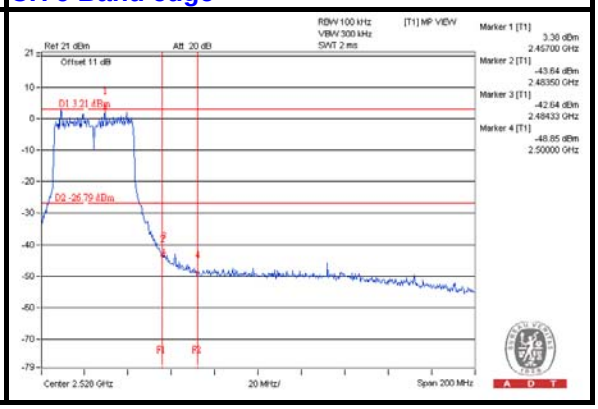




CH 3 Band edge

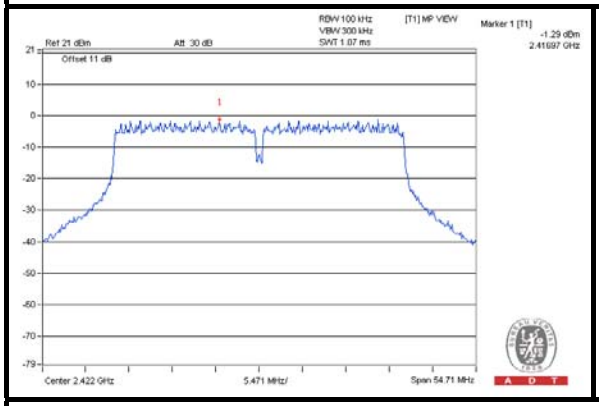


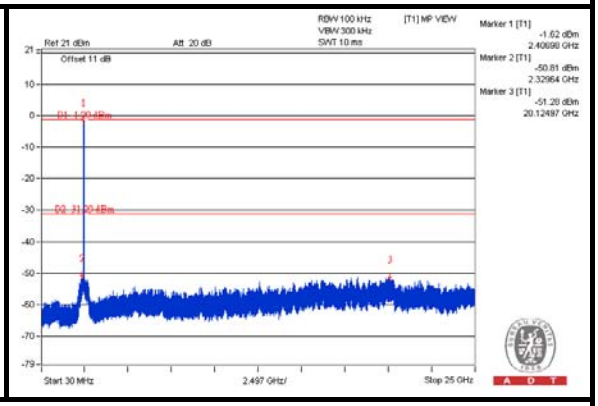
CH 9 Band edge



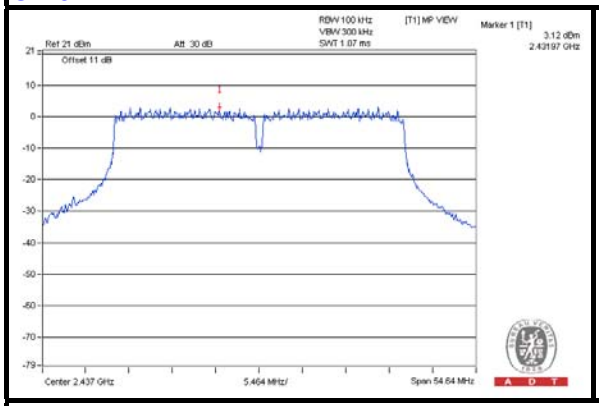
CHAIN 1

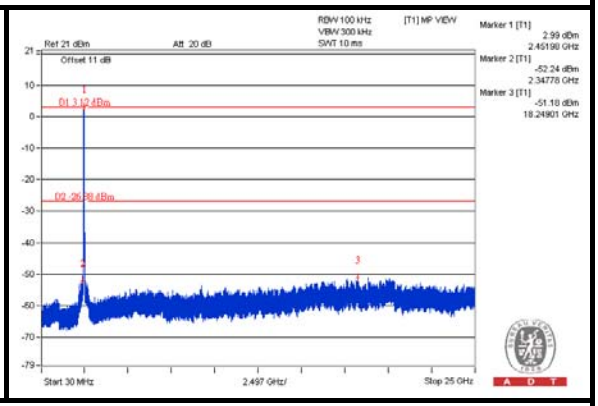
CH 3



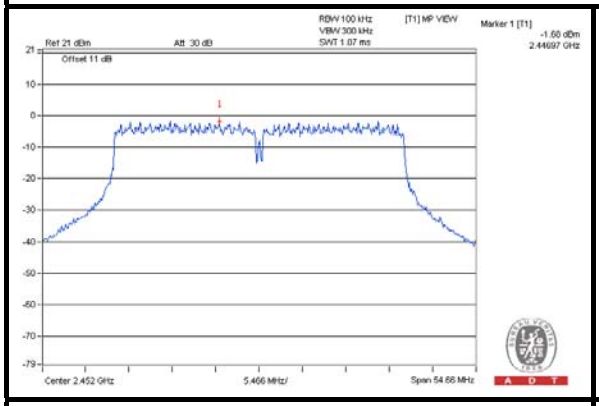


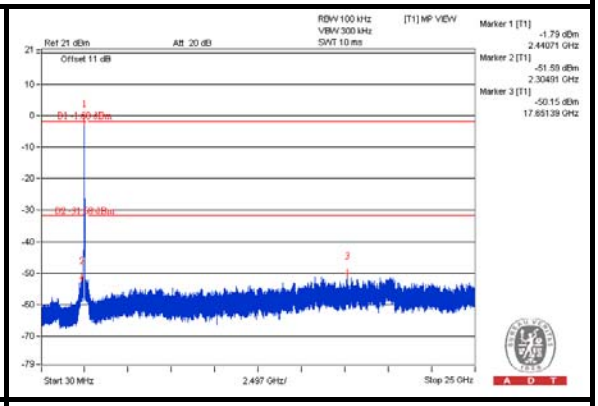
CH 6



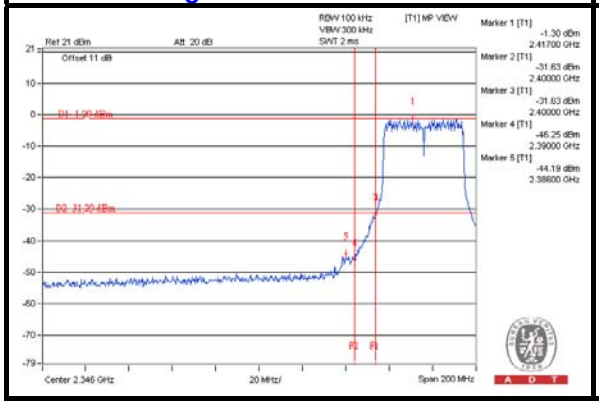


CH 9

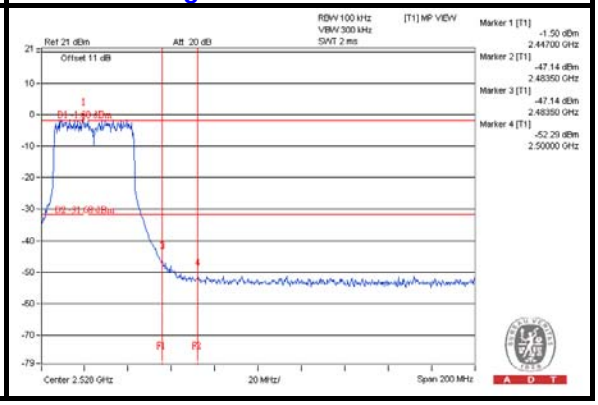




CH 3 Band edge

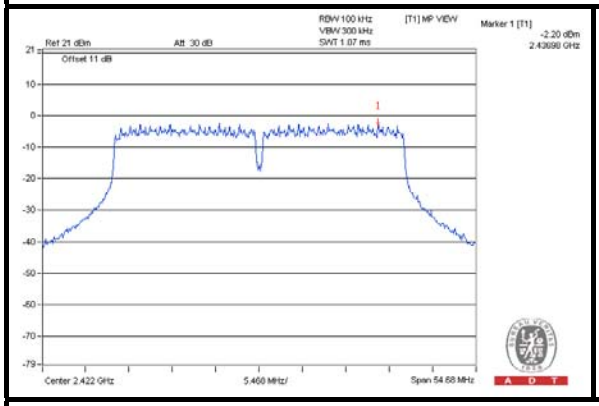


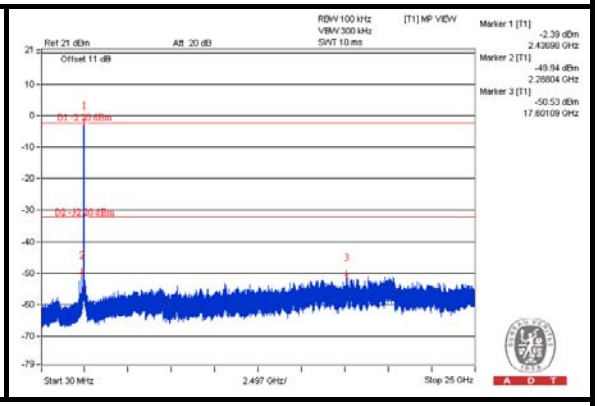
CH 9 Band edge



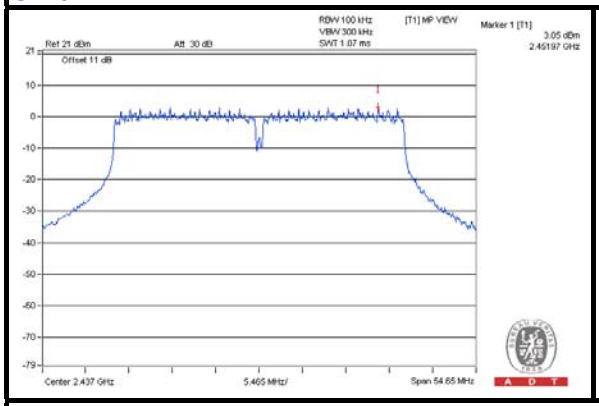
CHAIN 2

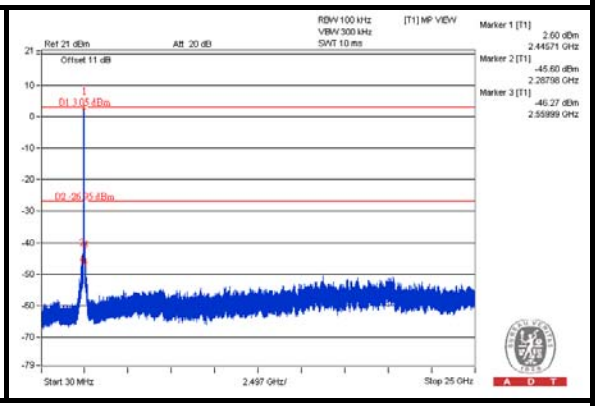
CH 3



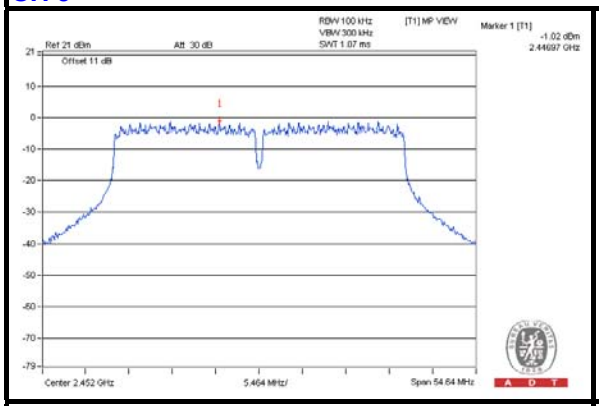


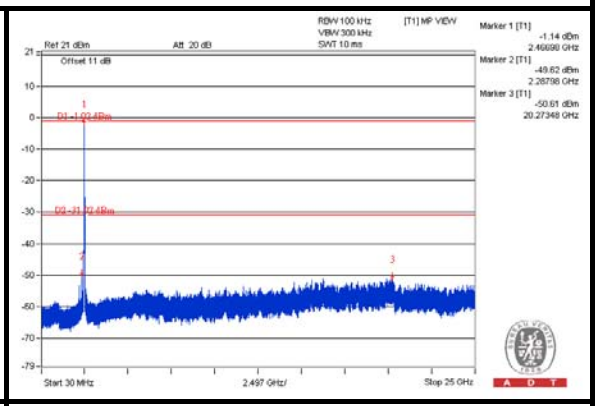
CH 6



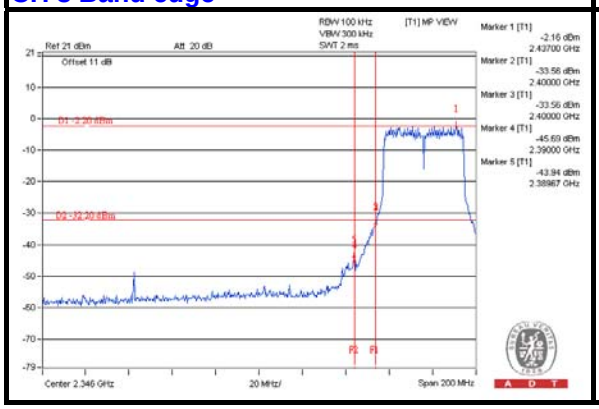


CH 9

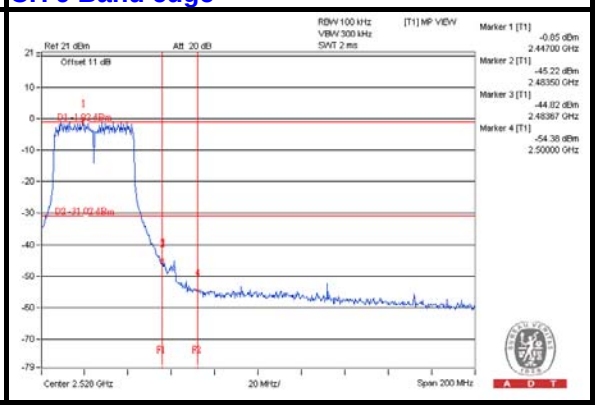




CH 3 Band edge



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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27deg. C, 66%RH	TESTED BY	Jones Chang

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	5040.00	59.7 PK	74.0	-14.3	1.10 H	360	54.60	5.10
2	5040.00	50.3 AV	54.0	-3.7	1.10 H	360	45.20	5.10
3	5360.00	63.0 PK	74.0	-11.0	1.20 H	350	57.40	5.60
4	5360.00	50.7 AV	54.0	-3.3	1.20 H	350	45.10	5.60
5	*5745.00	119.7 PK			1.00 H	334	79.50	40.20
6	*5745.00	108.6 AV			1.00 H	334	68.40	40.20
7	11490.00	60.5 PK	74.0	-13.5	1.14 H	286	41.10	19.40
8	11490.00	49.8 AV	54.0	-4.2	1.14 H	286	30.40	19.40
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	5040.00	56.7 PK	74.0	-17.3	1.15 V	96	51.60	5.10
2	5040.00	42.7 AV	54.0	-11.3	1.15 V	96	37.60	5.10
3	5360.00	58.1 PK	74.0	-15.9	1.23 V	69	52.50	5.60
4	5360.00	45.3 AV	54.0	-8.7	1.23 V	69	39.70	5.60
5	*5745.00	107.1 PK			1.00 V	19	66.90	40.20
6	*5745.00	97.7 AV			1.00 V	19	57.50	40.20
7	11490.00	62.0 PK	74.0	-12.0	1.14 V	52	42.60	19.40
8	11490.00	47.0 AV	54.0	-7.0	1.14 V	52	27.60	19.40

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27deg. C, 66%RH	TESTED BY	Jones Chang

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	5040.00	61.6 PK	74.0	-12.4	1.00 H	353	56.50	5.10
2	**5040.00**	**53.0 AV**	**54.0**	**-1.0**	**1.00 H**	**353**	**47.90**	**5.10**
3	5360.00	64.0 PK	74.0	-10.0	1.18 H	345	58.40	5.60
4	5360.00	52.0 AV	54.0	-2.0	1.18 H	345	46.40	5.60
5	*5785.00	122.9 PK			1.06 H	161	82.50	40.40
6	*5785.00	112.8 AV			1.06 H	161	72.40	40.40
7	11570.00	61.7 PK	74.0	-12.3	1.24 H	58	42.60	19.10
8	11570.00	47.5 AV	54.0	-6.5	1.24 H	58	28.40	19.10
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	5040.00	56.0 PK	74.0	-18.0	1.00 V	74	50.90	5.10
2	5040.00	45.5 AV	54.0	-8.5	1.00 V	74	40.40	5.10
3	5360.00	55.9 PK	74.0	-18.1	1.18 V	105	50.50	5.40
4	5360.00	43.8 AV	54.0	-10.2	1.18 V	105	38.40	5.40
5	*5785.00	107.8 PK			1.00 V	14	69.20	38.60
6	*5785.00	98.8 AV			1.00 V	14	60.20	38.60
7	11570.00	63.1 PK	74.0	-10.9	1.14 V	87	42.70	20.40
8	11570.00	48.9 AV	54.0	-5.1	1.14 V	87	28.50	20.40

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Jones Chang

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	59.8 PK	74.0	-14.2	1.11 H	173	54.50	5.30
2	5000.00	52.2 AV	54.0	-1.8	1.11 H	173	46.90	5.30
3	5080.00	60.6 PK	74.0	-13.4	1.00 H	354	55.40	5.20
4	5080.00	50.4 AV	54.0	-3.6	1.00 H	354	45.20	5.20
5	5360.00	62.2 PK	74.0	-11.8	1.23 H	173	56.80	5.40
6	**5360.00**	**53.0 AV**	**54.0**	**-1.0**	**1.23 H**	**173**	**47.60**	**5.40**
7	*5825.00	117.9 PK			1.02 H	154	79.20	38.70
8	*5825.00	108.2 AV			1.02 H	154	69.50	38.70
9	11650.00	62.9 PK	74.0	-11.1	1.14 H	56	42.60	20.30
10	11650.00	48.7 AV	54.0	-5.3	1.14 H	56	28.40	20.30

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Jones Chang

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	57.2 PK	74.0	-16.8	1.00 V	210	51.90	5.30
2	5000.00	45.6 AV	54.0	-8.4	1.00 V	210	40.30	5.30
3	5080.00	55.5 PK	74.0	-18.5	1.10 V	121	50.30	5.20
4	5080.00	43.5 AV	54.0	-10.5	1.10 V	121	38.30	5.20
5	5360.00	56.3 PK	74.0	-17.7	1.05 V	61	50.90	5.40
6	5360.00	43.5 AV	54.0	-10.5	1.05 V	61	38.10	5.40
7	*5825.00	106.7 PK			1.67 V	11	68.00	38.70
8	*5825.00	97.1 AV			1.67 V	11	58.40	38.70
9	11650.00	61.9 PK	74.0	-12.1	1.14 V	321	41.60	20.30
10	11650.00	48.3 AV	54.0	-5.7	1.14 V	321	28.00	20.30

REMARKS:

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

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Jones Chang

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	5040.00	58.7 PK	74.0	-15.3	1.22 H	172	53.60	5.10
2	5040.00	49.8 AV	54.0	-4.2	1.22 H	172	44.70	5.10
3	5360.00	58.7 PK	74.0	-15.3	1.01 H	348	53.30	5.40
4	5360.00	49.4 AV	54.0	-4.6	1.01 H	348	44.00	5.40
5	*5745.00	115.6 PK			1.02 H	155	77.10	38.50
6	*5745.00	106.6 AV			1.02 H	155	68.10	38.50
7	11490.00	63.4 PK	74.0	-10.6	1.33 H	258	43.00	20.40
8	11490.00	49.0 AV	54.0	-5.0	1.33 H	258	28.60	20.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5040.00	55.70 PK	74.00	-18.30	1.10 V	116	50.60	5.10
2	5040.00	46.40 AV	54.00	-7.60	1.10 V	116	41.30	5.10
3	5360.00	56.60 PK	74.00	-17.40	1.36 V	54	51.20	5.40
4	5360.00	45.70 AV	54.00	-8.30	1.36 V	54	40.30	5.40
5	*5745.00	104.30 PK			1.00 V	11	65.80	38.50
6	*5745.00	94.50 AV			1.00 V	11	56.00	38.50
7	11490.00	62.40 PK	74.00	-11.60	1.47 V	58	42.00	20.40
8	11490.00	48.80 AV	54.00	-5.20	1.47 V	58	28.40	20.40

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27deg. C, 66%RH	TESTED BY	Martin Lee

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	5040.00	60.5 PK	74.0	-13.5	1.00 H	352	55.40	5.10
2	5040.00	52.1 AV	54.0	-1.9	1.00 H	352	47.00	5.10
3	5360.00	62.1 PK	74.0	-11.9	1.00 H	179	56.70	5.40
4	5360.00	51.5 AV	54.0	-2.5	1.00 H	179	46.10	5.40
5	*5785.00	118.8 PK			1.00 H	334	80.20	38.60
6	*5785.00	108.8 AV			1.00 H	334	70.20	38.60
7	11570.00	63.0 PK	74.0	-11.0	1.33 H	258	42.60	20.40
8	11570.00	48.8 AV	54.0	-5.2	1.33 H	258	28.40	20.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5040.00	58.0 PK	74.0	-16.0	1.13 V	79	52.90	5.10
2	5040.00	44.7 AV	54.0	-9.3	1.13 V	79	39.60	5.10
3	5360.00	56.7 PK	74.0	-17.3	1.12 V	96	51.30	5.40
4	5360.00	44.0 AV	54.0	-10.0	1.12 V	96	38.60	5.40
5	*5785.00	109.2 PK			1.00 V	11	70.60	38.60
6	*5785.00	99.3 AV			1.00 V	11	60.70	38.60
7	11570.00	62.4 PK	74.0	-11.6	1.14 V	58	42.00	20.40
8	11570.00	48.0 AV	54.0	-6.0	1.14 V	58	27.60	20.40

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Jones Chang

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	5080.00	59.3 PK	74.0	-14.7	1.11 H	179	54.10	5.20
2	5080.00	51.6 AV	54.0	-2.4	1.11 H	179	46.40	5.20
3	5360.00	61.7 PK	74.0	-12.3	1.01 H	360	56.30	5.40
4	5360.00	52.1 AV	54.0	-1.9	1.01 H	360	46.70	5.40
5	*5825.00	116.5 PK			1.11 H	162	77.80	38.70
6	*5825.00	106.7 AV			1.11 H	162	68.00	38.70
7	11650.00	63.0 PK	74.0	-11.0	1.23 H	69	42.70	20.30
8	11650.00	48.2 AV	54.0	-5.8	1.23 H	69	27.90	20.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5080.00	56.8 PK	74.0	-17.2	1.32 V	69	51.60	5.20
2	5080.00	44.6 AV	54.0	-9.4	1.32 V	69	39.40	5.20
3	5360.00	56.5 PK	74.0	-17.5	1.34 V	157	51.10	5.40
4	5360.00	43.9 AV	54.0	-10.1	1.34 V	157	38.50	5.40
5	*5825.00	106.5 PK			1.68 V	10	67.80	38.70
6	*5825.00	96.2 AV			1.68 V	10	57.50	38.70
7	11650.00	61.9 PK	74.0	-12.1	1.14 V	87	41.60	20.30
8	11650.00	47.9 AV	54.0	-6.1	1.14 V	87	27.60	20.30

REMARKS:

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

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 151	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27deg. C, 66%RH	TESTED BY	Jones Chang

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	*5755.00	111.3 PK			1.00 H	188	71.10	40.20
2	*5755.00	101.5 AV			1.00 H	188	61.30	40.20
3	11510.00	61.9 PK	74.0	-12.1	1.44 H	59	42.60	19.30
4	11510.00	47.9 AV	54.0	-6.1	1.44 H	59	28.60	19.30
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	*5755.00	100.8 PK			1.00 V	208	60.60	40.20
2	*5755.00	90.8 AV			1.00 V	208	50.60	40.20
3	11510.00	60.8 PK	74.0	-13.2	1.22 V	69	41.50	19.30
4	11510.00	47.9 AV	54.0	-6.1	1.22 V	69	28.60	19.30

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27deg. C, 66%RH	TESTED BY	Jones Chang

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	5080.00	61.0 PK	74.0	-13.0	1.00 H	353	55.80	5.20
2	5080.00	50.9 AV	54.0	-3.1	1.00 H	353	45.70	5.20
3	*5795.00	119.2 PK			1.03 H	161	78.80	40.40
4	*5795.00	109.5 AV			1.03 H	161	69.10	40.40
5	11590.00	61.6 PK	74.0	-12.4	1.14 H	85	42.60	19.00
6	11590.00	47.6 AV	54.0	-6.4	1.14 H	85	28.60	19.00
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	5080.00	48.2 PK	74.0	-25.8	1.14 V	321	43.00	5.20
2	5080.00	44.9 AV	54.0	-9.1	1.14 V	321	39.70	5.20
3	*5795.00	108.5 PK			1.00 V	12	68.10	40.40
4	*5795.00	98.8 AV			1.00 V	12	58.40	40.40
5	11590.00	61.6 PK	74.0	-12.4	1.14 V	87	42.60	19.00
6	11590.00	46.6 AV	54.0	-7.4	1.14 V	87	27.60	19.00

REMARKS:

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

BELOW 1GHz WORST-CASE DATA：802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	48Vdc	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	27deg. C, 66%RH	TESTED BY	Martin Lee

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	119.16	40.8 QP	43.5	-2.7	1.55 H	263	57.40	-16.60
2	128.86	39.4 QP	43.5	-4.1	1.49 H	257	55.20	-15.80
3	173.49	40.0 QP	43.5	-3.5	1.49 H	261	54.90	-14.90
4	375.29	40.4 QP	46.0	-5.6	1.00 H	225	51.80	-11.40
5	625.60	38.6 QP	46.0	-7.4	1.75 H	30	45.20	-6.60
6	749.79	32.8 QP	46.0	-13.2	2.25 H	30	37.10	-4.30
7	901.14	34.5 QP	46.0	-11.5	1.49 H	321	36.50	-2.00
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	41.54	35.9 QP	40.0	-4.1	1.85 V	7	51.10	-15.20
2	121.10	38.9 QP	43.5	-4.6	1.00 V	7	55.40	-16.50
3	187.07	34.5 QP	43.5	-9.0	1.25 V	200	50.50	-16.00
4	375.29	35.8 QP	46.0	-10.2	1.00 V	88	47.20	-11.40
5	625.60	34.0 QP	46.0	-12.0	1.00 V	268	40.60	-6.60
6	901.14	35.2 QP	46.0	-10.8	2.00 V	227	37.20	-2.00

REMARKS:

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

5.2 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 T EST 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

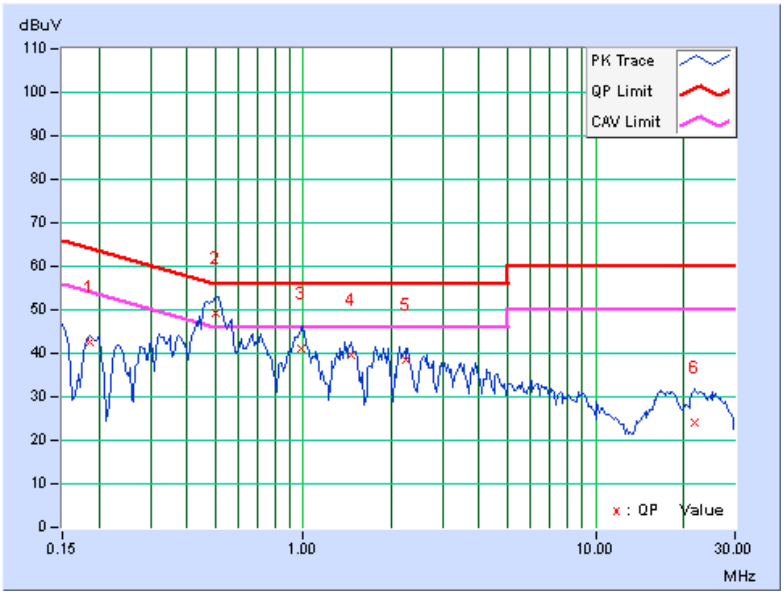
CONDUCTED WORST-CASE DATA：802.11a

PHASE	Line 1	6dB BANDWIDTH	9kHz

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	0.18516	0.16	42.28	39.38	42.44	39.54	64.25	54.25	-21.81	-14.71
2	0.50156	0.23	49.04	40.24	49.27	40.47	56.00	46.00	-6.73	-5.53
3	0.97813	0.25	40.79	34.71	41.04	34.96	56.00	46.00	-14.96	-11.04
4	1.45703	0.27	39.52	33.68	39.79	33.95	56.00	46.00	-16.21	-12.05
5	2.23438	0.30	38.12	32.66	38.42	32.96	56.00	46.00	-17.58	-13.04
6	21.81250	1.32	22.78	14.85	24.10	16.17	60.00	50.00	-35.90	-33.83

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

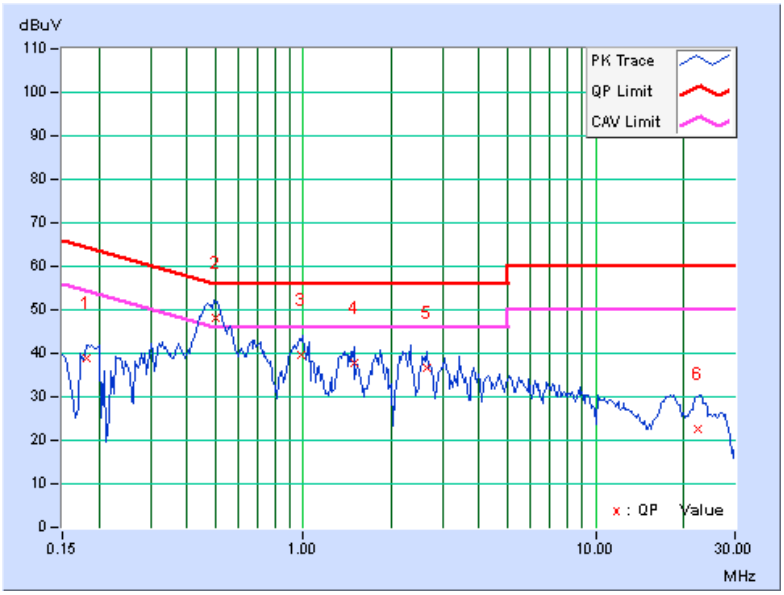


PHASE	Line 2	6dB BANDWIDTH	9kHz

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	0.18125	0.17	38.63	31.86	38.80	32.03	64.43	54.43	-25.63	-22.40
2	0.50156	0.24	47.80	38.80	48.04	39.04	56.00	46.00	-7.96	-6.96
3	0.98203	0.25	39.50	33.07	39.75	33.32	56.00	46.00	-16.25	-12.68
4	1.48828	0.26	37.59	31.38	37.85	31.64	56.00	46.00	-18.15	-14.36
5	2.64063	0.31	36.24	30.84	36.55	31.15	56.00	46.00	-19.45	-14.85
6	22.31641	1.01	21.69	14.06	22.70	15.07	60.00	50.00	-37.30	-34.93

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



5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

5.3.2 TEST SETUP

Same as item 4.3.2.

5.3.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.3.4 TEST PROCEDURE

Same as item 4.3.4.

5.3.5 DEVIATION FROM TEST STANDARD

No deviation.

5.3.6 EUT OPERATING CONDITIONS

Same as item 4.3.6.

5.3.7 TEST RESULTS

802.11a

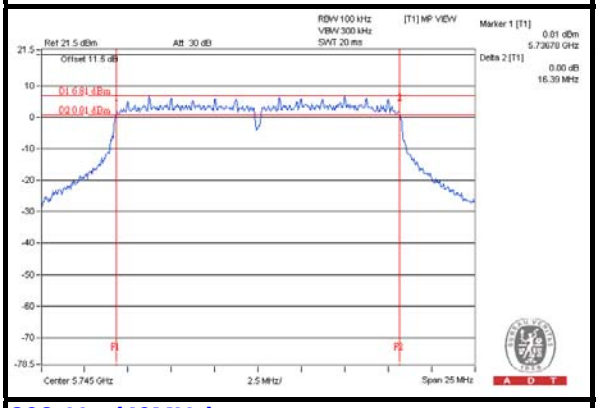
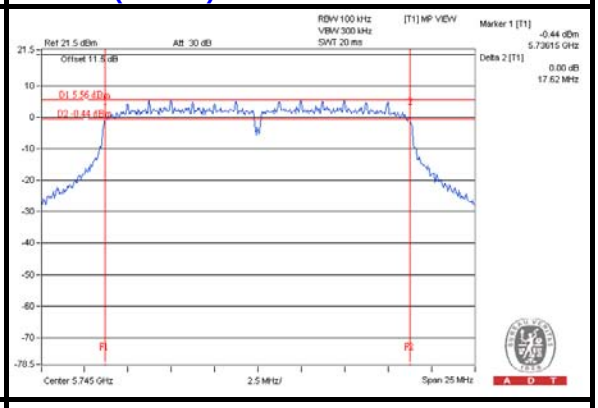
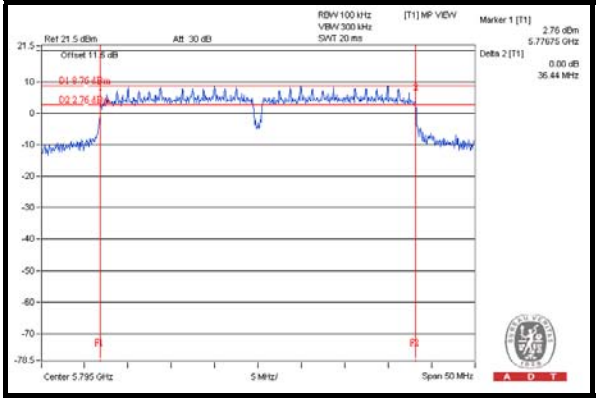
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	16.39	15.79	16.38	0.5	PASS
157	5785	16.39	13.29	16.36	0.5	PASS
165	5825	16.38	15.72	16.37	0.5	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	17.62	16.98	17.61	0.5	PASS
157	5785	17.60	16.33	17.30	0.5	PASS
165	5825	17.57	16.36	17.58	0.5	PASS

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
151	5755	36.42	36.37	36.42	0.5	PASS
159	5795	36.42	33.13	36.44	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 20MHz 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

802.11a

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (mW)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
149	5745	18.74	20.18	20.41	288.950	24.61	30	PASS
157	5785	23.69	23.78	22.73	**660.164**	28.20	30	PASS
165	5825	20.14	20.19	20.54	320.988	25.06	30	PASS

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (mW)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
149	5745	17.34	18.74	19.14	211.052	23.24	30	PASS
157	5785	23.01	23.46	22.10	583.987	27.66	30	PASS
165	5825	19.14	20.78	20.34	309.852	24.91	30	PASS

802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (mW)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
151	5755	15.41	16.68	17.19	133.673	21.26	30	PASS
159	5795	21.81	23.24	22.41	536.749	27.30	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	Chan.	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD W/O DUTY FACTOR (dBm/3kHz)	DUTY FACTOR	Total PSD WITH DUTY FACTOR (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-14.95	4.77	-10.18	0.16	-10.02	2.23	PASS
	157	5785	-9.04	4.77	-4.27	0.16	-4.11	2.23	PASS
	165	5825	-11.43	4.77	-6.66	0.16	-6.50	2.23	PASS
1	149	5745	-11.06	4.77	-6.29	0.16	-6.13	2.23	PASS
	157	5785	-8.31	4.77	-3.54	0.16	-3.38	2.23	PASS
	165	5825	-10.47	4.77	-5.70	0.16	-5.54	2.23	PASS
2	149	5745	-13.08	4.77	-8.31	0.16	-8.15	2.23	PASS
	157	5785	-10.04	4.77	-5.27	0.16	-5.11	2.23	PASS
	165	5825	-12.40	4.77	-7.63	0.16	-7.47	2.23	PASS

NOTE: Directional gain = 7dBi + 10log(3) = 11.77dBi > 6dBi , so the power density limit shall be reduced to 8-(11.77-6) = 2.23dBm.

802.11n (20MHz)

TX chain	Chan.	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD W/O DUTY FACTOR (dBm/3kHz)	DUTY FACTOR	Total PSD WITH DUTY FACTOR (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-14.61	4.77	-9.84	0.14	-9.70	7	PASS
	157	5785	-10.29	4.77	-5.52	0.14	-5.38	7	PASS
	165	5825	-12.38	4.77	-7.61	0.14	-7.47	7	PASS
1	149	5745	-11.81	4.77	-7.04	0.14	-6.90	7	PASS
	157	5785	-8.10	4.77	-3.33	0.14	-3.19	7	PASS
	165	5825	-11.34	4.77	-6.57	0.14	-6.43	7	PASS
2	149	5745	-13.28	4.77	-8.51	0.14	-8.37	7	PASS
	157	5785	-10.67	4.77	-5.90	0.14	-5.76	7	PASS
	165	5825	-11.83	4.77	-7.06	0.14	-6.92	7	PASS

NOTE: 802.11n (20MHz)(MCS16~23 / Nss=3)

Directional gain = 7dBi + 10log(3/3) = 7dBi > 6dBi , so the power density limit shall be reduced to 8-(7-6) = 7dBm.

802.11n (40MHz)

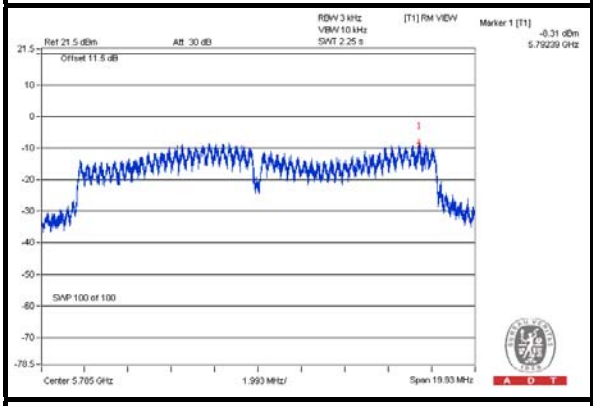
TX chain	Chan.	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD W/O DUTY FACTOR (dBm/3kHz)	DUTY FACTOR	Total PSD WITH DUTY FACTOR (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	151	5755	-21.18	4.77	-16.41	0.24	-16.17	7	PASS
	159	5795	-13.11	4.77	-8.34	0.24	-8.10	7	PASS
1	151	5755	-19.97	4.77	-15.20	0.24	-14.96	7	PASS
	159	5795	-11.92	4.77	-7.15	0.24	-6.91	7	PASS
2	151	5755	-19.19	4.77	-14.42	0.24	-14.18	7	PASS
	159	5795	-13.46	4.77	-8.69	0.24	-8.45	7	PASS

NOTE: 802.11n (40MHz)(MCS16~23 / Nss=3)

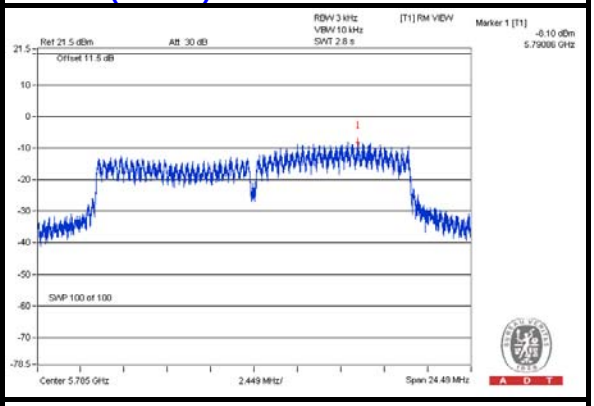
Directional gain = 7dBi + 10log(3/3) = 7dBi > 6dBi , so the power density limit shall be reduced to 8-(7-6) = 7dBm.

SPECTRUM PLOT OF WORST VALUE

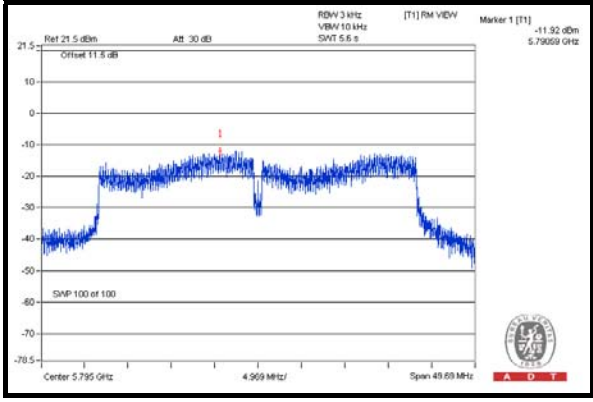
802.11a



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

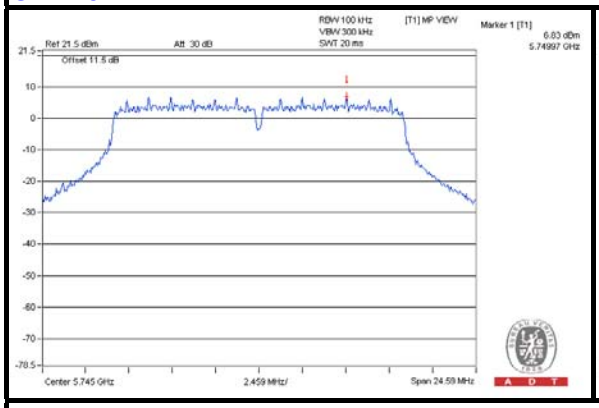
5.6.7 TEST RESULTS

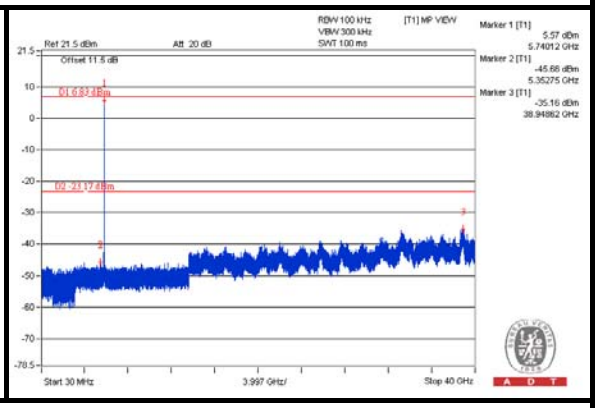
The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.

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.

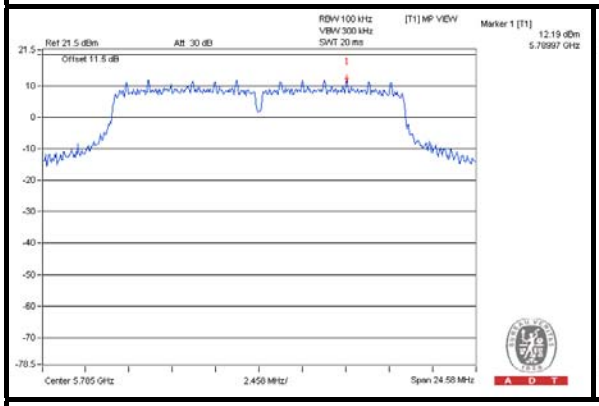
802.11a
CHAIN 0

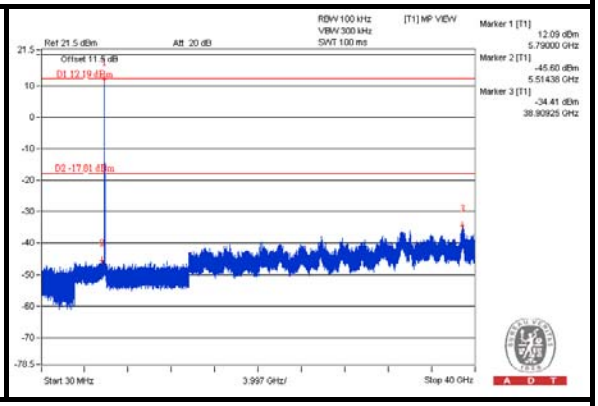
CH 149



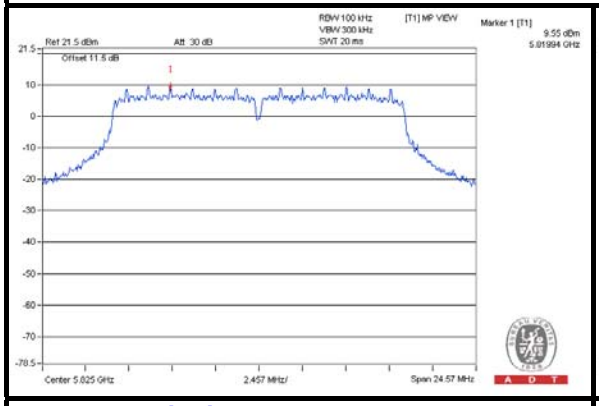


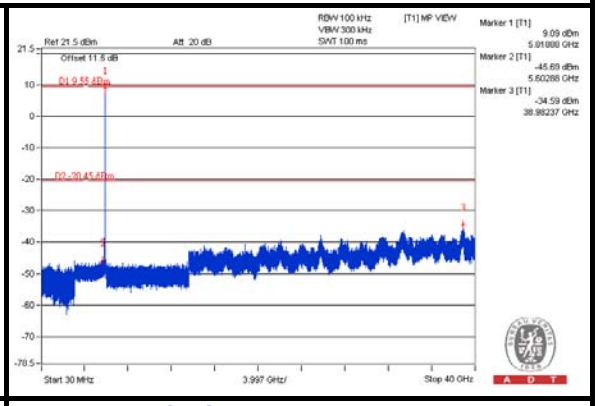
CH 157



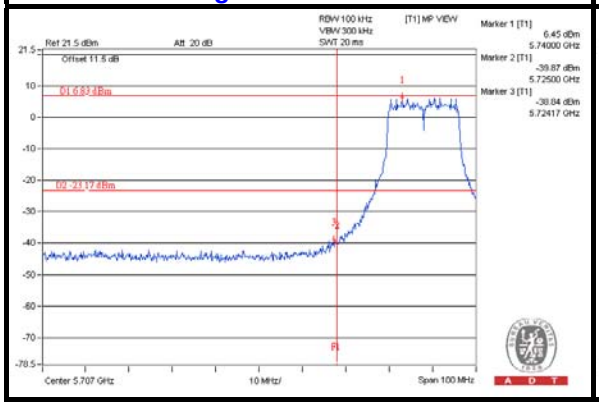


CH 165

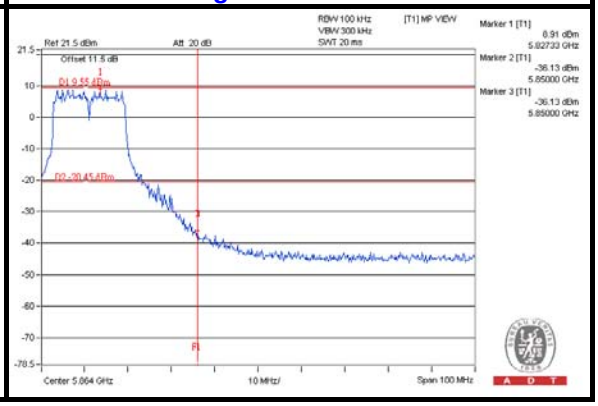




CH 149 Band edge

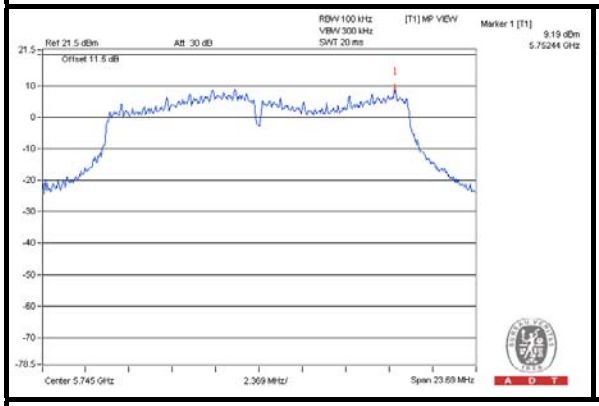


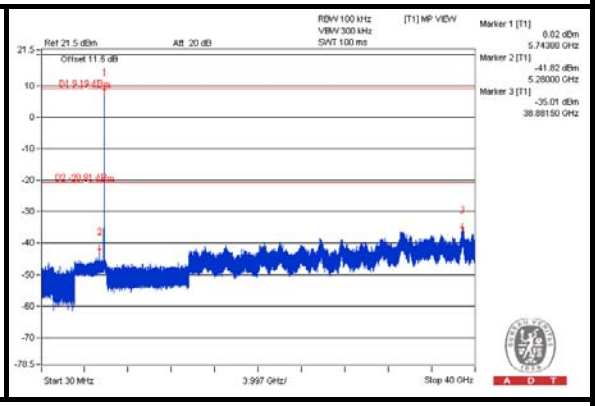
CH 165 Band edge



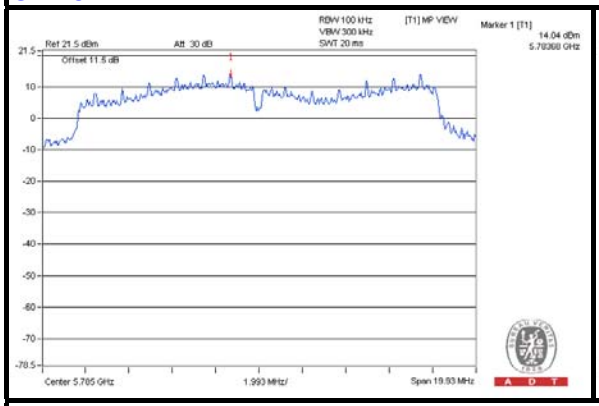
CHAIN 1

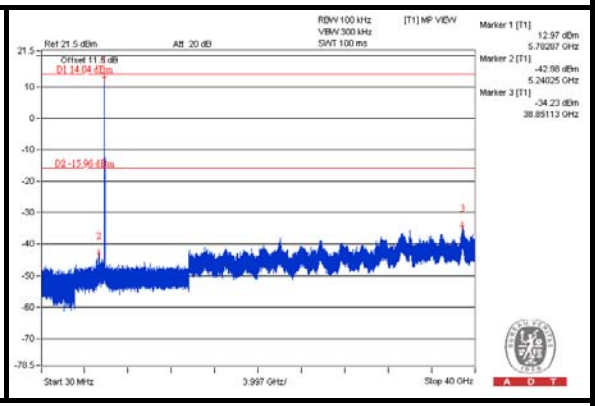
CH 149



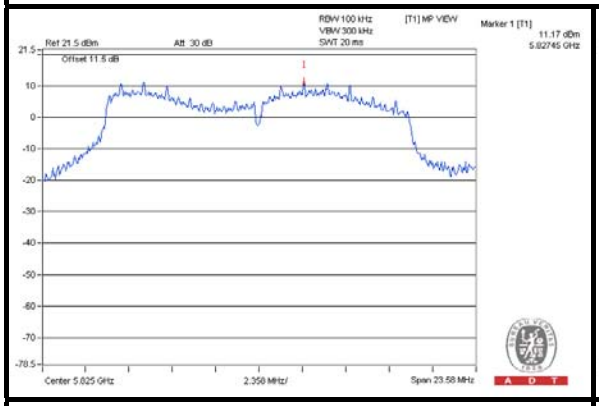


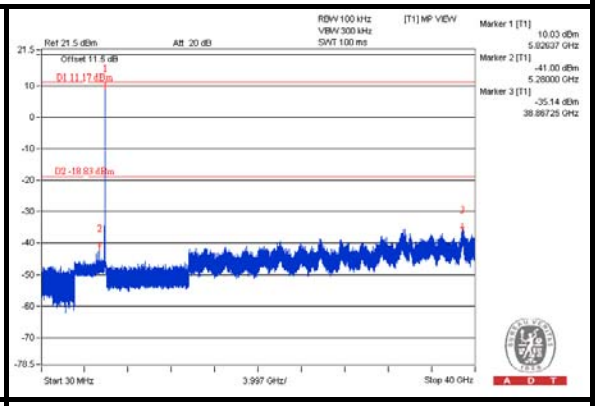
CH 157



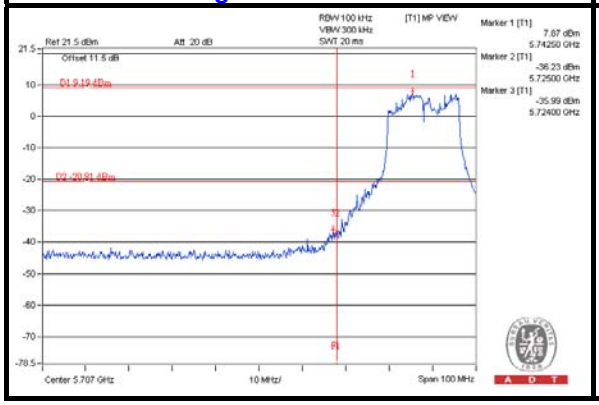


CH 165

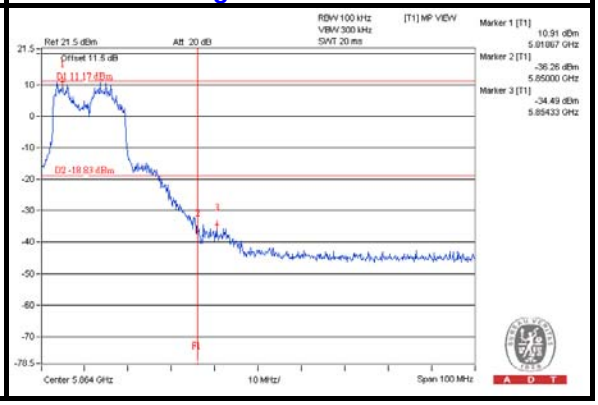




CH 149 Band edge

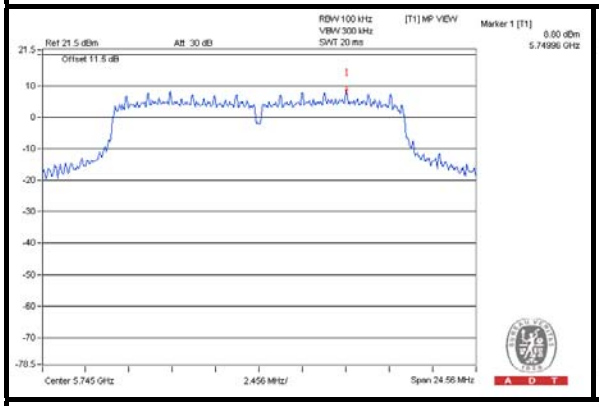


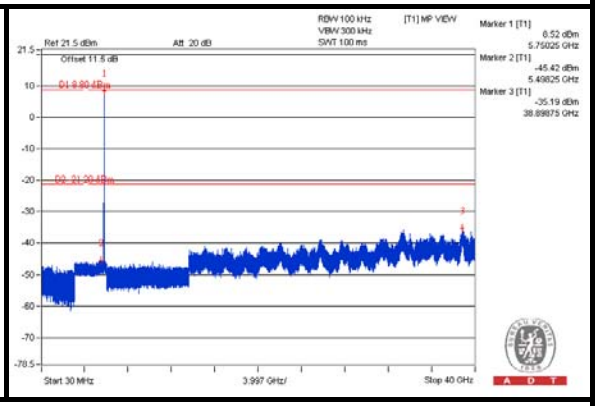
CH 165 Band edge



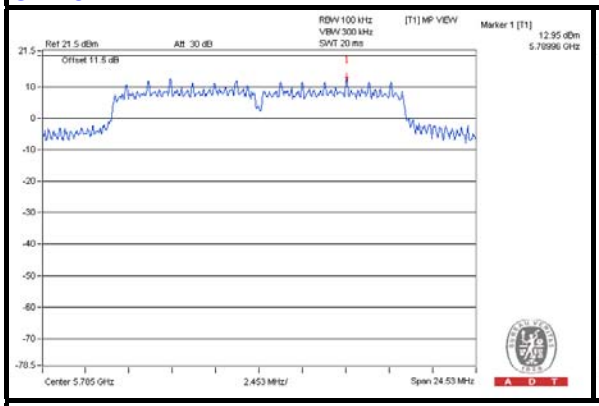
CHAIN 2

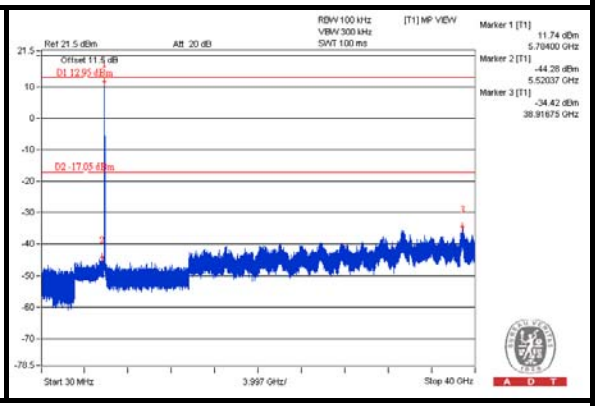
CH 149



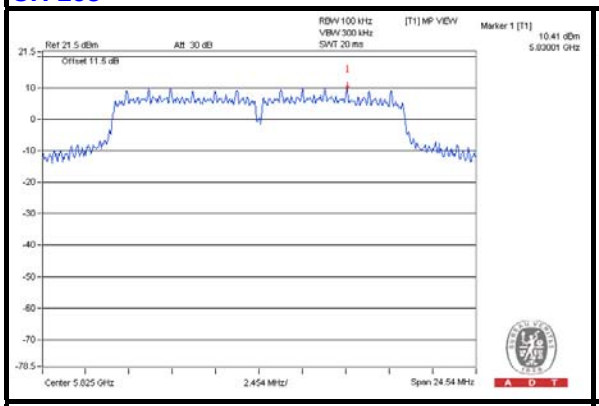


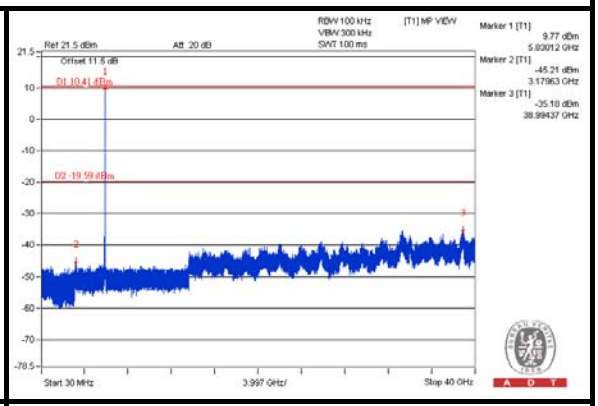
CH 157



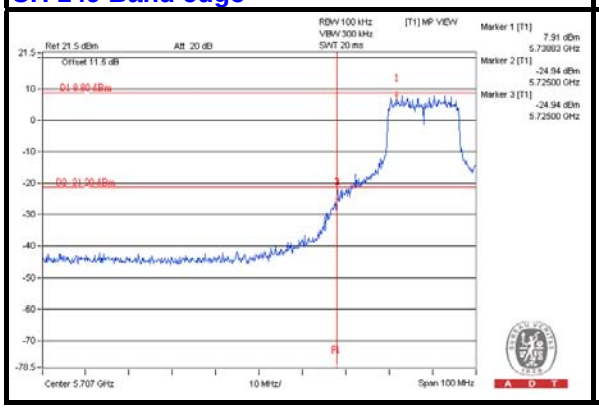


CH 165

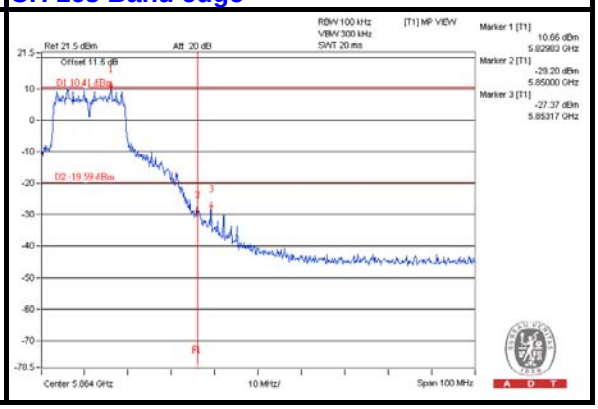




CH 149 Band edge

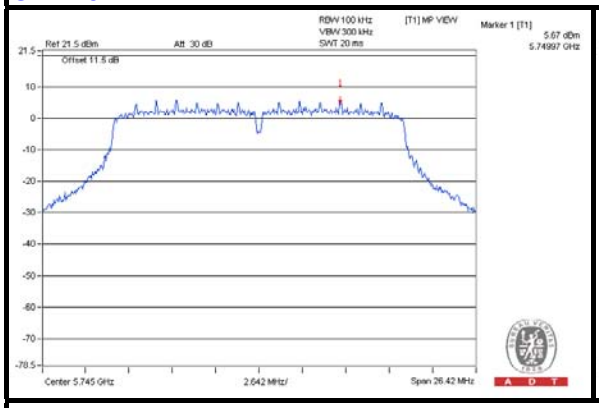


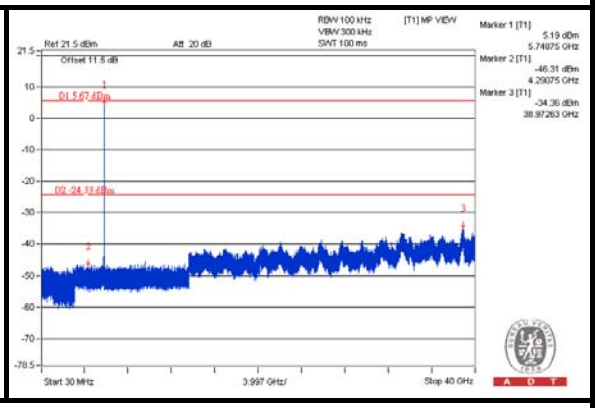
CH 165 Band edge



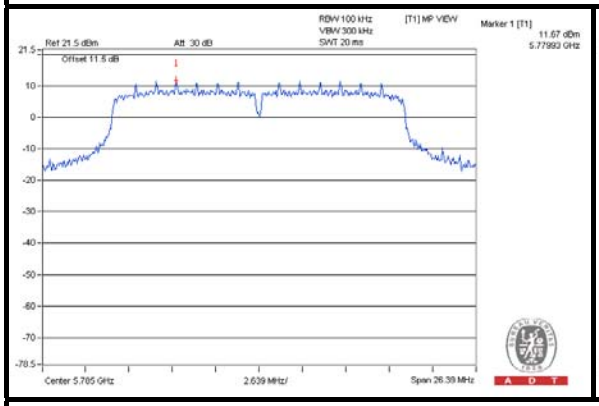
802.11n (20MHz)
CHAIN 0

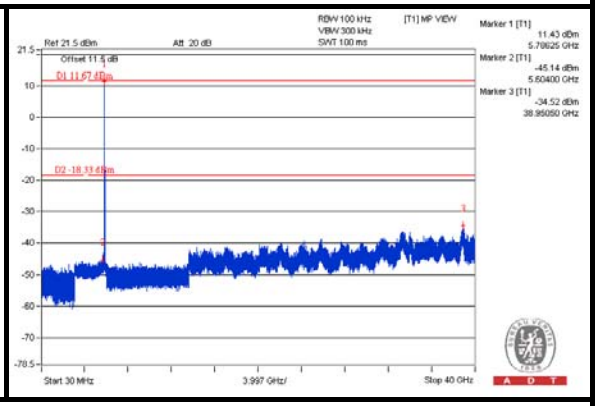
CH 149



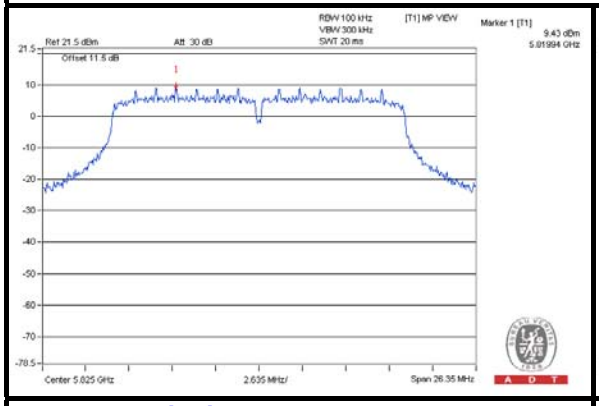


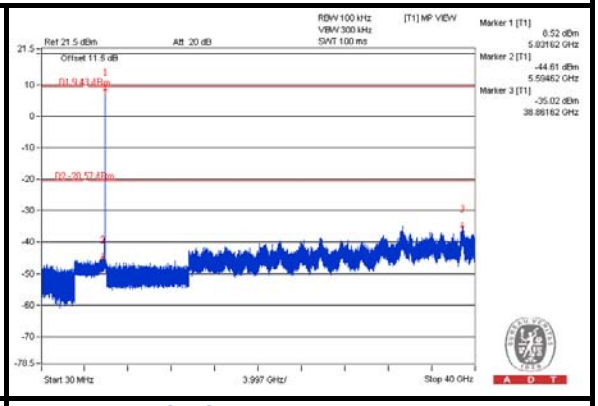
CH 157



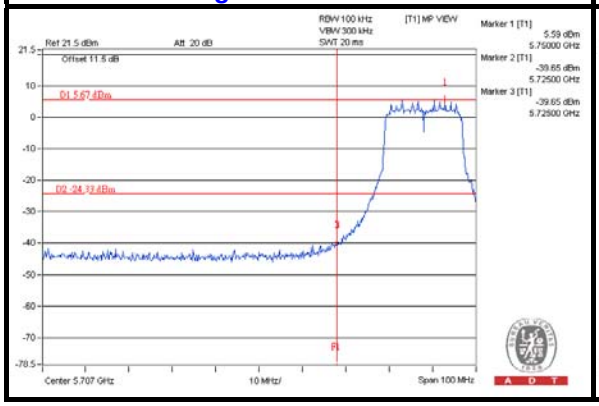


CH 165

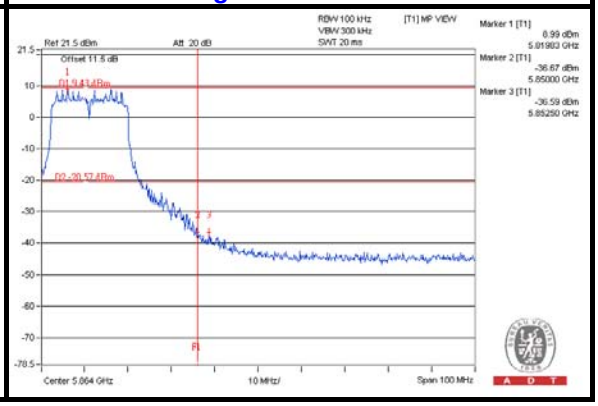




CH 149 Band edge

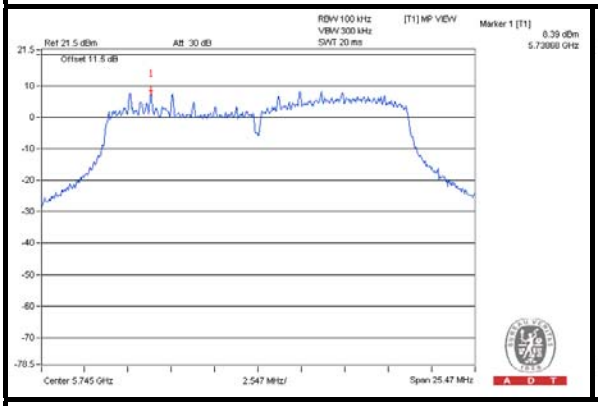


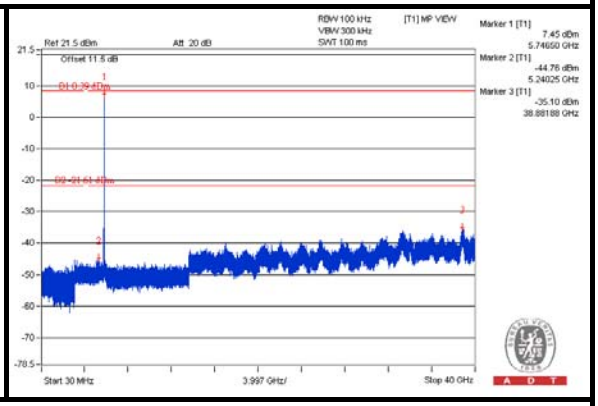
CH 165 Band edge



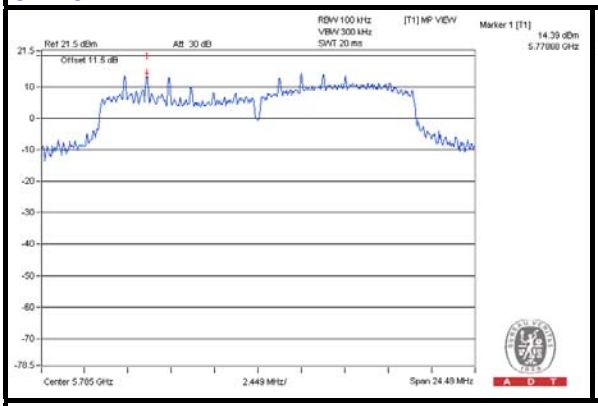
CHAIN 1

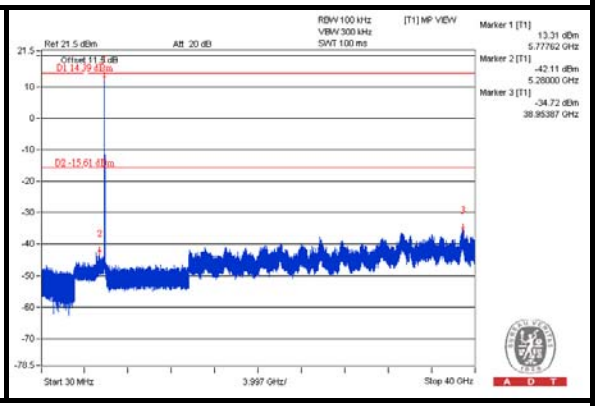
CH 149



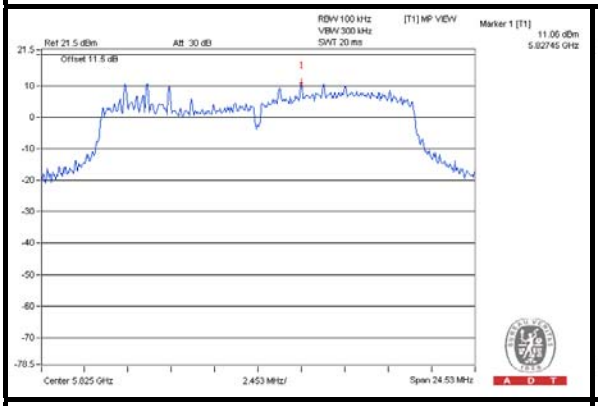


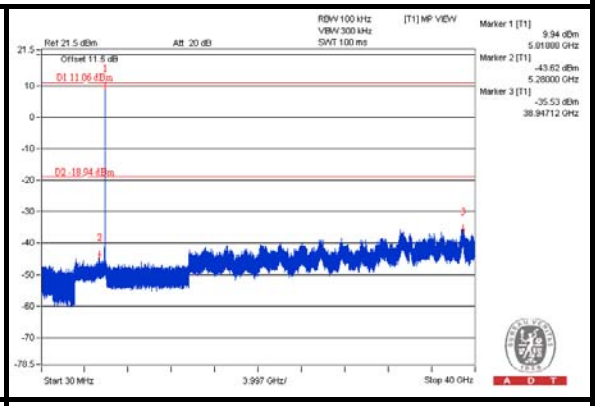
CH 157



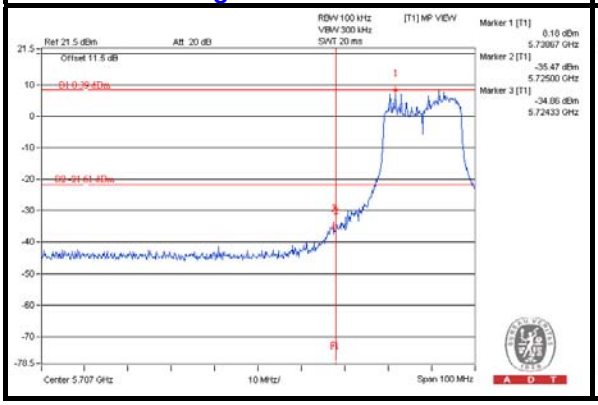


CH 165

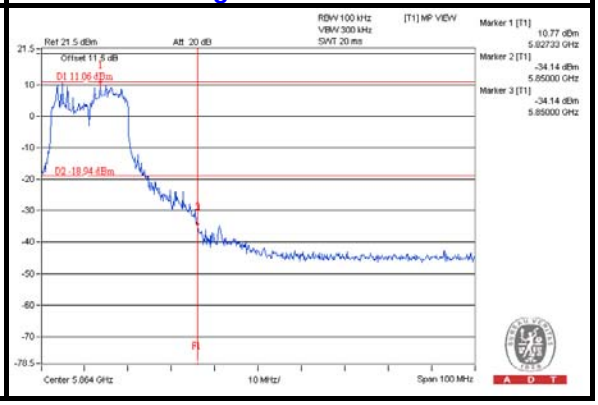




CH 149 Band edge

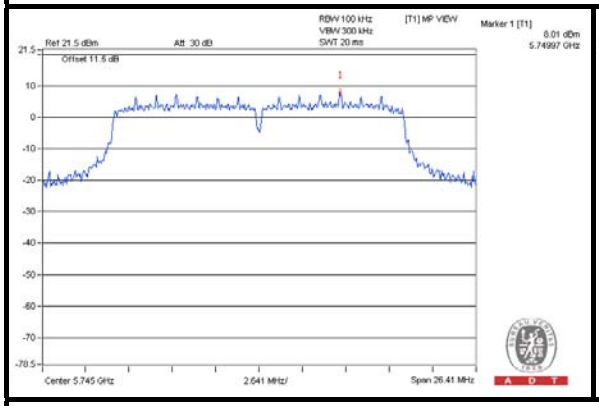


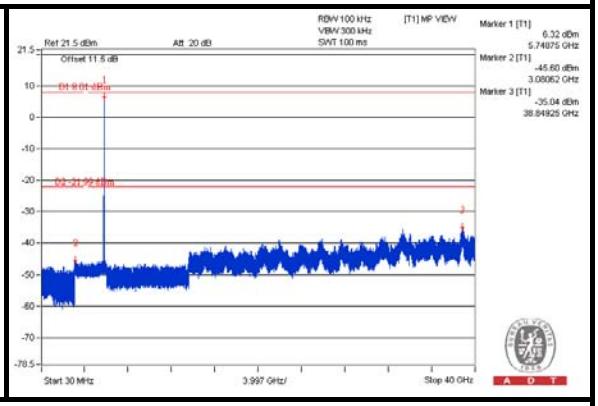
CH 165 Band edge



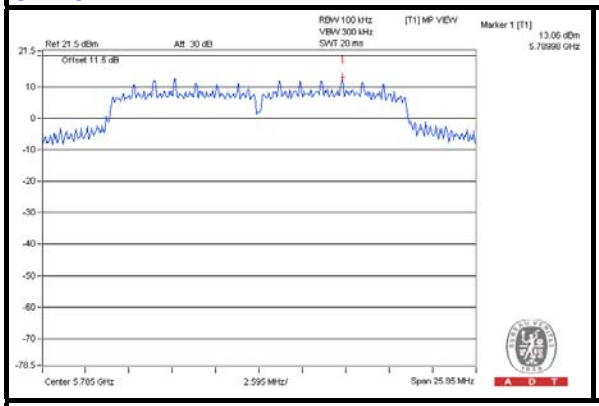
CHAIN 2

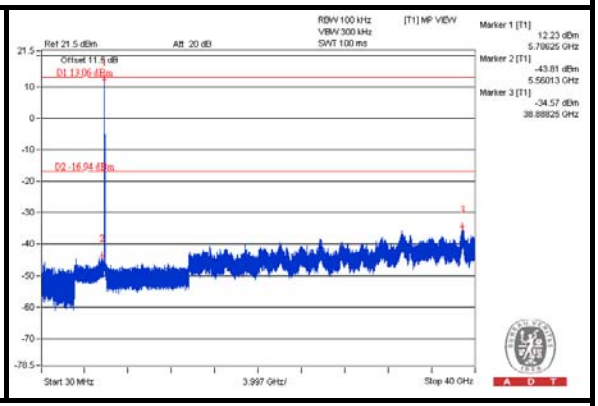
CH 149



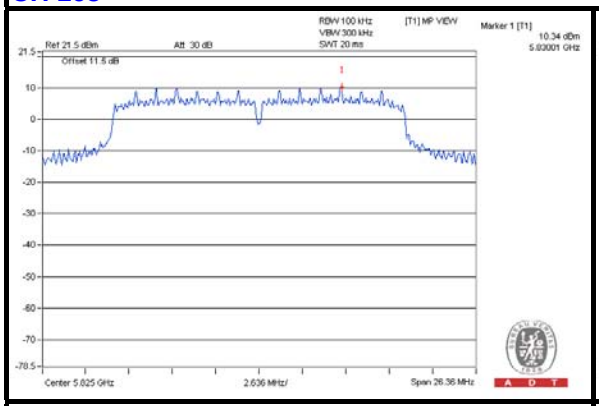


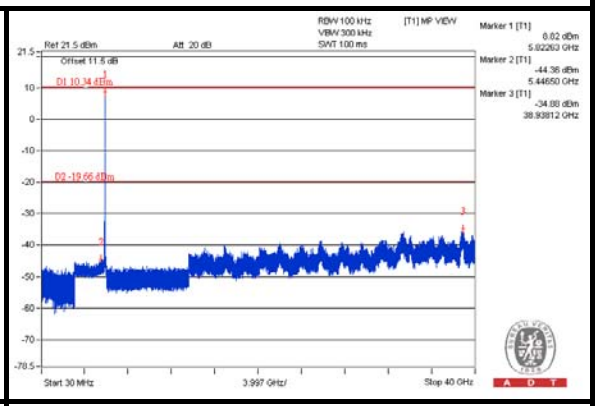
CH 157



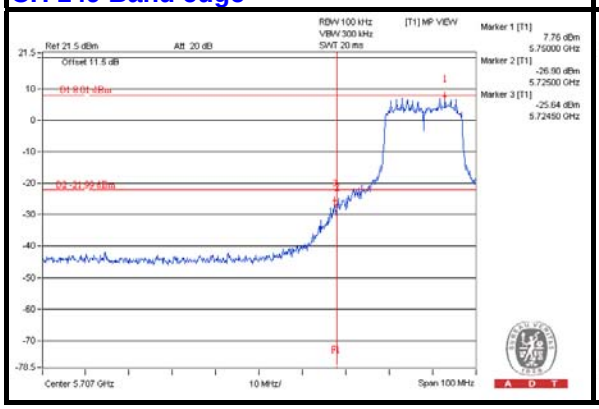


CH 165

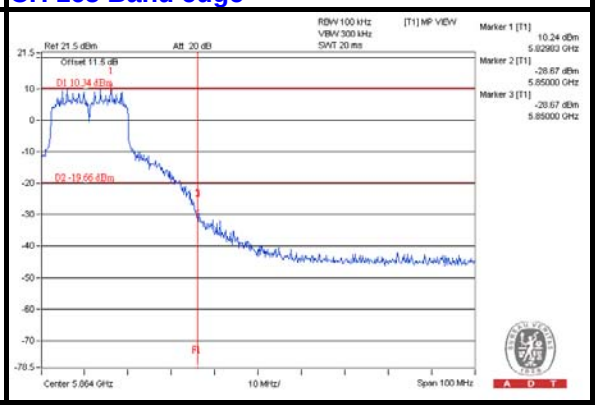




CH 149 Band edge

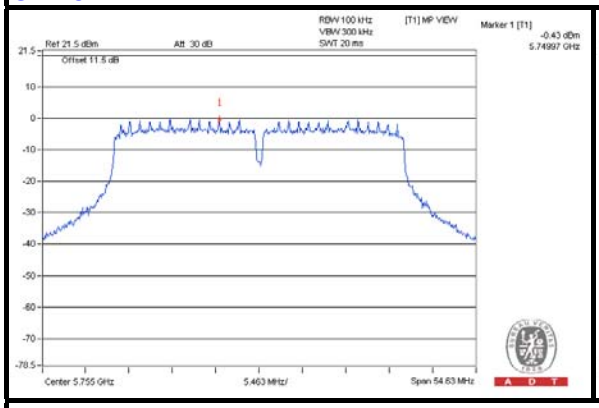


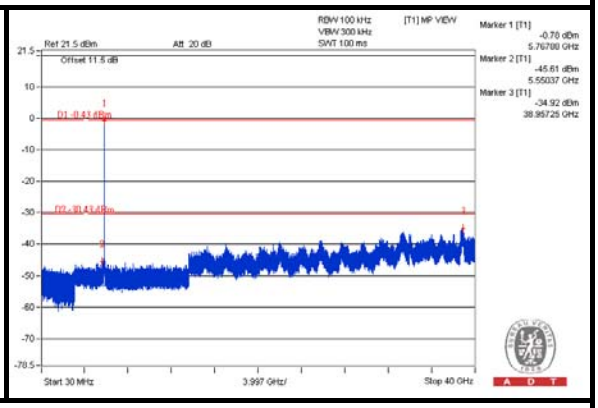
CH 165 Band edge



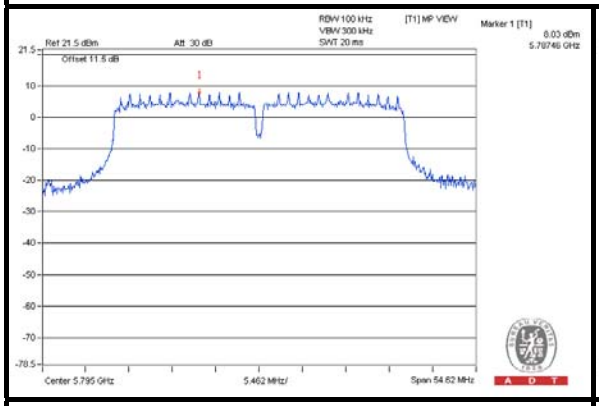
802.11n (40MHz)
CHAIN 0

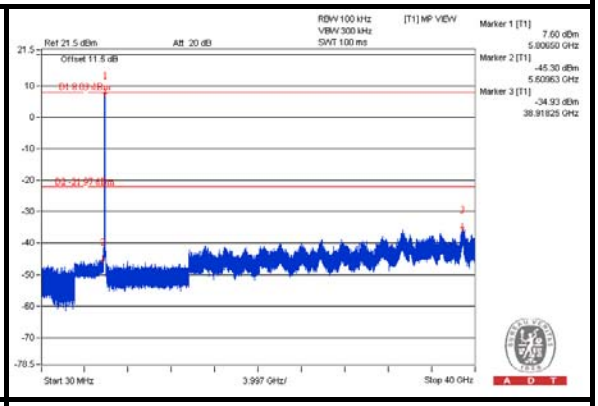
CH 151



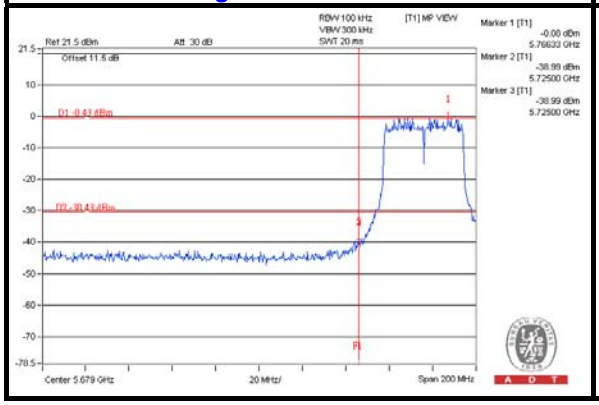


CH 159

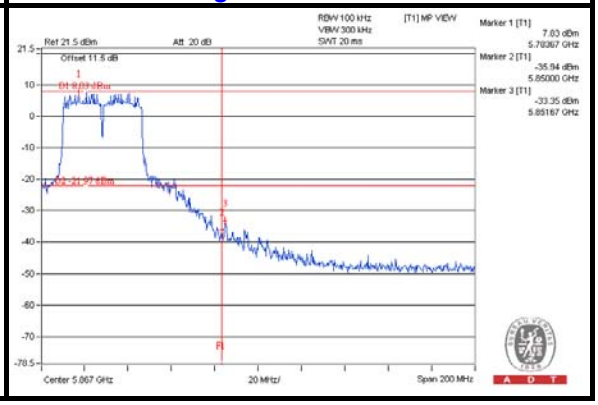




CH 151 Band edge

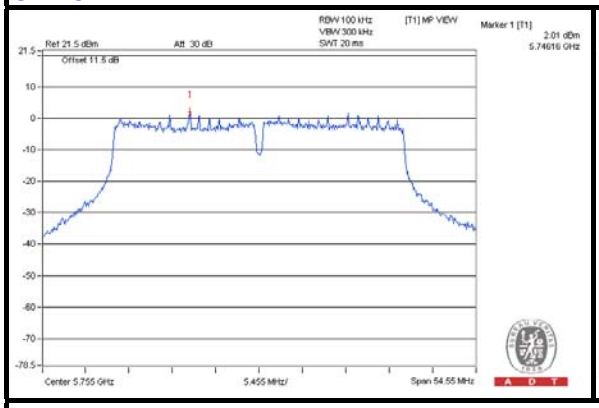


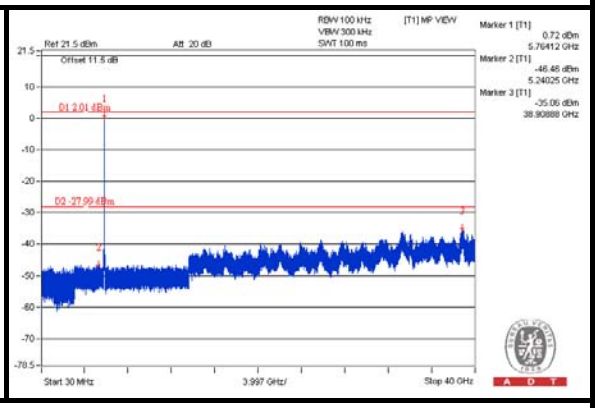
CH 159 Band edge



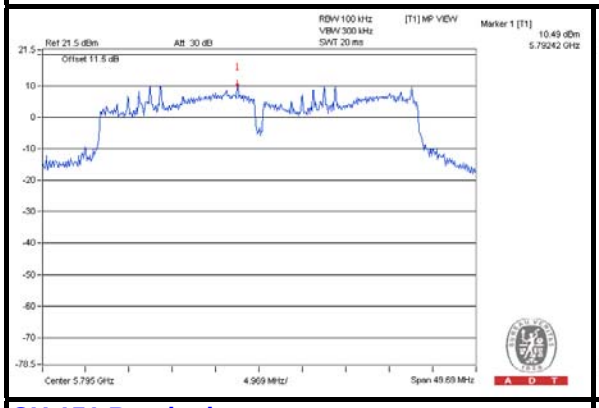
CHAIN 1

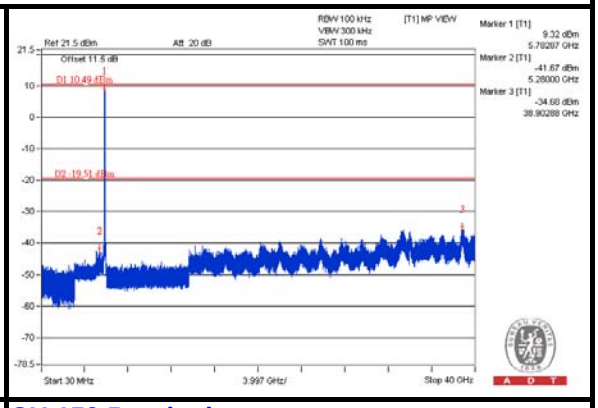
CH 151



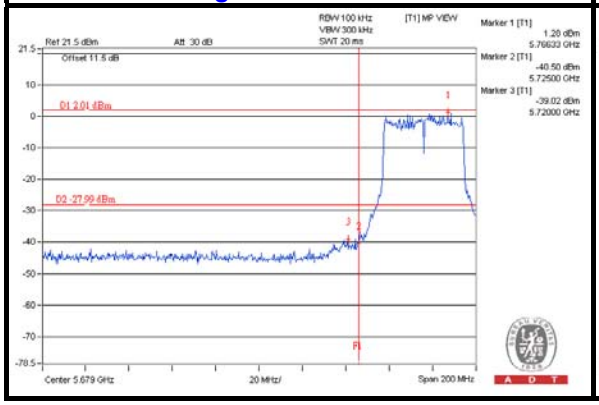


CH 159

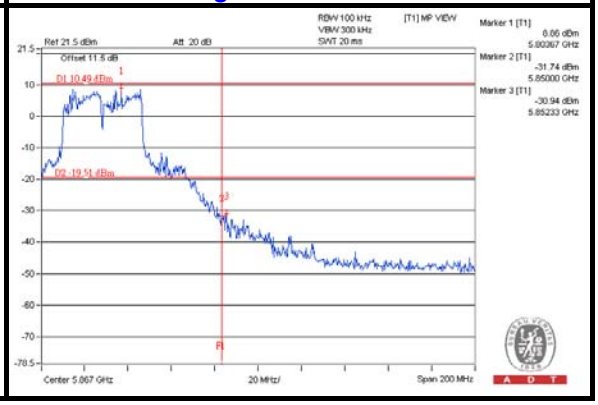




CH 151 Band edge

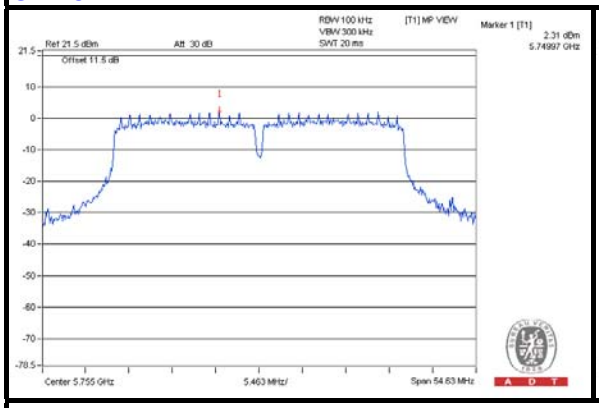


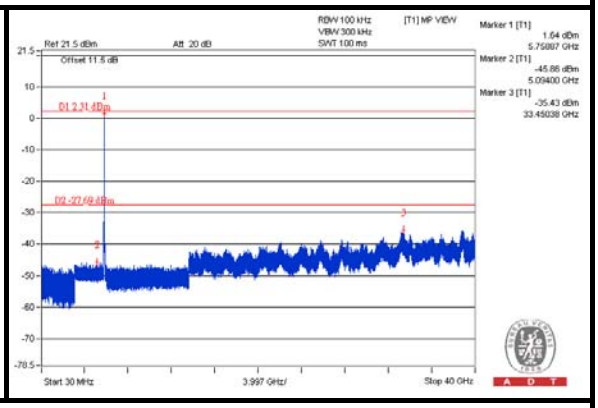
CH 159 Band edge



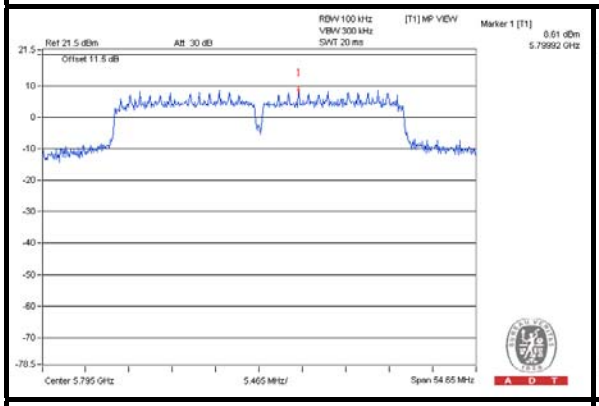
CHAIN 2

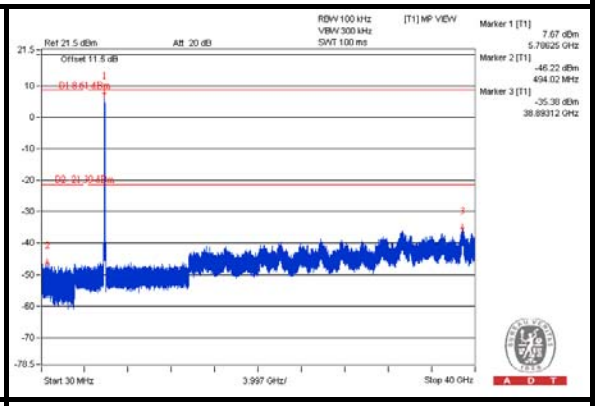
CH 151



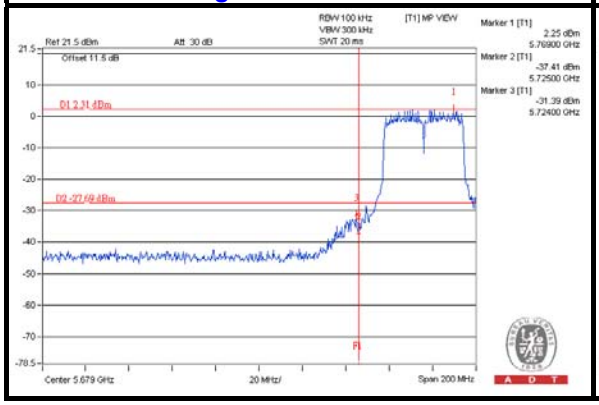


CH 159

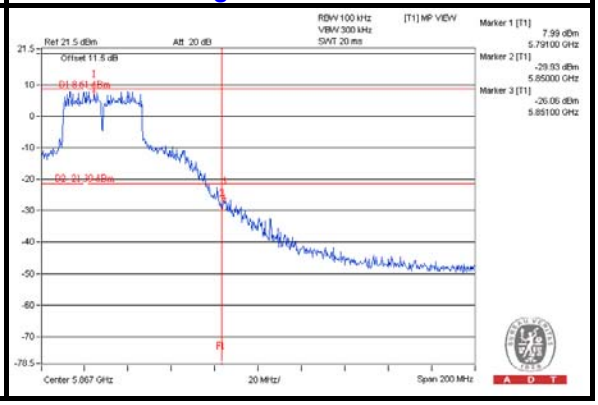




CH 151 Band edge



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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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.

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---