FCC TEST REPORT (15.247)

REPORT NO.: RF130926C18

MODEL NO.: ESR1750

FCC ID: A8JESR1750

RECEIVED: Sep. 26, 2013

TESTED: Oct. 07 ~ Nov. 29, 2013

ISSUED: Dec. 04, 2013

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.

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TABLE OF CONTENTS

RELEASE CONTROL RECORD 5
1. CERTIFICATION 6
2. SUMMARY OF TEST RESULTS 7
2.1 MEASUREMENT UNCERTAINTY 7
3. GENERAL INFORMATION 8
3.1 GENERAL DESCRIPTION OF EUT 8
3.2 DESCRIPTION OF TEST MODES 10
3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL 11
3.3 DUTY CYCLE OF TEST SIGNAL 15
3.4 DESCRIPTION OF SUPPORT UNITS 17
3.4.1 CONFIGURATION OF SYSTEM UNDER TEST 18
3.5 GENERAL DESCRIPTION OF APPLIED STANDARDS 19
4. TEST TYPES AND RESULTS (FOR 2.4GHz BAND) 20
4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT 20
4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT 20
4.1.2 TEST INSTRUMENTS 21
4.1.3 TEST PROCEDURES 22
4.1.4 DEVIATION FROM TEST STANDARD 22
4.1.5 TEST SETUP 23
4.1.6 EUT OPERATING CONDITIONS 24
4.1.7 TEST RESULTS 25
4.2 CONDUCTED EMISSION MEASUREMENT 38
4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT 38
4.2.2 TEST INSTRUMENTS 38
4.2.3 TEST PROCEDURES 39
4.2.4 DEVIATION FROM TEST STANDARD 39
4.2.5 TEST SETUP 39
4.2.6 EUT OPERATING CONDITIONS 39
4.2.7 TEST RESULTS 40
4.3 6dB BANDWIDTH MEASUREMENT 42
4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT 42
4.3.2 TEST SETUP 42
4.3.3 TEST INSTRUMENTS 42
4.3.4 TEST PROCEDURE 42
4.3.5 DEVIATION FROM TEST STANDARD 42
4.3.6 EUT OPERATING CONDITIONS 42
4.3.7 TEST RESULTS 43
4.4 CONDUCTED OUTPUT POWER 45
4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT 45
4.4.2 TEST SETUP 45
4.4.3 TEST INSTRUMENTS 45
4.4.4 TEST PROCEDURES 45
4.4.5 DEVIATION FROM TEST STANDARD 46
4.4.6 EUT OPERATING CONDITIONS 46
4.4.7 TEST RESULTS 47

4.5 POWER SPECTRAL DENSITY MEASUREMENT 49
4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT 49
4.5.2 TEST SETUP 49
4.5.3 TEST INSTRUMENTS 49
4.5.4 TEST PROCEDURE 49
4.5.5 DEVIATION FROM TEST STANDARD 49
4.5.6 EUT OPERATING CONDITION 49
4.5.7 TEST RESULTS 50
4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT 53
4.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT 53
4.6.2 TEST SETUP 53
4.6.3 TEST INSTRUMENTS 53
4.6.4 TEST PROCEDURE 54
4.6.5 DEVIATION FROM TEST STANDARD 54
4.6.6 EUT OPERATING CONDITION 54
4.6.7 TEST RESULTS 54
5. TEST TYPES AND RESULTS (FOR 5.0GHz BAND) 67
5.1 RADIATED EMISSION MEASUREMENT 67
5.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT 67
5.1.2 TEST INSTRUMENTS 68
5.1.3 TEST PROCEDURES 68
5.1.4 DEVIATION FROM TEST STANDARD 68
5.1.5 TEST SETUP 68
5.1.6 EUT OPERATING CONDITIONS 68
5.1.7 TEST RESULTS 69
5.2 CONDUCTED EMISSION MEASUREMENT 79
5.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT 79
5.2.2 TEST INSTRUMENTS 79
5.2.3 TEST PROCEDURES 79
5.2.4 DEVIATION FROM TEST STANDARD 79
5.2.5 TEST SETUP 79
5.2.6 EUT OPERATING CONDITIONS 79
5.2.7 TEST RESULTS 80
5.3 6dB BANDWIDTH MEASUREMENT 82
5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT 82
5.3.2 TEST SETUP 82
5.3.3 TEST INSTRUMENTS 82
5.3.4 TEST PROCEDURE 82
5.3.5 DEVIATION FROM TEST STANDARD 82
5.3.6 EUT OPERATING CONDITIONS 82
5.3.7 TEST RESULTS 83
5.4 CONDUCTED OUTPUT POWER 85
5.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT 85
5.4.2 TEST SETUP 85
5.4.3 INSTRUMENTS 85
5.4.4 TEST PROCEDURES 86
5.4.5 DEVIATION FROM TEST STANDARD 86
5.4.6 EUT OPERATING CONDITIONS 86

5.4.7 TEST RESULTS 87
5.5 POWER SPECTRAL DENSITY MEASUREMENT 89
5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT.....89
5.5.2 TEST SETUP.....89
5.5.3 TEST INSTRUMENTS.....89
5.5.4 TEST PROCEDURE.....89
5.5.5 DEVIATION FROM TEST STANDARD 89
5.5.6 EUT OPERATING CONDITION 89
5.5.7 TEST RESULTS 90
5.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT 93
5.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT 93
5.6.2 TEST SETUP.....93
5.6.3 TEST INSTRUMENTS.....93
5.6.4 TEST PROCEDURE.....93
5.6.5 DEVIATION FROM TEST STANDARD 93
5.6.6 EUT OPERATING CONDITION 93
5.6.7 TEST RESULTS 93
6. PHOTOGRAPHS OF THE TEST CONFIGURATION 106
7. INFORMATION ON THE TESTING LABORATORIES.....107
8. APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB 108

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF130926C18	Original release.	Dec. 04, 2013

1. CERTIFICATION

PRODUCT: Dual Band Wireless AC1750 Router
MODEL NO.: ESR1750
BRAND: EnGenius
APPLICANT: EnGenius Technologies
TESTED: Oct. 07 ~ Nov. 29, 2013
TEST SAMPLE: ENGINEERING SAMPLE
STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**
ANSI C63.10-2009

The above equipment (model: ESR1750) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch,** and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : _____ **, DATE :** Dec. 04, 2013
Polly Chien / Specialist

APPROVED BY : _____ **, DATE :** Dec. 04, 2013
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 -11.27dB at 0.49408MHz.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 2390.00MHz, 2483.50MHz, 11490.00MHz, 11650.00MHz.
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 IPEX not a standard connector.

2.1 MEASUREMENT UNCERTAINTY

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

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

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

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Dual Band Wireless AC1750 Router
MODEL NO.	ESR1750
POWER SUPPLY	12Vdc (Adapter)
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b:11/5.5/2/1Mbps 802.11a/g: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 450Mbps 802.11ac: up to 1299.9Mbps
OPERATING FREQUENCY	**2.4GHz:** 2412 ~ 2462MHz **5.0GHz:** 5745 ~ 5825MHz
NUMBER OF CHANNEL	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7 **5.0GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20): 5 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1
OUTPUT POWER	**2.4GHz:** 986.111mW **5.0GHz:** 555.354mW
ANTENNA TYPE	**2.4GHz:** PCB antenna with 2.45dBi gain **5.0GHz:** PCB antenna with 5.51dBi gain
ANTENNA CONNECTOR	IPEX
DATA CABLE	0.5m non-shielded RJ45 cable without core
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	Adapter

NOTE:

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

MODULATION MODE	TX FUNCTION
802.11b	3TX
802.11g	3TX
802.11a	3TX
802.11n (HT20)	3TX
802.11n (HT40)	3TX
802.11ac (VHT20)	3TX
802.11ac (VHT40)	3TX
802.11ac (VHT80)	3TX

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

2. The EUT consumes power from following adapter.

Brand	Shenzhen Gongjin Electronics Co., Ltd.
Model	S24B12-120A150-04
Input Power	100-240Vac, 50/60Hz, Max 0.7A LPS
Output Power	12Vdc, 1.5A
Power Line	1.4m cable without 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, 802.11n (HT20):

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

7 channels are provided for 802.11n (HT40):

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

FOR 5.0GHz (5745 ~ 5825MHz):

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

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

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

CHANNEL	FREQUENCY
155	5775MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

FOR 2.4GHz:

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

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

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-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 (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
-	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	15.0

RADIATED EMISSION TEST (BELOW 1GHz):

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

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

POWER LINE CONDUCTED EMISSION TEST:

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

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

ANTENNA PORT CONDUCTED MEASUREMENT:

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

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

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

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

TEST CONDITION:

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

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
-	802.11ac (VHT20)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
-	802.11ac (VHT40)	151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (VHT80)	155	155	OFDM	BPSK	97.5

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
-	802.11ac (VHT20)	149 to 165	149, 165	OFDM	BPSK	7.2
-	802.11ac (VHT40)	151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (VHT80)	155	155	OFDM	BPSK	97.5

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
-	802.11ac (VHT20)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
-	802.11ac (VHT40)	151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (VHT80)	155	155	OFDM	BPSK	97.5

TEST CONDITION:

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

3.3 DUTY CYCLE OF TEST SIGNAL

For 2.4GHz Band:

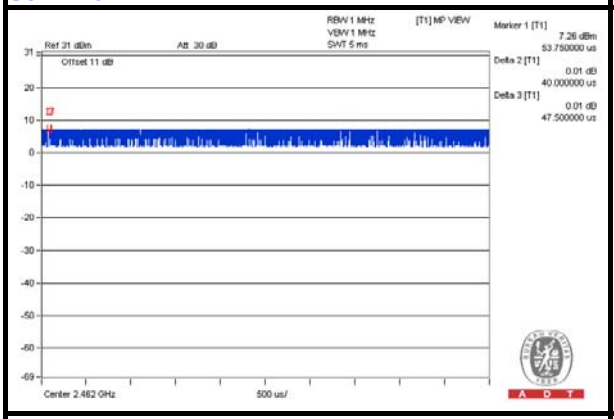
802.11b: Duty cycle of test signal is > 98 %

802.11g: Duty cycle = 2.023/2.074 = 0.975, Duty factor = 10 * log(1/0.975) = 0.11

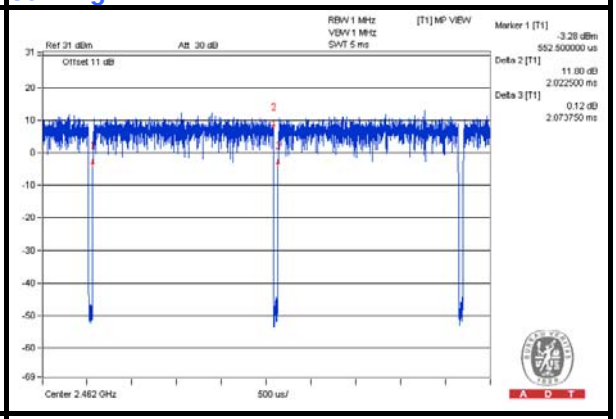
802.11n (HT20): Duty cycle = 1.890/1.940 = 0.974, Duty factor = 10 * log(1/0.974) = 0.11

802.11n (HT40): Duty cycle = 0.921/0.966 = 0.953, Duty factor = 10 * log(1/0.953) = 0.21

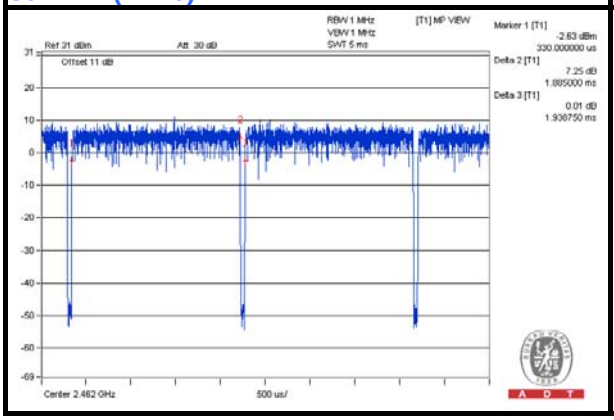
802.11b



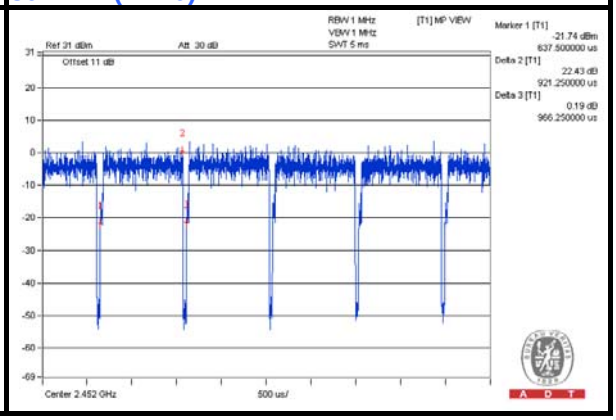
802.11g



802.11n (HT20)



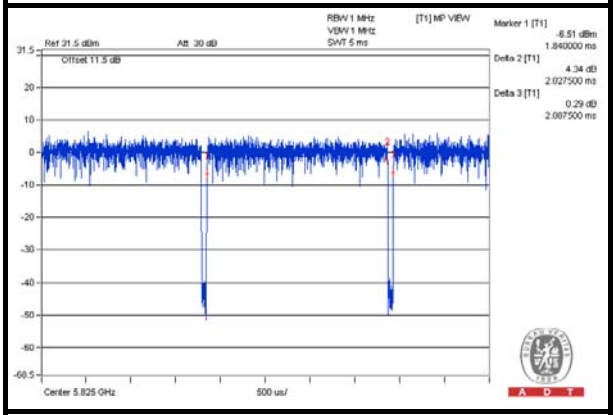
802.11n (HT40)



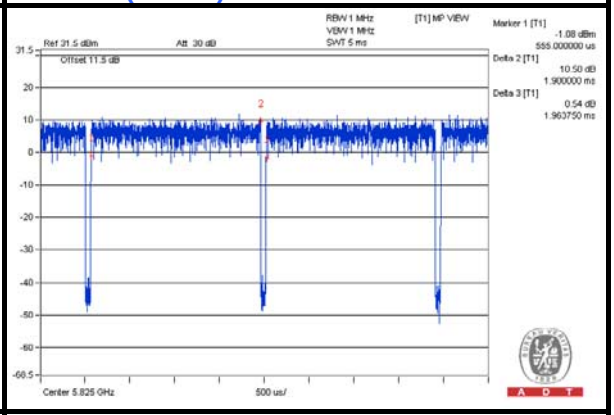
For 5GHz Band:

802.11a: Duty cycle = 2.03/2.09 = 0.971, Duty factor = 10 * log(1/0.971) = 0.13
802.11ac (VHT20): Duty cycle = 1.90/1.96 = 0.969, Duty factor = 10 * log(1/0.969) = 0.14
802.11ac (VHT40): Duty cycle = 0.936/0.995 = 0.941, Duty factor = 10 * log(1/0.941) = 0.26
802.11ac (VHT80): Duty cycle = 0.455/0.511 = 0.870, Duty factor = 10 * log(1/0.870) = 0.60

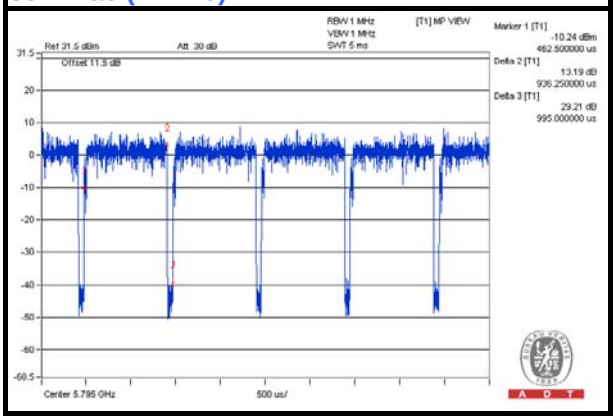
802.11a



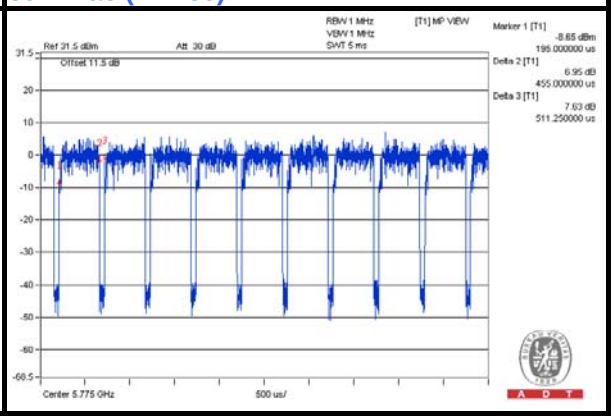
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 DESCRIPTION OF SUPPORT UNITS

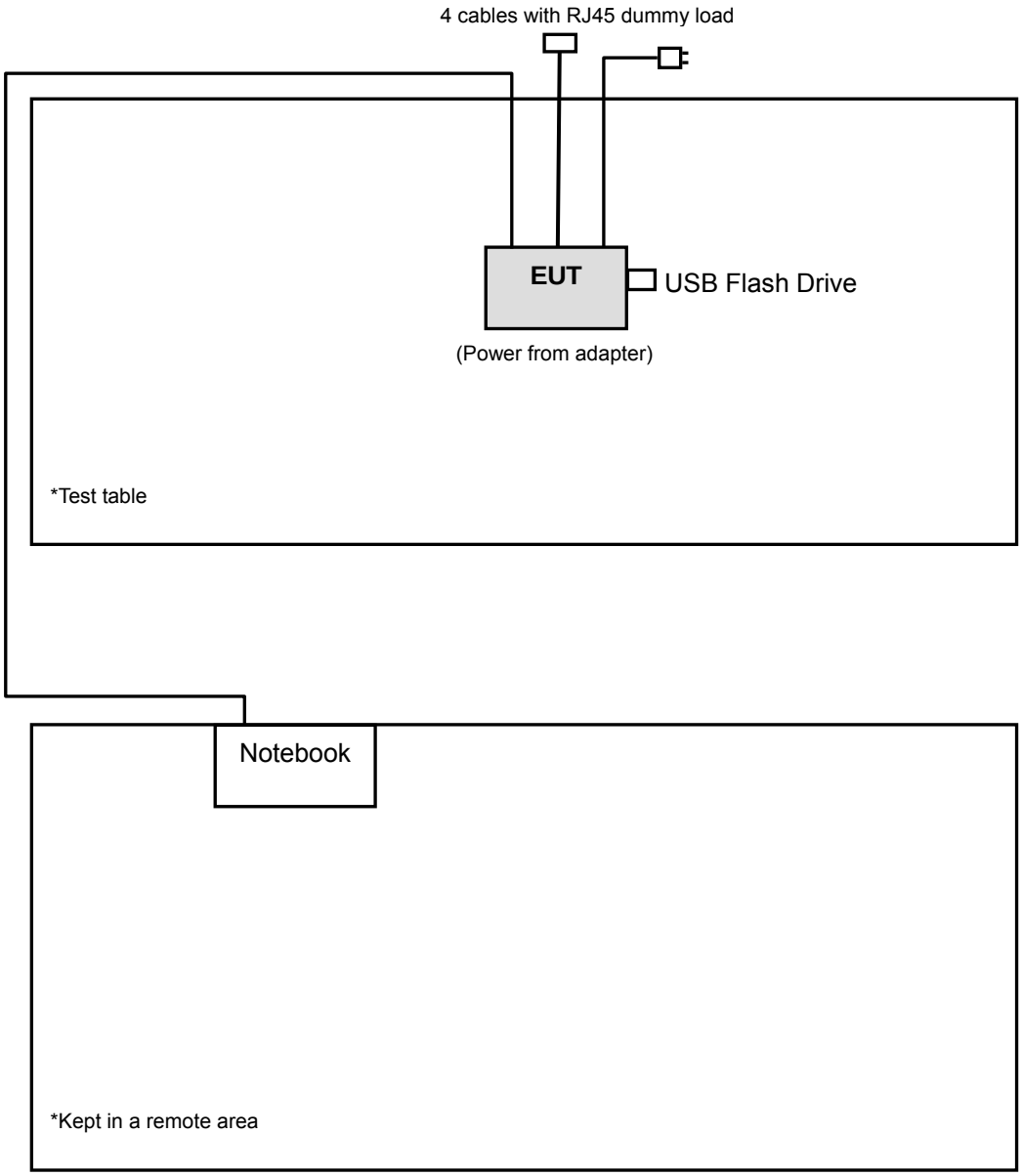
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook	DELL	E5420	BPQ7MQ1	FCC DoC Approved
2	USB Flash Drive	Transcend	V85	538455 4489	NA

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

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

3.4.1 CONFIGURATION OF SYSTEM UNDER TEST



3.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart C (15.247)
558074 D01 DTS Meas Guidance v03r01
662911 D01 Multiple Transmitter Output v02
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 20dB 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 20dB under any condition of modulation.

4.1.2 TEST INSTRUMENTS

Tested date: Oct. 07 ~ Nov. 29, 2013

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESI7	838496/016	Dec. 25, 2012	Dec. 24, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Jan. 31, 2013	Jan. 30, 2014
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Mar. 20, 2013	Mar. 19, 2014
HORN Antenna SCHWARZBECK	9120D	209	Sep. 12, 2013	Sep. 11, 2014
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	8447D	2944A10633	Oct. 07, 2013	Oct. 06, 2014
Preamplifier Agilent	8449B	3008A01964	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	214378/4	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6+309224/4	Aug. 26, 2013	Aug. 25, 2014
Software BV ADT	ADT_Radiated_V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 25, 2012	Oct. 24, 2013
			Oct. 18, 2013	Oct. 17, 2014
High Speed Peak Power Meter	ML2495A	0824011	Jul. 29, 2013	Jul. 28, 2014
Power Sensor	MA2411B	0738171	Jul. 29, 2013	Jul. 28, 2014

NOTE:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The 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 3.
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 988962.
6. The IC Site Registration No. is IC 7450F-3.

4.1.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

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

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE:

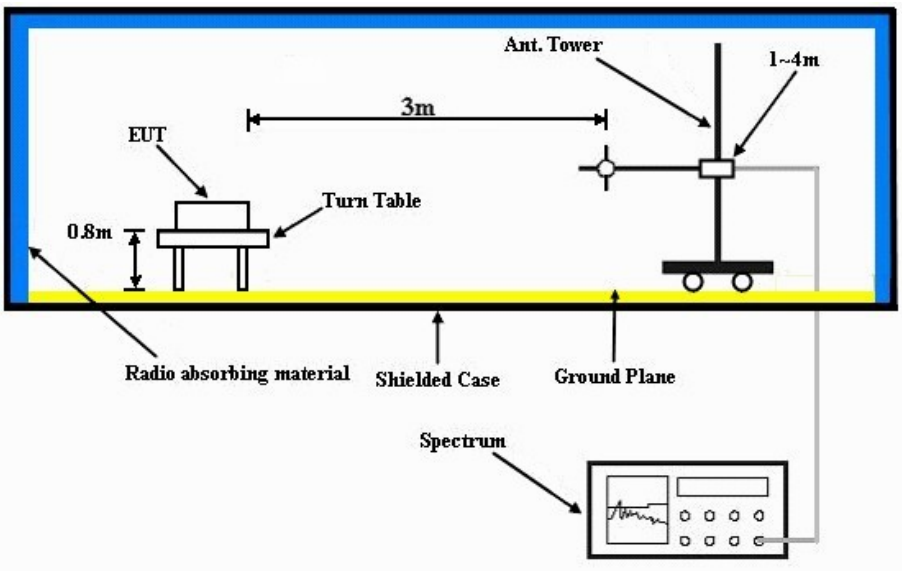
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution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

4.1.4 DEVIATION FROM TEST STANDARD

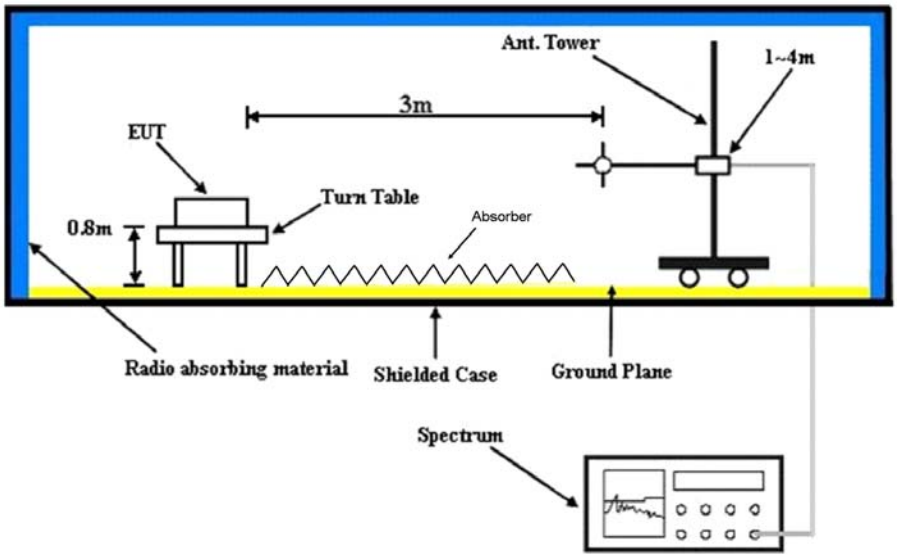
No deviation.

4.1.5 TEST SETUP

Frequency range 30MHz~1GHz



Frequency range above 1GHz



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

4.1.6 EUT OPERATING CONDITIONS

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

4.1.7 TEST RESULTS

ABOVE 1GHz DATA：

802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	**FREQUENCY RANGE**	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%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	2390.00	54.6 PK	74.0	-19.4	1.00 H	24	23.60	31.00
2	2390.00	44.4 AV	54.0	-9.6	1.00 H	24	13.40	31.00
3	*2412.00	106.7 PK			1.00 H	24	75.60	31.10
4	*2412.00	103.5 AV			1.00 H	24	72.40	31.10
5	4824.00	56.1 PK	74.0	-17.9	1.20 H	235	51.70	4.40
6	4824.00	52.9 AV	54.0	-1.1	1.20 H	235	48.50	4.40
7	#7235.00	53.5 PK	86.7	-33.2	1.00 H	239	43.00	10.50
8	#7235.00	43.8 AV	83.5	-39.7	1.00 H	239	33.30	10.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	2390.00	54.1 PK	74.0	-19.9	1.24 V	64	23.10	31.00
2	2390.00	43.2 AV	54.0	-10.8	1.24 V	64	12.20	31.00
3	*2412.00	105.1 PK			1.24 V	64	74.00	31.10
4	*2412.00	101.6 AV			1.24 V	64	70.50	31.10
5	4824.00	55.0 PK	74.0	-19.0	1.10 V	162	50.60	4.40
6	4824.00	51.2 AV	54.0	-2.8	1.10 V	162	46.80	4.40
7	#7235.00	53.1 PK	85.1	-32.0	1.00 V	66	42.60	10.50
8	#7235.00	43.3 AV	81.6	-38.3	1.00 V	66	32.80	10.50

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%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	*2437.00	108.9 PK			1.00 H	23	77.70	31.20
2	*2437.00	105.8 AV			1.00 H	23	74.60	31.20
3	4874.00	56.0 PK	74.0	-18.0	1.20 H	233	51.50	4.50
4	4874.00	52.9 AV	54.0	-1.1	1.20 H	233	48.40	4.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	107.9 PK			1.23 V	66	76.70	31.20
2	*2437.00	104.4 AV			1.23 V	66	73.20	31.20
3	4874.00	55.7 PK	74.0	-18.3	1.10 V	163	51.20	4.50
4	4874.00	52.0 AV	54.0	-2.0	1.10 V	163	47.50	4.50

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%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	*2462.00	105.7 PK			1.00 H	312	74.40	31.30
2	*2462.00	102.3 AV			1.00 H	312	71.00	31.30
3	2483.50	55.5 PK	74.0	-18.5	1.00 H	312	24.10	31.40
4	2483.50	44.5 AV	54.0	-9.5	1.00 H	312	13.10	31.40
5	4924.00	55.8 PK	74.0	-18.2	1.23 H	199	51.00	4.80
6	4924.00	52.3 AV	54.0	-1.7	1.23 H	199	47.50	4.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.5 PK			1.18 V	186	75.20	31.30
2	*2462.00	103.1 AV			1.18 V	186	71.80	31.30
3	2483.50	54.9 PK	74.0	-19.1	1.18 V	186	23.50	31.40
4	2483.50	43.7 AV	54.0	-10.3	1.18 V	186	12.30	31.40
5	4924.00	52.4 PK	74.0	-21.6	1.09 V	162	47.60	4.80
6	4924.00	48.0 AV	54.0	-6.0	1.09 V	162	43.20	4.80

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%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	2390.00	72.5 PK	74.0	-1.5	1.00 H	234	41.50	31.00
2	2390.00	52.7 AV	54.0	-1.3	1.00 H	234	21.70	31.00
3	*2412.00	112.0 PK			1.00 H	224	80.90	31.10
4	*2412.00	101.5 AV			1.00 H	224	70.40	31.10
5	4824.00	64.4 PK	74.0	-9.6	1.13 H	225	60.00	4.40
6	4824.00	47.0 AV	54.0	-7.0	1.13 H	225	42.60	4.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.1 PK	74.0	-2.9	1.00 V	318	40.10	31.00
2	2390.00	52.6 AV	54.0	-1.4	1.00 V	318	21.60	31.00
3	*2412.00	111.5 PK			1.00 V	318	80.40	31.10
4	*2412.00	102.7 AV			1.00 V	318	71.60	31.10
5	4824.00	57.4 PK	74.0	-16.6	1.00 V	169	53.00	4.40
6	4824.00	43.4 AV	54.0	-10.6	1.00 V	169	39.00	4.40

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%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	*2437.00	112.4 PK			1.00 H	41	81.20	31.20
2	*2437.00	102.5 AV			1.00 H	41	71.30	31.20
3	4874.00	69.2 PK	74.0	-4.8	1.22 H	227	64.70	4.50
4	4874.00	52.2 AV	54.0	-1.8	1.22 H	227	47.70	4.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	113.2 PK			1.03 V	82	82.00	31.20
2	*2437.00	104.2 AV			1.03 V	82	73.00	31.20
3	4874.00	65.4 PK	74.0	-8.6	1.00 V	168	60.90	4.50
4	4874.00	48.8 AV	54.0	-5.2	1.00 V	168	44.30	4.50

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%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	*2462.00	111.9 PK			1.00 H	36	80.60	31.30
2	*2462.00	103.0 AV			1.00 H	36	71.70	31.30
3	2483.50	72.1 PK	74.0	-1.9	1.00 H	36	40.70	31.40
4	2483.50	52.7 AV	54.0	-1.3	1.00 H	36	21.30	31.40
5	4924.00	59.1 PK	74.0	-14.9	1.00 H	227	54.30	4.80
6	4924.00	43.4 AV	54.0	-10.6	1.00 H	227	38.60	4.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	111.7 PK			1.00 V	82	80.40	31.30
2	*2462.00	103.3 AV			1.00 V	82	72.00	31.30
3	2483.50	72.6 PK	74.0	-1.4	1.00 V	82	41.20	31.40
4	2483.50	52.9 AV	54.0	-1.1	1.00 V	82	21.50	31.40
5	4924.00	56.8 PK	74.0	-17.2	1.11 V	168	52.00	4.80
6	4924.00	41.8 AV	54.0	-12.2	1.11 V	168	37.00	4.80

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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 (HT20)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%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	2390.00	72.2 PK	74.0	-1.8	1.23 H	55	41.20	31.00
2	2390.00	52.6 AV	54.0	-1.4	1.23 H	55	21.60	31.00
3	*2412.00	111.2 PK			1.23 H	55	80.10	31.10
4	*2412.00	102.1 AV			1.23 H	55	71.00	31.10
5	4824.00	60.4 PK	74.0	-13.6	1.12 H	224	56.00	4.40
6	4824.00	46.3 AV	54.0	-7.7	1.12 H	224	41.90	4.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.0 PK	74.0	-5.0	1.00 V	339	38.00	31.00
2	2390.00	52.6 AV	54.0	-1.4	1.00 V	339	21.60	31.00
3	*2412.00	111.1 PK			1.00 V	330	80.00	31.10
4	*2412.00	102.0 AV			1.00 V	330	70.90	31.10
5	4824.00	57.1 PK	74.0	-16.9	1.00 V	171	52.70	4.40
6	4824.00	43.8 AV	54.0	-10.2	1.00 V	171	39.40	4.40

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%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	*2437.00	112.9 PK			1.17 H	53	81.70	31.20
2	*2437.00	103.3 AV			1.17 H	53	72.10	31.20
3	4874.00	60.7 PK	74.0	-13.3	1.13 H	209	56.20	4.50
4	4874.00	48.2 AV	54.0	-5.8	1.13 H	209	43.70	4.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	110.5 PK			1.09 V	44	79.30	31.20
2	*2437.00	100.9 AV			1.09 V	44	69.70	31.20
3	4874.00	61.2 PK	74.0	-12.8	1.32 V	258	56.70	4.50
4	4874.00	47.0 AV	54.0	-7.0	1.32 V	258	42.50	4.50

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%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	*2462.00	111.4 PK			1.54 H	166	80.10	31.30
2	*2462.00	102.0 AV			1.54 H	166	70.70	31.30
3	2483.50	69.2 PK	74.0	-4.8	1.54 H	166	37.80	31.40
4	2483.50	52.3 AV	54.0	-1.7	1.54 H	166	20.90	31.40
5	4924.00	58.9 PK	74.0	-15.1	1.00 H	214	54.10	4.80
6	4924.00	43.3 AV	54.0	-10.7	1.00 H	214	38.50	4.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	111.4 PK			1.22 V	326	80.10	31.30
2	*2462.00	102.0 AV			1.22 V	326	70.70	31.30
3	2483.50	72.9 PK	74.0	-1.1	1.22 V	326	41.50	31.40
4	2483.50	52.3 AV	54.0	-1.7	1.22 V	326	20.90	31.40
5	4924.00	56.7 PK	74.0	-17.3	1.14 V	158	51.90	4.80
6	4924.00	41.6 AV	54.0	-12.4	1.14 V	158	36.80	4.80

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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 (HT40)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%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	2390.00	64.8 PK	74.0	-9.2	1.02 H	321	33.80	31.00
2	2390.00	51.9 AV	54.0	-2.1	1.02 H	321	20.90	31.00
3	*2422.00	104.8 PK			1.02 H	191	73.60	31.20
4	*2422.00	92.5 AV			1.02 H	191	61.30	31.20
5	4844.00	57.2 PK	74.0	-16.8	1.10 H	103	52.70	4.50
6	4844.00	41.4 AV	54.0	-12.6	1.10 H	103	36.90	4.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.5 PK	74.0	-7.5	1.23 V	198	35.50	31.00
2	**2390.00**	**53.0 AV**	**54.0**	**-1.0**	**1.23 V**	**198**	**22.00**	**31.00**
3	*2422.00	104.1 PK			1.00 V	194	72.90	31.20
4	*2422.00	92.0 AV			1.00 V	194	60.80	31.20
5	4844.00	53.8 PK	74.0	-20.2	1.00 V	178	49.30	4.50
6	4844.00	40.8 AV	54.0	-13.2	1.00 V	178	36.30	4.50

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%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	2390.00	69.8 PK	74.0	-4.2	1.62 H	174	38.80	31.00
2	2390.00	52.5 AV	54.0	-1.5	1.62 H	174	21.50	31.00
3	*2437.00	108.4 PK			1.56 H	181	77.20	31.20
4	*2437.00	96.4 AV			1.56 H	181	65.20	31.20
5	4874.00	62.4 PK	74.0	-11.6	1.21 H	104	57.90	4.50
6	4874.00	49.2 AV	54.0	-4.8	1.21 H	104	44.70	4.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.0 PK	74.0	-7.0	1.00 V	187	36.00	31.00
2	2390.00	51.7 AV	54.0	-2.3	1.00 V	187	20.70	31.00
3	*2437.00	107.2 PK			1.00 V	184	76.00	31.20
4	*2437.00	95.6 AV			1.00 V	184	64.40	31.20
5	4874.00	61.8 PK	74.0	-12.2	1.00 V	176	57.30	4.50
6	4874.00	47.3 AV	54.0	-6.7	1.00 V	176	42.80	4.50

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%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	*2452.00	105.8 PK			1.78 H	317	74.50	31.30
2	*2452.00	93.8 AV			1.78 H	317	62.50	31.30
3	2483.50	66.5 PK	74.0	-7.5	1.85 H	345	35.10	31.40
4	2483.50	51.6 AV	54.0	-2.4	1.85 H	345	20.20	31.40
5	4904.00	57.3 PK	74.0	-16.7	1.10 H	231	52.60	4.70
6	4904.00	43.7 AV	54.0	-10.3	1.10 H	231	39.00	4.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	106.4 PK			1.00 V	52	75.10	31.30
2	*2452.00	93.6 AV			1.00 V	52	62.30	31.30
3	2483.50	67.1 PK	74.0	-6.9	1.23 V	319	35.70	31.40
4	**2483.50**	**53.0 AV**	**54.0**	**-1.0**	**1.23 V**	**319**	**21.60**	**31.40**
5	4904.00	56.5 PK	74.0	-17.5	1.23 V	174	51.80	4.70
6	4904.00	42.9 AV	54.0	-11.1	1.23 V	174	38.20	4.70

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted 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	57.07	29.1 QP	40.0	-10.9	1.24 H	9	44.00	-14.90
2	225.88	38.7 QP	46.0	-7.3	1.99 H	213	55.20	-16.50
3	338.42	40.1 QP	46.0	-5.9	1.00 H	215	51.60	-11.50
4	499.48	30.9 QP	46.0	-15.1	1.99 H	102	39.20	-8.30
5	625.60	41.5 QP	46.0	-4.5	1.50 H	182	47.00	-5.50
6	749.79	36.6 QP	46.0	-9.4	1.00 H	168	39.80	-3.20
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	53.18	35.7 QP	40.0	-4.3	1.24 V	327	49.70	-14.00
2	223.94	40.9 QP	46.0	-5.1	1.50 V	330	57.30	-16.40
3	332.60	35.4 QP	46.0	-10.6	1.00 V	153	47.10	-11.70
4	499.48	38.4 QP	46.0	-7.6	1.00 V	11	46.70	-8.30
5	625.60	40.5 QP	46.0	-5.5	1.99 V	192	46.00	-5.50
6	749.79	34.7 QP	46.0	-11.3	1.00 V	164	37.90	-3.20

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

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: Oct. 10, 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
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	100311	Jul. 17, 2013	Jul. 16, 2014
LISN ROHDE & SCHWARZ (Peripheral)	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.

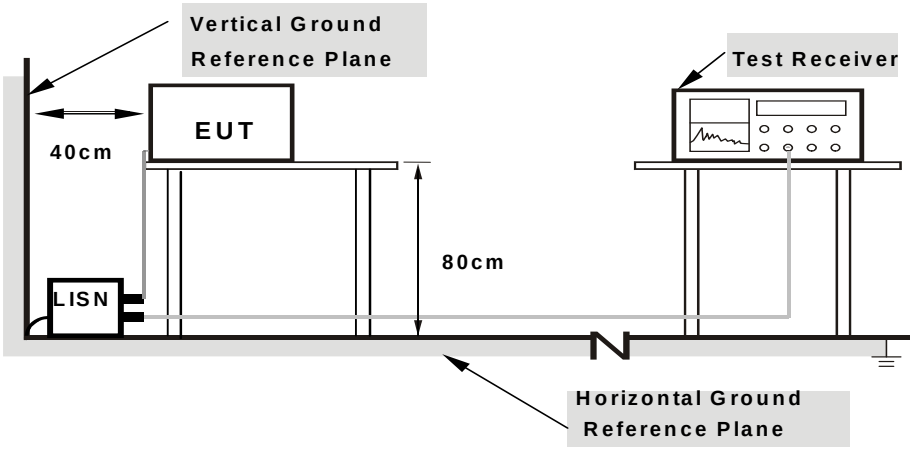
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

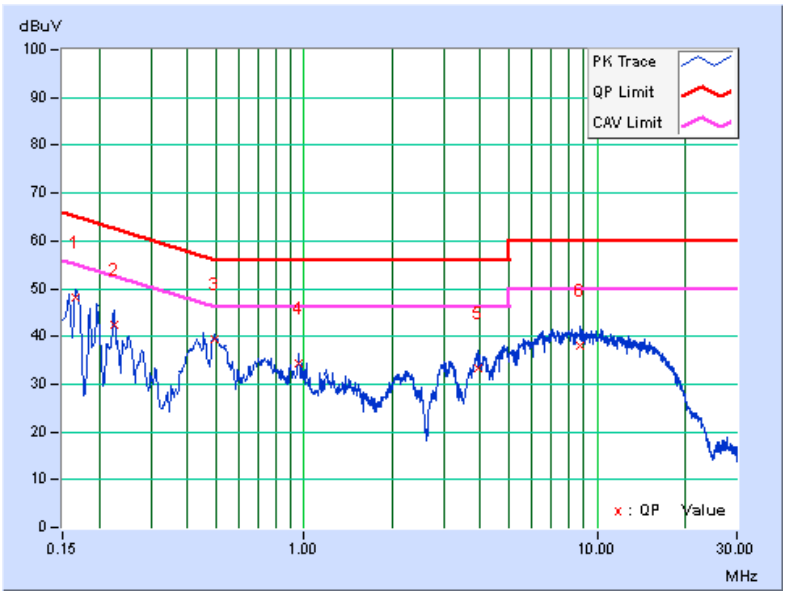
CONDUCTED WORST-CASE DATA：802.11g

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	0.16569	0.16	48.04	37.94	48.20	38.10	65.17	55.17	-16.98	-17.08
2	0.22429	0.17	42.28	34.52	42.45	34.69	62.66	52.66	-20.21	-17.97
3	0.49454	0.23	39.16	30.64	39.39	30.87	56.09	46.09	-16.70	-15.22
4	0.95813	0.25	34.14	27.57	34.39	27.82	56.00	46.00	-21.61	-18.18
5	3.95052	0.40	32.91	26.26	33.31	26.66	56.00	46.00	-22.69	-19.34
6	8.75200	0.65	37.47	30.82	38.12	31.47	60.00	50.00	-21.88	-18.53

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.

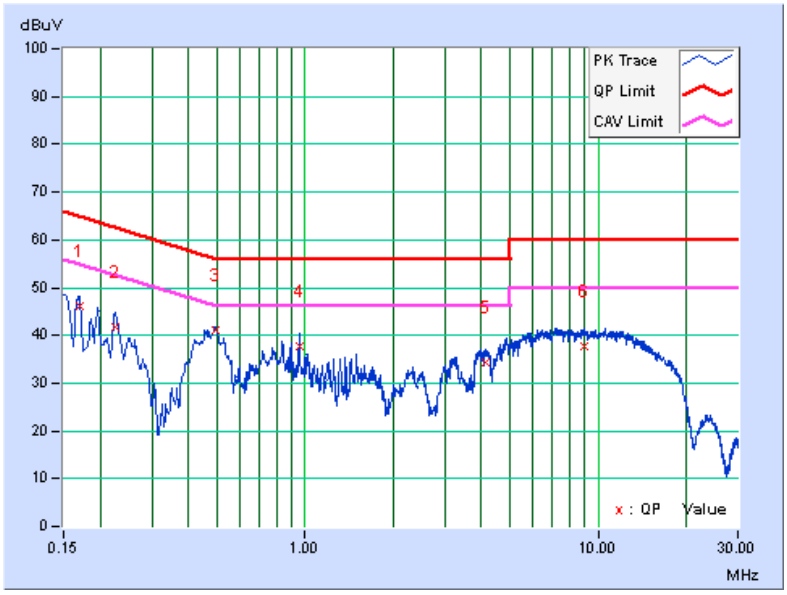


PHASE	Line 2	6dB BANDWIDTH	9kHz

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	0.16955	0.17	45.95	36.25	46.12	36.42	64.98	54.98	-18.87	-18.57
2	0.22434	0.18	41.46	35.20	41.64	35.38	62.66	52.66	-21.02	-17.28
3	**0.49408**	**0.24**	**40.90**	**34.59**	**41.14**	**34.83**	**56.10**	**46.10**	**-14.96**	**-11.27**
4	0.95561	0.25	37.43	30.73	37.68	30.98	56.00	46.00	-18.32	-15.02
5	4.13544	0.38	34.03	28.56	34.41	28.94	56.00	46.00	-21.59	-17.06
6	8.95141	0.56	37.22	30.40	37.78	30.96	60.00	50.00	-22.22	-19.04

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.

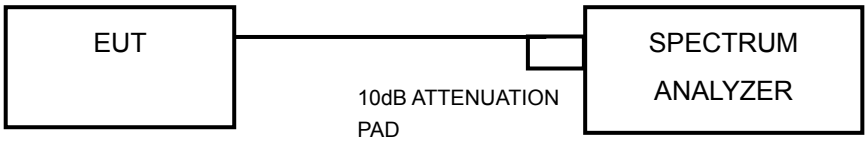


4.3 6dB BANDWIDTH MEASUREMENT

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	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	6.53	6.09	6.09	0.5	PASS
6	2437	6.09	5.61	6.12	0.5	PASS
11	2462	6.06	6.55	6.56	0.5	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	16.50	16.49	16.53	0.5	PASS
6	2437	16.46	16.50	16.50	0.5	PASS
11	2462	16.47	16.48	16.46	0.5	PASS

802.11n (HT20)

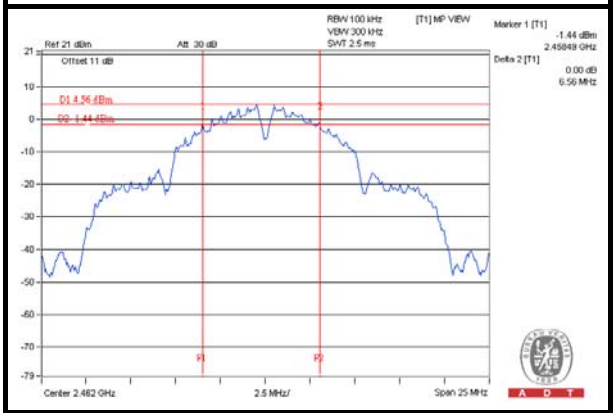
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	17.67	17.66	17.69	0.5	PASS
6	2437	17.67	17.69	17.69	0.5	PASS
11	2462	17.67	17.68	17.68	0.5	PASS

802.11n (HT40)

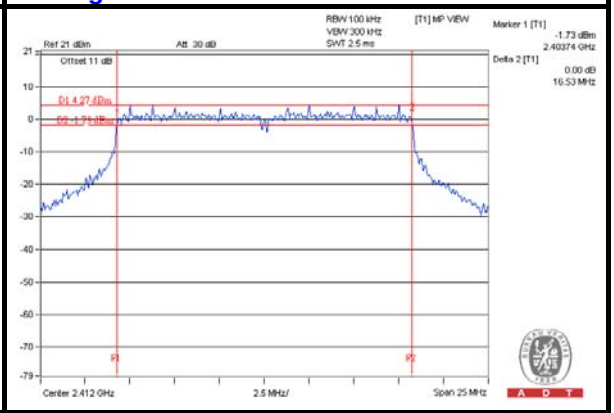
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
3	2422	36.48	36.47	36.52	0.5	PASS
6	2437	36.44	36.47	36.44	0.5	PASS
9	2452	36.16	36.43	36.44	0.5	PASS

SPECTRUM PLOT OF WORST VALUE

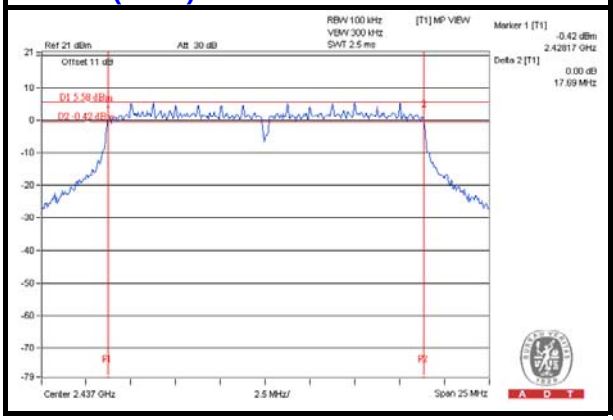
802.11b



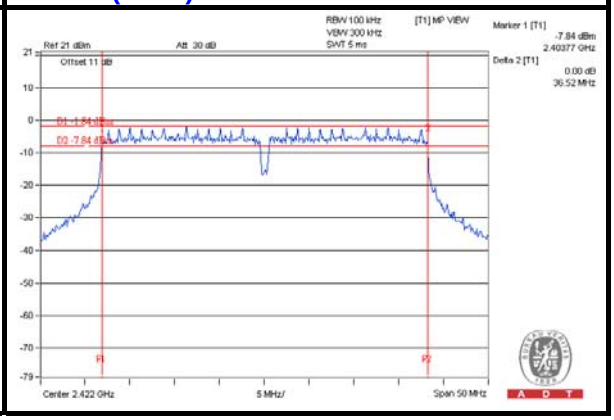
802.11g



802.11n (HT20)



802.11n (HT40)



4.4 CONDUCTED OUTPUT POWER

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

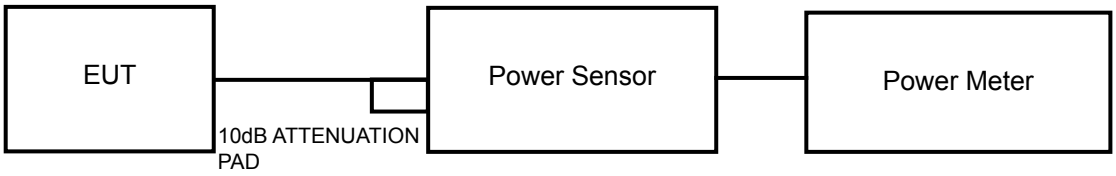
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

Per KDB 662911 D01 Multiple Transmitter Output v02 Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;
Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less for 20-MHz channel widths with NANT ≥ 5.

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

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.4.4 TEST PROCEDURES

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

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.

4.4.7 TEST RESULTS

FOR PEAK POWER

802.11b

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	13.91	14.45	13.84	76.675	18.85	30	PASS
6	2437	15.30	14.52	14.49	90.317	19.56	30	PASS
11	2462	15.48	14.84	14.53	94.176	19.74	30	PASS

802.11g

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	25.76	24.34	23.87	892.129	29.50	30	PASS
6	2437	26.23	25.32	23.54	**986.111**	29.94	30	PASS
11	2462	25.48	23.21	23.08	765.830	28.84	30	PASS

802.11n (HT20)

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	23.60	24.60	23.49	740.847	28.70	30	PASS
6	2437	25.59	25.00	23.13	884.060	29.46	30	PASS
11	2462	23.82	23.37	22.88	652.350	28.14	30	PASS

802.11n (HT40)

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
3	2422	22.32	21.25	21.16	434.577	26.38	30	PASS
6	2437	24.69	24.94	23.49	829.688	29.19	30	PASS
9	2452	23.57	22.67	22.24	579.931	27.63	30	PASS

FOR AVERAGE POWER

802.11b

CHAN.	FREQUENCY (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	10.27	10.77	10.25	33.174	15.21
6	2437	11.62	10.96	10.80	39.018	15.91
11	2462	11.74	11.04	10.93	40.022	16.02

802.11g

CHAN.	FREQUENCY (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	17.16	16.33	16.01	134.856	21.30
6	2437	17.86	17.09	16.99	162.265	22.10
11	2462	16.60	15.02	15.05	109.467	20.39

802.11n (HT20)

CHAN.	FREQUENCY (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	16.18	16.65	15.68	124.716	20.96
6	2437	17.55	16.83	16.29	147.640	21.69
11	2462	15.96	14.94	15.38	105.149	20.22

802.11n (HT40)

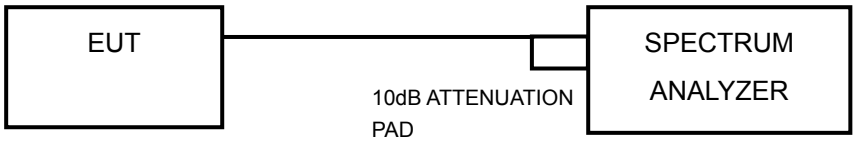
CHAN.	FREQUENCY (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1	CHAIN 2		
3	2422	13.30	13.25	12.56	60.545	17.82
6	2437	16.59	16.13	15.58	122.765	20.89
9	2452	14.46	13.97	13.47	75.104	18.76

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	-11.72	4.77	-6.95	6.78	PASS
	6	2437	-11.28	4.77	-6.51	6.78	PASS
	11	2462	-9.30	4.77	-4.53	6.78	PASS
1	1	2412	-11.35	4.77	-6.58	6.78	PASS
	6	2437	-11.19	4.77	-6.42	6.78	PASS
	11	2462	-10.55	4.77	-5.78	6.78	PASS
2	1	2412	-11.05	4.77	-6.28	6.78	PASS
	6	2437	-10.14	4.77	-5.37	6.78	PASS
	11	2462	-8.90	4.77	-4.13	6.78	PASS

NOTE:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2.45dBi + 10log(3) = 7.22dBi > 6dBi , so the power density limit shall be reduced to 8-(7.22-6) = 6.78dBm.

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-8.96	4.77	-4.19	6.78	PASS
	6	2437	-9.04	4.77	-4.27	6.78	PASS
	11	2462	-10.59	4.77	-5.82	6.78	PASS
1	1	2412	-8.76	4.77	-3.99	6.78	PASS
	6	2437	-8.74	4.77	-3.97	6.78	PASS
	11	2462	-9.86	4.77	-5.09	6.78	PASS
2	1	2412	-4.78	4.77	-0.01	6.78	PASS
	6	2437	-5.98	4.77	-1.21	6.78	PASS
	11	2462	-9.83	4.77	-5.06	6.78	PASS

NOTE:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2.45dBi + 10log(3) = 7.22dBi > 6dBi , so the power density limit shall be reduced to 8-(7.22-6) = 6.78dBm.

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-10.48	4.77	-5.71	6.78	PASS
	6	2437	-9.39	4.77	-4.62	6.78	PASS
	11	2462	-9.97	4.77	-5.20	6.78	PASS
1	1	2412	-9.76	4.77	-4.99	6.78	PASS
	6	2437	-8.96	4.77	-4.19	6.78	PASS
	11	2462	-10.40	4.77	-5.63	6.78	PASS
2	1	2412	-9.49	4.77	-4.72	6.78	PASS
	6	2437	-8.04	4.77	-3.27	6.78	PASS
	11	2462	-7.73	4.77	-2.96	6.78	PASS

NOTE:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2.45dBi + 10log(3) = 7.22dBi > 6dBi , so the power density limit shall be reduced to 8-(7.22-6) = 6.78dBm.

802.11n (HT40)

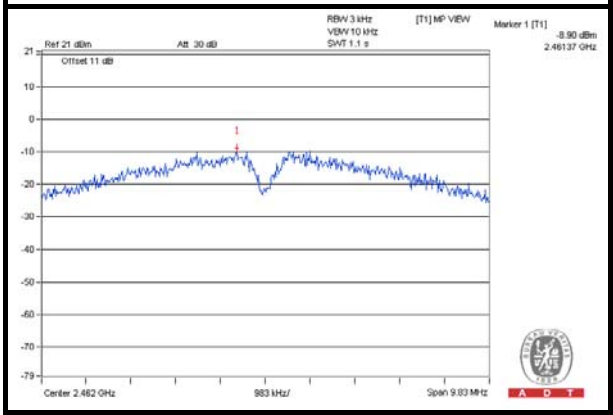
TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	3	2422	-16.34	4.77	-11.57	6.78	PASS
	6	2437	-9.32	4.77	-4.55	6.78	PASS
	9	2452	-14.12	4.77	-9.35	6.78	PASS
1	3	2422	-8.55	4.77	-3.78	6.78	PASS
	6	2437	-5.41	4.77	-0.64	6.78	PASS
	9	2452	-11.36	4.77	-6.59	6.78	PASS
2	3	2422	-13.32	4.77	-8.55	6.78	PASS
	6	2437	-8.00	4.77	-3.23	6.78	PASS
	9	2452	-7.23	4.77	-2.46	6.78	PASS

NOTE:

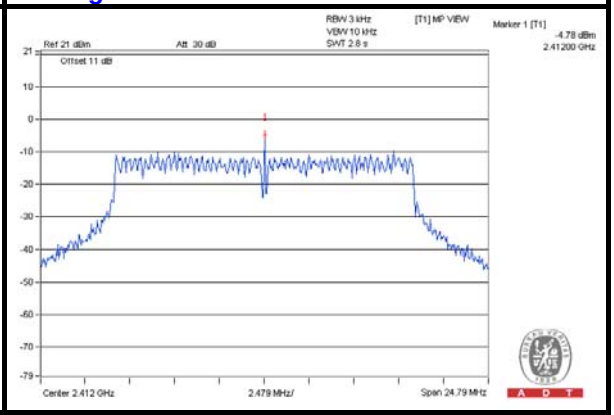
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2.45dBi + 10log(3) = 7.22dBi > 6dBi , so the power density limit shall be reduced to 8-(7.22-6) = 6.78dBm.

SPECTRUM PLOT OF WORST VALUE

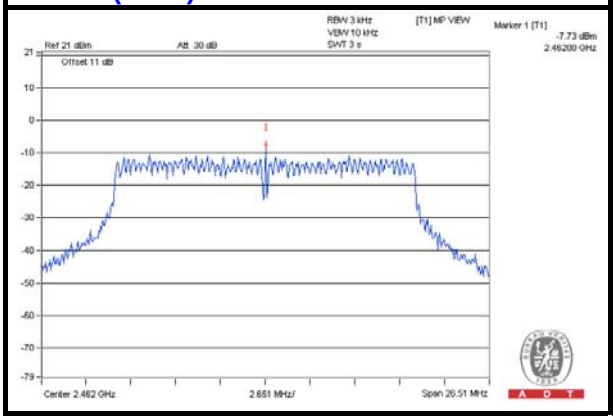
802.11b



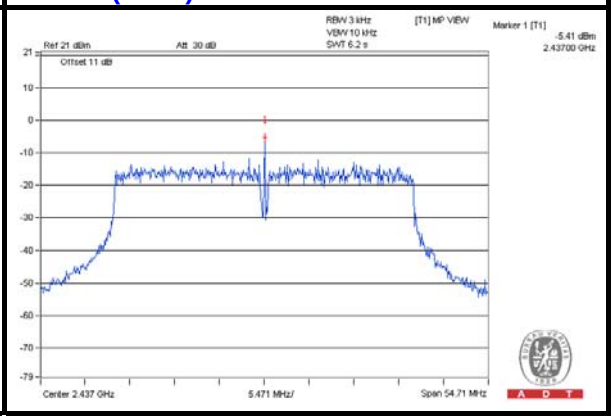
802.11g



802.11n (HT20)



802.11n (HT40)

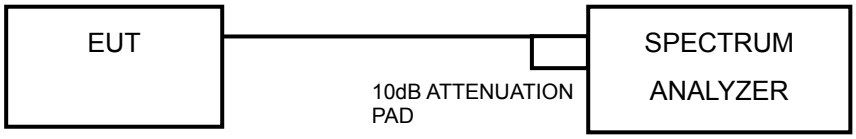


4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

Below -20dB 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

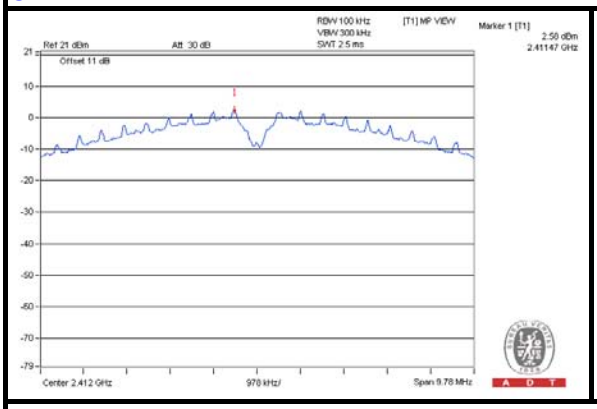
The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.

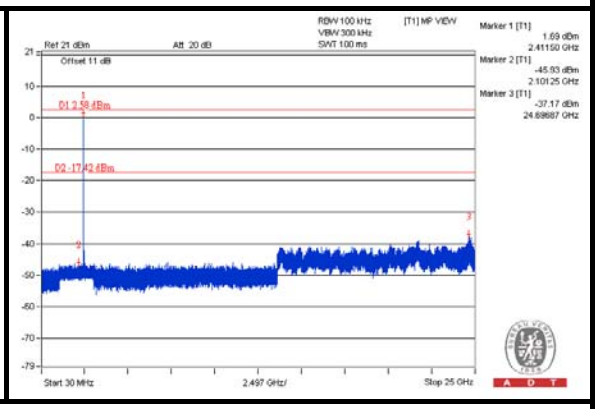
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b

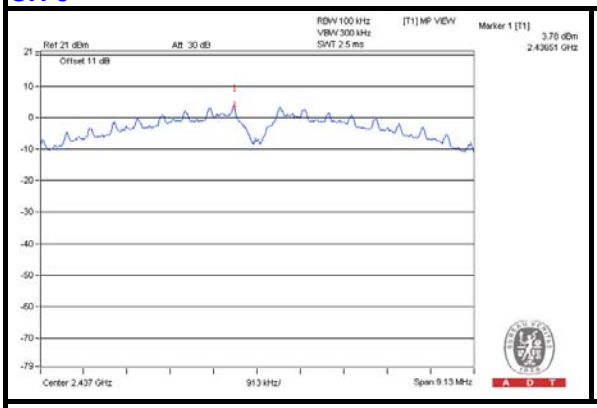
CHAIN 0

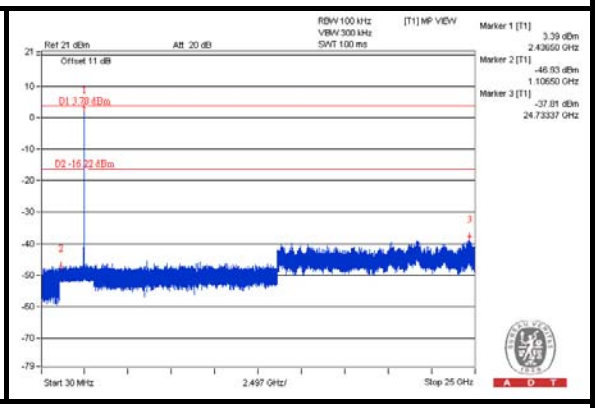
CH 1



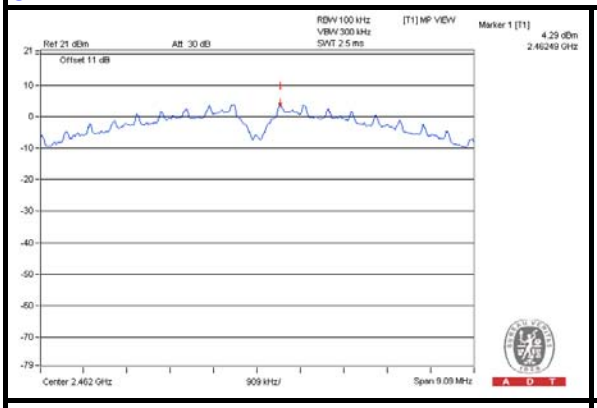


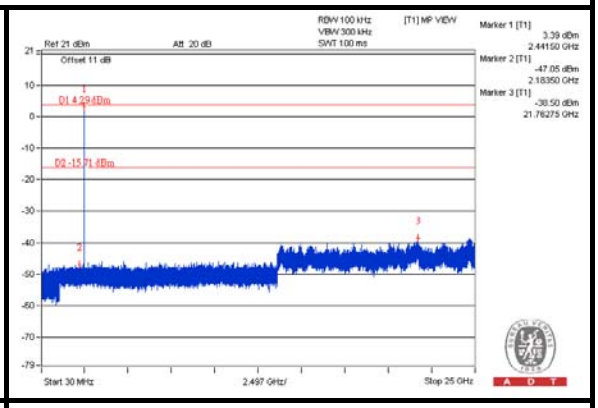
CH 6



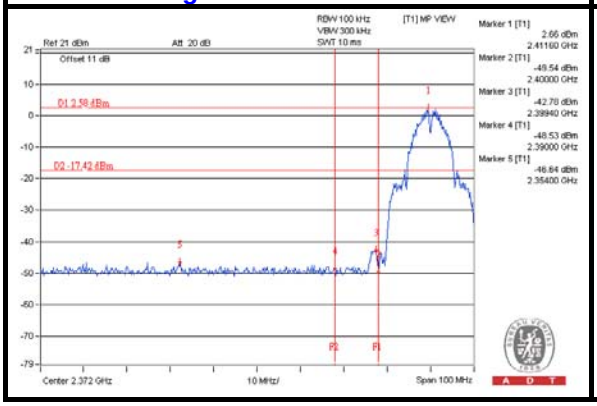


CH 11

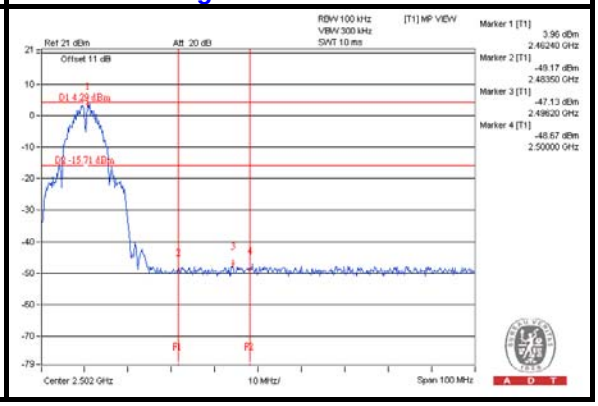




CH 1 Band edge

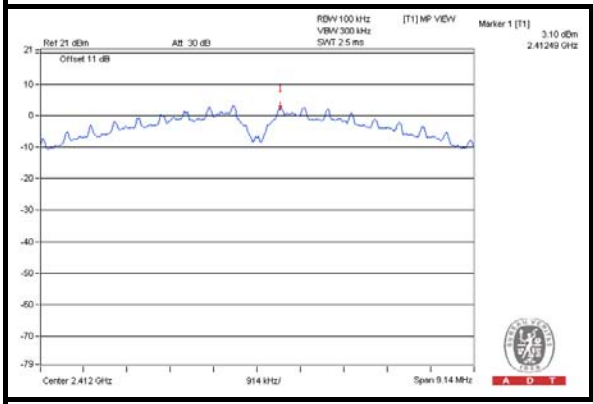


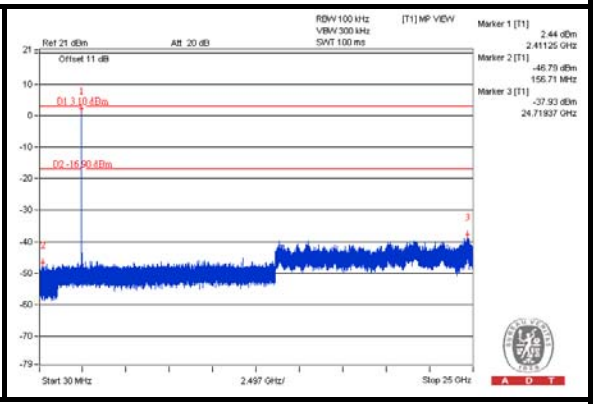
CH 11 Band edge



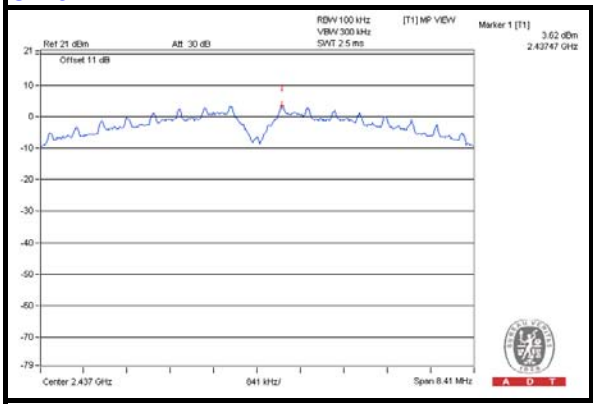
CHAIN 1

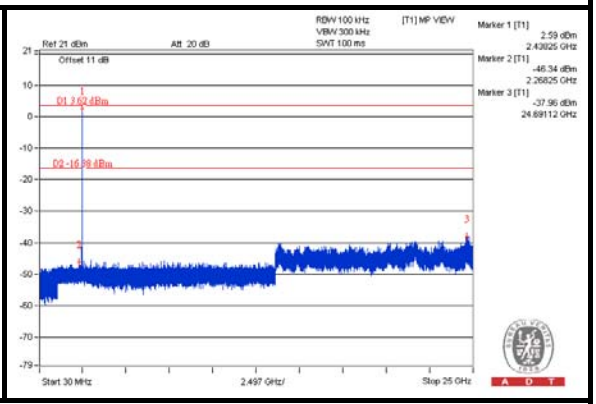
CH 1



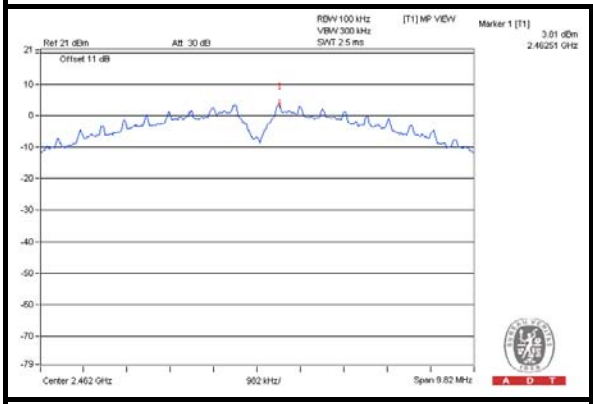


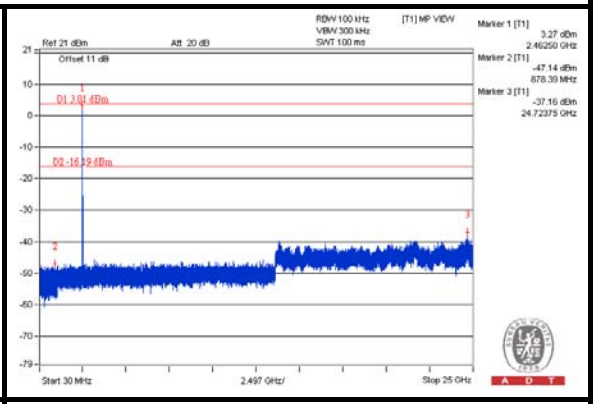
CH 6



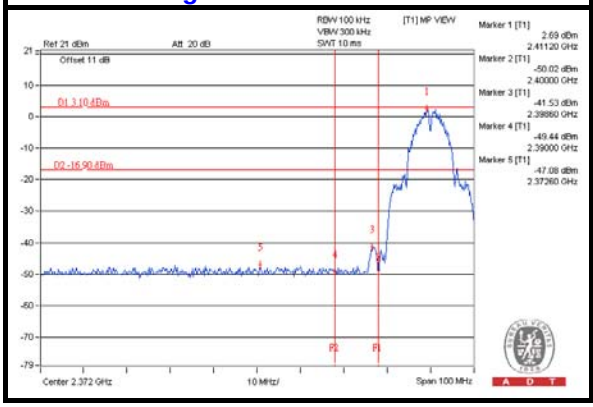


CH 11

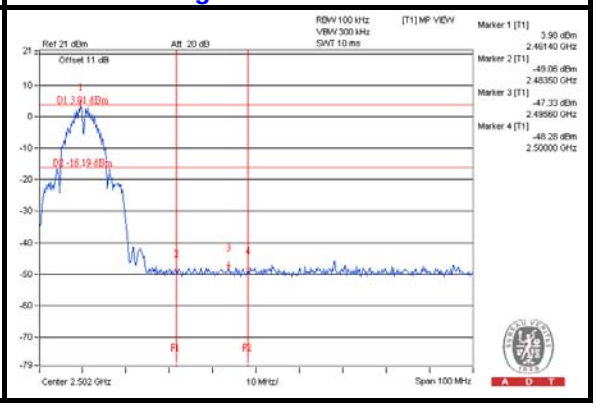




CH 1 Band edge

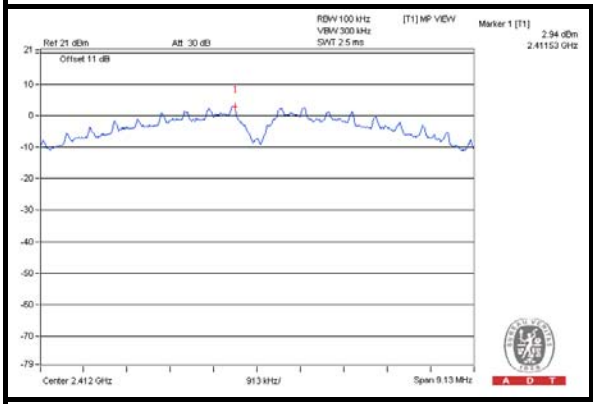


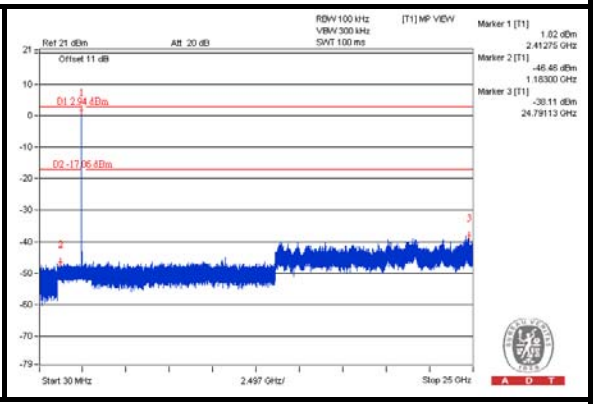
CH 11 Band edge



CHAIN 2

CH 1





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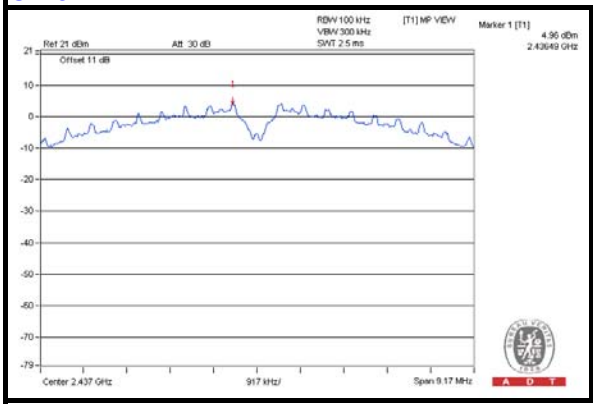

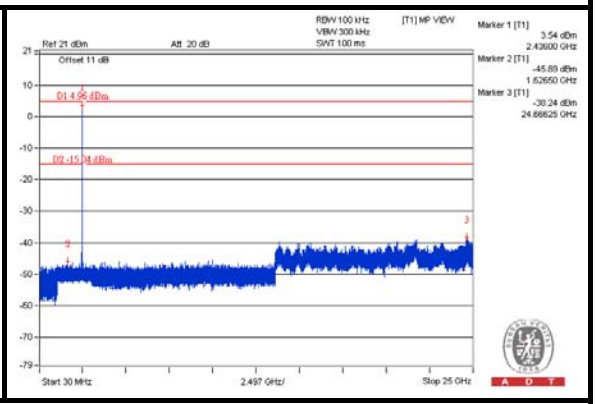

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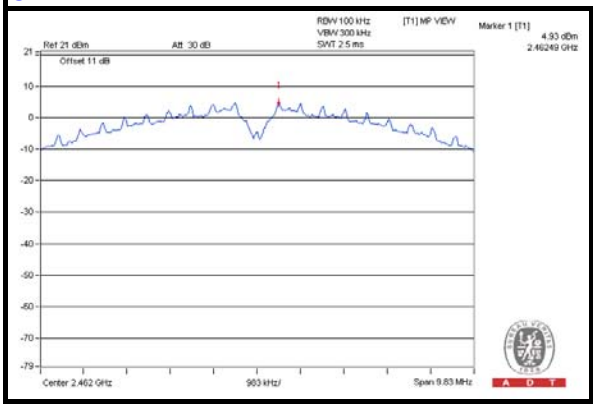

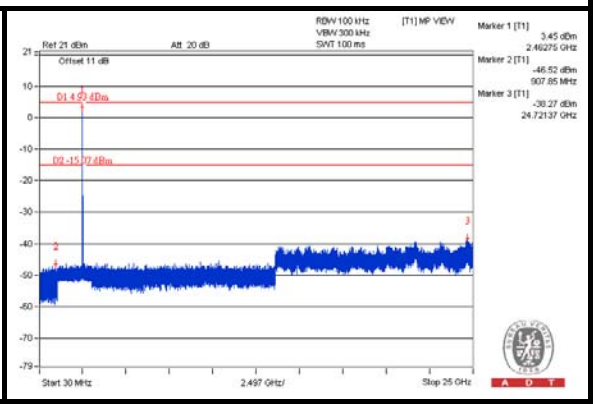

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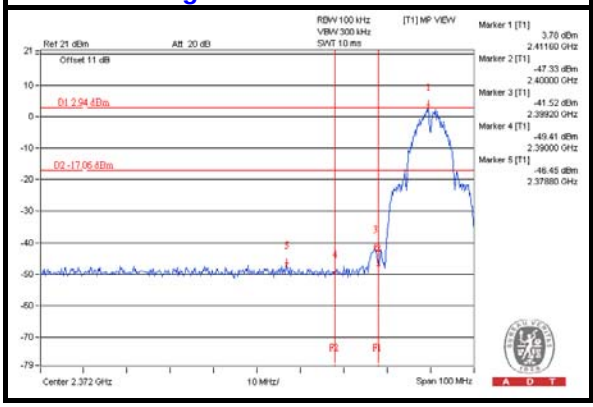

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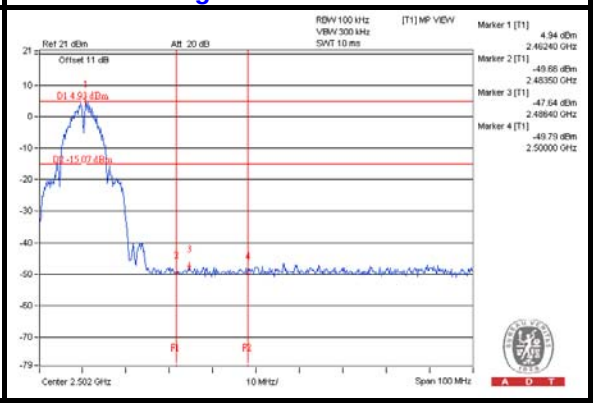

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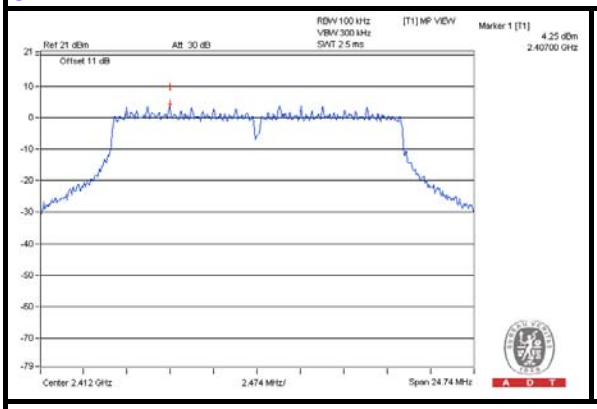

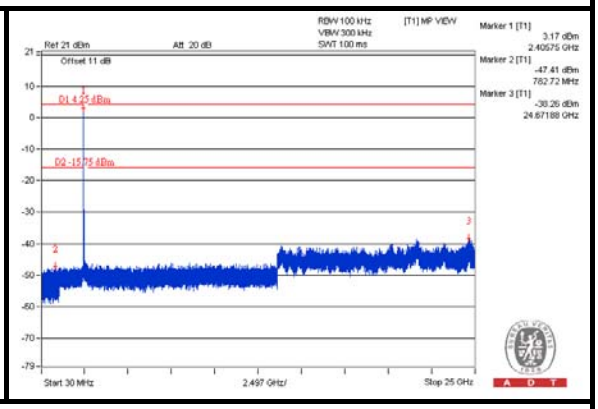

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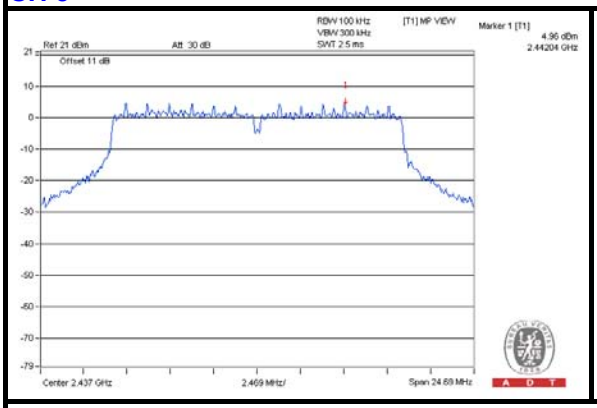

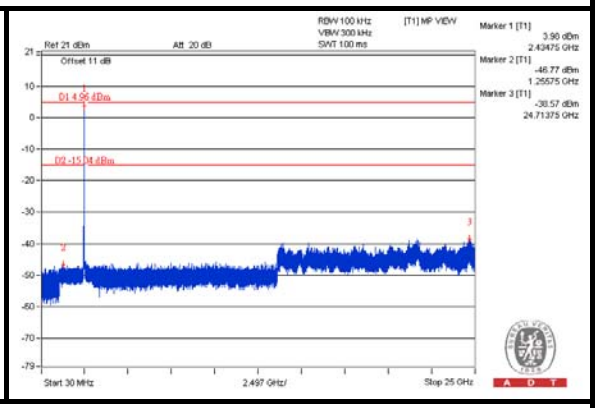

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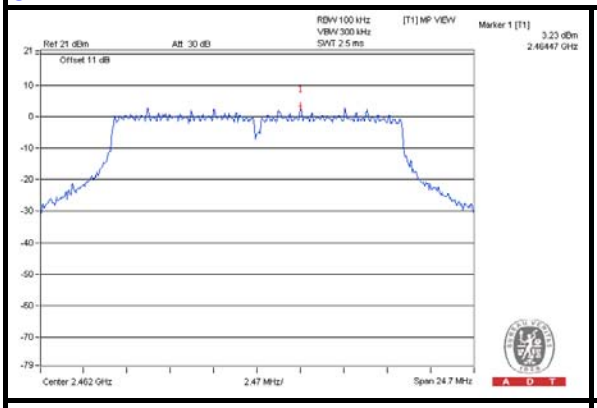

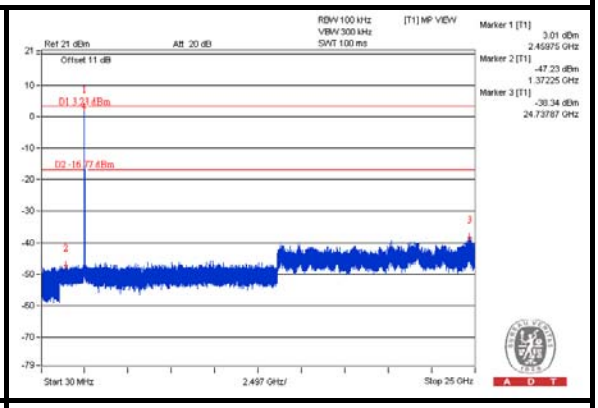

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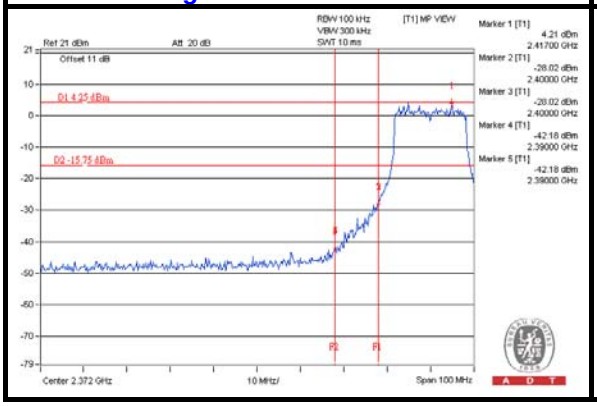

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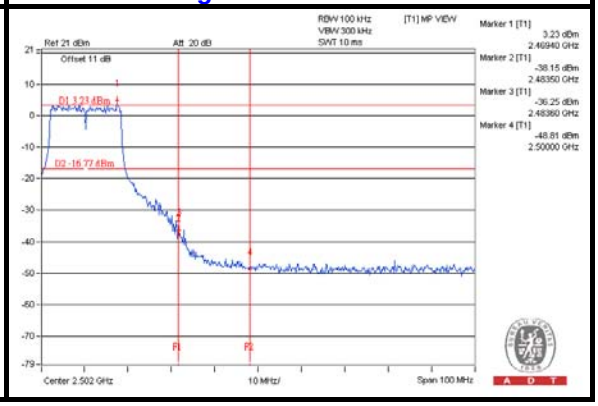

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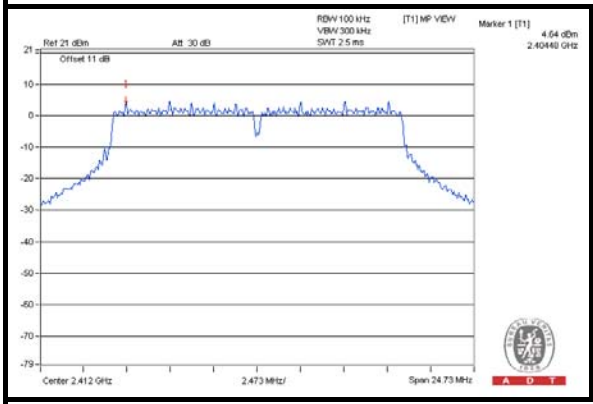

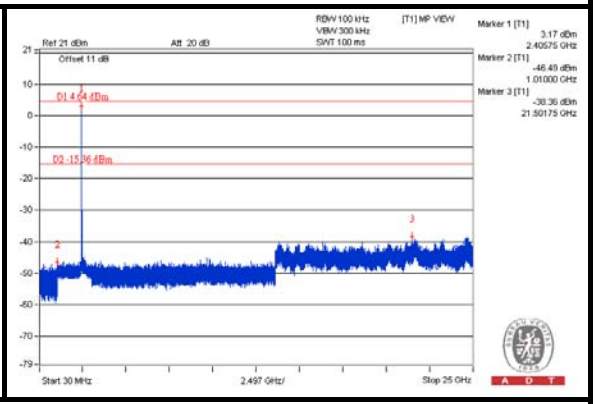

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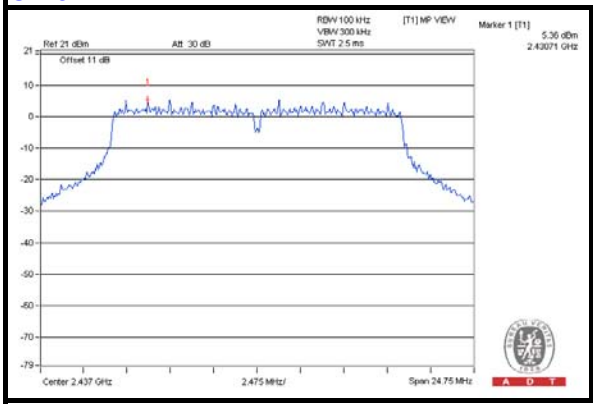

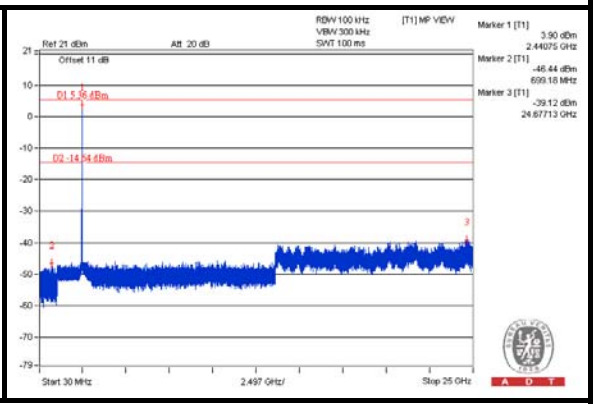

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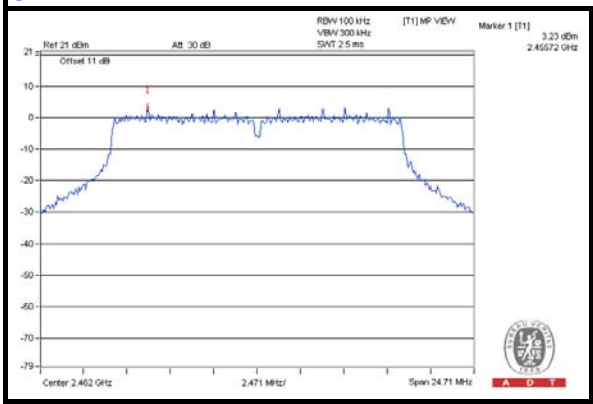

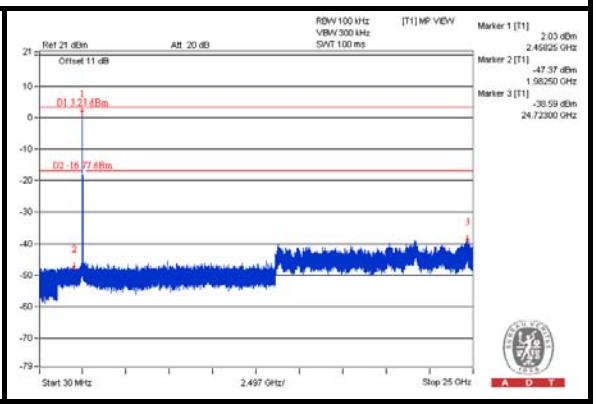

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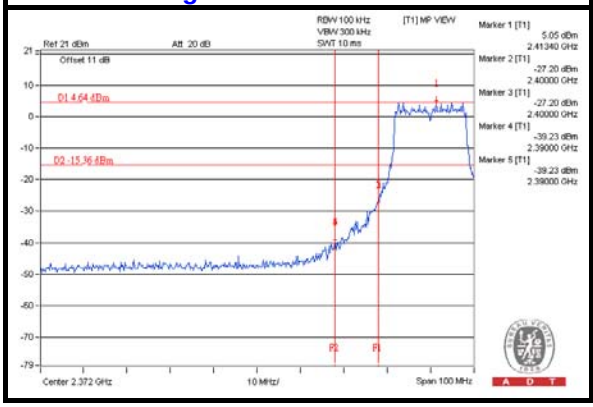

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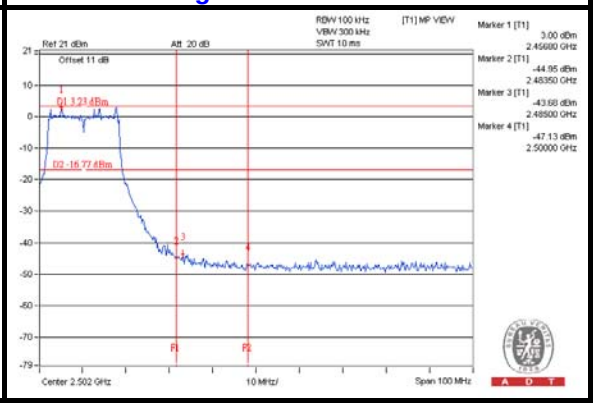
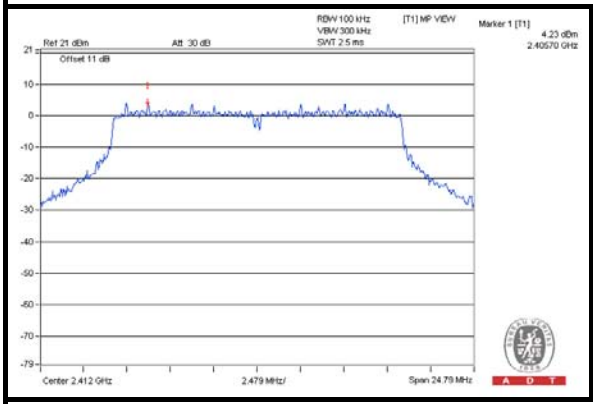
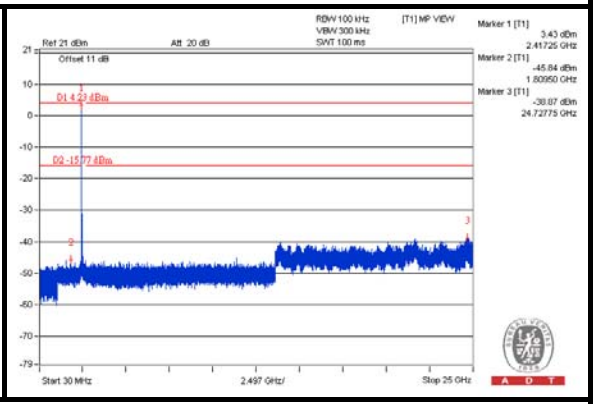


CHAIN 2

CH 1





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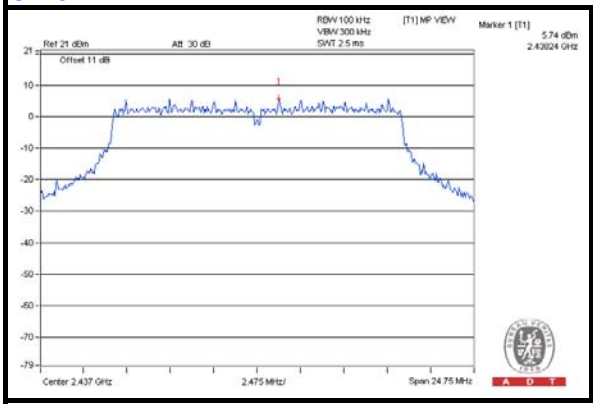

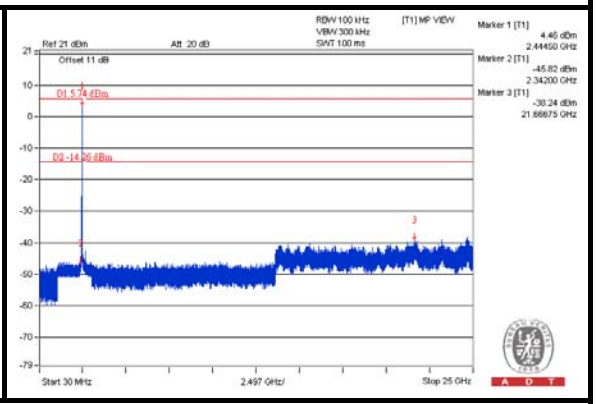

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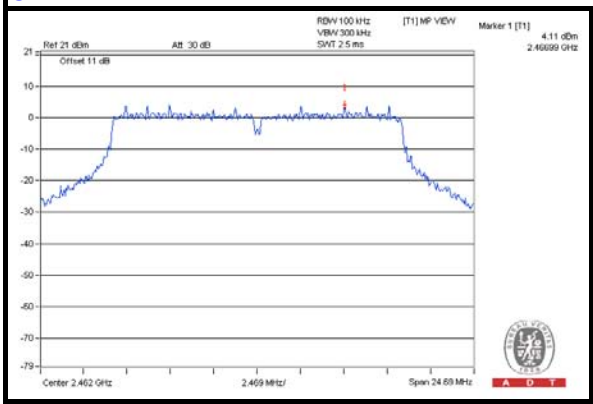

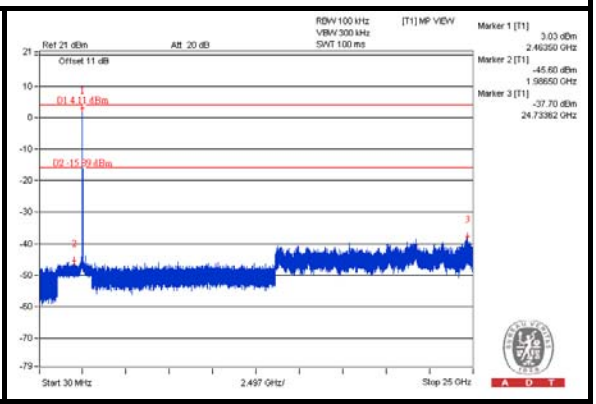

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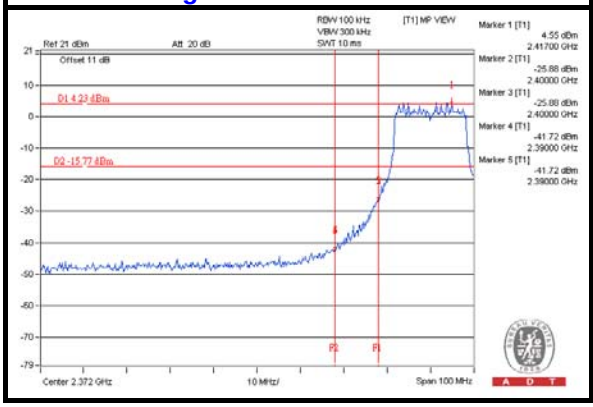

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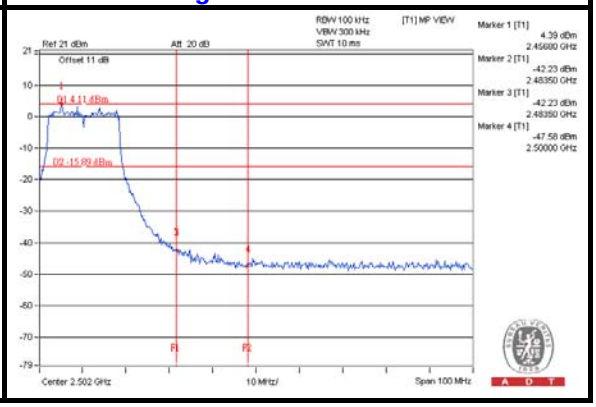

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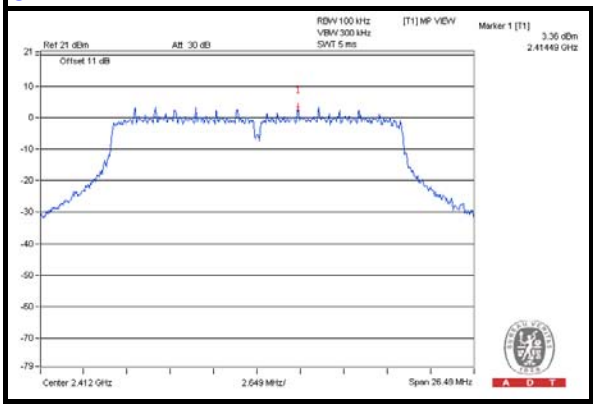

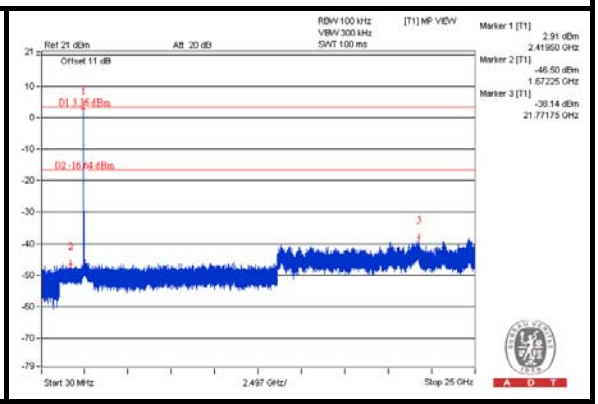

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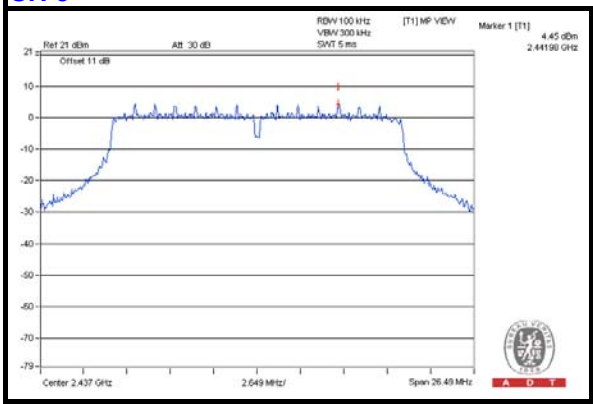

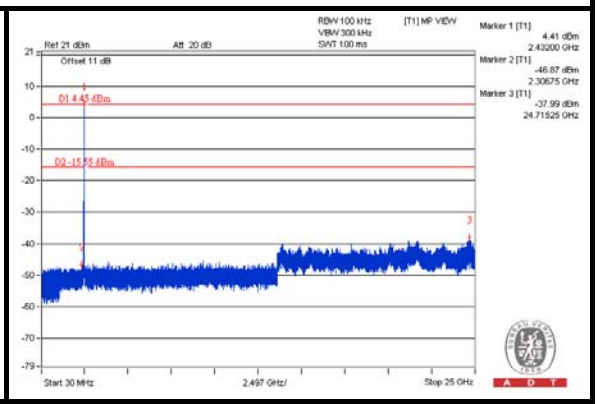

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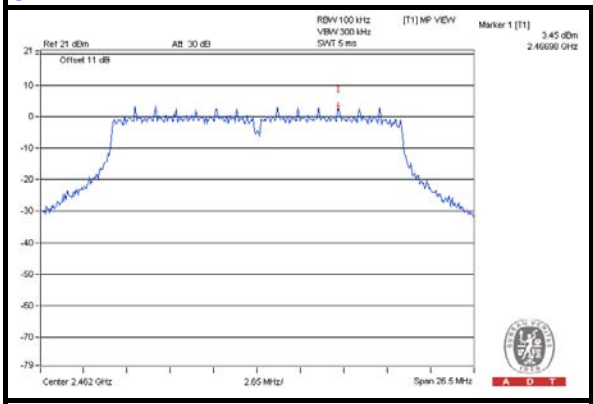

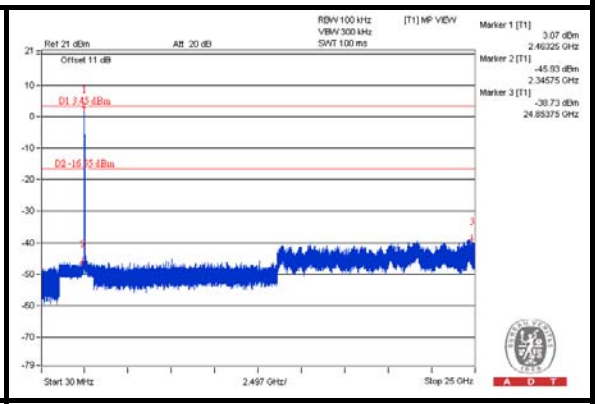

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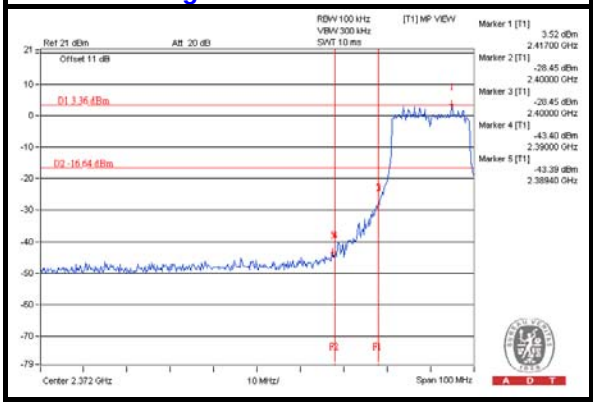

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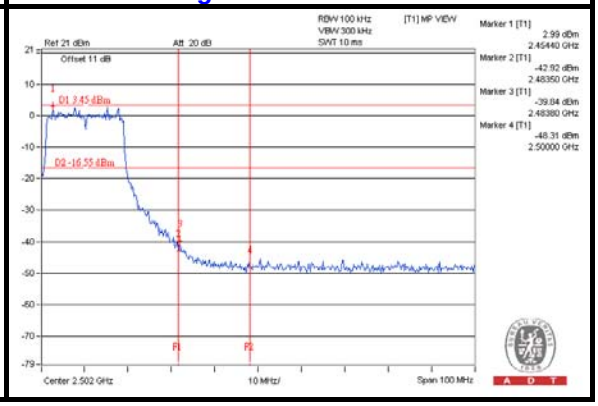

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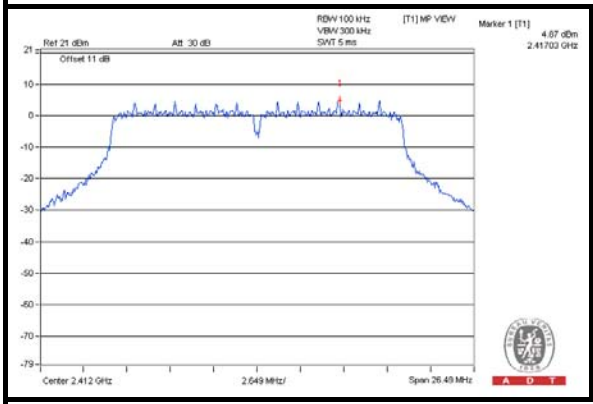

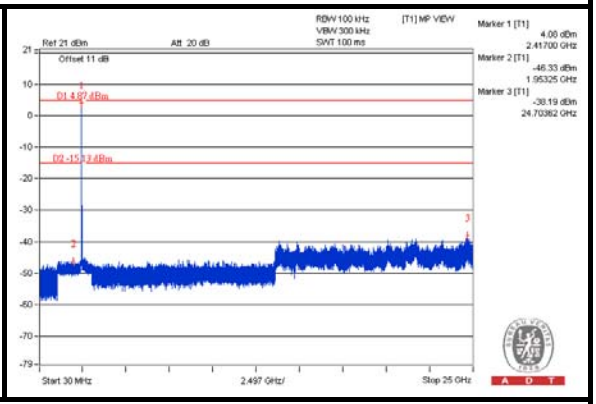

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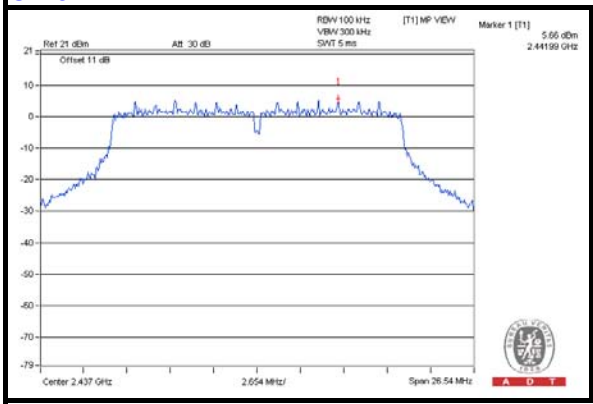

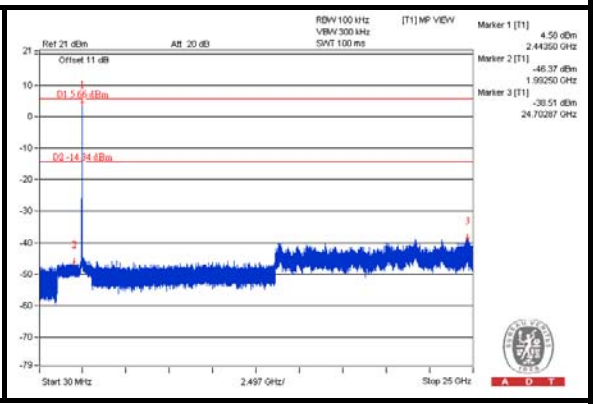

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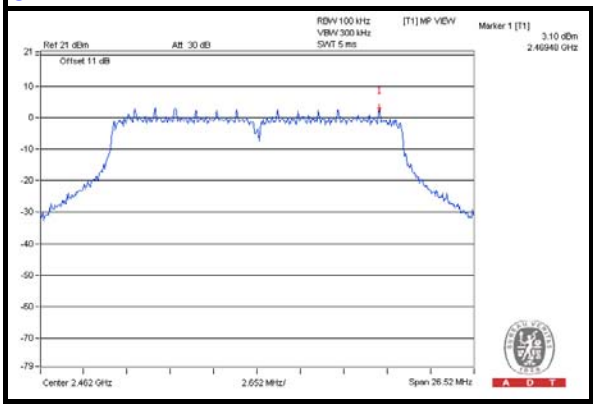

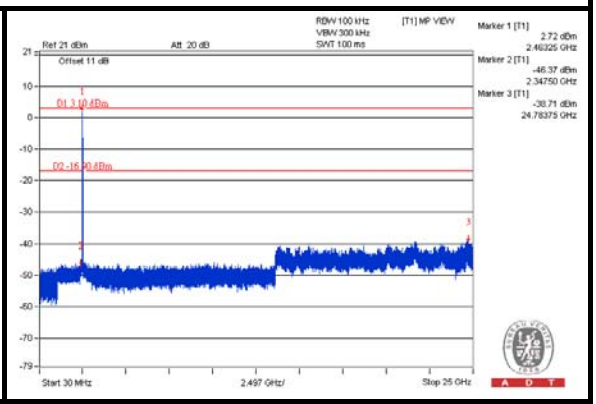

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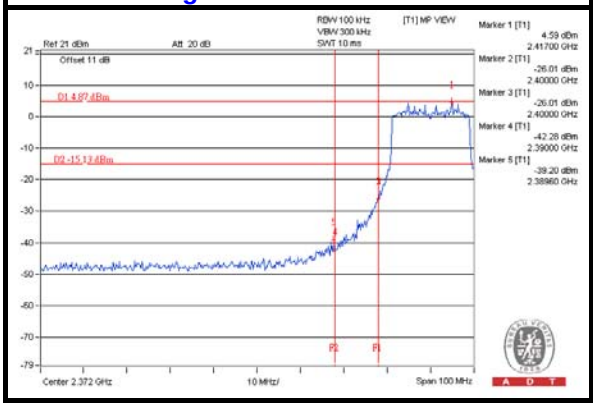

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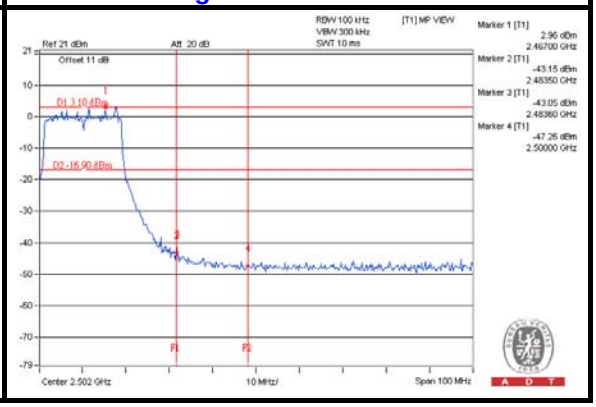

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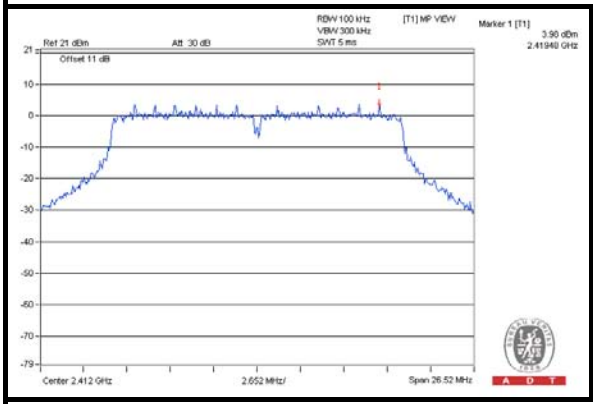

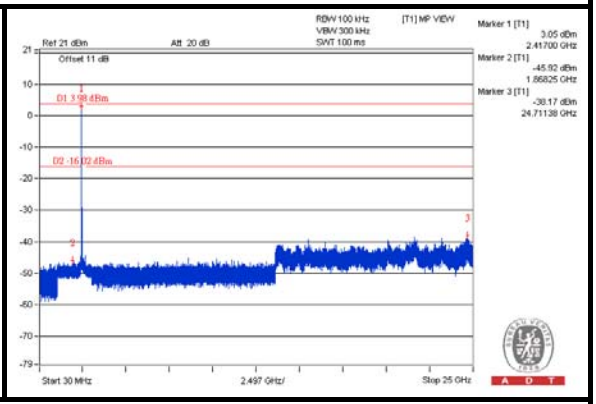

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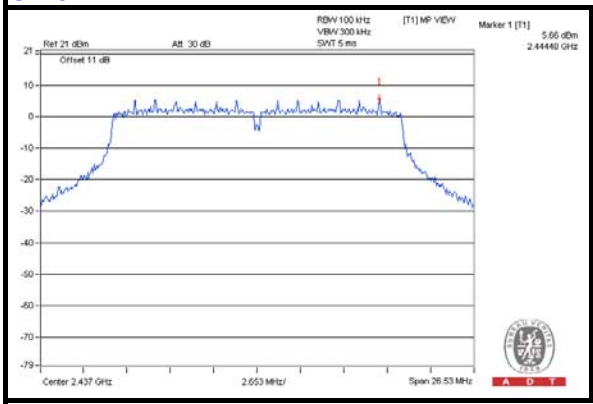

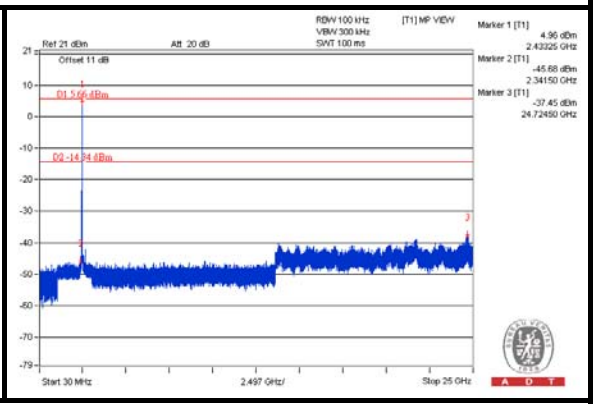

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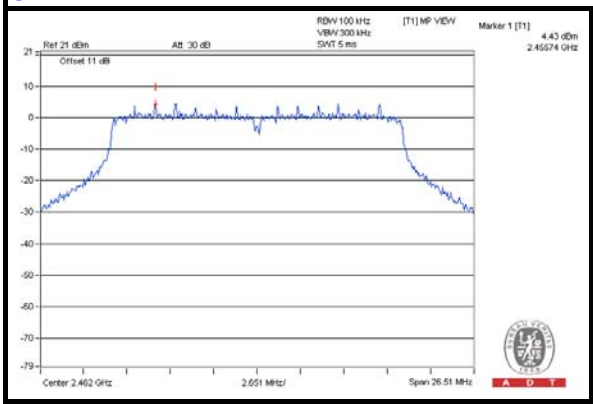

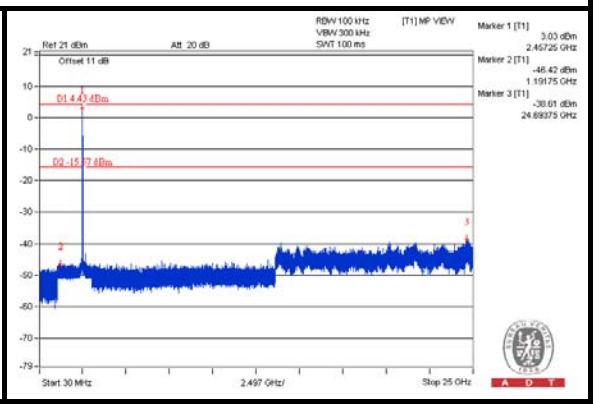

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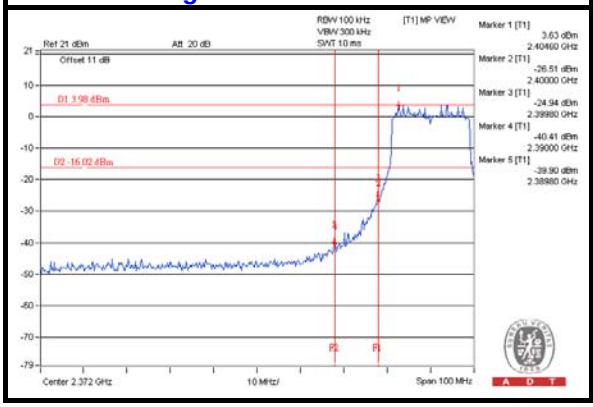

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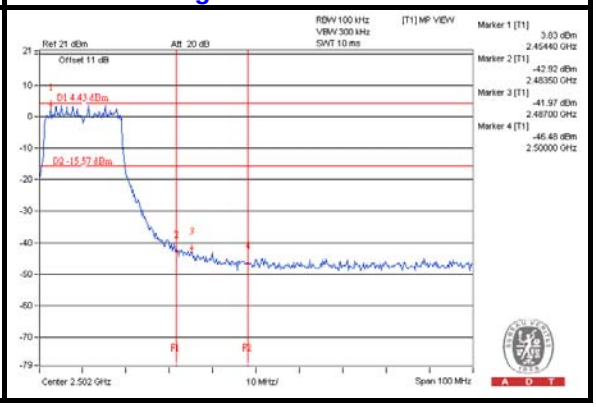

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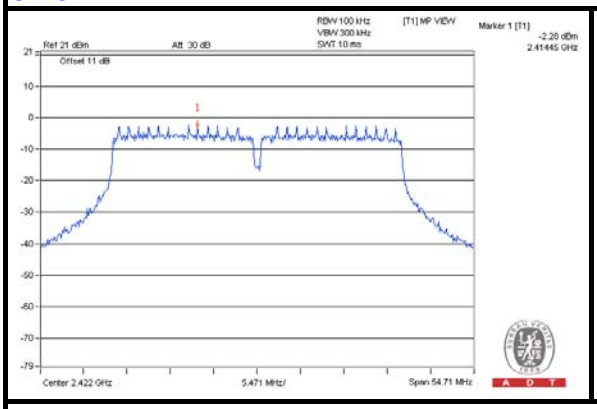
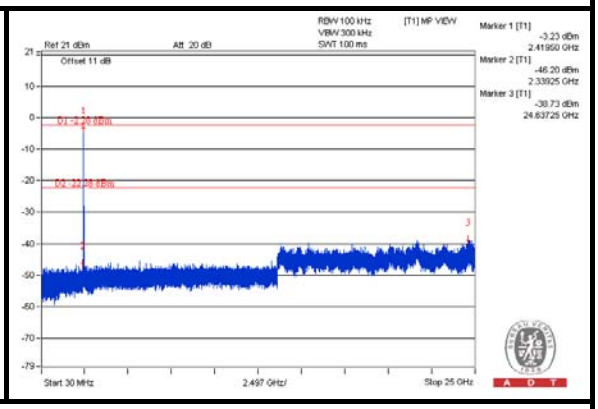
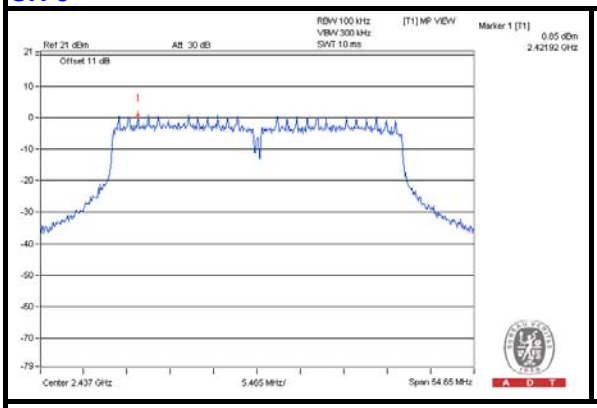
CHAIN 0

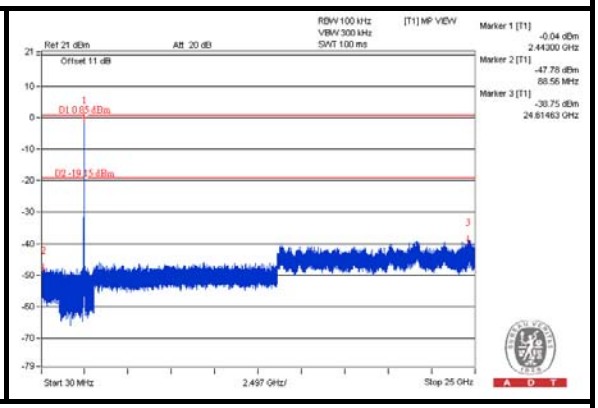
CH 3





CH 6





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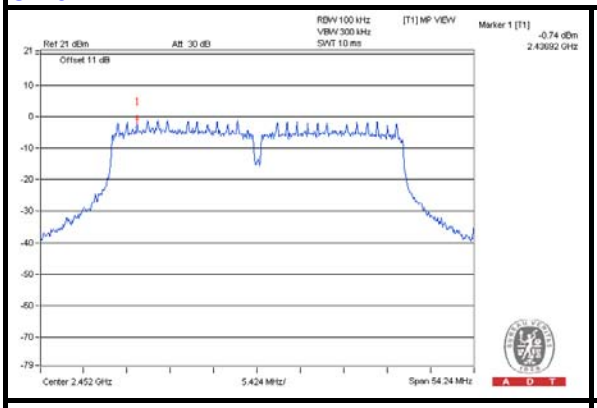
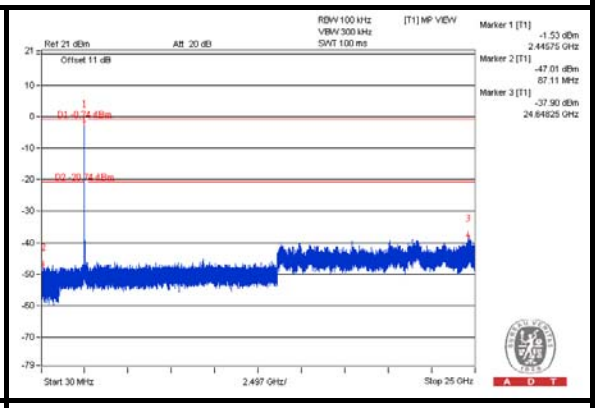
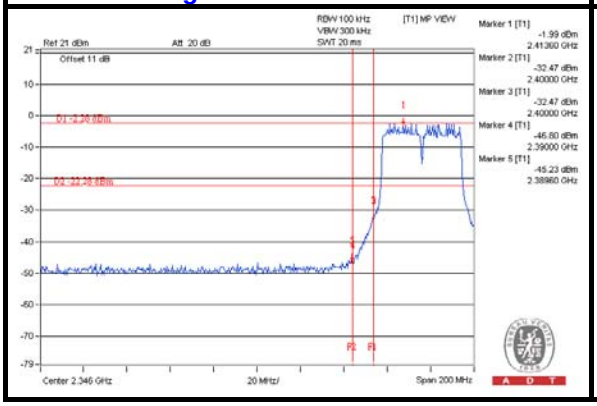
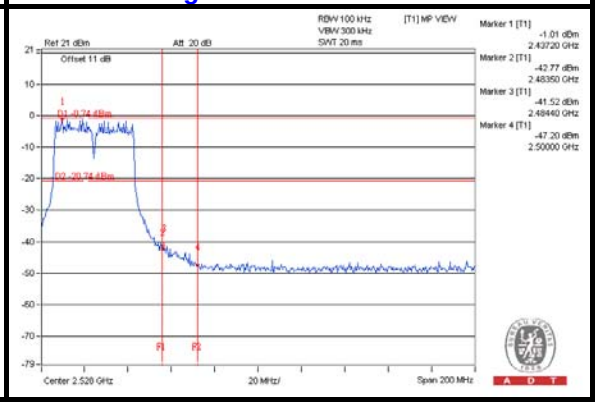




CH 3 Band edge

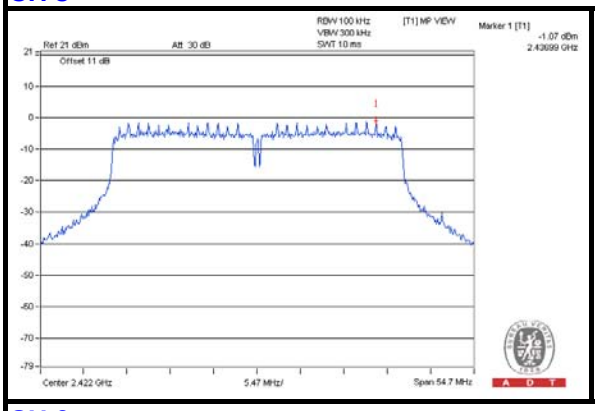


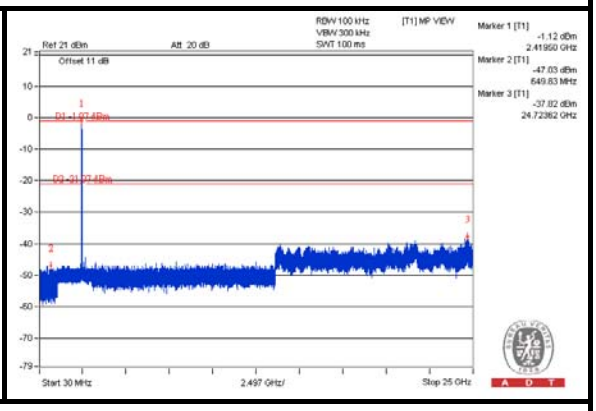
CH 9 Band edge



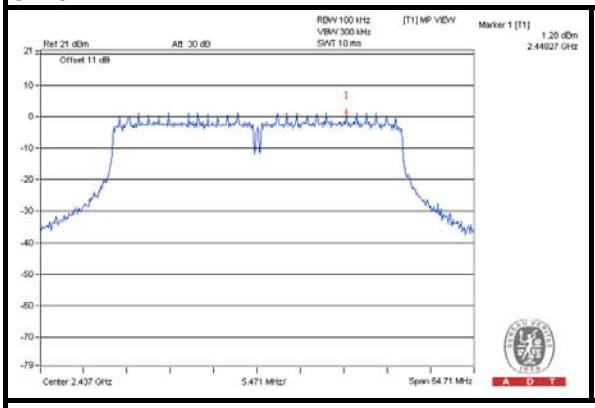
CHAIN 1

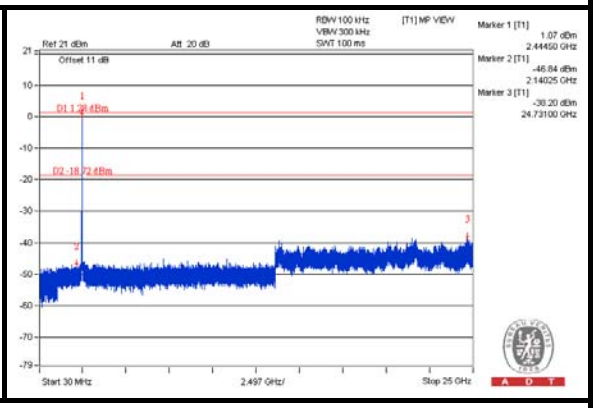
CH 3





CH 6





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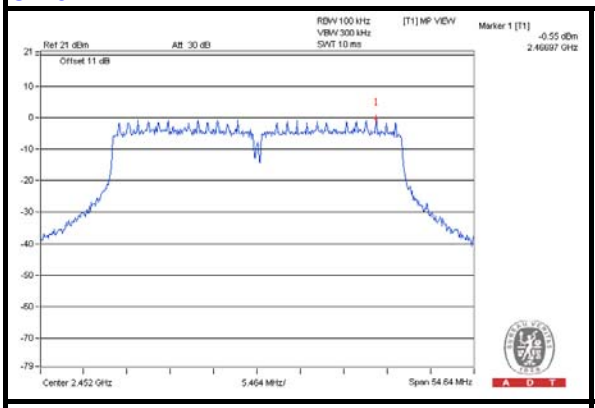
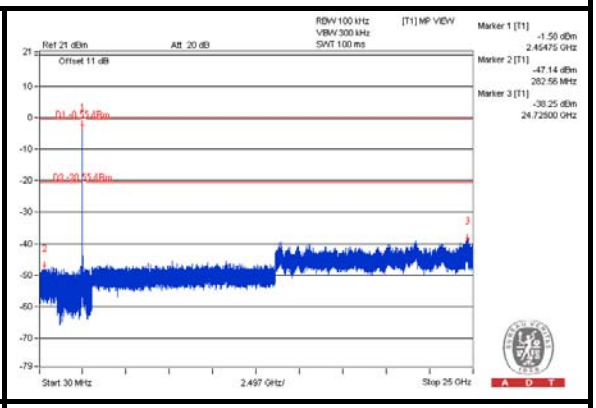
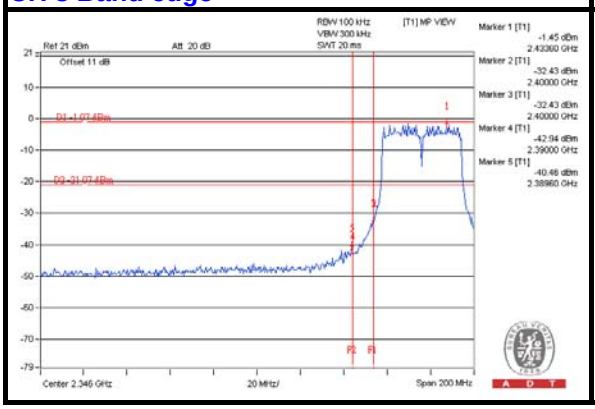
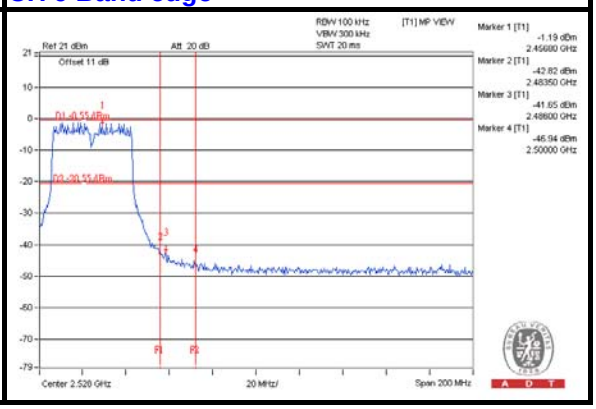




CH 3 Band edge

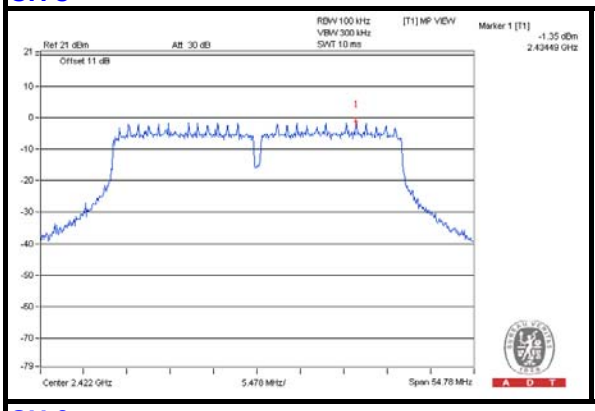


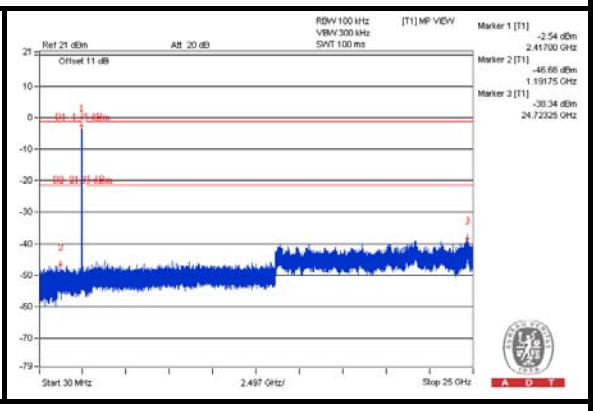
CH 9 Band edge



CHAIN 2

CH 3





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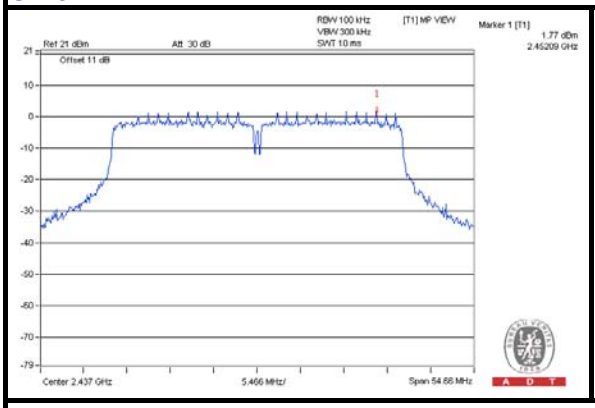
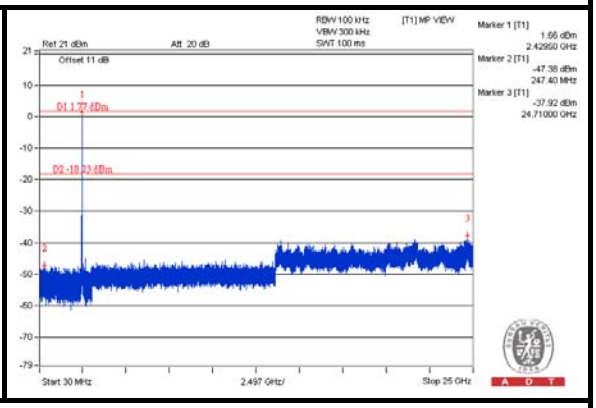
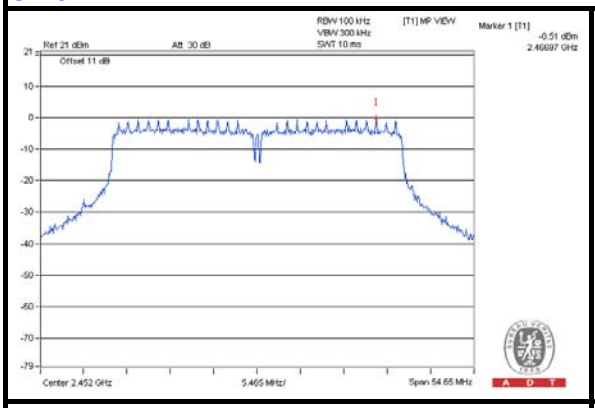
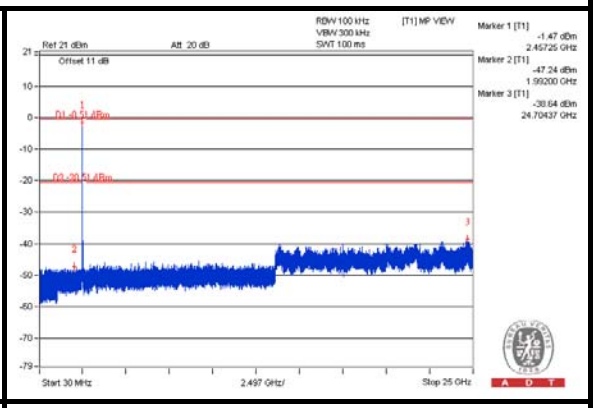


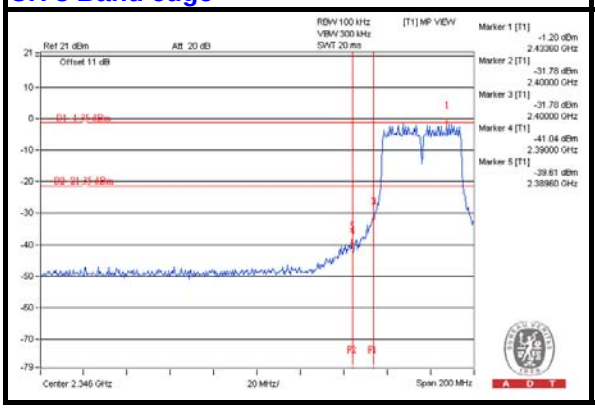


CH 9

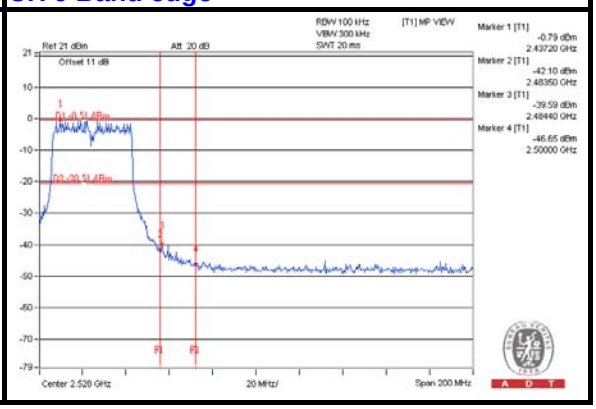




CH 3 Band edge



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 20dB 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 20dB 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	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	**TESTED BY**	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	#5725.00	61.1 PK	94.2	-33.1	1.55 H	29	55.10	6.00
2	#5725.00	50.7 AV	83.8	-33.1	1.55 H	29	44.70	6.00
3	*5745.00	114.2 PK			1.10 H	352	75.70	38.50
4	*5745.00	103.8 AV			1.10 H	352	65.30	38.50
5	11490.00	64.6 PK	74.0	-9.4	1.42 H	230	45.60	19.00
6	11490.00	51.8 AV	54.0	-2.2	1.42 H	230	32.80	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	#5725.00	63.4 PK	96.5	-33.1	1.55 V	29	57.40	6.00
2	#5725.00	52.8 AV	85.9	-33.1	1.55 V	29	46.80	6.00
3	*5745.00	116.5 PK			1.02 V	37	78.00	38.50
4	*5745.00	105.9 AV			1.02 V	37	67.40	38.50
5	11490.00	65.4 PK	74.0	-8.6	1.97 V	207	46.40	19.00
6	**11490.00**	**53.0 AV**	**54.0**	**-1.0**	**1.97 V**	**207**	**34.00**	**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.
7. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	112.1 PK			1.00 H	345	73.50	38.60
2	*5785.00	102.4 AV			1.00 H	345	63.80	38.60
3	11570.00	63.6 PK	74.0	-10.4	1.41 H	137	44.60	19.00
4	11570.00	51.3 AV	54.0	-2.7	1.41 H	137	32.30	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	*5785.00	116.3 PK			1.13 V	23	77.70	38.60
2	*5785.00	105.9 AV			1.13 V	23	67.30	38.60
3	11570.00	65.3 PK	74.0	-8.7	1.23 V	219	46.30	19.00
4	11570.00	52.8 AV	54.0	-1.2	1.23 V	219	33.80	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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	112.9 PK			1.21 H	328	74.20	38.70
2	*5825.00	101.7 AV			1.21 H	328	63.00	38.70
3	#5850.00	60.2 PK	92.9	-32.7	1.52 H	20	54.00	6.20
4	#5850.00	49.0 AV	81.7	-32.7	1.52 H	20	42.80	6.20
5	11650.00	64.0 PK	74.0	-10.0	1.21 H	145	45.10	18.90
6	11650.00	51.7 AV	54.0	-2.3	1.21 H	145	32.80	18.90
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	*5825.00	116.3 PK			1.01 V	14	77.60	38.70
2	*5825.00	106.4 AV			1.01 V	14	67.70	38.70
3	#5850.00	63.6 PK	96.3	-32.7	1.52 V	20	57.40	6.20
4	#5850.00	53.7 AV	86.4	-32.7	1.52 V	20	47.50	6.20
5	11650.00	67.5 PK	74.0	-6.5	1.28 V	221	48.60	18.90
6	**11650.00**	**53.0 AV**	**54.0**	**-1.0**	**1.28 V**	**221**	**34.10**	**18.90**

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.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.

802.11ac (VHT20)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	70.3 PK	93.1	-22.8	1.37 H	56	64.30	6.00
2	#5725.00	59.8 AV	82.6	-22.8	1.37 H	56	53.80	6.00
3	*5745.00	113.1 PK			1.09 H	350	74.60	38.50
4	*5745.00	102.6 AV			1.09 H	350	64.10	38.50
5	11490.00	65.2 PK	74.0	-8.8	1.30 H	138	46.20	19.00
6	11490.00	52.4 AV	54.0	-1.6	1.30 H	138	33.40	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	#5725.00	74.0 PK	96.8	-22.8	1.37 V	56	68.00	6.00
2	#5725.00	63.6 AV	86.4	-22.8	1.37 V	56	57.60	6.00
3	*5745.00	116.8 PK			1.14 V	19	78.30	38.50
4	*5745.00	106.4 AV			1.14 V	19	67.90	38.50
5	11490.00	65.8 PK	74.0	-8.2	1.37 V	216	46.80	19.00
6	11490.00	52.2 AV	54.0	-1.8	1.37 V	216	33.20	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.
7. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	113.3 PK			1.00 H	347	74.70	38.60
2	*5785.00	102.9 AV			1.00 H	347	64.30	38.60
3	11570.00	63.8 PK	74.0	-10.2	1.09 H	138	44.80	19.00
4	11570.00	51.5 AV	54.0	-2.5	1.09 H	138	32.50	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	*5785.00	116.7 PK			1.24 V	19	78.10	38.60
2	*5785.00	106.5 AV			1.24 V	19	67.90	38.60
3	11570.00	65.0 PK	74.0	-9.0	1.29 V	218	46.00	19.00
4	11570.00	52.4 AV	54.0	-1.6	1.29 V	218	33.40	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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	114.3 PK			1.00 H	339	75.60	38.70
2	*5825.00	104.2 AV			1.00 H	339	65.50	38.70
3	#5850.00	64.3 PK	94.3	-30.0	1.12 H	17	25.60	38.70
4	#5850.00	54.2 AV	84.2	-30.0	1.12 H	17	15.50	38.70
5	11650.00	67.0 PK	74.0	-7.0	1.24 H	145	48.10	18.90
6	11650.00	52.8 AV	54.0	-1.2	1.24 H	145	33.90	18.90
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	*5825.00	117.5 PK			1.31 V	31	78.80	38.70
2	*5825.00	107.3 AV			1.31 V	31	68.60	38.70
3	#5850.00	67.5 PK	97.5	-30.0	1.12 V	17	28.80	38.70
4	#5850.00	57.3 AV	87.3	-30.0	1.12 V	17	18.60	38.70
5	11650.00	66.7 PK	74.0	-7.3	1.17 V	219	47.80	18.90
6	11650.00	52.0 AV	54.0	-2.0	1.17 V	219	33.10	18.90

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.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.

802.11ac (VHT40)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 151	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted 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	#5725.00	80.6 PK	94.4	-13.8	1.33 H	30	42.10	38.50
2	#5725.00	70.4 AV	83.8	-13.4	1.33 H	30	31.90	38.50
3	*5755.00	114.4 PK			1.00 H	346	75.80	38.60
4	*5755.00	103.8 AV			1.00 H	346	65.20	38.60
5	11510.00	65.1 PK	74.0	-8.9	1.32 H	145	46.10	19.00
6	11510.00	51.5 AV	54.0	-2.5	1.32 H	145	32.50	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	#5725.00	81.6 PK	95.4	-13.8	1.33 V	30	43.10	38.50
2	#5725.00	71.0 AV	84.8	-13.8	1.33 V	30	32.50	38.50
3	*5755.00	115.4 PK			1.02 V	28	76.80	38.60
4	*5755.00	104.8 AV			1.02 V	28	66.20	38.60
5	11510.00	65.9 PK	74.0	-8.1	1.64 V	206	46.90	19.00
6	11510.00	52.8 AV	54.0	-1.2	1.64 V	206	33.80	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.
7. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted 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	*5795.00	113.2 PK			1.00 H	344	74.60	38.60
2	*5795.00	103.2 AV			1.00 H	344	64.60	38.60
3	#5850.00	66.8 PK	93.2	-26.4	1.02 H	12	28.10	38.70
4	#5850.00	56.8 AV	83.2	-26.4	1.02 H	12	18.10	38.70
5	11590.00	65.6 PK	74.0	-8.4	1.27 H	142	46.60	19.00
6	11590.00	51.9 AV	54.0	-2.1	1.27 H	142	32.90	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	*5795.00	116.4 PK			1.02 V	26	77.80	38.60
2	*5795.00	105.7 AV			1.02 V	26	67.10	38.60
3	#5850.00	70.0 PK	96.4	-26.4	1.02 V	12	31.30	38.70
4	#5850.00	59.3 AV	85.7	-26.4	1.02 V	12	20.60	38.70
5	11590.00	66.6 PK	74.0	-7.4	1.58 V	220	47.60	19.00
6	11590.00	52.8 AV	54.0	-1.2	1.58 V	220	33.80	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.
7. "#":The radiated frequency is out the restricted band.

802.11ac (VHT80)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 155	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted 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	#5725.00	91.0 PK	93.2	-2.2	1.14 H	31	52.50	38.50
2	#5725.00	79.7 AV	81.9	-2.2	1.14 H	31	41.20	38.50
3	*5775.00	113.2 PK			1.00 H	353	74.60	38.60
4	*5775.00	101.9 AV			1.00 H	353	63.30	38.60
5	#5850.00	87.0 PK	93.2	-6.2	1.00 H	20	48.30	38.70
6	#5850.00	75.7 AV	81.9	-6.2	1.00 H	20	37.00	38.70
7	11550.00	64.5 PK	74.0	-9.5	1.29 H	143	45.50	19.00
8	11550.00	50.8 AV	54.0	-3.2	1.29 H	143	31.80	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	#5725.00	92.7 PK	94.9	-2.2	1.14 V	31	54.20	38.50
2	#5725.00	80.5 AV	82.7	-2.2	1.14 V	31	42.00	38.50
3	*5775.00	114.9 PK			1.02 V	30	76.30	38.60
4	*5775.00	102.7 AV			1.02 V	30	64.10	38.60
5	#5850.00	88.7 PK	94.9	-6.2	1.00 V	20	50.00	38.70
6	#5850.00	76.5 AV	82.7	-6.2	1.00 V	20	37.80	38.70
7	11550.00	64.2 PK	74.0	-9.8	1.73 V	207	45.20	19.00
8	11550.00	51.3 AV	54.0	-2.7	1.73 V	207	32.30	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 radiated frequency is out of the restricted band.
7. The limit value is defined as per 15.247.

BELOW 1GHz WORST-CASE DATA：802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Ted 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	223.94	39.5 QP	46.0	-6.5	1.00 H	91	55.90	-16.40
2	336.48	40.5 QP	46.0	-5.5	1.00 H	292	52.10	-11.60
3	375.29	37.2 QP	46.0	-8.8	1.00 H	282	48.10	-10.90
4	625.60	38.4 QP	46.0	-7.6	1.00 H	166	43.90	-5.50
5	751.73	38.1 QP	46.0	-7.9	1.00 H	166	41.10	-3.00
6	875.91	39.8 QP	46.0	-6.2	1.00 H	233	40.80	-1.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	45.42	35.1 QP	40.0	-4.9	1.50 V	309	49.20	-14.10
2	223.94	40.2 QP	46.0	-5.8	1.00 V	312	56.60	-16.40
3	319.02	34.7 QP	46.0	-11.3	1.24 V	150	46.50	-11.80
4	499.48	33.8 QP	46.0	-12.2	1.00 V	123	42.10	-8.30
5	625.60	34.5 QP	46.0	-11.5	1.99 V	166	40.00	-5.50
6	751.73	35.3 QP	46.0	-10.7	1.50 V	145	38.30	-3.00

REMARKS:

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

5.2 CONDUCTED EMISSION MEASUREMENT

5.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

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

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

5.2.2 TEST INSTRUMENTS

Same as item 4.2.2.

5.2.3 TEST PROCEDURES

Same as item 4.2.3.

5.2.4 DEVIATION FROM TEST STANDARD

No deviation.

5.2.5 TEST SETUP

Same as item 4.2.5.

5.2.6 EUT OPERATING CONDITIONS

Same as item 4.1.6.

5.2.7 TEST RESULTS

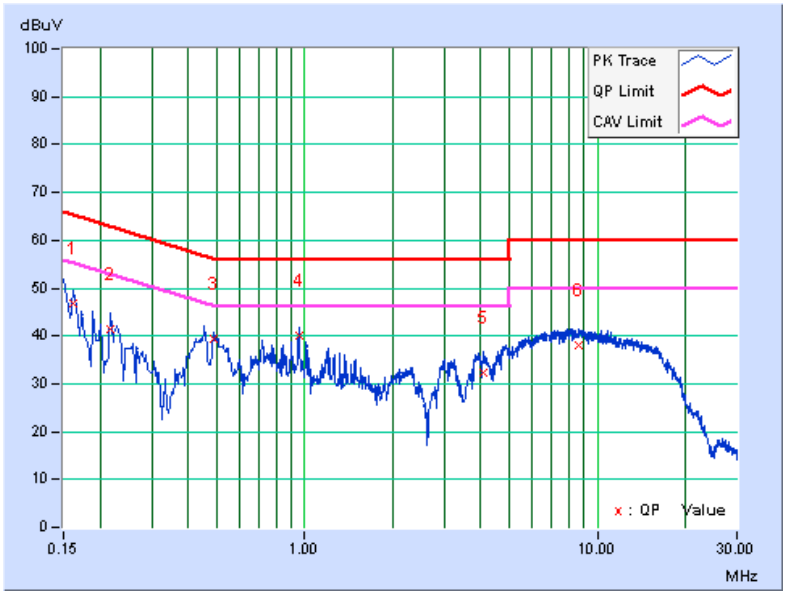
CONDUCTED WORST-CASE DATA：802.11a

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	0.16181	0.16	46.61	34.00	46.77	34.16	65.37	55.37	-18.60	-21.21
2	0.21647	0.17	41.30	30.38	41.47	30.55	62.95	52.95	-21.49	-22.41
3	0.49064	0.23	39.00	31.92	39.23	32.15	56.16	46.16	-16.92	-14.00
4	0.95546	0.25	39.70	33.00	39.95	33.25	56.00	46.00	-16.05	-12.75
5	4.06782	0.40	31.78	24.22	32.18	24.62	56.00	46.00	-23.82	-21.38
6	8.67771	0.65	37.50	30.96	38.15	31.61	60.00	50.00	-21.85	-18.39

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.

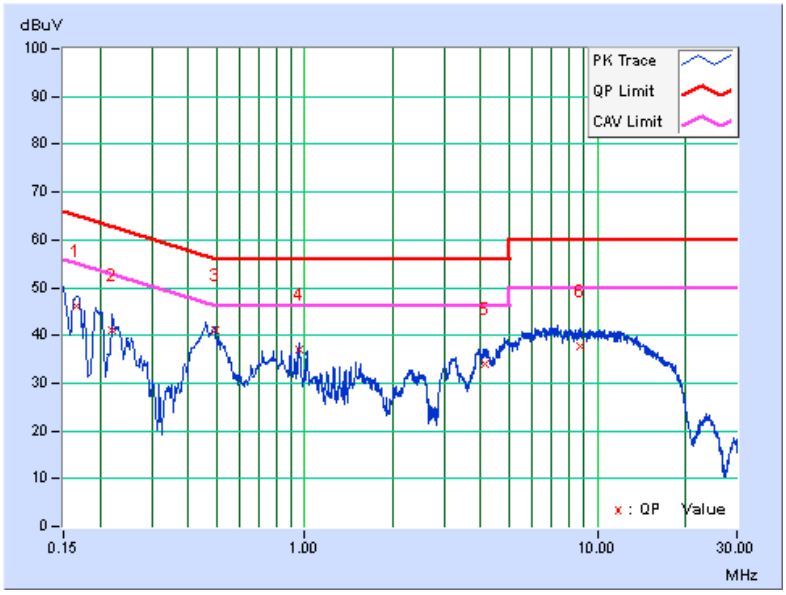


PHASE	Line 2	6dB BANDWIDTH	9kHz

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	0.16526	0.17	45.97	35.07	46.14	35.24	65.20	55.20	-19.06	-19.96
2	0.22038	0.18	40.96	32.81	41.14	32.99	62.80	52.80	-21.67	-19.82
3	0.49324	0.24	40.78	34.34	41.02	34.58	56.11	46.11	-15.09	-11.53
4	0.95561	0.25	36.89	30.21	37.14	30.46	56.00	46.00	-18.86	-15.54
5	4.12647	0.38	33.67	27.79	34.05	28.17	56.00	46.00	-21.95	-17.83
6	8.72854	0.55	37.29	30.91	37.84	31.46	60.00	50.00	-22.16	-18.54

REMARKS:

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



5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

5.3.2 TEST SETUP

Same as item 4.3.2.

5.3.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.3.4 TEST PROCEDURE

Same as item 4.3.4.

5.3.5 DEVIATION FROM TEST STANDARD

No deviation.

5.3.6 EUT OPERATING CONDITIONS

Same as item 4.3.6.

5.3.7 TEST RESULTS

802.11a

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	16.37	16.33	16.35	0.5	PASS
157	5785	16.13	15.75	16.36	0.5	PASS
165	5825	15.98	15.22	16.32	0.5	PASS

802.11ac (VHT20)

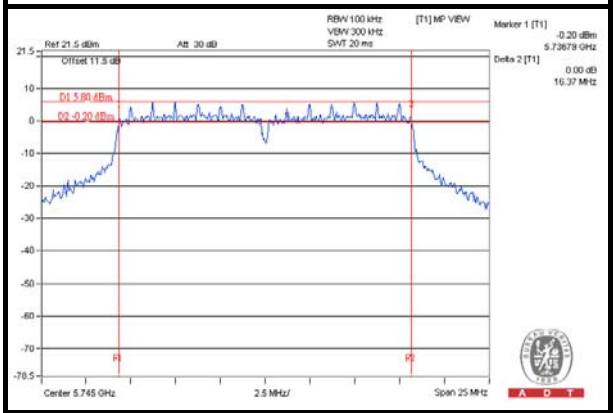
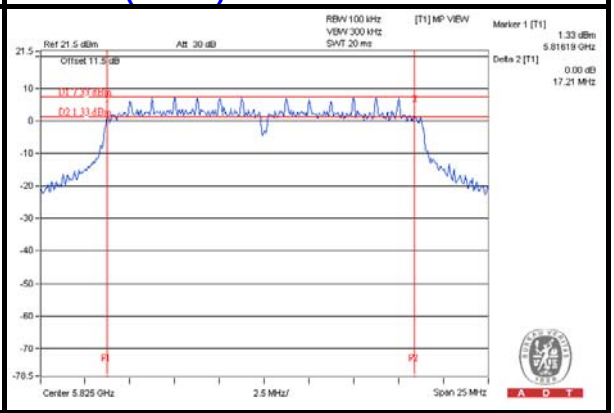
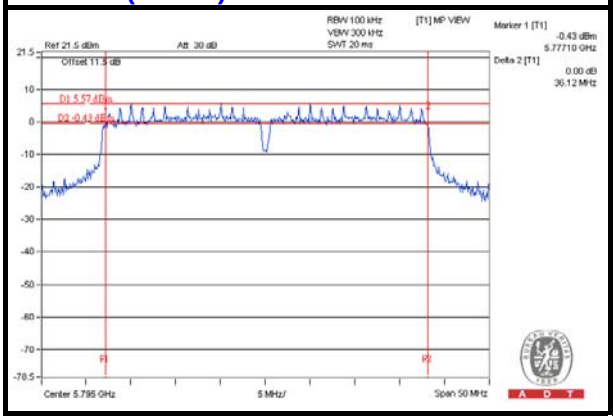
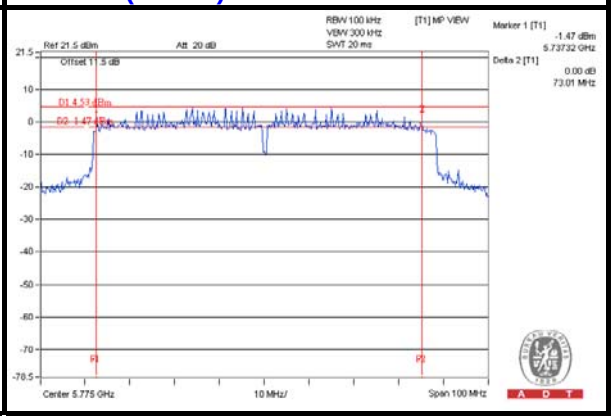
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	16.73	16.43	16.39	0.5	PASS
157	5785	16.67	15.47	16.67	0.5	PASS
165	5825	17.21	17.00	16.58	0.5	PASS

802.11ac (VHT40)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
151	5755	35.80	35.77	35.86	0.5	PASS
159	5795	36.12	35.31	35.87	0.5	PASS

802.11ac (VHT80)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
155	5775	73.01	70.36	70.05	0.5	PASS

SPECTRUM PLOT OF WORST VALUE	
802.11a	**802.11ac (VHT20)**
	
802.11ac (VHT40)	**802.11ac (VHT80)**
	

5.4 CONDUCTED OUTPUT POWER

5.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

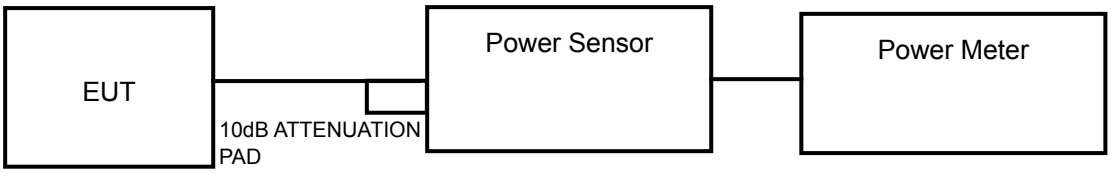
Per KDB 662911 D01 Multiple Transmitter Output v02 Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;
Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less for 20-MHz channel widths with NANT ≥ 5.

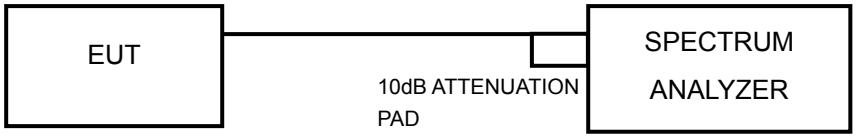
For power measurements on all other devices: Array Gain = 10 log(NANT/NSS) dB.

5.4.2 TEST SETUP

For 802.11a, 802.11ac (VHT20), 802.11ac (VHT40)



For 802.11ac (VHT80)



5.4.3 INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.4.4 TEST PROCEDURES

For 802.11a, 802.11ac (VHT20), 802.11ac (VHT40)

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

For 802.11ac (VHT80)

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

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

5.4.5 DEVIATION FROM TEST STANDARD

No deviation.

5.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.

5.4.7 TEST RESULTS

FOR PEAK POWER

802.11a

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
149	5745	19.10	19.56	18.11	236.362	23.74	30	PASS
157	5785	19.64	19.74	18.47	256.541	24.09	30	PASS
165	5825	19.02	19.17	19.04	242.571	23.85	30	PASS

802.11ac (VHT20)

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
149	5745	19.14	19.08	17.65	221.155	23.45	30	PASS
157	5785	18.41	18.54	17.30	194.496	22.89	30	PASS
165	5825	18.47	18.34	17.26	191.752	22.83	30	PASS

802.11ac (VHT40)

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
151	5755	22.79	22.92	22.19	551.569	27.42	30	PASS
159	5795	22.52	22.38	21.72	500.225	26.99	30	PASS

802.11ac (VHT80)

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
155	5775	22.90	22.80	22.30	**555.354**	27.45	30	PASS

FOR AVERAGE POWER

802.11a

CHANNEL	FREQUENCY (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1	CHAIN 0		
149	5745	14.53	14.92	13.47	81.658	19.12
157	5785	15.02	15.17	14.05	90.064	19.55
165	5825	14.84	14.73	14.87	90.886	19.58

802.11ac (VHT20)

CHANNEL	FREQUENCY (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1	CHAIN 0		
149	5745	14.69	14.72	13.33	80.620	19.06
157	5785	13.90	14.01	12.88	69.133	18.40
165	5825	13.80	13.72	12.86	66.858	18.25

802.11ac (VHT40)

CHANNEL	FREQUENCY (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1	CHAIN 0		
151	5755	18.49	18.59	17.79	203.026	23.08
159	5795	18.26	18.25	17.28	187.278	22.72

802.11ac (VHT80)

CHANNEL	FREQUENCY (MHz)	AVG. POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1	CHAIN 0		
155	5775	18.46	18.31	17.95	200.283	23.02

5.5 POWER SPECTRAL DENSITY MEASUREMENT

5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.5.2 TEST SETUP

Same as item 4.5.2.

5.5.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.5.4 TEST PROCEDURE.

Same as item 4.5.4.

5.5.5 DEVIATION FROM TEST STANDARD

No deviation.

5.5.6 EUT OPERATING CONDITION

Same as item 4.3.6.

5.5.7 TEST RESULTS

802.11a

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-10.27	4.77	-5.50	3.72	PASS
	157	5785	-11.40	4.77	-6.63	3.72	PASS
	165	5825	-9.55	4.77	-4.78	3.72	PASS
1	149	5745	-9.32	4.77	-4.55	3.72	PASS
	157	5785	-9.67	4.77	-4.90	3.72	PASS
	165	5825	-11.96	4.77	-7.19	3.72	PASS
2	149	5745	-11.94	4.77	-7.17	3.72	PASS
	157	5785	-12.84	4.77	-8.07	3.72	PASS
	165	5825	-12.23	4.77	-7.46	3.72	PASS

NOTE:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 5.51dBi + 10log(3) = 10.28dBi > 6dBi , so the power density limit shall be reduced to 8-(10.28-6) = 3.72dBm.

802.11ac (VHT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-11.31	4.77	-6.54	3.72	PASS
	157	5785	-11.00	4.77	-6.23	3.72	PASS
	165	5825	-8.62	4.77	-3.85	3.72	PASS
1	149	5745	-10.66	4.77	-5.89	3.72	PASS
	157	5785	-11.45	4.77	-6.68	3.72	PASS
	165	5825	-10.28	4.77	-5.51	3.72	PASS
2	149	5745	-12.46	4.77	-7.69	3.72	PASS
	157	5785	-12.71	4.77	-7.94	3.72	PASS
	165	5825	-10.51	4.77	-5.74	3.72	PASS

NOTE:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 5.51dBi + 10log(3) = 10.28dBi > 6dBi , so the power density limit shall be reduced to 8-(10.28-6) = 3.72dBm.

802.11ac (VHT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	151	5755	-11.12	4.77	-6.35	3.72	PASS
	159	5795	-9.70	4.77	-4.93	3.72	PASS
1	151	5755	-11.54	4.77	-6.77	3.72	PASS
	159	5795	-10.75	4.77	-5.98	3.72	PASS
2	151	5755	-11.95	4.77	-7.18	3.72	PASS
	159	5795	-11.68	4.77	-6.91	3.72	PASS

NOTE:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 5.51dBi + 10log(3) = 10.28dBi > 6dBi , so the power density limit shall be reduced to 8-(10.28-6) = 3.72dBm.

802.11ac (VHT80)

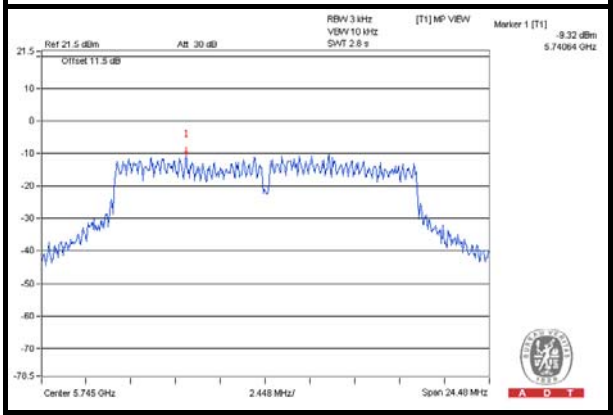
TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	151	5775	-11.73	4.77	-6.96	3.72	PASS
1	151	5775	-10.92	4.77	-6.15	3.72	PASS
2	151	5775	-13.63	4.77	-8.86	3.72	PASS

NOTE:

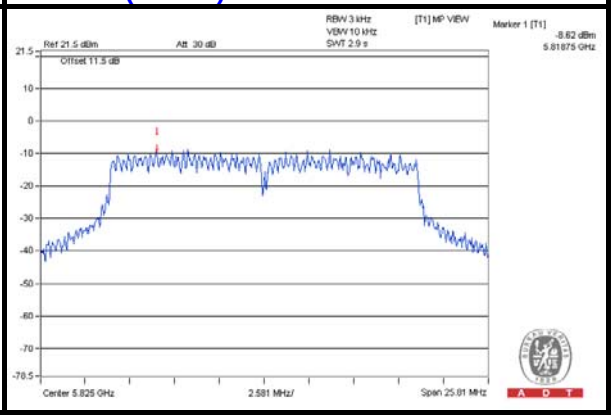
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 5.51dBi + 10log(3) = 10.28dBi > 6dBi , so the power density limit shall be reduced to 8-(10.28-6) = 3.72dBm.

SPECTRUM PLOT OF WORST VALUE

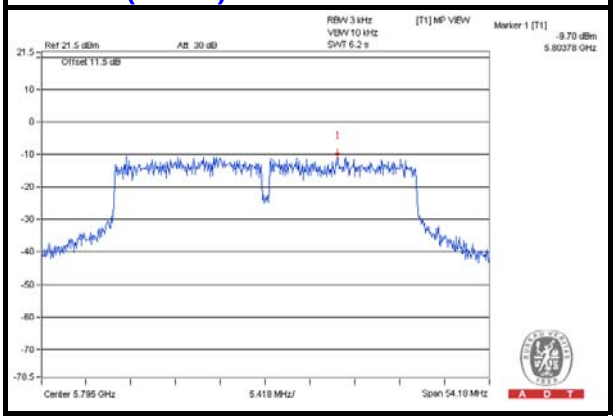
802.11a



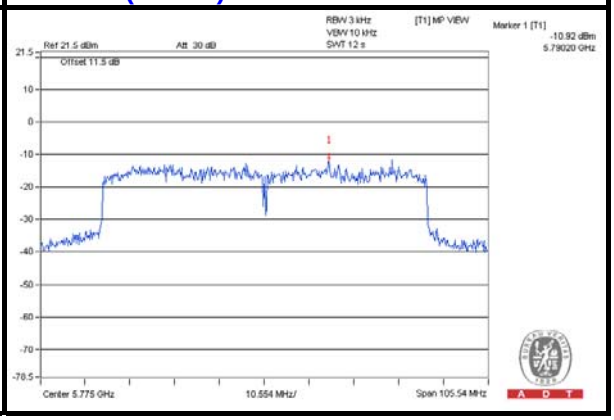
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



5.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

5.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

Below –20dB 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

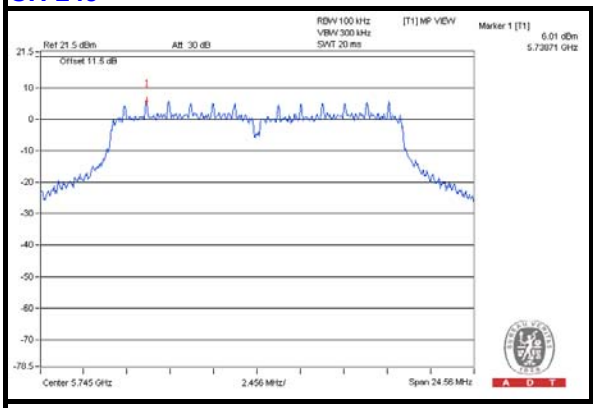
The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.

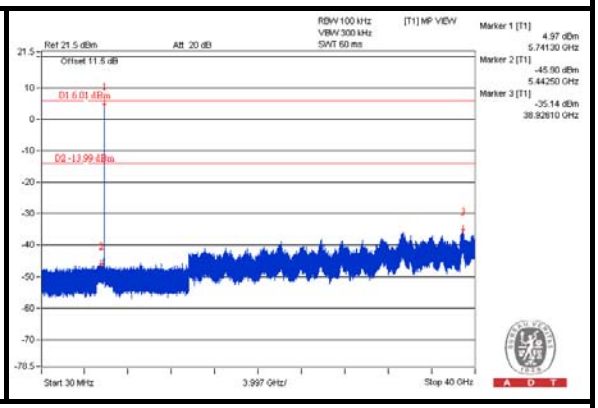
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11a

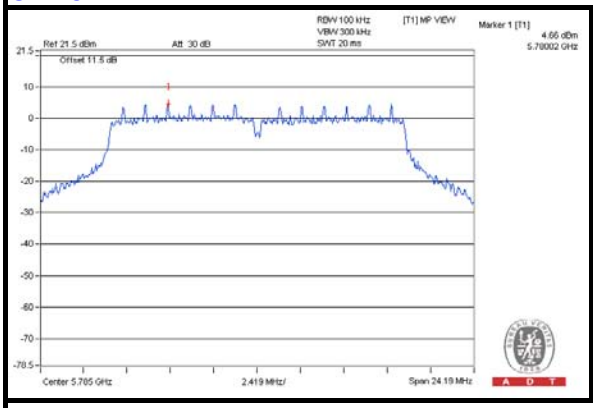
CHAIN 0

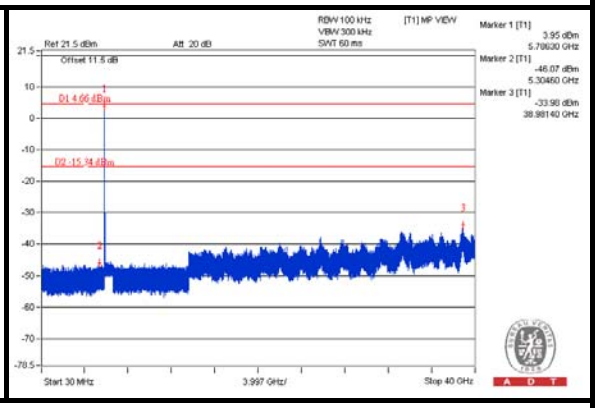
CH 149



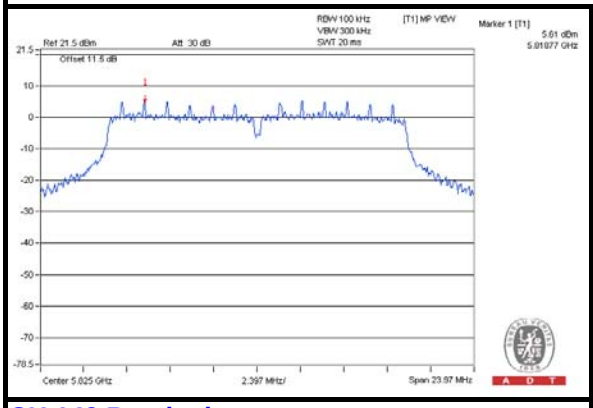


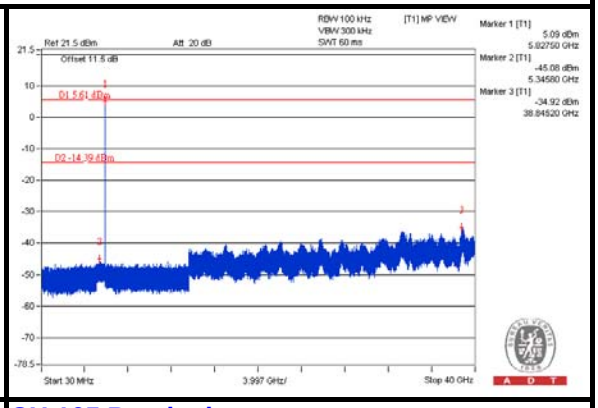
CH 157



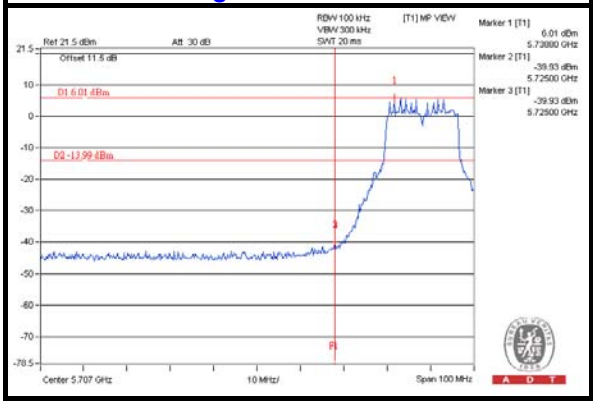


CH 165

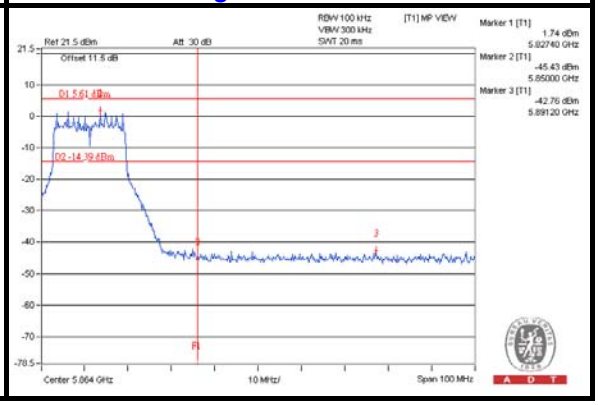




CH 149 Band edge

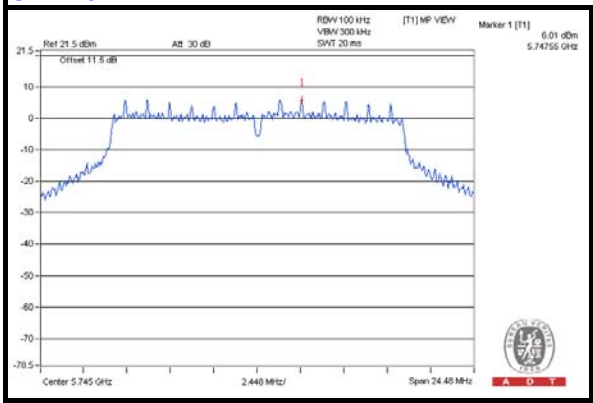


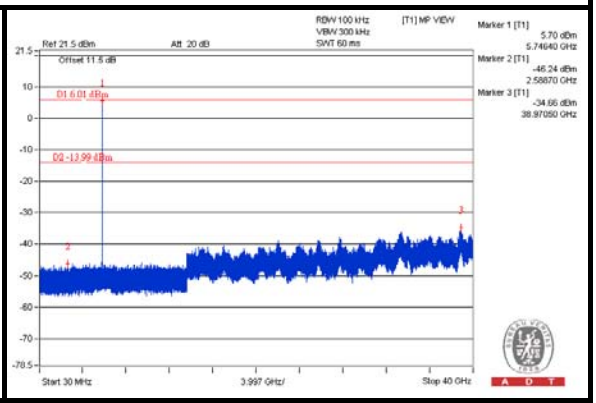
CH 165 Band edge



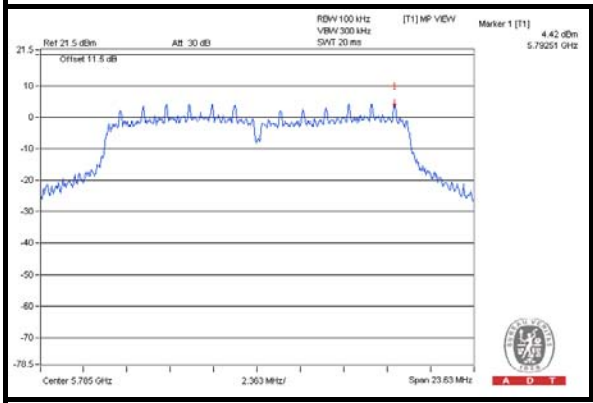
CHAIN 1

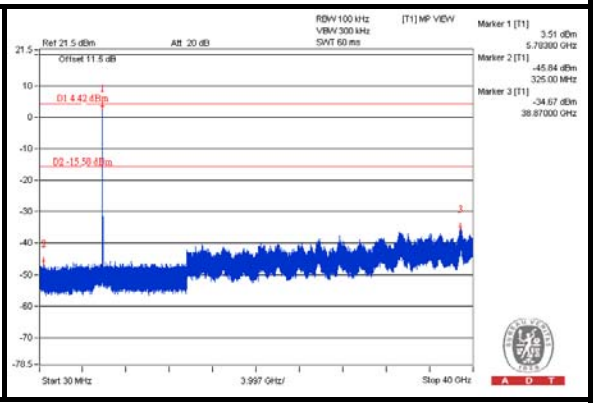
CH 149



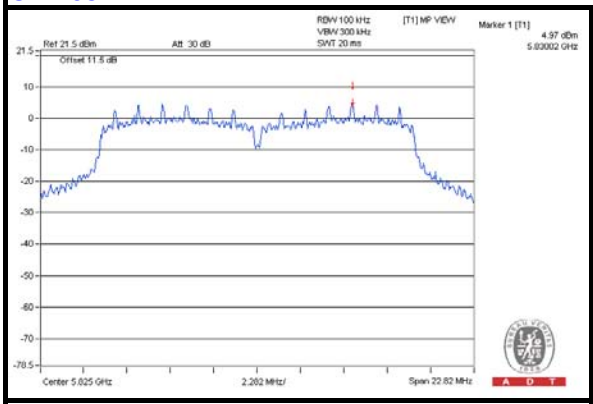


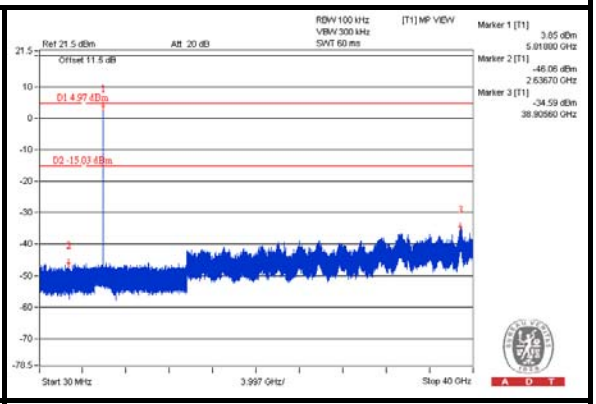
CH 157



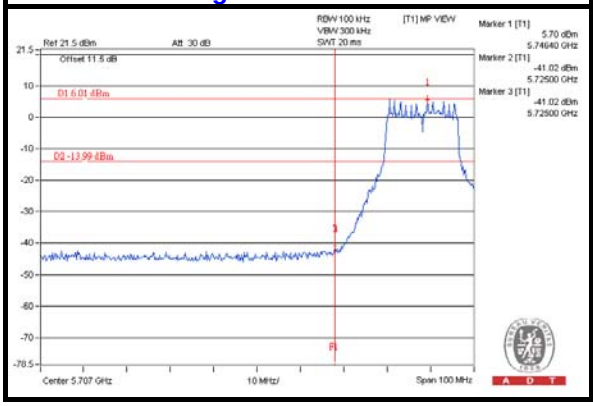


CH 165

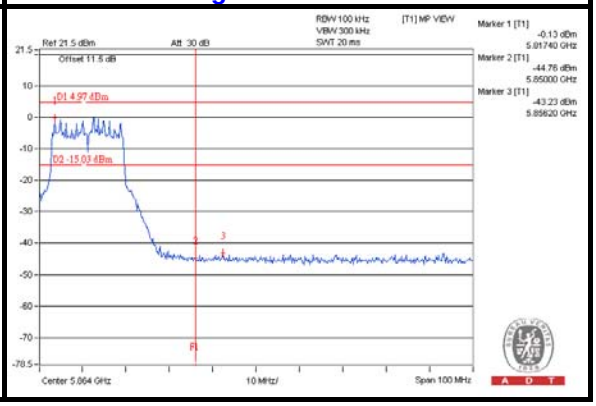




CH 149 Band edge

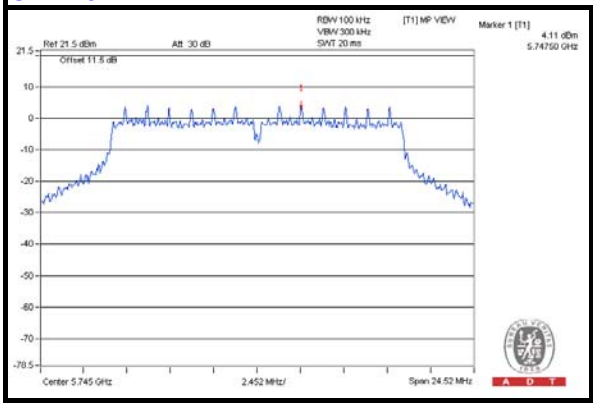


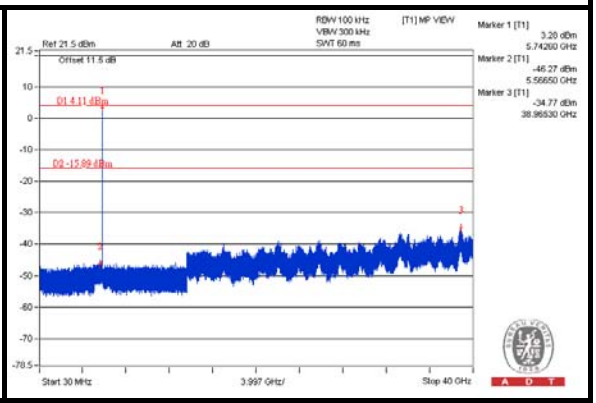
CH 165 Band edge



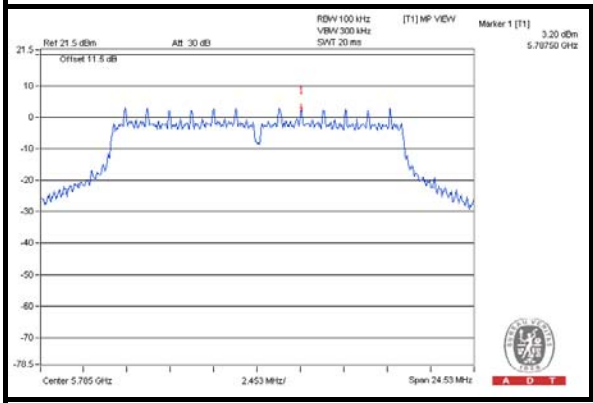
CHAIN 2

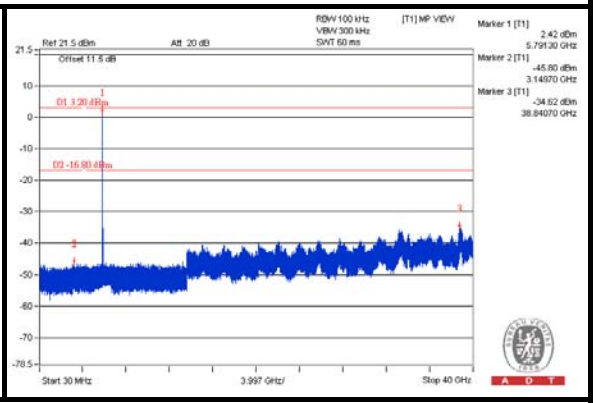
CH 149



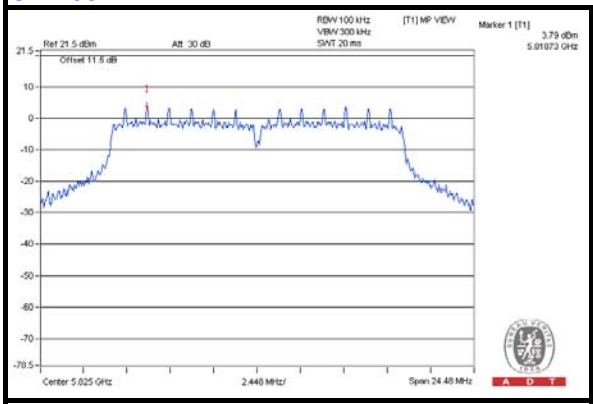


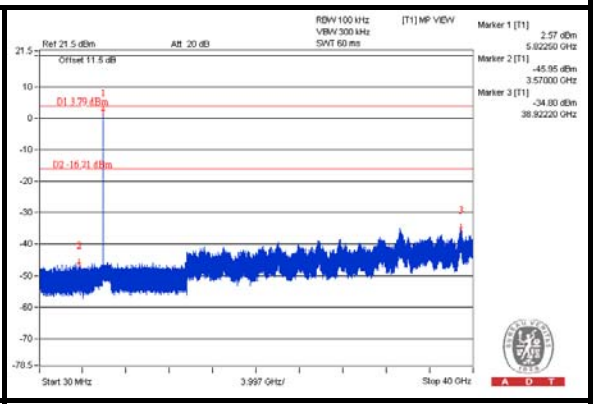
CH 157



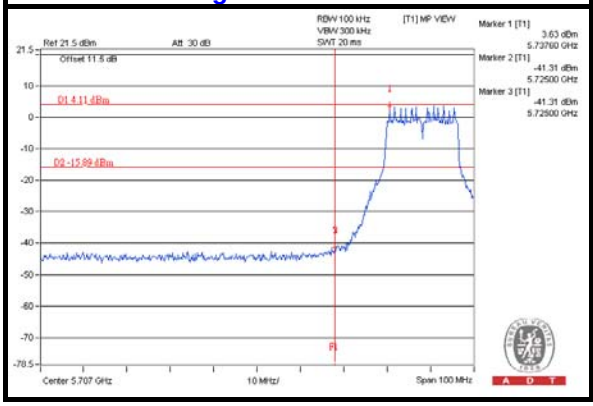


CH 165

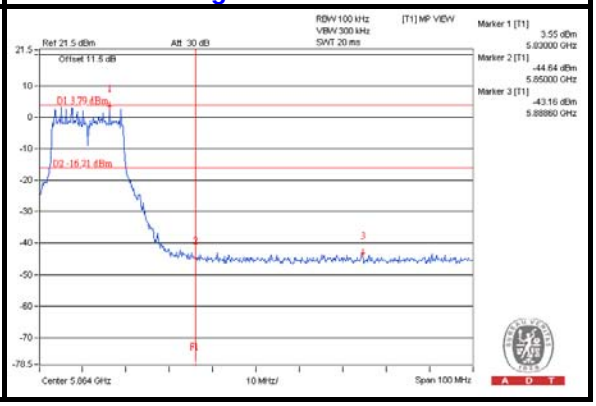




CH 149 Band edge

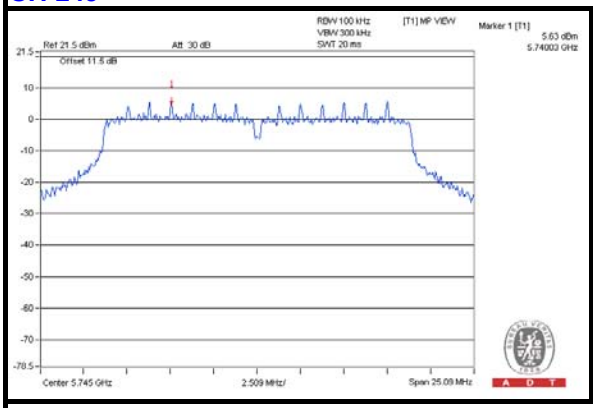


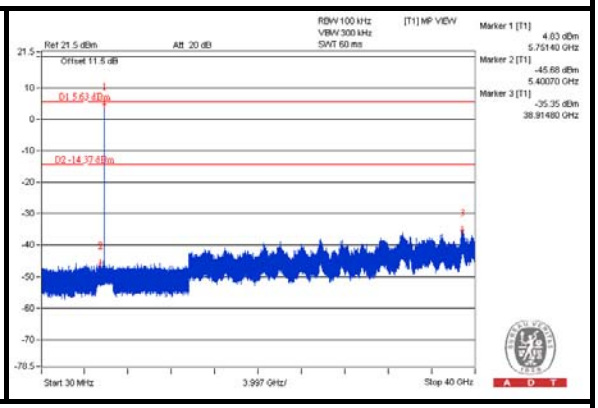
CH 165 Band edge



802.11ac (VHT20)
CHAIN 0

CH 149





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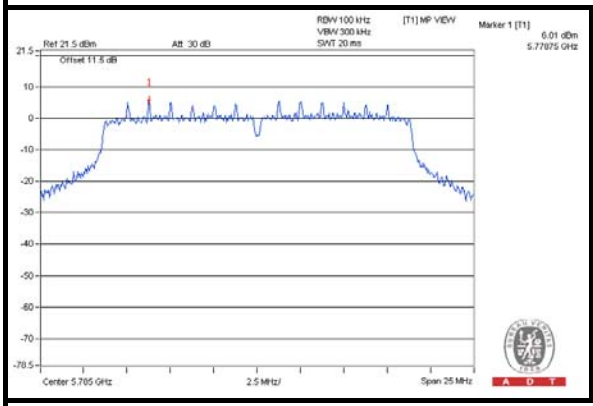

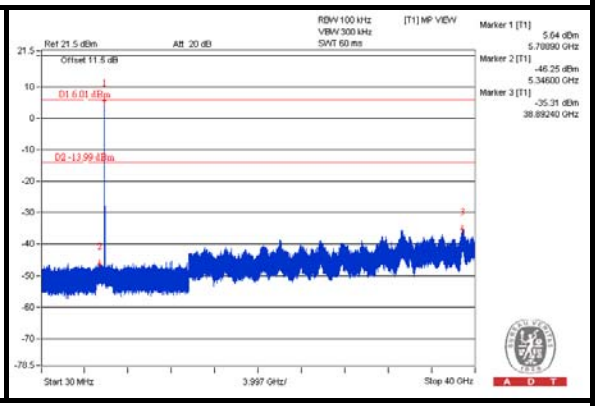

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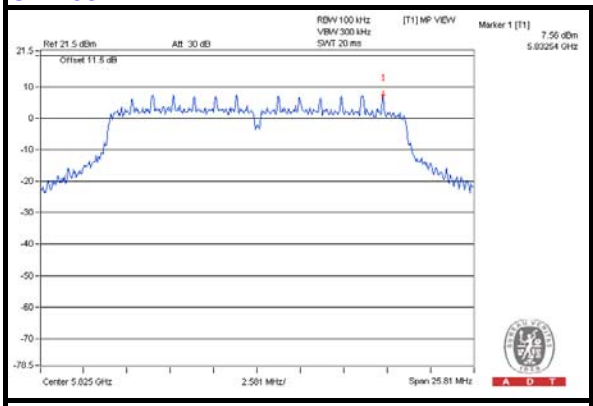
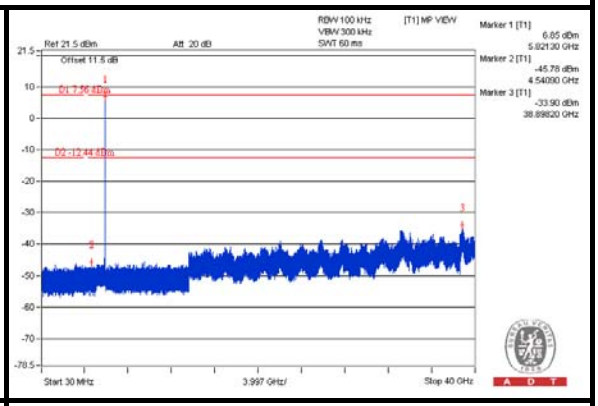
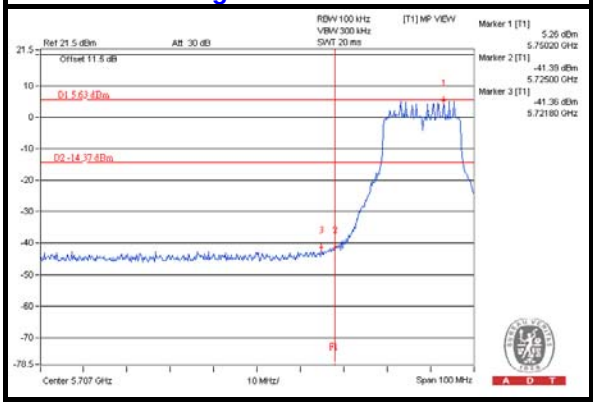
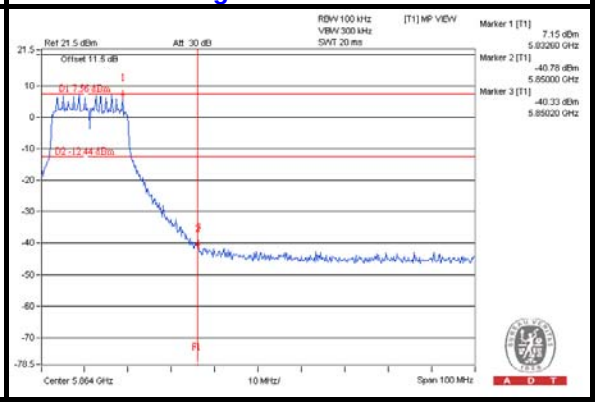




CH 149 Band edge

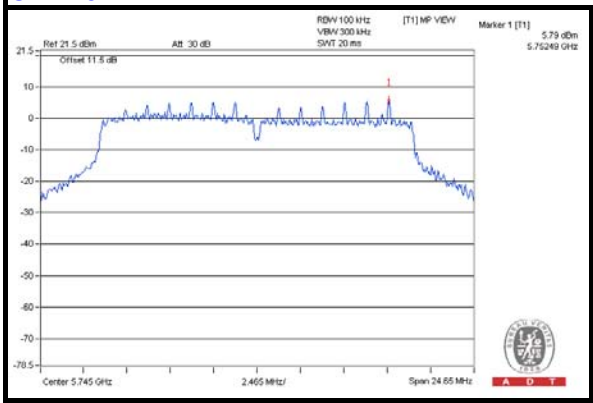


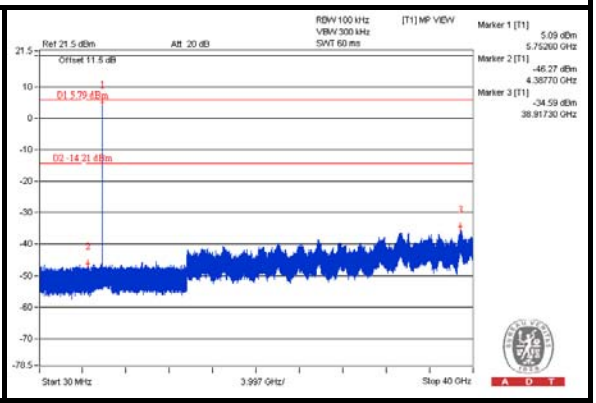
CH 165 Band edge



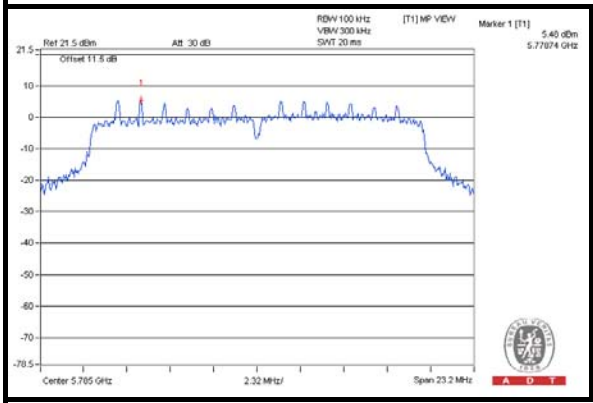
CHAIN 1

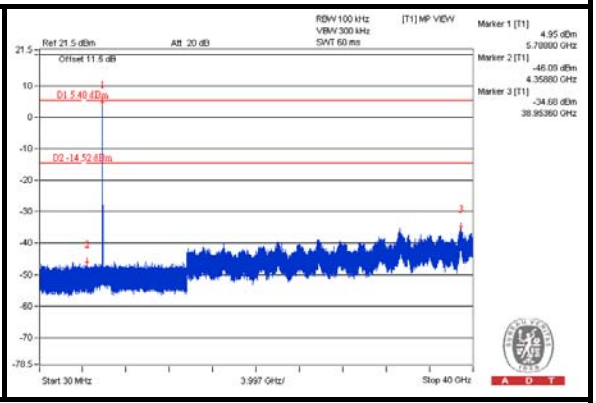
CH 149



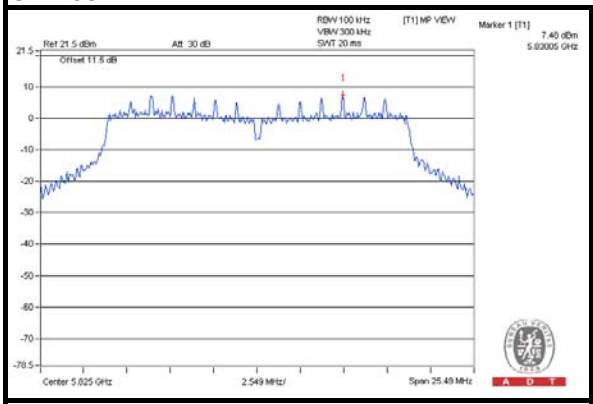


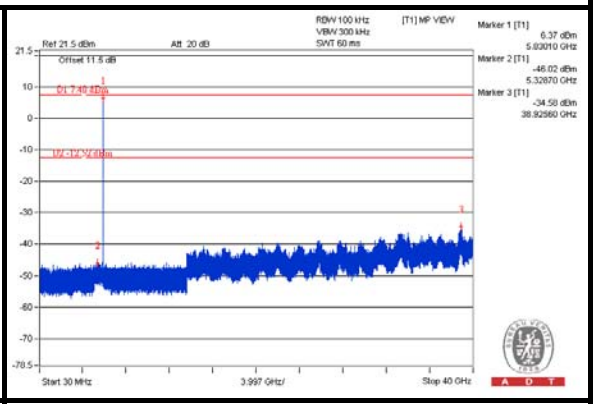
CH 157



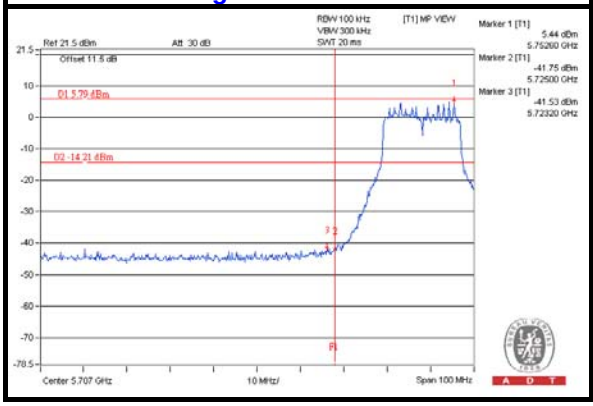


CH 165

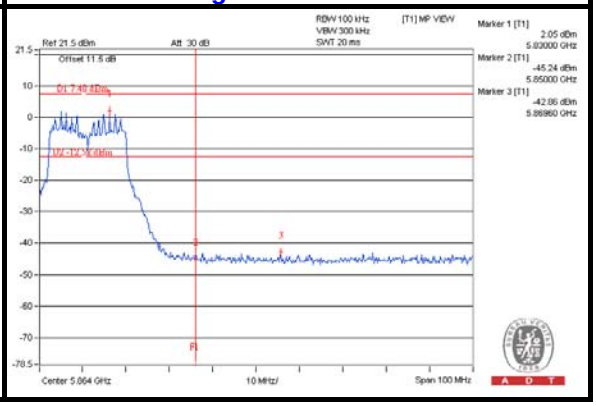




CH 149 Band edge

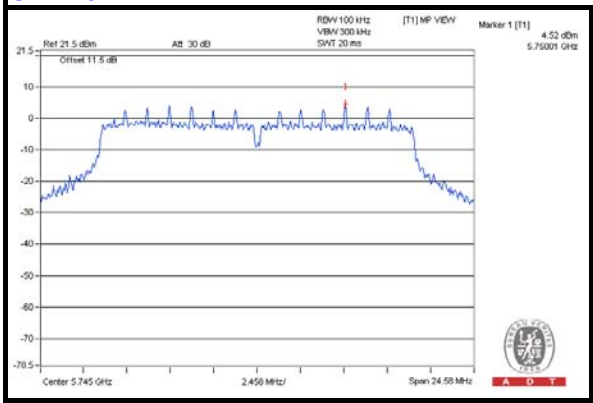


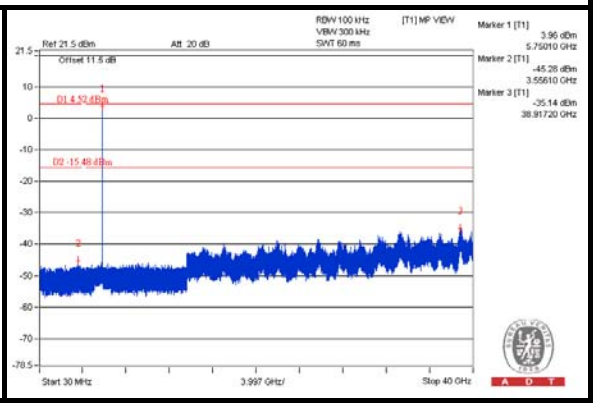
CH 165 Band edge



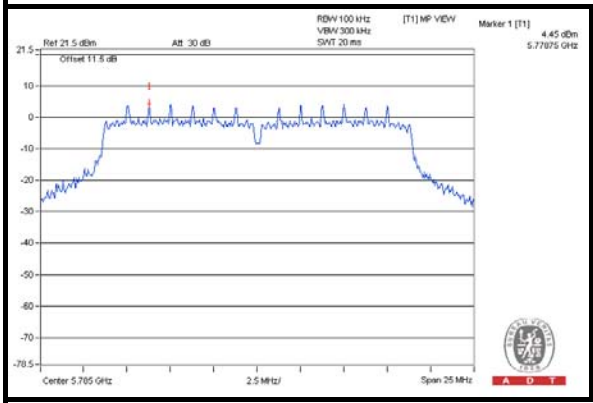
CHAIN 2

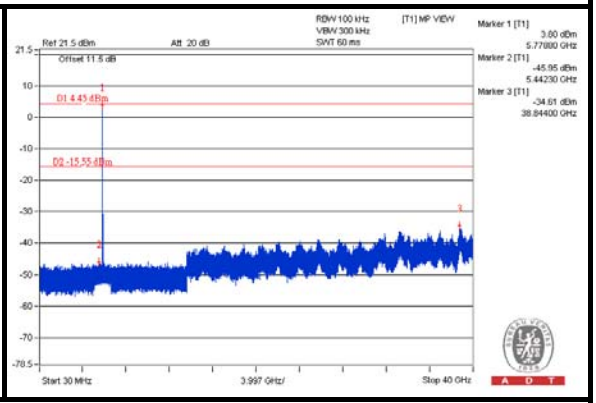
CH 149



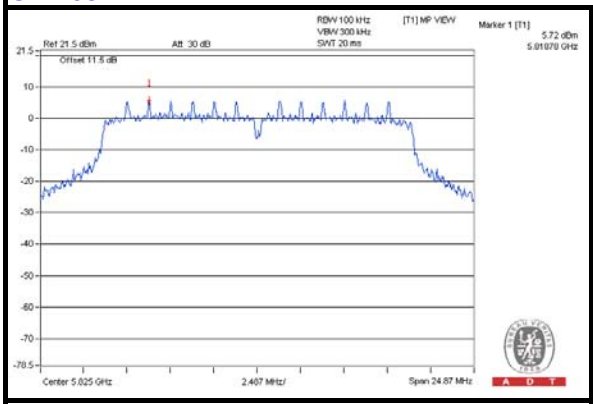


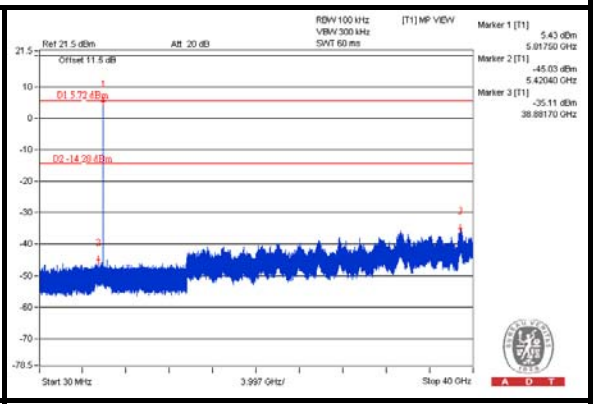
CH 157



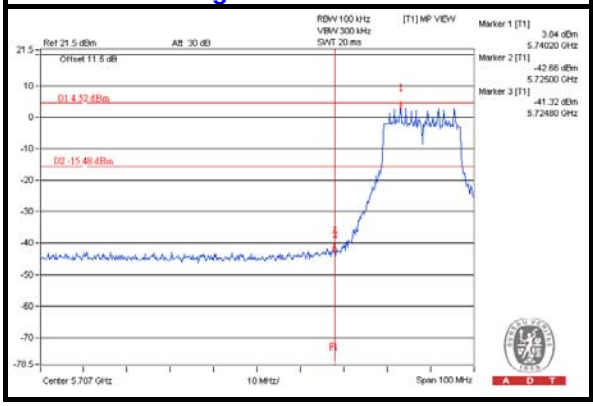


CH 165

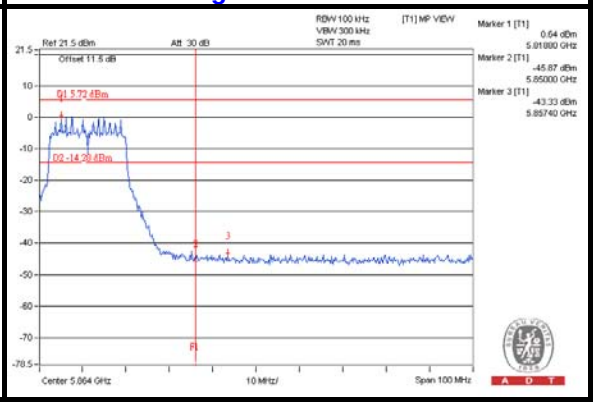




CH 149 Band edge

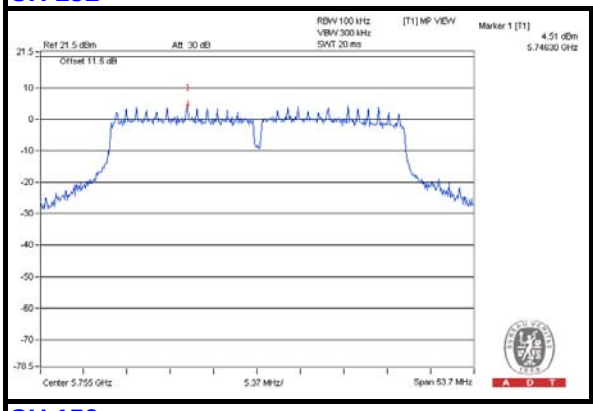


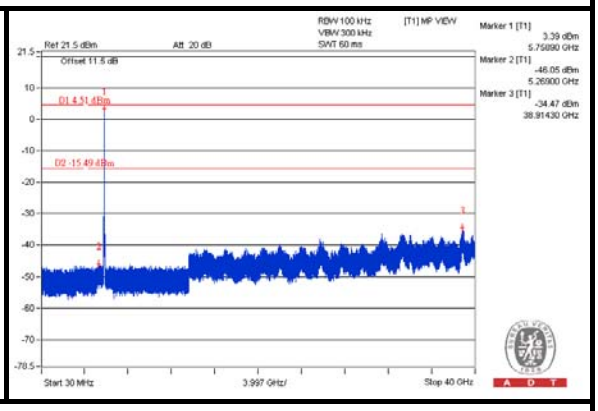
CH 165 Band edge



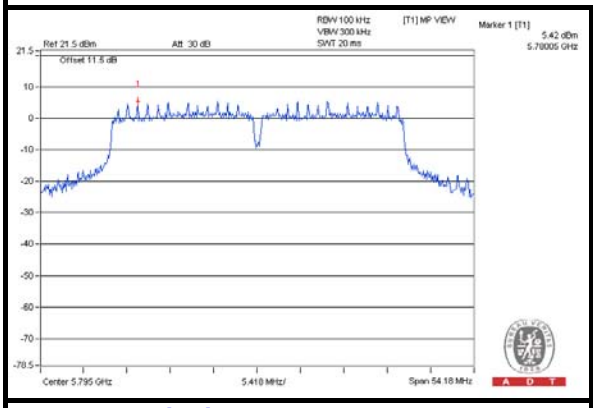
802.11ac (VHT40)
CHAIN 0

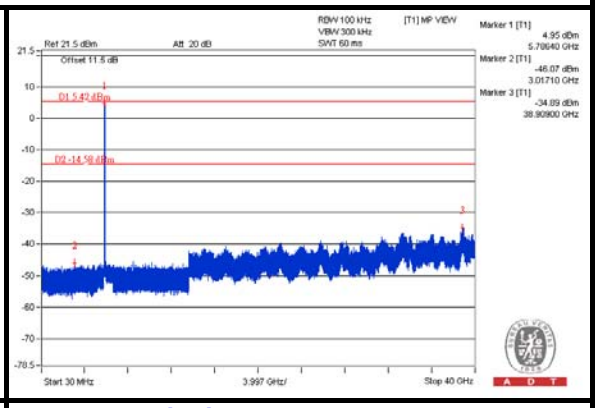
CH 151



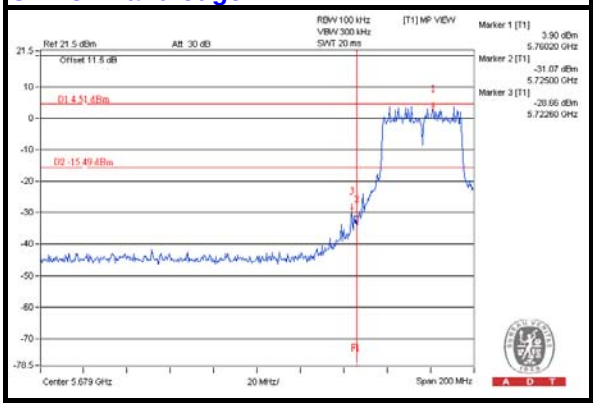


CH 159

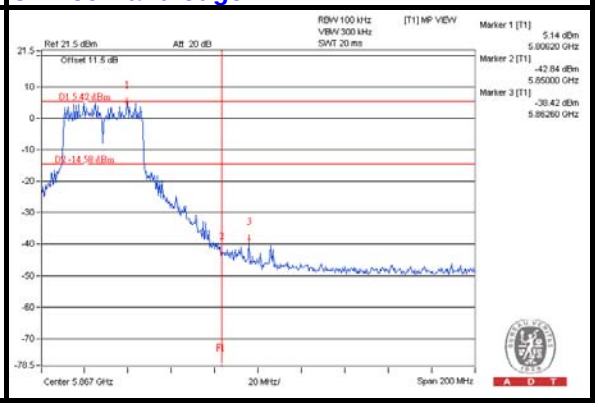




CH 151 Band edge

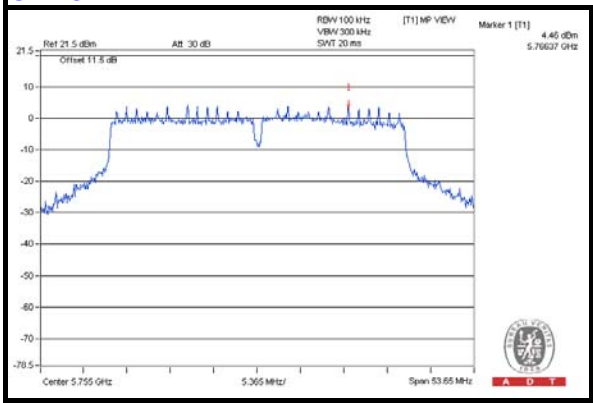


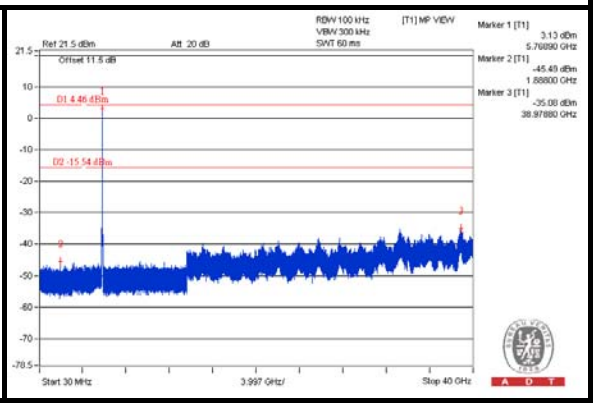
CH 159 Band edge



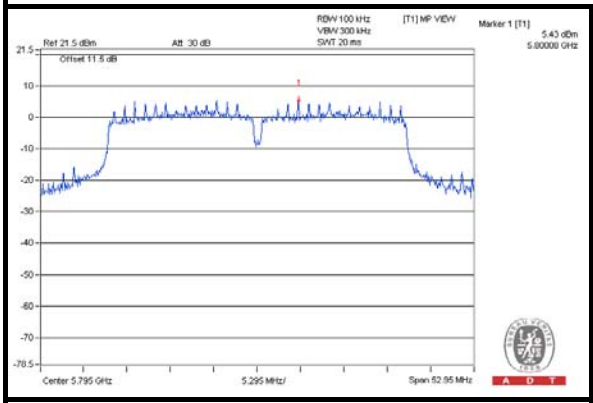
CHAIN 1

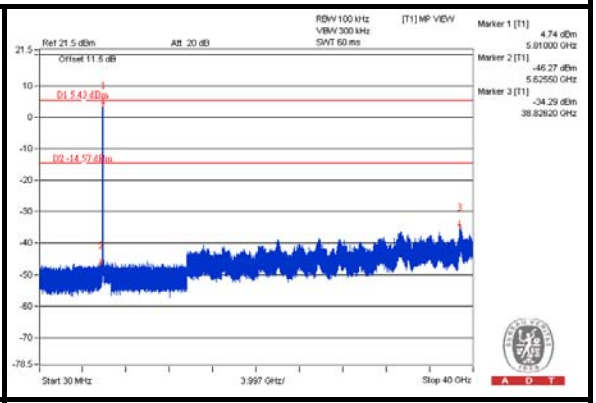
CH 151



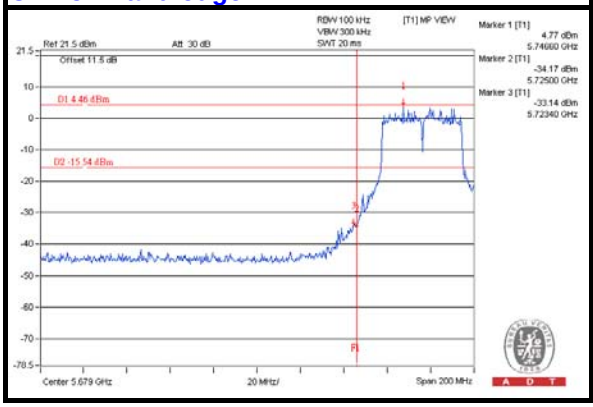


CH 159

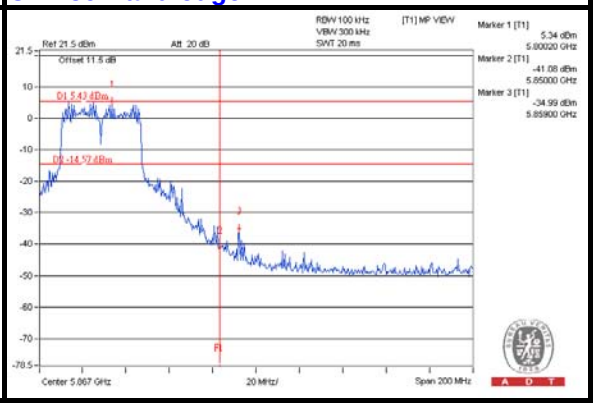




CH 151 Band edge

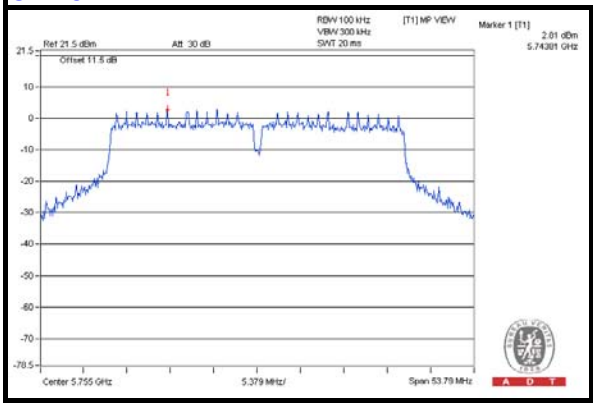


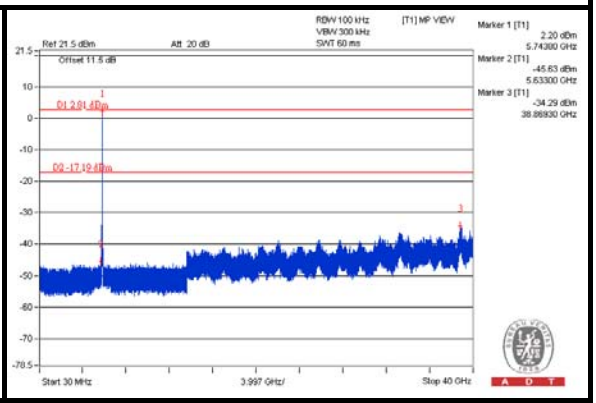
CH 159 Band edge



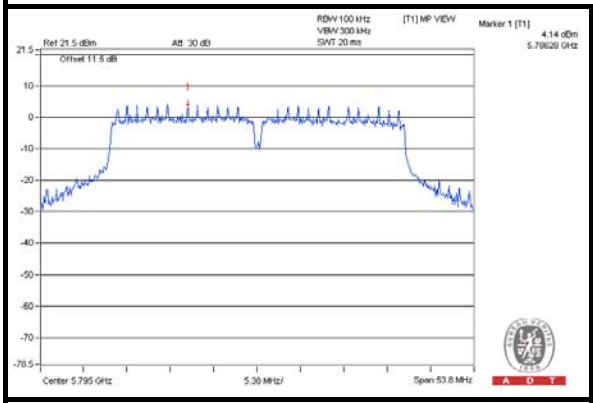
CHAIN 2

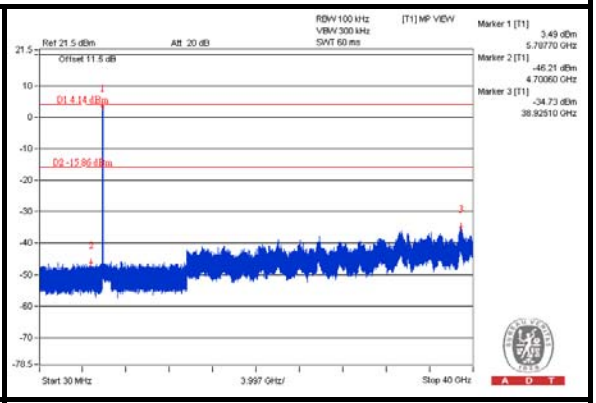
CH 151



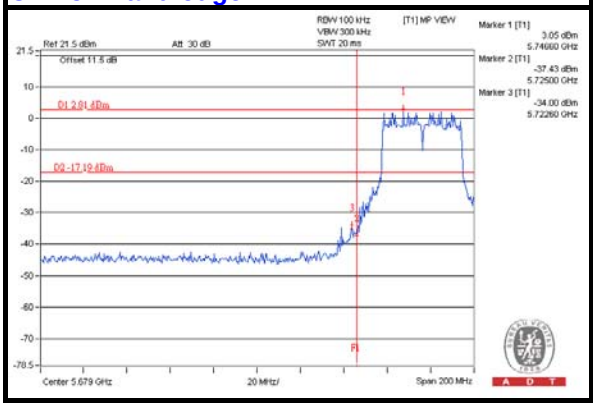


CH 159

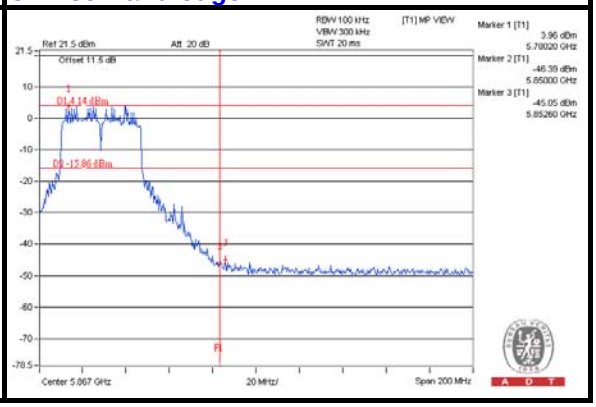




CH 151 Band edge

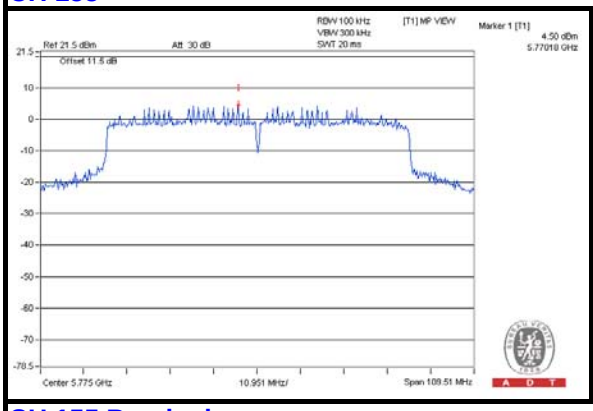


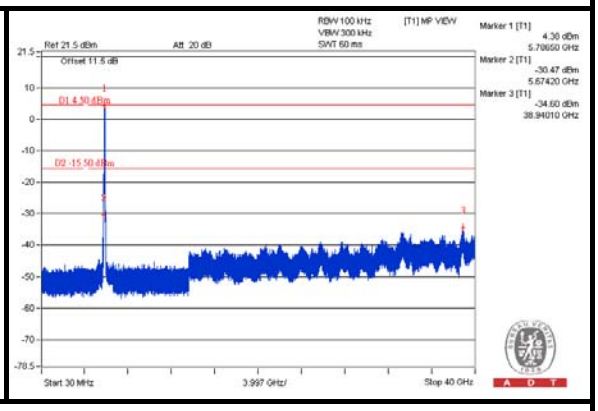
CH 159 Band edge



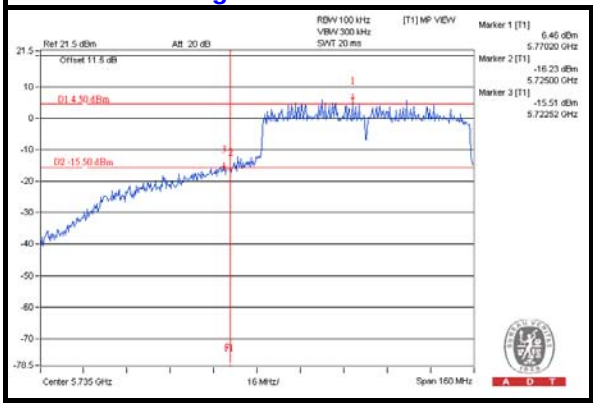
802.11ac (VHT80)
CHAIN 0

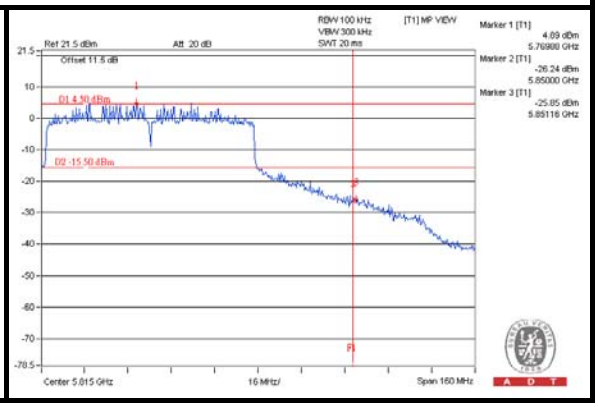
CH 155





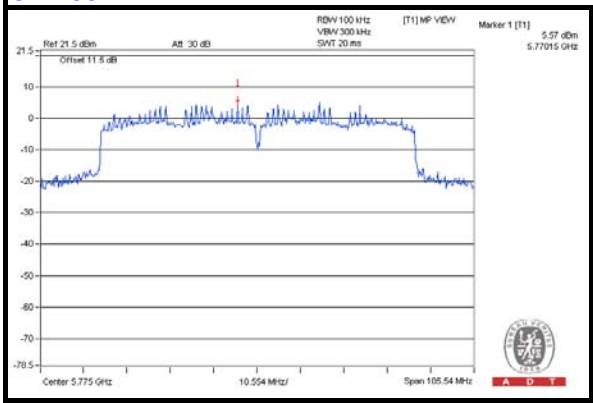
CH 155 Band edge

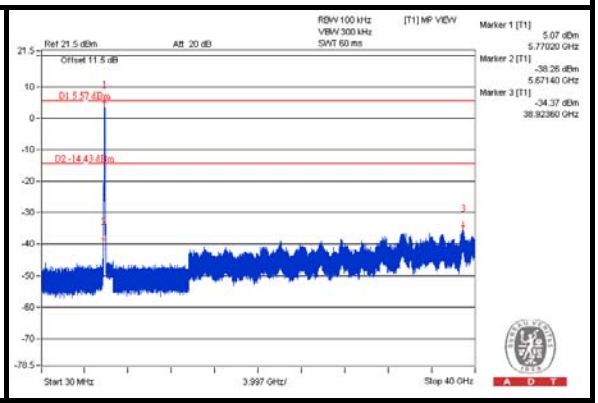




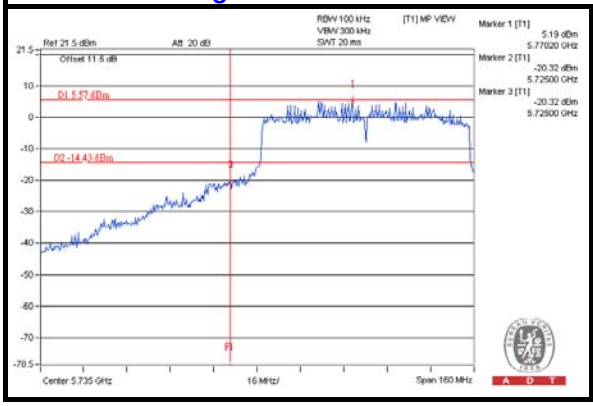
CHAIN 1

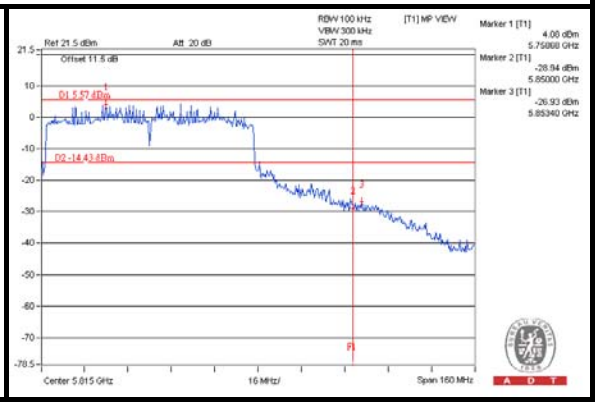
CH 155





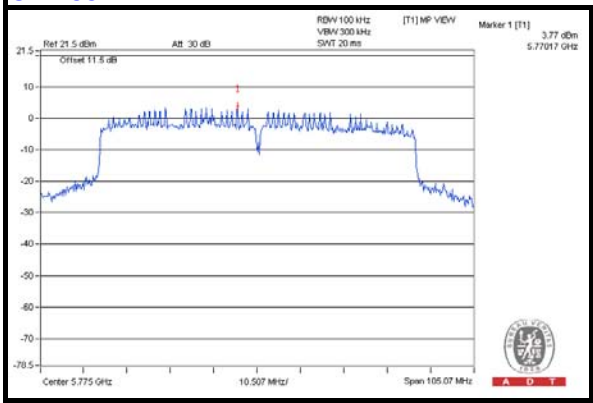
CH 155 Band edge

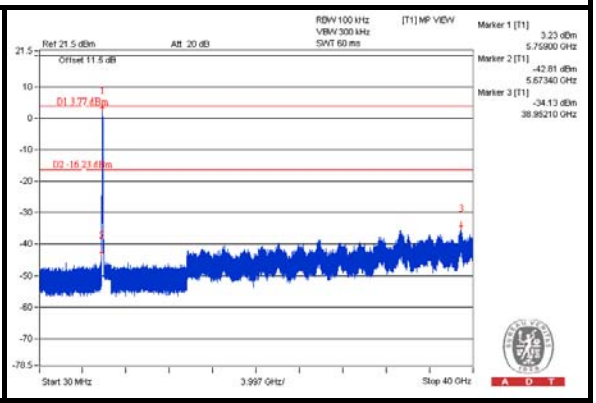




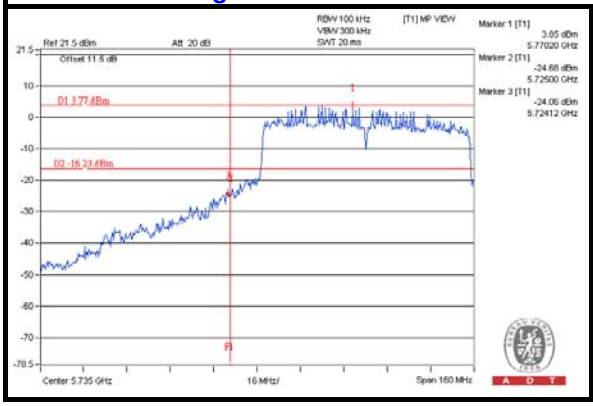
CHAIN 2

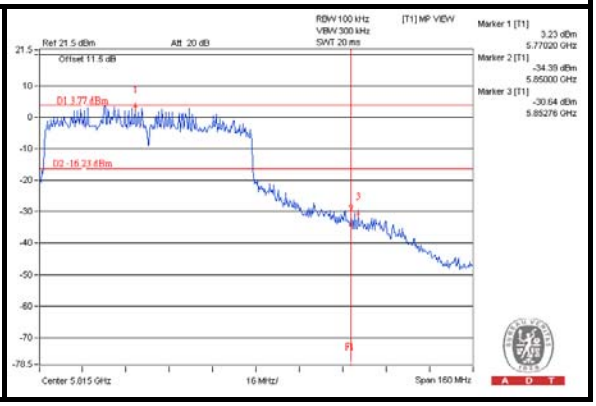
CH 155





CH 155 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:

Linko EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF Lab
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

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

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

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---