

Issuing Laboratory:
Intertek Testing Services Hong Kong Limited

Hong Kong Accreditation Service (HKAS) has accredited this laboratory under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with its terms of accreditation.



TEST REPORT

Report No.: 13051823HKG-001

ALCO Electronics Ltd.

Application
For
Certification
(Original Grant)
(FCC ID: A2HDBA936)
(IC: 9903A-DBA936)

Transceiver

Prepared and Checked by:

Approved by:

Handwritten signature of Wong Cheuk Ho, Herbert.

Wong Cheuk Ho, Herbert
Lead Engineer

Handwritten signature of Chan Chi Hung, Terry.

Chan Chi Hung, Terry
Assistant Supervisor
Date: July 11, 2013

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Intertek Testing Services Hong Kong Ltd.

2/F., Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong.

Tel: (852) 2173 8888 Fax: (852) 2785 5487 Website: www.hk.intertek-ettsemko.com

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GENERAL INFORMATION

ALCO Electronics Ltd.
BRAND NAME: VENTURER, MODEL: SAB1936
BRAND NAME: RCA, MODEL: DBA936
FCC ID: A2HDBA936
IC: 9903A-DBA936

Grantee:	ALCO Electronics Ltd.
Grantee Address:	11/F., Zung Fu Industrial Building, 1067 King's Road, Quarry Bay, Hong Kong.
Contact Person:	Peggy Suen
Tel:	852-2562 6121
Fax:	852-2597 5201
e-mail:	peggy@alco.com.hk
Manufacturer:	Dongguan Houjie Alco Electronics General Factory
Manufacturer Address:	The 3 rd Industrial District, Houjie, Dongguan, Guangdong, P.R.C.
Brand Name:	VENTURER / RCA
Model:	DBA936
Additional Model:	SAB1936
Type of EUT:	Transceiver
Description of EUT:	Steaming Media Box
Serial Number:	N/A
FCC ID / IC:	A2HDBA936 / 9903A-DBA936
Date of Sample Submitted:	May 31, 2013
Date of Test:	Jun 26, 2013 to Aug 16, 2013
Report No.:	13051823HKG-001
Report Date:	Aug 16, 2013
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

Report No.: 13051823HKG-001
FCC ID: A2HDBA936
IC: 9903A-DBA936

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SUMMARY OF TEST RESULT

ALCO Electronics Ltd.
BRAND NAME: VENTURER, MODEL: SAB1936
BRAND NAME: RCA, MODEL: DBA936
FCC ID: A2HDBA936
IC: 9903A-DBA936

TEST SPECIFICATION	REFERENCE	RESULTS
Transmitter Power Line Conducted Emissions	15.207 / RSS-Gen 7.2.4	Pass
Transmitter Field Strength and Bandwidth Requirement	15.249 / RSS-210 A2.9	Pass
Digital Device Radiated Emissions	15.109 / RSS-210 2.5	Pass
Digital Device Conducted Emissions	15.107 / ICES-003	Pass

The equipment under test is found to be complying with the following standards:
FCC Part 15, October 1, 2011 Edition
RSS-210 Issue 8, December 2010
RSS-Gen Issue 3, December 2010

- Note: 1. The EUT uses a permanently attached antenna which, in accordance to section 15.203, is considered sufficient to comply with the provisions of this section.
2. Pursuant to FCC part 15 Section 15.215(c), the 20 dB bandwidth of the emission was contained within the frequency band designated (mentioned as above) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over excepted variations in temperature and supply voltage were considered.

Report No.: 13051823HKG-001
FCC ID: A2HDBA936
IC: 9903A-DBA936

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1.0 General Description

1.1 Product Description

The Equipment Under Test (EUT) is a Streaming Media Box, equipped with HDMI, USB (with PC connectivity), LAN, SD Interface, audio and video output. The EUT contains a 2.4GHz WiFi module (RL-UM02L) operates in the frequency range from 2412MHz to 2462MHz at 802.11b,g,n HT20 (11 channels with 5MHz spacing), while 2422MHz to 2452MHz at 802.11n HT40 (7 channels with 5MHz spacing). The EUT is powered by an external AC/DC adaptor with 5VDC output. The adaptor accepts 100 – 120VAC only.

The Model: SAB1936 is the same as the Model: DBA936 in hardware aspect. The difference in model number and brand name serves as marketing strategy.

Antenna Type : Internal, Integral (single antenna)

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

1.2 Related Submittal(s) Grants

This is the application for certification of transceiver and PC connectivity.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009). All radiated measurements were performed in an Open Area Test Site. Preliminary scans were performed in the Open Area Test Site only to determine worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the “**Justification Section**” of this Application.

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been placed on file with the FCC and IC.

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2.0 System Test Configuration

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2009).

The device was powered by 120VAC.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The rear of unit shall be flushed with the rear of the table.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was mounted to a plastic stand if necessary and placed on the wooden turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

All configuration (with and without PC connectivity during transceiver test) and setting of data rate for each 802.11b/g/n(HT20)/n(HT40) mode had been considered and worst case test data are shown on this test report.

2.2 EUT Exercising Software

There was no special software to exercise the device. Once the unit is powered up, it transmits the RF signal continuously.

2.3 Special Accessories

There are no special accessories necessary for compliance of this product.

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2.4 Equipment Modification

Any modifications installed previous to testing by ALCO Electronics Ltd. will be incorporated in each production model sold/leased in the United States and Canada.

No modifications were installed by Intertek Testing Services Hong Kong Ltd.

2.5 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

2.6 Support Equipment List and Description

1. 4GB Kingston USB Flash Drive
2. 2GB Kingston SD Card
3. 1 x 1m LAN port cable with termination
4. 1 x 1.5m Panasonic HDMI cable
5. 2 x 1m long audio cable with 47k ohm resistive terminator
6. 1 x 1m long video cable with 75 ohm resistive terminator
7. 1 x 2m long USB cable
8. HDMI monitor
(Provided by Intertek)
9. Software: WiFi EMI Test
10. Notebook Computer
(IBM Thinkpad, Type: X40, MIS-1486)
11. AC/DC Adaptor
(Model: GT-WACL05000200-302 – GST; Input: 100-120VAC 50/60Hz;
Output: 5VDC 2A)
(Provided by Applicant)

3.0 Emission Results

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any), Average Factor (optional) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG - AV$$

where FS = Field Strength in dB μ V/m
 RA = Receiver Amplitude (including preamplifier) in dB μ V
 CF = Cable Attenuation Factor in dB
 AF = Antenna Factor in dB
 AG = Amplifier Gain in dB
 AV = Average Factor in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:

$$FS = RR + LF$$

where FS = Field Strength in dB μ V/m
 RR = RA - AG - AV in dB μ V
 LF = CF + AF in dB

Assume a receiver reading of 52.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB are added. The amplifier gain of 29 dB and average factor of 5 dB are subtracted, giving a field strength of 27 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$\begin{aligned} RA &= 52.0 \text{ dB}\mu\text{V/m} & RR &= 18.0 \text{ dB}\mu\text{V} \\ AF &= 7.4 \text{ dB} & LF &= 9.0 \text{ dB} \\ CF &= 1.6 \text{ dB} \\ AG &= 29.0 \text{ dB} \\ AV &= 5.0 \text{ dB} \\ FS &= RR + LF \\ FS &= 18 + 9 = 27 \text{ dB}\mu\text{V/m} \end{aligned}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(27 \text{ dB}\mu\text{V/m})/20] = 22.4 \mu\text{V/m}$$

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3.2 Radiated Emission Configuration Photograph

The worst case in radiated emission was found at 2400.000 MHz (at bandedge) and 86.250 MHz (PC mode)

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgment: Passed by 0.8 dB (at bandedge) and 4.5 dB (PC mode)

3.4 Conducted Emission Configuration Photograph

The worst case in line-conducted emission was found at 0.474 MHz (Wi-Fi portion) and 0.452 MHz (PC mode)

For electronic filing, the worst case line-conducted configuration photographs are saved with filename: conducted photo.pdf.

3.5 Conducted Emission Data

The graph and data table of conducted emission is shown as below.

Judgment: Pass by 11.5 dB (Wi-Fi portion) and 11.2 dB (PC mode)

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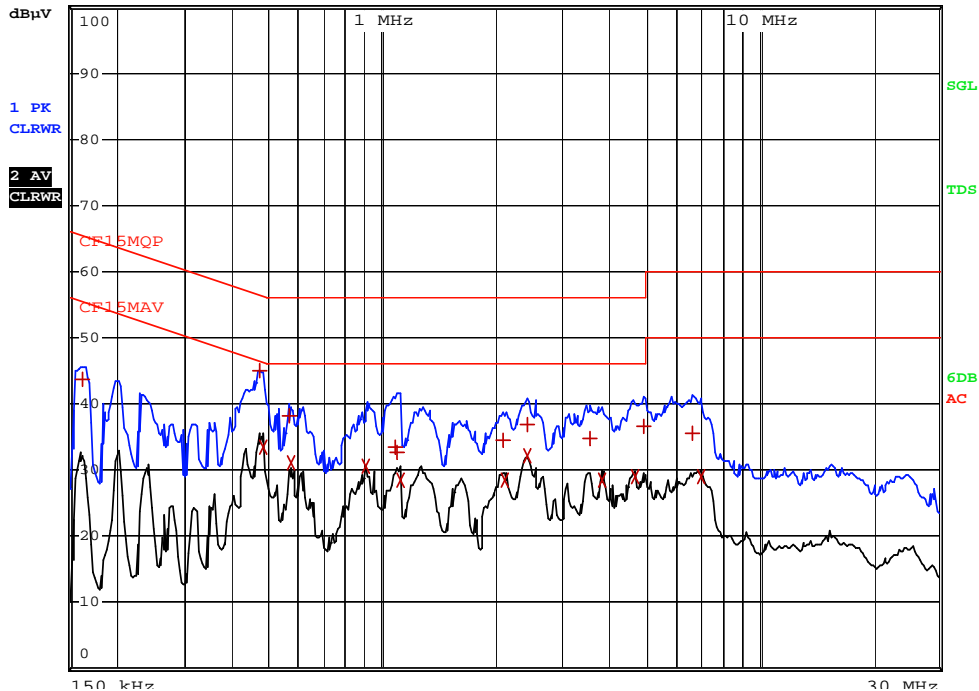


Worst-Case Operating Mode: WiFi Transmitting

EDIT PEAK LIST (Final Measurement Results)					
TRACE		FREQUENCY	LEVEL		DELTA LIMIT
Trace1:	CF15MQP				
Trace2:	CF15MAV				
Trace3:	---				
TRACE		FREQUENCY	LEVEL		DELTA LIMIT
1	Quasi Peak	163.5 kHz	43.63	L1	-21.65
1	Quasi Peak	474 kHz	44.95	N	-11.48
2	CISPR Average	483 kHz	33.41	L1	-12.87
1	Quasi Peak	568.5 kHz	38.10	N	-17.89
2	CISPR Average	573 kHz	31.00	L1	-14.99
2	CISPR Average	906 kHz	30.46	L1	-15.53
1	Quasi Peak	1.0905 MHz	33.48	N	-22.51
1	Quasi Peak	1.0995 MHz	32.73	N	-23.26
2	CISPR Average	1.1175 MHz	28.38	N	-17.61
1	Quasi Peak	2.0895 MHz	34.39	N	-21.60
2	CISPR Average	2.1075 MHz	28.38	L1	-17.61
2	CISPR Average	2.4225 MHz	32.03	N	-13.96
1	Quasi Peak	2.427 MHz	36.92	L1	-19.07
1	Quasi Peak	3.5475 MHz	34.80	N	-21.19
2	CISPR Average	3.84 MHz	28.37	N	-17.63
2	CISPR Average	4.695 MHz	28.98	N	-17.01
1	Quasi Peak	4.9515 MHz	36.53	N	-19.47
1	Quasi Peak	6.6345 MHz	35.57	L1	-24.43
2	CISPR Average	7.044 MHz	29.02	L1	-20.98



RBW 9 kHz
MT 1 s
Att 10 dB AUTO PREAMP OFF



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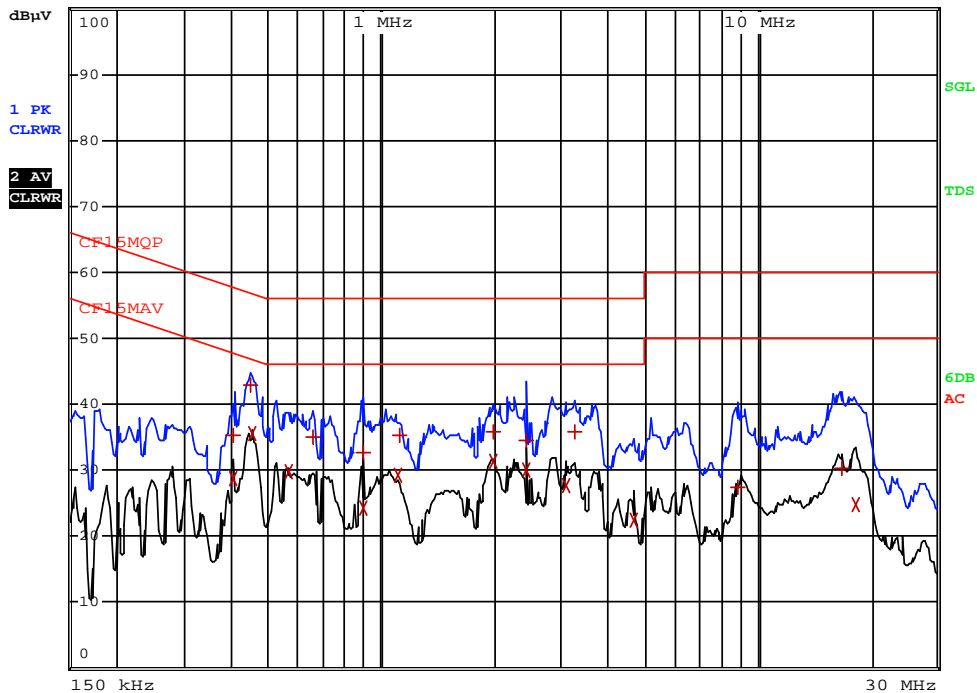
Worst-Case Operating Mode: data transfer via USB (PC mode)

EDIT PEAK LIST (Final Measurement Results)

TRACE	FREQUENCY	LEVEL dBμV	DELTA	LIMIT dB
Trace1:	CF15MQP			
Trace2:	CF15MAV			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dBμV	DELTA	LIMIT dB
1 Quasi Peak	402 kHz	35.36 N		-22.44
2 CISPR Average	402 kHz	28.64 N		-19.17
1 Quasi Peak	447 kHz	42.82 L1		-14.10
2 CISPR Average	451.5 kHz	35.64 L1		-11.19
2 CISPR Average	568.5 kHz	29.69 L1		-16.30
1 Quasi Peak	658.5 kHz	34.95 L1		-21.05
2 CISPR Average	892.5 kHz	24.26 L1		-21.73
1 Quasi Peak	897 kHz	32.74 N		-23.25
2 CISPR Average	1.104 MHz	29.14 N		-16.85
1 Quasi Peak	1.113 MHz	35.24 N		-20.75
1 Quasi Peak	1.9905 MHz	35.80 L1		-20.20
2 CISPR Average	1.9905 MHz	31.41 L1		-14.58
1 Quasi Peak	2.4225 MHz	34.54 N		-21.45
2 CISPR Average	2.4225 MHz	30.10 L1		-15.89
2 CISPR Average	3.102 MHz	27.80 L1		-18.19
1 Quasi Peak	3.282 MHz	35.75 L1		-20.24
2 CISPR Average	4.713 MHz	22.44 L1		-23.55
1 Quasi Peak	8.8215 MHz	27.31 L1		-32.68
1 Quasi Peak	16.6695 MHz	30.35 N		-29.64
2 CISPR Average	18.2085 MHz	24.83 N		-25.16



RBW 9 kHz
MT 1 s
Att 10 dB AUTO PREAMP OFF



Applicant: ALCO Electronics Ltd.

Date of Test: June 26, 2013

Model: DBA936

Worst-Case Operating Mode: Transmitting (802.11b DSSS 11Mbps)

Table 1
Radiated Emissions
Pursuant to FCC Part 15 Section 15.249 Requirement

Channel 01

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
V	2412.000	92.6	33	29.4	89.0	94.0	-5.0
H	4824.000	44.6	33	34.9	46.5	54.0	-7.5
H	7230.000	40.7	33	37.9	45.6	54.0	-8.4
H	9648.000	37.9	33	40.4	45.3	54.0	-8.7
H	12060.000	37.7	33	40.5	45.2	54.0	-8.8
H	14472.000	38.1	33	40.0	45.1	54.0	-8.9

Channel 06

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
V	2437.000	92.5	33	29.4	88.9	94.0	-5.1
H	4874.000	45.1	33	34.9	47.0	54.0	-7.0
H	7311.000	41.9	33	37.9	46.8	54.0	-7.2
H	9748.000	38.2	33	40.4	45.6	54.0	-8.4
H	12185.000	37.8	33	40.5	45.3	54.0	-8.7
H	14622.000	39.2	33	38.4	44.6	54.0	-9.4

Channel 11

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
V	2462.000	92.4	33	29.4	88.8	94.0	-5.2
H	4924.000	44.4	33	34.9	46.3	54.0	-7.7
H	7386.000	40.6	33	37.9	45.5	54.0	-8.5
H	9848.000	38.0	33	40.4	45.4	54.0	-8.6
H	12310.000	37.7	33	40.5	45.2	54.0	-8.8
H	14772.000	39.4	33	38.4	44.8	54.0	-9.2

- NOTES:
1. Average Detector is used for emission measurement.
 2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
 3. Negative sign in the column shows value below limit.
 4. Horn antenna is used for the emission over 1000MHz.
 5. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
 6. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

Applicant: ALCO Electronics Ltd.

Date of Test: June 26, 2013

Model: DBA936

Worst-Case Operating Mode: Transmitting (802.11b DSSS 11Mbps)

Table 2
Radiated Emissions
Pursuant to FCC Part 15 Section 15.249 Requirement

Channel 01

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
V	2412.000	104.4	33	29.4	100.8	114.0	-13.2
H	4824.000	52.1	33	34.9	54.0	74.0	-20.0
H	7230.000	46.7	33	37.9	51.6	74.0	-22.4
H	9648.000	43.8	33	40.4	51.2	74.0	-22.8
H	12060.000	43.7	33	40.5	51.2	74.0	-22.8
H	14472.000	44.0	33	40.0	51.0	74.0	-23.0

Channel 06

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
V	2437.000	103.2	33	29.4	99.6	114.0	-14.4
H	4874.000	53.0	33	34.9	54.9	74.0	-19.1
H	7311.000	47.3	33	37.9	52.2	74.0	-21.8
H	9748.000	43.8	33	40.4	51.2	74.0	-22.8
H	12185.000	44.1	33	40.5	51.6	74.0	-22.4
H	14622.000	44.8	33	38.4	50.2	74.0	-23.8

Channel 11

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
V	2462.000	102.7	33	29.4	99.1	114.0	-14.9
H	4924.000	50.1	33	34.9	52.0	74.0	-22.0
H	7386.000	46.4	33	37.9	51.3	74.0	-22.7
H	9848.000	44.1	33	40.4	51.5	74.0	-22.5
H	12310.000	43.8	33	40.5	51.3	74.0	-22.7
H	14772.000	44.9	33	38.4	50.3	74.0	-23.7

- NOTES:
1. Peak Detector is used for emission measurement.
 2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
 3. Negative sign in the column shows value below limit.
 4. Horn antenna is used for the emission over 1000MHz.
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Applicant: ALCO Electronics Ltd.
Model: DBA936

Date of Test: June 26, 2013

Worst-Case Operating Mode: Transmitting (802.11g OFDM 54Mbps)

Table 3
Radiated Emissions
Pursuant to FCC Part 15 Section 15.249 Requirement

Channel 01

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
V	2412.000	90.5	33	29.4	86.9	94.0	-7.1
H	4824.000	44.6	33	34.9	46.5	54.0	-7.5
H	7230.000	41.9	33	37.9	46.8	54.0	-7.2
H	9648.000	37.9	33	40.4	45.3	54.0	-8.7
H	12060.000	37.7	33	40.5	45.2	54.0	-8.8
H	14472.000	38.0	33	40.0	45.0	54.0	-9.0

Channel 06

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
V	2437.000	90.4	33	29.4	86.8	94.0	-7.2
H	4874.000	45.1	33	34.9	47.0	54.0	-7.0
H	7311.000	41.9	33	37.9	46.8	54.0	-7.2
H	9748.000	38.2	33	40.4	45.6	54.0	-8.4
H	12185.000	37.1	33	40.5	44.6	54.0	-9.4
H	14622.000	39.2	33	38.4	44.6	54.0	-9.4

Channel 11

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
V	2462.000	89.8	33	29.4	86.2	94.0	-7.8
H	4924.000	44.4	33	34.9	46.3	54.0	-7.7
H	7386.000	40.9	33	37.9	45.8	54.0	-8.2
H	9848.000	37.8	33	40.4	45.2	54.0	-8.8
H	12310.000	37.3	33	40.5	44.8	54.0	-9.2
H	14772.000	39.1	33	38.4	44.5	54.0	-9.5

- NOTES:
1. Average Detector is used for emission measurement.
 2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
 3. Negative sign in the column shows value below limit.
 4. Horn antenna is used for the emission over 1000MHz.
 5. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
 6. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

Applicant: ALCO Electronics Ltd.

Date of Test: June 26, 2013

Model: DBA936

Worst-Case Operating Mode: Transmitting (802.11g OFDM 54Mbps)

Table 4
Radiated Emissions
Pursuant to FCC Part 15 Section 15.249 Requirement

Channel 01

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
V	2412.000	102.2	33	29.4	98.6	114.0	-15.4
H	4824.000	50.9	33	34.9	52.8	74.0	-21.2
H	7230.000	47.4	33	37.9	52.3	74.0	-21.7
H	9648.000	43.8	33	40.4	51.2	74.0	-22.8
H	12060.000	43.5	33	40.5	51.0	74.0	-23.0
H	14472.000	43.8	33	40.0	50.8	74.0	-23.2

Channel 06

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
V	2437.000	101.2	33	29.4	97.6	114.0	-16.4
H	4874.000	52.6	33	34.9	54.5	74.0	-19.5
H	7311.000	47.3	33	37.9	52.2	74.0	-21.8
H	9748.000	43.8	33	40.4	51.2	74.0	-22.8
H	12185.000	42.7	33	40.5	50.2	74.0	-23.8
H	14622.000	44.6	33	38.4	50.0	74.0	-24.0

Channel 11

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
V	2462.000	99.7	33	29.4	96.1	114.0	-17.9
H	4924.000	50.1	33	34.9	52.0	74.0	-22.0
H	7386.000	46.7	33	37.9	51.6	74.0	-22.4
H	9848.000	43.9	33	40.4	51.3	74.0	-22.7
H	12310.000	42.8	33	40.5	50.3	74.0	-23.7
H	14772.000	44.8	33	38.4	50.2	74.0	-23.8

- NOTES:
1. Peak Detector is used for emission measurement.
 2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
 3. Negative sign in the column shows value below limit.
 4. Horn antenna is used for the emission over 1000MHz.
 5. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
 6. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

Applicant: ALCO Electronics Ltd.

Date of Test: June 26, 2013

Model: DBA936

Worst-Case Operating Mode: Transmitting (802.11n HT20 mcs7 65Mbps)

Table 5
Radiated Emissions
Pursuant to FCC Part 15 Section 15.249 Requirement

Channel 01

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
V	2412.000	89.5	33	29.4	85.9	94.0	-8.1
H	4824.000	44.7	33	34.9	46.6	54.0	-7.4
H	7230.000	41.6	33	37.9	46.5	54.0	-7.5
H	9648.000	37.9	33	40.4	45.3	54.0	-8.7
H	12060.000	37.7	33	40.5	45.2	54.0	-8.8
H	14472.000	38.1	33	40.0	45.1	54.0	-8.9

Channel 06

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
V	2437.000	89.4	33	29.4	85.8	94.0	-8.2
H	4874.000	44.8	33	34.9	46.7	54.0	-7.3
H	7311.000	41.9	33	37.9	46.8	54.0	-7.2
H	9748.000	38.4	33	40.4	45.8	54.0	-8.2
H	12185.000	38.1	33	40.5	45.6	54.0	-8.4
H	14622.000	39.2	33	38.4	44.6	54.0	-9.4

Channel 11

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
V	2462.000	88.8	33	29.4	85.2	94.0	-8.8
H	4924.000	45.0	33	34.9	46.9	54.0	-7.1
H	7386.000	41.4	33	37.9	46.3	54.0	-7.7
H	9848.000	38.4	33	40.4	45.8	54.0	-8.2
H	12310.000	38.0	33	40.5	45.5	54.0	-8.5
H	14772.000	39.8	33	38.4	45.2	54.0	-8.8

- NOTES:
1. Average Detector is used for emission measurement.
 2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
 3. Negative sign in the column shows value below limit.
 4. Horn antenna is used for the emission over 1000MHz.
 5. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
 6. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

Applicant: ALCO Electronics Ltd.

Date of Test: June 26, 2013

Model: DBA936

Worst-Case Operating Mode: Transmitting (802.11n HT20 mcs7 65Mbps)

Table 6
Radiated Emissions
Pursuant to FCC Part 15 Section 15.249 Requirement

Channel 01

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
V	2412.000	98.8	33	29.4	95.2	114.0	-18.8
H	4824.000	52.7	33	34.9	54.6	74.0	-19.4
H	7230.000	47.2	33	37.9	52.1	74.0	-21.9
H	9648.000	43.8	33	40.4	51.2	74.0	-22.8
H	12060.000	43.5	33	40.5	51.0	74.0	-23.0
H	14472.000	43.9	33	40.0	50.9	74.0	-23.1

Channel 06

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
V	2437.000	98.2	33	29.4	94.6	114.0	-19.4
H	4874.000	52.4	33	34.9	54.3	74.0	-19.7
H	7311.000	47.3	33	37.9	52.2	74.0	-21.8
H	9748.000	43.9	33	40.4	51.3	74.0	-22.7
H	12185.000	43.7	33	40.5	51.2	74.0	-22.8
H	14622.000	44.8	33	38.4	50.2	74.0	-23.8

Channel 11

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
V	2462.000	98.0	33	29.4	94.4	114.0	-19.6
H	4924.000	52.6	33	34.9	54.5	74.0	-19.5
H	7386.000	47.3	33	37.9	52.2	74.0	-21.8
H	9848.000	44.2	33	40.4	51.6	74.0	-22.4
H	12310.000	43.8	33	40.5	51.3	74.0	-22.7
H	14772.000	45.9	33	38.4	51.3	74.0	-22.7

- NOTES:
1. Peak Detector is used for emission measurement.
 2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
 3. Negative sign in the column shows value below limit.
 4. Horn antenna is used for the emission over 1000MHz.
 5. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
 6. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

Applicant: ALCO Electronics Ltd.

Date of Test: June 26, 2013

Model: DBA936

Worst-Case Operating Mode: Transmitting (802.11n HT40 mcs7 150Mbps)

Table 7
Radiated Emissions
Pursuant to FCC Part 15 Section 15.249 Requirement

Channel 03

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
V	2422.000	88.8	33	29.4	85.2	94.0	-8.8
H	4844.000	44.7	33	34.9	46.6	54.0	-7.4
H	7266.000	41.6	33	37.9	46.5	54.0	-7.5
H	9688.000	37.9	33	40.4	45.3	54.0	-8.7
H	12110.000	37.7	33	40.5	45.2	54.0	-8.8
H	14532.000	39.6	33	38.4	45.0	54.0	-9.0

Channel 06

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
V	2437.000	88.8	33	29.4	85.2	94.0	-8.8
H	4874.000	47.0	33	34.9	48.9	54.0	-5.1
H	7311.000	41.9	33	37.9	46.8	54.0	-7.2
H	9748.000	38.5	33	40.4	45.9	54.0	-8.1
H	12185.000	38.1	33	40.5	45.6	54.0	-8.4
H	14622.000	39.9	33	38.4	45.3	54.0	-8.7

Channel 09

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
V	2452.000	88.7	33	29.4	85.1	94.0	-8.9
H	4904.000	44.5	33	34.9	46.4	54.0	-7.6
H	7356.000	41.4	33	37.9	46.3	54.0	-7.7
H	9808.000	38.1	33	40.4	45.5	54.0	-8.5
H	12260.000	37.7	33	40.5	45.2	54.0	-8.8
H	14712.000	39.6	33	38.4	45.0	54.0	-9.0

- NOTES:
1. Average Detector is used for emission measurement.
 2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
 3. Negative sign in the column shows value below limit.
 4. Horn antenna is used for the emission over 1000MHz.
 5. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
 6. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

Applicant: ALCO Electronics Ltd.

Date of Test: June 26, 2013

Model: DBA936

Worst-Case Operating Mode: Transmitting (802.11n HT40 mcs7 150Mbps)

Table 8
Radiated Emissions
Pursuant to FCC Part 15 Section 15.249 Requirement

Channel 03

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
V	2422.000	97.2	33	29.4	93.6	114.0	-20.4
H	4844.000	52.3	33	34.9	54.2	74.0	-19.8
H	7266.000	47.3	33	37.9	52.2	74.0	-21.8
H	9688.000	43.4	33	40.4	50.8	74.0	-23.2
H	12110.000	43.5	33	40.5	51.0	74.0	-23.0
H	14532.000	44.7	33	38.4	50.1	74.0	-23.9

Channel 06

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
V	2437.000	96.8	33	29.4	93.2	114.0	-20.8
H	4874.000	51.3	33	34.9	53.2	74.0	-20.8
H	7311.000	47.3	33	37.9	52.2	74.0	-21.8
H	9748.000	44.2	33	40.4	51.6	74.0	-22.4
H	12185.000	43.7	33	40.5	51.2	74.0	-22.8
H	14622.000	44.8	33	38.4	50.2	74.0	-23.8

Channel 09

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
V	2452.000	96.2	33	29.4	92.6	114.0	-21.4
H	4904.000	51.7	33	34.9	53.6	74.0	-20.4
H	7356.000	47.1	33	37.9	52.0	74.0	-22.0
H	9808.000	43.9	33	40.4	51.3	74.0	-22.7
H	12260.000	43.6	33	40.5	51.1	74.0	-22.9
H	14712.000	44.9	33	38.4	50.3	74.0	-23.7

- NOTES:
1. Peak Detector is used for emission measurement.
 2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
 3. Negative sign in the column shows value below limit.
 4. Horn antenna is used for the emission over 1000MHz.
 5. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
 6. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

Issuing Laboratory:
Intertek Testing Services Hong Kong Limited

Hong Kong Accreditation Service (HKAS) has accredited this laboratory under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with its terms of accreditation.



Applicant: ALCO Electronics Ltd.
Model: DBA936
Worst-Case Operating Mode: WiFi (Other Digital)

Date of Test: June 26, 2013

Table 9

**Radiated Emissions
Pursuant to FCC Part 15 Section 15.109 Requirement**

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	72.000	42.6	16	7.0	33.6	40.0	-6.4
V	120.000	35.5	16	14.0	33.5	43.5	-10.0
H	156.000	34.5	16	16.0	34.5	43.5	-9.0
H	180.000	30.6	16	20.0	34.6	43.5	-8.9
H	216.000	33.0	16	17.0	34.0	43.5	-9.5
H	240.000	31.3	16	19.0	34.3	46.0	-11.7
H	300.000	28.8	16	22.0	34.8	46.0	-11.2
H	336.000	26.6	16	24.0	34.6	46.0	-11.4
H	350.012	29.6	16	24.0	37.6	46.0	-8.4
H	371.280	27.8	16	24.0	35.8	46.0	-10.2
H	742.568	24.2	16	30.0	38.2	46.0	-7.8

- NOTES: 1. Peak Detector Data unless otherwise stated.
2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative sign in the column shows value below limit.
4. Horn antenna is used for the emission over 1000MHz.

Issuing Laboratory:
Intertek Testing Services Hong Kong Limited

Hong Kong Accreditation Service (HKAS) has accredited this laboratory under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with its terms of accreditation.



Applicant: ALCO Electronics Ltd.

Date of Test: Aug 16, 2013

Model: DBA936

Worst-Case Operating Mode: Data transfer via USB (PC mode)

Table 10

**Radiated Emissions
Pursuant to FCC Part 15 Section 15.109 Requirement**

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	68.750	41.3	16	8.0	33.3	40.0	-6.7
V	64.875	42.3	16	9.0	35.3	40.0	-4.7
V	86.250	43.5	16	8.0	35.5	40.0	-4.5
H	84.250	43.2	16	8.0	35.2	40.0	-4.8
H	113.001	40.0	16	14.0	38.0	43.5	-5.5
H	119.500	37.4	16	14.0	35.4	43.5	-8.1
H	216.020	32.3	16	17.0	33.3	46.0	-12.7
H	224.520	34.8	16	18.0	36.8	46.0	-9.2
H	228.020	36.5	16	18.0	38.5	46.0	-7.5
H	300.000	26.6	16	22.0	32.6	46.0	-13.4
H	432.030	27.0	16	25.0	36.0	46.0	-10.0
H	540.055	23.0	16	28.0	35.0	46.0	-11.0

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative sign in the column shows value below limit.

4. Horn antenna is used for the emission over 1000MHz.

Issuing Laboratory:
Intertek Testing Services Hong Kong Limited

Hong Kong Accreditation Service (HKAS) has accredited this laboratory under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with its terms of accreditation.



4.0 **Equipment Photographs**

For electronic filing, the photographs are saved with filename: external photos.pdf and internal photos.pdf.

5.0 **Product Labelling**

For electronics filing, the FCC ID and IC label artwork and the label location are saved with filename: label.pdf.

6.0 **Technical Specifications**

For electronic filing, the block diagram and schematic of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

7.0 **Instruction Manual**

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States and Canada.

Issuing Laboratory:
Intertek Testing Services Hong Kong Limited

Hong Kong Accreditation Service (HKAS) has accredited this laboratory under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with its terms of accreditation.



8.0 **Miscellaneous Information**

The miscellaneous information includes details of the test procedure and measured bandwidth / calculation of factor such as pulse desensitization and averaging factor.

8.1 Measured Bandwidth

From the following plots, they show that the fundamental emissions are confined in the specified band (2400MHz to 2483.5MHz). In case of the fundamental emissions are within two standard bandwidths from the bandedge, the delta measurement technique is used for determining bandedge compliance. Standard bandwidth is the bandwidth specified by ANSI C63.4 (2009) for frequency being measured.

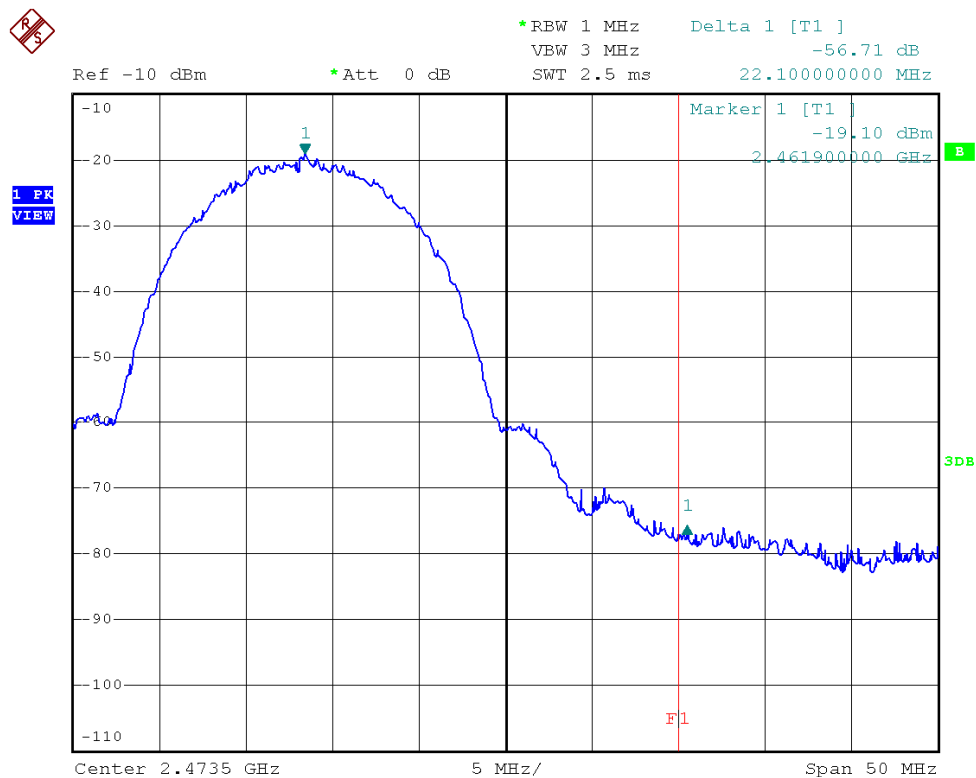
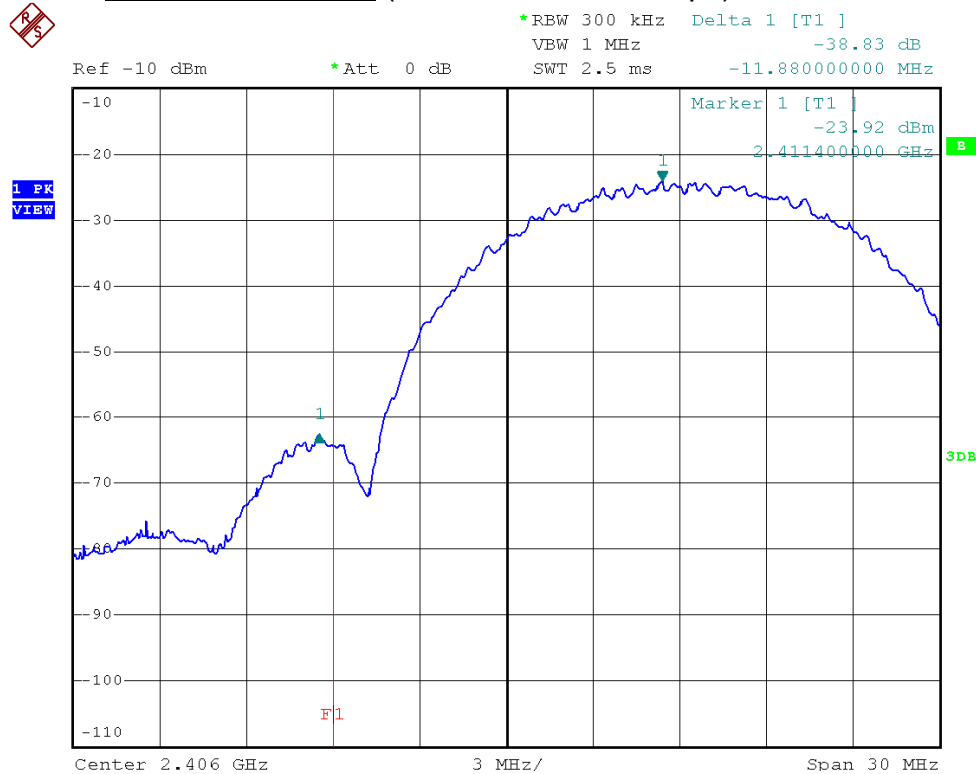
Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50dB below the level of the fundamental or to the general radiated emissions limits in Section 15.209, whichever is the lesser attenuation, which meet the requirement of part 15.249(d).

Issuing Laboratory:
Intertek Testing Services Hong Kong Limited

Hong Kong Accreditation Service (HKAS) has accredited this laboratory under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with its terms of accreditation.



Peak Measurement (802.11b DSSS 11Mbps)



Issuing Laboratory:
Intertek Testing Services Hong Kong Limited

Hong Kong Accreditation Service (HKAS) has accredited this laboratory under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with its terms of accreditation.



Peak Measurement (802.11b DSSS 11Mbps)

Bandedge compliance is determined by applying marker-delta method, i.e. (Bandedge Plot).

Lower bandedge

Peak Resultant field strength = Fundamental emissions (peak value) – delta from the plot

$$\begin{aligned} &= 100.8 \text{ dB}\mu\text{V/m} - 38.8 \text{ dB} \\ &= 62.0 \text{ dB}\mu\text{V/m} \end{aligned}$$

Average Resultant field strength = Fundamental emissions (average value) – delta from the plot

$$\begin{aligned} &= 89.0 \text{ dB}\mu\text{V/m} - 38.8 \text{ dB} \\ &= 50.2 \text{ dB}\mu\text{V/m} \end{aligned}$$

Upper bandedge

Peak Resultant field strength = Fundamental emissions (peak value) – delta from the plot

$$\begin{aligned} &= 99.1 \text{ dB}\mu\text{V/m} - 56.7 \text{ dB} \\ &= 42.4 \text{ dB}\mu\text{V/m} \end{aligned}$$

Average Resultant field strength = Fundamental emissions (average value) – delta from the plot

$$\begin{aligned} &= 88.8 \text{ dB}\mu\text{V/m} - 56.7 \text{ dB} \\ &= 32.1 \text{ dB}\mu\text{V/m} \end{aligned}$$

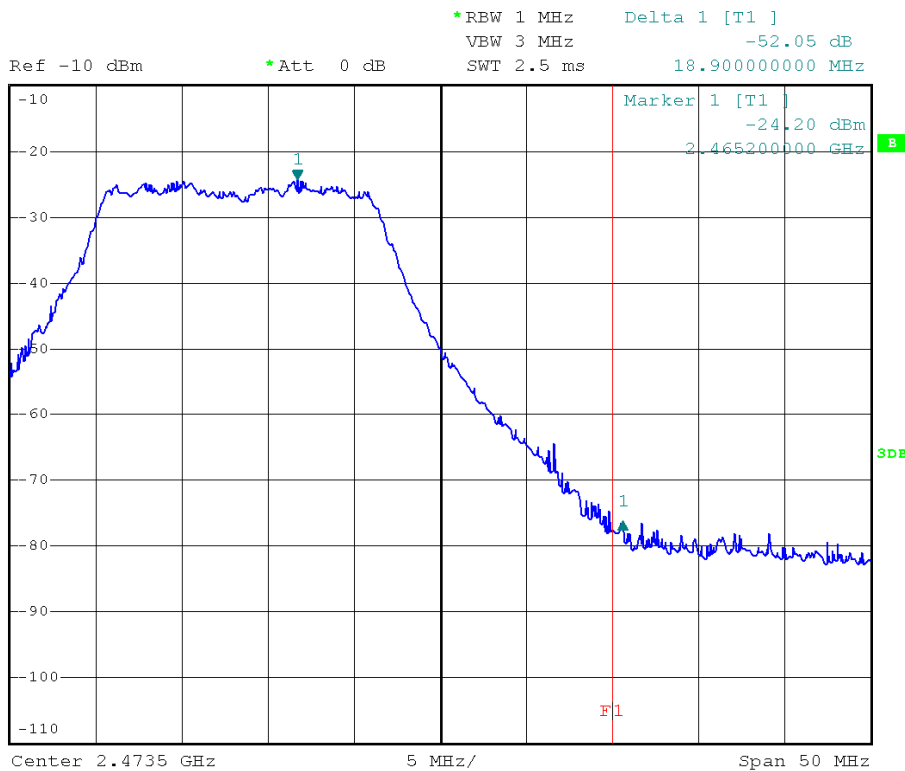
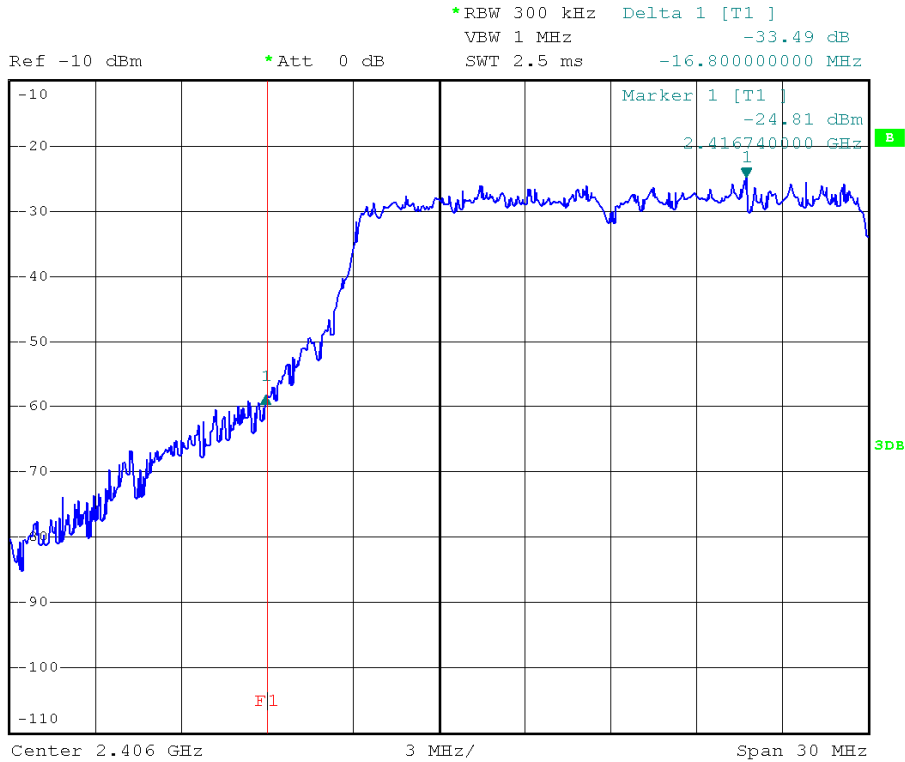
The resultant field strength meets the general radiated emission limit in section 15.209, which does not exceed 74 dB μ V/m (Peak Limit) and 54 dB μ V/m (Average Limit).

Issuing Laboratory:
Intertek Testing Services Hong Kong Limited

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Peak Measurement (802.11g OFDM 54Mbps)



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Peak Measurement (802.11g OFDM 54Mbps)

Bandedge compliance is determined by applying marker-delta method, i.e. (Bandedge Plot).

Lower bandedge

Peak Resultant field strength = Fundamental emissions (peak value) – delta from the plot

=98.6 dB μ V/m - 33.5 dB
=65.1 dB μ V/m

Average Resultant field strength = Fundamental emissions (average value) – delta from the plot

=86.9 dB μ V/m - 33.5 dB
=53.4 dB μ V/m

Upper bandedge

Peak Resultant field strength = Fundamental emissions (peak value) – delta from the plot

=96.1 dB μ V/m - 52.1 dB
=44.0 dB μ V/m

Average Resultant field strength = Fundamental emissions (average value) – delta from the plot

=86.2 dB μ V/m - 52.1 dB
=34.1 dB μ V/m

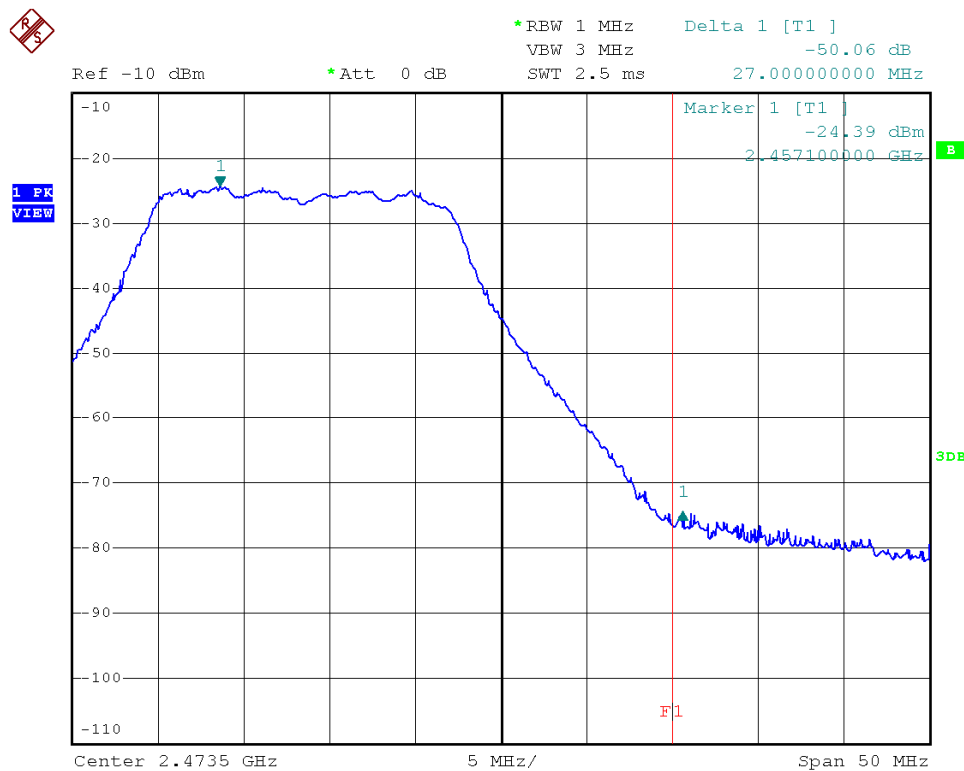
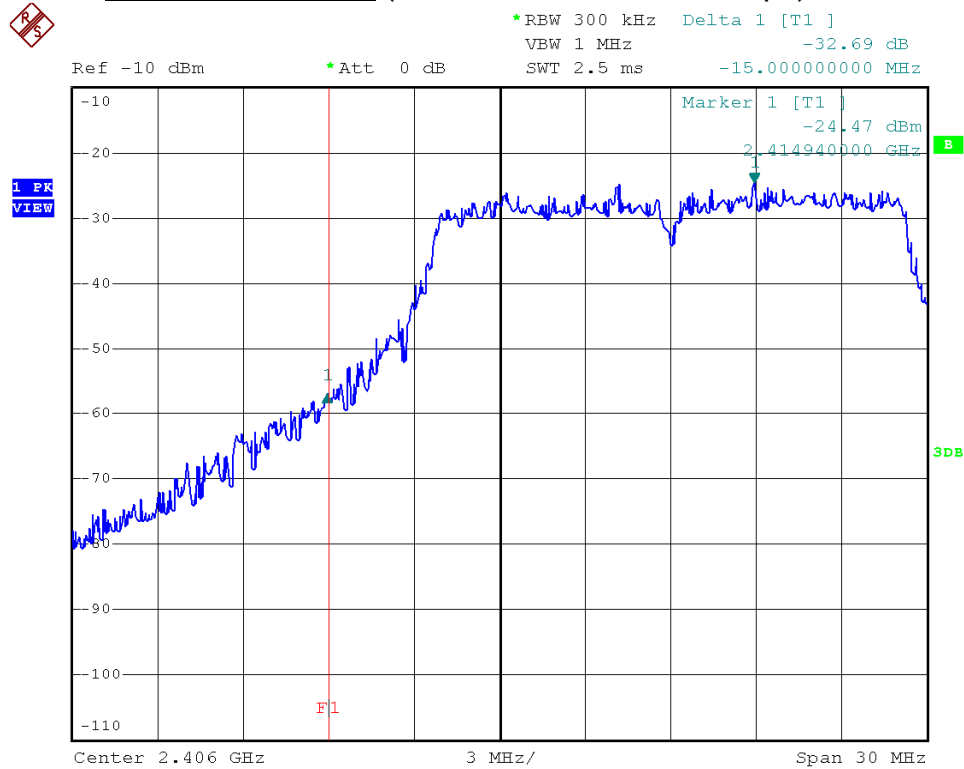
The resultant field strength meets the general radiated emission limit in section 15.209, which does not exceed 74 dB μ V/m (Peak Limit) and 54 dB μ V/m (Average Limit).

Issuing Laboratory:
Intertek Testing Services Hong Kong Limited

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Peak Measurement (802.11n HT20 mcs7 65Mbps)



Report No.: 13051823HKG-001
FCC ID: A2HDBA936
IC: 9903A-DBA936

Issuing Laboratory:
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Peak Measurement (802.11n HT20 mcs7 65Mbps)

Bandedge compliance is determined by applying marker-delta method, i.e. (Bandedge Plot).

Lower bandedge

Peak Resultant field strength = Fundamental emissions (peak value) – delta from the plot

$$\begin{aligned} &=95.2 \text{ dB}\mu\text{V/m} - 32.7 \text{ dB} \\ &=62.5 \text{ dB}\mu\text{V/m} \end{aligned}$$

Average Resultant field strength = Fundamental emissions (average value) – delta from the plot

$$\begin{aligned} &=85.9 \text{ dB}\mu\text{V/m} - 32.7 \text{ dB} \\ &=53.2 \text{ dB}\mu\text{V/m} \end{aligned}$$

Upper bandedge

Peak Resultant field strength = Fundamental emissions (peak value) – delta from the plot

$$\begin{aligned} &=94.4 \text{ dB}\mu\text{V/m} - 50.1 \text{ dB} \\ &=44.3 \text{ dB}\mu\text{V/m} \end{aligned}$$

Average Resultant field strength = Fundamental emissions (average value) – delta from the plot

$$\begin{aligned} &=85.2 \text{ dB}\mu\text{V/m} - 50.1 \text{ dB} \\ &=35.1 \text{ dB}\mu\text{V/m} \end{aligned}$$

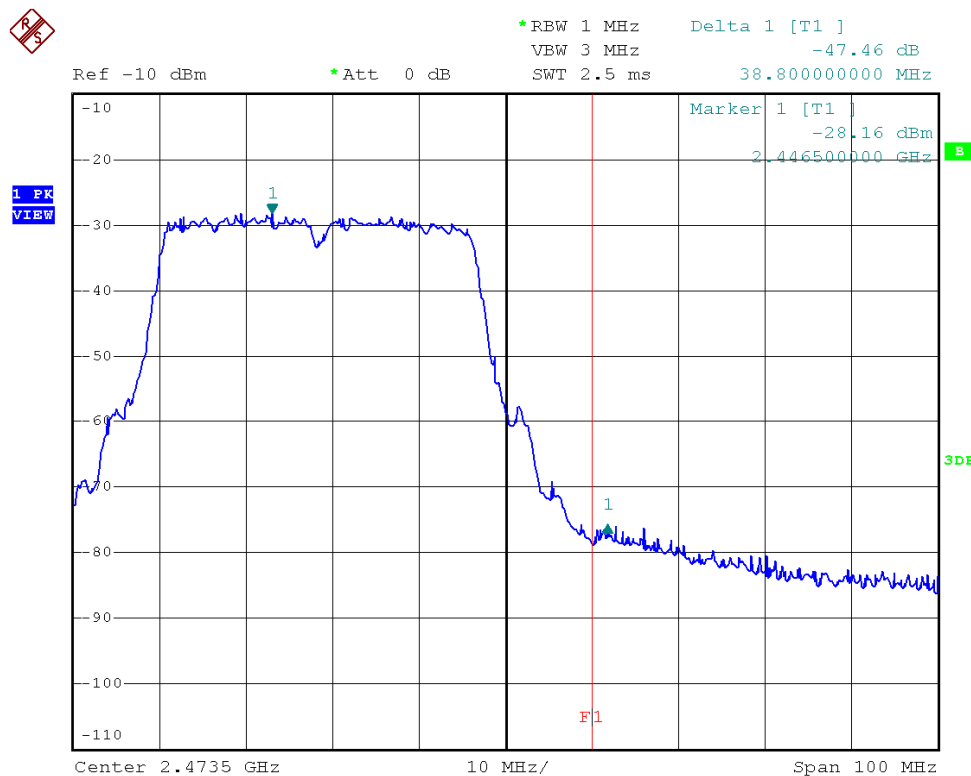
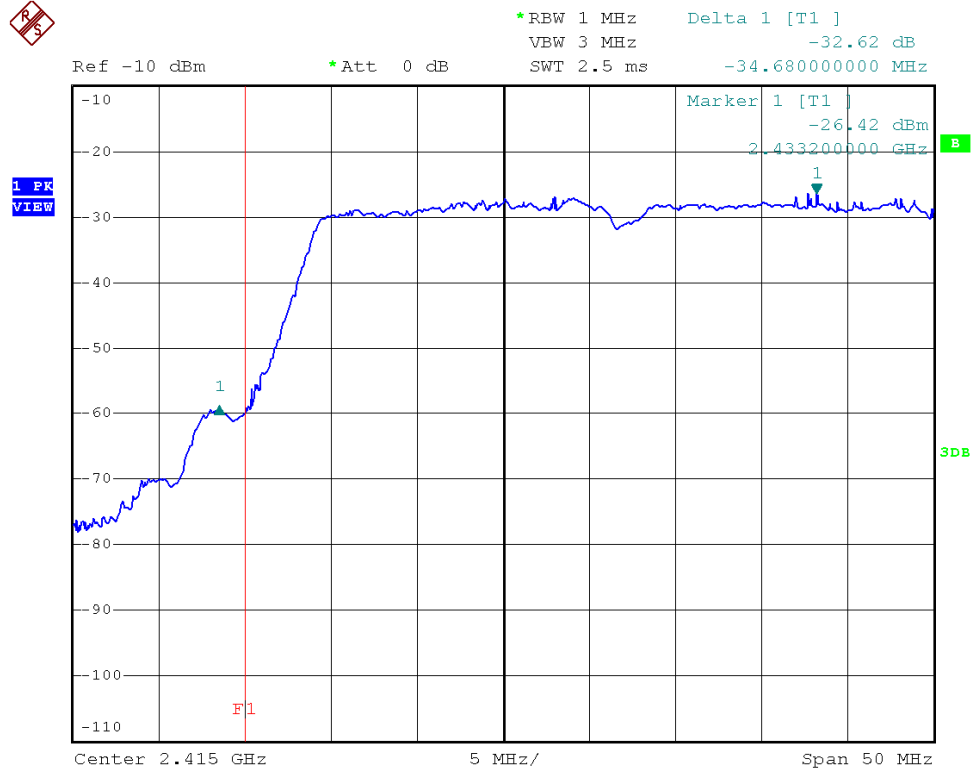
The resultant field strength meets the general radiated emission limit in section 15.209, which does not exceed 74 dB μ V/m (Peak Limit) and 54 dB μ V/m (Average Limit).

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Peak Measurement (802.11n HT40 mcs7 150Mbps)



Issuing Laboratory:
Intertek Testing Services Hong Kong Limited

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Peak Measurement (802.11n HT40 mcs7 150Mbps)

Bandedge compliance is determined by applying marker-delta method, i.e. (Bandedge Plot).

Lower bandedge

Peak Resultant field strength = Fundamental emissions (peak value) – delta from the plot

$$\begin{aligned} &= 93.6 \text{ dB}\mu\text{V/m} - 32.6 \text{ dB} \\ &= 61.0 \text{ dB}\mu\text{V/m} \end{aligned}$$

Average Resultant field strength = Fundamental emissions (average value) – delta from the plot

$$\begin{aligned} &= 85.2 \text{ dB}\mu\text{V/m} - 32.6 \text{ dB} \\ &= 52.6 \text{ dB}\mu\text{V/m} \end{aligned}$$

Upper bandedge

Peak Resultant field strength = Fundamental emissions (peak value) – delta from the plot

$$\begin{aligned} &= 92.6 \text{ dB}\mu\text{V/m} - 47.5 \text{ dB} \\ &= 45.1 \text{ dB}\mu\text{V/m} \end{aligned}$$

Average Resultant field strength = Fundamental emissions (average value) – delta from the plot

$$\begin{aligned} &= 85.1 \text{ dB}\mu\text{V/m} - 47.5 \text{ dB} \\ &= 37.6 \text{ dB}\mu\text{V/m} \end{aligned}$$

The resultant field strength meets the general radiated emission limit in section 15.209, which does not exceed 74 dB μ V/m (Peak Limit) and 54 dB μ V/m (Average Limit).

Issuing Laboratory:
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8.2 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device. Since the transmitter transmits the RF signal continuously.

8.3 Calculation of Average Factor

The average factor is not applicable for this device as the transmitted signal is a continuously signal.

8.4 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services Hong Kong Ltd. in the measurements of transmitter operating under the Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 (2009). A typical or an unmodulated CW signal at the operating frequency of the EUT has been supplied to the EUT for all measurements. Such a signal is supplied by a signal generator and an antenna in close proximity to the EUT. The signal level is sufficient to stabilize the local oscillator of the EUT.

The transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjusted through all three orthogonal axis to obtain maximum emission levels. The antenna height and polarization are also varied during the testing to search for maximum signal levels. The height of the antenna is varied from one to four meters.

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in Exhibit 8.3.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower. For line conducted emissions, the range scanned is 150 kHz to 30 MHz.

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8.4 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements were made as described in ANSI C63.4 (2009).

The IF bandwidth used for measurement of radiated signal strength was 100 kHz or greater when frequency is below 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. A discussion of whether pulse desensitivity is applicable to this unit is included in this report (See Exhibit 8.1). Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the forbidden bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, unless otherwise reported. Measurements taken at a closer distance are so marked.

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9.0 Equipment List

1) Radiated Emissions Test

Equipment	EMI Test Receiver	Biconical Antenna	Log Periodic Antenna
Registration No.	EW-2500	EW-0571	EW-1042
Manufacturer	R&S	EMCO	EMCO
Model No.	ESCI	3104C	3148
Calibration Date	Mar. 22, 2013	Apr. 05, 2012	Apr. 25, 2012
Calibration Due Date	Feb. 28, 2014	Oct. 05, 2013	Oct. 25, 2013

Equipment	Spectrum Analyzer	Double Ridged Guide Antenna
Registration No.	EW-2188	EW-1015
Manufacturer	AGILENTTECH	EMCO
Model No.	E4407B	3115
Calibration Date	Nov. 05, 2012	Mar. 05, 2013
Calibration Due Date	Nov. 05, 2013	Sep. 05, 2014

2) Conducted Emissions Test

Equipment	EMI Test Receiver	LISN
Registration No.	EW-2500	EW-2501
Manufacturer	R&S	R&S
Model No.	ESCI	ENV-216
Calibration Date	Mar. 22, 2013	Nov. 30, 2012
Calibration Due Date	Feb. 28, 2014	Nov. 30, 2013

3) Bandedge Measurement

Equipment	Spectrum Analyzer
Registration No.	EW-2249
Manufacturer	R&S
Model No.	FSP30
Calibration Date	Oct. 04, 2012
Calibration Due Date	Oct. 04, 2013