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.

HOKLAS 005
TEST

TEST REPORT

Report Number: HK12100071-1

Application
for
Original Grant of 47 CFR Part 15 Certification

Corded Telephone with TAM and WiFi Feature - Base Unit

FCC ID: ACEENSEMBLE

Prepared and Checked by:

Koo Wai Ip
Senior Lead Engineer

Approved by:

Nip Ming Fung, Melvin
Assistant Manager
November 27, 2012

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GENERAL INFORMATION

Applicant Name:	Clarity, A Division of Plantronics, Inc.
Applicant Address:	6131 Preservation Drive, Chattanooga, TN 37416
FCC Specification Standard:	FCC Part 15, October 1, 2011 Edition
FCC ID:	ACEENSEMBLE
FCC Model(s):	ENSEMBLE
Type of EUT:	Digital Transmission System
Description of EUT:	Corded Telephone with TAM and WiFi - Base Unit
Serial Number:	N/A
Sample Receipt Date:	October 05, 2012
Date of Test:	October 24 - November 12, 2012
Report Date:	November 27, 2012
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

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EXHIBIT 1
SUMMARY OF TEST RESULTS & STATEMENT OF COMPLIANCE

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1.0 Summary of Test Results

Test Items	FCC Part 15 Section	Results	Details see section
Antenna Requirement	15.203	Pass	2.1
Security Code Information	15.214(d)	Pass	2.1
Max. Conducted Output Power	15.247(b)(3)&(4)	Pass	4.1
Min. 6dB RF Bandwidth	15.247(a)(2)	Pass	4.2
Max. Power Density	15.247(e)	Pass	4.3
Out of Band Antenna Conducted Emission	15.247(d)	Pass	4.4
Radiated Emission in Restricted Bands and Spurious Emissions	15.247(d), 15.209 & 15.109	Pass	4.6
AC Power Line Conducted Emission	15.207 & 15.107	Pass	4.7
Radio Frequency Radiation Exposure	15.247(i)	Pass	4.8

Note: Pursuant to FCC Part 15 Section 15.215(c), the 20dB 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 expected variations in temperature and supply voltage were considered.

1.1 Statement of Compliance

The equipment under test is found to be complying with the following standards:

FCC Part 15, October 1, 2011 Edition

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EXHIBIT 2
GENERAL DESCRIPTION

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2.0 General Description

2.1 Product Description

The ENSEMBLE is a Corded Telephone with TAM and WiFi Feature - Base Unit. It operates at frequency range of 2400MHz to 2483.5MHz. The Base Unit is power by an adaptor 100-240VAC 50/60Hz 0.6A to 5.0VDC 3A.

The antenna(s) used in the EUT are integral, and the test sample is a prototype.

The circuit description is saved with filename: descri.pdf.

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2.2 Purpose of Application

This is an application of certification of the transmitter.

2.3 Test Methodology

Both AC power line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009). Preliminary radiated scans and all radiated measurements were performed in Open Area Test Sites. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application. Antenna port conducted measurements were performed according to ANSI C63.10 (2009) and KDB Publication No. 558074 D01 v02(10/04/2012).

2.4 Test Facility

The open area test site, AC Power Line conducted measurement facility, and antenna port conducted measurement facility used to collect the radiated data, AC Power Line conducted data, and conductive data are at Roof Top, 2nd Floor, and 5th Floor respectively of Intertek Testing Services Hong Kong Ltd., which is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC.

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EXHIBIT 3
SYSTEM TEST CONFIGURATION

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3.0 System Test Configuration

3.1 Justification

For radiated emissions testing, the equipment under test (EUT) was setup to transmit continuously / transmit under normal mode / receive continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables (if any) were manipulated to produce worst case emissions.

The EUT was powered by a 100-240VAC 50/60Hz 0.6A to 5.0VDC 3A adaptor.

For the measurements, the EUT was attached to a plastic stand if necessary and placed on the wooden turntable. If the base unit attached to peripherals, they were connected and operational (as typical as possible).

The signal was maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization were varied during the search for maximum signal level. The antenna height was varied from 1 to 4 meters. Radiated emissions were taken at three meters unless the signal level was too low for measurement at that distance. If necessary, a pre-amplifier was used and/or the test was conducted at a closer distance.

For any intentional radiator powered by AC power line, measurements of the radiated signal level of the fundamental frequency component of the emission was performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

Radiated emission measurement for transmitter were performed 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 to 40 GHz, whichever is lower.

Emission that are directly caused by digital circuits in the transmit path and transmitter portion were measured, and the limit are according to FCC Part 15 Section 15.209. Digital circuitry used to control additional functions other than the operation of the transmitter are subject to FCC Part 15 Section 15.109 Limits.

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3.1 Justification – Cont'd

Detector function for radiated emissions was in peak mode. Average readings, when required, were 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 section 4.2.3.

For AC line conducted emission test, the EUT along with its peripherals were placed on a 1.0m (W) x 1.5m (L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN), which provided 50ohm coupling impedance for measuring instrument. The LISN housing, measuring instrument case, reference ground plane, and vertical ground plane were bounded together. The excess power cable between the EUT and the LISN was bundled.

All connecting cables of EUT and peripherals were manipulated to find the maximum emission.

Different data rates have been tested. Worst case is reported only.

All relevant operation modes have been tested, and the worst case data is included in this report.

All data rates were tested under normal mode of WiFi. Only the worst-case data is shown in the report for DSSS and OFDM modulation types.

3.2 EUT Exercising Software

The EUT exercise program (if any) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

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3.3 Details of EUT and Description of Accessories

Details of EUT:

An AC adaptor (provided with the unit) was used to power the device. Their description are listed below.

(1) Base Unit: An AC adaptor (100-240VAC to 5.0VDC 3A, Model: T05030U003) (Supplied by Client)

Description of Accessories:

(1) Headset with 1.2m unshielded cable (Supplied by Client)
(2) 1 x Bedshaker with 2.0 m cable (Supplied by Client)
(3) 1 x Neckloop with 2.0m cable (Supplied by Client)

3.4 Measurement Uncertainty

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

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

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EXHIBIT 4
TEST RESULTS

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4.0 Test Results

4.1 Maximum Conducted Output Power at Antenna Terminals
The antenna port of the EUT was connected to the input of a spectrum analyzer.

☒ External attenuation and cable loss were compensated for using the OFFSET function of the analyser. The measurement procedure Option 1 was used.

☐ The EUT should be configured to transmit continuously (at a minimum duty cycle of 98%) at full power over the measurement duration. The measurement procedure AVG1 was used.

Base Unit, IEEE 802.11b Antenna Gain = 1.5dBi		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	17.15	51.88
Middle Channel: 2437	16.66	46.35
High Channel: 2462	16.88	48.75

Cable loss : 0.5 dB External Attenuation : 0 dB

Cable loss, external attenuation: ☒ included in OFFSET function
☐ added to SA raw reading

Base Unit
dBm max. output level = 17.15 dBm

Limits:
☒ 1W (30dBm) for antennas with gains of 6dBi or less

☐ ___W (___dBm) for antennas with gains more than 6dBi

The plots of conducted output power are saved as below.

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Maximum Conducted Output Power at Antenna Terminals

The antenna port of the EUT was connected to the input of a spectrum analyzer.

☒ External attenuation and cable loss were compensated for using the OFFSET function of the analyser. The measurement procedure Option 2 was used.

☐ The EUT should be configured to transmit continuously (at a minimum duty cycle of 98%) at full power over the measurement duration. The measurement procedure AVG1 was used.

Base Unit, IEEE 802.11g Antenna Gain = 1.5 dBi		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	18.65	73.28
Middle Channel: 2437	20.30	107.15
High Channel: 2462	19.08	80.91

Cable loss : 0.4 dB External Attenuation : 0 dB

Cable loss, external attenuation: ☒ included in OFFSET function
☐ added to SA raw reading

Base Unit
dBm max. output level = 20.30 dBm

Limits:
☒ 1W (30dBm) for antennas with gains of 6dBi or less

☐ ___W (___dBm) for antennas with gains more than 6dBi

The plots of conducted output power are saved as below.

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Maximum Conducted Output Power at Antenna Terminals

The antenna port of the EUT was connected to the input of a spectrum analyzer.

☒ External attenuation and cable loss were compensated for using the OFFSET function of the analyser. The measurement procedure Option 2 was used.

☐ The EUT should be configured to transmit continuously (at a minimum duty cycle of 98%) at full power over the measurement duration. The measurement procedure AVG1 was used.

Base Unit, IEEE 802.11n Antenna Gain = 1.5 dBi		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	21.10	128.8
Middle Channel: 2437	22.25	167.9
High Channel: 2462	21.81	151.7

Cable loss : 0.4 dB External Attenuation : 0 dB

Cable loss, external attenuation: ☒ included in OFFSET function
☐ added to SA raw reading

Base Unit
dBm max. output level = 22.25 dBm

Limits:
☒ 1W (30dBm) for antennas with gains of 6dBi or less

☐ ___W (___dBm) for antennas with gains more than 6dBi

The plots of conducted output power are saved as below.

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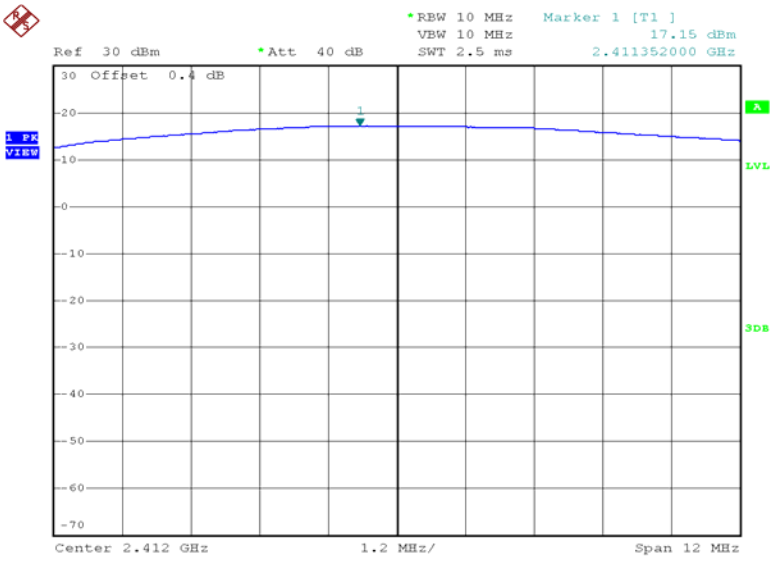
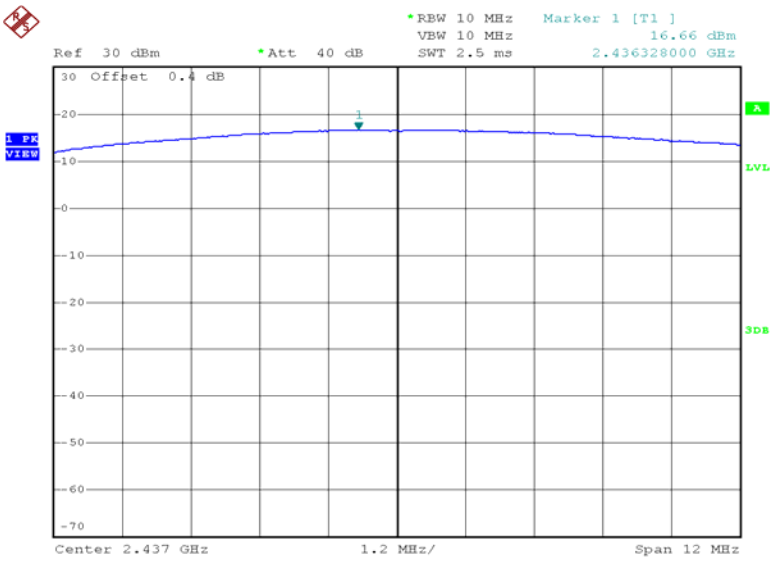
Plots of maximum output power (802.11b)

802.11b, Lowest channel



802.11b, Middle channel



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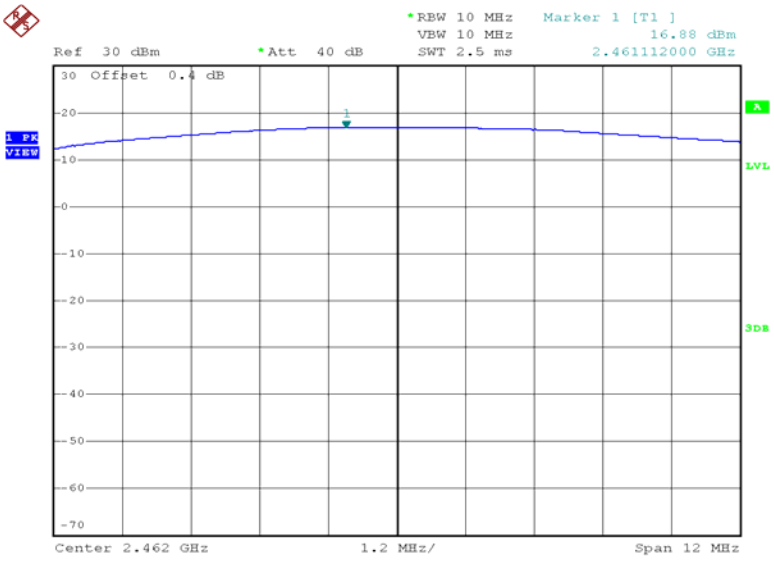
Plots of maximum output power (802.11b)

802.11b, Highest channel



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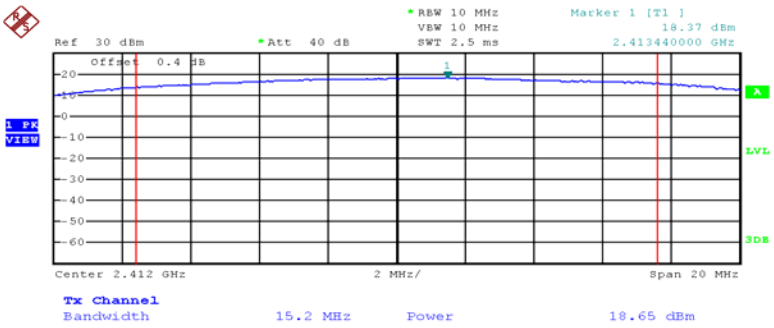
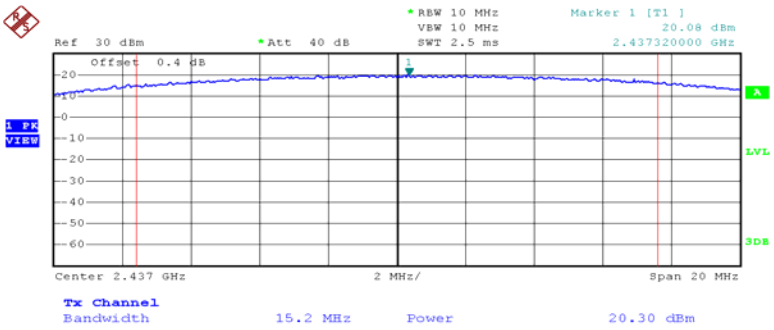
Plots of maximum output power (802.11g)

802.11b, Lowest channel



802.11b, Middle channel



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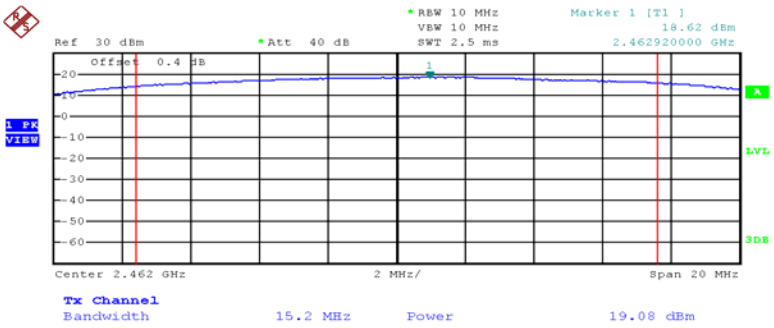
Plots of maximum output power (802.11g)

802.11b, Highest channel



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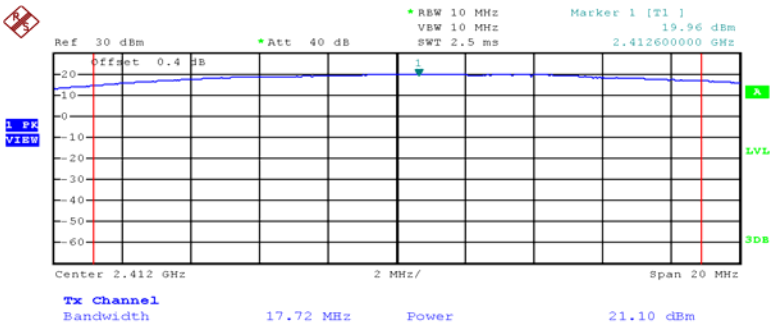
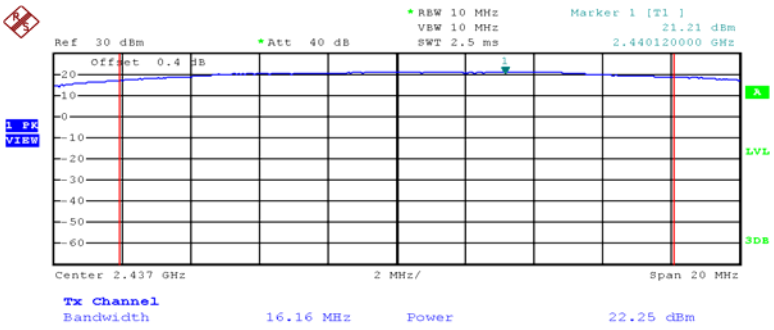
Plots of maximum output power (802.11n)

802.11n, Lowest channel



802.11n, Middle channel



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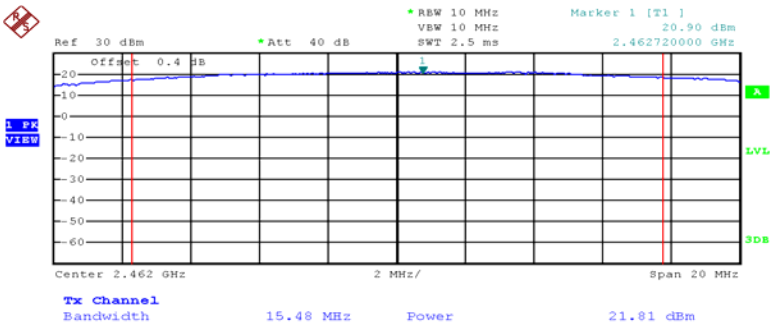
Plots of maximum output power (802.11n)

802.11n, Highest channel



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4.2 Minimum 6dB RF Bandwidth

The antenna port of the EUT was connected to the input of a spectrum analyzer. The Option 1 measurement procedure was used. A PEAK output reading was taken, a DISPLAY line was drawn 6dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

Base Unit, IEEE 802.11b	
Frequency (MHz)	6dB Bandwidth (kHz)
Low Channel: 2412	7560
Middle Channel: 2437	7840
High Channel: 2462	7640

Base Unit, IEEE 802.11g	
Frequency (MHz)	6dB Bandwidth (kHz)
Low Channel: 2412	15200
Middle Channel: 2437	15200
High Channel: 2462	15200

Base Unit, IEEE 802.11n	
Frequency (MHz)	6dB Bandwidth (kHz)
Low Channel: 2412	16120
Middle Channel: 2437	16160
High Channel: 2462	15480

Limits
6 dB bandwidth shall be at least 500kHz

The plots of 6dB RF bandwidth and occupied bandwidth are saved as below.

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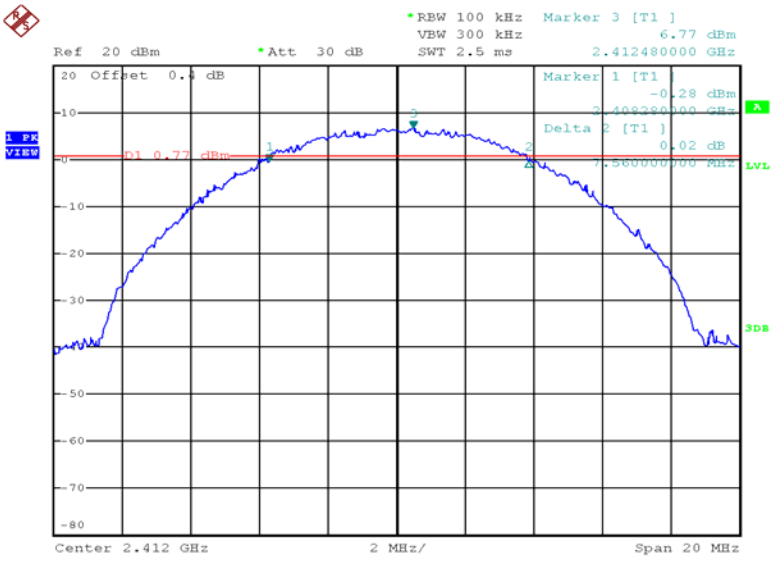
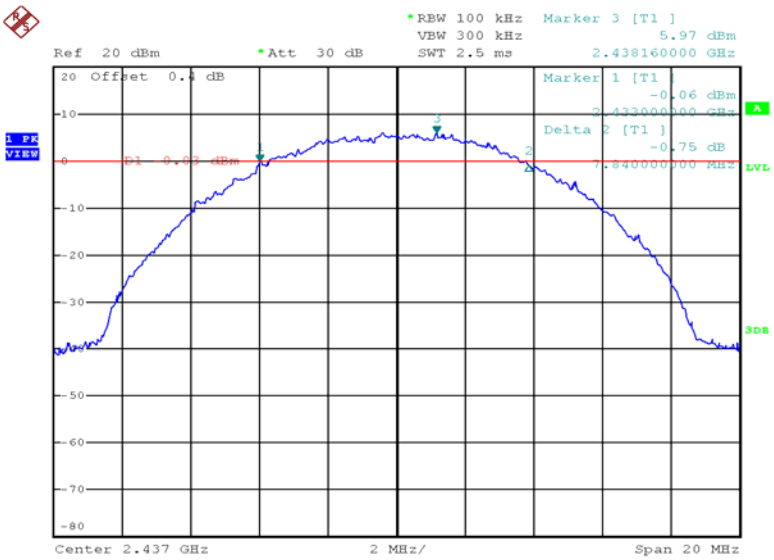
Plots of 6dB RF bandwidth (802.11b)

802.11b, Lowest channel



802.11b, Middle channel



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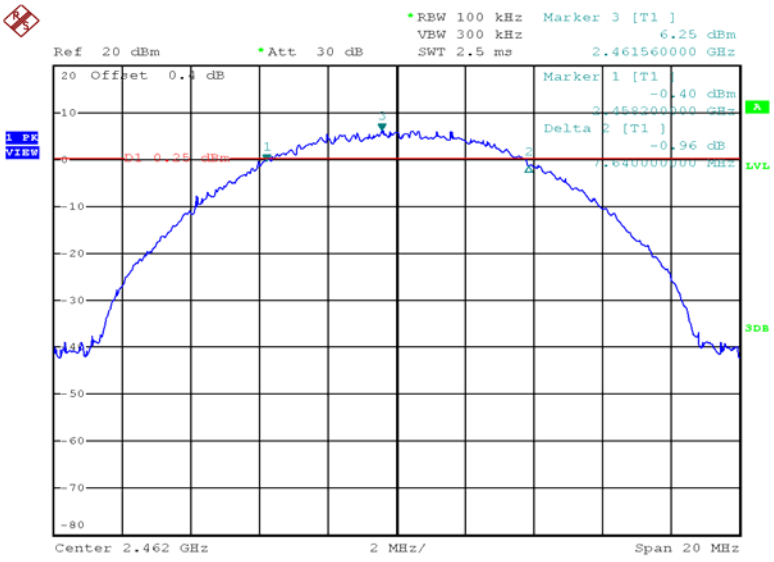
Plots of 6dB RF bandwidth (802.11b)

802.11b, Highest channel



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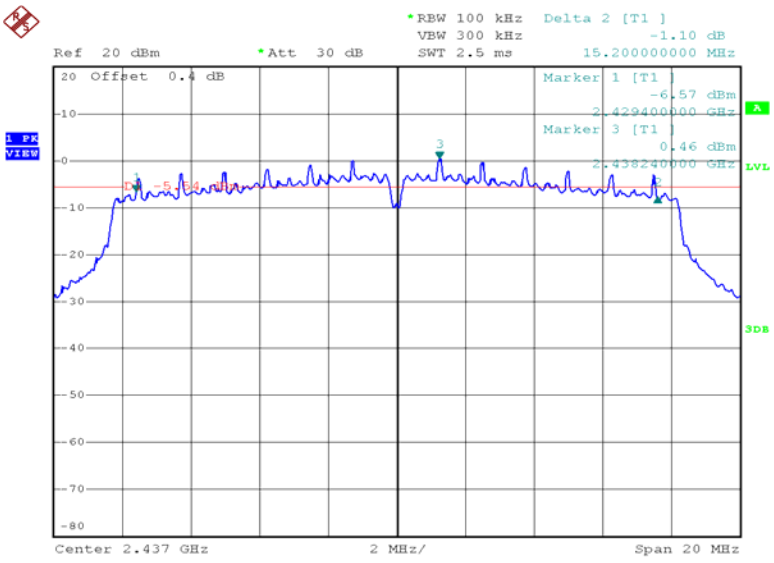
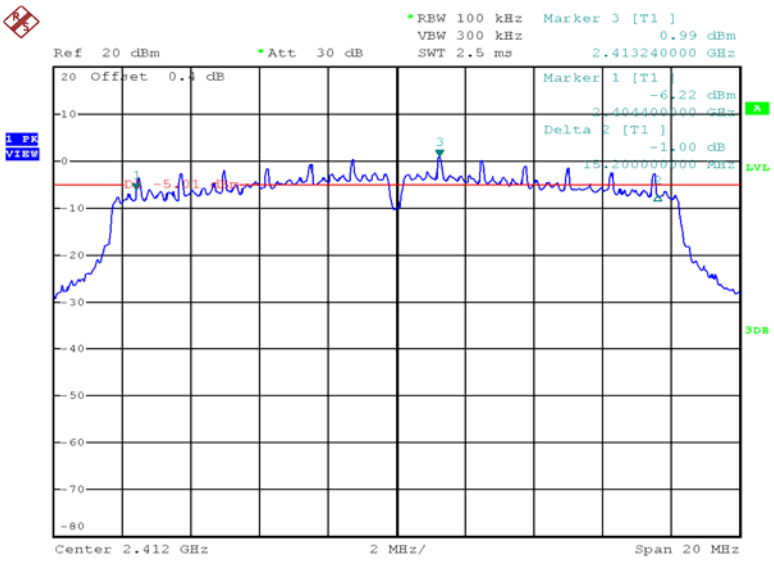
Plots of 6dB RF bandwidth (802.11g)

802.11g, Lowest channel



802.11g, Middle channel



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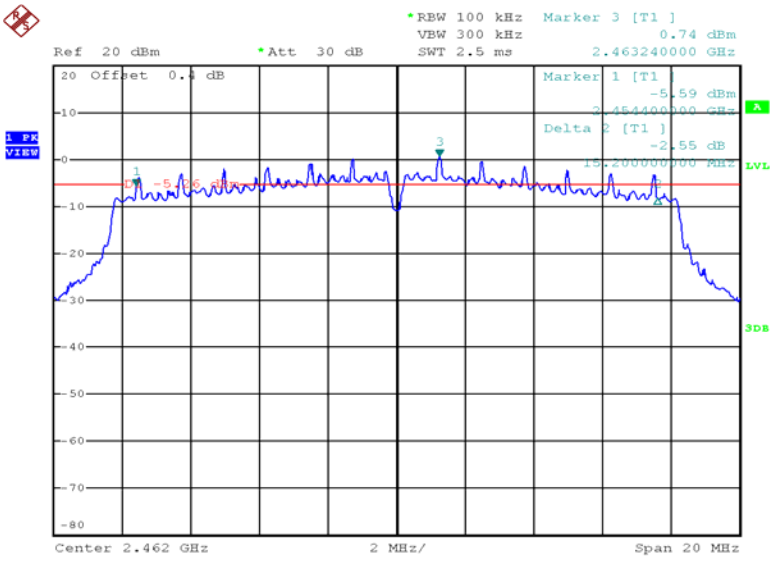
Plots of 6dB RF bandwidth (802.11g)

802.11g, Highest channel



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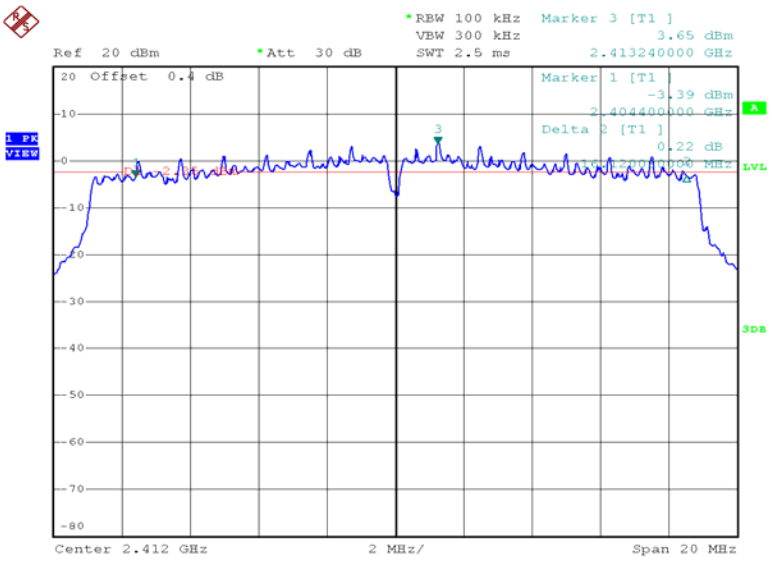
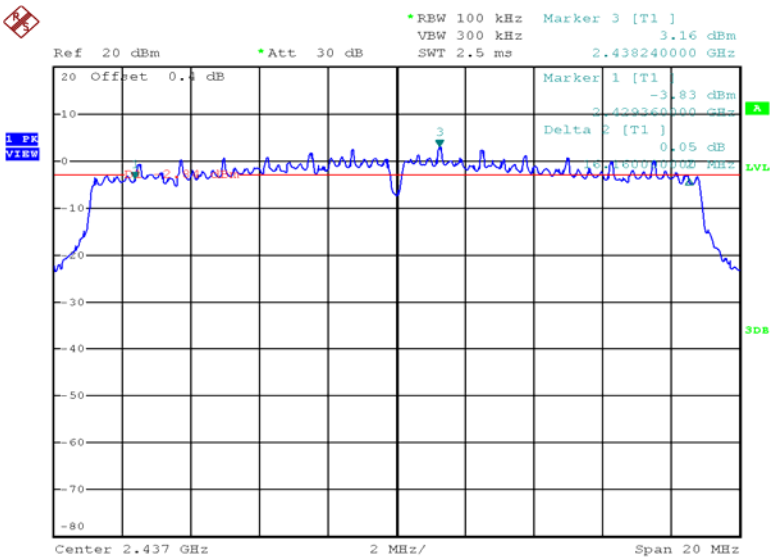
Plots of 6dB RF bandwidth (802.11n)

802.11n, Lowest channel



802.11n, Middle channel



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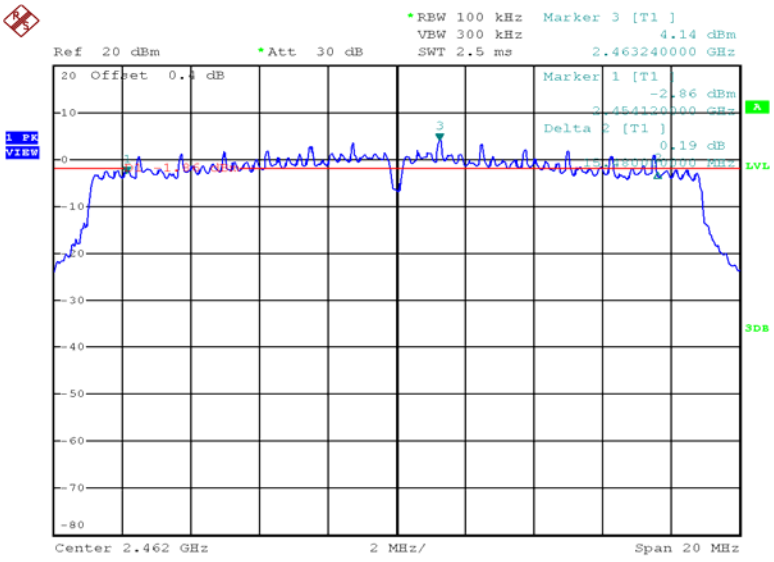
Plots of 6dB RF bandwidth (802.11n)

802.11n, Highest channel



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4.3 Maximum Power Spectral Density

Antenna output of the EUT was coupled directly to spectrum analyzer. The measurement procedure Option 1 was used. If an external attenuator and/or cable was used, these losses are compensated for using the OFFSET function of the analyser.

Base Unit IEEE 802.11b	
Frequency (MHz)	PSD in 3kHz (dBm)
Low Channel: 2412	-8.95
Middle Channel: 2437	-9.28
High Channel: 2462	-8.63

Base Unit IEEE 802.11g	
Frequency (MHz)	PSD in 3kHz (dBm)
Low Channel: 2412	-12.80
Middle Channel: 2437	-13.62
High Channel: 2462	-12.34

Base Unit IEEE 802.11n	
Frequency (MHz)	PSD in 3kHz (dBm)
Low Channel: 2412	-12.35
Middle Channel: 2437	-12.62
High Channel: 2462	-12.84

Cable Loss: 0.4 dB

Limit:
8dBm in 3kHz

The plots of power spectral density are as below.

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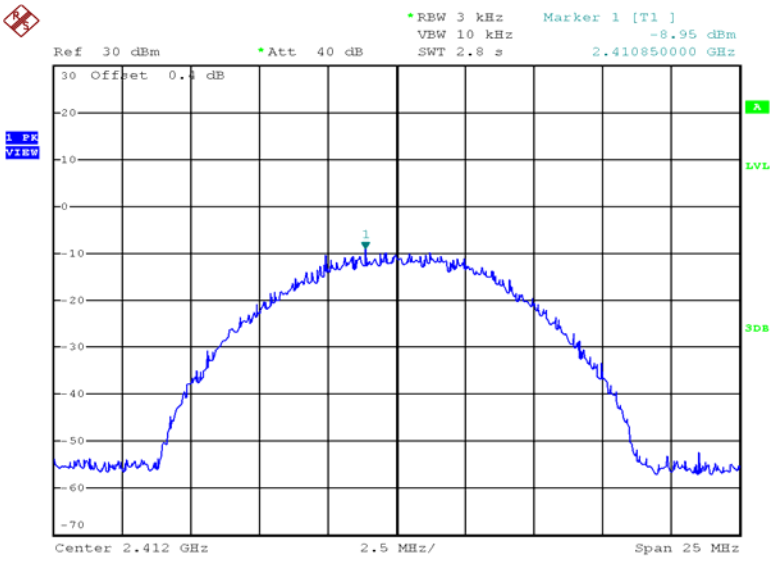
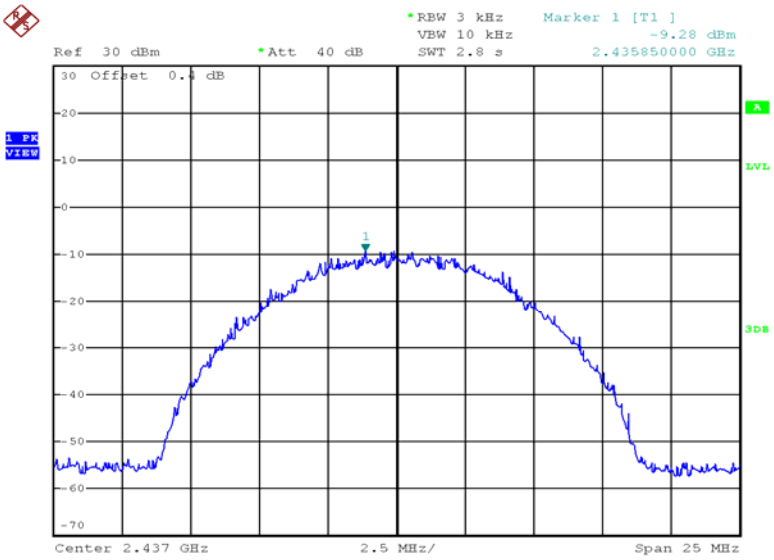
Tel: (852) 2173 8888 Fax: (852) 2785 5487 Website: www.hk.intertek-etlsemko.com

Plots of power spectral density (802.11b)

802.11b, Lowest channel



802.11b, Middle channel



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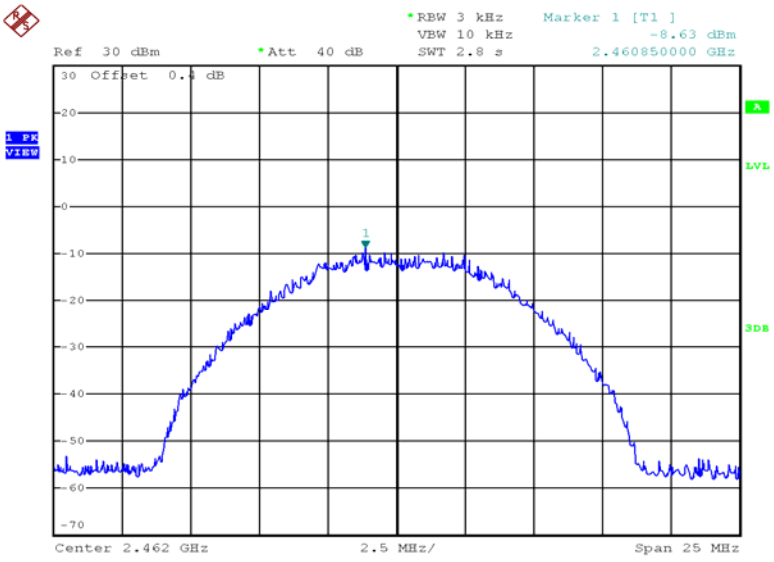
Plots of power spectral density (802.11b)

802.11b, Highest channel



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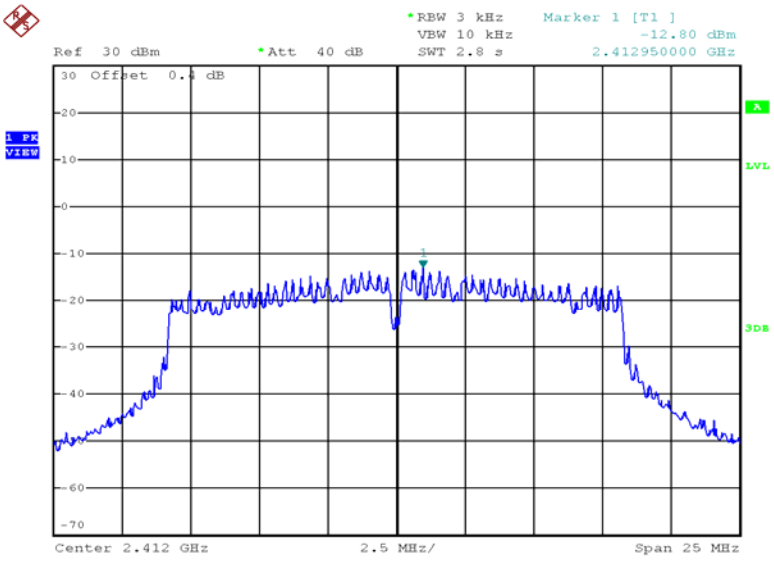
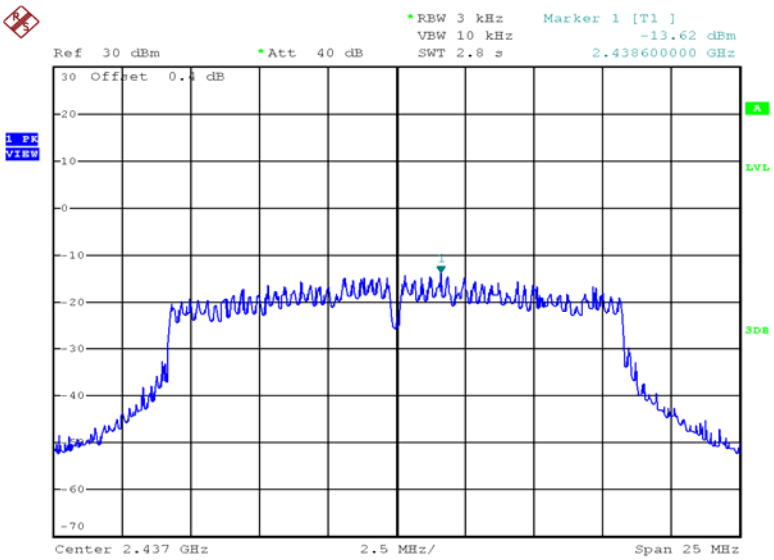
Plots of power spectral density (802.11g)

802.11g, Lowest channel



802.11g, Middle channel



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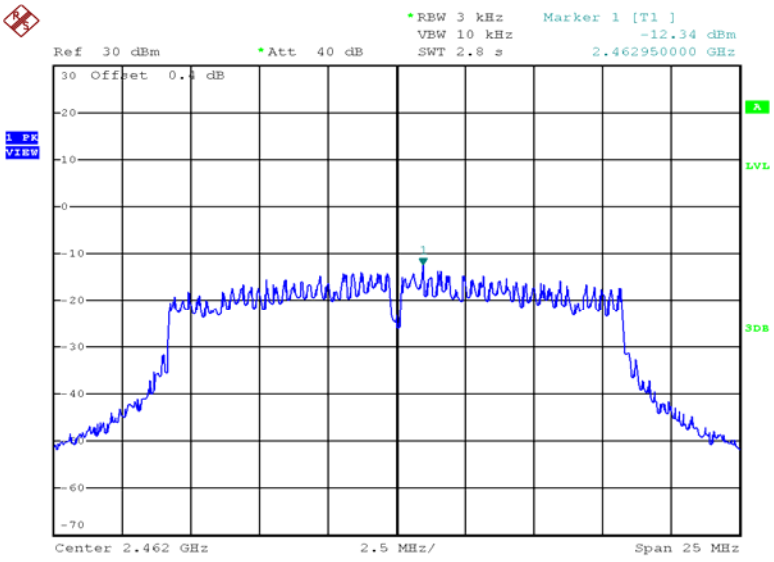
Plots of power spectral density (802.11g)

802.11g, Highest channel



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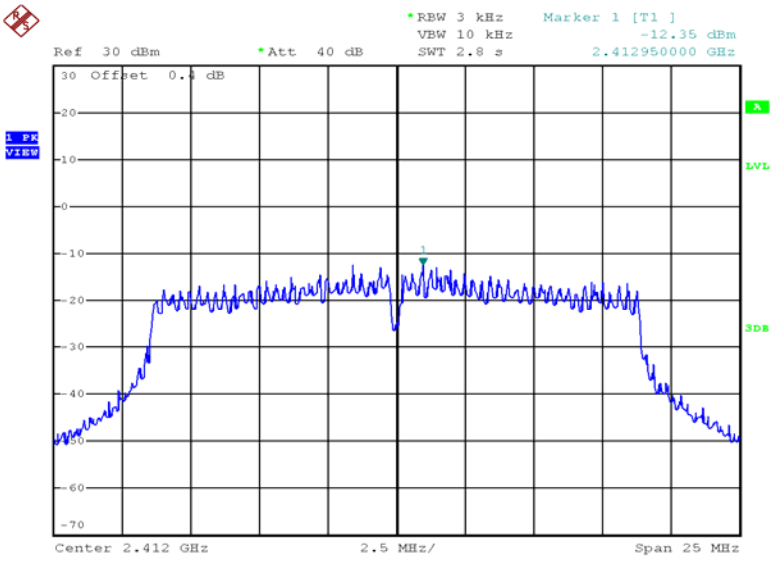
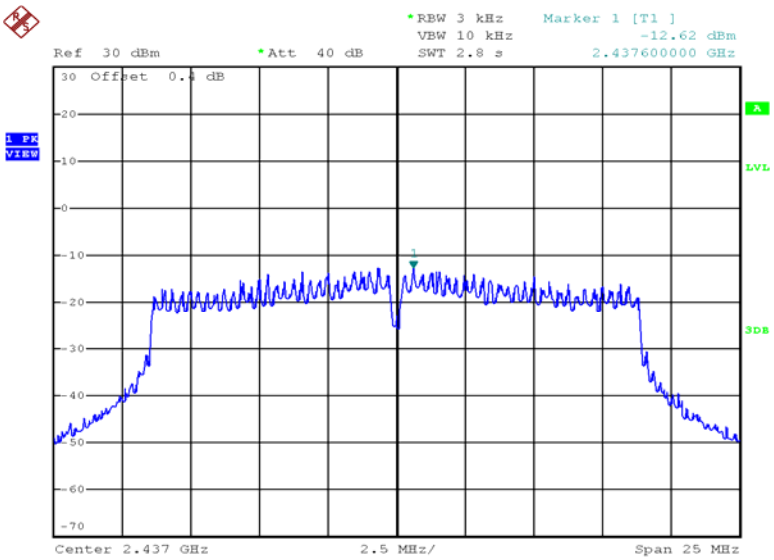
Plots of power spectral density (802.11n)

802.11n, Lowest channel



802.11n, Middle channel



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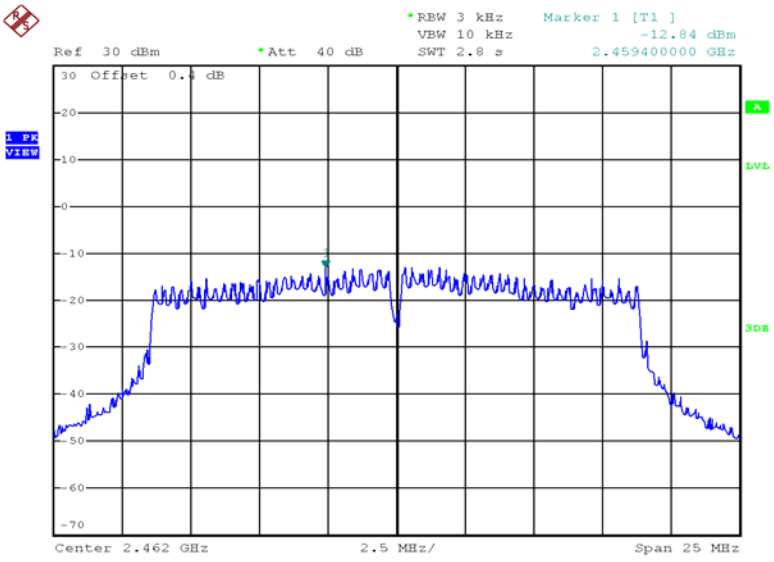
Plots of power spectral density (802.11n)

802.11n, Highest channel



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4.4 Out of Band Conducted Emissions

In any 100 kHz bandwidth outside the EUT passband, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission.

The measurement procedures under sections 10.1.1 of KDB558074 were used.

Furthermore, delta measurement technique for measuring bandedge emissions was incorporated in the test of the edge at 2483.5MHz.

Limits:
All spurious emission and up to the tenth harmonic was measured and they were found to be at least 20 dB below the maximum measured in-band peak PSD level.

The plots of out of band conducted emissions and bandedge are as below.

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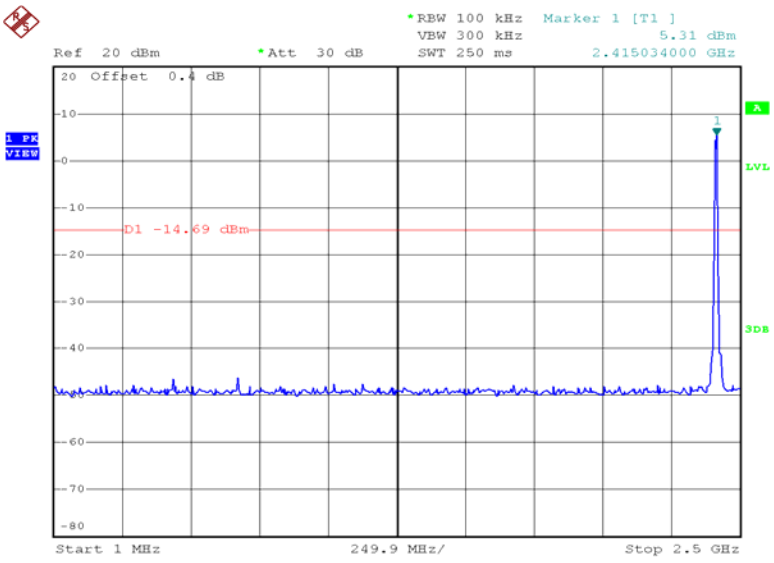
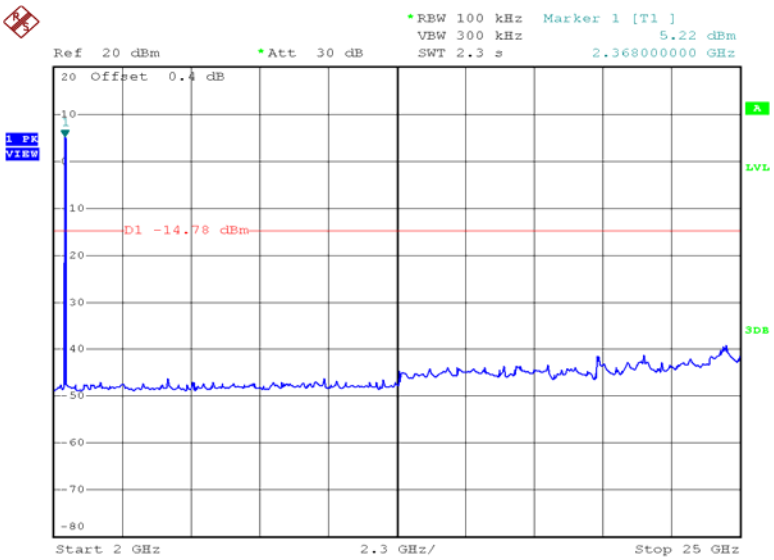
Plots of out of band conducted emissions (802.11b)

802.11b, Lowest channel, Plot 1



802.11b, Lowest channel, Plot 2



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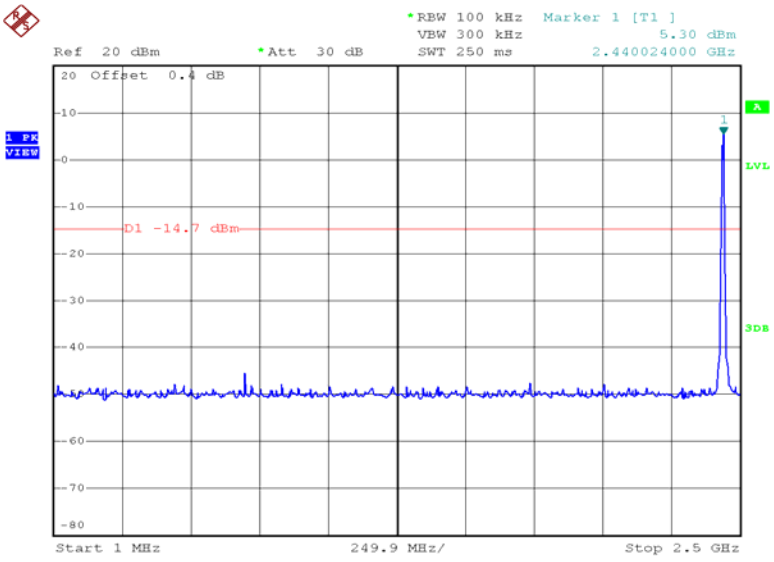
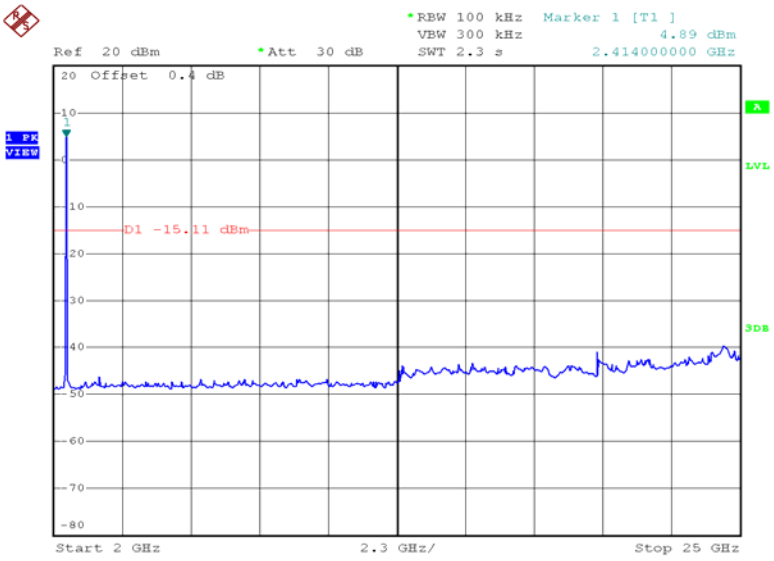
Plots of out of band conducted emissions (802.11b)

802.11b, Middle channel, Plot 1



802.11b, Middle channel, Plot 2



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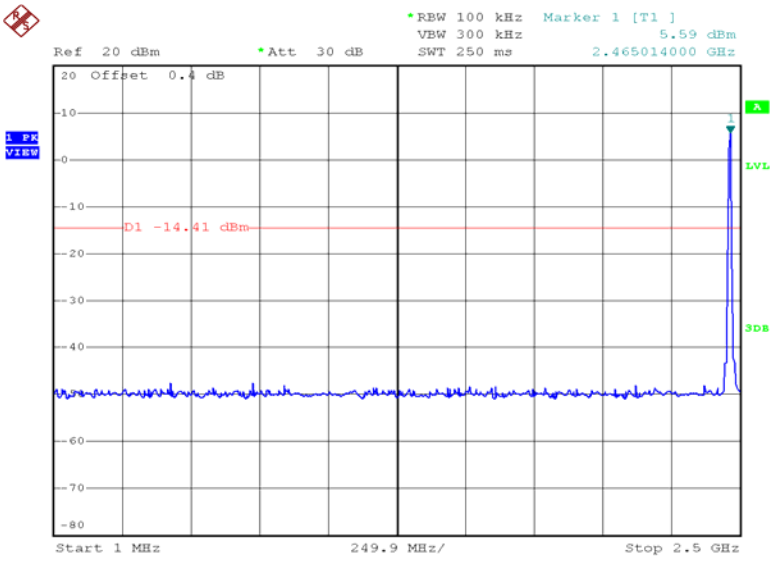
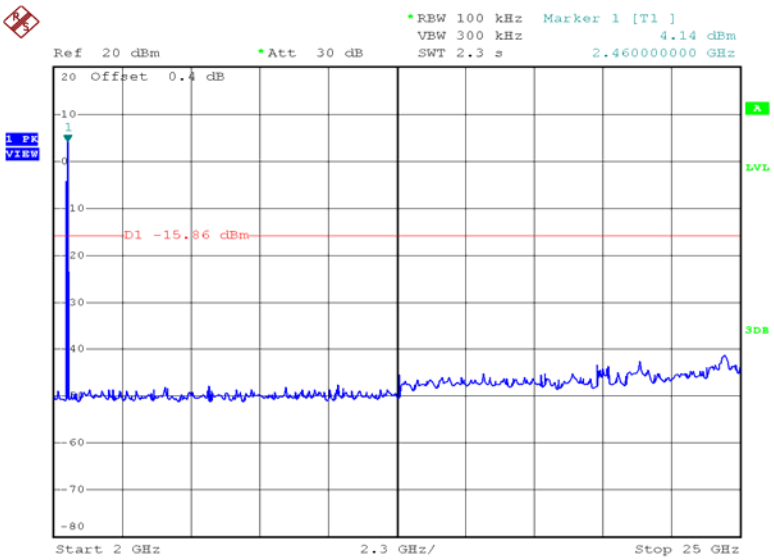
Plots of out of band conducted emissions (802.11b)

802.11b, Highest channel, Plot 1



802.11b, Highest channel, Plot 2



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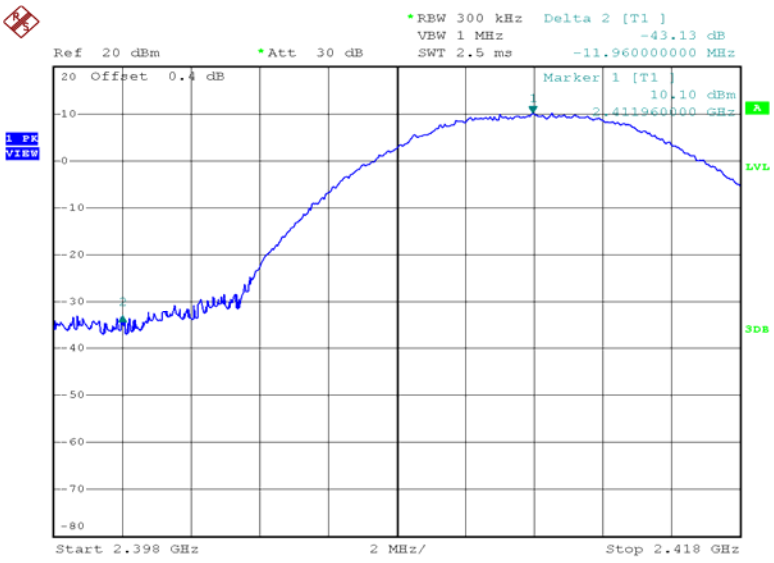
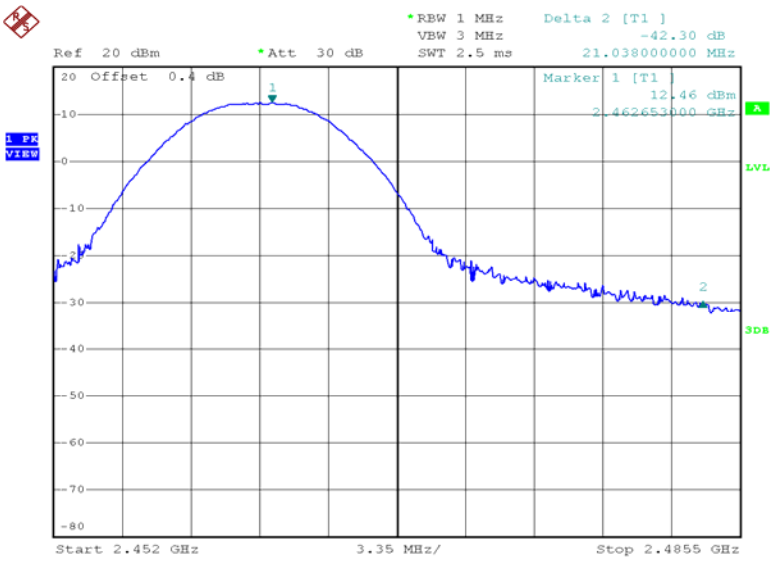
2/F., Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong.
Tel: (852) 2173 8888 Fax: (852) 2785 5487 Website: www.hk.intertek-etlsemko.com

Plots of bandedge (802.11b)

802.11b, Bandedge plot, Plot 1



802.11b, Bandedge plot, Plot 2



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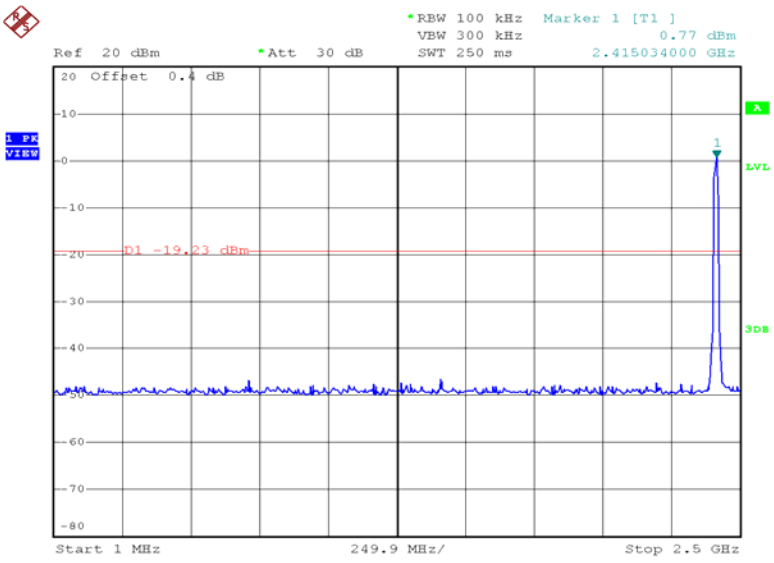
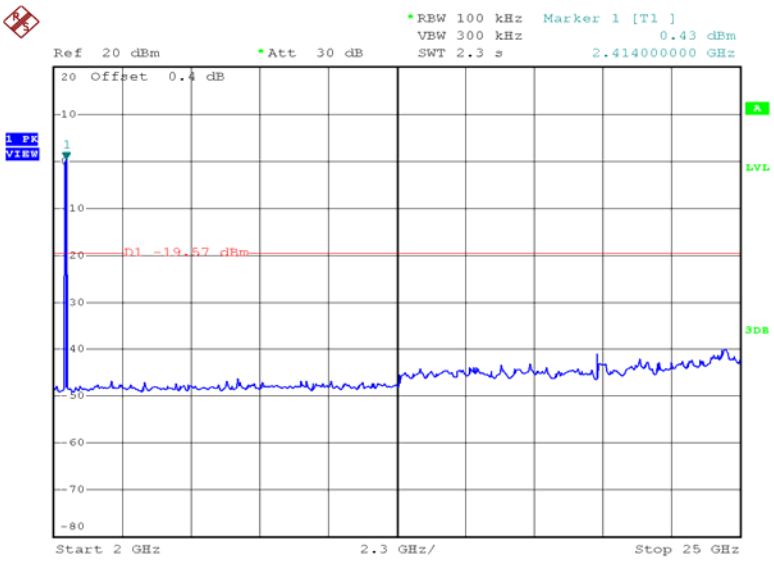
Plots of out of band conducted emissions (802.11g)

802.11g, Lowest channel, Plot 1



802.11g, Lowest channel, Plot 2



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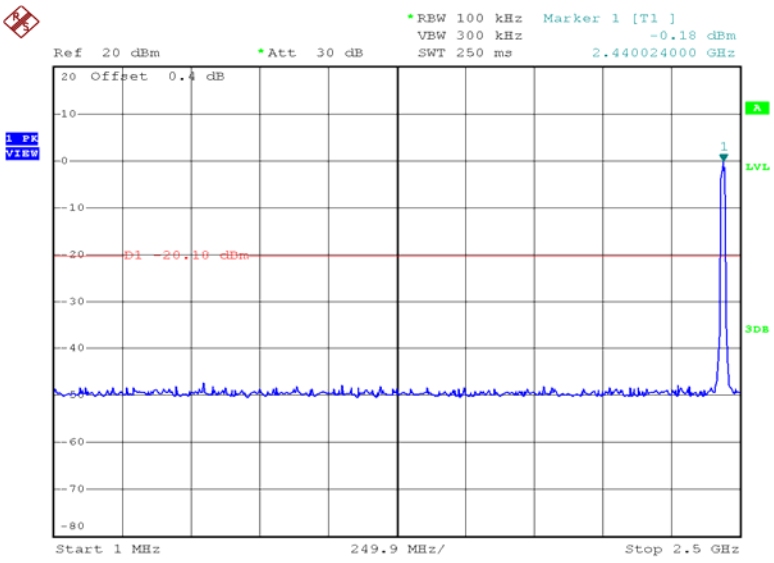
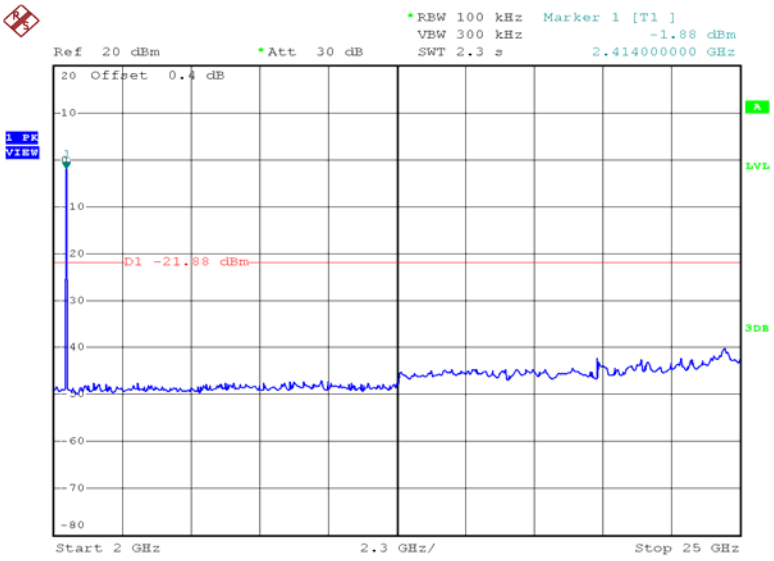
Plots of out of band conducted emissions (802.11g)

802.11g, Middle channel, Plot 1



802.11g, Middle channel, Plot 2



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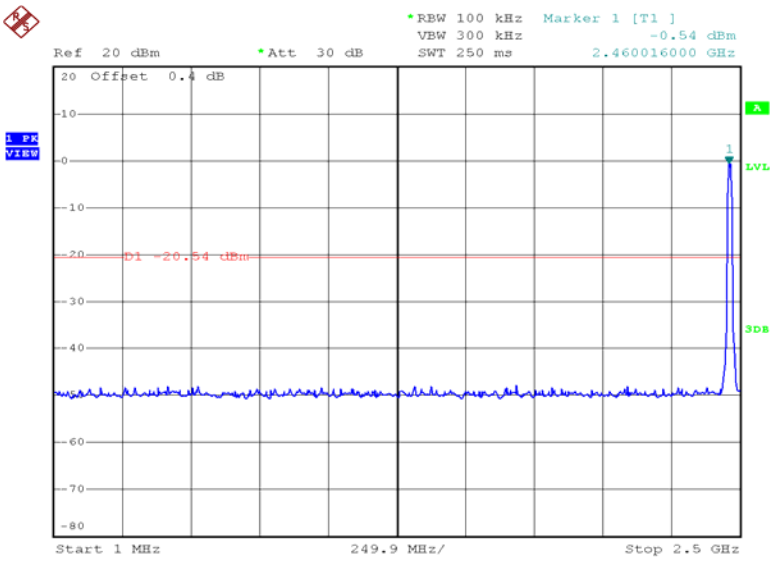
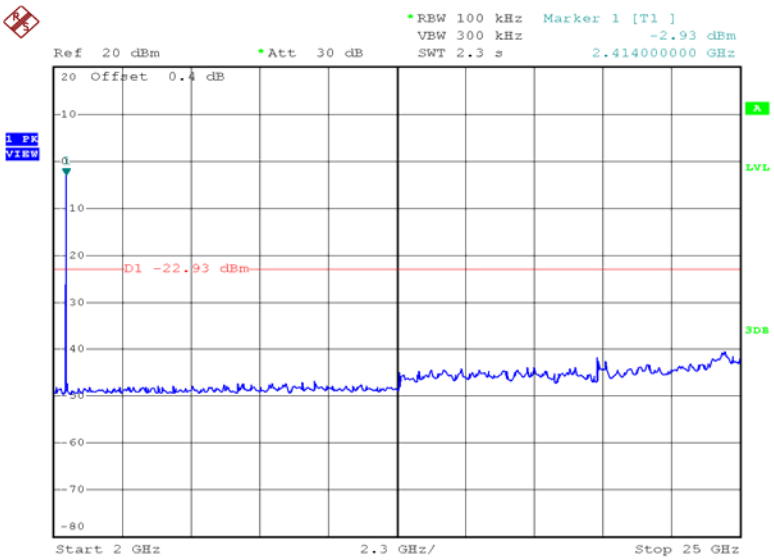
Plots of out of band conducted emissions (802.11g)

802.11g, Highest channel, Plot 1



802.11g, Highest channel, Plot 2



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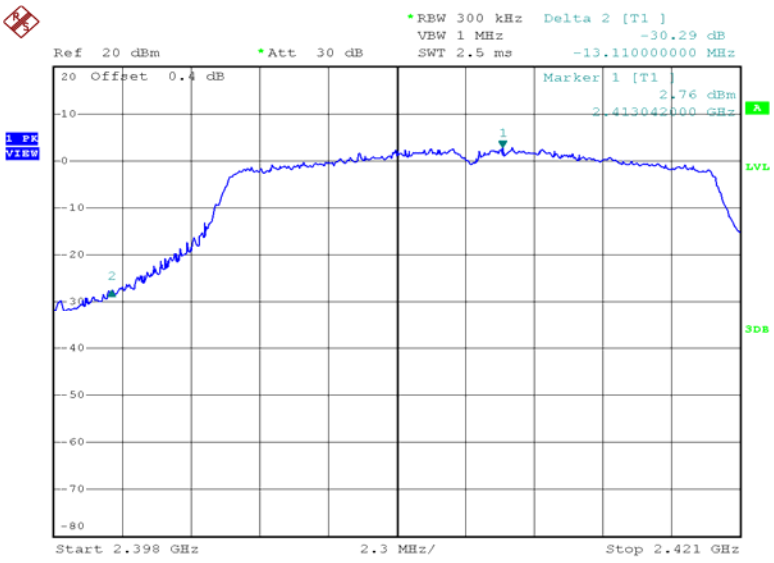
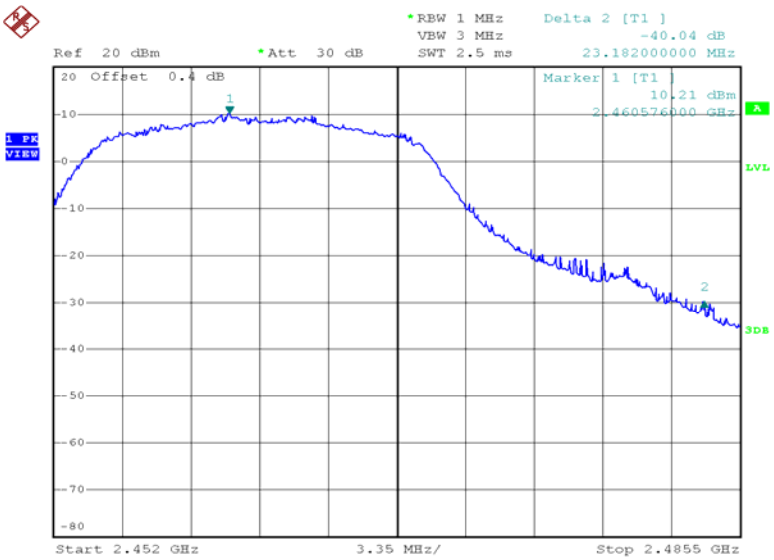
Plots of bandedge (802.11g)

802.11g, Bandedge plot, Plot 1



802.11g, Bandedge plot, Plot 2



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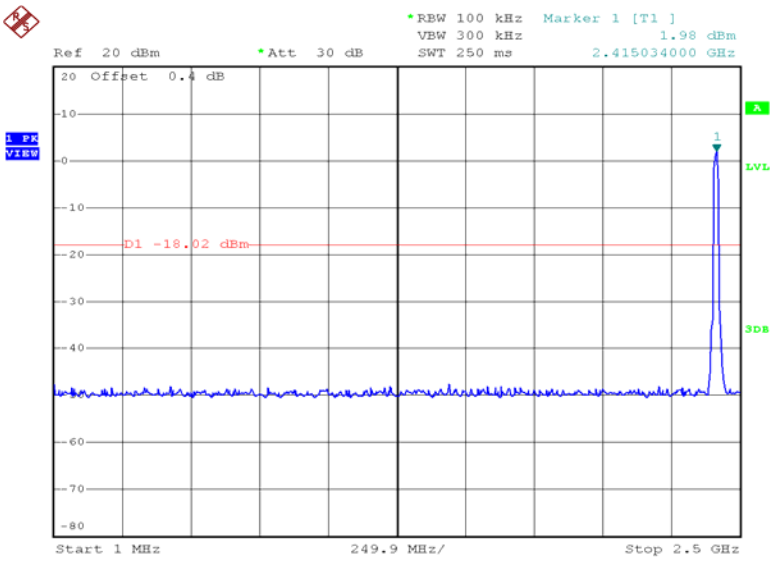
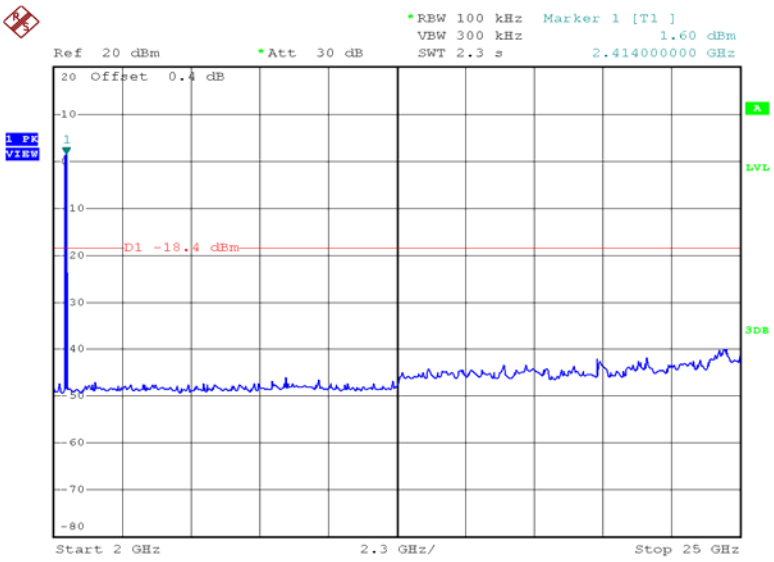
Plots of out of band conducted emissions (802.11n)

802.11n, Lowest channel, Plot 1



802.11n, Lowest channel, Plot 2



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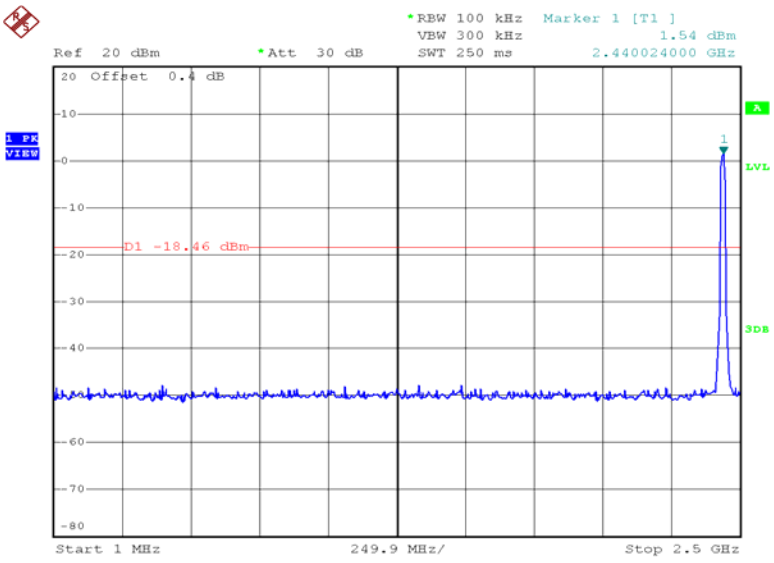
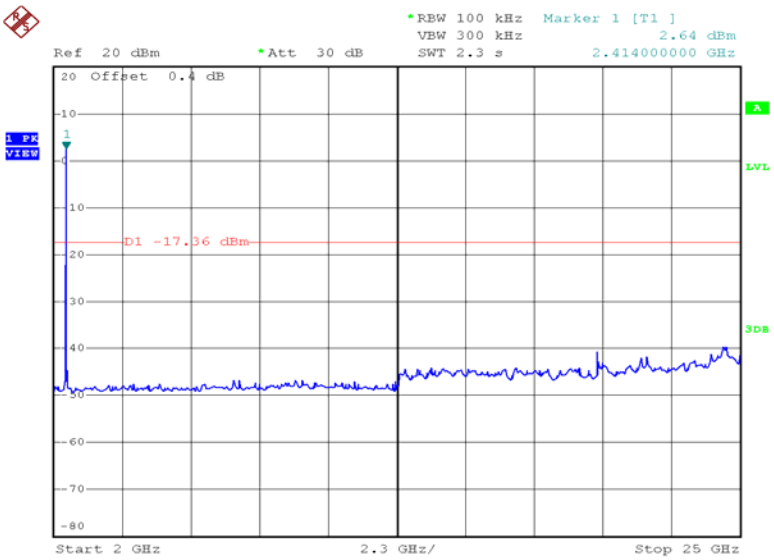
Plots of out of band conducted emissions (802.11n)

802.11n, Middle channel, Plot 1



802.11n, Middle channel, Plot 2



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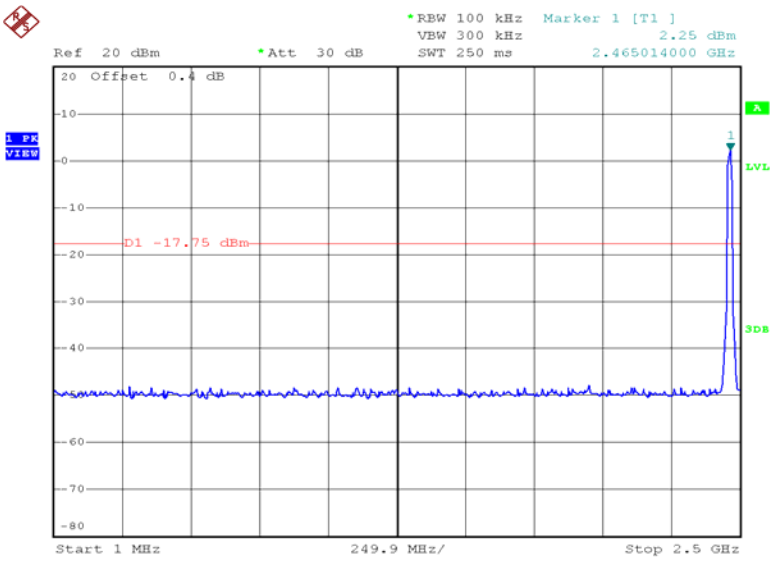
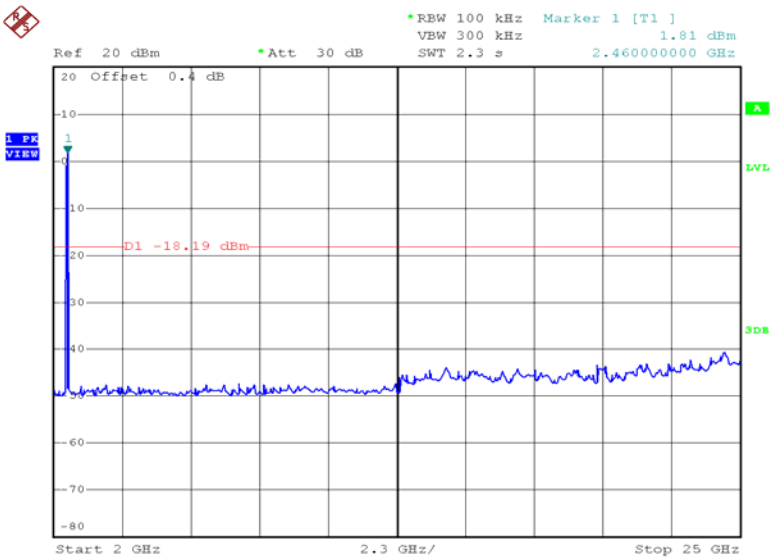
Plots of out of band conducted emissions (802.11n)

802.11n, Highest channel, Plot 1



802.11n, Highest channel, Plot 2



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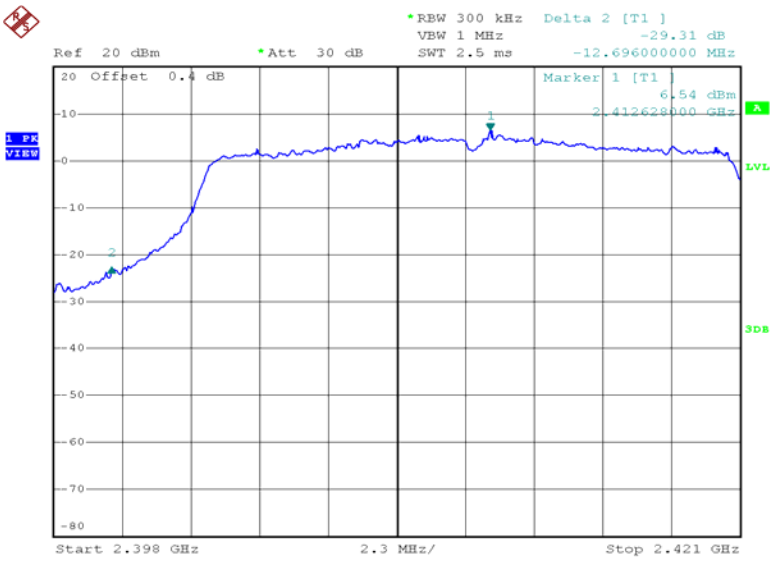
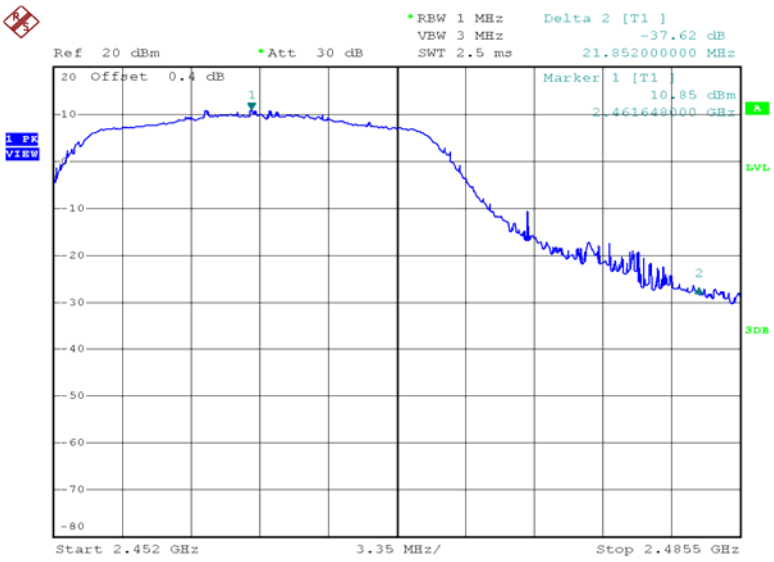
Plots of bandedge (802.11n)

802.11n, Bandedge plot, Plot 1



802.11n, Bandedge plot, Plot 2



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4.5 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

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

Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB
AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

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

Example
Assume a receiver reading of 62.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29.0 dB is subtracted. The pulse desensitization factor of the spectrum analyzer is 0.0 dB, and the resultant average factor is -10.0 dB. The net field strength for comparison to the appropriate emission limit is 32.0 dBμV/m. This value in dBμV/m is converted to its corresponding level in μV/m.

RA = 62.0 dBμV
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0.0 dB
AV = -10 dB

FS = 62.0 + 7.4 + 1.6 – 29.0 + 0.0 + (-10.0) = 32.0 dBμV/m

Level in μV/m = Common Antilogarithm [(32.0 dBμV/m)/20] = 39.8 μV/m

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4.6 Transmitter Radiated Emissions in Restricted Bands and Spurious Emissions

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.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

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4.6.1 Radiated Emission Configuration Photograph

Worst Case Restricted Band Radiated Emission
at

Base Unit: 2483.500 MHz

The worst case radiated emission configuration photographs are saved with filename: config photos.pdf

4.6.2 Radiated Emission Data

The data in tables 1-10 list the significant emission frequencies, the limit and the margin of compliance.

Judgement -

Base Unit: Passed by 0.4 dB margin

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Mode: TX-Channel 01

Table 1
Base Unit - IEEE 802.11b

Radiated Emission Data

Polari-zation	Frequency	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBuV/m)	Average Limit at 3m (dBuV/m)	Margin (dB)
H	***2390.000***	***57.0***	***33***	***29.4***	***53.4***	***54.0***	***-0.6***
H	***4824.000***	***38.3***	***33***	***34.9***	***40.2***	***54.0***	***-13.8***
H	***12060.000***	***32.4***	***33***	***40.5***	***39.9***	***54.0***	***-14.1***
H	***14472.000***	***31.6***	***33***	***40.0***	***38.6***	***54.0***	***-15.4***

Polari-zation	Frequency	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBuV/m)	Peak Limit at 3m (dBuV/m)	Margin (dB)
H	***2390.000***	***67.9***	***33***	***29.4***	***64.3***	***74.0***	***-9.7***
H	***4824.000***	***49.3***	***33***	***34.9***	***51.2***	***74.0***	***-22.8***
H	***12060.000***	***42.5***	***33***	***40.5***	***50.0***	***74.0***	***-24.0***
H	***14472.000***	***42.6***	***33***	***40.0***	***49.6***	***74.0***	***-24.4***

NOTES: 1. Peak / average detector are used for the emission measurement.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance 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 radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

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

5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205

* Emission within the restricted band meets the requirement of part 15.205.

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2/F., Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong.
Tel: (852) 2173 8888 Fax: (852) 2785 5487 Website: www.hk.intertek-etlsemko.com

Mode: TX-Channel 06

Table 2
Base Unit - IEEE 802.11b

Radiated Emission Data

Polari-zation	Frequency	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBuV/m)	Average Limit at 3m (dBuV/m)	Margin (dB)
H	***4874.000***	***38.4***	***33***	***34.9***	***40.3***	***54.0***	***-13.7***
H	***7311.000***	***34.6***	***33***	***37.9***	***39.5***	***54.0***	***-14.5***
H	***12185.000***	***38.5***	***33***	***40.5***	***46.0***	***54.0***	***-8.0***

Polari-zation	Frequency	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBuV/m)	Peak Limit at 3m (dBuV/m)	Margin (dB)
H	***4874.000***	***49.4***	***33***	***34.9***	***51.3***	***74.0***	***-22.7***
H	***7311.000***	***45.7***	***33***	***37.9***	***50.6***	***74.0***	***-23.4***
H	***12185.000***	***42.5***	***33***	***40.5***	***50.0***	***74.0***	***-24.0***

NOTES:
1. Peak/Average detector is used for the emission measurement.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance 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 radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.

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Mode: TX-Channel 11

Table 3
Base Unit - IEEE 802.11 b

Radiated Emission Data

Polari-zation	Frequency	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBuV/m)	Average Limit at 3m (dBuV/m)	Margin (dB)
H	***2483.500***	***57.2***	***33***	***29.4***	***53.6***	***54.0***	***-0.4***
H	***4924.000***	***38.2***	***33***	***34.9***	***40.1***	***54.0***	***-13.9***
H	***7386.000***	***34.4***	***33***	***37.9***	***39.3***	***54.0***	***-14.7***
H	***12310.000***	***31.3***	***33***	***40.5***	***38.8***	***54.0***	***-15.2***

Polari-zation	Frequency	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBuV/m)	Peak Limit at 3m (dBuV/m)	Margin (dB)
H	***2483.500***	***68.2***	***33***	***29.4***	***64.6***	***74.0***	***-9.4***
H	***4924.000***	***49.3***	***33***	***34.9***	***51.2***	***74.0***	***-22.8***
H	***7386.000***	***45.5***	***33***	***37.9***	***50.4***	***74.0***	***-23.6***
H	***12310.000***	***42.4***	***33***	***40.5***	***49.9***	***74.0***	***-24.1***

NOTES: 1. Peak / average detector are used for the emission measurement.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance 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 radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

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

5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205

* Emission within the restricted band meets the requirement of part 15.205.

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Mode: TX-Channel 01

Table 4
Base Unit - IEEE 802.11g

Radiated Emission Data

Polari-zation	Frequency	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBuV/m)	Average Limit at 3m (dBuV/m)	Margin (dB)
H	***2390.000***	***55.8***	***33***	***29.4***	***52.2***	***54.0***	***-1.8***
H	***4824.000***	***39.0***	***33***	***34.9***	***40.9***	***54.0***	***-13.1***
H	***12060.000***	***31.9***	***33***	***40.5***	***39.4***	***54.0***	***-14.6***
H	***14472.000***	***32.3***	***33***	***40.0***	***39.3***	***54.0***	***-14.7***

Polari-zation	Frequency	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBuV/m)	Peak Limit at 3m (dBuV/m)	Margin (dB)
H	***2390.000***	***68.4***	***33***	***29.4***	***64.8***	***74.0***	***-9.2***
H	***4824.000***	***49.0***	***33***	***34.9***	***50.9***	***74.0***	***-23.1***
H	***12060.000***	***42.1***	***33***	***40.5***	***49.6***	***74.0***	***-24.4***
H	***14472.000***	***42.4***	***33***	***40.0***	***49.4***	***74.0***	***-24.6***

NOTES: 1. Peak / average detector are used for the emission measurement.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance 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 radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

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

5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205

* Emission within the restricted band meets the requirement of part 15.205.

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Mode: TX-Channel 06

Table 5
Base Unit - IEEE 802.11g

Radiated Emission Data

Polari-zation	Frequency	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBuV/m)	Average Limit at 3m (dBuV/m)	Margin (dB)
H	***4874.000***	***38.8***	***33***	***34.9***	***40.7***	***54.0***	***-13.3***
H	***7311.000***	***35.0***	***33***	***37.9***	***39.9***	***54.0***	***-14.1***
H	***12185.000***	***32.5***	***33***	***40.5***	***40.0***	***54.0***	***-14.0***

Polari-zation	Frequency	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBuV/m)	Peak Limit at 3m (dBuV/m)	Margin (dB)
H	***4874.000***	***48.9***	***33***	***34.9***	***50.8***	***74.0***	***-23.2***
H	***7311.000***	***45.7***	***33***	***37.9***	***50.6***	***74.0***	***-23.4***
H	***12185.000***	***41.9***	***33***	***40.5***	***49.4***	***74.0***	***-24.6***

NOTES: 1. Peak / average detector are used for the emission measurement.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance 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 radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

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

5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205

* Emission within the restricted band meets the requirement of part 15.205.

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Mode: TX-Channel 11

Table 6
Base Unit - IEEE 802.11g

Radiated Emission Data

Polari-zation	Frequency	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBuV/m)	Average Limit at 3m (dBuV/m)	Margin (dB)
H	***2483.500***	***55.7***	***33***	***29.4***	***52.1***	***54.0***	***-1.9***
H	***4924.000***	***38.4***	***33***	***34.9***	***40.3***	***54.0***	***-13.7***
H	***7386.000***	***35.3***	***33***	***37.9***	***40.2***	***54.0***	***-13.8***
H	***12310.000***	***32.3***	***33***	***40.5***	***39.8***	***54.0***	***-14.2***

Polari-zation	Frequency	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBuV/m)	Peak Limit at 3m (dBuV/m)	Margin (dB)
H	***2483.500***	***67.8***	***33***	***29.4***	***64.2***	***74.0***	***-9.8***
H	***4924.000***	***48.7***	***33***	***34.9***	***50.6***	***74.0***	***-23.4***
H	***7386.000***	***45.5***	***33***	***37.9***	***50.4***	***74.0***	***-23.6***
H	***12310.000***	***42.1***	***33***	***40.5***	***49.6***	***74.0***	***-24.4***

NOTES: 1. Peak / average detector are used for the emission measurement.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance 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 radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

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

5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205

* Emission within the restricted band meets the requirement of part 15.205.

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Mode: TX-Channel 01

Table 4
Base Unit - IEEE 802.11n

Radiated Emission Data

Polari-zation	Frequency	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBuV/m)	Average Limit at 3m (dBuV/m)	Margin (dB)
H	***2390.000***	***55.4***	***33***	***29.4***	***51.8***	***54.0***	***-2.2***
H	***4824.000***	***39.0***	***33***	***34.9***	***40.9***	***54.0***	***-13.1***
H	***12060.000***	***32.5***	***33***	***40.5***	***40.0***	***54.0***	***-14.0***
H	***14472.000***	***33.0***	***33***	***40.0***	***40.0***	***54.0***	***-14.0***

Polari-zation	Frequency	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBuV/m)	Peak Limit at 3m (dBuV/m)	Margin (dB)
H	***2390.000***	***67.0***	***33***	***29.4***	***63.4***	***74.0***	***-10.6***
H	***4824.000***	***49.1***	***33***	***34.9***	***51.0***	***74.0***	***-23.0***
H	***12060.000***	***42.4***	***33***	***40.5***	***49.9***	***74.0***	***-24.1***
H	***14472.000***	***42.6***	***33***	***40.0***	***49.6***	***74.0***	***-24.4***

NOTES: 1. Peak / average detector are used for the emission measurement.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance 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 radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

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

5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205

* Emission within the restricted band meets the requirement of part 15.205.

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Mode: TX-Channel 06

Table 8
Base Unit - IEEE 802.11n

Radiated Emission Data

Polari-zation	Frequency	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBuV/m)	Average Limit at 3m (dBuV/m)	Margin (dB)
H	***4874.000***	***38.6***	***33***	***34.9***	***40.5***	***54.0***	***-13.5***
H	***7311.000***	***35.7***	***33***	***37.9***	***40.6***	***54.0***	***-13.4***
H	***12185.000***	***32.5***	***33***	***40.5***	***40.0***	***54.0***	***-14.0***

Polari-zation	Frequency	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBuV/m)	Peak Limit at 3m (dBuV/m)	Margin (dB)
H	***4874.000***	***48.3***	***33***	***34.9***	***50.2***	***74.0***	***-23.8***
H	***7311.000***	***45.9***	***33***	***37.9***	***50.8***	***74.0***	***-23.2***
H	***12185.000***	***41.9***	***33***	***40.5***	***49.4***	***74.0***	***-24.6***

NOTES: 1. Peak / average detector are used for the emission measurement.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance 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 radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

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

5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205

* Emission within the restricted band meets the requirement of part 15.205.

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Mode: TX-Channel 11

Table 9
Base Unit - IEEE 802.11n

Radiated Emission Data

Polari-zation	Frequency	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBuV/m)	Average Limit at 3m (dBuV/m)	Margin (dB)
H	***2483.500***	***54.7***	***33***	***29.4***	***51.1***	***54.0***	***-2.9***
H	***4924.000***	***38.7***	***33***	***34.9***	***40.6***	***54.0***	***-13.4***
H	***7386.000***	***35.4***	***33***	***37.9***	***40.3***	***54.0***	***-13.7***
H	***12310.000***	***32.2***	***33***	***40.5***	***39.7***	***54.0***	***-14.3***

Polari-zation	Frequency	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBuV/m)	Peak Limit at 3m (dBuV/m)	Margin (dB)
H	***2483.500***	***66.8***	***33***	***29.4***	***63.2***	***74.0***	***-10.8***
H	***4924.000***	***48.9***	***33***	***34.9***	***50.8***	***74.0***	***-23.2***
H	***7386.000***	***45.7***	***33***	***37.9***	***50.6***	***74.0***	***-23.4***
H	***12310.000***	***42.5***	***33***	***40.5***	***50.0***	***74.0***	***-24.0***

NOTES: 1. Peak / average detector are used for the emission measurement.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance 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 radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

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

5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205

* Emission within the restricted band meets the requirement of part 15.205.

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Mode: Talk

Table 10
Base Unit

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	64.006	40.6	16	9.0	33.6	40.0	-6.4
V	124.834	36.1	16	14.0	34.1	43.5	-9.4
H	182.649	30.9	16	20.0	34.9	43.5	-8.6
H	235.071	39.6	16	19.0	42.6	46.0	-3.4
H	242.068	38.0	16	19.0	41.0	46.0	-5.0
H	272.096	29.0	16	22.0	35.0	46.0	-11.0

NOTES: 1. Peak detector is used for the emission measurement.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance 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 radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.

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4.6.3 Transmitter Duty Cycle Calculation

Not applicable – No average factor is required.

4.7 AC Power Line Conducted Emission

☐ Not applicable – EUT is only powered by battery for operation.

☒ EUT connects to AC power line. Emission Data is listed in following pages.

☐ Base Unit connects to AC power line and has transmission. Handset connects to AC power line but has no transmission. Emission Data of Base Unit is listed in following pages.

4.7.1 AC Power Line Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration
at

3.908 MHz

The worst case line conducted configuration photographs are attached in the Appendix and saved with filename: config photos.pdf

4.7.2 AC Power Line Conducted Emission Data

The plot(s) and data in the following pages list the significant emission frequencies, the limit and the margin of compliance

Passed by 9.43 dB margin compare with average limit

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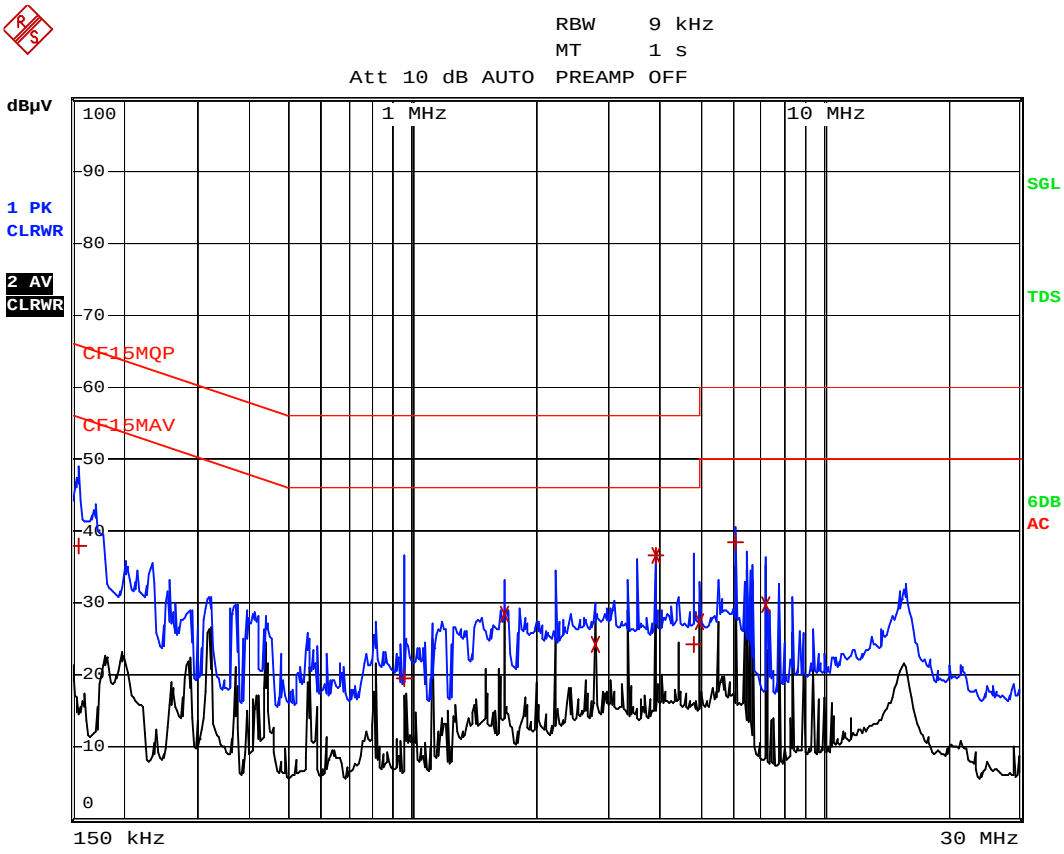
Worst Case: Ringing



Date: 24.OCT.2012 17:00:03

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Worst Case: Ringing

EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

	TRACE	FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	154.5 kHz	37.89	N	-27.86
1	Quasi Peak	955.5 kHz	19.42	N	-36.57
2	CISPR Average	1.6755 MHz	28.40	L1	-17.59
2	CISPR Average	2.7915 MHz	24.19	N	-21.80
1	Quasi Peak	3.9075 MHz	36.65	N	-19.34
2	CISPR Average	3.9075 MHz	36.56	L1	-9.43
1	Quasi Peak	4.8345 MHz	24.25	N	-31.75
2	CISPR Average	5.019 MHz	27.51	N	-22.48
1	Quasi Peak	6.1395 MHz	38.39	N	-21.60
2	CISPR Average	7.251 MHz	29.73	N	-20.26

Date: 24.OCT.2012 16:59:41

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4.8 Radio Frequency Radiation Exposure

EUT is subject to the radio frequency exposure requirements specified in FCC Rule §§ 1.1307. It shall be considered to operate in a "general population / uncontrolled" environment.

☐ Output power is less than the applicable low threshold from SAR evaluation. The evaluation calculation results are saved with filename: RF exposure info.pdf

☒ EUT was evaluated for Maximum Permissible Exposure (MPE) evaluation compliance according to OET Bulletin 65, Supplement C (Edition 01-01). The evaluation calculation results are saved with filename: RF exposure info.pdf

☐ EUT was evaluated for Specific Absorption Rate (SAR) evaluation compliance according to OET Bulletin 65, Supplement C (Edition 01-01). It is in compliance with the SAR evaluation requirements. A SAR test report was submitted at same time and saved as SAR Report.pdf

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EXHIBIT 5
EQUIPMENT LIST

Intertek Testing Services Hong Kong Ltd.
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5.0 **Equipment List**

1) Radiated Emissions Test

Equipment	Log Periodic Antenna	Double Ridged Guide Antenna	Broad-Band Horn Antenna
Registration No.	EW-0446	EW-1015	EW-1679
Manufacturer	EMCO	EMCO	SCHWARZBECK
Model No.	3146	3115	BBHA9170
Calibration Date	Oct. 31, 2011	Aug. 24, 2011	Mar. 21, 2012
Calibration Due Date	Apr. 30, 2013	Feb. 24, 2013	Mar. 21, 2013

Equipment	Biconical Antenna 20MHz to 200MHz	Spectrum Analyzer	EMI Test Receiver
Registration No.	EW-2512	EW-2253	EW-2500
Manufacturer	EMCO	R&S	EMCO
Model No.	3104C	FSP40	ESCI
Calibration Date	Nov. 15, 2011	Jan. 12, 2012	Feb. 24, 2012
Calibration Due Date	May. 15, 2013	Jan. 12, 2013	Feb. 24, 2013

2) Conducted Emissions Test

Equipment	EMI Test Receiver	Artificial Mains Network	Pulse Limiter
Registration No.	EW-2500	EW-2874	EW-0698
Manufacturer	ROHDESCHWARZ	ROHDESCHWARZ	ROHDESCHWARZ
Model No.	ESCI	ENV216	ESH3-Z2
Calibration Date	Feb. 24, 2012	Aug. 15, 2012	Apr. 06, 2012
Calibration Due Date	Feb. 24, 2013	Aug. 15, 2013	Apr. 06, 2013

3) Conductive Measurement Test

Equipment	Spectrum Analyzer
Registration No.	EW-2253
Manufacturer	R&S
Model No.	FSP40
Calibration Date	Jan. 12, 2012
Calibration Due Date	Jan. 12, 2013

END OF TEST REPORT

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