

TEST REPORT**Report No.: 14040555HKG-004R1****Kenxen Limited**

Application
For
Certification
(Original Grant)
(FCC ID: ZVTWSF0100)

Transceiver

This report supersedes previous report with report number 14040555HKG-004 dated
July 16, 2015

Prepared and Checked by:

Signed On File
Lee Shui Tim, Tim
Engineer

Approved by:

Wong Kwok Yeung, Kenneth
Lead Engineer
Date: Sep 15, 2015

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GENERAL INFORMATION

Grantee:	Kenxen Limited
Grantee Address:	26/F., Lever Tech Center, 69-71 King Yip St., Hong Kong.
Contact Person:	Robin Shaw
Tel:	(852) 2187 0550
Fax:	(852) 2187 1005
e-mail:	N/A
Manufacturer:	Kenxen Limited
Manufacturer Address:	26/F., Lever Tech Center, 69-71 King Yip St., Hong Kong.
Brand Name:	Magicscan / Directscan
Model:	WSF01
Type of EUT:	Transceiver
Description of EUT:	Auto-Feed Portable WiFi Scanner
Serial Number:	N/A
FCC ID:	ZVTWSF0100
Date of Sample Submitted:	April 09, 2014
Date of Test:	April 09, 2014 to June 04, 2015
Report No.:	14040555HKG-004R1
Report Date:	July 16, 2015
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

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SUMMARY OF TEST RESULT

TEST SPECIFICATION	REFERENCE	RESULTS
Transmitter Power Line Conducted Emissions	15.207	Pass
Radiated Emission Radiated Emission on the Bandedge	15.249, 15.209	Pass
Radiated Emission in Restricted Bands	15.205	Pass

The equipment under test is found to be complying with the following standards:
FCC Part 15, October 1, 2014 Edition

- 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 expected variations in temperature and supply voltage were considered.

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1.0 General Description

1.1 Product Description

The WSF01 is an Auto-Feed Portable WiFi Scanner.

For 802.11b mode, it operates at frequency range of 2412MHz to 2462MHz (11 channels with 5MHz channel spacing). It transmits via DSSS modulation. Maximum bit rate can be up to 11Mbps. For 802.11g mode, it operates at frequency range of 2412MHz to 2462MHz (11 channels with 5MHz channel spacing). It transmits via OFDM modulation. Maximum bit rate can be up to 54Mbps. For 802.11n (with 20MHz bandwidth) mode, it operates at frequency range of 2412MHz to 2462MHz (11 channels with 5MHz channel spacing). It transmits via OFDM modulation. Maximum bit rate can support up to 65Mbps.

The EUT is power by 4.5VDC (6x"AA"size batteries).

Antenna Type: Internal, Integral

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

1.2 Related Submittal(s) Grants

This is a single application for certification of a transceiver.

The Declaration of the Conformity procedure of PC Connectivity for this transceiver (with FCC ID: ZVTWSF0100) is being processed as the same time of this application.

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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 3m Chamber. Preliminary scans were performed in the 3m Chamber 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. Average measurements were performed according to ANSI C63.10 (2009).

1.4 Test Facility

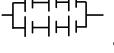
The 3m Chamber and conducted measurement facility used to collect the radiated data is located at Workshop No. 3, G/F., World-Wide Industrial Centre, 43-47 Shan Mei Street, Fo Tan, Sha Tin, N.T., Hong Kong. This test facility and site measurement data have been placed on file with the FCC.

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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 4.5VDC (6x "AA" size new batteries) .

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 802.11b/g/n(HT20) of WiFi mode had been considered, and worst case test data are shown on this test report.

For simultaneous transmission, WiFi is switched on when taking radiated emission for determining worst-case spurious emission.

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2.2 EUT Exercising Software

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

2.3 Special Accessories

1. USB cable of 1m long with ferrite.
(Provide by Applicant)

2.4 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.

2.5 Support Equipment List and Description

1. 4GB Micro SD Card
2. Notebook Computer (MIS1492)
(Provided by Intertek)
3. Notebook adaptor (model number: HSTNN-CA40)
(Provided by Intertek)
4. Test Mode Software: Wifi ref.exe
(Provided by Applicant)
5. LAN cable of 1m long.
(Provide by Intertek)

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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 $\text{dB}\mu\text{V}/\text{m}$
 RA = Receiver Amplitude (including preamplifier) in $\text{dB}\mu\text{V}$
 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 $\text{dB}\mu\text{V}/\text{m}$
 RR = $RA - AG - AV$ in $\text{dB}\mu\text{V}$
 LF = $CF + AF$ in dB

Assume a receiver reading of 52.0 $\text{dB}\mu\text{V}$ 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 $\text{dB}\mu\text{V}/\text{m}$. This value in $\text{dB}\mu\text{V}/\text{m}$ was converted to its corresponding level in $\mu\text{V}/\text{m}$.

$RA = 52.0 \text{ dB}\mu\text{V}/\text{m}$

$AF = 7.4 \text{ dB}$

$CF = 1.6 \text{ dB}$

$AG = 29.0 \text{ dB}$

$AV = 5.0 \text{ dB}$

$FS = RR + LF$

$FS = 18 + 9 = 27 \text{ dB}\mu\text{V}/\text{m}$

$RR = 18.0 \text{ dB}\mu\text{V}$

$LF = 9.0 \text{ dB}$

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

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3.2 Radiated Emission Configuration Photograph

The worst case in radiated emission was found at 2400.000 MHz

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 0.7 dB

3.4 Conducted Emission Configuration Photograph

The worst case in line-conducted emission was found at 30 MHz

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

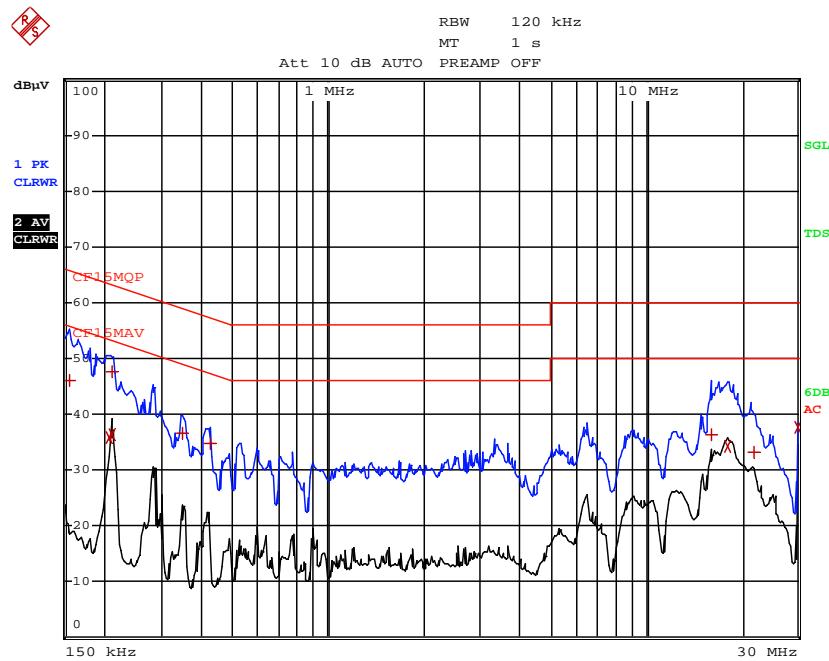
3.5 Conducted Emission Data

For electronic filing, the graph and data table of conducted emission is saved with filename: conducted.pdf.

Judgment: Pass by 12.5 dB

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Worst-Case Operating Mode: Transmitting (WiFi)



EDIT PEAK LIST (Final Measurement Results)				
Trace1:	CF15MQP			
Trace2:	CF15MAV			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dBµV	DELTA	LIMIT dB
1	Quasi Peak 154.5 kHz	46.04	N	-19.71
2	CISPR Average 208.5 kHz	35.75	L1	-17.51
1	Quasi Peak 213 kHz	47.76	N	-15.32
2	CISPR Average 213 kHz	36.32	L1	-16.75
1	Quasi Peak 348 kHz	36.62	N	-22.39
1	Quasi Peak 424.5 kHz	34.81	N	-22.54
1	Quasi Peak 16.062 MHz	36.38	N	-23.61
2	CISPR Average 17.988 MHz	34.20	N	-15.79
1	Quasi Peak 21.804 MHz	33.08	L1	-26.91
2	CISPR Average 30 MHz	37.54	N	-12.45

Note: Measurement Uncertainty is $\pm 4.2\text{dB}$ at a level of confidence of 95%.

INTERTEK TESTING SERVICES

Applicant: Kenxen Limited

Date of Test: June 04, 2015

Model: WSF01

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	2400.000	56.9	33	29.4	53.3	54.0	-0.7
V	2412.000	95.3	33	29.4	91.7	94.0	-2.3
V	4824.000	40.6	33	34.9	42.5	54.0	-11.5
V	7236.000	38.7	33	37.9	43.6	54.0	-10.4
V	9648.000	39.5	33	40.4	46.9	54.0	-7.1
V	12060.000	41.9	33	40.5	49.4	54.0	-4.6
V	14472.000	43.4	33	40.0	50.4	54.0	-3.6

Channel 07

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	2442.000	95.3	33	29.4	91.7	94.0	-2.3
V	4884.000	40.2	33	34.9	42.1	54.0	-11.9
V	7326.000	38.6	33	37.9	43.5	54.0	-10.5
V	9768.000	39.3	33	40.4	46.7	54.0	-7.3
V	12210.000	42.1	33	40.5	49.6	54.0	-4.4
V	14652.000	44.8	33	38.4	50.2	54.0	-3.8

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	95.9	33	29.4	92.3	94.0	-1.7
V	2483.500	51.7	33	29.4	48.1	54.0	-5.9
V	4924.000	40.5	33	34.9	42.4	54.0	-11.6
V	7386.000	38.7	33	37.9	43.6	54.0	-10.4
V	9848.000	39.4	33	40.4	46.8	54.0	-7.2
V	12310.000	42.0	33	40.5	49.5	54.0	-4.5
V	14772.000	44.9	33	38.4	50.3	54.0	-3.7

- NOTES:
1. Average measurement method 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.
 7. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.
 8. Measurement Uncertainty is ± 5.3 dB at a level of confidence of 95%.

INTERTEK TESTING SERVICES

Applicant: Kenxen Limited

Date of Test: June 04, 2015

Model: WSF01

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	2400.000	66.1	33	29.4	62.5	74.0	-11.5
V	2412.000	99.9	33	29.4	96.3	114.0	-17.7
V	4824.000	53.8	33	34.9	55.7	74.0	-18.3
V	7236.000	49.2	33	37.9	54.1	74.0	-19.9
V	9648.000	50.4	33	40.4	57.8	74.0	-16.2
V	12060.000	52.6	33	40.5	60.1	74.0	-13.9
V	14472.000	54.3	33	40.0	61.3	74.0	-12.7

Channel 07

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	2442.000	100.0	33	29.4	96.4	114.0	-17.6
V	4884.000	53.0	33	34.9	54.9	74.0	-19.1
V	7326.000	49.4	33	37.9	54.3	74.0	-19.7
V	9768.000	50.7	33	40.4	58.1	74.0	-15.9
V	12210.000	52.8	33	40.5	60.3	74.0	-13.7
V	14652.000	55.8	33	38.4	61.2	74.0	-12.8

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	100.8	33	29.4	97.2	114.0	-16.8
V	2483.500	63.7	33	29.4	60.1	74.0	-13.9
V	4924.000	53.5	33	34.9	55.4	74.0	-18.6
V	7386.000	49.3	33	37.9	54.2	74.0	-19.8
V	9848.000	50.6	33	40.4	58.0	74.0	-16.0
V	12310.000	52.6	33	40.5	60.1	74.0	-13.9
V	14772.000	56.0	33	38.4	61.4	74.0	-12.6

- NOTES:
1. Peak measurement method 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.
 7. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.
 8. Measurement Uncertainty is ± 5.3 dB at a level of confidence of 95%.

INTERTEK TESTING SERVICES

Applicant: Kenxen Limited

Date of Test: June 04, 2015

Model: WSF01

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 (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	2400.000	54.0	33	29.4	50.4	54.0	-3.6
V	2412.000	89.4	33	29.4	85.8	94.0	-8.2
V	4824.000	40.4	33	34.9	42.3	54.0	-11.7
V	7236.000	38.5	33	37.9	43.4	54.0	-10.6
V	9648.000	39.2	33	40.4	46.6	54.0	-7.4
V	12060.000	42.2	33	40.5	49.7	54.0	-4.3
V	14472.000	43.0	33	40.0	50.0	54.0	-4.0

Channel 07

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	2442.000	90.0	33	29.4	86.4	94.0	-7.6
V	4884.000	40.1	33	34.9	42.0	54.0	-12.0
V	7326.000	38.7	33	37.9	43.6	54.0	-10.4
V	9768.000	39.4	33	40.4	46.8	54.0	-7.2
V	12210.000	41.7	33	40.5	49.2	54.0	-4.8
V	14652.000	44.7	33	38.4	50.1	54.0	-3.9

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	90.3	33	29.4	86.7	94.0	-7.3
V	2483.500	51.6	33	29.4	48.0	54.0	-6.0
V	4924.000	40.3	33	34.9	42.2	54.0	-11.8
V	7386.000	38.9	33	37.9	43.8	54.0	-10.2
V	9848.000	39.1	33	40.4	46.5	54.0	-7.5
V	12310.000	42.1	33	40.5	49.6	54.0	-4.4
V	14772.000	44.9	33	38.4	50.3	54.0	-3.7

- NOTES:
1. Average measurement method 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.
 7. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.
 8. Measurement Uncertainty is ± 5.3 dB at a level of confidence of 95%.

INTERTEK TESTING SERVICES

Applicant: Kenxen Limited

Date of Test: June 04, 2015

Model: WSF01

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	2400.000	74.6	33	29.4	71.0	74.0	-3.0
V	2412.000	99.8	33	29.4	96.2	114.0	-17.8
V	4824.000	53.4	33	34.9	55.3	74.0	-18.7
V	7236.000	49.3	33	37.9	54.2	74.0	-19.8
V	9648.000	50.5	33	40.4	57.9	74.0	-16.1
V	12060.000	52.5	33	40.5	60.0	74.0	-14.0
V	14472.000	54.2	33	40.0	61.2	74.0	-12.8

Channel 07

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	2442.000	100.6	33	29.4	97.0	114.0	-17.0
V	4884.000	52.6	33	34.9	54.5	74.0	-19.5
V	7326.000	49.5	33	37.9	54.4	74.0	-19.6
V	9768.000	51.0	33	40.4	58.4	74.0	-15.6
V	12210.000	52.6	33	40.5	60.1	74.0	-13.9
V	14652.000	55.6	33	38.4	61.0	74.0	-13.0

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	101.0	33	29.4	97.4	114.0	-16.6
V	2483.500	63.4	33	29.4	59.8	74.0	-14.2
V	4924.000	52.9	33	34.9	54.8	74.0	-19.2
V	7386.000	49.1	33	37.9	54.0	74.0	-20.0
V	9848.000	50.9	33	40.4	58.3	74.0	-15.7
V	12310.000	52.9	33	40.5	60.4	74.0	-13.6
V	14772.000	56.1	33	38.4	61.5	74.0	-12.5

- NOTES:
1. Peak measurement method 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.
 7. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 .
 8. Measurement Uncertainty is ± 5.3 dB at a level of confidence of 95%.

INTERTEK TESTING SERVICES

Applicant: Kenxen Limited

Date of Test: June 04, 2015

Model: WSF01

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	2400.000	54.0	33	29.4	50.4	54.0	-3.6
V	2412.000	88.8	33	29.4	85.2	94.0	-8.8
V	4824.000	40.2	33	34.9	42.1	54.0	-11.9
V	7236.000	38.8	33	37.9	43.7	54.0	-10.3
V	9648.000	38.9	33	40.4	46.3	54.0	-7.7
V	12060.000	42.1	33	40.5	49.6	54.0	-4.4
V	14472.000	43.1	33	40.0	50.1	54.0	-3.9

Channel 07

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	2442.000	89.9	33	29.4	86.3	94.0	-7.7
V	4884.000	40.3	33	34.9	42.2	54.0	-11.8
V	7326.000	38.5	33	37.9	43.4	54.0	-10.6
V	9768.000	39.1	33	40.4	46.5	54.0	-7.5
V	12210.000	42.0	33	40.5	49.5	54.0	-4.5
V	14652.000	44.9	33	38.4	50.3	54.0	-3.7

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	90.1	33	29.4	86.5	94.0	-7.5
V	2483.500	51.7	33	29.4	48.1	54.0	-5.9
V	4924.000	40.5	33	34.9	42.4	54.0	-11.6
V	7386.000	38.3	33	37.9	43.2	54.0	-10.8
V	9848.000	39.1	33	40.4	46.5	54.0	-7.5
V	12310.000	41.6	33	40.5	49.1	54.0	-4.9
V	14772.000	44.7	33	38.4	50.1	54.0	-3.9

- NOTES:
1. Average measurement method 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.
 7. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.
 8. Measurement Uncertainty is ± 5.3 dB at a level of confidence of 95%.

INTERTEK TESTING SERVICES

Applicant: Kenxen Limited

Date of Test: June 04, 2015

Model: WSF01

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	2400.000	75.6	33	29.4	72.0	74.0	-2.0
V	2412.000	100.1	33	29.4	96.5	114.0	-17.5
V	4824.000	53.0	33	34.9	54.9	74.0	-19.1
V	7236.000	49.6	33	37.9	54.5	74.0	-19.5
V	9648.000	50.6	33	40.4	58.0	74.0	-16.0
V	12060.000	52.6	33	40.5	60.1	74.0	-13.9
V	14472.000	53.9	33	40.0	60.9	74.0	-13.1

Channel 07

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	2442.000	100.9	33	29.4	97.3	114.0	-16.7
V	4884.000	52.9	33	34.9	54.8	74.0	-19.2
V	7326.000	49.5	33	37.9	54.4	74.0	-19.6
V	9768.000	50.9	33	40.4	58.3	74.0	-15.7
V	12210.000	53.1	33	40.5	60.6	74.0	-13.4
V	14652.000	55.9	33	38.4	61.3	74.0	-12.7

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	101.0	33	29.4	97.4	114.0	-16.6
V	2483.500	62.9	33	29.4	59.3	74.0	-14.7
V	4924.000	53.2	33	34.9	55.1	74.0	-18.9
V	7386.000	49.4	33	37.9	54.3	74.0	-19.7
V	9848.000	50.7	33	40.4	58.1	74.0	-15.9
V	12310.000	52.6	33	40.5	60.1	74.0	-13.9
V	14772.000	55.6	33	38.4	61.0	74.0	-13.0

- NOTES:
1. Peak measurement method 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.
 7. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 .
 8. Measurement Uncertainty is ± 5.3 dB at a level of confidence of 95%.

INTERTEK TESTING SERVICES

Applicant: Kenxen Limited

Date of Test: June 04, 2015

Model: WSF01

Worst-Case Operating Mode: Wi-Fi Transmit and Receive with PC

Table 7

Radiated Emissions Pursuant to FCC Part 15 Section 15.209 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	75.001	40.4	16	6.0	30.4	40.0	-9.6
V	120.063	33.3	16	14.0	31.3	43.5	-12.2
V	140.500	35.2	16	14.0	33.2	43.5	-10.3
H	217.400	34.5	16	17.0	35.5	46.0	-10.5
H	247.400	33.5	16	20.0	37.5	46.0	-8.5
H	322.400	36.0	16	23.0	43.0	46.0	-3.0
H	390.200	34.4	16	25.0	43.4	46.0	-2.6
H	645.200	31.2	16	29.0	44.2	46.0	-1.8
H	675.200	31.0	16	29.0	44.0	46.0	-2.0
H	705.200	29.6	16	30.0	43.6	46.0	-2.4
H	713.000	29.8	16	30.0	43.8	46.0	-2.2
H	727.000	30.6	16	30.0	44.6	46.0	-1.4
H	735.200	30.5	16	30.0	44.5	46.0	-1.5

- 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. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.
 5. Measurement Uncertainty is ± 5.3 dB at a level of confidence of 95%.

INTERTEK TESTING SERVICES

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 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.

INTERTEK TESTING SERVICES

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 Radiated Emission on the Bandedge

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).

Lower bandedge emission

The test data of lower bandedge emission is shown on page 8 to page 13.

Upper bandedge emission

The test data of upper bandedge emission is shown on page 8 to page 13.

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).

INTERTEK TESTING SERVICES

8.2 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 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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8.2 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).

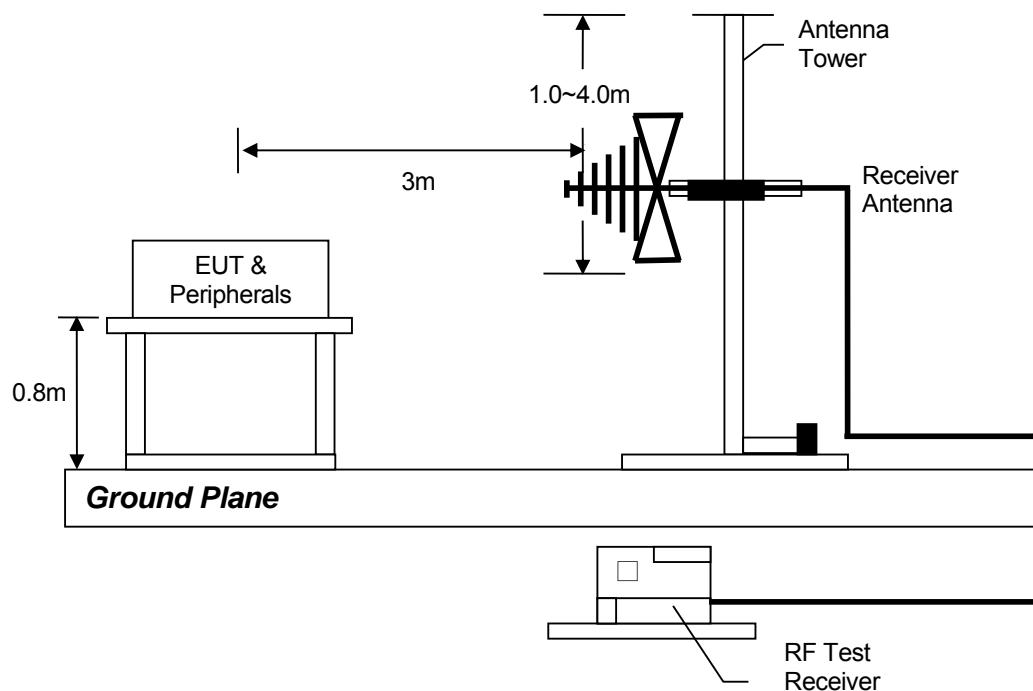
The IF bandwidth used for measurement of radiated signal strength was 100 kHz or greater when frequency is below 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. A discussion 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.

INTERTEK TESTING SERVICES

8.2.1 Radiated Emission Test Setup

The figure below shows the test setup, which is utilized to make these measurements.



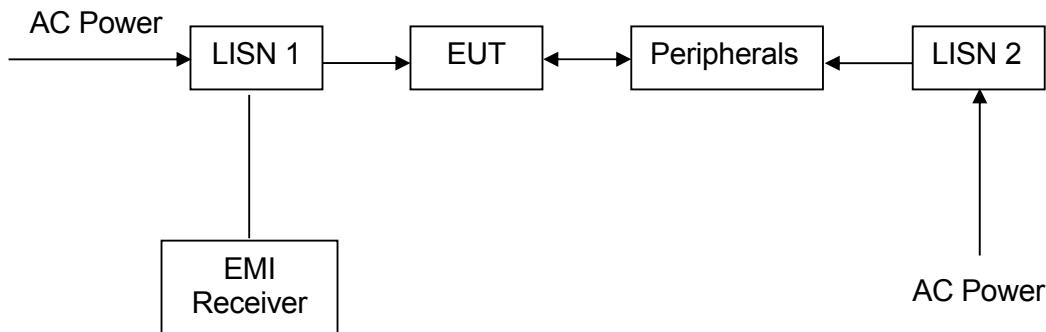
INTERTEK TESTING SERVICES

8.2.2 Conducted Emission Test Procedures

For tabletop equipment, the EUT along with its peripherals were placed on a 1.0m(W)×1.5m(L) and 0.8m in height wooden table. For floor-standing equipment, the EUT and all cables were insulated, if required, from the ground plane by up to 12 mm of insulating material. 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 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. The excess power cable between the EUT and the LISN was bundled.

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

8.2.3 Conducted Emission Test Setup



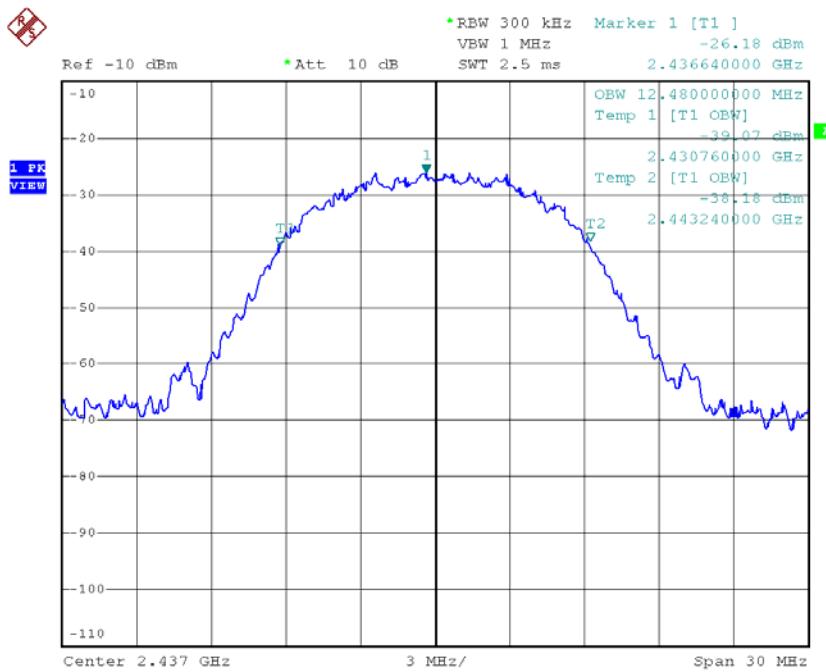
INTERTEK TESTING SERVICES

8.3 Occupied Bandwidth

Occupied Bandwidth Results: (802.11b DSSS 11Mbps)

Bluetooth	Occupied Bandwidth (kHz)
Low Channel: 2412	12360
Middle Channel: 2437	12480
High Channel: 2462	12420

The worst case is shown as below

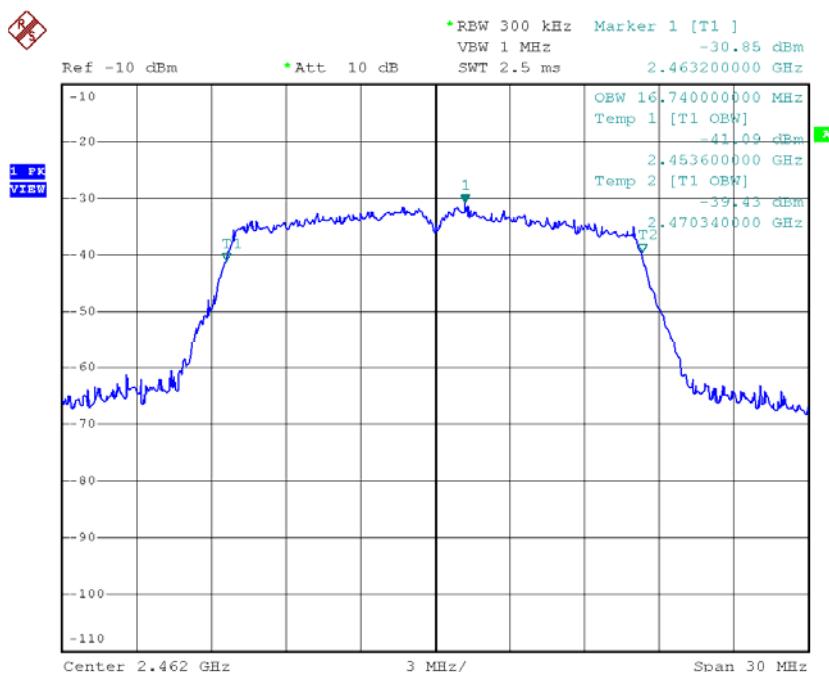


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Occupied Bandwidth Results: (802.11g OFDM 54Mbps)

Bluetooth	Occupied Bandwidth (kHz)
Low Channel: 2412	16740
Middle Channel: 2437	16740
High Channel: 2462	16740

The worst case is shown as below

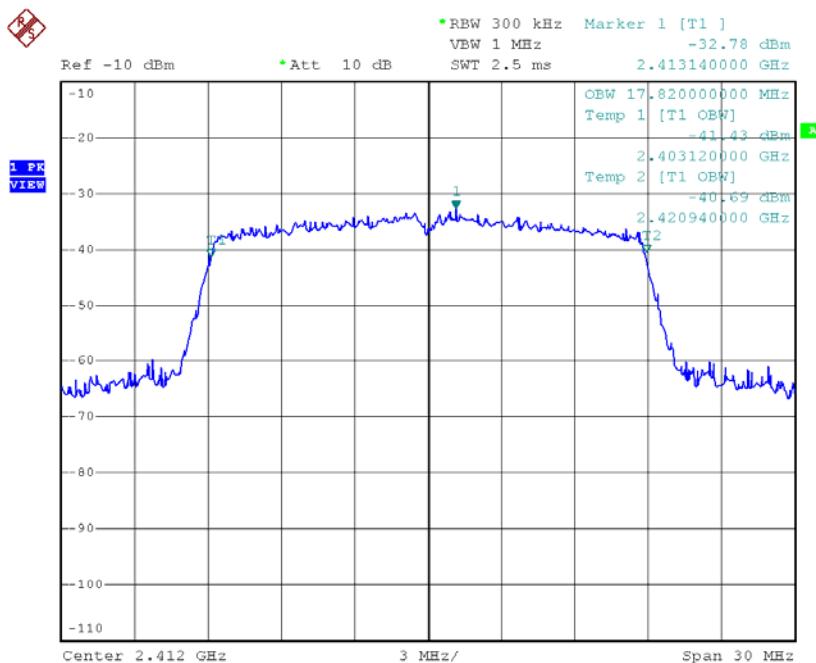


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Occupied Bandwidth Results: (802.11n HT20 mcs7 65Mbps)

Bluetooth	Occupied Bandwidth (kHz)
Low Channel: 2412	17820
Middle Channel: 2437	17760
High Channel: 2462	17760

The worst case is shown as below



INTERTEK TESTING SERVICES

9.0 Confidentiality Request

For electronic filing, a preliminary copy of the confidentiality request is saved with filename: request.pdf.

10.0 Equipment List

1) Radiated Emissions Test

Equipment	EMI Test Receiver	Spectrum Analyzer
Registration No.	EW-3095	EW-2466
Manufacturer	R&S	R&S
Model No.	ESCI	FSP30
Calibration Date	Oct. 16, 2013	Sep. 02, 2013
Calibration Due Date	Oct. 16, 2015	Sep. 02, 2015

Equipment	BiConiLog Antenna	Pyramidal Horn Antenna	Double Ridged Guide Antenna
Registration No.	EW-3061	EW-0905	EW-1133
Manufacturer	EMCO	EMCO	EMCO
Model No.	3412E	3160-09	3115
Calibration Date	Jul. 17, 2013	Jan. 28, 2014	Apr. 30, 2014
Calibration Due Date	Jul. 17, 2015	Jul. 28, 2015	Oct. 30, 2015

2) Conducted Emissions Test

Equipment	EMI Test Receiver	LISN
Registration No.	EW-2500	EW-2874
Manufacturer	R&S	R&S
Model No.	ESCI	ENV-216
Calibration Date	Nov. 06, 2013	Dec. 08, 2013
Calibration Due Date	Nov. 06, 2015	Dec. 08, 2015

3) Bandedge/Bandwidth Measurement

Equipment	Spectrum Analyzer
Registration No.	EW-2249
Manufacturer	R&S
Model No.	FSP30
Calibration Date	Nov. 19, 2013
Calibration Due Date	Nov. 19, 2015

END OF TEST REPORT