



VTech Telecommunications Ltd.

Application
For
Certification

WiFi Internet Radio

(FCC ID: EW780-6569-02)

HK09090688-1
MN/ cl
October 28, 2009

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INTERTEK TESTING SERVICES

MEASUREMENT/TECHNICAL REPORT

VTech Telecommunications Ltd. – MODEL: IS9181

FCC ID: EW780-6569-02

This report concerns (check one) Original Grant ☒ Class II Change ☐

Equipment Type: DTS – Digital Transmission System

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes ☐ No ☒

If yes, defer until :
date

Company Name agrees to notify the Commission by:
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes ☐ No ☒

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-01-08 Edition] provision.

Report reviewed by:

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**EXHIBIT 1
SUMMARY OF TEST RESULTS**

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1.0 Summary of Test

VTech Telecommunications Ltd. - MODEL: IS9181

FCC ID: EW780-6569-02

TEST	REFERENCE	RESULTS
Max. Output Power	15.247(b)	Pass
Minimum 6 dB Bandwidth	15.247(a)(2)	Pass
Maximum Power Density	15.247(e)	Pass
Out of Band Antenna Conducted Emission	15.247(d)	Pass
Radiated Emission in Restricted Bands	15.247(d)	Pass
Radiated Spurious Emissions	15.247(d) 15.109	Pass
AC Conducted Emission	15.207 15.107	Pass
Antenna Requirement	15.203	Pass (See Notes)
Radio Frequency Radiation Exposure	15.247(i)	Pass

Notes: 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.

**EXHIBIT 2
GENERAL DESCRIPTION**

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2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a WiFi Internet Radio operated at 2412MHz – 2462MHz with 11 channels. It is powered by a 100-240VAC to 14VDC 1500mA switching AC adaptor, rechargeable batteries (6 x 1.2V 2500mAh “Ni-MH” battery), or alkaline batteries (6 x 1.5V “AA” size battery). The EUT can access internet broadcasting station or multimedia sharing by WiFi (IEEE802.11b/g), and it also supports FM radio, auxiliary input, and audio output functions.

Antenna(s) Type : Integral, Internal

The circuit description is saved with filename: descri.pdf

2.2 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2003). Preliminary radiated scans were performed in the Open Area Test Sites 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. Antenna port conducted measurements were performed according to KDB Publication No. 558074. All other measurements were made in accordance with the procedures in 47 CFR Part 2.

2.3 Test Facility

The open area test site and conducted measurement facility used to collect the data 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.

**EXHIBIT 3
SYSTEM TEST CONFIGURATION**

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3.0 System Test Configuration

3.1 Justification

For emissions testing, the equipment under test (EUT) was setup to transmit continuously with 100% duty cycle verified by spectrum analyzer 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 to 14VDC 1500mA switching adaptor, fully charged batteries, or new alkaline batteries.

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

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

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.

Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. For frequencies above 1000MHz, 1MHz RBW with 1MHz VBW is set to measure the peak data, and 1MHz RBW with 10Hz VBW is set to measure the average data.

Radiated emission measurement were performed 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.

Three types of power sources were considered, and all data rates were tested. Only the worst-case data is shown in the report for DSSS and OFDM modulation types.

As the EUT has 2 antennas, both have been checked. While conducting the test on one of antennas, another one was being disable its transmission. The data in this report represented the worst-case.

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 Peripherals

Details of EUT:

An AC adaptor and/or a battery (provided with the unit) were used to power the device. Their description are listed below.

- (1) Switching AC Adaptor: 100-240VAC to 14VDC 1500mA, Model: S024EU1400150 (Supplied by Client)
- (2) Operated Rechargeable Battery: 6 x "AA" size Ni-MH type 1.2V 2500mAh rechargeable battery (Supplied by Intertek)
- (3) Operated Battery: 6 x "AA" size 1.5VDC Alkaline battery (Supplied by Intertek)

Description of Peripherals:

- (1) Sony Walkman, Model: WM-FX288 (Supplied by Intertek)
- (2) 3m long audio cable with 47kohm resistive terminator (Supplied by Intertek)
- (3) 3.5mm stereo cable with 1.5m long (Supplied by Intertek)

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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.

3.5 Equipment Modification

Any modifications installed previous to testing VTech Telecommunications Ltd. will be incorporated in each production model sold/leased in the United States.

No modifications were installed by Commercial & Electrical Division, Intertek Testing Services Hong Kong Ltd.

All the items listed under section 3.0 of this report are confirmed by:

Confirmed by:

*Nip Ming Fung, Melvin
Supervisor
Intertek Testing Services Hong Kong Ltd.
Agent for VTech Telecommunications Ltd.*



Signature

October 28, 2009 Date

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EXHIBIT 4 MEASUREMENT RESULTS

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Company: VTech Telecommunications Ltd.
Model: IS9181

Date of Test: October 05-15, 2009

4.0 Measurement Results

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b):

- ☒ The antenna power of the EUT was connected to the input of a power meter. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.
- ☐ The antenna port of the EUT was connected to the input of a spectrum analyzer. The analyzer was set for RBW>20dB bandwidth and power was read directly in dBm. External attenuation and cable loss were compensated for using the OFFSET function of the analyser.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm).

IEEE 802.11b (DSSS, 11Mbps) (Antenna Gain = 0 dBi)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	17.80	60.26
Middle Channel: 2437	17.73	59.29
High Channel: 2462	18.30	67.61

IEEE 802.11g (OFDM, 54Mbps) (Antenna Gain = 0 dBi)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	20.86	121.90
Middle Channel: 2437	20.70	117.49
High Channel: 2462	20.96	124.74

Cable loss : 0.5 dB External Attenuation : Nil dB

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

IEEE 802.11b (DSSS, 11Mbps):
EUT dBm max. output level = 18.30 dBm (+30 dBm or less)

IEEE 802.11g (OFDM, 54Mbps):
EUT dBm max. output level = 20.96 dBm (+30 dBm or less)

INTERTEK TESTING SERVICES

Company: VTech Telecommunications Ltd.
Model: IS9181

Date of Test: October 05-15, 2009

4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a)(2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

IEEE 802.11b (DSSS, 11Mbps)	
Frequency (MHz)	6 dB Bandwidth (kHz)
Low Channel: 2412	12300
Middle Channel: 2437	12280
High Channel: 2462	12320

IEEE 802.11g (OFDM, 54Mbps)	
Frequency (MHz)	6 dB Bandwidth (kHz)
Low Channel: 2412	16620
Middle Channel: 2437	16600
High Channel: 2462	16640

Limit: at least 500kHz

Refer to the following plots for 6 dB bandwidth:

IEEE 802.11b

Plot B2A: Low Channel 6 dB RF Bandwidth

Plot B2B: Middle Channel 6 dB RF Bandwidth

Plot B2C: High Channel 6 dB RF Bandwidth

IEEE 802.11g

Plot G2A: Low Channel 6 dB RF Bandwidth

Plot G2B: Middle Channel 6 dB RF Bandwidth

Plot G2C: High Channel 6 dB RF Bandwidth

For electronic filing, the above plots are saved with filename: 6dB.pdf

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Company: VTech Telecommunications Ltd.
Model: IS9181

Date of Test: October 05-15, 2009

4.3 Maximum Power Density, FCC Rule 15.247(e):

The spectrum analyzer RES BW was set to 3kHz. In order to look for a peak, the START and STOP frequencies were set to the band edges of the maximum output passband. If there is no clear maximum amplitude in any given portion of the band, it may be necessary to make measurements at a number of bands defined by several START and STOP frequency pairs.

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are added to the analyzer raw readings.

IEEE 802.11b (DSSS, 11Mbps)	
Frequency (MHz)	Power Density (dBm/3kHz)
Low Channel: 2412	-9.11
Middle Channel: 2437	-9.07
High Channel: 2462	-8.39

Frequency Span = 1.5MHz

Sweep Time = Frequency Span/3kHz
= 500 seconds

Cable Loss: 0.5 dB

Max. Peak Power Density (at 2462MHz) = -8.39dBm/3kHz

Limit: 8dBm/ 3kHz

Refer to the following plots for power density data :

Plot B3A: Low Channel power density
Plot B3B: Middle Channel power density
Plot B3C: High Channel power density

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Company: VTech Telecommunications Ltd.
Model: IS9181

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4.3 Maximum Power Density Reading, FCC Rule 15.247(e) – Continued:

IEEE 802.11g (OFDM, 54Mbps)	
Frequency (MHz)	Power Density (dBm/3kHz)
Low Channel: 2412	-15.55
Middle Channel: 2437	-15.73
High Channel: 2462	-14.63

Frequency Span = 1.5MHz

Sweep Time = Frequency Span/3kHz
= 500 seconds

Cable Loss: 0.5 dB

Max. Peak Power Density (at 2462MHz) = -14.63dBm/3kHz

Limit: 8dBm/ 3kHz

Refer to the following plots for power density data :

Plot G3A: Low Channel power density
Plot G3B: Middle Channel power density
Plot G3C: High Channel power density

For electronic filing, the above plots are saved with filename: maxpd.pdf

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Company: VTech Telecommunications Ltd.
Model: IS9181

Date of Test: October 05-15, 2009

4.4 Out of Band Conducted Emissions, FCC Rule 15.247(d):

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.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

Refer to the following plots for out of band conducted emissions data:

IEEE 802.11b (DSSS, 11Mbps):

Plot B4A1 - B4A3: Low Channel Emissions

Plot B4B1 - B4B2: Middle Channel Emissions

Plot B4C1 - B4C3: High Channel Emissions

IEEE 802.11g (OFDM, 54Mbps):

Plot G4A1 - G4A3: Low Channel Emissions

Plot G4B1 - G4B2: Middle Channel Emissions

Plot G4C1 - G4C3: High Channel Emissions

All spurious emission and up to the tenth harmonic was measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

For electronic filing, the above plots are saved with filenames: obantcon.pdf

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Company: VTech Telecommunications Ltd.
Model: IS9181

Date of Test: October 05-15, 2009

4.5 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b), (c):

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. All measurements were performed with peak detection unless otherwise specified.

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

4.6 Radiated Spurious Emissions FCC Ref: 15.247(d), 15.109

☐ Not required – No digital part

☒ Test results are attached

☐ Included in the separated DoC report.

INTERTEK TESTING SERVICES

Company: VTech Telecommunications Ltd.
Model: IS9181

Date of Test: October 05-15, 2009

4.7 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 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
 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 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

RA = 62.0 dB μ V
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0 dB
AV = -10 dB
 $FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 \text{ dB}\mu\text{V/m}$

Level in μ V/m = Common Antilogarithm $[(32 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$

INTERTEK TESTING SERVICES

Company: VTech Telecommunications Ltd.
Model: IS9181

Date of Test: October 05-15, 2009

4.8 Radiated Emission Configuration Photograph

Worst Case Restricted Band Radiated Emission
at

2390.000MHz

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

4.9 Radiated Emission Data

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

Judgement : Passed by 0.7 dB margin compared with peak limit

TEST PERSONNEL:



Tester Signature

Koo Wai Ip, Engineer
Typed/Printed Name

October 28, 2009
Date

INTERTEK TESTING SERVICES

Company: VTech Telecommunications Ltd.

Date of Test: October 05-15, 2009

Model: IS9181

Mode : 802.11b with 11Mbps data rate (TX-Channel 01)

Table 1

Radiated Emissions Pursuant to FCC 15.247(d) Emissions Requirement

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)
<i>V</i>	<i>2390.000</i>	<i>56.6</i>	<i>33</i>	<i>29.4</i>	<i>53.0</i>	<i>54.0</i>	<i>-1.0</i>
<i>V</i>	<i>4824.000</i>	<i>36.6</i>	<i>33</i>	<i>34.9</i>	<i>38.5</i>	<i>54.0</i>	<i>-15.5</i>
<i>H</i>	<i>12060.000</i>	<i>29.6</i>	<i>33</i>	<i>40.5</i>	<i>37.1</i>	<i>54.0</i>	<i>-16.9</i>
<i>H</i>	<i>14472.000</i>	<i>29.8</i>	<i>33</i>	<i>40.0</i>	<i>36.8</i>	<i>54.0</i>	<i>-17.2</i>
<i>H</i>	<i>19296.000</i>	<i>32.1</i>	<i>33</i>	<i>37.7</i>	<i>36.8</i>	<i>54.0</i>	<i>-17.2</i>

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
<i>V</i>	<i>2390.000</i>	<i>76.2</i>	<i>33</i>	<i>29.4</i>	<i>72.6</i>	<i>74.0</i>	<i>-1.4</i>
<i>V</i>	<i>4824.000</i>	<i>50.2</i>	<i>33</i>	<i>34.9</i>	<i>52.1</i>	<i>74.0</i>	<i>-21.9</i>
<i>H</i>	<i>12060.000</i>	<i>43.3</i>	<i>33</i>	<i>40.5</i>	<i>50.8</i>	<i>74.0</i>	<i>-23.2</i>
<i>H</i>	<i>14472.000</i>	<i>44.0</i>	<i>33</i>	<i>40.0</i>	<i>51.0</i>	<i>74.0</i>	<i>-23.0</i>
<i>H</i>	<i>19296.000</i>	<i>45.7</i>	<i>33</i>	<i>37.7</i>	<i>50.4</i>	<i>74.0</i>	<i>-23.6</i>

- NOTES: 1. Average detector and Peak detector are used for the emission measurement.
2. All measurements were made at 3 meters. Harmonic 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 harmonic 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 used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of part 15.205.

Test Engineer: Koo Wai Ip

INTERTEK TESTING SERVICES

Company: VTech Telecommunications Ltd.

Date of Test: October 05-15, 2009

Model: IS9181

Mode : 802.11b with 11Mbps data rate (TX-Channel 06)

Table 2

Radiated Emissions Pursuant to FCC 15.247(d) Emission Requirement

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	4874.000	36.3	33	34.9	38.2	54.0	-15.8
H	7311.000	32.9	33	37.9	37.8	54.0	-16.2
H	12185.000	30.1	33	40.5	37.6	54.0	-16.4
H	19496.000	31.8	33	37.7	36.5	54.0	-17.5

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
V	4874.000	50.7	33	34.9	52.6	74.0	-21.4
H	7311.000	45.2	33	37.9	50.1	74.0	-23.9
H	12185.000	42.8	33	40.5	50.3	74.0	-23.7
H	19496.000	45.3	33	37.7	50.0	74.0	-24.0

- NOTES:
1. Average detector and Peak detector are used for the emission measurement.
 2. All measurements were made at 3 meters. Harmonic 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 harmonic 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 used for the emission over 1000MHz.
 5. Emission (the row indicated by **bold italic**) within the restricted band meets the requirement of part 15.205.

Test Engineer: Koo Wai Ip

INTERTEK TESTING SERVICES

Company: VTech Telecommunications Ltd.

Date of Test: October 05-15, 2009

Model: IS9181

Mode : 802.11b with 11Mbps data rate (TX-Channel 11)

Table 3

Radiated Emissions Pursuant to FCC 15.247(d) Emissions Requirement

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	2483.500	56.3	33	29.4	52.7	54.0	-1.3
V	4924.000	36.1	33	34.9	38.0	54.0	-16.0
H	7386.000	32.2	33	37.9	37.1	54.0	-16.9
H	12310.000	29.0	33	40.5	36.5	54.0	-17.5
H	19696.000	31.8	33	37.8	36.6	54.0	-17.4

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
V	2483.500	75.7	33	29.4	72.1	74.0	-1.9
V	4924.000	50.3	33	34.9	52.2	74.0	-21.8
H	7386.000	45.8	33	37.9	50.7	74.0	-23.3
H	12310.000	42.7	33	40.5	50.2	74.0	-23.8
H	19696.000	45.5	33	37.8	50.3	74.0	-23.7

- NOTES: 1. Average detector and Peak detector are used for the emission measurement.
2. All measurements were made at 3 meters. Harmonic 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 harmonic 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 used for the emission over 1000MHz.
5. Emission (the row indicated by **bold italic**) within the restricted band meets the requirement of part 15.205.

Test Engineer: Koo Wai Ip

INTERTEK TESTING SERVICES

Company: VTech Telecommunications Ltd.
Model: IS9181
Mode: 802.11b with 11Mbps data rate (TX)

Date of Test: October 05-15, 2009

Table 4

Radiated Emissions
Pursuant to FCC 15.247(d), 15.109 Emission Requirement

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
V	38.429	39.3	16	10.0	33.3	40.0	-6.7
V	42.020	38.7	16	10.0	32.7	40.0	-7.3
H	44.625	39.0	16	10.0	33.0	40.0	-7.0
H	50.096	40.6	16	11.0	35.6	40.0	-4.4
H	53.431	39.6	16	11.0	34.6	40.0	-5.4
H	62.534	41.1	16	10.0	35.1	40.0	-4.9
H	108.729	35.9	16	14.0	33.9	43.5	-9.6
H	168.436	30.6	16	18.0	32.6	43.5	-10.9
H	192.548	33.0	16	16.0	33.0	43.5	-10.5

- NOTES:
1. Quasi-peak detector is used for the emission below or equal to 1000 MHz.
 2. All measurements were made at 3 meters. Harmonic 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 harmonic 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 part 15.205.

Test Engineer: Koo Wai Ip

INTERTEK TESTING SERVICES

Company: VTech Telecommunications Ltd.

Date of Test: October 05-15, 2009

Model: IS9181

Mode : 802.11g with 54Mbps data rate (TX-Channel 01)

Table 5

Radiated Emissions Pursuant to FCC 15.247(d) Emissions Requirement

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)
<i>V</i>	<i>2390.000</i>	<i>56.3</i>	<i>33</i>	<i>29.4</i>	<i>52.7</i>	<i>54.0</i>	<i>-1.3</i>
<i>V</i>	<i>4824.000</i>	<i>36.4</i>	<i>33</i>	<i>34.9</i>	<i>38.3</i>	<i>54.0</i>	<i>-15.7</i>
<i>H</i>	<i>12060.000</i>	<i>28.1</i>	<i>33</i>	<i>40.5</i>	<i>35.6</i>	<i>54.0</i>	<i>-18.4</i>
<i>H</i>	<i>14472.000</i>	<i>28.7</i>	<i>33</i>	<i>40.0</i>	<i>35.7</i>	<i>54.0</i>	<i>-18.3</i>
<i>H</i>	<i>19296.000</i>	<i>30.3</i>	<i>33</i>	<i>37.7</i>	<i>35.0</i>	<i>54.0</i>	<i>-19.0</i>

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
<i>V</i>	<i>2390.000</i>	<i>76.9</i>	<i>33</i>	<i>29.4</i>	<i>73.3</i>	<i>74.0</i>	<i>-0.7</i>
<i>V</i>	<i>4824.000</i>	<i>50.4</i>	<i>33</i>	<i>34.9</i>	<i>52.3</i>	<i>74.0</i>	<i>-21.7</i>
<i>H</i>	<i>12060.000</i>	<i>43.1</i>	<i>33</i>	<i>40.5</i>	<i>50.6</i>	<i>74.0</i>	<i>-23.4</i>
<i>H</i>	<i>14472.000</i>	<i>42.4</i>	<i>33</i>	<i>40.0</i>	<i>49.4</i>	<i>74.0</i>	<i>-24.6</i>
<i>H</i>	<i>19296.000</i>	<i>44.6</i>	<i>33</i>	<i>37.7</i>	<i>49.3</i>	<i>74.0</i>	<i>-24.7</i>

- NOTES: 1. Average detector and Peak detector are used for the emission measurement.
2. All measurements were made at 3 meters. Harmonic 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 harmonic 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 used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of part 15.205.

Test Engineer: Koo Wai Ip

INTERTEK TESTING SERVICES

Company: VTech Telecommunications Ltd.

Date of Test: October 05-15, 2009

Model: IS9181

Mode : 802.11g with 54Mbps data rate (TX-Channel 06)

Table 6

Radiated Emissions Pursuant to FCC 15.247(d) Emission Requirement

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	4874.000	36.7	33	34.9	38.6	54.0	-15.4
H	7311.000	30.4	33	37.9	35.3	54.0	-18.7
H	12285.000	27.7	33	40.5	35.2	54.0	-18.8
H	19476.000	30.4	33	37.7	35.1	54.0	-18.9

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
V	4874.000	50.4	33	34.9	52.3	74.0	-21.7
H	7311.000	45.4	33	37.9	50.3	74.0	-23.7
H	12285.000	42.5	33	40.5	50.0	74.0	-24.0
H	19476.000	44.9	33	37.7	49.6	74.0	-24.4

- NOTES:
1. Average detector and Peak detector are used for the emission measurement.
 2. All measurements were made at 3 meters. Harmonic 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 harmonic 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 used for the emission over 1000MHz.
 5. Emission (the row indicated by **bold italic**) within the restricted band meets the requirement of part 15.205.

Test Engineer: Koo Wai Ip

INTERTEK TESTING SERVICES

Company: VTech Telecommunications Ltd.

Date of Test: October 05-15, 2009

Model: IS9181

Mode : 802.11g with 54Mbps data rate (TX-Channel 11)

Table 7

Radiated Emissions Pursuant to FCC 15.247(d) Emissions Requirement

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	2483.500	56.7	33	29.4	53.1	54.0	-0.9
V	4924.000	36.1	33	34.9	38.0	54.0	-16.0
H	7386.000	30.5	33	37.9	35.4	54.0	-18.6
H	12310.000	28.1	33	40.5	35.6	54.0	-18.4
H	19696.000	30.5	33	37.8	35.3	54.0	-18.7

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
V	2483.500	76.6	33	29.4	73.0	74.0	-1.0
V	4924.000	50.7	33	34.9	52.6	74.0	-21.4
H	7386.000	45.8	33	37.9	50.7	74.0	-23.3
H	12310.000	42.8	33	40.5	50.3	74.0	-23.7
H	19696.000	44.3	33	37.8	49.1	74.0	-24.9

NOTES: 1. Average detector and Peak detector are used for the emission measurement.

2. All measurements were made at 3 meters. Harmonic 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 harmonic 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.

5. Horn antenna used for the emission over 1000MHz.

5. Emission (the row indicated by **bold italic**) within the restricted band meets the requirement of part 15.205.

Test Engineer: Koo Wai Ip

INTERTEK TESTING SERVICES

Company: VTech Telecommunications Ltd.
Model: IS9181
Mode: 802.11g with 54Mbps data rate (TX)

Date of Test: October 05-15, 2009

Table 8

Radiated Emissions
Pursuant to FCC 15.247(d), 15.109 Emission Requirement

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
V	42.002	41.5	16	10.0	35.5	40.0	-4.5
V	44.625	38.5	16	10.0	32.5	40.0	-7.5
H	50.076	40.2	16	11.0	35.2	40.0	-4.8
H	53.392	39.6	16	11.0	34.6	40.0	-5.4
H	62.534	41.0	16	10.0	35.0	40.0	-5.0
H	108.745	37.6	16	14.0	35.6	43.5	-7.9
H	168.298	32.8	16	18.0	34.8	43.5	-8.7
H	192.364	34.3	16	16.0	34.3	43.5	-9.2

- NOTES:
1. Quasi-peak detector is used for the emission below or equal to 1000 MHz.
 2. All measurements were made at 3 meters. Harmonic 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 harmonic 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 part 15.205.

Test Engineer: Koo Wai Ip

INTERTEK TESTING SERVICES

Company: VTech Telecommunications Ltd.
Model: IS9181

Date of Test: October 05-15, 2009

4.10 AC Line Conducted Emission, FCC Rule 15.207, 15.107:

☐ Not required; battery operation only

☒ Test data attached

INTERTEK TESTING SERVICES

Company: VTech Telecommunications Ltd.
Model: IS9181

Date of Test: October 05-15, 2009

4.11 AC Line Conducted Configuration Photograph

Worst Case Line-Conducted Configuration
at

1.784 MHz

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

4.12 AC Line Conducted Emission Data

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

Judgement : Passed by 3.9 dB margin compared with average limit

For electronic filing, the worst case line conducted emission data are saved with filename: conduct.pdf

TEST PERSONNEL:



Tester Signature

Koo Wai Ip, Engineer
Typed/Printed Name

October 28, 2009
Date

INTERTEK TESTING SERVICES

Company: VTech Telecommunications Ltd.
Model: IS9181

Date of Test: October 05-15, 2009

4.13 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The transmitter ON time was determined from the resultant time-amplitude display.

	See attached spectrum analyzer chart (s) for transmitter timing
	See transmitter timing diagram provided by manufacturer
X	Not applicable, duty cycle was not used.

4.14 Radio Frequency Radiation Exposure, FCC Rule 15.247(i):

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 greater than the applicable low threshold from TCB Exclusions List (17 July 2002). EUT was evaluated for Specific Absorption Rate (SAR) evaluation compliance according to OET Bulletin 65 Supplement C (Edition 01-01) and SAR Measurement Requirements for 3-6GHz (October 2006, Revised). It is in compliance with the SAR evaluation requirements. The caution statement specified in the user manual.
- [x] 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 as filename: RF exposure.pdf

INTERTEK TESTING SERVICES

5.0 Equipment List

1) Radiated Emissions Test

Equipment	Spectrum Analyzer	
Registration No.	EW-1792	EW-2188
Manufacturer	R&S	AGILENTTECH
Model No.	FSP40	E4407B
Calibration Date	Feb. 02, 2009	Dec. 18, 2008
Calibration Due Date	Feb. 02, 2010	Dec. 18, 2009

Equipment	EMI Test Receiver	Log Periodic Antenna	Broad-Band Horn Antenna
Registration No.	EW-0014	EW-0446	EW-1679
Manufacturer	R&S	EMCO	SCHWARZBECK
Model No.	ESVS30	3146	BBHA9170
Calibration Date	Jun 01, 2009	Oct. 02, 2008	Feb. 10, 2009
Calibration Due Date	Jun 01, 2010	Apr. 02, 2010	Feb. 10, 2010

Equipment	Biconical Antenna	Double Ridged Guide Antenna	Digital Multimeter
Registration No.	EW-0954	EW-1015	EW-1234
Manufacturer	EMCO	EMCO	FLUKE
Model No.	3104C	3115	189
Calibration Date	Sep. 30, 2008	Jul. 28, 2008	Jun. 18, 2009
Calibration Due Date	Mar. 30, 2010	Jan. 28, 2010	Jul. 13, 2010

2) Conducted Emissions Test

Equipment	EMI Test Receiver	LISN	Pulse Limiter
Registration No.	EW-0017	EW-0090	EW-0700
Manufacturer	R&S	R&S	R&S
Model No.	ESHS30	ESH3-Z5	ESH3-Z2
Calibration Date	Jun. 01, 2009	Jan. 20, 2009	Jun. 08, 2009
Calibration Due Date	Jun. 01, 2010	Jan. 20, 2010	Dec. 08, 2010

3) Conductive Measurement Test

Equipment	RF Power Meter with Power Sensor	Spectrum Analyzer
Registration No.	EW-2270	EW-2253
Manufacturer	AGILENTTECH	R&S
Model No.	N1911A	FSP40
Calibration Date	Oct. 18, 2008	Aug. 12, 2008
Calibration Due Date	Oct. 18, 2009	Nov. 12, 2009