

Giant Telecom Ltd.

Application
For
Certification

Internet Radio Player with WiFi

FCC ID: RAQIT3500

HK09090292-1

MN/ sl

November 25, 2009

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INTERTEK TESTING SERVICES

MEASUREMENT/TECHNICAL REPORT

Giant Telecom Ltd. – MODEL: IT3500

FCC ID: RAQIT3500

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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Table of Contents

1.0 Summary of Test	4
2.0 General Description	6
2.1 Product Description	6
2.2 Test Methodology	6
2.3 Test Facility	6
3.0 System Test Configuration	8
3.1 Justification	8
3.2 EUT Exercising Software	8
3.3 Details of EUT Description of Peripherals	9
3.4 Measurement Uncertainty	10
3.5 Equipment Modification	10
4.0 Measurement Results	12
4.1 Maximum Conducted Output Power at Antenna Terminals	12
4.2 Minimum 6dB RF Bandwidth	13
4.3 Maximum Power Density	14
4.4 Out of Band Conducted Emissions	16
4.5 Transmitter Radiated Emissions in Restricted Bands	17
4.6 Radiated Spurious Emissions	17
4.7 Field Strength Calculation	18
4.8 Radiated Emission Configuration Photograph	19
4.9 Radiated Emission Data	19
4.10 AC Line Conducted Emission	28
4.11 AC Line Conducted Configuration Photograph	29
4.12 AC Line Conducted Emission Data	29
4.13 Transmitter Duty Cycle Calculation and Measurements	30
4.14 Radio Frequency Radiation Exposure	30
5.0 Equipment List	31

Appendix - Exhibits of Application for Certification

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EXHIBIT 1 SUMMARY OF TEST RESULTS

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1.0 Summary of Test

Giant Telecom Ltd. – MODEL: IT3500

FCC ID: RAQIT3500

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.

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EXHIBIT 2 GENERAL DESCRIPTION

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2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a Internet Radio Player with WiFi operated at 2412MHz - 2462MHz with 11 channels. It is powered by a 100-240VAC to 5VDC 2A switching AC adaptor. The EUT can access internet broadcasting station by WiFi (IEEE802.11b/g). The EUT also supports headphone output function and playback of digital multimedia contents such as photos and MP3.

Antenna 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.

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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 under normal mode. 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 5VDC 2A switching adaptor with ferrite.

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.

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.

Determination of pulse desensitization was made according to *Hewlett Packard Application Note 150-2, Spectrum Analysis... Pulsed RF*. The effective period (τ_{eff}) was 176 μ s. With the resolution bandwidth 1MHz and spectrum analyzer IF bandwidth 3 dB, the pulse desensitization factor was 0 dB.

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 (provided with the unit) were used to power the device. Their description are listed below.

- (1) Switching AC adaptor with ferrite (100-240VAC to 5VDC 2A, Model: ZDA050200US) (Supplied by Client)

Description of Peripherals:

- (1) SanDisk 512MB Ultra II SD card (Supplied by Intertek)
- (2) Headphone 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 by Giant Telecom 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 Giant Telecom Ltd.*



Signature

November 25, 2009 Date

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EXHIBIT 4 MEASUREMENT RESULTS

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: IT3500

Date of Test: November 11, 2009

4.0 Measurement Results

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

[x] 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 analyzer.

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

IEEE 802.11b (DSSS, 11Mbps) (Antenna Gain = 2 dBi)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	16.44	44.06
Middle Channel: 2437	15.05	31.99
High Channel: 2462	14.93	31.12

IEEE 802.11g (OFDM, 54Mbps) (Antenna Gain = 2 dBi)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	22.07	161.06
Middle Channel: 2437	20.83	121.06
High Channel: 2462	18.44	69.82

Cable loss: 0.5dB

External Attenuation: 0dB

Cable loss, external attenuation: [x] included in OFFSET function
[] added to SA raw reading

IEEE 802.11b (DSSS, 11Mbps):
EUT dBm max. output level = 16.44dBm (+30 dBm or less)

IEEE 802.11g (OFDM, 54Mbps):
EUT dBm max. output level = 22.07 dBm (+30 dBm or less)

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Company: Giant Telecom Ltd.
Model: IT3500

Date of Test: November 11, 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 20 dB lower than PEAK level. The 6 dB 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	10100
Middle Channel: 2437	10100
High Channel: 2462	10100

IEEE 802.11g (OFDM, 54Mbps)	
Frequency (MHz)	6 dB Bandwidth (kHz)
Low Channel: 2412	16700
Middle Channel: 2437	16700
High Channel: 2462	16700

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: Giant Telecom Ltd.
Model: IT3500

Date of Test: November 11, 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	-10.04
Middle Channel: 2437	-13.00
High Channel: 2462	-12.90

Frequency Span = 500kHz

Sweep Time = Frequency Span/3kHz
= 170 seconds

Cable Loss: 0.5 dB

Max. Peak Power Density (at 2412MHz) = -10.04dBm/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: Giant Telecom Ltd.
Model: IT3500

Date of Test: November 11, 2009

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	-11.88
Middle Channel: 2437	-14.08
High Channel: 2462	-14.02

Frequency Span = 500kHz

Sweep Time = Frequency Span/3kHz
= 170 seconds

Cable Loss: 0.5 dB

Max. Peak Power Density (at 2412MHz) = -11.88dBm/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: Giant Telecom Ltd.
Model: IT3500

Date of Test: November 11, 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.

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: Giant Telecom Ltd.
Model: IT3500

Date of Test: October 31-November 03, 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) and 15.109

- ☐ Not required – No digital part
- ☒ Test results are attached
- ☐ Included in the separated DoC report.

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Company: Giant Telecom Ltd.
Model: IT3500

Date of Test: October 31-November 03, 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 dB μ V/m

Level in μ V/m = Common Antilogarithm [(32 dB μ V/m)/20] = 39.8 μ V/m

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Company: Giant Telecom Ltd.
Model: IT3500

Date of Test: October 31-November 03, 2009

4.8 Radiated Emission Configuration Photograph

Worst Case Restricted Band Radiated Emission
at

2390.000 MHz

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 2.6 dB compare with the average limit

TEST PERSONNEL:



Tester Signature

Koo Wai Ip, Engineer
Typed/Printed Name

November 25, 2009
Date

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.

Date of Test: October 31-November 03, 2009

Model: IT3500

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 (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
<i>V</i>	2390.000	53.0	33	29.4	49.4	54.0	-4.6
<i>H</i>	4824.000	48.5	33	34.9	50.4	54.0	-3.6
<i>H</i>	12060.000	42.5	33	40.5	50.0	54.0	-4.0
<i>H</i>	14472.000	42.6	33	40.0	49.6	54.0	-4.4
<i>H</i>	19296.000	44.3	33	37.7	49.0	54.0	-5.0

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
<i>V</i>	2390.000	72.0	33	29.4	68.4	74.0	-5.6

- NOTES:
1. All Peak Detector Data except Average Detector Data at 2390MHz of the upper table.
 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 with ***bold italic***) within the restricted band meets the requirement of part 15.205.

Test Engineer: Koo Wai Ip

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.

Date of Test: October 31-November 03, 2009

Model: IT3500

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 (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
<i>H</i>	<i>4874.000</i>	<i>48.3</i>	<i>33</i>	<i>34.9</i>	<i>50.2</i>	<i>54.0</i>	<i>-3.8</i>
<i>H</i>	<i>7311.000</i>	<i>45.3</i>	<i>33</i>	<i>37.9</i>	<i>50.2</i>	<i>54.0</i>	<i>-3.8</i>
<i>H</i>	<i>12185.000</i>	<i>41.9</i>	<i>33</i>	<i>40.5</i>	<i>49.4</i>	<i>54.0</i>	<i>-4.6</i>
<i>H</i>	<i>19496.000</i>	<i>43.9</i>	<i>33</i>	<i>37.7</i>	<i>48.6</i>	<i>54.0</i>	<i>-5.4</i>

- NOTES:
1. Peak detector is 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 with ***bold italic***) within the restricted band meets the requirement of part 15.205.

Test Engineer: Koo Wai Ip

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.

Date of Test: October 31-November 03, 2009

Model: IT3500

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 (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
<i>V</i>	<i>2483.500</i>	<i>52.2</i>	<i>33</i>	<i>29.4</i>	<i>48.6</i>	<i>54.0</i>	<i>-5.4</i>
<i>H</i>	<i>4924.000</i>	<i>48.4</i>	<i>33</i>	<i>34.9</i>	<i>50.3</i>	<i>54.0</i>	<i>-3.7</i>
<i>H</i>	<i>7386.000</i>	<i>45.1</i>	<i>33</i>	<i>37.9</i>	<i>50.0</i>	<i>54.0</i>	<i>-4.0</i>
<i>H</i>	<i>12310.000</i>	<i>41.7</i>	<i>33</i>	<i>40.5</i>	<i>49.2</i>	<i>54.0</i>	<i>-4.8</i>
<i>H</i>	<i>19696.000</i>	<i>43.4</i>	<i>33</i>	<i>37.8</i>	<i>48.2</i>	<i>54.0</i>	<i>-5.8</i>

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
<i>V</i>	<i>2483.500</i>	<i>71.8</i>	<i>33</i>	<i>29.4</i>	<i>68.2</i>	<i>74.0</i>	<i>-5.8</i>

- NOTES:
1. All Peak Detector Data except Average Detector Data at 2483.5MHz of the upper table.
 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 with ***bold italic***) within the restricted band meets the requirement of part 15.205.

Test Engineer: Koo Wai Ip

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.

Date of Test: October 31-November 03, 2009

Model: IT3500

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

Table 4

Radiated Emissions
Pursuant to FCC 15.247(d) and 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	32.077	40.6	16	10.0	34.6	40.0	-5.4
V	42.663	40.2	16	10.0	34.2	40.0	-5.8
V	64.032	42.1	16	9.0	35.1	40.0	-4.9
V	85.326	46.4	16	8.0	38.4	40.0	-1.6
V	127.988	41.0	16	14.0	39.0	43.5	-4.5
H	170.652	35.5	16	18.0	37.5	43.5	-6.0
H	213.315	35.2	16	17.0	36.2	43.5	-7.3
H	341.304	28.8	16	24.0	36.8	46.0	-9.2
H	426.630	27.2	16	25.0	36.2	46.0	-9.8
H	511.956	24.2	16	27.0	35.2	46.0	-10.8

- 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 with ***bold italic***) within the restricted band meets the requirement of part 15.205.

Test Engineer: Koo Wai Ip

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.

Date of Test: October 31-November 03, 2009

Model: IT3500

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 (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
<i>V</i>	<i>2390.000</i>	<i>55.0</i>	<i>33</i>	<i>29.4</i>	<i>51.4</i>	<i>54.0</i>	<i>-2.6</i>
<i>H</i>	<i>4824.000</i>	<i>48.5</i>	<i>33</i>	<i>34.9</i>	<i>50.4</i>	<i>54.0</i>	<i>-3.6</i>
<i>H</i>	<i>12060.000</i>	<i>42.7</i>	<i>33</i>	<i>40.5</i>	<i>50.2</i>	<i>54.0</i>	<i>-3.8</i>
<i>H</i>	<i>14472.000</i>	<i>42.6</i>	<i>33</i>	<i>40.0</i>	<i>49.6</i>	<i>54.0</i>	<i>-4.4</i>
<i>H</i>	<i>19296.000</i>	<i>43.5</i>	<i>33</i>	<i>37.7</i>	<i>48.2</i>	<i>54.0</i>	<i>-5.8</i>

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
<i>V</i>	<i>2390.000</i>	<i>71.6</i>	<i>33</i>	<i>29.4</i>	<i>68.0</i>	<i>74.0</i>	<i>-6.0</i>

- NOTES:
1. All Peak Detector Data except Average Detector Data at 2390MHz of the upper table.
 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 with ***bold italic***) within the restricted band meets the requirement of part 15.205.

Test Engineer: Koo Wai Ip

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.

Date of Test: October 31-November 03, 2009

Model: IT3500

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 (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
<i>H</i>	<i>4874.000</i>	<i>48.4</i>	<i>33</i>	<i>34.9</i>	<i>50.3</i>	<i>54.0</i>	<i>-3.7</i>
<i>H</i>	<i>7311.000</i>	<i>45.3</i>	<i>33</i>	<i>37.9</i>	<i>50.2</i>	<i>54.0</i>	<i>-3.8</i>
<i>H</i>	<i>12185.000</i>	<i>42.3</i>	<i>33</i>	<i>40.5</i>	<i>49.8</i>	<i>54.0</i>	<i>-4.2</i>
<i>H</i>	<i>19496.000</i>	<i>43.7</i>	<i>33</i>	<i>37.7</i>	<i>48.4</i>	<i>54.0</i>	<i>-5.6</i>

- NOTES:
1. Peak detector is 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 with ***bold italic***) within the restricted band meets the requirement of part 15.205.

Test Engineer: Koo Wai Ip

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.

Date of Test: October 31-November 03, 2009

Model: IT3500

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 (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
<i>V</i>	<i>2483.500</i>	<i>52.1</i>	<i>33</i>	<i>29.4</i>	<i>48.5</i>	<i>54.0</i>	<i>-5.5</i>
<i>H</i>	<i>4924.000</i>	<i>48.4</i>	<i>33</i>	<i>34.9</i>	<i>50.3</i>	<i>54.0</i>	<i>-3.7</i>
<i>H</i>	<i>7386.000</i>	<i>45.5</i>	<i>33</i>	<i>37.9</i>	<i>50.4</i>	<i>54.0</i>	<i>-3.6</i>
<i>H</i>	<i>12310.000</i>	<i>42.0</i>	<i>33</i>	<i>40.5</i>	<i>49.5</i>	<i>54.0</i>	<i>-4.5</i>
<i>H</i>	<i>19696.000</i>	<i>43.4</i>	<i>33</i>	<i>37.8</i>	<i>48.2</i>	<i>54.0</i>	<i>-5.8</i>

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
<i>V</i>	<i>2483.500</i>	<i>71.8</i>	<i>33</i>	<i>29.4</i>	<i>68.2</i>	<i>74.0</i>	<i>-5.8</i>

- NOTES:
1. All Peak Detector Data except Average Detector Data at 2483.5MHz of the upper table.
 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 with ***bold italic***) within the restricted band meets the requirement of part 15.205.

Test Engineer: Koo Wai Ip

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.

Date of Test: October 31-November 03, 2009

Model: IT3500

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

Table 8

Radiated Emissions
Pursuant to FCC 15.247(d) and 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	32.077	40.6	16	10.0	34.6	40.0	-5.4
V	42.664	40.2	16	10.0	34.2	40.0	-5.8
V	64.032	42.2	16	9.0	35.2	40.0	-4.8
V	85.326	46.4	16	8.0	38.4	40.0	-1.6
V	127.988	40.2	16	14.0	38.2	43.5	-5.3
H	170.650	35.5	16	18.0	37.5	43.5	-6.0
H	213.315	35.0	16	17.0	36.0	43.5	-7.5
H	341.304	28.8	16	24.0	36.8	46.0	-9.2
H	426.630	27.0	16	25.0	36.0	46.0	-10.0
H	511.956	24.0	16	27.0	35.0	46.0	-11.0

- 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 with ***bold italic***) within the restricted band meets the requirement of part 15.205.

Test Engineer: Koo Wai Ip

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: IT3500

Date of Test: November 03, 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: Giant Telecom Ltd.
Model: IT3500

Date of Test: November 03, 2009

4.11 AC Line Conducted Configuration Photograph

Worst Case Line-Conducted Configuration
at

16.539 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 5.3 dB margin compare with the 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

November 25, 2009
Date

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: IT3500

Date of Test: October 31-November 03, 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 SWEF 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.
- [×] 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	Biconical Antenna	Log Periodic Antenna	Broad-Band Horn Antenna	Double Ridged Guide Antenna
Registration No.	EW-0954	EW-0446	EW-1679	EW-1015
Manufacturer	EMCO	EMCO	SCHWARZBECK	EMCO
Model No.	3104C	3146	BBHA9170	3115
Calibration Date	Sep. 30, 2008	Oct. 02, 2008	Feb. 10, 2009	Jul. 28, 2008
Calibration Due Date	Mar. 30, 2010	Apr. 02, 2010	Feb. 10, 2010	Jan. 28, 2010

Equipment	EMI Test Receiver	Digital Multimeter	Spectrum Analyzer	Spectrum Analyzer
Registration No.	EW-0014	EW-1237	EW-2188	EW-1792
Manufacturer	R&S	FLUKE	AGILENTTECH	R&S
Model No.	ESVS30	179	E4407B	FSP40
Calibration Date	Jun 01, 2009	Sep. 01, 2009	Dec. 18, 2008	Feb. 02, 2009
Calibration Due Date	Jun 01, 2010	Oct. 01, 2010	Dec. 18, 2009	Feb. 02, 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	Spectrum Analyzer	RF Power Meter with Power Sensor
Registration No.	EW-2253	EW-2270
Manufacturer	R&S	AGILENTTECH
Model No.	FSP40	N1911A
Calibration Date	Aug. 12, 2008	Nov. 04, 2009
Calibration Due Date	Nov. 12, 2009	Nov. 04, 2010