

Giant Telecom Ltd.

Application
For
Certification

2.4GHz Frequency Hopping Spread Spectrum Cordless Network (VOIP)
Phone

(FCC ID: RAQVP1000X)

04232601
TL/Ann Choy
February 3, 2005

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LIST OF EXHIBITS

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MEASUREMENT/TECHNICAL REPORT

Giant Telecom Ltd.- MODEL: VP1000
FCC ID: RAQVP1000X

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

Equipment Type: DSS-Part 15 Spread Spectrum Transmitter and Class B
Computer Peripheral

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

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 X

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [12-08-03 Edition] provision.

Report prepared by:

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List of attached file

| Exhibit type | File Description | filename |
|-----------------------|--|------------------------------|
| Cover Letter | Confidentiality Request | request.pdf |
| Test Report | Test Report | report.pdf |
| Operation Description | Technical Description | descri.pdf |
| Test Setup Photo | Radiated Emission for Base | config photos.doc |
| Test Setup Photo | Radiated Emission for Handset | config photos.doc |
| Test Report | Maximum Output Power Plot | bmaxop.pdf, hmaxop.pdf |
| Test Report | 20 dB Bandwidth Plot | b20dB.pdf, h20dB.pdf |
| Test Report | Minimum Number of Hopping Frequencies | bchno.pdf |
| Test Report | Minimum Hopping Channel Carrier Frequency Separation | bfsepa.pdf, hfsepa.pdf |
| Test Report | Average Channel Occupancy Time | bavetime.pdf, havetime.pdf |
| Test Report | Out Band Antenna Conducted Emission Plot | bobantcon.pdf, hobantcon.pdf |
| Test Report | Duty Cycle Calculation and Measurement | bdcc.pdf, hdcc.pdf |
| Test Setup Photo | Conducted Emission | config photos.doc |
| Test Report | Conducted Emission Test Result | conduct.pdf |
| External Photo | External Photo | external photos.doc |
| Internal Photo | Internal Photo | internal photos.doc |
| Block Diagram | Block Diagram | block.pdf |
| Schematics | Circuit Diagram | circuit.pdf |
| ID Label/Location | Label Artwork and Location | label.pdf |
| User Manual | User Manual | manual.pdf |
| User Manual | FCC Information | FCC information.pdf |
| RF Exposure Info | RF Safety | RF exposure info.pdf |

EXHIBIT 1
SUMMARY OF TEST RESULTS

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1.0 Summary of Test

Giant Telecom Ltd.- MODEL: VP1000
FCC ID: RAQVP1000X

| TEST | REFERENCE | RESULTS |
|---|--------------|------------------|
| Max. Output Power | 15.247(b) | Pass |
| Min. No. of Hopping Frequencies | 15.247(a)(1) | Pass |
| Min. Hopping Channel Carrier Frequency Separation | 15.247(a)(1) | Pass |
| Average Time of Occupancy | 15.247(a)(1) | Pass |
| Out of Band Antenna Conducted Emission | 15.247(c) | Pass |
| Radiated Emission in Restricted Bands | 15.247(c) | Pass |
| AC Conducted Emission | 15.207 | Pass |
| Radiated Emission from Digital Part | 15.109 | Pass |
| Antenna Requirement | 15.203 | Pass (See Notes) |

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 VP1000 is a 2.4GHz Frequency Hopping Spread Spectrum Cordless Network (VOIP) Phone. It operates at frequency range of 2401.056MHz to 2482.272MHz with 95 hopping frequencies.

The system includes a base unit and handset unit.

The base unit consists of a page key and a LAN interface.

The handset unit consists of a keypad with twelve standard keys (0,...9,*,#), nine function keys (V.Mail, PROG/Cancel, Int., Clear, Flash/Spk, Redial, Call return, Info, repeat dial). A Phone key is provided to control pick/release telephone line in a toggle base.

The antennas used in base unit and handset are integral, and the test sample is a prototype.

The circuit description and frequency hopping algorithm is saved with filename: descri.pdf

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2.2 Related Submittal(s) Grants

This is an application for Certification of a DSS-Part 15 Spread Spectrum Cordless VOIP Phone and a Class B Personal Computer Peripheral.

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2001). All measurements were performed in Open Area Test Sites. Preliminary 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. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

2.4 Test Facility

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

EXHIBIT 3
SYSTEM TEST CONFIGURATION

3.0 **System Test Configuration**

3.1 Justification

For emissions testing, the units were setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. The handset was powered by a fully charged battery.

For the measurements, the EUT is attached to a plastic stand if necessary and placed on the wooden turntable. If the base unit attaches to peripherals, they are connected and operational (as typical as possible). The handset is remotely located as far from the antenna and the base as possible to ensure full power transmission from the base. Else, the base is wired to transmit full power without modulation.

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. Detector function is in peak mode. 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.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000MHz. The resolution is 1MHz or greater for frequencies above 1000MHz.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9kHz to 25GHz.

3.2 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.

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3.3 Support Equipment List and Description

The FCC ID's for all equipment, plus descriptions of all cables used in the tested system (included inserted cards, which have grants) are:

HARDWARE:

The unit was operated standalone. An AC adapter (provided with the unit) was used to power the device. Its description is listed below.

- (1) 1 x AC adaptor for base unit (120VAC to 9VDC 700mA, Model: SA41-118A).
- (2) Non-removeable adaptor for extra charger (120VAC to 9VDC 200mA, Model: MA132-090020).
- (3) Rechargeable battery, Ni-MH battery 3.6V 600mA.

CABLES:

- (1) 3m RJ45 Cat 5 unshielded cable.

OTHERS:

- (1) HUB, Model: 1151A1. (Supplied by Client)
- (2) Headset with 1.2m unshielded cable.

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3.4 Measurement Uncertainty

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

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 ETL Division, Intertek Testing Services Hong Kong Ltd.

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

Confirmed by:

*Tommy Leung
Assistant Manager
Intertek Testing Services Hong Kong Ltd.
Agent for Giant Telecom Ltd.*



Signature

February 03, 2005 Date

EXHIBIT 4
MEASUREMENT RESULTS

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: VP1000

Date of Test: January 12, 2005-January 28, 2005

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 greater than 6 dBi, transmitter output level must be decreased by an amount equal to (GAIN - 6) dBm.

| (Base Unit) Antenna Gain = 1.5 dBi | | |
|------------------------------------|---------------|-----------------|
| Frequency (MHz) | Output in dBm | Output in mWatt |
| Low Channel: 2401.136 | 24.23 | 264.85 |
| Middle Channel: 2441.664 | 23.61 | 229.61 |
| High Channel: 2482.222 | 23.38 | 217.77 |

Cable loss : 0.5 dB External Attenuation : N/A dB

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

dBm max. output level = 24.23 dBm (30 dBm or less)

Please refer to the attached plots for details:

Plot B1a: Low Channel Output Power
Plot B1b: Middle Channel Output Power
Plot B1c: High Channel Output Power

Limit: 1W

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: VP1000

Date of Test: January 12, 2005-January 28, 2005

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

| (Handset Unit) Maximum Antenna Gain = -4.5 dBi | | |
|--|---------------|-----------------|
| Frequency (MHz) | Output in dBm | Output in mWatt |
| Low Channel: 2401.012 | 21.84 | 152.76 |
| Middle Channel: 2441.620 | 21.25 | 133.35 |
| High Channel: 2482.232 | 20.70 | 117.49 |

Cable loss : 0.5 dB External Attenuation : N/A dB

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

dBm max. output level = 21.84 dBm (30 dBm or less)

Please refer to the attached plots for details:

Plot H1a: Low Channel Output Power
Plot H1b: Middle Channel Output Power
Plot H1c: High Channel output Power

Limit: 1W

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

For RF Safety, the information is saved with filename: RF exposure info.pdf.

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Company: Giant Telecom Ltd.
Model: VP1000

Date of Test: January 12, 2005-January 28, 2005

4.2 Maximum 20 dB RF Bandwidth, FCC Rule 15.247(a)(1):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was chosen so that the display was a result of the hopping channel modulation. 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 20 dB bandwidth was determined from where the channel output spectrum intersected the display line.

| (Base Unit) | |
|-----------------|-----------------------|
| Frequency (MHz) | 20 dB Bandwidth (kHz) |
| 2482.272 | 750 |

Refer to the following plots for 20 dB bandwidth sharp:

Plot B2a: Low Channel 20 dB RF Bandwidth

Plot B2b: Middle Channel 20 dB RF Bandwidth

Plot B2c: High Channel 20 dB RF Bandwidth

For electronic filing, the above plots are saved with filename: b20dB.pdf

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Company: Giant Telecom Ltd.
Model: VP1000

Date of Test: January 12, 2005-January 28, 2005

4.2 Maximum 20 dB RF Bandwidth, FCC Rule 15.247(a)(1) - Continued:

| (Handset Unit) | |
|-----------------|-----------------------|
| Frequency (MHz) | 20 dB Bandwidth (kHz) |
| 2441.628 | 792 |

Refer to the following plots for 20 dB bandwidth sharp:

Plot H2a: Low Channel 20 dB RF Bandwidth

Plot H2b: Middle Channel 20 dB RF Bandwidth

Plot H2c: High Channel 20 dB RF Bandwidth

For electronic filing, the above plots are saved with filename: h20dB.pdf

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: VP1000

Date of Test: January 12, 2005-January 28, 2005

4.3 Minimum Number of Hopping Frequencies, FCC Rule 15.247(a)(1)(iii) :

The RF passband of the EUT was divided into 5 approximately equal bands. With the analyzer set to MAX HOLD readings were taken for 2-3 minutes in each band. The channel peaks so recorded were added together, and the total number compared to the minimum number of channels required in the regulation.

| Base Unit and Handset | |
|-------------------------|----|
| No. of hopping channels | 95 |

Minimum Requirements: at least 15 non-overlapping channels for 2400MHz-2483.5MHz.

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

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Company: Giant Telecom Ltd.
Model: VP1000

Date of Test: January 12, 2005-January 28, 2005

4.4 Minimum Hopping Channel Carrier Frequency Separation, FCC Ref: 15.247(a)(1) :

Using the DELTA MARKER function of the analyzer, the frequency separation between two adjacent channels was measured and compared against the limit.

[] 25 kHz [x] 20 dB bandwidth of hopping channel: 750kHz

| Base Unit | |
|--------------------|---------|
| Channel Separation | 856 kHz |

Plot B4: Channel 44 and Channel 46

Requirement: The frequency separation is more than 20dB bandwidth of hopping channel.

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

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: VP1000

Date of Test: January 12, 2005-January 28, 2005

4.4 Minimum Hopping Channel Carrier Frequency Separation, FCC Ref: 15.247(a)(1) - Continued:

Using the DELTA MARKER function of the analyzer, the frequency separation between two adjacent channels was measured and compared against the limit.

[] 25 kHz [x] 20 dB bandwidth of hopping channel: 792kHz

| Handset | |
|--------------------|---------|
| Channel Separation | 864 kHz |

Plot H4: Channel 44 and Channel 46

Requirement: The frequency separation is more than 20dB bandwidth of hopping channel.

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

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Company: Giant Telecom Ltd.
Model: VP1000

Date of Test: January 12, 2005-January 28, 2005

4.5 Average Channel Occupancy Time, FCC Ref: 15.247(a)(1)(iii)

The spectrum analyzer center frequency was set to one of the known hopping channels. The SWEEP was set to 38ms, the SPAN was set to ZERO SPAN, and the TRIGGER was set to VIDEO. The time duration of the transmission so captured was measured with the MARKER DELTA function.

The SWEEP was then set to the time required by the regulation (20 seconds for 902-928 MHz devices, if the 20dB bandwidth is less than 250kHz, 10 seconds for 902-928 MHz if the 20dB bandwidth is or greater than 250kHz, "0.4 seconds x Number of hopping channels employed" seconds for 2400-2483.5 MHz, 30 seconds for 5725-5850 MHz). The analyzer was set to SINGLE SWEEP, the total ON time was added and compared against the limit (0.4 seconds).

Average 0.4 seconds maximum occupancy in 38 seconds, (0.4sec. x 95) for 2400MHz-2483.5MHz.

| Base Unit | |
|--|----------|
| Average Occupancy Time = $810\mu\text{s} \times 4 \times 40$ | 129.6 ms |

Refer to attached spectrum analyzer plots B5a-e

| Hanset Unit | |
|---|-------|
| Average Occupancy Time = $800\mu\text{s} \times 40$ | 32 ms |

Refer to attached spectrum analyzer plots H5a-d

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

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Company: Giant Telecom Ltd.
Model: VP1000

Date of Test: January 12, 2005-January 28, 2005

4.6 Out of Band Radiated Emissions, FCC Rule 15.247(c):

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, or else shall meet the general limits for radiated emissions at frequencies outside the passband, whichever results in lower attenuation.

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:

Plot B6a.1- B6a.2: Low Channel Emissions
Plot B6b.1- B6b.2: Middle Channel Emissions
Plot B6c.1- B6c.2: High Channel Emissions
Plot B6d.1- B6d.2: Modulation Products Emissions*
Plot H6a.1- H6a.2: Low Channel Emissions
Plot H6b.1- H6b.2: Middle Channel Emissions
Plot H6c.1- H6c.2: High Channel Emissions
Plot H6d.1- H6d.2: Modulation Products Emissions*

The plots showed the 2nd harmonic and modulation products at the band edges of 2400 MHz and 2483.5 MHz. In addition, all spurious emission and up to the tenth harmonic was measured and they were found to be at least 26 dB below the highest level of the desired power in the passband.

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

*These 2 plots are shown the worst-case which has been already considered between enable and disable the hopping function of the EUT.

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

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Company: Giant Telecom Ltd.
Model: VP1000

Date of Test: January 12, 2005-January 28, 2005

4.7 Out of Band Radiated Emissions (for emissions in 4.6 above that are less than 20 dB below carrier), FCC Rule 15.247(c):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

- ☒ Not required, all emissions more than 20dB below fundamental
- ☐ See attached data sheet

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Company: Giant Telecom Ltd.
Model: VP1000

Date of Test: January 12, 2005-January 28, 2005

4.8 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.

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Company: Giant Telecom Ltd.
Model: VP1000

Date of Test: January 12, 2005-January 28, 2005

4.9 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.

$$RA = 62.0 \text{ dB}\mu\text{V}$$

$$AF = 7.4 \text{ dB}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$PD = 0 \text{ dB}$$

$$AV = -10 \text{ dB}$$

$$FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 \text{ dB}\mu\text{V/m}$$

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

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Company: Giant Telecom Ltd.
Model: VP1000

Date of Test: January 12, 2005-January 28, 2005

4.10 Radiated Emission Configuration Photograph - Base Unit

Worst Case Radiated Emission
at
4883.328 MHz

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

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Company: Giant Telecom Ltd.
Model: VP1000

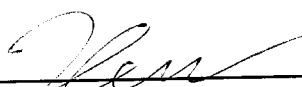
Date of Test: January 12, 2005-January 28, 2005

4.11 Radiated Emission Data - Base Unit

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

Judgement : Passed by 20.9 dB compare with the peak limit

TEST PERSONNEL:



Tester Signature

Kenneth C. C. Lam, Senior Lead Engineer
Typed/Printed Name

February 3, 2005
Date

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: VP1000
Mode : TX-Channel 0

Date of Test: January 12, 2005-January 28, 2005

Table 1, Base Unit

Radiated Emissions

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Average Factor (-dB) | Calculated at 3m (dBμV/m) | Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|--------------------|-------------------|-------------------------|---------------------------|---------------------------------|----------------------------|---------------------------------|----------------------------|----------------|
| V | *1200.569 | 58.9 | 34 | 25.5 | 50.4 | 29.7 | 20.7 | 54 | -33.3 |
| V | *4802.112 | 52.6 | 34 | 34.0 | 52.6 | 29.7 | 22.9 | 54 | -31.1 |
| V | *12005.280 | 42.3 | 34 | 40.2 | 48.5 | 29.7 | 18.8 | 54 | -35.2 |
| V | *19208.448 | 36.3 | 34 | 45.3 | 47.6 | 29.7 | 17.9 | 54 | -36.1 |

NOTES: 1. Peak detector data.

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 is used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Kenneth C. C. Lam

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: VP1000
Mode : TX-Channel 47

Date of Test: January 12, 2005-January 28, 2005

Table 2, Base unit

Radiated Emissions

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Average Factor (-dB) | Calculated at 3m (dBμV/m) | Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|--------------------|-------------------|-------------------------|---------------------------|---------------------------------|----------------------------|---------------------------------|----------------------------|----------------|
| V | *1220.832 | 58.8 | 34 | 25.5 | 50.3 | 29.7 | 20.6 | 54 | -33.4 |
| V | *4883.328 | 53.1 | 34 | 34.0 | 53.1 | 29.7 | 23.4 | 54 | -30.6 |
| V | *7324.992 | 49.0 | 34 | 37.0 | 52.0 | 29.7 | 22.3 | 54 | -31.7 |
| V | *12208.324 | 41.4 | 34 | 40.2 | 47.6 | 29.7 | 17.9 | 54 | -36.1 |
| V | *19533.312 | 35.9 | 34 | 45.3 | 47.2 | 29.7 | 17.5 | 54 | -36.5 |

NOTES: 1. Peak detector data.

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 is used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function, and this is the worst-case of 20.9 dB margin at 4883.328MHz.

Test Engineer: Kenneth C. C. Lam

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: VP1000
Mode : TX-Channel 94

Date of Test: January 12, 2005-January 28, 2005

Table 3, Base unit

Radiated Emissions

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Average Factor (-dB) | Calculated at 3m (dBμV/m) | Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|--------------------|-------------------|-------------------------|---------------------------|---------------------------------|----------------------------|---------------------------------|----------------------------|----------------|
| H | **2482.272 | 119.7 | 34 | 29.1 | 114.8 | 29.7 | 85.1 | --- | --- |
| V | *7446.816 | 48.7 | 34 | 37.0 | 51.7 | 29.7 | 22.0 | 54 | -32.0 |
| V | *12411.360 | 41.6 | 34 | 40.2 | 47.8 | 29.7 | 18.1 | 54 | -35.9 |
| V | *19858.176 | 36.3 | 34 | 45.3 | 47.6 | 29.7 | 17.9 | 54 | -36.1 |
| V | *22340.448 | 35.9 | 34 | 45.3 | 47.2 | 29.7 | 17.5 | 54 | -36.5 |

NOTES: 1. Peak detector data.

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 and average detector are used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

** Fundamental emission was measured for determining band-edge compliance of using delta measurement technique.

Test Engineer: Kenneth C. C. Lam

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: VP1000

Date of Test: January 12, 2005-January 28, 2005

4.12 Radiated Emission Configuration Photograph - Handset

Worst Case Radiated Emission
at
4883.326 MHz

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

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: VP1000

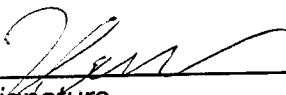
Date of Test: January 12, 2005-January 28, 2005

4.13 Radiated Emission Data - Handset

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

Judgement : Passed by 25.5 dB compare with the peak limit

TEST PERSONNEL:



Tester Signature

Kenneth C. C. Lam, Senior Lead Engineer
Typed/Printed Name

February 3, 2005
Date

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: VP1000
Mode : TX-Channel 0

Date of Test: January 12, 2005-January 28, 2005

Table 4, Handset

Radiated Emissions

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Average Factor (-dB) | Calculated at 3m (dBμV/m) | Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|--------------------|-------------------|-------------------------|---------------------------|---------------------------------|----------------------------|---------------------------------|----------------------------|----------------|
| V | *1200.568 | 55.3 | 34 | 25.5 | 46.8 | 41.9 | 4.9 | 54 | -49.1 |
| V | *4802.112 | 45.0 | 34 | 34.0 | 45.0 | 41.9 | 3.1 | 54 | -50.9 |
| V | *12005.285 | 40.0 | 34 | 40.2 | 46.2 | 41.9 | 4.3 | 54 | -49.7 |
| V | *19208.448 | 34.7 | 34 | 45.3 | 46.0 | 41.9 | 4.1 | 54 | -49.9 |

NOTES: 1. Peak detector data.

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 is used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Kenneth C. C. Lam

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: VP1000
Mode : TX-Channel 47

Date of Test: January 12, 2005-January 28, 2005

Table 5, Handset

Radiated Emissions

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Average Factor (-dB) | Calculated at 3m (dBμV/m) | Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|--------------------|-------------------|-------------------------|---------------------------|---------------------------------|----------------------------|---------------------------------|----------------------------|----------------|
| V | *1220.832 | 55.4 | 34 | 25.5 | 46.9 | 41.9 | 5.0 | 54 | -49.0 |
| V | *4883.326 | 48.5 | 34 | 34.0 | 48.5 | 41.9 | 6.6 | 54 | -47.4 |
| V | *7324.992 | 44.4 | 34 | 37.0 | 47.4 | 41.9 | 5.5 | 54 | -48.5 |
| V | *12208.320 | 41.3 | 34 | 40.2 | 47.5 | 41.9 | 5.6 | 54 | -48.4 |
| V | *19533.312 | 35.7 | 34 | 45.3 | 47.0 | 41.9 | 5.1 | 54 | -48.9 |

NOTES: 1. Peak detector data.

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 is used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function, and this is the worst-case of 25.5 dB margin at 4883.326MHz.

Test Engineer: Kenneth C. C. Lam

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: VP1000
Mode : TX-Channel 94

Date of Test: January 12, 2005-January 28, 2005

Table 6, Handset

Radiated Emissions

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBμV/m) | Average Factor (-dB) | Calculated at 3m (dBμV/m) | Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|---------------------------|----------------------|---------------------------|----------------------|-------------|
| V | **2482.275 | 112.8 | 34 | 29.1 | 107.9 | 41.9 | 66.0 | --- | --- |
| V | *7446.826 | 44.5 | 34 | 37.0 | 47.5 | 41.9 | 5.6 | 54 | -48.4 |
| V | *12411.365 | 41.4 | 34 | 40.2 | 47.6 | 41.9 | 5.7 | 54 | -48.3 |
| V | *19858.176 | 36.2 | 34 | 45.3 | 47.5 | 41.9 | 5.6 | 54 | -48.4 |
| V | *22340.449 | 34.9 | 34 | 45.3 | 46.2 | 41.9 | 4.3 | 54 | -49.7 |

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 is used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

** Fundamental emission was measured for determining band-edge compliance of using delta measurement technique.

Test Engineer: Kenneth C. C. Lam

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: VP1000

Date of Test: January 12, 2005-January 28, 2005

4.14 AC Line Conducted Emission, FCC Rule 15.207:

☐ Not required; battery operation only

☒ Test data attached

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: VP1000

Date of Test: January 12, 2005-January 28, 2005

4.15 Line Conducted Configuration Photograph - Base

Worst Case Line-Conducted Configuration

at 26.610 MHz

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

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: VP1000

Date of Test: January 12, 2005-January 28, 2005


4.16 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 more than -17.0 dB margin compare with average limit

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

TEST PERSONNEL:



Tester Signature

Kenneth C. C. Lam, Senior Lead Engineer
Typed/Printed Name

February 3, 2005
Date

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: VP1000

Date of Test: January 12, 2005-January 28, 2005

4.17 Radiated Emissions from Digital Section of Transceiver and Class B Personal Computer Peripheral, FCC Ref: 15.109

☐ Not required - No digital part

☒ Test results are attached

☐ Included in the separated DOC report.

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: VP1000
Mode: Talk

Date of Test: January 12, 2005-January 28, 2005

Table 7, Base Unit

Radiated Emissions

| Polarization | Frequency (MHz) | Reading (dB μ V) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) |
|--------------|--------------------|-------------------------|-------------------------|---------------------------|--------------------------------|-------------------------|----------------|
| V | 155.520 | 33.2 | 16 | 12.4 | 29.6 | 43.5 | -13.9 |
| H | 176.259 | 31.0 | 16 | 15.5 | 30.5 | 43.5 | -13.0 |
| H | 225.002 | 38.8 | 16 | 11.4 | 34.2 | 46.0 | -11.8 |
| H | 250.002 | 37.7 | 16 | 12.4 | 34.1 | 46.0 | -11.9 |
| H | 300.002 | 37.3 | 16 | 14.3 | 35.6 | 46.0 | -10.4 |
| H | 375.006 | 34.8 | 16 | 15.4 | 34.2 | 46.0 | -11.8 |
| H | 400.020 | 33.2 | 16 | 15.9 | 33.1 | 46.0 | -12.9 |

- 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.

Test Engineer: Kenneth C. C. Lam

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: VP1000
Mode: Talk

Date of Test: January 12, 2005-January 28, 2005

Table 8, Handset

Radiated Emissions

| Polarization | Frequency (MHz) | Reading (dB μ V) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) |
|--------------|--------------------|-------------------------|-------------------------|---------------------------|--------------------------------|-------------------------|----------------|
| H | 125.007 | 35.5 | 16 | 12.6 | 32.1 | 43.5 | -11.4 |
| H | 150.007 | 37.7 | 16 | 11.9 | 33.6 | 43.5 | -9.9 |
| H | 155.518 | 38.6 | 16 | 12.4 | 35.0 | 43.5 | -8.5 |
| H | 165.896 | 42.3 | 16 | 13.8 | 40.1 | 43.5 | -3.4 |
| H | 176.253 | 39.6 | 16 | 15.5 | 39.1 | 43.5 | -4.4 |
| H | 186.620 | 38.3 | 16 | 16.7 | 39.0 | 43.5 | -4.5 |
| H | 225.002 | 39.8 | 16 | 11.4 | 35.2 | 46.0 | -10.8 |
| H | 250.002 | 37.8 | 16 | 12.4 | 34.2 | 46.0 | -11.8 |
| H | 300.006 | 37.6 | 16 | 14.3 | 35.9 | 46.0 | -10.1 |
| H | 375.006 | 35.1 | 16 | 15.4 | 34.5 | 46.0 | -11.5 |
| H | 400.020 | 35.3 | 16 | 15.9 | 35.2 | 46.0 | -10.8 |
| H | 500.190 | 32.2 | 16 | 18.0 | 34.2 | 46.0 | -11.8 |

- 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.

Test Engineer: Kenneth C. C. Lam

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: VP1000
Mode: Data Transfer

Date of Test: January 12, 2005-January 28, 2005

Table 8, VOIP

Radiated Emissions

| Polarization | Frequency (MHz) | Reading (dB μ V) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) |
|--------------|--------------------|-------------------------|-------------------------|---------------------------|--------------------------------|-------------------------|----------------|
| V | 50.007 | 31.3 | 16 | 11.7 | 27.0 | 40.0 | -13.0 |
| V | 75.007 | 39.7 | 16 | 6.3 | 30.0 | 40.0 | -10.0 |
| H | 100.004 | 38.2 | 16 | 11.6 | 33.8 | 43.5 | -9.7 |
| H | 125.007 | 41.4 | 16 | 12.6 | 38.0 | 43.5 | -5.5 |
| H | 150.007 | 36.9 | 16 | 11.9 | 32.8 | 43.5 | -10.7 |
| H | 225.002 | 40.1 | 16 | 11.4 | 35.5 | 46.0 | -10.5 |
| H | 250.002 | 44.7 | 16 | 12.4 | 41.1 | 46.0 | -4.9 |
| H | 300.006 | 42.4 | 16 | 14.3 | 40.7 | 46.0 | -5.3 |
| H | 375.006 | 43.9 | 16 | 15.4 | 43.3 | 46.0 | -2.7 |
| H | 400.020 | 36.7 | 16 | 15.9 | 36.6 | 46.0 | -9.4 |
| H | 500.019 | 33.5 | 16 | 18.0 | 35.5 | 46.0 | -10.5 |
| H | 624.999 | 32.7 | 16 | 18.9 | 35.6 | 46.0 | -10.4 |

- 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.

Test Engineer: Kenneth C. C. Lam

INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.
Model: VP1000

Date of Test: January 12, 2005-January 28, 2005

4.18 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:

Base Unit:

$$\begin{aligned}\text{Duty cycle (DC)} &= \text{Maximum ON time in } 100\text{ms}/100\text{ms} \\ &= (0.18 \times 4)\text{ms}/100\text{ms}\end{aligned}$$

$$\begin{aligned}\text{Duty cycle correction, dB} &= 20 * \log (\text{DC}) \\ &= 20 * \log (0.0324) \\ &= -29.7 \text{ dB}\end{aligned}$$

Handset:

$$\begin{aligned}\text{Duty cycle (DC)} &= \text{Maximum ON time in } 0.8\text{ms}/100\text{ms} \\ &= 0.008\end{aligned}$$

$$\begin{aligned}\text{Duty cycle correction, dB} &= 20 * \log (\text{DC}) \\ &= 20 * \log (0.008) \\ &= -41.9 \text{ dB}\end{aligned}$$

| | |
|---|---|
| X | See attached spectrum analyzer chart (s) for transmitter timing Base Unit: Plot B7a-b, Handset: Plot H7a-b |
| | See transmitter timing diagram provided by manufacturer |
| | Not applicable, duty cycle was not used. |

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

EXHIBIT 5
EQUIPMENT PHOTOGRAPHS

5.0 **Equipment Photographs**

For electronic filing, the photographs are saved with filename: external photos.doc & internal photos.doc

EXHIBIT 6
PRODUCT LABELLING

6.0 **Product Labelling**

For electronic filing, the FCC ID label artwork and location is saved with filename:
label.pdf

EXHIBIT 7
TECHNICAL SPECIFICATIONS

7.0 **Technical Specifications**

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

EXHIBIT 8
INSTRUCTION MANUAL

INTERTEK TESTING SERVICES

8.0 **Instruction Manual**

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

Please note that the required FCC Information to the User is saved with filename: FCC information.pdf.

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

EXHIBIT 9
CONFIDENTIALITY REQUEST

9.0 **Confidentiality Request**

For electronic filing, confidentiality request is saved with filename: request.pdf.

EXHIBIT 10
SECURITY CODE INFORMATION

10.0 **Security Code Information**

The VP1000 has at least 2^{64} discrete digital codes, and the code is automatically generated during registration and send through the charging terminals to the base and the base confirms over the air.