



Giant Telecom Ltd.

Application  
For  
Certification

2.4GHz Direct Sequence Spread Spectrum 10 Channel  
Cordless Phone with Caller ID and Speakerphone

**(FCC ID: RAQ22437EX)**

07216581  
BH/ ac  
November 19, 2007

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## INTERTEK TESTING SERVICES

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### MEASUREMENT/TECHNICAL REPORT

**Giant Telecom Ltd.- MODEL: EX22437AE1E-A  
EX22437EE1E-A**

**FCC ID: RAQ22437EX**

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

Equipment Type: DTS - Digital Transmission System

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 [05-04-07 Edition] provision.

Report prepared by:

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### List of attached file

Exhibit type	File Description	filename
Test Report	Test Report	report.pdf
Operation Description	Technical Description	descri.pdf
Test Report	Maximum Output Power Plot	maxop.pdf
RF Exposure Info	RF Safety	RF exposure info.pdf
Test Report	6 dB Bandwidth Plot	6dB.pdf
Test Report	Maximum Power Density Plot	maxpd.pdf
Test Report	Out Band Antenna Conducted Emission Plot	obantcon.pdf
Test Report	Duty Cycle Calculation and Measurement	dcc.pdf
Test Setup Photo	Radiated & Conducted Emission for Base Unit	config photos.doc
Test Setup Photo	Radiated & Conducted Emission for Handset	
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
Operation Description	Security Code Information	security.pdf
Cover Letter	Confidentiality Request	request.pdf

**EXHIBIT 1**  
**SUMMARY OF TEST RESULTS**

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## INTERTEK TESTING SERVICES

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### 1.0 Summary of Test

**Giant Telecom Ltd.- MODEL: EX22437AE1E-A  
EX22437EE1E-A**

**FCC ID: RAQ22437EX**

TEST	REFERENCE	RESULTS
Max. Output power	15.247(b)	Pass
6 dB Bandwidth	15.247(a)(2)	Pass
Max. 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
AC Conducted Emission from Transmitter Part	15.207	Pass
Radiated Emission from Transmitter Part	15.209	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**



## INTERTEK TESTING SERVICES

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### 2.0 **General Description**

#### 2.1 Product Description

The EX22437AE1E-A is a 2.4GHz Direct Sequence Spread Spectrum 10 Channel Cordless Phone with Caller ID and Speakerphone. It operates at frequency range of 2406.240MHz to 2475.360MHz with 10 Channels. The unit is capable of either tone or pulse dialing. The internal power supply's isolation is accomplished through a power transformer having an adequate dielectric rating. The circuit wiring is consistent under the requirement of part 68.

The handset unit consists of a keypad with twelve standard keys (0,...9,\*,#), eight function keys (menu/ok, speakerphone, Redial/up key, caller ID/down key, Cancel/mute key, Intercom key, phonebook key, Flash key). A Talk key and an OFF key are provided to control pick and release telephone line respectively.

The base unit has a page key, which is used to communicate with handset unit.

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

The Model: EX22437EE1E-A is the same as the Model: EX22437AE1E-1 in hardware aspect. The difference in model number serves as marketing strategy.

The circuit description is saved with filename: descri.pdf

Connection between the device and the telephone network is accomplished through the use of USOC RJ11C in the 2-wire loop calling central office line.

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### 2.2 Related Submittal(s) Grants

This is an application for Certification of a DTS - Digital Transmission System. Two transmitters are included in this application. The device is also subject to Part 68 Registration.

### 2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2003). 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 equipment under test (EUT) was 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 cardboard box 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. 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.

Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

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.

#### 3.2 EUT Exercising Software

The EUT exercise program (provided by client) 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) Base Unit: An AC Adaptor: (230VAC to 6VDC 350mA, Model: VD060035D)
- (2) Handset: 2 x "Ni-MH" type rechargeable battery (1.2V 600mAh)

#### Description of Peripherals:

- (1) Telecommunication cable with RJ11C connectors (1m, unshielded), terminated
- (2) Reverse Converter (Input 120VAC, Output 230VAC)

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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:*

*Ho Wai Kin, Ben  
Supervisor  
Intertek Testing Services Hong Kong Ltd.  
Agent for Giant Telecom Ltd.*



\_\_\_\_\_  
Signature

November 19, 2007 Date

**EXHIBIT 4**  
**MEASUREMENT RESULTS**

## INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A

Date of Test: September 11-October 15, 2007

### 4.0 **Measurement Results**

#### 4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3):

- ☐ 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 > 6dB 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 (+30 dBm).

(Base Unit) Antenna Gain = 0 dBi		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2406.240	23.28	212.81
Middle Channel: 2445.120	22.47	176.60
High Channel: 2475.360	21.73	148.94

Cable loss : 0.5 dB External Attenuation : 0 dB

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

EUT dBm max. output level = 23.28 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



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## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A

Date of Test: September 11-October 15, 2007

### 4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3) - Continued:

(Handset Unit) Maximum Antenna Gain = 0 dBi		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2406.240	17.80	60.26
Middle Channel: 2445.120	18.31	67.76
High Channel: 2475.360	18.48	70.47

Cable loss : 0.5 dB External Attenuation : 0 dB

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

EUT dBm max. output level = 18.48 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

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

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

## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A

Date of Test: September 11-October 15, 2007

### 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.

Base Unit	
Frequency (MHz)	6 dB Bandwidth (kHz)
2475.360	786.000

Limit: at least 500kHz

Refer to the following plots for 6 dB bandwidth sharp:

Plot B2A: Low Channel 6 dB RF Bandwidth  
Plot B2B: Middle Channel 6 dB RF Bandwidth  
Plot B2C: High Channel 6 dB RF Bandwidth

## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A

Date of Test: September 11-October 15, 2007

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

(Handset Unit)	
Frequency (MHz)	6 dB Bandwidth (kHz)
2406.240	846.000

Limit: at least 500kHz

Refer to the following plots for 6 dB bandwidth sharp:

Plot H2A: Low Channel 6 dB RF Bandwidth

Plot H2B: Middle Channel 6 dB RF Bandwidth

Plot H2C: High Channel 6 dB RF Bandwidth

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

## INTERTEK TESTING SERVICES

Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A

Date of Test: September 11-October 15, 2007

### 4.3 Maximum Power Density Reading, 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 compensated for with the analyzer OFFSET function.

Since the spectrum line spacing is less than 3kHz which is provided by the manufacturer, the RES BW was reduced below 3kHz until the individual lines were resolved. It is found that they were resolved when RES BW is 100Hz. The measured data was normalized to 3kHz bandwidth by adding the following correction factor:

$$10\log (3\text{kHz}/100\text{Hz}) = 14.77\text{dB}$$

Base Unit	
Frequency (MHz)	Power Density (dBm/3kHz)
2406.499	3.53

Frequency Span = 50kHz

Sweep Time = Frequency Span/100Hz  
= 500 seconds

Cable Loss: 0.5 dB

Peak Power Density (at 2406.499MHz) = -11.24dBm/100Hz + 14.8dB  
= 3.53dBm/3kHz

Limit: 8dBm/ 3kHz

Refer to the following plots for power density data :

Plot B3A-A1: Low Channel power density  
Plot B3B-B1: Middle Channel power density  
Plot B3C-C1: High Channel power density

## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A

Date of Test: September 11-October 15, 2007

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

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 compensated for with the analyzer OFFSET function.

Since the spectrum line spacing is less than 3kHz which is provided by the manufacturer, the RES BW was reduced below 3kHz until the individual lines were resolved. It is found that they were resolved when RES BW is 300Hz. The measured data was normalized to 3kHz bandwidth by adding the following correction factor:

$$10\log (3\text{kHz}/300\text{Hz})= 10.00 \text{ dB}$$

Handset Unit	
Frequency (MHz)	Power Density (dBm/3kHz)
2475.591	5.52

Frequency Span = 150kHz

Sweep Time = Frequency Span/300Hz  
= 500 seconds

Cable Loss: 0.5 dB

Peak Power Density (at 2475.591MHz) = -4.48dBm/300Hz + 10.00dB  
= 5.52dBm/3kHz

Limit: 8dBm/ 3kHz

Refer to the following plots for power density data :

Plot H3A-A1: Low Channel power density  
Plot H3B-B1: Middle Channel power density  
Plot H3C-C1: High Channel power density

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

## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A

Date of Test: September 11-October 15, 2007

### 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 20dB 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 B4A1 - B4A2: Low Channel Emissions  
Plot B4B1 - B4B2: Middle Channel Emissions  
Plot B4C1 - B4C2: High Channel Emissions  
Plot B4D1 - B4D2: Modulation Products Emissions  
Plot H4A1 - H4A2: Low Channel Emissions  
Plot H4B1 - H4B2: Middle Channel Emissions  
Plot H4C1 - H4C2: High Channel Emissions  
Plot H4D1 - H4D2: Modulation Products Emissions

The plots showed the 2<sup>nd</sup> harmonic and modulation products at the band edges of 2400MHz and 2483.5MHz. In addition, 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.

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

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

## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A

Date of Test: September 11-October 15, 2007

### 4.5 Out of Band Radiated Emissions (for emissions in 4.4 above that are less than 20dB below carrier), FCC Rule 15.247(d):

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, since all emissions are more than 20dB below fundamental
- ☐ See attached data sheet

### 4.6 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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## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A

Date of Test: September 11-October 15, 2007

### 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 $\mu$ V/m

RA = Receiver Amplitude (including preamplifier) in dB $\mu$ 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 $\mu$ 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 $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

RA = 62.0 dB $\mu$ V

AF = 7.4 dB

CF = 1.6 dB

AG = 29.0 dB

PD = 0 dB

AV = -10 dB

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

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



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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A

Date of Test: September 11-October 15, 2007

### 4.8 Radiated Emission Configuration Photograph - Base Unit

Worst Case Radiated Emission  
at  
7335.360 MHz

For the 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: EX22437AE1E-A

Date of Test: September 11-October 15, 2007

### 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 5.1 dB margin compare with the peak limit

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### **TEST PERSONNEL:**



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*Tester Signature*

Jess Tang, Lead Engineer  
*Typed/Printed Name*

November 19, 2007  
*Date*

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## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A  
Mode : TX-Channel 0

Date of Test: September 11-October 15, 2007

Table 1 (Base Unit)

### Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB $\mu$ V/m)	Average Factor (-dB)	Calculated at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
H	*4812.480	58.3	33	34.9	60.2	21.1	39.1	54.0	-14.9
H	*12031.200	61.2	33	40.5	68.7	21.1	47.6	54.0	-6.4

- NOTES:
1. Peak detector is used for the emission measurement.
  2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
  3. Negative value in the margin column shows emission below limit.
  4. Horn antenna 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: Jess Tang

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## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A  
Mode : TX-Channel 5

Date of Test: September 11-October 15, 2007

Table 2 (Base Unit)

### Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB $\mu$ V/m)	Average Factor (-dB)	Calculated at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
H	*4890.240	58.1	33	34.9	60.0	21.1	38.9	54.0	-15.1
H	*7335.360	64.0	33	37.9	68.9	21.1	47.8	54.0	-6.2
H	*12225.600	61.0	33	40.5	68.5	21.1	47.4	54.0	-6.6

- NOTES: 1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna 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 5.1dB margin at 7335.360MHz.

Test Engineer: Jess Tang

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## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A  
Mode : TX-Channel 9

Date of Test: September 11-October 15, 2007

Table 3 (Base Unit)

### Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB $\mu$ V/m)	Average Factor (-dB)	Calculated at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
H	**2475.360	117.7	33	29.4	114.1	21.1	93.0	---	---
H	*4950.720	57.9	33	34.9	59.8	21.1	38.7	54.0	-15.3
H	*7426.080	63.2	33	37.9	68.1	21.1	47.0	54.0	-7.0
H	*12376.800	60.7	33	40.5	68.2	21.1	47.1	54.0	-6.9

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

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

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

4. Horn antenna 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: Jess Tang

## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A

Date of Test: September 11-October 15, 2007

### 4.10 Radiated Emission Configuration Photograph - Handset Unit

Worst Case Radiated Emission  
at  
7426.080 MHz

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

## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A

Date of Test: September 11-October 15, 2007

### 4.11 Radiated Emission Data

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

Judgement : Passed by 12.9 dB margin compare with the peak limit

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### **TEST PERSONNEL:**



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*Tester Signature*

Jess Tang, Lead Engineer  
*Typed/Printed Name*

November 19, 2007  
*Date*

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## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A  
Mode : TX-Channel 0

Date of Test: September 11-October 15, 2007

Table 4, Handset Unit

### Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB $\mu$ V/m)	Average Factor (-dB)	Calculated at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
H	*4812.480	55.9	33	34.9	57.8	28.4	29.4	54.0	-24.6
H	*12031.200	50.9	33	40.5	58.4	28.4	30.0	54.0	-24.0

- NOTES:
1. Peak detector is used for the emission measurement.
  2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
  3. Negative value in the margin column shows emission below limit.
  4. Horn antenna 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: Jess Tang



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## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A  
Mode : TX-Channel 5

Date of Test: September 11-October 15, 2007

Table 5, Handset Unit

### Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB $\mu$ V/m)	Average Factor (-dB)	Calculated at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
H	*4890.240	56.0	33	34.9	57.9	28.4	29.5	54.0	-24.5
H	*7335.360	56.1	33	37.9	61.0	28.4	32.6	54.0	-21.4
H	*12225.600	50.7	33	40.5	58.2	28.4	29.8	54.0	-24.2

- NOTES:
1. Peak detector is used for the emission measurement.
  2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
  3. Negative value in the margin column shows emission below limit.
  4. Horn antenna 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: Jess Tang

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## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A  
Mode : TX-Channel 9

Date of Test: September 11-October 15, 2007

Table 6, Handset Unit

### Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB $\mu$ V/m)	Average Factor (-dB)	Calculated at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
H	**2475.360	113.8	33	29.4	110.2	28.4	81.8	---	---
H	*4950.720	55.4	33	34.9	57.3	28.4	28.9	54.0	-25.1
H	*7426.080	56.2	33	37.9	61.1	28.4	32.7	54.0	-21.3
H	*12376.800	50.1	33	40.5	57.6	28.4	29.2	54.0	-24.8

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

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

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

4. Horn antenna 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 12.9dB margin at 7426.080MHz.

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

Test Engineer: Jess Tang

## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A

Date of Test: September 11-October 15, 2007

4.12 AC Line Conducted Emission, FCC Rule 15.207:

☐ Not required; battery operation only

☒ Test data attached

## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A

Date of Test: September 11-October 15, 2007

### 4.13 Line Conducted Configuration Photograph - Base Unit

#### Worst Case Line-Conducted Configuration

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

## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A

Date of Test: September 11-October 15, 2007

### 4.14 Line Conducted 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 more than 20 dB margin

For electronic filing, the conducted emission test result is saved with filename: conduct.pdf

### **TEST PERSONNEL:**



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*Tester Signature*

Jess Tang, Lead Engineer  
*Typed/Printed Name*

November 19, 2007  
*Date*

## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A

Date of Test: September 11-October 15, 2007

### 4.15 Line Conducted Configuration Photograph - Handset Unit

#### Worst Case Line-Conducted Configuration

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

## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A

Date of Test: September 11-October 15, 2007

### 4.16 Line Conducted Emission Data - Handset Unit

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

Judgement : Passed by more than 20 dB margin

For electronic filing, the conducted emission test result is saved with filename: conduct.pdf

### **TEST PERSONNEL:**



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*Tester Signature*

Jess Tang, Lead Engineer  
*Typed/Printed Name*

November 19, 2007  
*Date*

## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A

Date of Test: September 11-October 15, 2007

### 4.17 Radiated Emissions from Transmitter Part, FCC Ref: 15.209

☐ Not required - No digital part

☒ Test results are attached

☐ Included in the separated DOC report.



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## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A  
Mode: Talking

Date of Test: September 11-October 15, 2007

Table 7, Base Unit

### Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
V	38.007	37.4	16	10.0	31.4	40.0	-8.6
V	46.741	37.8	16	11.0	32.8	40.0	-7.2
V	54.862	37.4	16	11.0	32.4	40.0	-7.6
V	60.625	37.8	16	10.0	31.8	40.0	-8.2
V	72.294	39.9	16	7.0	30.9	40.0	-9.1
V	120.458	32.0	16	14.0	30.0	43.5	-13.5

- NOTES: 1. Quasi-peak detector is used for the emission below or equal to 1000 MHz.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.

Test Engineer: Jess Tang

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## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A  
Mode: Talk with Charging

Date of Test: September 11-October 15, 2007

Table 8, Handset Unit

### Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
V	37.710	34.9	16	10.0	28.9	40.0	-11.1
V	46.245	34.4	16	11.0	29.4	40.0	-10.6
V	57.889	35.0	16	11.0	30.0	40.0	-10.0
V	67.164	37.8	16	8.0	29.8	40.0	-10.2
V	71.028	38.7	16	7.0	29.7	40.0	-10.3
V	126.064	31.4	16	14.0	29.4	43.5	-14.1

- NOTES: 1. Quasi-peak detector is used for the emission below or equal to 1000 MHz.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.

Test Engineer: Jess Tang

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## INTERTEK TESTING SERVICES

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Company: Giant Telecom Ltd.  
Model: EX22437AE1E-A

Date of Test: September 11-October 15, 2007

### 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 SWEPT function on the analyzer was set to ZERO SPAN. The transmitter ON time was determined from the resultant time-amplitude display:

Base Unit:

Duty cycle (DC) = Maximum ON time in 10ms/10ms  
= [(0.380ms x 2) + 0.120ms]/10ms for 2 handsets operation

Duty cycle correction, dB =  $20 \cdot \log(\text{DC})$   
=  $20 \cdot \log(0.088)$   
= -21.1 dB

Handset:

Duty cycle (DC) = Maximum ON time in 10ms/10ms  
= 0.380ms/10ms

Duty cycle correction, dB =  $20 \cdot \log(\text{DC})$   
=  $20 \cdot \log(0.038)$   
= -28.4 dB

X	See attached spectrum analyzer chart (s) for transmitter timing Plot B5A1: Dummy bearer, Base Unit Plot B5A2: Traffic bearer, Base Unit Plot H5A: Traffic bearer, Handset
	See transmitter timing diagram provided by manufacturer
	Not applicable, duty cycle was not used.

For electronic filing, the above plots are saved with filename: dcc.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**

### 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 attached on P.17 of the Instruction Manual.

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

**EXHIBIT 9**  
**SECURITY CODE INFORMATION**

### 9.0 **Security code information**

For electronic filing, Security Code Information is saved with filename: security.pdf.

**EXHIBIT 10**  
**CONFIDENTIALITY REQUEST**

### 10.0 **Confidentiality Request**

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