

**Global China Technology Limited**

Application  
For  
47 CFR Part 15 Certification

Unlicensed Personal Communication Service Devices  
(Base Unit)

**FCC ID: VNN-LL4822**  
**Model: LL4822HER2, LL4822HER1, LG4821HER1, PowerTel 580,**  
**PowerTel 501**

**Test Report Number: HK10050635-1**

**Issue Date: June 15, 2010**

MN/ cl

- The test report only allows to be revised within the retention period unless further standard or the requirement was noticed.
- This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

# INTERTEK TESTING SERVICES

---

## MEASUREMENT/TECHNICAL REPORT

**Global China Technology Limited - Model: LL4822HER2, LL4822HER1,  
LG4821HER1, PowerTel 580, PowerTel 501  
FCC ID: VNN-LL4822**

This report concerns (check one): Original Grant  Class II Change   
Equipment Type : PUB - Part 15 Unlicensed PCS Base Station

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 D for Unlicensed Personal Communication Service Device - the new 47 CFR [10-01-08 Edition] Provision.

Report reviewed by: Nip Ming Fung, Melvin

Intertek Testing Services Hong Kong Ltd.  
2/F., Garment Centre,  
576 Castle Peak Road,  
Kowloon, Hong Kong.  
Phone : 852-2173-8535  
Fax: 852-2741-1693

# INTERTEK TESTING SERVICES

---

---

## Table of Contents

<b>1.0 Summary of Test Results .....</b>	<b>5</b>
<b>2.0 General Description .....</b>	<b>8</b>
2.1 Product Description .....	8
2.2 Technical Description .....	8
2.3 Test Methodology .....	9
2.4 Test Facility .....	9
<b>3.0 System Test Configuration .....</b>	<b>11</b>
3.1 Justification .....	11
3.2 Conducted Emission Test Configuration .....	12
3.3 Conducted Monitoring and Operational Test Configuration .....	12
3.4 EUT Exercising Software .....	12
3.5 Details of EUT and Description of Peripherals .....	13
3.6 Measurement Uncertainty .....	14
3.7 Equipment Modification .....	14
<b>4.0 Measurement Results .....</b>	<b>16</b>
4.1 Antenna Requirement .....	16
4.2 Digital Modulation Techniques .....	16
4.3 Emission Bandwidth .....	17
4.4 Directional Gain of the Antenna .....	17
4.5 Peak Transmit Power .....	18
4.6 Power Spectral Density .....	19
4.7 Automatic Discontinuation of Transmission .....	19
4.8 Unwanted Emission Inside the Sub-Band .....	20
4.9 Emissions Outside the Sub-Band .....	21
4.9.1 Radiated Emissions Configuration Photographs .....	22
4.9.2 Radiated Emissions Data .....	22
4.9.3 Field Strength Calculation .....	28
4.9.4 Average Factor Calculation and Transmitter ON Time Measurements .....	29
4.10 AC Power Line Conducted Emissions from Transmitter portion of EUT .....	30
4.10.1 AC Power Line Conducted Emissions Configuration Photographs .....	31
4.10.2 AC Power Line Conducted Emissions Data .....	31
4.11 Radio Frequency Radiation Exposure .....	32
4.12 Frame Repetition Stability .....	33
4.13 Frame Period and Jitter .....	34
4.14 Carrier Frequency Stability .....	35
4.15 Monitoring Threshold .....	37
4.15.1 Lower Monitoring Threshold .....	38
4.15.2 Least Interfered Channel, LIC .....	39
4.15.2.1 Upper Monitoring Threshold .....	39
4.15.2.2 Least Interfered Channel (LIC) Selection .....	40
4.15.2.3 Least Interfered Channel (LIC) Confirmation .....	41
4.15.2.4 Maximum Spectrum Occupance .....	41

# INTERTEK TESTING SERVICES

---

---

## Table of Contents

4.16 Monitoring Time.....	42
4.17 Maximum Transmit Period.....	43
4.18 System Acknowledgement .....	44
4.19 Random Waiting.....	45
4.20 Monitoring Bandwidth.....	46
4.21 Maximum Reaction Time.....	47
4.22 Monitoring Antenna .....	47
4.23 Duplex Connections .....	48
4.24 Alternative Monitoring Interval for Co-located Device.....	50
4.25 Fair Access.....	50
<b>5.0 Equipment List .....</b>	<b>51</b>

## Appendix – Exhibits of Application for Certification

---

---

**INTERTEK TESTING SERVICES**

---

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

# INTERTEK TESTING SERVICES

## 1.0 Summary of Test Results

**Global China Technology Limited**

**FCC ID: VNN-LL4822**

**MODEL: LL4822HER2, LL4822HER1, LG4821HER1, PowerTel 580,  
PowerTel 501**

<b>General Technical Requirements</b>				
<b>Test Items</b>	<b>FCC Part 15 Section</b>	<b>Test Procedure ANSI C63.17 / ANSI C63.4<sup>*</sup></b>	<b>Results</b>	<b>Details see section</b>
Antenna Requirement	15.317	---	Pass	4.1
Digital Modulation Techniques	15.319(b)	6.1.4	Pass	4.2
Emission Bandwidth	15.323(a)	6.1.3	Pass	4.3
Directional Gain of the Antenna	15.319(e)	4.3.1	Pass	4.4
Peak Transmit Power	15.319(c)	6.1.2	Pass	4.5
Power Spectral Density	15.319(d)	6.1.5	Pass	4.6
Automatic Discontinuation of Transmission	15.319(f)	---	Pass	4.7
AC Power Lines Conducted Emissions from EUT	15.315	7 <sup>*</sup>	Pass	4.10
Radio Frequency Radiation Exposure	15.319(i)	---	Pass	4.11

**Test Engineer:**



Simple Shum  
Engineer

Date: June 15, 2010

**Approved By:**



Nip Ming Fung, Melvin  
Supervisor

Date: June 15, 2010

# INTERTEK TESTING SERVICES

## 1.0 Summary of Test Results (continued)

<b>Specific Requirements for UPCS Device</b>				
<b>Test Items</b>	<b>FCC Part 15 Section</b>	<b>Test Procedure ANSI C63.17</b>	<b>Results</b>	<b>Details see section</b>
Unwanted Emission Inside the Sub-Band	15.323(d)	6.1.6.1	Pass	4.8
Emissions Outside the Sub-Band	15.323(d)	6.1.6.2	Pass	4.9
Frame Repetition Stability	15.323(e)	6.2.2	Pass	4.12
Frame Period and Jitter	15.323(e)	6.2.3	Pass	4.13
Carrier Frequency Stability	15.323(f)	6.2.1	Pass	4.14
Lower Monitoring Threshold	15.323(c2&c9)	7.3.1	NA	4.15.1
Upper Monitoring Threshold	15.323(c5.1&c9)	7.3.2	Pass	4.15.2.1
Least Interfered Channel (LIC) Selection	15.323(c)(5)	7.3.3	Pass	4.15.2.2
Least Interfered Channel (LIC) Confirmation	15.323(c)(5)	7.3.3	Pass	4.15.2.3
Maximum Spectrum Occupancy	15.323(c)(5)	---	Pass	4.15.2.4
Monitoring Time	15.323(c)(1)	7.3.4	Pass	4.16
Maximum Transmit Period	15.323(c)(3)	---	Pass	4.17
System Acknowledgement	15.323(c4)	8.1 or 8.2	Pass	4.18
Random Waiting	15.323(c)(6)	8.1.2 or 8.1.3	Pass	4.19
Monitoring Bandwidth	15.323(c)(7)	7.4	Pass	4.20
Maximum Reaction Time	15.323(c)(7)	7.5	Pass	4.21
Monitoring Antenna	15.323(c)(8)	4	Pass	4.22
Duplex Connections	15.323(c)(10)	8.3	NA	4.23
Alternative Monitoring Interval for Co-located Device	15.323(c)(11)	8.4	NA	4.24
Fair Access	15.323(c)(12)	---	Pass	4.25

**Test Engineer:**



Simple Shum  
Engineer

Date: June 15, 2010

**Approved By:**



Nip Ming Fung, Melvin  
Supervisor

Date: June 15, 2010

---

---

**INTERTEK TESTING SERVICES**

---

**EXHIBIT 2**  
**GENERAL DESCRIPTION**

## INTERTEK TESTING SERVICES

---

### 2.0 General Description

#### 2.1 Product Description

The LL4822HER2 is a 1.9GHz Digital Modulation Cordless Phone with Caller ID, Digital Answering Machine and Speakerphone - Base Unit. It operates at frequency range of 1921.536MHz to 1928.448MHz with 5 channels (1921.536MHz, 1923.264MHz, 1924.992MHz, 1926.720MHz and 1928.448MHz). The Base Unit is powered by an adaptor 100-240VAC to 12VDC 670mA.

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

The Model(s): LL4822HER1 and PowerTel 580 are the same as the tested Model: LL4822HER2 in electronics/electrical designs including software & firmware, PCB layout and construction design/physical design/enclosure. The only differences between these models are trade name, model number and packing configuration to be sold for marketing purpose.

The Models: LG4821HER1 and PowerTel 501 are one handset with an external charger for selling. The difference in model number serves as the marketing strategy.

Handset unit and extra charger of Models: LL4822HER1, LL4822HER2, and PowerTel 580 are identical with that of Models: LA4829HER1, LA4829HER2, LG4821HER1, PowerTel 500, PowerTel 502, and PowerTel 501 (FCC ID: VNN-LA4829) in electronics/electrical designs including software & firmware, PCB layout and construction design/physical design/enclosure. The only differences between these models are trade name, model number and packing configuration to be sold for marketing purpose.

#### 2.2 Technical Description

The circuit description and digital modulation techniques description are saved as filename: descri.pdf.

## INTERTEK TESTING SERVICES

---

### 2.3 Test Methodology

The radiated emission measurements for unintentional radiator (if any) and AC power line-conducted emission measurements were performed according to the test procedures specified in ANSI C63.4 (2003). The radiated emission measurements for intentional radiator contained in UPSC device, conducted emission measurements, Listen Before Transmit (LBT) tests, Time Frame and Frequency Stability tests were performed according to the test procedures specified in ANSI C63.17 (2006). All radiated 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 47 CFR Part 2.

### 2.4 Test Facility

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

**INTERTEK TESTING SERVICES**

---

---

**EXHIBIT 3**  
**SYSTEM TEST CONFIGURATION**

## INTERTEK TESTING SERVICES

---

### 3.0 System Test Configuration

#### 3.1 Justification

For emissions testing, the equipment under test (EUT) was setup to transmit continuously in burst mode with pseudo-random data to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables (if any) were manipulated to produce worst-case emissions. The handset (if any) was powered by a fully charged battery.

For the measurements, the EUT was attached to a plastic stand if necessary and placed on the wooden turntable. If the base unit attached to accessories, they were connected and operational (as typical as possible).

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

For UPSCS transmitter radiated measurement, the spectrum analyzer resolution bandwidth was approximately 1% of EUT emission bandwidth, unless otherwise specified.

Radiated emission measurements for UPSCS transmitter were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

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

## INTERTEK TESTING SERVICES

---

### 3.2 Conducted Emission Test Configuration

The setup and equipment setting were made in accordance with ANSI C63.17. The antenna of EUT transmitter was replaced by a coaxial cable. The impedance matching of connection, cable loss and external RF attenuator are taken into account. The EUT was arranged to communicate via a fixed carrier frequency between its transmitter and a companion device. The transmission was configured in burst mode with pseudo-random data as typical as normal operation.

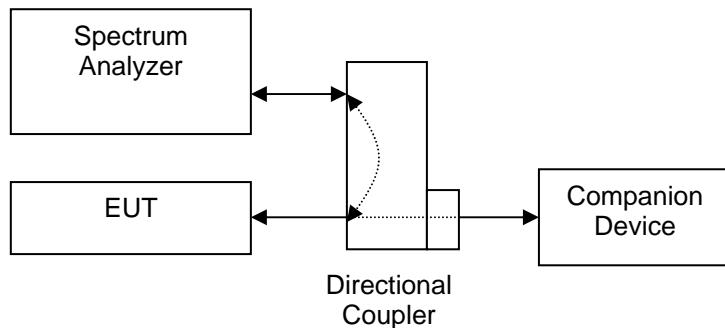


Figure 3.2.1

### 3.3 Conducted Monitoring and Operational Test Configuration

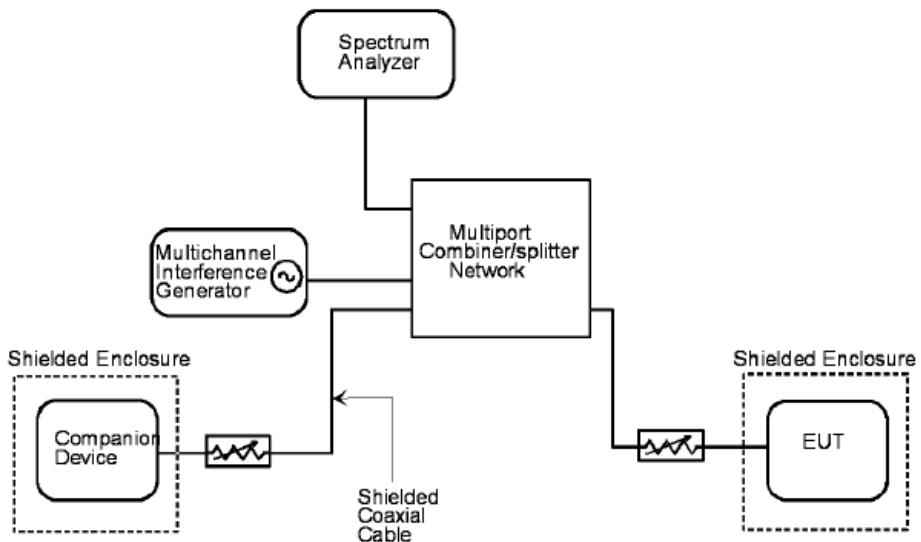


Figure 3.3.1

### 3.4 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.

## INTERTEK TESTING SERVICES

---

### 3.5 Details of EUT and Description of Accessories

#### Details of EUT:

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

- (1) Base Unit: An AC adaptor (100-240VAC to 12VDC 670mA, Model: S008CU1200067) (Supplied by Client)

#### Description of Accessories:

- (1) Telephone Line Simulator, Model: TLS-5C-01, S/N: 059355 (Supplied by Intertek)
- (2) Telephone Headset (Supplied by Client)
- (3) Handset Unit, Model: LA4829HER2, FCC ID: VNN-LA4829 (Supplied by Client)
- (4) Geemarc Vibrator, Model: CLA2, DoC Product (Supplied by Client)
- (5) 1 x 3m Telephone Line (Supplied by Intertek)

## **INTERTEK TESTING SERVICES**

---

---

### **3.6 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.

### **3.7 Equipment Modification**

Any modifications installed previous to testing by Global China Technology Limited 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.

## **INTERTEK TESTING SERVICES**

---

---

### **EXHIBIT 4**

### **MEASUREMENT RESULTS**

# INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

## 4.0 Measurement Results

### 4.1 Antenna Requirement, FCC Rule 15.317:

EUT must meet the antenna requirement of FCC Rule 15.203.

- [  ] EUT uses a permanently attached antenna which is considered sufficient to comply with the provisions of this rule. Please refer to internal photos.pdf for more details.
- [  ] EUT uses a unique antenna jack or electrical connector which is considered sufficient to comply with the provisions of this rule. Please refer to internal photos.pdf for more details.

### 4.2 Digital Modulation Techniques, FCC Rule 15.319(b):

All transmissions must use only digital modulation techniques.

The requirements are made in accordance with ANSI C63.17 sub-clause 6.1.4.

Attestation:

Please refer to the technical description in section 2.2 or relevant DECT standards for more details.

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.3 Emission Bandwidth, FCC Rule 15.323(a):

Operation shall be contained within the 1920 – 1930 MHz band. The emission bandwidth ( $B$ ) shall be less than 2.5 MHz and greater than 50 kHz.

Measurements are made in accordance with ANSI C63.17 sub-clause 6.1.3. Test setup is shown in section 3.2 Figure 3.2.1.

#### Test Results:

##### Ia. Base unit - Traffic Carrier

Channel	Channel Frequency (MHz)	Measuring Signal Level	Measured Emission Bandwidth (MHz)	Results
Lowest	1921.536	26 dB down	2.13	Pass
Highest	1928.448	26 dB down	2.17	Pass

##### Ib. Base unit - Dummy Carrier

Channel	Channel Frequency (MHz)	Measuring Signal Level	Measured Emission Bandwidth (MHz)	Results
Lowest	1921.536	26 dB down	1.43	Pass
Highest	1928.448	26 dB down	1.46	Pass

The plots of emission bandwidth and test frequency are saved as filename: bw.pdf

### 4.4 Directional Gain of the Antenna, FCC Rule FCC 15.319(e):

The peak transmit power shall be reduced by the amount in dB that the maximum directional gain of the antenna exceeds 3 dBi.

The requirements are made in accordance with ANSI C63.17 sub-clause 4.3.1.

[  ] Manufacturer declares that the directional gain of the antenna is less than or equal to 3dBi. No peak transmit power reduction is required.

[  ] Manufacturer declares that the directional gain of the antenna is greater than 3dBi. The peak transmit power shall be reduced by \_\_\_\_\_ dB.

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.5 Peak Transmit Power, FCC Rule 15.319(c):

The peak transmit power ( $P_{EUT}$ ) shall not exceed  $100\mu\text{W}$  multiplied by the square root of the emission bandwidth / occupied bandwidth ( $B$ ) in Hz or  $5 \log_{10} B - 10$  dBm. The peak transmit power shall be reduced by the amount in dB that the maximum directional gain of the antenna exceeds 3 dBi.

Measurements are made in accordance with ANSI C63.17 sub-clause 6.1.2. Test setup is shown in section 3.2 Figure 3.2.1. The cable loss and/or external attenuation are included in OFFSET function of spectrum analyzer.

Calculation of Peak Transmit Power Limit ( $P_{\max}$ ):

$$\begin{aligned} [\times] \quad P_{\max} &= 5 \log_{10} B - 10 \text{ dBm} && \text{when } G_A \leq 3 \text{ dBi} \\ [ ] \quad P_{\max} &= 5 \log_{10} B - 10 \text{ dBm} - (G_A - 3 \text{ dBi}) && \text{when } G_A > 3 \text{ dBi} \end{aligned}$$

Where  $G_A$  = EUT Antenna Gain: 0 dBi for Base Unit  
 $B$  = Measured Emission Bandwidth

Test Results:

#### Ia. Base unit - Traffic Carrier

Channel	Channel Frequency (MHz)	Measured Peak Transmit Power (dBm)	Limit (dBm)	Results
Lowest	1921.536	19.04	21.64	Pass
Highest	1928.448	18.98	21.68	Pass

#### Ib. Base unit - Dummy Carrier

Channel	Channel Frequency (MHz)	Measured Peak Transmit Power (dBm)	Limit (dBm)	Results
Lowest	1921.536	19.04	20.78	Pass
Highest	1928.448	18.98	20.82	Pass

The plots of peak transmit power are saved as filename: peaktp.pdf

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.6 Power Spectral Density, FCC Rule 15.319(d):

Power spectral density shall not exceed 3 mW (4.8dBm) in any 3 kHz bandwidth as measured with a spectrum analyzer having a resolution bandwidth of 3 kHz.

Measurements are made in accordance with ANSI C63.17 sub-clause 6.1.5. Test setup is shown in section 3.2 Figure 3.2.1.

Test Results:

#### Ia. Base unit - Traffic Carrier

Channel	Channel Frequency (MHz)	Measured Power Spectral Density (dBm/3kHz)	Limit (dBm/3 kHz)	Results
Lowest	1921.536	-9.1	4.8	Pass
Highest	1928.448	-9.5	4.8	Pass

#### Ib. Base unit - Dummy Carrier

Channel	Channel Frequency (MHz)	Measured Power Spectral Density (dBm/3kHz)	Limit (dBm/3 kHz)	Results
Lowest	1921.536	-14.8	4.8	Pass
Highest	1928.448	-13.2	4.8	Pass

The plots of the power spectral density are saved as filename: psd.pdf

### 4.7 Automatic Discontinuation of Transmission, FCC Rule 15.319(f):

The EUT shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude transmission of control and signaling information or use of repetitive codes used by certain digital technologies to complete frame or burst intervals.

The manufacturer declares that the EUT can automatically discontinue transmission in case of either absent information to transmit or operational failure. Please refer to the declaration letter (declaration.pdf) for details.

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.8 Unwanted Emission Inside the Sub-Band, FCC Rule 15.323(d):

Emissions inside the sub-band must comply with the following emission mask:

1. In the bands between  $1B$  and  $2B$  measured from the center of the emission bandwidth, emission shall be at least 30 dB below the permitted peak transmit power.
2. In the bands between  $2B$  and  $3B$  measured from the center of the emission bandwidth, emission shall be at least 50 dB below the permitted peak transmit power.
3. In the bands between  $3B$  and the band edge, emission shall be at least 60 dB below the permitted peak transmit power.

Where  $B$  = emission bandwidth in Hz

Measurements are made in accordance with ANSI C63.17 sub-clause 6.1.6.1. Test setup is shown in section 3.2 Figure 3.2.1.

#### Test Results:

##### Ia. Base unit - Traffic Carrier

Channel	Channel Frequency (MHz)	Results
Lowest	1921.536	Pass
Highest	1928.448	Pass

##### Ib. Base unit - Dummy Carrier

Channel	Channel Frequency (MHz)	Results
Lowest	1921.536	Pass
Highest	1928.448	Pass

The plots of the unwanted emission inside the sub-band are saved as filename: inband.pdf

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.9 Emissions Outside the Sub-Band, FCC Rule 15.323(d):

Emissions outside the sub-band shall be attenuated below a reference power of 112 mW (20.5 dBm) as follows:

1. 30 dB between the band edge and 1.25 MHz above or below the band;
2. 50 dB between 1.25 and 2.5 MHz above or below the band; and
3. 60 dB at 2.5 MHz or greater above or below the band, or shall meet the requirement of FCC Rule 15.319(g) which shall not exceed the limits of FCC Rule 15.209.

Example: Calculation of Limit for emissions between the band edge and 1.25 MHz (1920.000 – 1918.750 MHz)

The emissions shall not exceed the Limit: 20.5 dBm – 30 dB = -9.5 dBm

Measurements are made in accordance with ANSI C63.17 sub-clause 6.1.6.2. As EUT has non-detachable antenna(s), radiated emissions test method is used for out-of-band emissions tests. Emissions that are directly caused by digital circuits in the transmit path and transmitter portion are measured. Test setup and procedures are described in section 3.2 Figure 3.2.1.

### Test Results:

Channel	Carrier Frequency (MHz)	Measured Band (MHz)	Limit (dBm)	Results
Lowest	1921.536	1920.000 - 1918.750	-9.5	Pass
		1918.750 - 1917.500	-29.5	Pass
		0.009 - 1917.500 & 1932.500 - 19300.000	-39.5 / FCC Rule 15.209	Pass
Highest	1928.448	1930.000 - 1931.250	-9.5	Pass
		1931.250 - 1932.500	-29.5	Pass
		0.009 – 1917.500 & 1932.500 - 19300.000	-39.5 / FCC Rule 15.209	Pass

Please refer to the section 4.9.1 to 4.9.4 for more details.

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited

Date of Test: May 17-23, 2010

Model: LL4822HER2

Mode: Transmission

### 4.9.1 Radiated Emissions Configuration Photographs:

Worst Case Radiated Emission  
at

Base Unit: 7713.792 MHz

The worst case radiated emission configuration photographs are saved as filename: config photos.pdf

### 4.9.2 Radiated Emissions Data:

Data are 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 in table 1-5 list the significant emission frequencies, the limit and the margin of compliance.

Judgement:

Base Unit - Passed by 11.8 dB margin compared with peak limit

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited

Date of Test: May 17-23, 2010

Model: LL4822HER2

Mode: Transmission

Table 1, Base Unit

**Radiated Emissions Data  
Pursuant To FCC Part 15 Section 15.323 (d)  
Emissions Requirements**

Lowest Channel

Polarization	Frequency (MHz)	Measured Power (dBm)	Power Limit (dBm)	Margin (dB)
V	1919.850	-44.6	-9.5	-35.1
V	1917.869	-47.8	-29.5	-18.3
V	1917.101	-52.4	-39.5	-12.9

NOTES:

1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited

Date of Test: May 17-23, 2010

Model: LL4822HER2

Mode: Transmission

Table 2, Base Unit

**Radiated Emissions Data  
Pursuant To FCC Part 15 Section 15.209  
Emissions Requirements**

Lowest Channel

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)	Average Limit at 3m (dB $\mu$ V/m)	Margin (dB)
H	3843.072	58.0	33	33.3	58.3	21.43	36.9	54.0	-17.1
H	5764.608	53.8	33	36.6	57.4	21.43	36.0	54.0	-18.0
H	7686.144	56.2	33	38.9	62.1	21.43	40.7	54.0	-13.3
H	9607.680	51.4	33	40.4	58.8	21.43	37.4	54.0	-16.6
H	11529.216	51.4	33	40.5	58.9	21.43	37.5	54.0	-16.5

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB $\mu$ V/m)	Peak Limit at 3m (dB $\mu$ V/m)	Margin (dB)
H	3843.072	58.0	33	33.3	58.3	74.0	-15.7
H	5764.608	53.8	33	36.6	57.4	74.0	-16.6
H	7686.144	56.2	33	38.9	62.1	74.0	-11.9
H	9607.680	51.4	33	40.4	58.8	74.0	-15.2
H	11529.216	51.4	33	40.5	58.9	74.0	-15.1

NOTES:

1. Peak detector is used for the emission measurement.
2. The resolution bandwidth of the spectrum analyzer was set 100 kHz and 1 MHz for spurious emission measurements below 1 GHz and above 1 GHz respectively.
3. All measurements were made at 3 meters.
4. Negative value in the margin column shows emission below limit.

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited

Date of Test: May 17-23, 2010

Model: LL4822HER2

Mode: Transmission

Table 3, Base Unit

**Radiated Emissions Data  
Pursuant To FCC Part 15 Section 15.323 (d)  
Emissions Requirements**

Highest Channel

Polarization	Frequency (MHz)	Measured Power (dBm)	Power Limit (dBm)	Margin (dB)
V	1930.013	-44.9	-9.5	-35.4
V	1931.686	-47.6	-29.5	-18.1
V	1933.471	-52.7	-39.5	-13.2

NOTES:

1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.

# INTERTEK TESTING SERVICES

Company: Global China Technology Limited

Date of Test: May 17-23, 2010

Model: LL4822HER2

Mode: Transmission

Table 4, Base Unit

## Radiated Emissions Data Pursuant To FCC Part 15 Section 15.209 Emissions Requirements

Highest Channel

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)	Average Limit at 3m (dB $\mu$ V/m)	Margin (dB)
H	3856.896	58.1	33	33.3	58.4	21.43	37.0	54.0	-17.0
H	5785.344	54.0	33	36.6	57.6	21.43	36.2	54.0	-17.8
H	7713.792	56.3	33	38.9	62.2	21.43	40.8	54.0	-13.2
H	9642.240	52.9	33	40.4	60.3	21.43	38.9	54.0	-15.1
H	11570.688	50.9	33	40.5	58.4	21.43	37.0	54.0	-17.0

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB $\mu$ V/m)	Peak Limit at 3m (dB $\mu$ V/m)	Margin (dB)
H	3856.896	58.1	33	33.3	58.4	74.0	-15.6
H	5785.344	54.0	33	36.6	57.6	74.0	-16.4
H	7713.792	56.3	33	38.9	62.2	74.0	-11.8
H	9642.240	52.9	33	40.4	60.3	74.0	-13.7
H	11570.688	50.9	33	40.5	58.4	74.0	-15.6

### NOTES:

1. Peak detector is used for the emission measurement.
2. The resolution bandwidth of the spectrum analyzer was set 100 kHz and 1 MHz for spurious emission measurements below 1 GHz and above 1 GHz respectively.
3. All measurements were made at 3 meters.
4. Negative value in the margin column shows emission below limit.

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited

Date of Test: May 17-23, 2010

Model: LL4822HER2

Mode: Talk

Table 5, Base Unit

**Radiated Emissions Data  
Pursuant To FCC Part 15 Section 15.323 (d)  
Emissions Requirements**

Polarization	Frequency (MHz)	Measured Power (dBm)	Power Limit (dBm)	Margin (dB)
V	55.300	-63.5	-39.5	-24.0
H	110.600	-63.3	-39.5	-23.8
H	165.900	-63.1	-39.5	-23.6
H	221.200	-64.0	-39.5	-24.5
H	276.500	-64.8	-39.5	-25.3
H	331.800	-65.2	-39.5	-25.7

NOTES:

1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.9.3 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 29.0 dB is subtracted. The pulse desensitization factor of the spectrum analyzer is 0.0 dB, and the resultant average factor is -10.0 dB. The net field strength for comparison to the appropriate emission limit is 32.0 dB $\mu$ V/m. This value in dB $\mu$ V/m is converted to its corresponding level in  $\mu$ V/m.

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

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

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

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

$$PD = 0.0 \text{ dB}$$

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

$$FS = 62.0 + 7.4 + 1.6 - 29.0 + 0.0 + (-10.0) = 32.0 \text{ dB}\mu\text{V/m}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32.0 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

4.9.4 Average Factor Calculation and Transmitter ON Time Measurements, FCC Rule 15.35(b, c):

Base Unit: (For 2 handsets operation with dummy)

$$\begin{aligned}\text{Duty Cycle (DC)} &= \text{Maximum ON time in 10ms/10ms} \\ &= (2 \times 0.378\text{ms} + 0.092\text{ms})/10\text{ms}\end{aligned}$$

$$\begin{aligned}\text{Average Factor (AF)} &= 20 \log (\text{DC}) \\ &= 20^* \log (0.0848) \\ &= -21.43 \text{ dB}\end{aligned}$$

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

Please refer to the attached plots for more details:

The plots of Transmitter ON Time Measurements are saved as filename: txon.pdf

- [  ] Please refer to the attached transmitter timing diagram that are provided by manufacturer
- [  ] Not applicable - No average factor is required.
- [  ] Please refer to Technical Description (descri.pdf) for more details

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.10 AC Power Line Conducted Emissions from Transmitter portion of EUT, FCC Rule 15.315:

The AC power line conducted emission shall not exceed the limits of FCC Rule 15.207.

Measurements are made in accordance with ANSI C63.4 sub-clause 7. Emissions that are directly caused by digital circuits in the transmit path and transmitter portion are measured.

- Not applicable – EUT is only powered by battery for operation.
- EUT connects to AC power line. Emission Data is listed in following pages.
- Base Unit connects to AC power line and has transmission. Handset connects to AC power line but has no transmission. Emission Data of Base Unit is listed in following pages.

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited

Date of Test: May 17-23, 2010

Model: LL4822HER2

Mode: Speakerphone On Line

### 4.10.1 AC Power Line Conducted Emissions Configuration Photographs:

Worst Case AC Power Line Conducted Emission  
at

Base Unit: 4.875 MHz

The worst case AC power Line conducted emission configuration photographs are saved as filename: config photos.pdf

### 4.10.2 AC Power Line Conducted Emissions Data:

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

Judgment:

Base Unit: Passed by 2.94 dB margin compare with the quasi-peak limit

The worst case AC power line conducted emission data are saved as filename: conduct.pdf

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.11 Radio Frequency Radiation Exposure, FCC Rule 15.319(i):

EUT is subject to the radio frequency exposure requirements specified in FCC Rule §§ 1.1307(b), 2.1091 and 2.1093. It shall be considered to operate in a “general population / uncontrolled” environment.

- [ ] Handset unit: EUT was evaluated for Specific Absorption Rate (SAR) evaluation compliance according to OET Bulletin 65, Supplement C (Edition 01-01). It is in compliance with the SAR evaluation requirements. A SAR test report was submitted at same time and saved as SAR Report.pdf.
- [x] Base unit: 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 info.pdf.

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.12 Frame Repetition Stability, FCC Rule 15.323(e):

- [ ] EUT implements Time Division Duplex (TDD) (not include TDMA) in order to support duplex connection on a given frequency carrier shall maintain a frame repetition rate whereby 3 x standard deviation of the frequency stability shall not exceed 50 ppm, not including a shift of the mean.
- [ x ] EUT uses Time Division Multiple Access (TDMA) in order to support multiple communication links on a given frequency carrier shall maintain a frame repetition rate whereby 3 x standard deviation of the frequency stability shall not exceed 10 ppm, not including a shift of the mean.

Measurements are made in accordance with ANSI C63.17 sub-clause 6.2.2. Test setup is shown in section 3.2 Figure 3.2.1. A spectrum analyzer measures the time duration between rising edges of two consecutive frames over a time period of at least 1000 frame periods. These measurement values are used to compute the 3 x standard deviation of the frequency stability.

### Test Results:

#### I. Base unit

Maximum Frame Repetition Stability (ppm)	Limit (ppm)	Results
0.0701	±10	Pass

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.13 Frame Period and Jitter, FCC Rule 15.323(e):

The frame period (a set of consecutive time slots in which the position of each time slot can be identified by reference to a synchronizing source) of EUT operating in these sub-bands shall be 20 ms or 10 ms/X where X is a positive whole number.

The jitter (time-related, abrupt, spurious variations in the duration of the frame interval) introduced at the two ends of such a communication link shall not exceed 25  $\mu$ s for any two consecutive transmissions. Transmissions shall be continuous in every time and spectrum window during the frame period defined for EUT.

Measurements are made in accordance with ANSI C63.17 sub-clause 6.2.3. Test setup is shown in section 3.2 Figure 3.2.1. A spectrum analyzer measures the time duration between the rising edges of two consecutive frames. The measurements are taken over 100,000 frames. These measurement values are used to compute mean value and the difference between any two consecutive frame periods. The mean value is the frame period.

### Test Results:

#### I. Base unit

Measured Maximum Jitter ( $\mu$ s)	Limit ( $\mu$ s)	Result
-0.1631	$\pm 25$	Pass

# INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

## 4.14 Carrier Frequency Stability, FCC Rule 15.323(f):

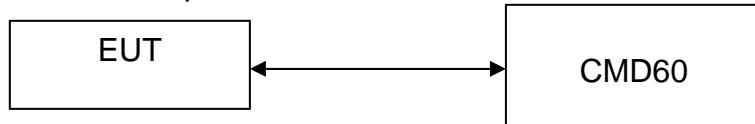
The carrier frequency stability of EUT shall be maintained within +/-10 ppm at the following conditions:

1. Over 1 hour at nominal supply voltage and a temperature of +20 °C;
2. Over a variation in the primary supply voltage of 85 % to 115 % of nominal supply voltage at a temperature of +20 °C. This test does not apply to an EUT that is only powered by battery for operation;
3. Over a temperature variation of -20 °C to +50 °C or at extreme temperatures as declared by manufacturer, and at nominal supply voltage.

For base unit:

The nominal supply voltage: 115VAC and the extreme temperatures of 0°C to 45°C are declared by manufacturer.

Measurements are made in accordance with ANSI C63.17 sub-clause 6.2.1. The EUT and CMD60 is connected with shielded coaxial cable. The EUT is controlled by DECT Radio Communication Tester, CMD60, to use a fixed frequency channel during test as well as record the frequency offset. The transmission of EUT is in burst mode with pseudo-random data. Test setup is shown as follows.



Test Results:

### I a. Carrier Frequency Stability over time - base unit

Supply Voltage	Temperature (°C)	Measured Frequency Offset Over an hour (ppm)		Limit (ppm)	Result
		Max.	Min.		
Nominal	+20°C	0.70	-0.85	±10	Pass

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.14 Carrier Frequency Stability, FCC Rule 15.323(f) - Continued

#### I b. Carrier Frequency Stability over Power Supply Voltage - base unit

Supply Voltage	Temperature (°C)	Measured Frequency Offset (ppm)	Limit (ppm)	Results
85%	+20°C	1.75	±10	Pass
115%	+20°C	0.19	±10	Pass

#### I c. Carrier Frequency Stability over Temperature - base unit

Supply Voltage	Temperature (°C)	Measured Frequency Offset (ppm)	Limit (ppm)	Results
Nominal	0°C	5.90	±10	Pass
Nominal	45°C	3.82	±10	Pass

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.15 Monitoring Threshold:

Monitoring threshold can be relaxed according to FCC Rule 15.323(c)(9). EUT that has a power output lower than the maximum permitted under FCC Rule 15.319(c) may increase their monitoring detection threshold by one decibel for each one decibel that the transmitter power is below the maximum permitted.

#### Calculation of Monitoring Threshold Limit:

$$\begin{aligned}\text{Monitoring Threshold } (T) &\leq -174 + 10 \log_{10} B + M + P_{\max} - P_{\text{EUT}} \text{ dBm} \\ &\leq 15 \log_{10} B - 184 + M - P_{\text{EUT}} \text{ dBm}\end{aligned}$$

Where  $B$  = Measured Emission Bandwidth or Occupied Bandwidth of base unit: 1.43 x 10<sup>6</sup> Hz  
 $M$  = 30 dB for Lower Monitoring Threshold ( $T_L$ ), or  
= 50 dB for Upper Monitoring Threshold ( $T_U$ )  
 $P_{\max}$  =  $5 \log_{10} B - 10$  dBm  
 $P_{\text{EUT}}$  = Measured Peak Transmit Power of base unit: 19.04 dBm

#### Calculated Monitoring Threshold Limits:

##### I. Base unit

Lower Monitoring Threshold ( $T_L + U_M$ ) in dBm	-74.7
Upper Monitoring Threshold ( $T_U + U_M$ ) in dBm	-54.7

NA - Not applicable

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.15.1 Lower Monitoring Threshold, FCC Rule 15.323(c)(2):

- [  ] Not applicable – EUT which supports at least of 40 duplex system access channels and implements Least Interfered Channel (LIC) algorithm is permitted to use an upper monitoring threshold. Please refer to the section 4.15.2 for more details.
- [  ] The lower monitoring threshold must not be more than 30 dB above the thermal noise power for a bandwidth equivalent to the emission bandwidth used by EUT.

Measurements are made in accordance with ANSI C63.17 sub-clause 7.3.1. Test setup is shown in section 3.3 Figure 3.3.1. The test is performed on the carrier closest to center of the band. RF signal generators apply uniform CW interference on all EUT carriers each at level  $T_L + U_M + 10$  dB. Then, the interference level is reduced uniformly on all carriers until the EUT can transmit. The interference level shall be lower than or equal to the threshold limit.

### Test Results:

#### I. Base unit

Measured Maximum Interference Level (dBm)	Lower Monitoring Threshold Limit (dBm) ( $T_L + U_M$ )	Results
NA	-74.7	NA

NA - Not applicable

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.15.2 Least Interfered Channel, LIC, FCC Rule 15.323(c)(5):

[ ] Not implemented – EUT met lower monitoring threshold requirements. Please refer to the section 4.15.1 for more details

[ x ] If access to spectrum is not available as determined by section 4.15.1 and a minimum of 40 duplex system access channels are defined for the EUT, the time and spectrum windows with the lowest power level below a monitoring threshold of 50 dB above the thermal noise power determined for the emission bandwidth may be accessed

Number of duplex channels per frequency channel = 12  
Number of frequency channel = 5  
Total Duplex Channels = 60

Hence, the time and spectrum windows below upper monitoring threshold may be accessed.

### 4.15.2.1 Upper Monitoring Threshold, FCC Rule 15.323(c)(5):

Measurements are made in accordance with ANSI C63.17 sub-clause 7.3.2. Test setup is shown in section 3.3 Figure 3.3.1. The test is performed on the carrier closest to center of the band. RF signal generators apply uniform CW interference on all EUT carriers each at level  $T_U + U_M + 10$  dB. Then, the interference level is reduced uniformly on all carriers until the EUT can transmit. The interference level shall be lower than or equal to the threshold limit.

#### Test Results:

##### I. Base unit

Measured Maximum Interference Level (dBm)	Upper Monitoring Threshold Limit (dBm) ( $T_U + U_M$ )	Results
-67.3	-54.7	Pass

NA - Not applicable

# INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

## 4.15.2.2 Least Interfered Channel (LIC) Selection, FCC Rule 15.323(c)(5):

The criteria are specified in section 4.15.2. In addition, the power measurement resolution for this comparison must be accurate to within 6 dB.

Measurements are made in accordance with ANSI C63.17 sub-clause 7.3.3. Test setup is shown in section 3.3 Figure 3.3.1. RF signal generators apply uniform CW interference on all EUT carriers except two carriers (designated  $f_1$  and  $f_2$ ), each at level  $T_U + U_M$ . EUT can only transmit on these two carriers.

### Test Descriptions and Results:

#### I. LIC Procedure - Base unit

	Test Descriptions	EUT transmits on	Results
1	Apply interference on $f_1$ at level $T_L + U_M + 7$ dB. Apply interference on $f_2$ at level $T_L + U_M$ . Initiate transmission. Verify transmission on $f_2$ . Terminate transmission. Repeat 5 times.	$f_2$	Pass
2	Apply interference on $f_1$ at level $T_L + U_M$ . Apply interference on $f_2$ at level $T_L + U_M + 7$ dB. Initiate transmission. Verify transmission on $f_1$ . Terminate transmission. Repeat 5 times.	$f_1$	Pass
3	Apply interference on $f_1$ at level $T_L + U_M + 1$ dB. Apply interference on $f_2$ at level $T_L + U_M - 6$ dB. Initiate transmission. Verify transmission on $f_2$ . Terminate transmission. Repeat 5 times.	$f_2$	Pass
4	Apply interference on $f_1$ at level $T_L + U_M - 6$ dB. Apply interference on $f_2$ at level $T_L + U_M + 1$ dB. Initiate transmission. Verify transmission on $f_1$ . Terminate transmission. Repeat 5 times.	$f_1$	Pass

NA - Not applicable

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.15.2.3 Least Interfered Channel (LIC) Confirmation, FCC Rule 15.323(c)(5):

EUT utilizing the provision of FCC Rule 15.323(c)(5) must have monitored all access channels defined for its system within the last 10 s and must verify, within the 20 ms (40 ms for EUT designed to use a 20 ms frame period) immediately preceding actual channel access that the detected power of the selected time and spectrum windows is no higher than the previously detected value.

Measurements are made in accordance with ANSI C63.17 sub-clause 7.3.4. This test is performed in section 4.16 and 4.17.

#### Results:

The tests are reported in section 4.16 and 4.17.

### 4.15.2.4 Maximum Spectrum Occupancy, FCC Rule 15.323(c)(5):

No EUT or group of co-operating EUTs located within 1 meter of each other shall during any frame period occupy more than 6 MHz of aggregate bandwidth, or alternatively, more than one third of the time and spectrum windows defined by the EUT.

#### Attestation:

According to the technical description provided, the total number of the time and spectrum windows defined by the system is  $5*12 = 60$ .

During any frame period, the maximum number of time and spectrum windows occupied by the system will be 12, which is less than one third of the time and spectrum windows defined by the system.

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.16 Monitoring Time, FCC Rule 15.323(c)(1):

Immediately prior to initiating transmission, EUT must monitor the combined time and spectrum windows in which they intend to transmit for a period of at least 10 ms for EUT designed to use a 10 ms or shorter frame period, or at least 20 ms for EUT designed to use a 20 ms frame period.

Measurements are made in accordance with ANSI C63.17 sub-clause 7.3.4. Test setup is shown in section 3.3 Figure 3.3.1. RF signal generators apply uniform CW interference on all system carriers except two carriers (designated  $f_1$  and  $f_2$ ), each at level  $T_u + U_m$ . EUT can only transmit on these two carriers.

### Test Descriptions and Results:

#### I. Base unit

	Test Descriptions	EUT transmits on	Results
1	Apply interference on $f_1$ at level $T_u + U_m$ , and no interference on $f_2$ . Initiate transmission. Verify transmission on $f_2$ . Then, terminate transmission.	$f_2$	Pass
2	Apply interference on $f_2$ at level $T_u + U_m$ , and remove interference from $f_1$ immediately. Also immediately initiate transmission but is at least 20 ms after interference on $f_2$ is applied. Verify transmission on $f_1$ .	$f_1$	Pass

# INTERTEK TESTING SERVICES

Company: Global China Technology Limited  
Model: LL4822HER2

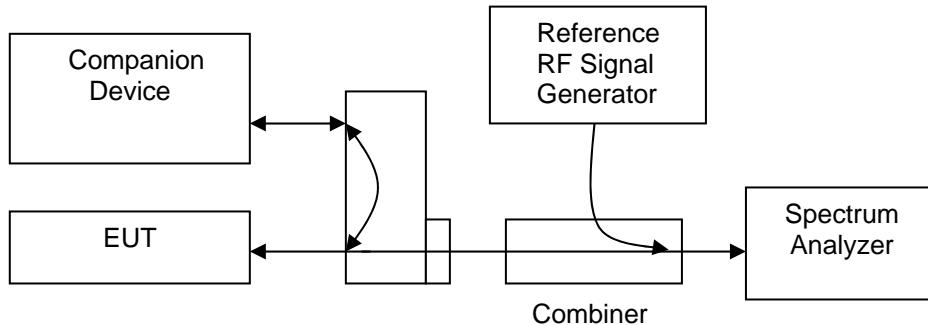
Date of Test: May 17-23, 2010

## 4.17 Maximum Transmit Period, FCC Rule 15.323(c)(3):

If no signal above the threshold level is detected, transmission may commence and continue with the same emission bandwidth in the monitored time and spectrum windows without further monitoring. However, occupation of the same combined time and spectrum windows by a EUT or group of co-operating EUTs continuously over a period of time longer than 8 hours is not permitted without repeating the access criteria.

EUT establishes a communication channel with its companion device, which occupies the duplex pair combined time and spectrum windows. Reference RF signal generator synchronized with the sample and then generated a pulse as a time frame reference. The centre frequency of spectrum analyzer was set to the carrier frequency and the SPAN was set to ZERO. The spectrum analyzer was used to monitor the time (reference to the time signal) and spectrum of the communication channel. The occupied time or spectrum of the communication channel shall be changed over a period of time no longer than 8 hours. For a EUT with a frame period of  $10/X$  ms, no more than 2,880,000 X frames should be transmitted without a break.

Test setup is shown as follows:



Test Results:

### I. Base unit

Measured Maximum Transmission Duration (minutes)	Limit (minutes)	Results
55	480	Pass

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.18 System Acknowledgement, FCC Rule 15.323(c)(4):

Once access to specific combined time and spectrum windows is obtained an acknowledgment from a system participant must be received by the initiating transmitter within one second or transmission must cease. Periodic acknowledgments must be received at least every 30 seconds or transmission must cease. Channels used exclusively for control and signaling information may transmit continuously for 30 seconds without receiving an acknowledgment, at which time the access criteria must be repeated.

Measurements are made in accordance with ANSI C63.17 sub-clause 8.1.1 and 8.2.1. Test setup is shown in section 3.3 Figure 3.3.1.

#### Test Results:

##### I. Base Unit

[ x ] Timing for EUTs using control and signaling channel type transmissions:

Conditions	Transmission Duration (seconds)	Limit (seconds)	Results
Time needed to repeat access criteria	5.1	30	Pass

[ x ] Timing for EUTs using communications channel type transmissions:

Conditions	Transmission Duration (seconds)	Limit (seconds)	Results
Activate EUT w/ companion device off	NA	1	NA
Time needed to cease Traffic Channel	5	30	Pass

NA - Not applicable

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.19 Random Waiting, FCC Rule 15.323(c)(6):

If the selected combined time and spectrum windows are unavailable, the EUT may either monitor and select different windows or seek to use the same windows after waiting an amount of time, randomly chosen from a uniform random distribution between 10 and 150 ms, commencing when the channel becomes available.

Measurements are made in accordance with ANSI C63.17 sub-clause 8.1.2 or 8.1.3. Test setup is shown in section 3.3 Figure 3.3.1.

#### Test Results:

##### I. Base unit

[  ] Random Waiting is not implemented in the EUT:

Conditions	Transmit Channel	Results
Interference applied at operating Channel, $f_1$	$f_2$	Pass

[  ] Random Waiting is implemented in the EUT:

Maximum time interval from the end of interference to the start of the control channel	The distribution of the measured time intervals	Results
NA	NA	NA

NA - Not applicable

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.20 Monitoring Bandwidth, FCC Rule 15.323(c)(7).1:

The monitoring bandwidth must be equal to or greater than the emission bandwidth of the intended transmission.

Measurements are made in accordance with ANSI C63.17 sub-clause 7.4. Test setup is shown in section 3.3 Figure 3.3.1.

Attestation:

Monitoring bandwidth of the EUT is equal to the occupied bandwidth of the intended transmission. Monitoring is made through the radio receiver used by the EUT for communication. Please refer to the section 2.2 Technical Description for more details. Designed bandwidth refers to section 4.3 Emission Bandwidth.

Compliance is demonstrated by Monitoring Bandwidth Tests as shown below.

Test Results:

#### Ia. Simple Compliance Test Results - Base unit

Interference from Carrier	Reaction of EUT	Results
-30% EBW	NA	NA
+30% EBW	NA	NA

#### Ib. Detailed Compliance Test Results - Base unit

CW Interference from Carrier	Reaction of EUT	Results
+ 6 dB	NA	NA
+ 12 dB	NA	NA
- 6 dB	NA	NA
- 12 dB	NA	NA

A – Could Transmit

B – Could not Transmit

NA – Not applicable

\*Remarks: Detailed Compliance Test was used to show the compliance of the EUT.

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.21 Maximum Reaction Time, FCC Rule 15.323(c)(7).2:

The monitoring system bandwidth must have a maximum reaction time less than  $50 \times \text{SQRT}(1.25/\text{emission bandwidth } B \text{ in MHz}) \mu\text{s}$  for signals at the applicable threshold level but shall not be required to be less than  $50 \mu\text{s}$ . If a signal is detected that is 6 dB or more above the applicable threshold level, the maximum reaction time shall be  $35 \times \text{SQRT}(1.25/\text{emission bandwidth } B \text{ in MHz}) \mu\text{s}$  but shall not be required to be less than  $35 \mu\text{s}$ .

Measurements are made in accordance with ANSI C63.17 sub-clause 7.5. Test setup is shown in section 3.3 Figure 3.3.1.

#### Test Results:

	Test	Reaction of EUT	Results
1	With Interference Pulse = $50\mu\text{s}$	B	Pass
2	With Interference Pulse = $35\mu\text{s}$	B	Pass

A – Could be connected in at least one channel  
B – Could not be connected in all channels  
NA – Not applicable

### 4.22 Monitoring Antenna, FCC Rule 15.323(c)(8):

The monitoring system shall use the same antenna used for transmission, or an antenna that yields equivalent reception at that location.

[  ] EUT uses the same antenna used for transmission and monitoring that is in compliance meet above provision.

[  ] EUT uses difference antenna used for transmission and monitoring. It must be verified that the monitoring antenna provides coverage equivalent to that of the transmitting antenna. Measurements are made in accordance with ANSI C63.17 sub-clause 4.

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.23 Duplex Connections, FCC 15.323(c)(10):

An initiating device may attempt to establish a duplex connection by monitoring both its intended transmit (Tx) and receive (Rx) time and spectrum windows. If both the intended transmit and receive time and spectrum windows meet the access criteria, then the initiating device can initiate a transmission in the intended transmit time and spectrum window. If the power detected by the responding device can be decoded as a duplex connection signal from the initiating device, then the responding device may immediately begin transmitting on the receive time and spectrum window monitored by the initiating device.

Measurements are made in accordance with ANSI C63.17 sub-clause 8.3. Test setup is shown in section 3.3 Figure 3.3.1.

#### Attestation:

[ ] Base unit: The EUT is the initiating device of the duplex connection  
[ x ] Handset: The EUT is the initiating device of the duplex connection

#### Test Results:

##### Ia. Base unit

[ ] Dual Access Criteria Check for EUT not Implemented the Upper Threshold:

Interference	Reaction of EUT	Results
All Tx and Rx Window, except one for Rx Window	NA	NA
All Tx and Rx Window, except one for Tx Window	NA	NA

A – Could be connected on the target Rx window and its duplex mate  
B – Could be connected on the target Tx window and its duplex mate  
C – Connected on window which is not the target Tx/Rx window  
D – Could not be connected

NA – Not applicable

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.23 Duplex Connections, FCC 15.323(c)(10) - Continued

#### Ib. Base unit

[ ] Dual Access Criteria Check for EUT Implemented the Upper Threshold:

Interference	Reaction of EUT	Results
All Tx windows with level $T_L + U_M$ & Rx windows with level $T_L + U_M + 7\text{dB}$ , except one for Tx window & one for Rx window, which are not duplex.	NA	NA
All Tx windows with level $T_L + U_M + 7\text{dB}$ & Rx windows with level $T_L + U_M$ , except one for Tx window & one for Rx, which are not duplex	NA	NA
All Tx & Rx windows with level $T_U + U_M$ , except one for Tx window & one for Rx Window, which are not duplex	NA	NA

- A – Could be connected on the target Rx window and its duplex mate
- B – Could be connected on the target Tx window and its duplex mate
- C – Connected on window which is not the target Tx/Rx window
- D – Could not be connected

NA – Not applicable

## INTERTEK TESTING SERVICES

---

Company: Global China Technology Limited  
Model: LL4822HER2

Date of Test: May 17-23, 2010

### 4.24 Alternative Monitoring Interval for Co-located Device, FCC Rule 15.323(c)(11):

An initiating device that is prevented from monitoring during its intended transmit window due to monitoring system blocking from the transmissions of a co-located (within one meter) transmitter of the same system, may monitor the portions of the time and spectrum windows in which they intend to receive over a period of at least 10 ms. The monitored time and spectrum window must total at least 50 % of the 10 ms frame interval and the monitored spectrum must be within the 1.25 MHz frequency channel(s) already occupied by that device or co-located co-operating devices. If the access criteria is met for the intended receive time and spectrum window under the above conditions, then transmission in the intended transmit window by the initiating device may commence.

Measurements are made in accordance with ANSI C63.17 sub-clause 8.4.

Attestation:

- Appropriate as it is co-located device, in which the monitoring system will be blocked from the transmissions of a co-located (Within one meter) transmitter of the same system. Please refer to attachment, 15.323(c)(11).pdf, for details.
- Not appropriate, as the system always monitor both the transmit and receive time/spectrum windows, it is not a co-located device.

### 4.25 Fair Access, FCC Rule 15.323(c)(12):

The provisions of FCC Rule 15.323(c)(10) or (c)(11) shall not be used to extend the range of spectrum occupied over space or time for the purpose of denying fair access to spectrum to other devices.

Attestation:

The manufacturer declares that the device does not use any mechanisms as provided by Part 15.323(c)(10) or (c)(11) to extend the range of spectrum occupied over space or time for the purpose of denying fair access to spectrum to other devices.

Please refer to the declaration letter (declaration.pdf).

# INTERTEK TESTING SERVICES

---

## 5.0 Equipment List

### 1) Radiated Emissions Test

Equipment	Biconical Antenna	Broad-Band Horn Antenna	Double Ridged Guide Antenna
Registration No.	EW-0571	EW-1679	EW-1015
Manufacturer	EMCO	SCHWARZBECK	EMCO
Model No.	3104C	BBHA9170	3115
Calibration Date	Nov. 12, 2008	Feb. 17, 2010	Feb. 09, 2010
Calibration Due Date	Aug. 13, 2010	Feb. 17, 2011	Aug. 09, 2011

Equipment	EMI Test Receiver	Spectrum Analyzer	Log Periodic Antenna
Registration No.	EW-0014	EW-2188	EW-0446
Manufacturer	R&S	AGILENTTECH	EMCO
Model No.	ESVS30	E4407B	3146
Calibration Date	Jun. 01, 2009	Dec. 25, 2009	Apr. 26, 2010
Calibration Due Date	Jun. 01, 2010	Dec. 31, 2010	Oct. 26, 2011

### 2) Conducted Emissions Test

Equipment	EMI Test Receiver	Artificial Mains	Pulse Limiter
Registration No.	EW-2251	EW-0192	EW-0699
Manufacturer	R&S	R&S	R&S
Model No.	ESCI	ESH3-Z5	ESH3-Z2
Calibration Date	Oct. 22, 2009	Nov. 23, 2009	Dec. 24, 2009
Calibration Due Date	Oct. 22, 2010	Nov. 23, 2010	Jun. 24, 2011

### 3) Conductive Measurement Test

Equipment	Spectrum Analyzer	Coaxial directional coupler	Vector Signal Generator
Registration No.	EW-2466	EW-2337	EW-2320
Manufacturer	R&S	MAGNA	R&S
Model No.	FSP30	4222-16	SMU200A
Calibration Date	Nov. 11, 2009	Nil*	Oct. 21, 2009
Calibration Due Date	Nov. 11, 2010	Nil*	Oct. 21, 2010

Equipment	Digital Radiocommunication Tester for DECT	Temperature & Humidity Chamber	Digital Multimeter
Registration No.	EW-2460	EW-2134	EW-1017
Manufacturer	R&S	GIANT FORCE	FLUKE
Model No.	CMD60	GTH-750-40-CP-SD	87-IV
Calibration Date	Mar. 03, 2010	Sep. 05, 2009	Jun. 08, 2009
Calibration Due Date	Mar. 03, 2011	Aug. 29, 2010	Jul. 06, 2010

**INTERTEK TESTING SERVICES**

---

**APPENDIX**  
**EXHIBITS OF APPLICATION FOR CERTIFICATION**