

Issuing Laboratory:  
Intertek Testing Services Hong Kong Limited

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**TEST REPORT**

**Report Number: 13041755HKG-001**

Application  
For

Class II Permissive Change of 47 CFR Part 15 Certification  
Class I Permissive Change of RSS-213 Issue 2 Equipment Certification

Unlicensed Personal Communication Service Devices/  
2 GHz License-exempt Personal Communications Service Devices

(Base Unit)

**FCC ID: EW780-8523-00**

**IC: 1135B-80852300**

Prepared and Checked by:

Approved by:

A handwritten signature in black ink, appearing to read 'Benny Lau', is written over a horizontal line.

Lau Chin Yu, Benny  
Lead Engineer

A handwritten signature in black ink, appearing to read 'Melvin Nip', is written over a horizontal line.

Nip Wing Fung, Melvin  
Assistant Manager  
September 18, 2013

- The test report only allows to be revised within the retention period unless further standard or the requirement was noticed.
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**Intertek Testing Services Hong Kong Ltd.**

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## GENERAL INFORMATION

<b>Applicant Name:</b>	VTech Telecommunications Ltd.
<b>Applicant Address:</b>	23/F, Tai Ping Industrial Centre, Block 1, 57 Ting Kok Road, Tai Po, Hong Kong.
<b>FCC Specification Standard:</b>	FCC Part 15, October 1, 2012 Edition
<b>FCC ID:</b>	EW780-8523-00
<b>FCC Model(s):</b>	TL7810, TL7812, TL7910, TL7912, HC8810, HC8812
<b>IC Specification Standard:</b>	RSS-213 Issue 2, December 2005 RSS-Gen Issue 3, December 2010
<b>IC:</b>	1135B-80852300
<b>IC Model(s):</b>	TL7810, TL7812, TL7910, TL7912, HC8810, HC8812
<b>Type of EUT:</b>	Unlicensed Personal Communications Service Devices
<b>Description of EUT:</b>	1.9GHz Digital Modulation Cordless Phone - Base Unit
<b>Serial Number:</b>	N/A
<b>Sample Receipt Date:</b>	April 29, 2013
<b>Date of Test:</b>	May 7, 2013 to May 14, 2013
<b>Report Date:</b>	September 18, 2013
<b>Environmental Conditions:</b>	Temperature: +10 to 40°C Humidity: 10 to 90%

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**EXHIBIT 1**  
**TEST RESULTS SUMMARY & STATEMENT OF COMPLIANCE**

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## 1.0 Test Results Summary & Statement of Compliance

### 1.1 Summary of Test Results

<b>General Technical Requirements</b>					
<b>Test Items</b>	<b>RSS-213 / RSS-Gen<sup>#</sup> Clause</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>
AC Power Line Conducted Emissions from EUT	6.3	15.315	7 <sup>*</sup>	Pass	4.2
Emissions Outside the Sub-Band	6.7.1	15.323(d)	6.1.6.2	Pass	4.1

### 1.2 Statement of Compliance

The equipment under test is found to be complying with the following standards:

FCC Part 15, October 1, 2012 Edition  
RSS-213 Issue 2, December 2005  
RSS-Gen Issue 3, December 2010

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

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## 2.0 General Description

### 2.1 Product Description

The TL7912 is a 1.9GHz Digital Modulation Cordless Phone - 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 EUT is powered by an adaptor 117VAC to 6VDC 300mA/450mA.

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

For FCC, The Model(s): TL7810, TL7812, TL7910, HC8810 and HC8812 are the same as the Model: TL7912 in electronics/electrical designs including software & firmware, PCB layout and construction design/physical design/enclosure. The only differences between these models are color, model number and package material to be sold for marketing purpose.

For IC, The Model(s): TL7810, TL7812, TL7910, HC8810 and HC8812 are the same as the Model: TL7912 in electronics/electrical designs including software & firmware, PCB layout and construction design/physical design/enclosure. The only differences between these models are color, model number and package material to be sold for marketing purpose.

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.

### 2.2 Test Methodology

The radiated emission measurements for intentional radiator contained in UPCS device, conducted emission measurements 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 / RSS-Gen Issue 3 (2010).

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### 2.3 Test Facility

The open area test site, AC power line conducted measurement facility used to collect the radiated data and AC Power Line conducted data are at Rooftop and 2<sup>nd</sup> Floor respectively of Intertek Testing Services Hong Kong Ltd., which 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 FCC and Industry Canada.

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

### 3.0 System Test Configuration

#### 3.1 Justification

For emissions testing, the equipment under test (EUT) was set up 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 EUT was powered by a 117VAC, 60Hz, 200mA to 6VDC 450mA/300mA adaptor.

For the measurements, the EUT was attached to a plastic stand if necessary and placed on the wooden turntable. If the EUT is 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 UPCS transmitter radiated measurement, the spectrum analyzer resolution bandwidth was approximately 1% of EUT emission bandwidth, unless otherwise specified.

Radiated emission measurements for UPCS 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.

RF module and antenna for base unit of TL7912 is the same with original/previous granted model TL7810. Therefore, conducted emission measurement for emission bandwidth, peak transmit power, jitter, frame repetition stability, carrier stability and listen before transmit requirements for TL7912 are skipped.

For IC, RF modules and antennas for base unit of TL7912 is the same with previous granted model TL7810. Therefore conducted emission measurement /conducted emission measurement for emission bandwidth, peak transmit power, power spectral density, unwanted emission inside the sub-band, jitter, frame repetition stability, carrier stability and listen before transmit requirements for TL7912 are skipped.

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.

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### 3.1 Justification

For AC line conducted emission test, the EUT along with its peripherals were placed on a 1.0m(W)x1.5m(L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN), which provided 50ohm coupling impedance for measuring instrument. The LISN housing, measuring instrument case, reference ground plane, and vertical ground plane were bounded together. The excess power cable between the EUT and the LISN was bundled.

All connecting cables of EUT and peripherals were manipulated to find the maximum emission.

### 3.2 EUT Exercising Software

The EUT exercise program (if any) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

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### 3.3 Details of EUT and Description of Accessories

#### Details of EUT:

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

- (1) An AC adaptor (117VAC to 6VDC 300mA/450mA, Model: SSA-6W2 US 6045/6030, Brand: Sunstrong) (Supplied by Client)

#### Description of Accessories:

- (1) Telephone Line Simulator, Model: TLS-5D-01, S/N: 151101 (Supplied by Intertek)
- (2) Simple Corded Phone, Model: AS7402, Brand: Uniden (Supplied by Intertek)
- (3) Lenovo Notebook, Model: SL500, S/N: ML-DXMM3, DoC Product (Supplied by Intertek)
- (4) Smart-Drive External Hard Disk, Model: HD3-SU2FW, S/N: 0800261, DoC Product (Supplied by Intertek)
- (5) 1 x USB cable with 0.7 meter long (Supplied by Intertek)
- (6) 1 x USB cable with 1 meter long (Supplied by Intertek)
- (7) 1 x 1394 cable with 0.8 meter long (Supplied by Intertek)
- (8) 1 x 3m Telephone Line (Supplied by Intertek)
- (9) Headset Lifter with Ring Detector, Model: TL7100 (Supplied by Client)
- (10) Headset Unit, Model: TL7912, FCC ID: EW780-8523-01, IC: 1135B-80852300 (Supplied by Client)
- (11) Corded Phone Interface cable with 1 meter long (Supplied by Client)

### 3.4 Measurement Uncertainty

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

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

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**EXHIBIT 4**  
**TEST RESULTS**

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**4.0 Measurement Results**

**4.1 Emissions Outside the Sub-Band, FCC Rule 15.323(d) / RSS-213 Clause 6.7.1:**

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 / RSS-210 Clause 2.5.

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. Radiated emissions test method is used. Emissions that are directly caused by digital circuits in the transmit path and transmitter portion are measured.

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 / RSS-210 Clause 2.5	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 / RSS-210 Clause 2.5	Pass

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#### 4.1.1 Radiated Emissions Configuration Photographs:

Worst Case Radiated Emission  
at

3856.896 MHz

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

#### 4.1.2 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 1-4 list the significant emission frequencies, the limit and the margin of compliance.

Judgement:

Passed by 0.7 dB margin

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Mode: Transmission

Table 1

**Radiated Emissions Data  
Pursuant To FCC Part 15 Section 15.323 (d) / RSS-213 Clause 6.7.1  
Emissions Requirements**

Lowest Channel

Polarization	Frequency (MHz)	Measured Power (dBm)	Power Limit (dBm)	Margin (dB)
V	1919.850	-42.0	-9.5	-32.5
V	1917.869	-46.7	-29.5	-17.2
V	1917.101	-51.6	-39.5	-12.1
H	3843.072	-40.3	-39.5	-0.8
H	5764.608	-40.7	-39.5	-1.2
H	7686.144	-44.6	-39.5	-5.1
H	9607.680	-45.0	-39.5	-5.5
H	11529.216	-45.1	-39.5	-5.6

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.

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Mode: Transmission

Table 2

**Radiated Emissions Data**  
**Pursuant To FCC Part 15 Section 15.323 (d) / RSS-213 Clause 6.7.1**  
**Emissions Requirements**

Highest Channel

Polarization	Frequency (MHz)	Measured Power (dBm)	Power Limit (dBm)	Margin (dB)
V	1930.013	-42.6	-9.5	-33.1
V	1931.686	-46.3	-29.5	-16.8
V	1933.471	-51.3	-39.5	-11.8
H	3856.896	-40.2	-39.5	-0.7
H	5785.344	-40.6	-39.5	-1.1
H	7713.792	-44.8	-39.5	-5.3
H	9642.240	-44.9	-39.5	-5.4
H	11570.688	-45.2	-39.5	-5.7

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.

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Mode: Talk (with adaptor “Sunstrong”)

Table 3

**Radiated Emissions Data  
Pursuant To FCC Part 15 Section 15.323 (d) / RSS-213 Clause 6.7.1  
Emissions Requirements**

Polarization	Frequency (MHz)	Measured Power (dBm)	Power Limit (dBm)	Margin (dB)
V	48.460	-63.6	-39.5	-24.1
V	96.920	-63.9	-39.5	-24.4
H	145.390	-62.8	-39.5	-23.3
H	188.580	-62.6	-39.5	-23.1
H	243.300	-63.8	-39.5	-24.3
H	290.760	-64.2	-39.5	-24.7

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.

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#### 4.1.3 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  $\text{dB}\mu\text{V}/\text{m}$
- RA = Receiver Amplitude (including preamplifier) in  $\text{dB}\mu\text{V}$
- 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  $62.0 \text{ dB}\mu\text{V}$  is obtained. The antenna factor of  $7.4 \text{ dB}$  and cable factor of  $1.6 \text{ dB}$  is added. The amplifier gain of  $29.0 \text{ dB}$  is subtracted. The pulse desensitization factor of the spectrum analyzer is  $0.0 \text{ dB}$ , and the resultant average factor is  $-10.0 \text{ dB}$ . The net field strength for comparison to the appropriate emission limit is  $32.0 \text{ dB}\mu\text{V}/\text{m}$ . This value in  $\text{dB}\mu\text{V}/\text{m}$  is converted to its corresponding level in  $\mu\text{V}/\text{m}$ .

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 =  $-10 \text{ dB}$

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

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

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4.1.4 Average Factor Calculation and Transmitter ON Time Measurements, FCC Rule 15.35(b, c) / RSS-Gen cl 4.5

[ ] 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 below.

[ ] Please refer to the attached transmitter timing diagram that are provided by manufacturer

[ x ] Not applicable - No average factor is required.

[ ] Please refer to Technical Description (descri.pdf) for more details

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#### 4.2 AC Power Line Conducted Emissions, FCC Rule 15.315 / RSS-213 Clause 6.3:

The AC power line conducted emission shall not exceed the limits of FCC Rule 15.207 / Table 4 in RSS-Gen Clause 7.2.4.

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 (indirectly) but has no transmission. Emission Data of Base Unit is listed in following pages.
  
- Handset connects to AC power line (indirectly) only during charging. Emission Data is listed in following pages.

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

Worst Case AC Power Line Conducted Emission  
at

26.412 MHz

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

#### 4.2.2 AC Power Line Conducted Emissions Data:

The plot(s) and data in the following pages list the significant emission frequencies, the limit and the worst case margin of compliance.

Judgment:

Passed by 7.24 dB margin compared with quasi-peak limit

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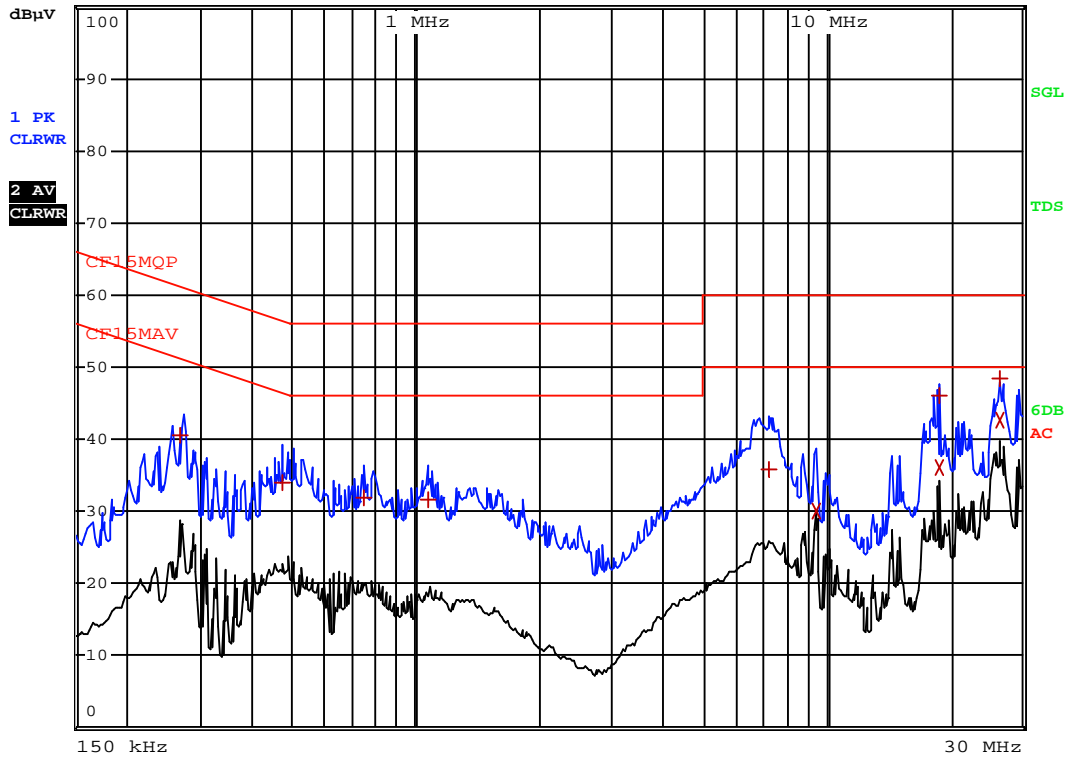


Worst Case: Base Talk with Headset



RBW 9 kHz  
MT 1 s

Att 10 dB AUTO PREAMP OFF



Date: 14.MAY.2013 15:57:38

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Worst Case: Base Talk with Headset

EDIT PEAK LIST (Final Measurement Results)				
Trace1:	CF15MQP			
Trace2:	CF15MAV			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dB $\mu$ V		DELTA LIMIT dB
1 Quasi Peak	271.5 kHz	40.43 N		-20.63
1 Quasi Peak	469.5 kHz	34.04 N		-22.47
1 Quasi Peak	744 kHz	31.83 N		-24.16
1 Quasi Peak	1.0725 MHz	31.51 N		-24.48
1 Quasi Peak	7.2645 MHz	35.90 N		-24.09
2 CISPR Average	9.4965 MHz	29.96 N		-20.03
1 Quasi Peak	18.735 MHz	46.07 N		-13.93
2 CISPR Average	18.7395 MHz	36.21 N		-13.78
2 CISPR Average	26.412 MHz	42.75 N		-7.24
1 Quasi Peak	26.4165 MHz	48.30 N		-11.69

Date: 14.MAY.2013 15:57:25

Issuing Laboratory:  
**Intertek Testing Services Hong Kong Limited**

Hong Kong Accreditation Service (HKAS) has accredited this laboratory under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with its terms of accreditation.



**EXHIBIT 5  
EQUIPMENT LIST**

Issuing Laboratory:  
Intertek Testing Services Hong Kong Limited

Hong Kong Accreditation Service (HKAS) has accredited this laboratory under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with its terms of accreditation.



## 5.0 Equipment List

### 1) Radiated Emissions Test

Equipment	EMI Test Receiver	Spectrum Analyzer	Double Ridged Guide Antenna
Registration No.	EW-2500	EW-2188	EW-1015
Manufacturer	R&S	AGILENTTECH	EMCO
Model No.	ESCI	E4407B	3115
Calibration Date	Mar. 22, 2013	Nov. 5, 2012	Mar. 5, 2013
Calibration Due Date	Feb. 28, 2014	Nov. 5, 2013	Sep. 5, 2014

Equipment	Biconical Antenna	Log Periodic Antenna	Double Ridged Guide Antenna
Registration No.	EW-0571	EW-0446	EW-1133
Manufacturer	EMCO	EMCO	EMCO
Model No.	3104C	3146	3115
Calibration Date	Apr. 5, 2012	Apr. 30, 2013	Oct. 5, 2012
Calibration Due Date	Oct. 5, 2013	Oct. 30, 2014	Apr. 5, 2014

Equipment	Biconical Antenna	EMI Test Receiver	Broad-Band Horn Antenna
Registration No.	EW-2512	EW-2666	EW-1679
Manufacturer	EMCO	R&S	SCHWARZBECK
Model No.	3104C	ESCI7	BBHA9170
Calibration Date	Nov. 15, 2011	May. 21, 2012	Apr. 1, 2013
Calibration Due Date	May. 15, 2013	May. 21, 2013	Apr. 1, 2014

### 2) Conducted Emissions Test

Equipment	EMI Test Receiver	LISN	Pulse Limiter
Registration No.	EW-2251	EW-2501	EW-0698
Manufacturer	R&S	R&S	R&S
Model No.	ESCI	ENV-216	ESH3-Z2
Calibration Date	Nov. 23, 2012	Nov. 30, 2012	Apr. 6, 2013
Calibration Due Date	Oct. 30, 2013	Nov. 30, 2013	Apr. 6, 2014

**END OF TEST REPORT**