Issuing Laboratory:
Intertek Testing Services Hong Kong Limited

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HOKLAS 005 TEST

TEST REPORT

Report Number: 13020063HKG-002

Application
for
Original Grant of 47 CFR Part 15 Certification
New Family of RSS-210 Issue 8 Equipment Certification

1.9GHz Digital Modulation Cordless Phone with Caller ID, Speakerphone and Bluetooth – Base Unit

FCC ID: VLJ80-9152-01

IC: 4522A-80915201

Prepared and Checked by:

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Approved by:

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Assistant Manager
April 25, 2013

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GENERAL INFORMATION

Applicant Name:	Binatone Electronics International Limited
Applicant Address:	Floor 23A, 9 Des Voeux Road West, Sheung Wan, Hong Kong
FCC Specification Standard:	FCC Part 15, October 1, 2011 Edition
FCC ID:	VLJ80-9152-01
FCC Model(s):	L601BT, L602BT, L603BT, L604BT, L605BT, L60XBT
IC Specification Standard:	RSS-210 Issue 8, December 2010 RSS-Gen Issue 3, December 2010 RSS-310 Issue 3, December 2010
IC:	4522A-80915201
IC Model(s):	L601BT, L602BT, L603BT, L604BT, L605BT
Type of EUT:	Transmitter
Description of EUT:	1.9GHz Digital Modulation Cordless Phone with Caller ID, Speakerphone and Bluetooth– Base Unit
Serial Number:	N/A
Sample Receipt Date:	February 01,.2013
Date of Test:	March 05 – 07, 2013
Report Date:	April 25, 2013
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

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EXHIBIT 1
TEST RESULTS SUMMARY & STATEMENT OF COMPLIANCE

1.0 Test Results Summary & Statement of Compliance

1.1 Summary of Test Results

Test Items	FCC Part 15 Section	RSS-210/ RSS-Gen#/ RSS-310^ Section	Results	Details see section
Antenna Requirement	15.203	7.1.2#	Pass	2.1
Radiated Emission Radiated Emission on the Bandedge	15.249(a), 209, & 109 15.249(d)	A2.9(a) A2.9(b)	Pass Pass	4.2 4.3
Radiated Emission in Restricted Bands	15.205	2.2	Pass	4.2
AC Power Line Conducted Emission	15.207 & 15.107	7.2.4#	Pass	4.4

Note: Pursuant to FCC Part 15 Section 15.215(c), the 20dB bandwidth of the emission was contained within the frequency band designated (mentioned as above) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over expected variations in temperature and supply voltage were considered.

1.2 Statement of Compliance

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

FCC Part 15, October 1, 2011 Edition
RSS-210 Issue 8, December 2010
RSS-Gen Issue 3, December 2010

EXHIBIT 2
GENERAL DESCRIPTION

2.0 General Description

2.1 Product Description

The L602BT is 1.9GHz Digital Modulation Cordless Phone with Caller ID, Speakerphone and Bluetooth. Only Base Unit has Bluetooth feature, and 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 AC adaptor 100-120VAC to 5VDC 300mA, (Brand: Ten Pao, Model: S003IU0500030) and 100-240VAC to 5VDC 300mA (Brand: Sunstrong, Model: SSA-5AP-09 US 050030). With Bluetooth and 1.9GHz wireless communications enabled, the Base Unit allows users to use a cordless handset to dial out or receive Bluetooth-equipped cellular phone calls via the cellular network. Two Bluetooth devices can be connected at the same time.

The Bluetooth antenna used in base unit is integral, and the test sample is a prototype.

For FCC, The Model(s): L601BT, L603BT, L604BT, L605BT and L60XBT are the same as the Model: L602BT in electronics/electrical designs including software & firmware, PCB layout and construction design/physical design/enclosure. The only differences between these models are color, cosmetic details and model number to be sold for marketing purpose. Suffix (X) indicates any alphanumeric character is presenting No. of Handset and charger

For IC, The Model(s): L601BT, L603BT, L604BT and L605BT are the same as the Model: L602BT in electronics/electrical designs including software & firmware, PCB layout and construction design/physical design/enclosure. The only differences between these models are color, cosmetic details and model number to be sold for marketing purpose.

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.

2.3 Test Methodology

Both AC power line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009). Preliminary radiated scans and all radiated measurements were performed in Open Area Test Sites. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

2.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data and conducted data are at Roof Top and 2nd 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 the FCC and the Industry Canada.

EXHIBIT 3
SYSTEM TEST CONFIGURATION

3.0 **System Test Configuration**

3.1 Justification

For radiated emissions testing, the equipment under test (EUT) was setup to transmit continuously / normal mode 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 Base Unit was powered by a 100-120VAC to 5VDC 300mA, Brand: Ten Pao
or 100-240VAC to 5VDC 300mA, Brand: Sunstrong.

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 peripherals, they were connected and operational to simulate typical use. The handset was remotely located as far from the antenna and the base as possible to ensure full power transmission from the base. Else, the base was wired to transmit full power.

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. Radiated emissions were 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 any intentional radiator powered by AC power line, measurements of the radiated signal level of the fundamental frequency component of the emission was performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

For transmitter radiated measurement, the spectrum analyzer resolution bandwidth was 100 kHz for frequencies below 1000 MHz. The resolution bandwidth was 1 MHz for frequencies above 1000 MHz.

Radiated emission measurement for transmitter was 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.
Radiated emission measurement was performed from the frequency 30MHz to 1GHz.

Emission that are directly caused by digital circuits in the transmit path and transmitter portion were measured, and the limit are according to FCC Part 15 Section 15.209. Digital circuitry used to control additional functions other than the operation of the transmitter are subject to FCC Part 15 Section 15.109 Limits.

3.1 Justification - Cont'd

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in section 4.2.3.

Determination of pulse desensitization was made according to *Hewlett Packard Application Note 150-2, Spectrum Analysis... Pulsed RF.* The effective period (Teff) was 625μs. With the resolution bandwidth 1MHz and spectrum analyzer IF bandwidth 3dB, the pulse desensitization factor was 0dB.

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.

All relevant operation modes have been tested, and the worst case data was included in this report.

3.2 EUT Exercising Software

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

3.3 Details of EUT and Description of Accessories

Details of EUT:

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

(1) Base Unit: AC adaptors (100-120VAC to 5VDC 300mA, Model: SSA-5AP-05 US 050030, Brand: Ten Pao) and (100-240VAC to 5VDC 300mA Model: S003IU050030, Brand: Sunstrong) (Supplied by Client)

Description of Accessories:

(1) Telephone Line Simulator, Model: TLS-5D-01, S/N: 151101 (Supplied by Intertek)
(2) Cordless Handset, Model: L60XBT, FCC ID: VLJ80-8619-00 (Supplied by Client)
(3) 3m Telephone Line (Supplied by Intertek)
(4) 3m Telephone Line with Termination (Supplied by Intertek)

3.4 Measurement Uncertainty

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

EXHIBIT 4
TEST RESULTS

4.0 **Test Results**

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.

4.1 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 dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
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 reflects 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 dBμV 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 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 62.0 dBμV
AF = 7.4 dB
CF = 1.6 dB
AG = 29 dB
PD = 0 dB
AV = -10 dB
FS = 62 + 7.4 +1.6 -29 +0 + (-10) = 32 dBμV/m

Level in μV/m = Common Antilogarithm [(32 dBμV/m)/20] = 39.8 μV/m

4.2 Radiated Emissions

4.2.1 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
at

Base Unit by Adaptor Ten Pao: 55.6 MHz

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

4.2.2 Radiated Emission Data

The data in tables 1-8 list the significant emission frequencies, the limit and the margin of compliance.

Judgement -

Base Unit by Adaptor Ten Pao: Passed by 6.1 dB margin

Mode: TX-Channel 00 (Adaptor: Sunstrong)

Table 1, Base Unit

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	2402.000	95.6	33	29.4	24	68.0	94.0	-26.0
H	***4804.000***	***49.7***	***33***	***34.9***	***24***	***27.6***	***54.0***	***-26.4***
H	7206.000	45.6	33	37.9	24	26.5	54.0	-27.5
H	9608.000	42.8	33	40.4	24	26.2	54.0	-27.8
H	***12010.000***	***42.0***	***33***	***40.5***	***24***	***25.5***	***54.0***	***-28.5***
H	14412.000	42.3	33	40.0	24	25.3	54.0	-28.7

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	2402.000	95.6	33	29.4	92.0	114.0	-22.0
H	***4804.000***	***49.7***	***33***	***34.9***	***51.6***	***74.0***	***-22.4***
H	7206.000	45.6	33	37.9	50.5	74.0	-23.5
H	9608.000	42.8	33	40.4	50.2	74.0	-23.8
H	***12010.000***	***42.0***	***33***	***40.5***	***49.5***	***74.0***	***-24.5***
H	14412.000	42.3	33	40.0	49.3	74.0	-24.7

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 is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

Mode: TX-Channel 39 (Adaptor: Sunstrong)

Table 2, Base Unit

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	2441.000	95.7	33	29.4	24	68.1	94.0	-25.9
H	***4882.000***	***49.0***	***33***	***34.9***	***24***	***26.9***	***54.0***	***-27.1***
H	***7323.000***	***45.5***	***33***	***37.9***	***24***	***26.4***	***54.0***	***-27.6***
H	9764.000	42.8	33	40.4	24	26.2	54.0	-27.8
H	***12205.000***	***42.0***	***33***	***40.5***	***24***	***25.5***	***54.0***	***-28.5***
H	14646.000	43.9	33	38.4	24	25.3	54.0	-28.7

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	2441.000	95.7	33	29.4	92.1	114.0	-21.9
H	***4882.000***	***49.0***	***33***	***34.9***	***50.9***	***74.0***	***-23.1***
H	***7323.000***	***45.5***	***33***	***37.9***	***50.4***	***74.0***	***-23.6***
H	9764.000	42.8	33	40.4	50.2	74.0	-23.8
H	***12205.000***	***42.0***	***33***	***40.5***	***49.5***	***74.0***	***-24.5***
H	14646.000	43.9	33	38.4	49.3	74.0	-24.7

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 is used for the emission over 1000MHz.

5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

Mode: TX-Channel 78 (Adaptor: Sunstrong)

Table 3, Base Unit

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	2480.000	95.5	33	29.4	24	67.9	94.0	-26.1
H	***4960.000***	***48.9***	***33***	***34.9***	***24***	***26.8***	***54.0***	***-27.2***
H	***7440.000***	***45.5***	***33***	***37.9***	***24***	***26.4***	***54.0***	***-27.6***
H	9920.000	42.1	33	40.4	24	25.5	54.0	-28.5
H	***12400.000***	***41.9***	***33***	***40.5***	***24***	***25.4***	***54.0***	***-28.6***
H	14880.000	43.9	33	38.4	24	25.3	54.0	-28.7

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	2480.000	95.5	33	29.4	91.9	114.0	-22.1
H	***4960.000***	***48.9***	***33***	***34.9***	***50.8***	***74.0***	***-23.2***
H	***7440.000***	***45.5***	***33***	***37.9***	***50.4***	***74.0***	***-23.6***
H	9920.000	42.1	33	40.4	49.5	74.0	-24.5
H	***12400.000***	***41.9***	***33***	***40.5***	***49.4***	***74.0***	***-24.6***
H	14880.000	43.9	33	38.4	49.3	74.0	-24.7

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 is used for the emission over 1000MHz.

5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

Mode: Talk

Table 4, Base unit

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	55.300	38.8	16	11.0	33.8	40.0	-6.2
V	110.600	35.8	16	14.0	33.8	43.5	-9.7
H	165.900	33.9	16	17.0	34.9	43.5	-8.6
H	***221.200***	***33.8***	***16***	***17.0***	***34.8***	***46.0***	***-11.2***
H	276.500	28.0	16	22.0	34.0	46.0	-12.0
H	***331.800***	***25.5***	***16***	***24.0***	***33.5***	***46.0***	***-12.5***

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. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

Mode: TX-Channel 00 (Adaptor: Ten Pao)

Table 5, Handset

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	2402.000	95.2	33	29.4	24	67.6	94.0	-26.4
H	***4804.000***	***49.9***	***33***	***34.9***	***24***	***27.8***	***54.0***	***-26.2***
H	7206.000	45.7	33	37.9	24	26.6	54.0	-27.4
H	9608.000	42.8	33	40.4	24	26.2	54.0	-27.8
H	***12010.000***	***42.0***	***33***	***40.5***	***24***	***25.5***	***54.0***	***-28.5***
H	14412.000	42.3	33	40.0	24	25.3	54.0	-28.7

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	2402.000	95.2	33	29.4	91.6	114.0	-22.4
H	***4804.000***	***49.9***	***33***	***34.9***	***51.8***	***74.0***	***-22.2***
H	7206.000	45.7	33	37.9	50.6	74.0	-23.4
H	9608.000	42.8	33	40.4	50.2	74.0	-23.8
H	***12010.000***	***42.0***	***33***	***40.5***	***49.5***	***74.0***	***-24.5***
H	14412.000	42.3	33	40.0	49.3	74.0	-24.7

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 is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

Mode: TX-Channel 39 (Adaptor: Ten Pao)

Table 6, Handset

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	2441.000	95.6	33	29.4	24	68.0	94.0	-26.0
H	***4882.000***	***49.0***	***33***	***34.9***	***24***	***26.9***	***54.0***	***-27.1***
H	***7323.000***	***45.5***	***33***	***37.9***	***24***	***26.4***	***54.0***	***-27.6***
H	9764.000	42.8	33	40.4	24	26.2	54.0	-27.8
H	***12205.000***	***42.0***	***33***	***40.5***	***24***	***25.5***	***54.0***	***-28.5***
H	14646.000	43.9	33	38.4	24	25.3	54.0	-28.7

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	2441.000	95.6	33	29.4	92.0	114.0	-22.0
H	***4882.000***	***49.0***	***33***	***34.9***	***50.9***	***74.0***	***-23.1***
H	***7323.000***	***45.5***	***33***	***37.9***	***50.4***	***74.0***	***-23.6***
H	9764.000	42.8	33	40.4	50.2	74.0	-23.8
H	***12205.000***	***42.0***	***33***	***40.5***	***49.5***	***74.0***	***-24.5***
H	14646.000	43.9	33	38.4	49.3	74.0	-24.7

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 is used for the emission over 1000MHz.

5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

Mode: TX-Channel 78 (Adaptor: Ten Pao)

Table 7, Handset

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	2480.000	95.8	33	29.4	24	68.2	94.0	-25.8
H	***4960.000***	***49.3***	***33***	***34.9***	***24***	***27.2***	***54.0***	***-26.8***
H	***7440.000***	***45.4***	***33***	***37.9***	***24***	***26.3***	***54.0***	***-27.7***
H	9920.000	42.1	33	40.4	24	25.5	54.0	-28.5
H	***12400.000***	***41.9***	***33***	***40.5***	***24***	***25.4***	***54.0***	***-28.6***
H	14880.000	43.9	33	38.4	24	25.3	54.0	-28.7

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	2480.000	95.8	33	29.4	92.2	114.0	-21.8
H	***4960.000***	***49.3***	***33***	***34.9***	***51.2***	***74.0***	***-22.8***
H	***7440.000***	***45.4***	***33***	***37.9***	***50.3***	***74.0***	***-23.7***
H	9920.000	42.1	33	40.4	49.5	74.0	-24.5
H	***12400.000***	***41.9***	***33***	***40.5***	***49.4***	***74.0***	***-24.6***
H	14880.000	43.9	33	38.4	49.3	74.0	-24.7

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 is used for the emission over 1000MHz.

5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

Mode: Talk (Adaptor: Ten Pao)

Table 8, Handset

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	55.300	38.9	16	11.0	33.9	40.0	-6.1
V	110.600	35.8	16	14.0	33.8	43.5	-9.7
H	165.900	33.5	16	17.0	34.5	43.5	-9.0
H	***221.200***	***33.8***	***16***	***17.0***	***34.8***	***46.0***	***-11.2***
H	276.500	28.2	16	22.0	34.2	46.0	-11.8
H	***331.800***	***25.5***	***16***	***24.0***	***33.5***	***46.0***	***-12.5***

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. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

4.2.3 Transmitter Duty Cycle Calculation

Based on the Bluetooth Specification Version 2.0 / 2.1 + EDR, the transmitter ON time for each timeslot of Bluetooth is 625μs. DH5 has the maximum duty cycle, which consists of 5 continuous Tx slots and 1 Rx slot. Therefore one hopset take (5+1) x 625μs = 3.75ms. For one period for a pseudo-random hopping through at least 20 RF channels in adaptive mode, it takes: 20 x 3.75ms = 75ms.

The dwell time for DH5 is 5 x 625μs = 3.125ms.

For the worst case calculation, there are two transmissions might occur in 100ms.

Therefore,

Duty Cycle (DC) = Maximum On time in 100ms/100ms
= 3.125ms x 2 /100ms
= 0.0625

Average Factor (AF) of Bluetooth in dB = $20 \log_{10} (0.0625)$
= -24dB

4.3 Radiated Emission on the Bandedge

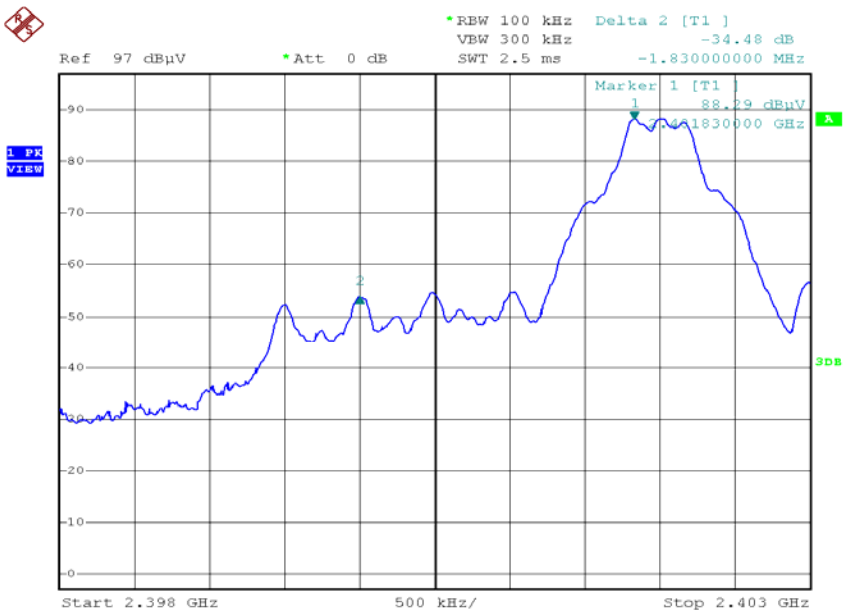
From the following plots, they show that the fundamental emissions are confined in the specified band (902MHz and 928MHz) / (2400MHz and 2483.5MHz) / (5725MHz and 5875MHz). In case of emissions up to two standard bandwidths away from the bandedge, the delta measurement technique is used for determining bandedge compliance. Standard bandwidth is the bandwidth specified by ANSI C63.4 (2009) for frequency being measured.

Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50 dB below the level of the fundamental or to the general radiated emission limits in FCC Part 15 Section 15.209 / Table 5 of RSS-Gen, whichever is the lesser attenuation, which meet the requirement of FCC Part 15 Section 15.249(d) / RSS-210 A2.9(b).

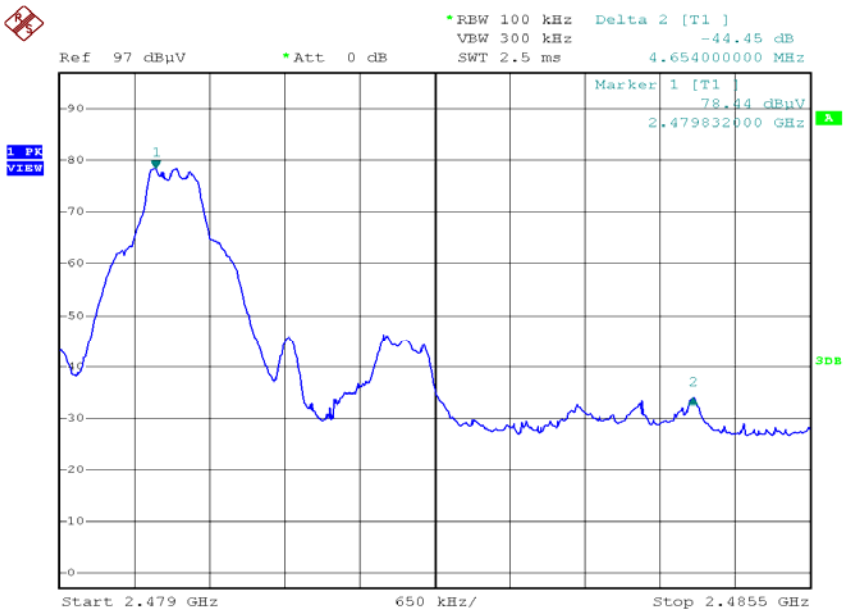
The plots of radiated emission on the bandedge are saved as below.

Plots of radiated emission on the bandedge

Base unit, Lowest channel



Base unit, Highest channel



Bandedge compliance is determined by applying marker-delta method, i.e.

Resultant Field Strength = Fundamental Emissions - Delta from the plot

Resultant field strength for the lowest and/or highest channel(s), with corresponding average values are calculated as follows:

	Channel	Fundamental Emission (dBµV/m)	Delta from the Plot (dB)	Resultant Field Strength (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)
Ten Pao	Lowest	67.6	34.48	33.12	54	-20.88
	Highest	68.2	44.45	23.75	54	-30.25
Sunstrong	Lowest	68	34.48	33.52	54	-20.48
	Highest	67.9	44.45	23.45	54	-30.55

	Channel	Fundamental Emission (dBµV/m)	Delta from the Plot (dB)	Resultant Field Strength (dBµV/m)	Peak Limit (dBµV/m)	Margin (dB)
Ten Pao	Lowest	91.6	34.48	57.12	74	-16.88
	Highest	92.2	44.45	47.75	74	-26.25
Sunstrong	Lowest	92.0	34.48	57.52	74	-16.48
	Highest	91.9	44.45	47.45	74	-26.55

The resultant field strength meets the general radiated emission limit in FCC Part 15 Section 15.209 / Table 5 of RSS-Gen, which does not exceed 74dBµV/m for peak limit and also 54dBµV/m for average limit.

4.4 AC Power Line Conducted Emission

[ ] 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.

4.4.1 AC Power Line Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration
at

Base Unit by Adaptor Ten Pao: 2.544 MHz

Base Unit by Adaptor Sunstrong: 7.0575 MHz

The worst case line conducted configuration photographs are saved with filename: config photos.pdf.

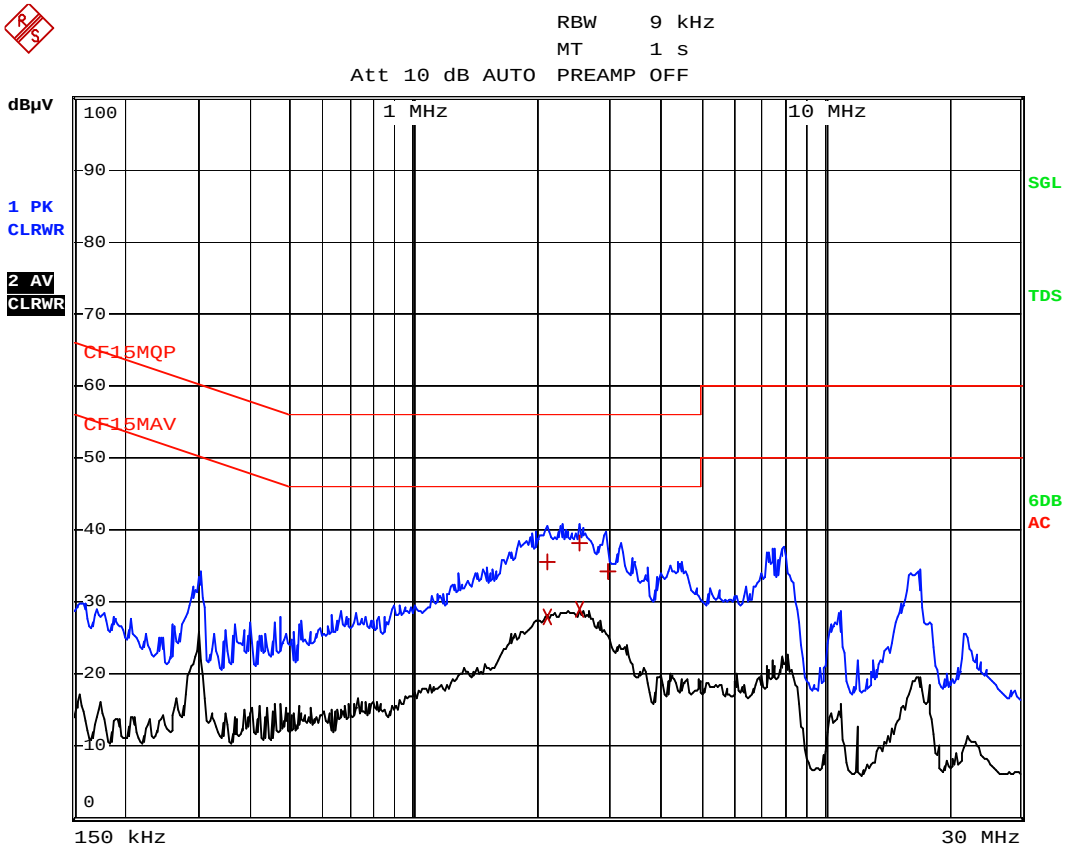
4.4.2 AC Power Line Conducted Emission Data

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

Base Unit by Adaptor Ten Pao: Passed by -16.99 dB margin compare with quasi-peak limit

Base Unit by Adaptor Sunstrong: Passed by -19.83 dB margin compare with quasi-peak limit

Worst Case: Talk – Ten Pao



Date: 21.FEB.2013 10:07:03

Worst Case: Talk – Ten Pao

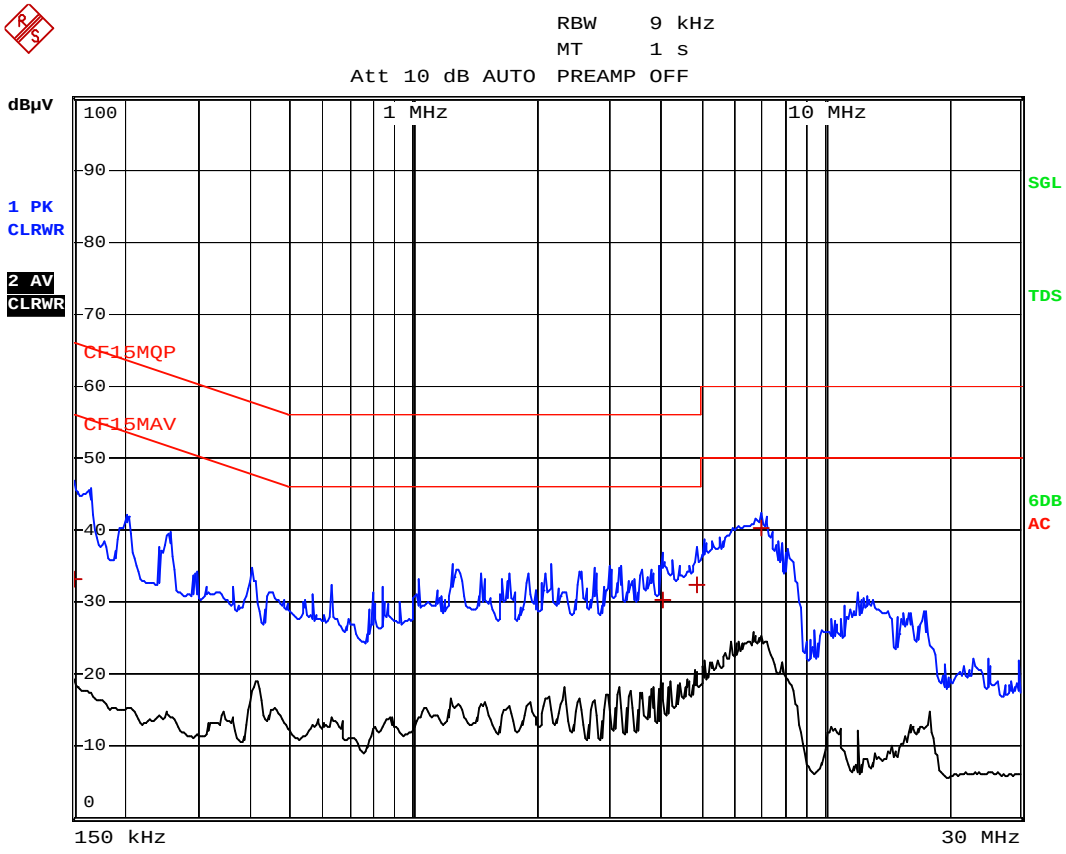
EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
2	CISPR Average	2.1075 MHz	27.88	L1	-18.11
1	Quasi Peak	2.1165 MHz	35.62	L1	-20.37
1	Quasi Peak	2.526 MHz	38.24	L1	-17.75
2	CISPR Average	2.544 MHz	29.00	L1	-16.99
1	Quasi Peak	2.967 MHz	34.14	L1	-21.85

Date: 21.FEB.2013 10:06:43

Worst Case: Talk – Sunstrong



Date: 21.FEB.2013 10:25:38

Worst Case: Talk – Sunstrong

EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	150 kHz	33.11	L1	-32.88
1	Quasi Peak	4.0515 MHz	30.43	N	-25.56
1	Quasi Peak	4.911 MHz	32.34	N	-23.65
1	Quasi Peak	7.0575 MHz	40.16	N	-19.83

Date: 21.FEB.2013 10:25:15

EXHIBIT 5
EQUIPMENT LIST

5.0 **Equipment List**

1) Radiated Emissions Test

Equipment	Biconical Antenna	Log Periodic Antenna	Spectrum Analyzer	Double Ridged Guide Antenna
Registration No.	EW-2500	EW-0446	EW-2188	EW-2512
Manufacturer	ROHDESCHWARZ	EMCO	AGILENTTECH	EMCO
Model No.	ESCI	3146	E4407B	3115
Calibration Date	Mar. 22, 2013	Oct. 31, 2011	Nov. 05, 2012	Nov. 15, 2011
Calibration Due Date	Feb. 28, 2014	Apr. 30, 2013	Nov. 05, 2013	May. 15, 2013

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. 06, 2013
Calibration Due Date	Oct. 30, 2013	Nov. 30, 2013	Apr. 06, 2014

END OF TEST REPORT