KEEN HIGH HOLDING(HK) LIMITED

Application
For
Certification

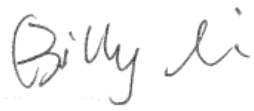
Mobile Internet Device
(2.4GHz Transceiver)

(FCC ID: ZYQ-NABI2-NV7A)

Model: NABI2-NV7A
Additional Model: MT799

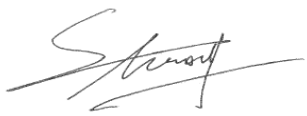
Report No.: SZ12050093-2

Prepared and Checked by:



Billy Li
Team Leader
May 16, 2012

Approved by:



Shawn Xing
Manager
Date: 18 May, 2012

TRF No.: FCC 15C_TXa
FCC ID: ZYQ-NABI2-NV7A

Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch
6F, D Block, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China

Tel: (86 755) 8601 6288 Fax: (86 755) 8601 6751 Website: www.china.intertek-etlsemko.com

LIST OF EXHIBITS

MEASUREMENT/TECHNICAL REPORT

KEEN HIGH HOLDING(HK) LIMITED - MODEL: NABI2-NV7A
Additional Model: MT799

FCC ID: ZYQ-NABI2-NV7A

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

Equipment Type: DXX - Part 15 Low Power Communication Device Transmitter

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

If yes, defer until: _____
date

Company Name agrees to notify the Commission by: _____
date
of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes _____ No X

If no, assumed Part 15, Subpart C for intentional radiator – the new 47 CFR [10-1-11 Edition] provision.

Report prepared by:

Shawn Xing
Intertek Testing Services Shenzhen Ltd.
Kejiyuan Branch
6F, Block D, Huahan Building, Langshan Road,
Nanshan District, Shenzhen, P. R. China
Phone: (86 755) 8601 6288
Fax: (86 755) 8601 6751

Table of Contents

List of attached file

Exhibit type	File Description	Filename
Test Report	Test Report	report.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
Test Setup Photo	Conducted Emission	conducted photos.pdf
External Photo	External Photo	external photos.pdf
Internal Photo	Internal Photo	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
Operation Description	Technical Description	descri.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Confidentiality Letter	request.pdf
Cover Letter	Letter of Agency	agency.pdf

EXHIBIT 1

GENERAL DESCRIPTION

1.0 General Description

1.1 Product Description

The Equipment Under Test (EUT) is a Mobile Internet Device with internal WiFi & BT module operating at 2412-2462MHz for 802.11b/g/n-20MHz, 11 channels with 5MHz channel spacing and 2402-2480MHz for Bluetooth, 79 channels with 1MHz channel spacing. The EUT has a capacitive multi-touch screen and is powered by 1 X 3.7V rechargeable battery or AC/DC Adapter (INPUT: AC100-240, 50/60Hz; OUTPUT: DC 5V, 2A). For more detailed features description, please refer to the user's manual.

Modulation Type: GFSK, π/4DQPSK and 8-DPSK
Antenna Type: Integral antenna

The Model: MT799 is the same as the Model: NABI2-NV7A in hardware aspect. The difference in model number serves as marketing strategy.

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

1.2 Related Submittal(s) Grants

This is an application for certification of a transceiver for the Mobile Internet Device Bluetooth function, and the certification of WiFi function is subject to the report of SZ12050093-1.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009). Radiated emission measurement was performed in Semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "Justification Section" of this Application. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

1.4 Test Facility

The Semi-anechoic chamber and shielding room used to collect the radiated data and conducted data are **Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch** and located at 6F, D Block, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: 242492).

EXHIBIT 2

SYSTEM TEST CONFIGURATION

2.0 System Test Configuration

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2009).

The EUT was powered by a 3.7V full charged lithium battery and charged by AC 120V/60Hz during the test and only the worst data was reported in this report.

All packets DH1, DH3 & DH5 mode in all modulation type GFSK, π/4 –DQPSK and 8-DPSK were tested, and only the worst data was reported in this report.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.

The rear of unit shall be flushed with the rear of the table.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on a turn table, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

2.2 EUT Exercising Software

During the test, Channel and power controlling software provided by the applicant was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the application and is going to be fixed on the firmware of the end product.

2.3 Special Accessories

There have one shielding USB cable with one ferrite core, two AC adapters respectively with one ferrite core attached.

2.4 Equipment Modification

Any modifications installed previous to testing by KEEN HIGH HOLDING(HK) LIMITED will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd Kejiyuan Branch.

2.5 Measurement Uncertainty

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

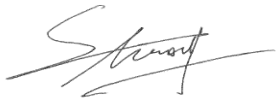
2.6 Support Equipment List and Description

Description	Manufacturer	Model No.
Adapter + 1.3m USB cable with one ferrite core	Ktec	KSAPK0110500200FU (INPUT: 100-240, 50/60Hz, 0.5A; OUTPUT: DC 5V-2A)
Adapter + 1.3m USB cable with one ferrite core	JingQuanHua	NSA12UU-050200 (INPUT: 100-240, 50/60Hz, 0.5A; OUTPUT: DC 5V-2A)
1.2m Earphone	N/A	N/A
Micro sd Card	Sandisk	1G
1.0m shielding USB Cable	Keen	N/A
1.5m HDMI Cable	N/A	N/A
Laptop	Lenovo	T420
Hard Disk	Smart.drive	HD-003
USB Cable	Smart.drive	Unshielded, Length 155cm
1394 Cable	Smart.drive	Unshielded, Length 180cm

All the items listed under section 2.0 of this report are

Confirmed by:

Shawn Xing
Manager
Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch
Agent for



Signature

May 16, 2012 Date

EXHIBIT 3

EMISSION RESULTS

3.0 **Emission Results**

Data is included 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.

3.1 Radiated Test Results

A sample calculation, configuration photographs and data tables of the emissions are included.

3.1.1 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 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

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 = 29.0 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

3.1.2 Radiated Emission Configuration Photograph

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated photos. pdf.

3.1.3 Transmitter Spurious Emissions (Radiated)

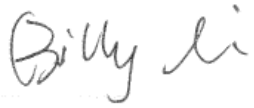
Worst Case Radiated Emission
at
2402.000 & 2480.000 MHz

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated photos. pdf.

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 9.9 dB

TEST PERSONNEL:



Signature

Billy Li, Team Leader
Typed/Printed Name

May 16, 2012
Date

Applicant: KEEN HIGH HOLDING(HK) LIMITED Date of Test: May 16, 2012
Model: NABI2-NV7A
Sample: 1/1
Worst Case Operating Mode: Transmit

Table 1

Radiated Emissions

With AC adapter (Model: KSAPK0110500200FU)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	73.251	39.4	20.0	6.8	26.2	40.0	-13.8
Horizontal	133.782	36.1	20.0	8.0	24.1	43.5	-19.4
Horizontal	332.240	32.6	20.0	15.8	28.4	46.0	-17.6
Vertical	37.912	28.9	20.0	18.0	26.9	40.0	-13.1
Vertical	38.024	25.0	20.0	18.1	23.1	40.0	-16.9
Vertical	112.320	32.9	20.0	7.2	20.1	43.5	-23.4

With AC adapter (Model: NSA12UU-050200)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	73.241	39.5	20.0	6.8	26.3	40.0	-13.7
Horizontal	133.256	36.7	20.0	8.0	24.7	43.5	-18.8
Horizontal	332.258	31.4	20.0	15.8	27.2	46.0	-18.8
Vertical	37.561	28.5	20.0	18.0	26.5	40.0	-13.5
Vertical	37.835	25.0	20.0	18.1	23.1	40.0	-16.9
Vertical	113.246	33.0	20.0	7.2	20.2	43.5	-23.3

NOTES:
1. Quasi-Peak detector is used except for others stated.
2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. All emissions are below the QP limit.

Applicant: KEEN HIGH HOLDING(HK) LIMITED Date of Test: May 16, 2012
Model: NABI2-NV7A
Sample: 1/1
Worst Case Operating Mode: Transmit with charging

Table 2

Radiated Emissions

(2402MHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Vertical	2402.000	112.3	36.7	28.5	104.1	114.0	-9.9
Vertical	4804.000	54.9	36.7	28.5	46.7	74.0	-27.3
Vertical	7206.000	54.5	36.1	33.1	51.5	74.0	-22.5

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Vertical	2402.000	112.3	36.7	28.5	30.1	74.0	94.0	-20.0
Vertical	4804.000	54.9	36.7	28.5	30.1	16.6	54.0	-37.4
Vertical	7206.000	54.5	36.1	33.1	30.1	21.4	54.0	-32.6

Notes: 1. Peak Detector Data unless otherwise stated.

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

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

4. Horn antenna is used for the emission over 1000MHz.

Test Engineer: Billy Li

Applicant: KEEN HIGH HOLDING(HK) LIMITED Date of Test: May 16, 2012
Model: NABI2-NV7A
Sample: 1/1
Worst Case Operating Mode: Transmit with charging

Table 3

Radiated Emissions

(2441MHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Vertical	2441.000	110.8	36.7	28.5	102.6	114.0	-11.4
Vertical	4882.000	55.4	36.7	28.5	47.2	74.0	-26.8
Vertical	7323.000	56.1	36.1	33.1	53.1	74.0	-20.9

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Vertical	2441.000	110.8	36.7	28.5	30.1	72.5	94.0	-21.5
Vertical	4882.000	55.4	36.7	28.5	30.1	17.1	54.0	-36.9
Vertical	7323.000	56.1	36.1	33.1	30.1	23.0	54.0	-31.0

Notes: 1. Peak Detector Data unless otherwise stated.

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

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

4. Horn antenna is used for the emission over 1000MHz.

Test Engineer: Billy Li

Applicant: KEEN HIGH HOLDING(HK) LIMITED Date of Test: May 16, 2012
Model: NABI2-NV7A
Sample: 1/1
Worst Case Operating Mode: Transmit with charging

Table 4

Radiated Emissions

(2480MHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Vertical	2480.000	112.2	36.7	28.6	104.1	114.0	-9.9
Vertical	4960.000	54.4	36.7	28.6	46.3	74.0	-27.7
Vertical	7440.000	55.4	36.1	33.4	52.7	74.0	-21.3

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Vertical	2480.000	112.2	36.7	28.6	30.1	74.0	94.0	-20.0
Vertical	4960.000	54.4	36.7	28.6	30.1	16.2	54.0	-37.8
Vertical	7440.000	55.4	36.1	33.4	30.1	22.6	54.0	-31.4

Notes: 1. Peak Detector Data unless otherwise stated.

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

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

4. Horn antenna is used for the emission over 1000MHz.

Test Engineer: Billy Li

3.2 Conducted Emission at Mains Terminal

3.2.1 Conducted Emissions Configuration Photograph

For electronic filing, the worst case conducted emission configuration photograph is saved with filename: conducted photos.pdf.

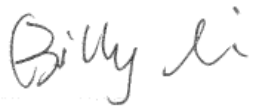
3.2.2 Conducted Emissions

Worst Case Live-Conducted Configuration With AC Adapter (Model: NSA12UU-050200) at

1.874 MHz

Judgement: Passed by 8.2 dB margin

TEST PERSONNEL:



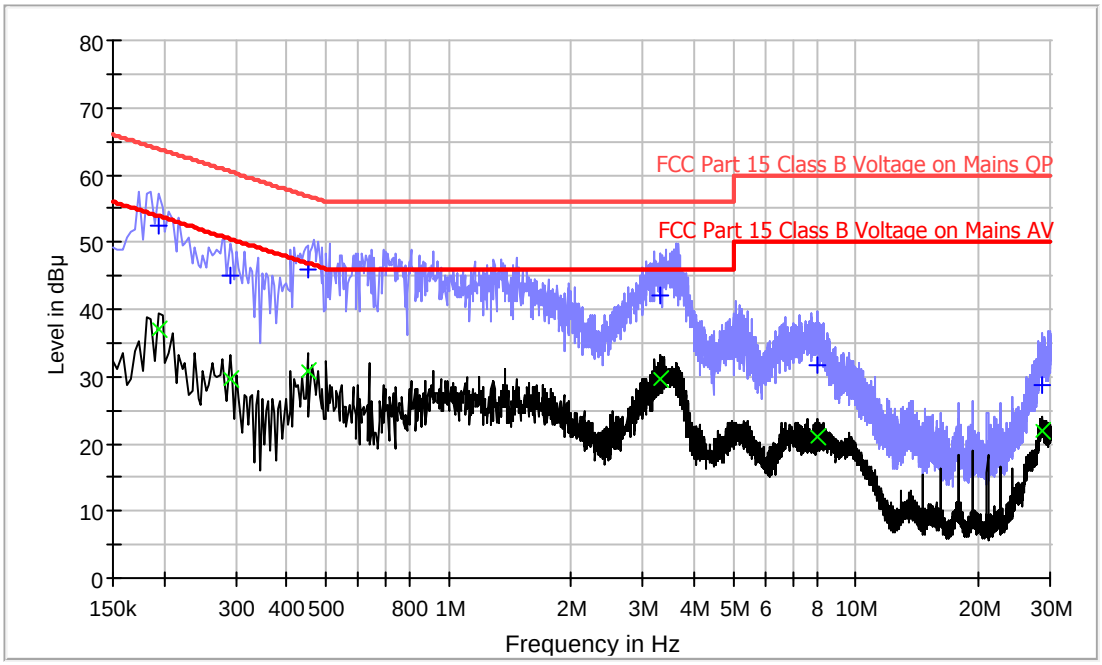
Signature

Billy Li, Team Leader
Typed/Printed Name

May 16, 2012
Date

Applicant: KEEN HIGH HOLDING(HK) LIMITED Date of Test: May 16, 2012
Model: NABI2-NV7A
Sample: 1/1
Worst Case Operating Mode: Transmit (2441MHz) + AC adapter with model: KSAPK0110500200FU

Conducted Emission Test - FCC



Result Table-QP

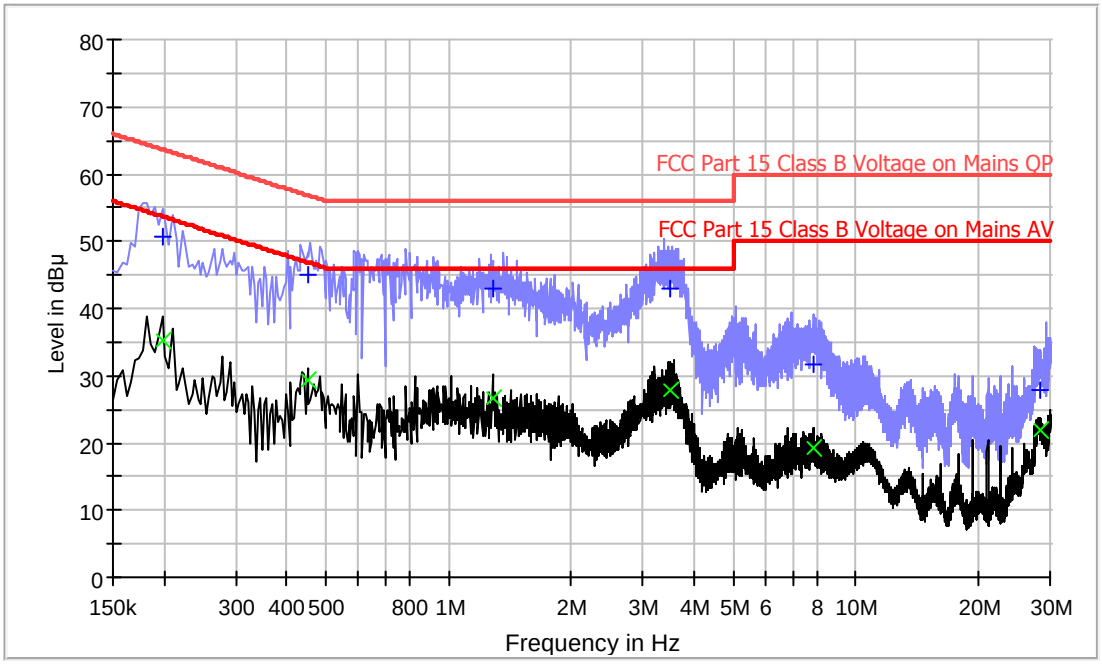
Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.194000	52.6	L1	9.6	11.3	63.9
0.290000	44.9	L1	9.6	15.6	60.5
0.450000	45.8	L1	9.6	11.1	56.9
3.298000	42.0	L1	9.7	14.0	56.0
8.006000	31.7	L1	9.9	28.3	60.0
28.622000	28.9	L1	10.6	31.1	60.0

Result Table-AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.194000	36.9	L1	9.6	17.0	53.9
0.290000	29.5	L1	9.6	21.0	50.5
0.450000	30.9	L1	9.6	16.0	46.9
3.298000	29.6	L1	9.7	16.4	46.0
8.006000	21.1	L1	9.9	28.9	50.0
28.622000	22.0	L1	10.6	28.0	50.0

Applicant: KEEN HIGH HOLDING(HK) LIMITED Date of Test: May 16, 2012
Model: NABI2-NV7A
Sample: 1/1
Worst Case Operating Mode: Transmit (2441MHz) + AC adapter with model: KSAPK0110500200FU

Conducted Emission Test - FCC



Result Table-QP

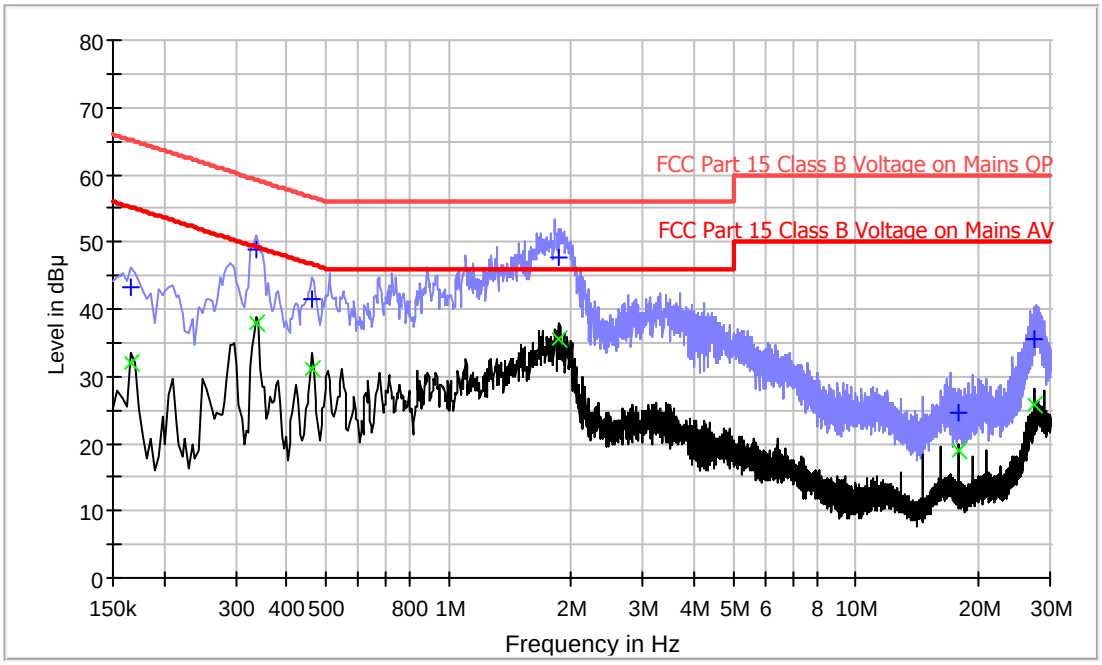
Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.198000	50.8	N	9.6	12.9	63.7
0.450000	45.1	N	9.6	11.8	56.9
1.282000	42.9	N	9.8	13.1	56.0
3.498000	42.9	N	9.7	13.1	56.0
7.834000	31.8	N	9.9	28.2	60.0
28.206000	27.8	N	10.7	32.2	60.0

Result Table-AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.198000	35.1	N	9.6	18.6	53.7
0.450000	29.2	N	9.6	17.7	46.9
1.282000	26.8	N	9.8	19.2	46.0
3.498000	28.0	N	9.7	18.0	46.0
7.834000	19.2	N	9.9	30.8	50.0
28.206000	22.0	N	10.7	28.0	50.0

Applicant: KEEN HIGH HOLDING(HK) LIMITED Date of Test: May 16, 2012
Model: NABI2-NV7A
Sample: 1/1
Worst Case Operating Mode: Transmit (2441MHz) + AC adapter with model: NSA12UU-050200

Conducted Emission Test - FCC



Result Table-QP

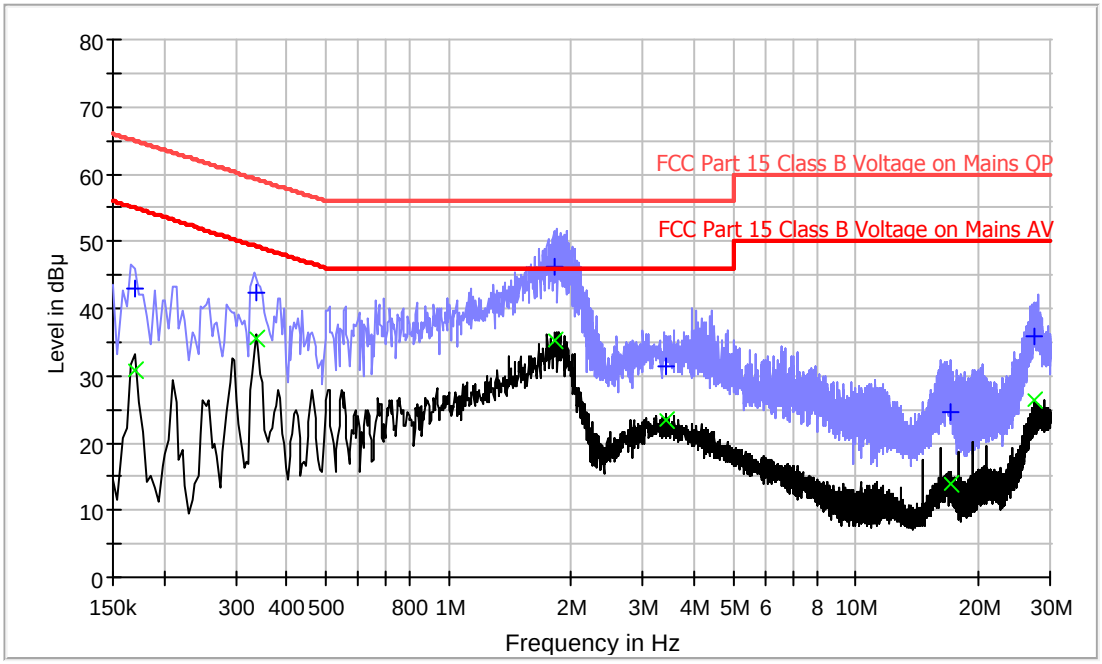
Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.166000	43.3	L1	9.6	21.9	65.2
0.338000	48.9	L1	9.6	10.4	59.3
0.462000	41.4	L1	9.6	15.3	56.7
1.874000	47.8	L1	9.8	8.2	56.0
17.794000	24.7	L1	10.4	35.3	60.0
27.502000	35.5	L1	10.6	24.5	60.0

Result Table-AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.166000	31.9	L1	9.6	23.3	55.2
0.338000	37.9	L1	9.6	11.4	49.3
0.462000	31.2	L1	9.6	15.5	46.7
1.874000	35.5	L1	9.8	10.5	46.0
17.794000	18.9	L1	10.4	31.1	50.0
27.502000	25.8	L1	10.6	24.2	50.0

Applicant: KEEN HIGH HOLDING(HK) LIMITED Date of Test: May 16, 2012
Model: NABI2-NV7A
Sample: 1/1
Worst Case Operating Mode: Transmit (2441MHz) + AC adapter with model: NSA12UU-050200

Conducted Emission Test - FCC



Result Table-QP

Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.150	9.6	N	9.6	56.4	66.0
0.310	16.3	N	9.6	43.7	60.0
1.542	10.6	N	9.8	45.4	56.0
8.018	11.8	N	10.0	48.2	60.0
23.738	42.3	N	10.2	17.7	60.0
24.974	41.6	N	10.2	18.4	60.0

Result Table-AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.150	6.4	N	9.6	49.6	56.0
0.310	14.9	N	9.6	35.1	50.0
1.542	7.3	N	9.8	38.7	46.0
8.018	7.7	N	10.0	42.3	50.0
23.738	36.7	N	10.2	13.3	50.0
24.974	35.8	N	10.2	14.2	50.0

EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

4.0 **Equipment Photographs**

For electronic filing, the photographs of the tested EUT are saved with filename: external photos.pdf & internal photos.pdf.

EXHIBIT 5

PRODUCT LABELLING

5.0 **Product Labelling**

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

EXHIBIT 6

TECHNICAL SPECIFICATIONS

6.0 Technical Specifications

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

EXHIBIT 7

INSTRUCTION MANUAL

7.0 Instruction Manual

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

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

EXHIBIT 8

MISCELLANEOUS INFORMATION

8.0 Miscellaneous Information

This miscellaneous information includes details of the measured bandedge, the test procedure and calculation of factor such as pulse desensitization.

8.1 Bandedge Plot

For electronic filing, the plot shows the fundamental emission when modulated is saved with filename: bandedge.pdf. From the plot, the field strength of any emissions outside of the specified frequency band are attenuated to the general radiated emission limits in section 15.209. It fulfils the requirement of 15.249(d).

Peak Measurement

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

(i) Lower channel 2402MHz:

Peak Resultant field strength = Fundamental emissions (peak value) – delta from the bandedge plot

= 104.1 dBµv/m-46.0 dB
= 58.1 dBµv/m

Average Resultant field strength = Peak field strength – Average Factor
= 58.1 dBµv/m-30.1 dB
= 28.0 dBµv/m

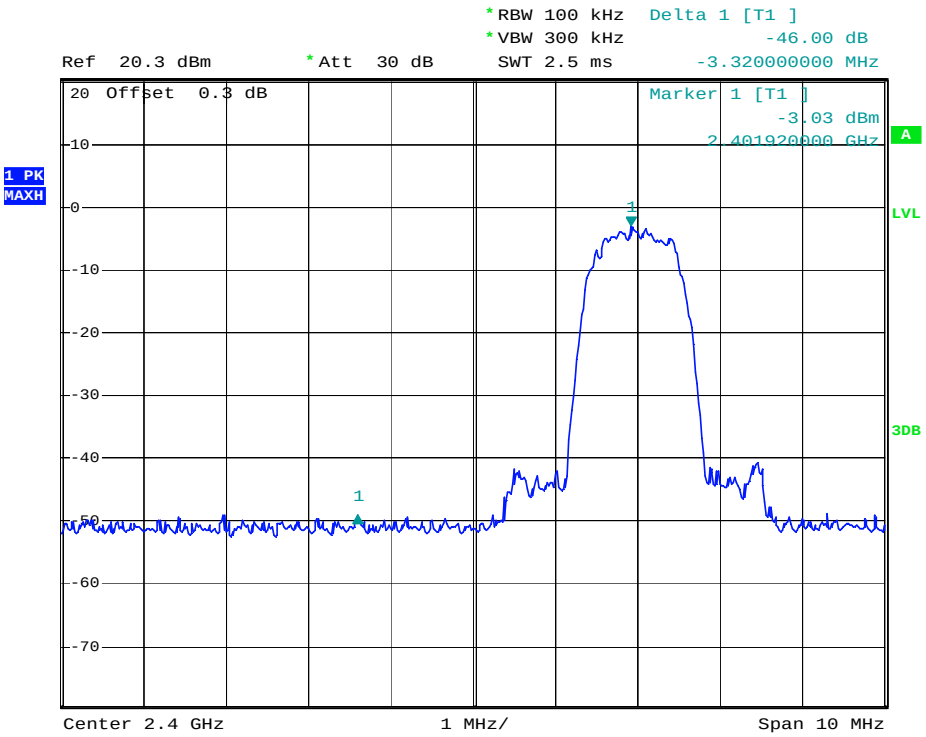
(ii) Upper channel 2480MHz:

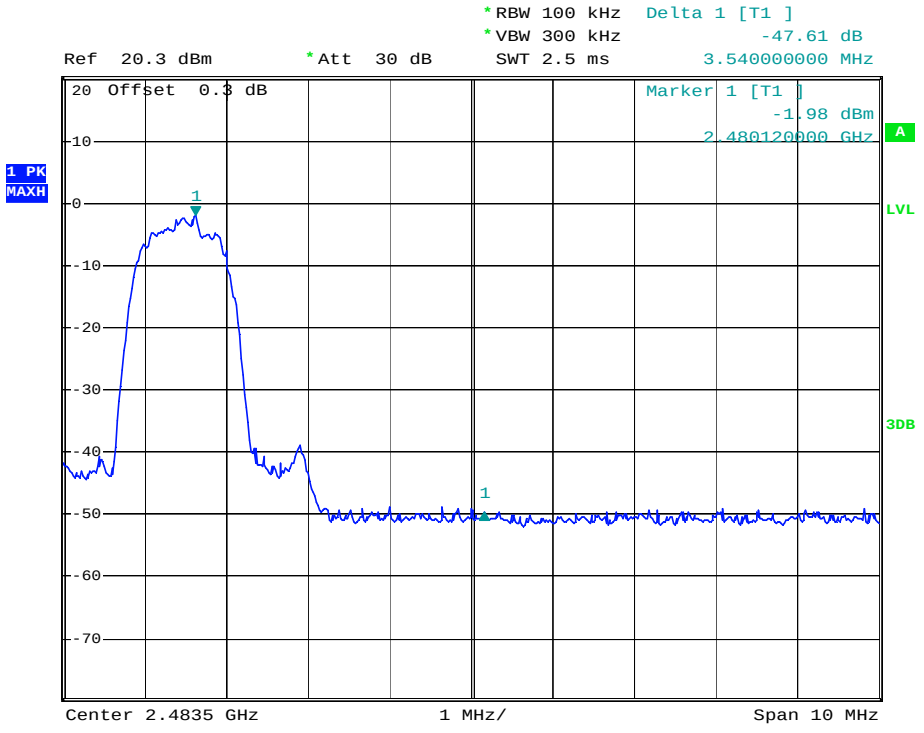
Peak Resultant field strength = Fundamental emissions (peak value) – delta from the bandedge plot

= 104.1 dBµv/m-47.6 dB
= 56.5 dBµv/m

Average Resultant field strength = Peak field strength – Average Factor
= 56.5 dBµv/m-30.1 dB
= 26.4 dBµv/m

The resultant field strength meets the general radiated emission limit in section 15.209, which does not exceed 74dBµv/m (Peak Limit) and 54dBµv/m (Average Limit).

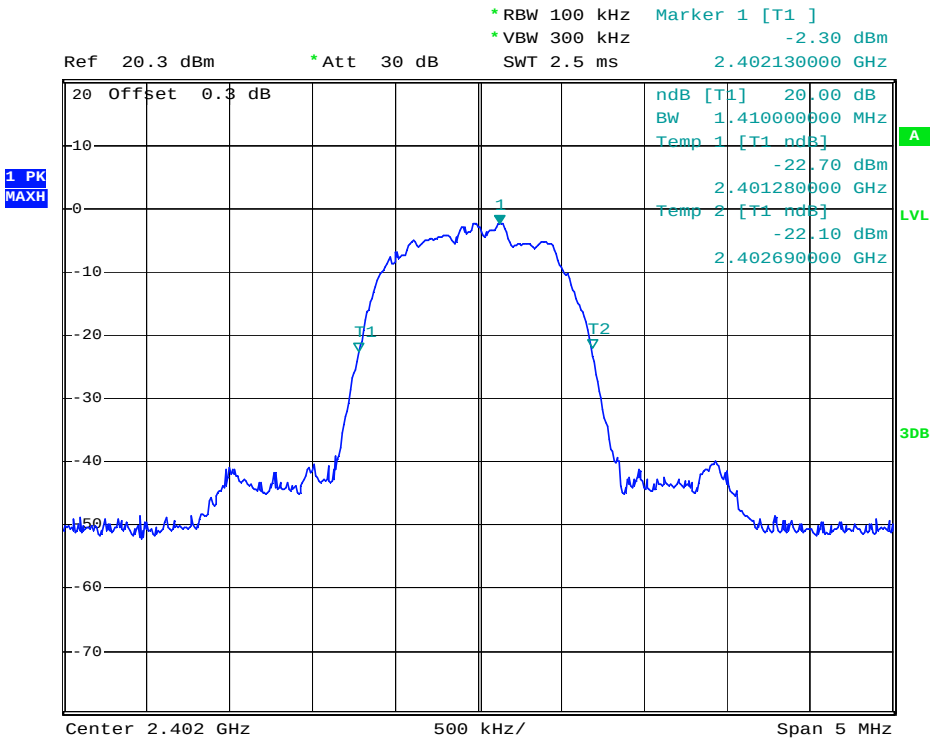

*RBW 100 kHz
*VBW 300 kHz
SWT 2.5 ms
Delta 1 [T1]
-46.00 dB
-3.320000000 MHz
Ref 20.3 dBm
*Att 30 dB
20 Offset 0.3 dB
Marker 1 [T1]
-3.03 dBm
2.401920000 GHz
1 PK
MAXH
A
LVL
3DB
10
0
-10
-20
-30
-40
-50
-60
-70
Center 2.4 GHz
1 MHz/
Span 10 MHz

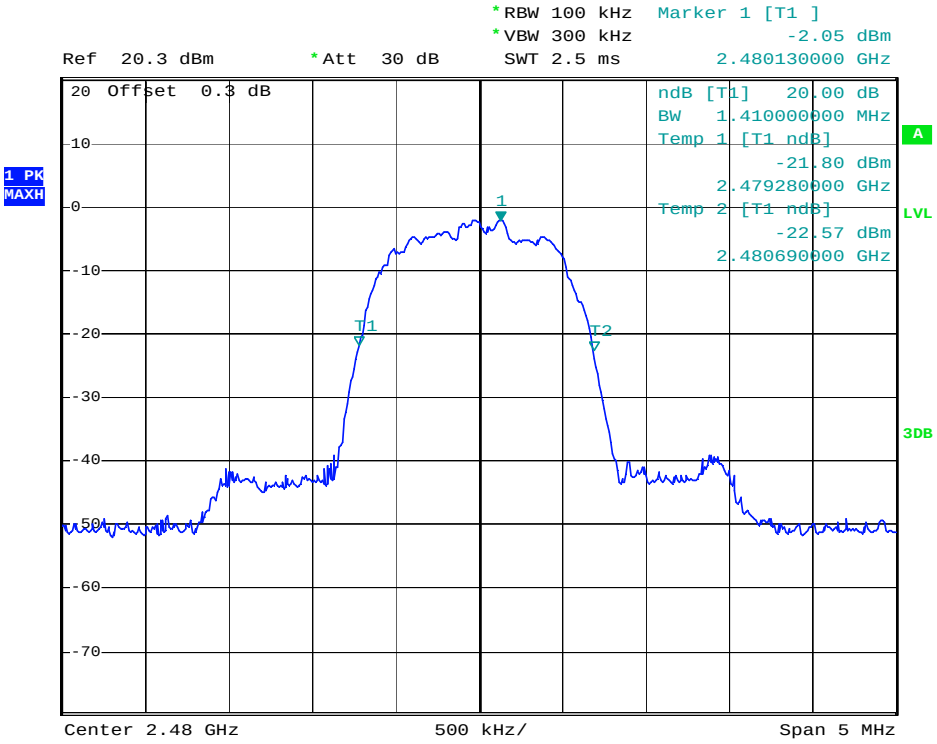

*RBW 100 kHz
*VBW 300 kHz
SWT 2.5 ms
Delta 1 [T1]
-47.61 dB
3.540000000 MHz
Ref 20.3 dBm
*Att 30 dB
20 Offset 0.3 dB
Marker 1 [T1]
-1.98 dBm
2.480120000 GHz
1 PK
MAXH
A
LVL
3DB
10
0
-10
-20
-30
-40
-50
-60
-70
Center 2.4835 GHz
1 MHz/
Span 10 MHz

8.2 Bandwidth Plot

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 excepted variations in temperature and supply voltage were considered.

Figure 8.1 Bandwidth


*RBW 100 kHz
*VBW 300 kHz
SWT 2.5 ms
Marker 1 [T1]
-2.30 dBm
2.402130000 GHz
Ref 20.3 dBm
*Att 30 dB
20 Offset 0.3 dB
ndB [T1] 20.00 dB
BW 1.410000000 MHz
Temp 1 [T1 ndB]
-22.70 dBm
2.401280000 GHz
Temp 2 [T1 ndB]
-22.10 dBm
2.402690000 GHz
1 PK
MAXH
A
LVL
3DB
T1
T2
Center 2.402 GHz
500 kHz/
Span 5 MHz


*RBW 100 kHz
*VBW 300 kHz
SWT 2.5 ms
Marker 1 [T1]
-2.05 dBm
2.480130000 GHz
Ref 20.3 dBm
*Att 30 dB
20 Offset 0.3 dB
ndB [T1] 20.00 dB
BW 1.410000000 MHz
Temp 1 [T1 ndB]
-21.80 dBm
2.479280000 GHz
Temp 2 [T1 ndB]
-22.57 dBm
2.480690000 GHz
1 PK
MAXH
A
LVL
3DB
T1
T2
Center 2.48 GHz
500 kHz/
Span 5 MHz

8.3 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device. The effective period (T_{eff}) is approximately 625µs for Bluetooth. With a resolution bandwidth (3dB) of 1MHz, so the pulse desensitivity factor is 0dB.

8.4 Transmitter Duty Cycle Calculation, FCC Rule 15.35(b, c)

Based on the Bluetooth Specification, transmitter ON time is independent of packet type (DH1, DH3 and DH5) and packet length (single-slot and multi-slot). The maximum transmitter ON time for the Bluetooth is 625µs.

Each TX and RX time slot is 625µs in length. A TDD scheme is used where master and slave alternately transmit. For one period for a pseudo-random hopping through all 79 RF channels, for DH5:

Time of 1 hopset (5 TX slots + 1 RX slot) = 0.625 ms x 6 = 3.75 ms

Time of 1 cycle =3.75 ms x 79 = 296.25 ms

Average factor = 20 log (3.125 / 100) = -30.1 dB

8.5 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of transmitters operating under Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 - 2009.

The transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjust through all three orthogonal axes to obtain maximum emission levels. The antenna height and polarization are varied during the testing to search for maximum signal levels.

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.

The frequency range scanned is 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 40 GHz, whichever is lower.

Detector function for conducted emissions is in QP & AV mode and IFBW setting is 9 kHz from the frequency band 150 kHz to 30MHz.

8.5 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements are made as described in ANSI C63.4 - 2009.

The IF bandwidth used for measurement of radiated signal strength was 10 kHz for emission below 30 MHz and 120 kHz for emission from 30 MHz to 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the restricted bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, but those measurements taken at a closer distance are so marked.

EXHIBIT 9

TEST EQUIPMENT LIST

9.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-03	BiConiLog Antenna	ETS	3142C	00066460	02-Jul-11	02-Jan-13
SZ185-01	EMI Receiver	R&S	ESCI	100547	11-Mar-12	11-Mar-13
SZ061-08	Horn Antenna	ETS	3115	00092346	15-Oct-11	15-Oct-12
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	11-Mar-12	11-Mar-13
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	11-Mar-12	11-Mar-13
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	11-Mar-12	11-Mar-13
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	03-Mar-12	03-Mar-13
SZ062-02	RF Cable	RADIALL	RG 213U	--	17-Mar-12	17-Sep-12
SZ062-06	RF Cable	RADIALL	0.04-26.5GHz	--	01-Nov-11	01-Nov-12
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	25-Feb-12	25-Aug-12
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	--	15-Jul-11	15-Jul-12
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	05-Nov-11	05-Nov-12
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	05-Nov-11	05-Nov-12
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	05-Nov-11	05-Nov-12
SZ188-03	Shielding Room	ETS	RFD-100	4100	16-Sep-10	16-Sep-13