

TEST REPORT**Report No.: 14061366HKG-001R1****The Whistler Group**

Application
For
Certification
(Original Grant)
(FCC ID: HSXSC10)

Scanning Receiver

This report supersedes previous report with report number 14061366HKG-001 dated August 29, 2014

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GENERAL INFORMATION

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Manufacturer:	Radix Telecom Phils., Industries Inc.
Manufacturer Address:	P-IMES Bldg. 2, Block 16, Phase IV, Peza Rosario Cavite, Philippines.
Brand Name:	radioshack, Whistler
Model:	2000668 (radioshack), WS1080 (Whistler)
Type of EUT:	Scanning Receiver
Description of EUT:	Digital Trunking Handheld Radio Scanner
Serial Number:	N/A
FCC ID:	HSXSC10
Date of Sample Submitted:	June 27, 2014
Date of Test:	June 27, 2014 to July 30, 2014
Report No.:	14061366HKG-001R1
Report Date:	September 01, 2014
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

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SUMMARY OF TEST RESULT

TEST SPECIFICATION	REFERENCE	RESULTS
AC Power Line Conducted Emissions	15.107	Pass
Receiver / Digital Device Radiated Emissions	15.109	Pass
Antenna Conducted Emissions	15.111	Pass
Scanning Receiver	15.121	Pass

The equipment under test is found to be complying with the following standards:
FCC Part 15, October 1, 2012 Edition

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1.0 General Description

1.1 Product Description

This Equipment Under Test (EUT) is an audio wireless scanning receiver for its corresponding transmitter. It is powered by 4 fully charged "AA" size rechargeable batteries or 4 X1.5V AA batteries. The USB port is used to connect with PC for Library and firmware update and battery charging. The microSD card is used to record all transmissions for specific systems or talkgroups and record audio with frequency information for all transmissions found while searching.

The Model: WS1080 is the same as the Model: 2000668 in hardware aspect. The difference in model number and brand name serves as marketing strategy.

Antenna Type: External, detachable

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 Scanning receiver.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009). All radiated measurements were performed in an Open Area Test Site. Preliminary scans were performed in the Open Area Test Site 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.

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at Workshop No. 3, G/F., World-Wide Industrial Centre, 43-47 Shan Mei Street, Fo Tan, Sha Tin, N.T., Hong Kong. This test facility and site measurement data have been placed on file with the FCC.

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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 device was powered by 4.8VDC (4 x 1.2V "AA" rechargeable battery) or USB 5.0VDC.

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 3.0.

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 mounted to a plastic stand if necessary and placed on the wooden turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

2.2 EUT Exercising Software

There was no special software to exercise the device. Once the unit is powered up, it receives the RF signal continuously.

2.3 Special Accessories

There are no special accessories necessary for compliance of this product.

2.4 Measurement Uncertainty

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

2.5 Support Equipment List and Description

1. Lenovo Notebook (Model: T61; S/N: L3-CF468)
2. External 1394 HDD (Smart-drive HD3-SU2FW)
3. 1 x USB cable with length of 0.7 meter long
4. 1 x 1394 cable with length of 0.8 meter long with ferrite
5. Lenovo Notebook Adaptor with ferrite (100-240VAC to 20VDC 4.5A, Model: 42T5274)
(Provided by Intertek)

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3.0 Emission 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.

3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any), Average Factor (optional) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG - AV$$

where $FS = \text{Field Strength in } dB\mu V/m$

$RA = \text{Receiver Amplitude (including preamplifier) in } dB\mu V$

$CF = \text{Cable Attenuation Factor in dB}$

$AF = \text{Antenna Factor in dB}$

$AG = \text{Amplifier Gain in dB}$

$AV = \text{Average Factor in dB}$

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:

$$FS = RR + LF$$

where $FS = \text{Field Strength in } dB\mu V/m$

$RR = RA - AG - AV \text{ in } dB\mu V$

$LF = CF + AF \text{ in dB}$

Assume a receiver reading of 52.0 $dB\mu V$ is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB are added. The amplifier gain of 29 dB and average factor of 5 dB are subtracted, giving a field strength of 27 $dB\mu V/m$. This value in $dB\mu V/m$ was converted to its corresponding level in $\mu V/m$.

$$RA = 52.0 \text{ } dB\mu V/m$$

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

$$RR = 18.0 \text{ } dB\mu V$$

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

$$LF = 9.0 \text{ dB}$$

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

$$AV = 5.0 \text{ dB}$$

$$FS = RR + LF$$

$$FS = 18 + 9 = 27 \text{ } dB\mu V/m$$

$$\text{Level in } \mu V/m = \text{Common Antilogarithm } [(27 \text{ } dB\mu V/m)/20] = 22.4 \text{ } \mu V/m$$

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3.2 Radiated Emission Configuration Photograph

The worst case in radiated emission was found at 814.175 MHz

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

3.3 Radiated Emission Data

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.

Judgment: Passed by 12.1 dB

3.4 Conducted Emission Configuration Photograph

The worst case in line-conducted emission was found at 0.15 MHz

For electronic filing, the worst case line-conducted configuration photographs are saved with filename: conducted photo.pdf.

3.5 Conducted Emission Data

For electronic filing, the graph and data table of conducted emission is saved with filename: conducted.pdf.

Judgment: Pass by 19.58 dB

3.6 Antenna Conducted Emission Data

The result of Antenna conducted emission is shown on the following page of report.

Judgment: Pass by 7.63 dB

3.7 38dB Rejection Measurement

The data on the following page lists the significant rejection frequencies, the limit and the margin of compliance.

Judgment: Passed by on response for the cellular band transmission.

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3.8 38dB Rejection Measurement Procedures

Step 1

Firstly, the RF generator was connected with the EUT for giving the reference signal to EUT, and then, the output of the receiver was connected to an audio analyzer (R&S radiocommunication monitor) for checking the audio output level is in appropriate level (12dB SINAD).

The reference signal was constructed with 1k audio, 19kHz pilot signal, 75kHz deviation in FM modulation.

After that, the power level of RF generator was adjusted to produce a 12 dB SINAD on the audio output. This was done across the receiver bands (scanning range) to determine a reference level. The highest sensitivity reference level was recorded for future use.

Step 2

When the reference level was found, the output level of RF generator was risen to 40 dB above the reference level and the output frequency was set to a low, medium and high frequency in both the mobile and base cellular bands A(Mobile = 824.04 MHz through 848.97 MHz, Base = 869.04 MHz through 893.97 MHz).

The scanning process was activated to see whether the cellular bands transmission could be received or not.

If the process stopped in particular frequency/(ies) during the scanning, this/these frequency/(ies) will be noted as response frequency/(ies).

After all the frequency of response was noted, the RF signal generator was set to measure the sensitivity at each of these response frequencies to do the 38dB rejection test intensively. The power level for this/these response frequency/(ies) then adjusted to appropriate for producing 12dB SINAD on the audio output.

The power level which obtain in step 2 was noted. P.S. The difference between the reference power level and the power level in response frequency/(ies) should be 38dB.

Frequencies used on the Signal Generator were 824.04, 836.50 and 48.97MHz for the Mobile and 869.04, 887.73 and 893.97MHz for the Base.

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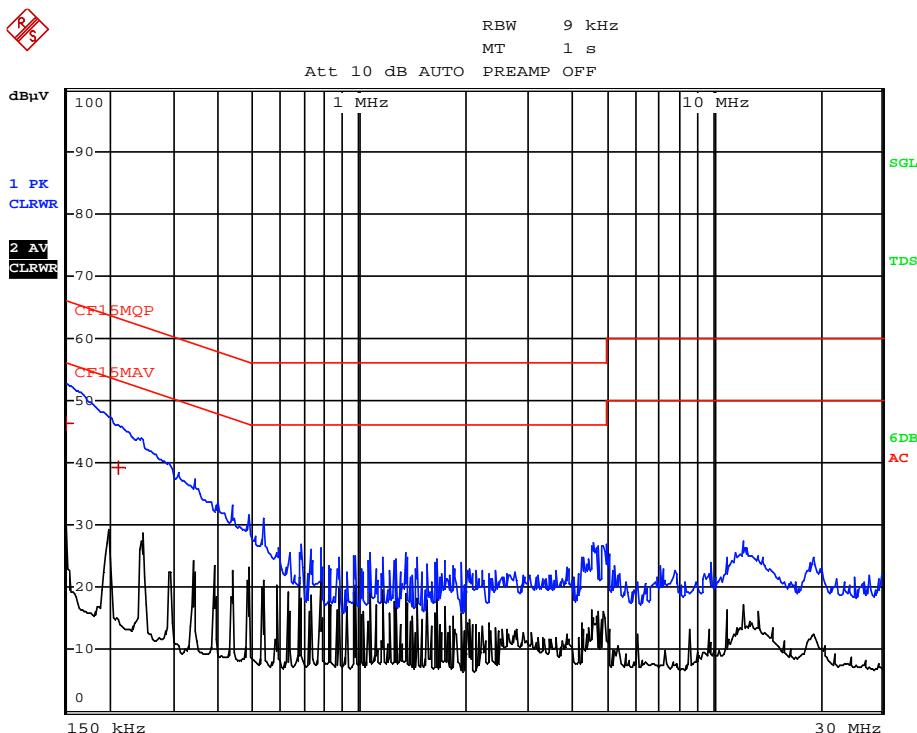
Applicant: The Whistler Group

Date of Test: July 30, 2014

Model: 2000668

Worst-Case Operating Mode: Rx

Conducted Emissions Section 15.107 Requirements



EDIT PEAK LIST (Final Measurement Results)					
Trace1:	CF15MQP				
Trace2:	CF15MAV				
Trace3:	---				
TRACE	FREQUENCY	LEVEL dB μ V		DELTA	LIMIT dB
1 Quasi Peak	150 kHz	46.41	N	-	-19.58
1 Quasi Peak	213 kHz	39.36	N	-	-23.72

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Applicant: The Whistler Group

Date of Test: July 30, 2014

Model: 2000668

Worst-Case Operating Mode: Rx

Table 1
Radiated Emissions
Pursuant to FCC Part 15 Section 15.109 Requirement

25.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	405.750	20.5	16	24.0	28.5	46.0	-17.5
H	811.500	15.4	16	31.0	30.4	46.0	-15.6

41.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	421.799	19.8	16	25.0	28.8	46.0	-17.2
H	843.598	15.9	16	31.0	30.9	46.0	-15.1

54.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	434.775	19.4	16	25.0	28.4	46.0	-17.6
H	869.550	15.2	16	31.0	30.2	46.0	-15.8

108.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	488.774	19.2	16	26.0	29.2	46.0	-16.8
H	977.548	15.5	16	33.0	32.5	54.0	-21.5

124.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	504.749	20.0	16	26.0	30.0	46.0	-16.0
H	1009.488	39.3	33	26.1	32.4	54.0	-21.6
H	1514.249	39.2	33	27.2	33.4	54.0	-20.6

136.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	516.749	19.2	16	27.0	30.2	46.0	-15.8
H	1033.499	39.7	33	26.1	32.8	54.0	-21.2
H	1550.247	39.3	33	27.2	33.5	54.0	-20.5

NOTES: 1. Peak Detector Data unless otherwise 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 sign in the column shows value below limit.
4. Horn antenna is used for the emission over 1000MHz.

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Applicant: The Whistler Group

Date of Test: July 30, 2014

Model: 2000668

Worst-Case Operating Mode: Rx

Table 2
Radiated Emissions
Pursuant to FCC Part 15 Section 15.109 Requirement

137.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	517.799	17.5	16	27.0	28.5	46.0	-17.5
H	1035.598	37.3	33	26.1	30.4	54.0	-23.6
H	1553.397	38.2	33	27.2	32.4	54.0	-21.6

155.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	535.799	16.7	16	28.0	28.7	46.0	-17.3
H	1071.598	37.3	33	26.1	30.4	54.0	-23.6
H	1607.397	38.5	33	27.2	32.7	54.0	-21.3

174.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	554.774	16.5	16	28.0	28.5	46.0	-17.5
H	1109.548	37.7	33	26.1	30.8	54.0	-23.2
H	1664.322	38.7	33	27.2	32.9	54.0	-21.1

NOTES: 1. Peak Detector Data unless otherwise 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 sign in the column shows value below limit.
4. Horn antenna is used for the emission over 1000MHz.

INTERTEK TESTING SERVICES

Applicant: The Whistler Group

Date of Test: July 30, 2014

Model: 2000668

Worst-Case Operating Mode: Rx

Table 3
Radiated Emissions
Pursuant to FCC Part 15 Section 15.109 Requirement

216.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	596.774	16.9	16	29.0	29.9	46.0	-16.1
H	1193.548	37.3	33	26.1	30.4	54.0	-23.6
H	1790.322	38.6	33	27.2	32.8	54.0	-21.2

257.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	637.799	17.0	16	29.0	30.0	46.0	-16.0
H	1275.598	38.2	33	26.1	31.3	54.0	-22.7
H	1913.397	38.6	33	27.2	32.8	54.0	-21.2

299.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	679.799	17.7	16	29.0	30.7	46.0	-15.3
H	1359.598	39.9	33	26.1	33.0	54.0	-21.0

NOTES:

1. Peak Detector Data unless otherwise 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 sign in the column shows value below limit.
4. Horn antenna is used for the emission over 1000MHz.

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Applicant: The Whistler Group

Date of Test: July 30, 2014

Model: 2000668

Worst-Case Operating Mode: Rx

Table 4
Radiated Emissions
Pursuant to FCC Part 15 Section 15.109 Requirement

300.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	680.774	16.8	16	29.0	29.8	46.0	-16.2
H	1361.548	40.8	33	26.1	33.9	54.0	-20.1

406.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	786.749	15.9	16	31.0	30.9	46.0	-15.1
H	1573.498	40.0	33	27.2	34.2	54.0	-19.8

512.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	892.799	15.5	16	32.0	31.5	46.0	-14.5
H	1785.598	40.3	33	27.2	34.5	54.0	-19.5

764.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	383.175	20.9	16	24.0	28.9	46.0	-17.1
H	766.349	15.7	16	31.0	30.7	46.0	-15.3
H	1149.524	39.4	33	26.1	32.5	54.0	-21.5

773.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	392.174	19.5	16	25.0	28.5	46.0	-17.5
H	784.349	15.9	16	31.0	30.9	46.0	-15.1
H	1176.523	39.7	33	26.1	32.8	54.0	-21.2

782.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	401.174	20.4	16	24.0	28.4	46.0	-17.6
H	802.349	15.5	16	31.0	30.5	46.0	-15.5
H	1203.522	39.7	33	26.1	32.8	54.0	-21.2

NOTES: 1. Peak Detector Data unless otherwise 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 sign in the column shows value below limit.
4. Horn antenna is used for the emission over 1000MHz.

INTERTEK TESTING SERVICES

Applicant: The Whistler Group

Date of Test: July 30, 2014

Model: 2000668

Worst-Case Operating Mode: Rx

Table 5
Radiated Emissions
Pursuant to FCC Part 15 Section 15.109 Requirement

791.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	410.174	21.8	16	25.0	30.8	46.0	-15.2
H	820.349	17.2	16	31.0	32.2	46.0	-13.8
H	1230.524	40.9	33	26.1	34.0	54.0	-20.0

794.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	413.174	21.4	16	25.0	30.4	46.0	-15.6
H	826.349	17.7	16	31.0	32.7	46.0	-13.3
H	1239.523	41.4	33	26.1	34.5	54.0	-19.5

797.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	411.674	21.1	16	25.0	30.1	46.0	-15.9
H	823.349	17.9	16	31.0	32.9	46.0	-13.1
H	1235.023	41.3	33	26.1	34.4	54.0	-19.6

NOTES: 1. Peak Detector Data unless otherwise 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 sign in the column shows value below limit.
4. Horn antenna is used for the emission over 1000MHz.

INTERTEK TESTING SERVICES

Applicant: The Whistler Group

Date of Test: July 30, 2014

Model: 2000668

Worst-Case Operating Mode: Rx

Table 6
Radiated Emissions
Pursuant to FCC Part 15 Section 15.109 Requirement

806.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	425.174	21.7	16	25.0	30.7	46.0	-15.3
H	850.349	17.8	16	31.0	32.8	46.0	-13.2
H	1275.523	42.1	33	26.1	35.2	54.0	-18.8

814.900MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	434.100	21.8	16	25.0	30.8	46.0	-15.2
H	868.200	18.0	16	31.0	33.0	46.0	-13.0
H	1302.300	42.6	33	26.1	35.7	54.0	-18.3

823.987MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	443.174	20.9	16	26.0	30.9	46.0	-15.1
H	886.349	16.8	16	32.0	32.8	46.0	-13.2
H	1329.523	42.3	33	26.1	35.4	54.0	-18.6

NOTES: 1. Peak Detector Data unless otherwise 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 sign in the column shows value below limit.
4. Horn antenna is used for the emission over 1000MHz.

INTERTEK TESTING SERVICES

Applicant: The Whistler Group

Date of Test: July 30, 2014

Model: 2000668

Worst-Case Operating Mode: Rx

Table 7
Radiated Emissions
Pursuant to FCC Part 15 Section 15.109 Requirement

849.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	468.149	21.2	16	26.0	31.2	46.0	-14.8
H	936.299	16.3	16	33.0	33.3	46.0	-12.7
H	1404.448	42.9	33	26.1	36.0	54.0	-18.0

858.980MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	478.124	21.4	16	26.0	31.4	46.0	-14.6
H	956.249	16.5	16	33.0	33.5	46.0	-12.5
H	1434.373	43.7	33	26.1	36.8	54.0	-17.2

868.987MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	488.174	21.7	16	26.0	31.7	46.0	-14.3
H	976.349	16.7	16	33.0	33.7	54.0	-20.3
H	1464.523	43.8	33	26.1	36.9	54.0	-17.1

NOTES: 1. Peak Detector Data unless otherwise 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 sign in the column shows value below limit.
4. Horn antenna is used for the emission over 1000MHz.

INTERTEK TESTING SERVICES

Applicant: The Whistler Group

Date of Test: July 30, 2014

Model: 2000668

Worst-Case Operating Mode: Rx

Table 8
Radiated Emissions
Pursuant to FCC Part 15 Section 15.109 Requirement

894.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	513.149	21.3	16	27.0	32.3	46.0	-13.7
H	1026.299	41.5	33	26.1	34.6	54.0	-19.4
H	1539.448	43.6	33	27.2	37.8	54.0	-16.2

927.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	546.149	20.9	16	28.0	32.9	46.0	-13.1
H	1092.299	41.7	33	26.1	34.8	54.0	-19.2
H	1638.449	43.5	33	27.2	37.7	54.0	-16.3

960.000MHz

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	579.149	20.5	16	28.0	32.5	46.0	-13.5
H	1158.299	41.2	33	26.1	34.3	54.0	-19.7
H	1737.448	43.0	33	27.2	37.2	54.0	-16.8

NOTES: 1. Peak Detector Data unless otherwise 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 sign in the column shows value below limit.
4. Horn antenna is used for the emission over 1000MHz.

INTERTEK TESTING SERVICES

Applicant: The Whistler Group

Date of Test: July 30, 2014

Model: 2000668

Worst-Case Operating Mode: Rx and Charging

Table 9
Radiated Emissions
Pursuant to FCC Part 15 Section 15.109 Requirement

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	36.000	31.6	16	10.0	25.6	40.0	-14.4
H	48.000	32.8	16	11.0	27.8	40.0	-12.2
H	180.000	25.7	16	20.0	29.7	43.5	-13.8
H	227.200	27.6	16	18.0	29.6	46.0	-16.4
H	377.600	23.4	16	24.0	31.4	46.0	-14.6
H	458.650	20.2	16	26.0	30.2	46.0	-15.8
H	499.200	23.2	16	26.0	33.2	46.0	-12.8
H	573.205	20.5	16	28.0	32.5	46.0	-13.5
H	718.850	19.5	16	30.0	33.5	46.0	-12.5
H	814.175	18.9	16	31.0	33.9	46.0	-12.1
H	918.650	16.5	16	33.0	33.5	46.0	-12.5

NOTES: 1. Peak Detector Data unless otherwise 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 sign in the column shows value below limit.
4. Horn antenna is used for the emission over 1000MHz.

INTERTEK TESTING SERVICES

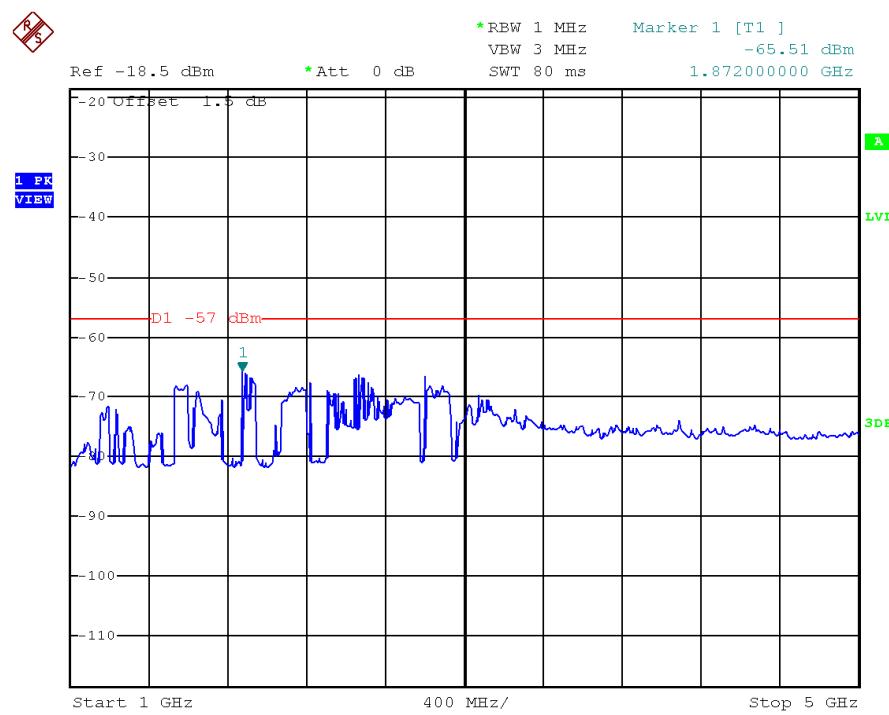
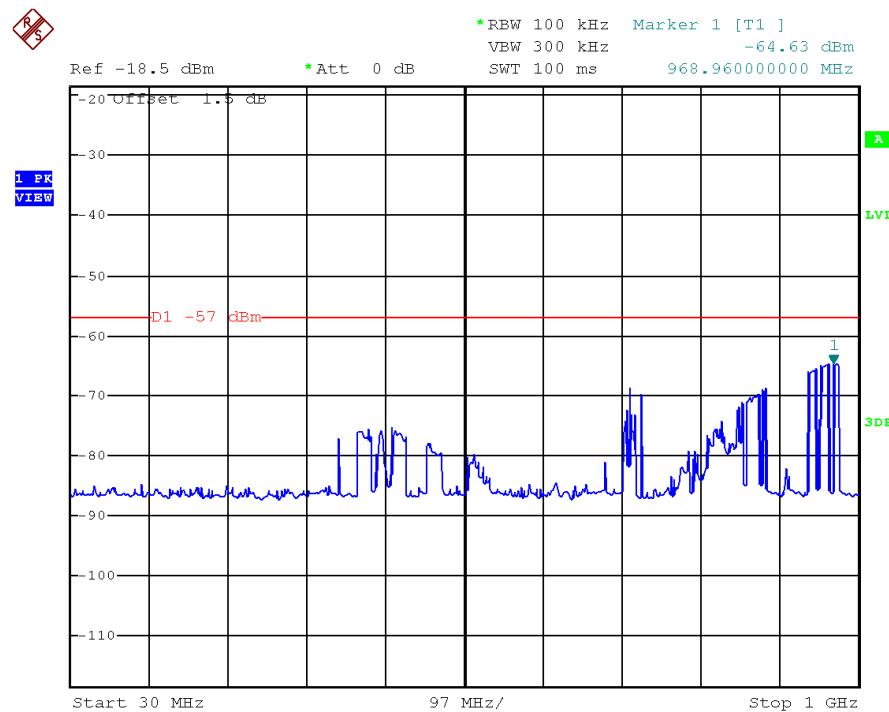
Applicant: The Whistler Group

Date of Test: July 30, 2014

Model: 2000668

Worst-Case Operating Mode: All bands scanning

Antenna Conducted Emissions Pursuant to FCC Part 15 Section 15.111 Requirement



INTERTEK TESTING SERVICES

Applicant: The Whistler Group

Date of Test: July 30, 2014

Model: 2000668

Worst-Case Operating Mode: Rx

Table 10
38dB Rejection Measurement
Pursuant to FCC Part 15 Section 15.121 Requirement

Injected Frequency (Cellular) (MHz)	Level 12dB SINAD at Injected frequency (dBm)	Rejection (dB)	Limit (dB)
824.040	>10	>48.5	38.0
836.000	>10	>48.5	38.0
848.970	>10	>48.5	38.0
896.040	>10	>48.5	38.0
881.000	>10	>48.5	38.0

NOTES: 1. The reference level of the EUT is -38.5dBm.

2. The RF reference signal is RF signal modulated with 1kHz audio signal, 19kHz pilot signal, 75k deviation FM signal.
3. The corresponding limit as per 15.121(b).

INTERTEK TESTING SERVICES

4.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf and internal photos.pdf.

5.0 Product Labelling

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

6.0 Technical Specifications

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

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.

INTERTEK TESTING SERVICES

8.0 **Miscellaneous Information**

The miscellaneous information includes details of the test procedure.

8.1 Discussion of Pulse Desensitization

This device is a scanning receiver. No desensitization of the measurement equipment is required as the received signals are continuously.

8.2 Calculation of Average Factor

This device is scanning receiver. It is not necessary to apply average factor to the measurement result.

INTERTEK TESTING SERVICES

8.3 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services Hong Kong Ltd. in the measurements of scanning receivers operating under the Part 15, Subpart B rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 (2009). A typical or an unmodulated CW signal at the operating frequency of the EUT has been supplied to the EUT for all measurements. Such a signal is supplied by a signal generator and an antenna in close proximity to the EUT. The signal level is sufficient to stabilize the local oscillator of the EUT.

The equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the groundplane. 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 antenna height and polarization are also varied during the testing to search for maximum signal levels. The height of the antenna is varied from one to four meters.

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 30 MHz to 1000 MHz. For line conducted emissions, the range scanned is 150 kHz to 30 MHz.

INTERTEK TESTING SERVICES

8.3 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 were 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. Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

Measurements are normally conducted at a measurement distance of three meters. All measurements are extrapolated to three meters using inverse scaling, unless otherwise reported. Measurements taken at a closer distance are so marked.

9.0 Confidentiality Request

For electronic filing, a preliminary copy of the confidentiality request is saved with filename: request.pdf.

INTERTEK TESTING SERVICES

10.0 Equipment List

1) Radiated Emissions Test

Equipment	EMI Test Receiver	Biconical Antenna	Log Periodic Antenna
Registration No.	EW-2666	EW-0571	EW-0572
Manufacturer	R&S	EMCO	EMCO
Model No.	ESCI7	3104C	3146
Calibration Date	Jun. 20, 2013	Nov. 01, 2013	Jun. 26, 2013
Calibration Due Date	Sep. 20, 2014	May 01, 2015	Dec. 26, 2014

Equipment	Spectrum Analyzer	Double Ridged Guide Antenna
Registration No.	EW-2466	EW-1015
Manufacturer	R&S	EMCO
Model No.	FSP30	3115
Calibration Date	Aug. 04, 2013	Mar. 05, 2013
Calibration Due Date	Aug. 04, 2014	Sep. 05, 2014

2) Conducted Emissions Test

Equipment	EMI Test Receiver	LISN
Registration No.	EW-2500	EW-2874
Manufacturer	R&S	R&S
Model No.	ESCI	ENV-216
Calibration Date	Mar. 22, 2013	Oct. 17, 2013
Calibration Due Date	Aug. 28, 2014	Aug. 17, 2014

3) Bandedge & Antenna Conduct Emission Measurement

Equipment	Spectrum Analyzer
Registration No.	EW-2249
Manufacturer	R&S
Model No.	FSP30
Calibration Date	Oct. 28, 2013
Calibration Due Date	Oct. 28, 2014

END OF TEST REPORT