Shenzhen Jingwah Information Technology Co., Ltd.

Application
For
Certification

FCC ID: RBD-B2

WIRELESS ACTIVITY TRACKER

Model: TRX220
Additional models: B1, B2, SIT50
Brand Name: SHAPER IMAGE, TRAXX

2.4GHz Transceiver

Report No.: 150720014SZN-001

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-13]

Prepared and Checked by:

Sign on file

Robert Li
Project Engineer

Approved by:

Andy Yan
Senior Project Engineer
Date: August 04, 2015

TRF No.: FCC 15C_TX_b

Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch
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LIST OF EXHIBITS

MEASUREMENT/TECHNICAL REPORT

Shenzhen Jingwah Information Technology Co., Ltd.
Model: TRX220
Additional models: B1, B2, SIT50

FCC ID: RBD-B2

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 [10-1-13 Edition] provision.

Report prepared by:

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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
Test Report	20dB BW Plot	bw.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 WIRELESS ACTIVITY TRACKER, it is able transmit data through Bluetooth (4.0) function operating at 2402-2480MHz. The EUT was powered by DC 3.7V, 55mAh. For more detail information pls. refer to the user manual.

The models B1, B2, SIT50 are same as the model TRX220 in hardware and electronic aspect. The models are difference in packaging and marking purpose only

Antenna Type: Integral antenna
Modulation Type: GFSK

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

1.2 Related Submittal(s) Grants

N/A

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). 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 C63.10 (2013).

The EUT was powered by a 3.7 VDC fully charged Li-ion rechargeable battery which is charged by an USB Power Adapter with AC 120V, 60Hz input during the test.

The EUT has only BLE mode, and the worst case mode reported in the 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

The EUT engineering mode (provided by client) used during testing as similar to a typical use.

2.3 Special Accessories

One shielded USB cable with charging connector is used.

2.4 Equipment Modification

Any modifications installed previous to testing by Shenzhen Jingwah Information Technology Co., Ltd 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.
110cm shielded USB Cable with charging connector	Shenzhen Jingwah Information Technology Co., Ltd	N/A
USB Power Adapter	Juxing Electronic (Huizhou) Co.,Ltd.	JXAS0050500100VU Input: AC 100-240V; 50/60Hz Output: DC 5V; 1000mA

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

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

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

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. The net field strength for comparison to the appropriate emission limit is 42 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
FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 dBµV/m

Level in µV/m = Common Antilogarithm [(42 dBµV/m)/20] = 125.9 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 Radiated Emissions

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.

Worst Case Radiated Emission
at
441.765 MHz

Judgement: Passed by 20.5 dB

TEST PERSONNEL:

Sign on file

Robert Li Project Engineer
Typed/Printed Name

July 21, 2015
Date

Applicant: Shenzhen Jingwah Information Technology Co., Ltd
Model: TRX220
Sample: 1/1
Worst Case Operating Mode: BT Link

Table 1

Radiated Emissions

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	97.900	23.7	20.0	10.0	13.7	43.5	-29.8
Horizontal	294.325	26.6	20.0	15.1	21.7	46.0	-24.3
Horizontal	441.765	26.8	20.0	18.7	25.5	46.0	-20.5
Vertical	52.795	30.0	20.0	9.3	19.3	40.0	-20.7
Vertical	94.990	26.1	20.0	9.8	15.9	43.5	-27.6
Vertical	135.730	27.6	20.0	9.1	16.7	43.5	-26.8

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.

3.1.4 Transmitter Spurious Emissions (Radiated)

Worst Case Radiated Emission
at
2483.5 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 3.6 dB

TEST PERSONNEL:

Sign on file

Robert Li Project Engineer
Typed/Printed Name

July 21, 2015
Date

Applicant: Shenzhen Jingwah Information Technology Co., Ltd
Model: TRX220
Sample: 1/1
Worst Case Operating Mode: Transmitting

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)
Horizontal	2402.000	101.6	36.7	28.5	93.4	114.0	-20.6
Horizontal	4804.000	56.3	36.7	35.0	54.6	74.0	-19.4
Horizontal	7206.000	57.4	36.1	37.0	58.3	74.0	-15.7
Horizontal	2399.156	71.4	36.7	28.5	63.2	74.0	-10.8

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2402.000	97.4	36.7	28.5	89.2	94.0	-4.8
Horizontal	4804.000	49.5	36.7	35.0	47.8	54.0	-6.2
Horizontal	7206.000	41.6	36.1	37.0	42.5	54.0	-11.5
Horizontal	2399.156	53.8	36.7	28.5	45.6	54.0	-8.4

Notes: 1. Peak detector is used, RBW=1MHz/VBW=3MHz used for peak value and RBW=1MHz / VBW=10Hz for average value, RBW 3MHz used for fundamental emission.
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.

Applicant: Shenzhen Jingwah Information Technology Co., Ltd
Model: TRX220
Sample: 1/1
Worst Case Operating Mode: Transmitting

Table 3

Radiated Emissions

(2442MHz)

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)
Horizontal	2442.000	106.1	36.7	28.5	97.9	114.0	-16.1
Horizontal	4884.000	53.0	36.7	35.0	51.3	74.0	-22.7
Horizontal	7326.000	54.0	36.1	37.0	54.9	74.0	-19.1
Horizontal	9768.000	55.7	36.2	38.0	57.5	74.0	-16.5

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2442.000	98.5	36.7	28.5	90.3	94.0	-3.7
Horizontal	4884.000	51.0	36.7	35.0	49.3	54.0	-4.7
Horizontal	7326.000	47.9	36.1	37.0	48.8	54.0	-5.2
Horizontal	9768.000	48.0	36.2	38.0	49.8	54.0	-4.2

Notes: 1. Peak detector is used, RBW=1MHz/VBW=3MHz used for peak value and RBW=1MHz / VBW=10Hz for average value, RBW 3MHz used for fundamental emission.
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.

Applicant: Shenzhen Jingwah Information Technology Co., Ltd
Model: TRX220
Sample: 1/1
Worst Case Operating Mode: Transmitting

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)
Horizontal	2480.000	103.0	36.7	28.3	94.6	114.0	-19.4
Horizontal	4960.000	53.7	36.7	35.3	52.3	74.0	-21.7
Horizontal	7440.000	55.5	36.1	37.0	56.4	74.0	-17.6
Horizontal	2483.500	67.2	36.7	28.3	58.8	74.0	-15.2

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2480.000	97.9	36.7	28.3	89.5	94.0	-4.5
Horizontal	4960.000	49.0	36.7	35.3	47.6	54.0	-6.4
Horizontal	7440.000	48.4	36.1	37.0	49.3	54.0	-4.7
Horizontal	2483.500	58.8	36.7	28.3	50.4	54.0	-3.6

Notes:
1. Peak detector is used, RBW=1MHz/VBW=3MHz used for peak value and RBW=1MHz / VBW=10Hz for average value, RBW 3MHz used for fundamental emission.
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.

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 Neutral-Conducted Configuration
At

0.1905 MHz

Judgement: Passed by 18.2 dB margin

TEST PERSONNEL:

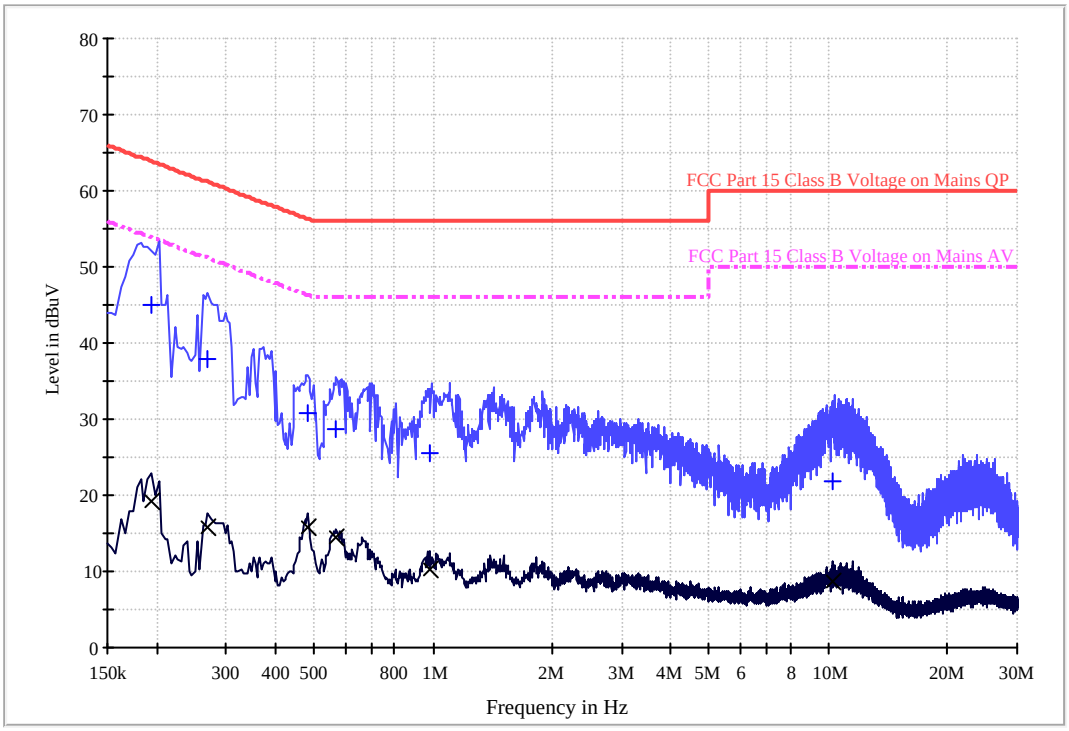
Sign on file

Robert Li Project Engineer
Typed/Printed Name

July 23, 2015
Date

Applicant: Shenzhen Jingwah Information Technology Co., Ltd
Model: TRX220
Sample: 1/1
Worst Case Operating Mode: Transmit with charging

Conducted Emission Test - FCC



Limit and Margin QP

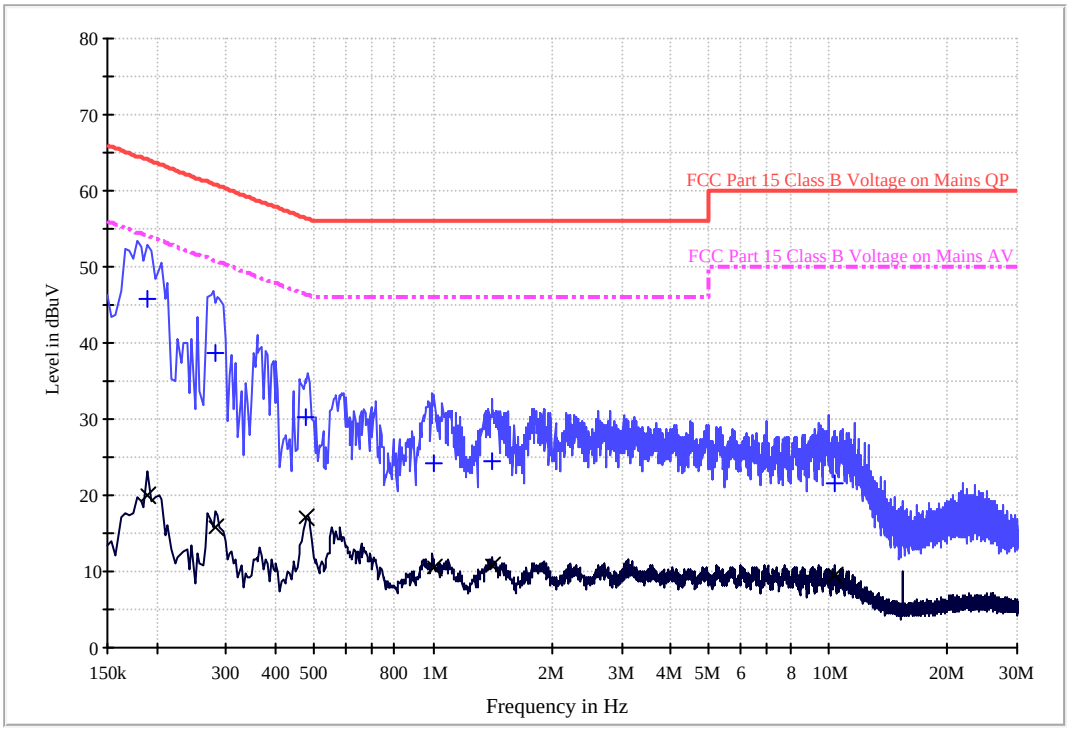
Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.194000	45.0	L1	9.8	18.9	63.9
0.270000	37.9	L1	9.9	23.2	61.1
0.482000	30.7	L1	9.9	25.6	56.3
0.570000	28.8	L1	10.0	27.2	56.0
0.982000	25.6	L1	9.9	30.4	56.0
10.306000	22.0	L1	10.1	38.0	60.0

Limit and Margin AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.194000	19.1	L1	9.8	34.8	53.9
0.270000	15.9	L1	9.9	35.2	51.1
0.482000	15.9	L1	9.9	30.4	46.3
0.570000	14.6	L1	10.0	31.4	46.0
0.982000	10.3	L1	9.9	35.7	46.0
10.306000	8.6	L1	10.1	41.4	50.0

Applicant: Shenzhen Zoko Industry Development Co.,Ltd
Model: T550
Sample: 1/1
Worst Case Operating Mode: Transmit with charging

Conducted Emission Test - FCC



Limit and Margin QP

Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.190500	45.8	N	10.1	18.2	64.0
0.282000	38.6	N	10.2	22.2	60.8
0.478000	30.1	N	10.2	26.3	56.4
1.002000	24.2	N	10.3	31.8	56.0
1.406000	24.4	N	10.3	31.6	56.0
10.334000	21.6	N	10.4	38.4	60.0

Limit and Margin AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.190500	19.9	N	10.1	34.1	54.0
0.282000	15.7	N	10.2	35.1	50.8
0.478000	17.2	N	10.2	29.2	46.4
1.002000	10.6	N	10.3	35.4	46.0
1.406000	10.7	N	10.3	35.3	46.0
10.334000	9.4	N	10.4	40.6	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 20dB BW 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

8.2 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device.

8.3 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 C63.10 - 2013.

The transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter, up to 1GHz 0.8m and above 1GHz 1.5m 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.

8.3 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 are made as described in ANSI C63.10 - 2013.

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, RBW 3MHz used for fundamental emission.

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

CONFIDENTIALITY REQUEST

9.0 Confidentiality Request

For electronic filing, the confidentiality request of the tested EUT is saved with filename: request.pdf.

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EXHIBIT 10

TEST EQUIPMENT LIST

10.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-03	BiConiLog Antenna	ETS	3142C	00066460	14-Jun-15	14-Jun-16
SZ061-07	Pyramidal Horn Antenna	ETS	3160-09	00083067	3-Sep-14	3-Sep-15
SZ061-08	Horn Antenna	ETS	3115	00092346	19-Oct-14	19-Oct-15
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	29-Apr-15	29-Apr-16
SZ056-03	Spectrum Analyzer	R&S	FSP30	101148	8-Jun-15	8-Jun-16
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	7-Feb-15	7-Feb-16
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	19-Apr-14	19-Apr-16
SZ062-02	RF Cable	RADIALL	RG 213U	--	30-Jun-15	30-Dec-15
SZ062-06	RF Cable	RADIALL	0.04-26.5GHz	--	30-Jun-15	30-Dec-15
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	7-Apr-2015	7-Oct-2015
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	--	20-May-15	20-May-16
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	1-Nov-14	1-Nov-15
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	1-Nov-14	1-Nov-15
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	1-Nov-14	1-Nov-15
SZ188-03	Shielding Room	ETS	RFD-100	4100	23-Aug-14	23-Aug-15