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HOKLAS 005
TEST

TEST REPORT

Report No.: 14070655HKG-001

Alco Electronics Ltd.

Application
For
Certification
(Original Grant)
(FCC ID: A2HONB14AV204)

Transceiver

Prepared and Checked by:

Wong Cheuk Ho, Herbert
Lead Engineer

Approved by:

Chan Chi Hung, Terry
Supervisor
Date: July 21, 2014

GENERAL INFORMATION

Grantee:	Alco Electronics Ltd.
Grantee Address:	11/F., Zung Fu Industrial Building, 1067 King's Road, Quarry Bay, Hong Kong.
Contact Person:	Peggy Suen
Tel:	(852) 2562 6121
Fax:	(852) 2597 5201
e-mail:	peggy.suen@alco.com.hk
Manufacturer:	Alco Electronics (Dongguan) Limited
Manufacturer Address:	Gong Ye Xi Road, Houjie Technology Industrial Park, Houjie, Dongguan, Guangdong P.R.C. 523960 China
Brand Name:	VENTURER / ONN
Model:	CR82060BE1 / ONB14AV204
Type of EUT:	Transceiver
Description of EUT:	Clock Radio
Serial Number:	N/A
FCC ID:	A2HONB14AV204
Date of Sample Submitted:	July 15, 2014
Date of Test:	July 15, 2014 to July 19, 2014
Report No.:	14070655HKG-001
Report Date:	July 21, 2014
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

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Tel: (852) 2173 8888 Fax: (852) 2785 5487 Website: www.hk.intertek-etlsemko.com

SUMMARY OF TEST RESULT

TEST SPECIFICATION	REFERENCE	RESULTS
Transmitter Power Line Conducted Emissions	15.207	Pass
Radiated Emission Radiated Emission on the Bandedge	15.249	Pass
Radiated Emission in Restricted Bands	15.205	Pass
Digital Device Radiated Emissions	15.109	Pass

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

Note: 1. The EUT uses a permanently attached antenna which, in accordance to section 15.203, is considered sufficient to comply with the pervisions of this section.
2. Pursuant to FCC part 15 Section 15.215(c), the 20 dB 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.

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1.0 General Description

1.1 Product Description

The Equipment Under Test (EUT) is a Clock Radio. The EUT has Bluetooth Audio portion which is operating between 2402MHz and 2480MHz (79 channels with 1MHz channel spacing). When the EUT is switched ON in Bluetooth mode, the display will show "BT" and a LED flashing. The Bluetooth enabled device would be searched and connected the EUT before playing audio. After pairing, the "BT" LED will stay lit. The audio signal will be amplified and fed to internal stereo loudspeaker. The EUT also have AM/FM radio and alarm clock function. A LED display acts as the visual interface. The EUT is powered by 5V DC from an AC/DC adaptor. The AC/DC adaptor can accept 100-240VAC. Two optional size AA batteries (3VDC) are for real-time-clock memory back-up. A USB port (5VDC) is for charging purpose only.

The Model: ONB14AV204 is the same as the Model: CR82060BE1 in hardware aspect. The difference in model number and brand name serves as marketing strategy.

Antenna Type: Internal, Integral

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

1.2 Related Submittal(s) Grants

This is a single application for certification of a transceiver.

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.

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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).

For radiated emissions testing, the equipment under test (EUT) was setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables (if any) were manipulated to produce worst case emissions.

The EUT was powered by 120VAC.

For the measurements, the EUT was attached to a plastic stand if necessary and placed on the wooden turntable. If the EUT attached to peripherals, they were connected and operational (as typical as possible).

The signal was maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization were varied during the search for maximum signal level. The antenna height was varied from 1 to 4 meters. 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.

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

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.

Radiated emission measurement for transmitter were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

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 is subject to FCC Part 15 Section 15.109 Limits.

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2.1 Justification (cont.)

For the 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 0.4meter 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.

2.2 EUT Exercising Software

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

2.3 Special Accessories

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

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2.4 Measurement Uncertainty

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

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

2.5 Support Equipment List and Description

1. Resistive load 2.38 ohm
2. USB cable of 2m long
   (Provided by Intertek)
3. Software: AppoTech RF Control Kit_V3.1
4. AC/DC Adaptor (Model: ZL-D015W0502500, Input: 100-240VAC 50/60Hz 0.5A, Output: 5VDC 2.5A)
   (Provided by Applicant)

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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 = 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
AV = 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 = Field Strength in dBµV/m
RR = RA - AG - AV in dBµV
LF = CF + AF in dB

Assume a receiver reading of 52.0 dBµV 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 32 dBµV/m. This value in dBµV/m was converted to its corresponding level in µV/m.

RA = 52.0 dBµV/m
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
AV = 5.0 dB
RR = 18.0 dBµV
LF = 9.0 dB
FS = RR + LF
FS = 18 + 9 = 27 dBµV/m

Level in µV/m = Common Antilogarithm [(27 dBµV/m)/20] = 22.4 µV/m

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3.2 Radiated Emission Configuration Photograph

The worst case in radiated emission was found at 7206.000 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 5.2 dB

3.4 Conducted Emission Configuration Photograph

The worst case in line-conducted emission was found at 0.533 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 14.9 dB

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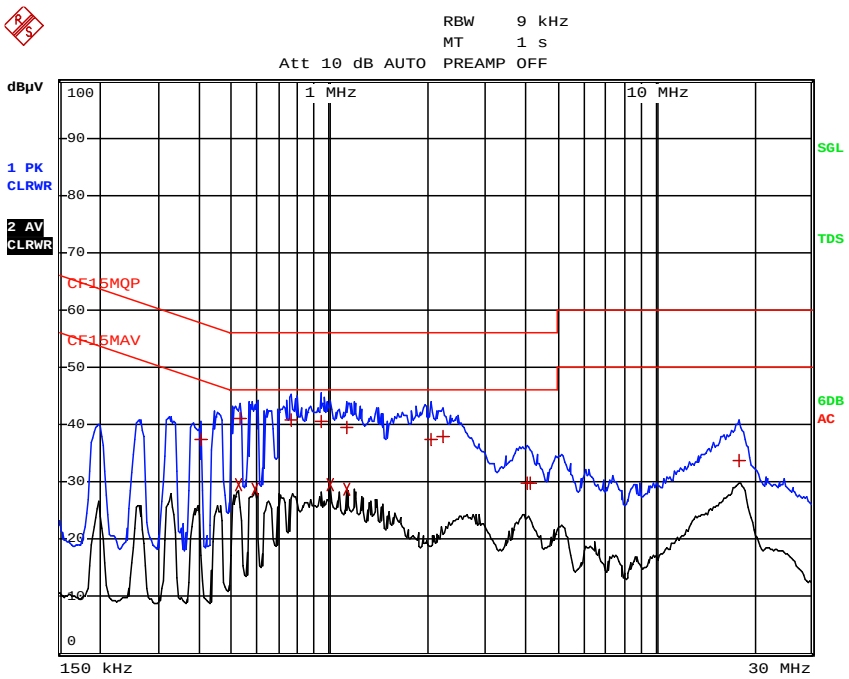
Worst-Case Operating Mode: Transmitting (Bluetooth)

EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

	TRACE	FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	402 kHz	37.38	N	-20.42
2	CISPR Average	523.5 kHz	29.58	N	-16.41
1	Quasi Peak	532.5 kHz	41.10	N	-14.89
2	CISPR Average	591 kHz	28.84	N	-17.15
1	Quasi Peak	762 kHz	40.73	L1	-15.26
1	Quasi Peak	946.5 kHz	40.62	L1	-15.37
2	CISPR Average	1.0095 MHz	29.63	N	-16.36
1	Quasi Peak	1.131 MHz	39.54	L1	-16.45
2	CISPR Average	1.1355 MHz	28.80	L1	-17.20
1	Quasi Peak	2.04 MHz	37.34	L1	-18.65
1	Quasi Peak	2.2245 MHz	37.81	N	-18.18
1	Quasi Peak	4.038 MHz	29.75	L1	-26.24
1	Quasi Peak	4.1145 MHz	29.70	N	-26.29
1	Quasi Peak	18.114 MHz	33.85	N	-26.14



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Applicant: Alco Electronics Ltd. Date of Test: July 19, 2014
Model: CR82060BE1
Worst-Case Operating Mode: Transmitting (Bluetooth)

Table 1

Radiated Emissions
Pursuant to FCC Part 15 Section 15.249 Requirement

Lowest Channel

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	2402.000	101.7	33	29.4	98.1	24	74.1	94.0	-19.9
H	***4804.000***	***61.6***	***33***	***34.9***	***63.5***	***24***	***39.5***	***54.0***	***-14.5***
H	7206.000	63.9	33	37.9	68.8	24	44.8	54.0	-9.2
H	9608.000	47.9	33	40.4	55.3	24	31.3	54.0	-22.7
H	***12010.000***	***50.8***	***33***	***40.5***	***58.3***	***24***	***34.3***	***54.0***	***-19.7***
H	14412.000	53.3	33	40.0	60.3	24	36.3	54.0	-17.7

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)
H	2402.000	101.7	33	29.4	98.1	114.0	-15.9
H	***4804.000***	***61.6***	***33***	***34.9***	***63.5***	***74.0***	***-10.5***
H	7206.000	63.9	33	37.9	68.8	74.0	-5.2
H	9608.000	47.9	33	40.4	55.3	74.0	-18.7
H	***12010.000***	***50.8***	***33***	***40.5***	***58.3***	***74.0***	***-15.7***
H	14412.000	53.3	33	40.0	60.3	74.0	-13.7

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.

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

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Applicant: Alco Electronics Ltd. Date of Test: July 19, 2014
Model: CR82060BE1
Worst-Case Operating Mode: Transmitting (Bluetooth)

Table 2

Radiated Emissions
Pursuant to FCC Part 15 Section 15.249 Requirement

Middle Channel

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	2440.000	101.6	33	29.4	98.0	24	74.0	94.0	-20.0
H	***4880.000***	***61.8***	***33***	***34.9***	***63.7***	***24***	***39.7***	***54.0***	***-14.3***
H	***7320.000***	***63.7***	***33***	***37.9***	***68.6***	***24***	***44.6***	***54.0***	***-9.4***
H	9760.000	48.2	33	40.4	55.6	24	31.6	54.0	-22.4
H	***12200.000***	***51.1***	***33***	***40.5***	***58.6***	***24***	***34.6***	***54.0***	***-19.4***
H	14640.000	55.0	33	38.4	60.4	24	36.4	54.0	-17.6

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)
H	2440.000	101.6	33	29.4	98.0	114.0	-16.0
H	***4880.000***	***61.8***	***33***	***34.9***	***63.7***	***74.0***	***-10.3***
H	***7320.000***	***63.7***	***33***	***37.9***	***68.6***	***74.0***	***-5.4***
H	9760.000	48.2	33	40.4	55.6	74.0	-18.4
H	***12200.000***	***51.1***	***33***	***40.5***	***58.6***	***74.0***	***-15.4***
H	14640.000	55.0	33	38.4	60.4	74.0	-13.6

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.

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

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Applicant: Alco Electronics Ltd. Date of Test: July 19, 2014
Model: CR82060BE1
Worst-Case Operating Mode: Transmitting (Bluetooth)

Table 3

Radiated Emissions
Pursuant to FCC Part 15 Section 15.249 Requirement

Highest Channel

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	2480.000	102.0	33	29.4	98.4	24	74.4	94.0	-19.6
H	***4960.000***	***61.7***	***33***	***34.9***	***63.6***	***24***	***39.6***	***54.0***	***-14.4***
H	***7440.000***	***63.3***	***33***	***37.9***	***68.2***	***24***	***44.2***	***54.0***	***-9.8***
H	9920.000	48.0	33	40.4	55.4	24	31.4	54.0	-22.6
H	***12400.000***	***50.9***	***33***	***40.5***	***58.4***	***24***	***34.4***	***54.0***	***-19.6***
H	14880.000	55.3	33	38.4	60.7	24	36.7	54.0	-17.3

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)
H	2480.000	102.0	33	29.4	98.4	114.0	-15.6
H	***4960.000***	***61.7***	***33***	***34.9***	***63.6***	***74.0***	***-10.4***
H	***7440.000***	***63.5***	***33***	***37.9***	***68.4***	***74.0***	***-5.6***
H	9920.000	48.0	33	40.4	55.4	74.0	-18.6
H	***12400.000***	***50.9***	***33***	***40.5***	***58.4***	***74.0***	***-15.6***
H	14880.000	55.3	33	38.4	60.7	74.0	-13.3

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.

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

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Applicant: Alco Electronics Ltd. Date of Test: July 19, 2014
Model: CR82060BE1
Worst-Case Operating Mode: Sound Playing (Bluetooth)

Table 4

Radiated Emissions
Pursuant to FCC Part 15 Section 15.209 Requirement

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	47.350	35.9	16	11.0	30.9	40.0	-9.1
H	90.003	38.0	16	11.0	33.0	43.5	-10.5
H	96.700	36.4	16	12.0	32.4	43.5	-11.1
H	159.004	31.8	16	16.0	31.8	43.5	-11.7
H	192.030	35.5	16	16.0	35.5	43.5	-8.0
H	194.004	32.3	16	16.0	32.3	43.5	-11.2

NOTES: 1. Quasi-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. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.

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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.

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8.0 **Miscellaneous Information**

The miscellaneous information includes details of the test procedure and measured bandwidth / calculation of factor such as pulse desensitization and averaging factor.

8.1 Radiated Emission on the Bandedge

From the following plots, they show that the fundamental emissions are confined in the specified band (2400MHz to 2483.5MHz). In case of the fundamental emissions are within two standard bandwidths 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 50dB below the level of the fundamental or to the general radiated emissions limits in Section 15.209, whichever is the lesser attenuation, which meet the requirement of part 15.249(d).

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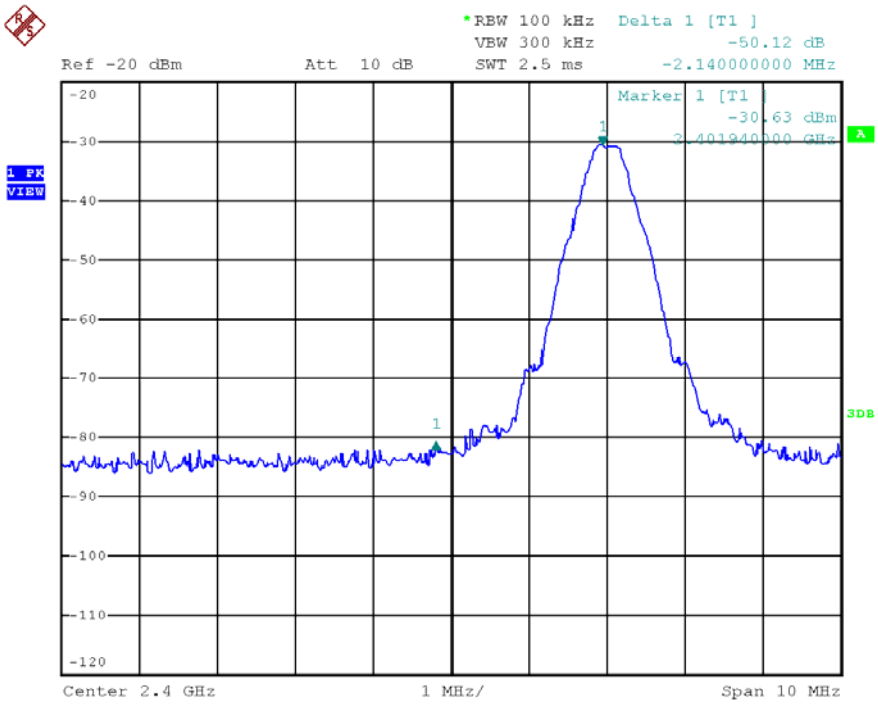

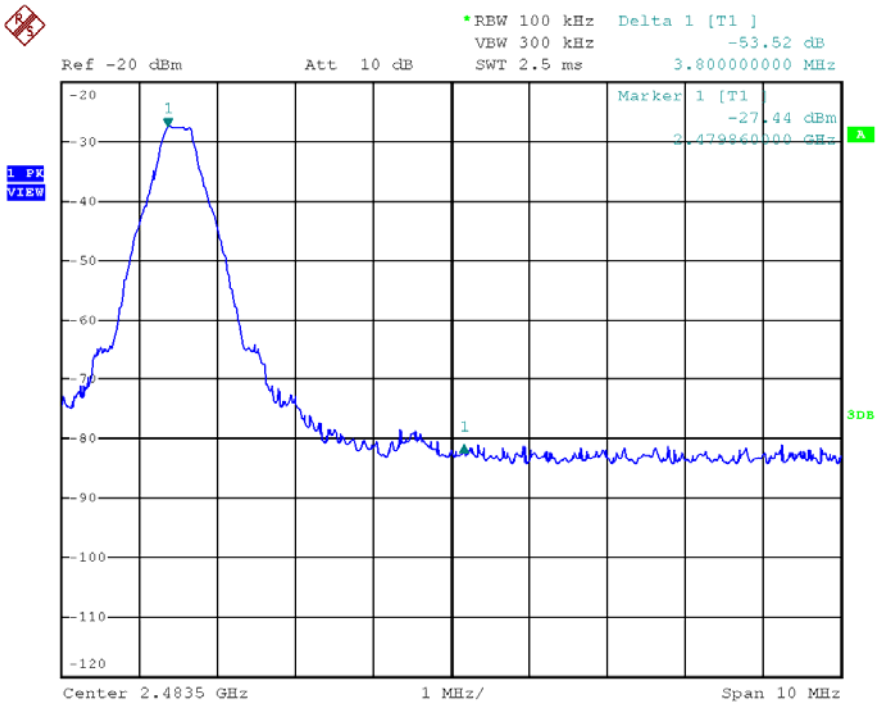

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8.2 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device. The effective period (Teff) is approximately 625µs for a digital "1" bit which illustrated on technical specification, with a resolution bandwidth (3dB) of 1MHz, so the pulse desensitivity factor is 0dB.

8.3 Calculation of Average Factor

Based on the Bluetooth Specification Version 3.0 + 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 (worse case), it take: 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 = $20 \log_{10} (0.0625)$
= -24 dB

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8.4 Emissions Test Procedures

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

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 adjusted through all three orthogonal axis to obtain maximum emission levels. 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. A detailed description for the calculation of the average factor can be found in Exhibit 8.3.

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

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8.4 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 100 kHz or greater when frequency is below 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. A discussion of whether pulse desensitivity is applicable to this unit is included in this report (See Exhibit 8.1). 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 forbidden 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, unless otherwise reported. Measurements taken at a closer distance are so marked.

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9.0 **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	Pyramidal Horn Antenna	Double Ridged Guide Antenna
Registration No.	EW-2466	EW-0905	EW-1015
Manufacturer	R&S	EMCO	EMCO
Model No.	FSP30	3160-09	3115
Calibration Date	Aug. 04, 2013	Jan. 28, 2014	Mar. 05, 2013
Calibration Due Date	Aug. 04, 2014	Jul. 28, 2015	Sep. 05, 2014

2) Conducted Emissions Test

Equipment	EMI Test Receiver	LISN
Registration No.	EW-2666	EW-2501
Manufacturer	R&S	R&S
Model No.	ESCI7	ENV-216
Calibration Date	Jun. 20, 2013	Dec. 25, 2013
Calibration Due Date	Sep. 20, 2014	Nov. 30, 2014

3) Bandedge 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