

TEST REPORT

Report No.: 19101236HKG-001

HeathCo LLC

Application For Certification
(Original Grant)

FCC ID: BJ4-4034

IC: 3984A-4034

Transceiver

Prepared and Checked by:

Approved by:

Signed On File
Wong Cheuk Ho, Herbert
Lead Engineer

Wong Kwok Yeung, Kenneth
Senior Lead Engineer
Date: November 28, 2019

Intertek's standard Terms and Conditions can be obtained at our website <http://www.intertek.com/terms/>.

The test report only allows to be revised within the retention period unless further standard or the requirement was noticed.

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

© 2017 Intertek

TEST REPORT

GENERAL INFORMATION

Grantee:	HeathCo LLC
Grantee Address:	2445 Nashville Road, Bowling Green, KY, 42101
Contact Person:	Jeff Bessinger
Tel:	(270)846-8271
Fax:	N/A
e-mail:	jbessinger@heathcollc.com
Manufacturer:	HeathCo LLC
Manufacturer Address:	2445 Nashville Road, Bowling Green, KY, 42101
Brand Name:	Heath, HeathCo, Heath/Zenith, Style Selections, Secure 360, Portfolio, Ace, Home Decorators, Utilitech, Hampton Bay, Notifi, Secure Home, Defiant
Description of EUT:	Linked Decorative Fixture
FCC ID:	BJ4-4034
Model:	XXXX-4034-07-YYYYY Note: XXXXX, YYYY refers to different packing and article number
IC:	3984A-4034
HVIN:	4034-07
PMN:	4034-07
Type of EUT:	Transceiver
Description of EUT:	Linked Decorative Fixture
Serial Number:	N/A
Date of Sample Submitted:	October 30, 2019
Date of Test:	October 30, 2019 to November 25, 2019
Report No.:	19101236HKG-001
Report Date:	November 28, 2019
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%
Conclusion:	Test was conducted by client submitted sample. The submitted sample as received complied with the 47 CFR Part 15 / RSS-210 Issue 9 Certification.

TEST REPORT

SUMMARY OF TEST RESULT

Test Specification	Reference	Results
Transmitter Power Line Conducted Emissions	15.207 / RSS-Gen 8.8	Pass
Radiated Emission	15.249, 15.209 /	Pass
Radiated Emission on the Bandedge	RSS-210 B.10, RSS-210 4.4	
Radiated Emission in Restricted Bands	15.205 / RSS-210 4.1	Pass

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

FCC Part 15, October 1, 2018 Edition

RSS-210 Issue 9, August 2016

RSS-Gen Issue 5 Amendment 1, March 2019

Note: 1. The EUT uses a permanently attached antenna which, in accordance to section 15.203, is considered sufficient to comply with the provisions 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.

TEST REPORT

TABLE OF CONTENTS

1.0	GENERAL DESCRIPTION	5
1.1	Product Description	5
1.2	Related Submittal(s) Grants	5
1.3	Test Methodology.....	5
1.4	Test Facility	5
2.0	SYSTEM TEST CONFIGURATION.....	6
2.1	Justification	6
2.2	EUT Exercising Software.....	6
2.3	Special Accessories	6
2.4	Measurement Uncertainty.....	6
2.5	Support Equipment List and Description.....	6
3.0	EMISSION RESULTS.....	7
3.1	Field Strength Calculation	7
3.2	Radiated Emission Configuration Photograph.....	8
3.3	Radiated Emission Data	8
3.4	Conducted Emission Configuration Photograph	8
3.5	Conducted Emission Data	8
4.0	EQUIPMENT PHOTOGRAPHS	14
5.0	PRODUCT LABELLING.....	14
6.0	TECHNICAL SPECIFICATIONS	14
7.0	INSTRUCTION MANUAL.....	14
8.0	MISCELLANEOUS INFORMATION	15
8.1	Radiated Emission on the Bandedge.....	15
8.2	Discussion of Pulse Desensitization.....	15
8.3	Calculation of Average Factor	15
8.4	Emissions Test Procedures.....	16
8.5	Occupied Bandwidth.....	20
9.0	CONFIDENTIALITY REQUEST	21
10.0	EQUIPMENT LIST	21

TEST REPORT

1.0 GENERAL DESCRIPTION

1.1 Product Description

The equipment under test (EUT) is the Linked Decorative Fixture (wireless control lighting) which contains a transceiver operating in the 902MHz to 928MHz band. The EUT will transmit RF signal to the corresponding receivers when a person triggering the motion sensor. The EUT is powered by 120VAC.

The EUT operates in 3 channels (905.355MHz, 911.953MHz, 923.350MHz).

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 C63.10 (2013). All radiated measurements were performed in an 3m Chamber. Preliminary scans were performed in the 3m Chamber 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 3m Chamber 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 SAR, China. This test facility and site measurement data have been placed on file with the FCC and IC No. 2042H.

TEST REPORT

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 device was powered by 120VAC.

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 unit was operated standalone and placed in the center of the turntable.

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

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 typical use.

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.

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

N/A.

TEST REPORT

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 dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ V

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 dB μ V/m

RR = RA - AG - AV in dB μ V

LF = CF + AF in dB

Assume a receiver reading of 52.0 dB μ 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 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

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

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

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

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

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

$$FS = RR + LF$$

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

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

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

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

TEST REPORT

3.2 Radiated Emission Configuration Photograph

The worst case in radiated emission was found at 923.344 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 2.2 dB

3.4 Conducted Emission Configuration Photograph

The worst case in line-conducted emission was found at 0.587 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 14.0 dB

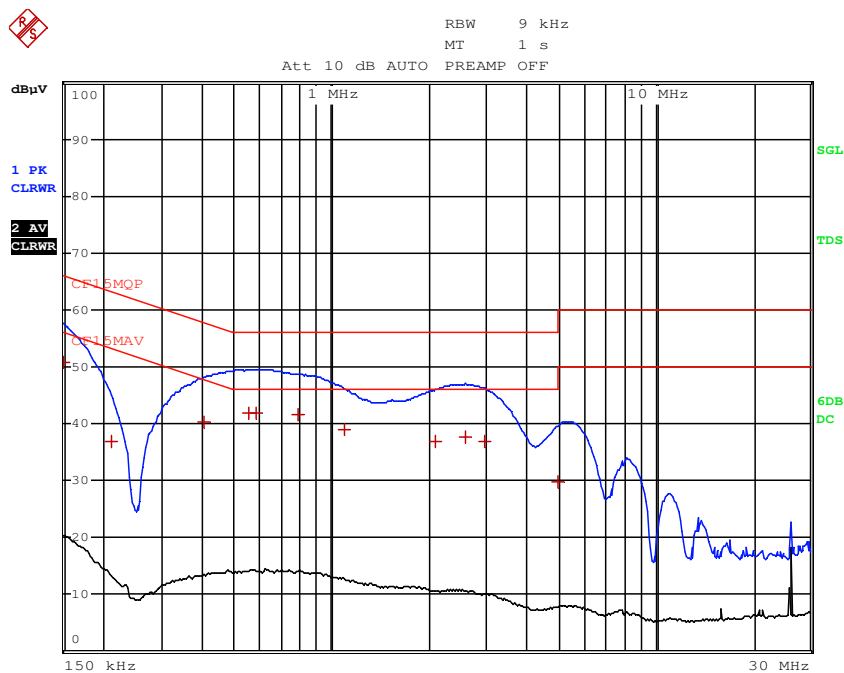
TEST REPORT

CONDUCTED EMISSION

Model: 4034-07

Date of Test: November 25, 2019

Worst-Case Operating Mode: Transceiver Operating



EDIT PEAK LIST (Final Measurement Results)				
Trace1:	CF15MQP			
Trace2:	CF15MAV			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dBμV	DELTA	LIMIT dB
1 Quasi Peak	150 kHz	50.77 L1	-15.22	
1 Quasi Peak	213 kHz	36.93 L1	-26.14	
1 Quasi Peak	402 kHz	40.36 L1	-17.45	
1 Quasi Peak	555 kHz	41.89 L1	-14.10	
1 Quasi Peak	586.5 kHz	41.95 L1	-14.04	
1 Quasi Peak	789 kHz	41.70 L1	-14.29	
1 Quasi Peak	1.0995 MHz	38.96 L1	-17.03	
1 Quasi Peak	2.103 MHz	36.74 N	-19.25	
1 Quasi Peak	2.598 MHz	37.60 N	-18.40	
1 Quasi Peak	2.958 MHz	36.84 L1	-19.15	
1 Quasi Peak	4.9965 MHz	29.89 N	-26.10	

Note: Measurement Uncertainty is ± 4.2 dB at a level of confidence of 95%.

TEST REPORT

RADIATED EMISSIONS

Model: 4034-07

Date of Test: November 25, 2019

Worst-Case Operating Mode: Transmitting (Lowest channel)

Table 1
Pursuant to FCC Part 15 Section 15.249 / RSS-210 B10.0 Requirement

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Quasi-Peak (dBμV/m)	Quasi-Peak Limit at 3m (dBμV/m)	Margin (dB)
V	902.000	32.0	16	32.0	48.0	54.0	-6.0
V	905.350	72.6	16	32.0	88.6	94.0	-5.4
V	928.000	29.0	16	33.0	46.0	54.0	-8.0

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
V	1810.700	68.1	33	27.2	50.4	54.0	-3.6
V	2716.050	40.8	33	30.4	40.4	54.0	-13.6
V	3621.400	34.9	33	33.3	44.2	54.0	-9.8
V	4526.750	36.4	33	34.9	45.6	54.0	-8.4
V	5432.100	37.4	33	35.7	42.2	54.0	-11.8
V	6337.450	36.4	33	36.9	44.6	54.0	-9.4
V	7242.800	36.6	33	37.9	38.2	54.0	-15.8
V	8148.150	37.2	33	39.0	40.2	54.0	-13.8

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
V	1810.700	76.8	33	27.2	71.0	74.0	-3.0
V	2716.050	60.6	33	30.4	58.0	74.0	-16.0
V	3621.400	67.5	33	33.3	67.8	74.0	-6.2
V	4526.750	56.3	33	34.9	58.2	74.0	-15.8
V	5432.100	56.7	33	35.7	59.4	74.0	-14.6
V	6337.450	56.9	33	36.9	60.8	74.0	-13.2
V	7242.800	46.9	33	37.9	51.8	74.0	-22.2
V	8148.150	37.8	33	39.0	43.8	74.0	-30.2

- NOTES:
1. Peak Detector Data unless otherwise stated. Average measurement is according to C63.10 (2013).
 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 / RSS-210 4.1.
 6. Measurement Uncertainty is ±5.3dB at a level of confidence of 95%.

TEST REPORT

Model: 4034-07

Date of Test: November 25, 2019

Worst-Case Operating Mode: Transmitting (Middle channel)

Table 2
Pursuant to FCC Part 15 Section 15.249 / RSS-210 B10.0 Requirement

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Quasi-Peak (dBμV/m)	Quasi-Peak Limit at 3m (dBμV/m)	Margin (dB)
V	902.000	28.0	16	32.0	44.0	54.0	-10.0
V	911.948	74.0	16	33.0	91.0	94.0	-3.0
V	928.000	29.0	16	33.0	46.0	54.0	-8.0

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
V	1823.896	68.1	33	27.2	51.6	54.0	-2.4
V	2735.844	40.8	33	30.4	40.6	54.0	-13.4
V	3647.792	34.9	33	33.3	42.4	54.0	-11.6
V	4559.740	36.4	33	34.9	44.8	54.0	-9.2
V	5471.688	37.4	33	35.7	42.8	54.0	-11.2
V	6383.636	36.4	33	36.9	44.8	54.0	-9.2
V	7295.584	36.6	33	37.9	38.6	54.0	-15.4
V	8207.532	37.2	33	39.0	44.2	54.0	-9.8

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
V	1823.896	77.3	33	27.2	71.5	74.0	-2.5
V	2735.844	60.8	33	30.4	58.2	74.0	-15.8
V	3647.792	66.5	33	33.3	66.8	74.0	-7.2
V	4559.740	54.7	33	34.9	56.6	74.0	-17.4
V	5471.688	57.1	33	35.7	59.8	74.0	-14.2
V	6383.636	56.3	33	36.9	60.2	74.0	-13.8
V	7295.584	47.9	33	37.9	52.8	74.0	-21.2
V	8207.532	42.8	33	39.0	48.8	74.0	-25.2

- NOTES:
1. Peak Detector Data unless otherwise stated. Average measurement is according to C63.10 (2013).
 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 / RSS-210 4.1.
 6. Measurement Uncertainty is ±5.3dB at a level of confidence of 95%.

TEST REPORT

Model: 4034-07

Date of Test: November 25, 2019

Worst-Case Operating Mode: Transmitting (Highest channel))

Table 3
Pursuant to FCC Part 15 Section 15.249 / RSS-210 B10.0 Requirement

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Quasi-Peak (dBμV/m)	Quasi-Peak Limit at 3m (dBμV/m)	Margin (dB)
V	902.000	28.2	16	32.0	44.2	54.0	-9.8
V	923.344	74.8	16	33.0	91.8	94.0	-2.2
V	928.000	34.0	16	33.0	51.0	54.0	-3.0

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
V	1846.688	68.1	33	27.2	50.6	54.0	-3.4
V	2770.032	40.8	33	30.4	41.6	54.0	-12.4
V	3693.376	34.9	33	33.3	40.4	54.0	-13.6
V	4616.720	36.4	33	34.9	50.8	54.0	-3.2
V	5540.064	37.4	33	36.6	41.8	54.0	-12.2
V	6463.408	36.4	33	36.9	46.8	54.0	-7.2
V	7386.752	36.6	33	37.9	37.6	54.0	-16.4
V	8310.096	37.2	33	39.0	43.2	54.0	-10.8

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
V	1846.688	76.3	33	27.2	70.5	74.0	-3.5
V	2770.032	58.8	33	30.4	56.2	74.0	-17.8
V	3693.376	60.5	33	33.3	60.8	74.0	-13.2
V	4616.720	56.9	33	34.9	58.8	74.0	-15.2
V	5540.064	53.2	33	36.6	56.8	74.0	-17.2
V	6463.408	52.3	33	36.9	56.2	74.0	-17.8
V	7386.752	47.7	33	37.9	52.6	74.0	-21.4
V	8310.096	42.2	33	39.0	48.2	74.0	-25.8

- NOTES:
1. Peak Detector Data unless otherwise stated. Average measurement is according to C63.10 (2013).
 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 / RSS-210 4.1.
 6. Measurement Uncertainty is ±5.3dB at a level of confidence of 95%.

TEST REPORT

Model: 4034-07

Date of Test: November 25, 2019

Worst-Case Operating Mode: Transceiver Operating

Table 4
Pursuant to FCC Part 15 Section 15.209 / RSS-210 4.4 Requirement

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
H	92.248	38.5	16	11.0	33.5	43.5	-10.0
H	104.982	37.8	16	13.0	34.8	43.5	-8.7
V	114.005	38.8	16	14.0	36.8	43.5	-6.7
V	155.786	38.8	16	16.0	38.8	43.5	-4.7
V	209.974	39.5	16	17.0	40.5	43.5	-3.0
V	259.998	33.2	16	21.0	38.2	46.0	-7.8
V	300.022	36.0	16	22.0	42.0	46.0	-4.0

- 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. Horn antenna is used for the emission over 1000MHz.
 5. Emission (the row indicated by **bold italic**) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 4.1.
 6. Measurement Uncertainty is ± 5.3 dB at a level of confidence of 95%.

TEST REPORT

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 and Canada.

TEST REPORT

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 (calculation and timing diagram).

8.1 Radiated Emission on the Bandedge

The bandedge data is shown in frequency table 1,2,3.

8.2 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device. Since the transmitter transmits the RF signal continuously.

8.3 Calculation of Average Factor

N/A.

TEST REPORT

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 0.8m in height above the ground plane for emission measurement at or below 1GHz and 1.5m in height above the ground plane for emission measurement above 1GHz. 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.

TEST REPORT

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 C63.10 (2013).

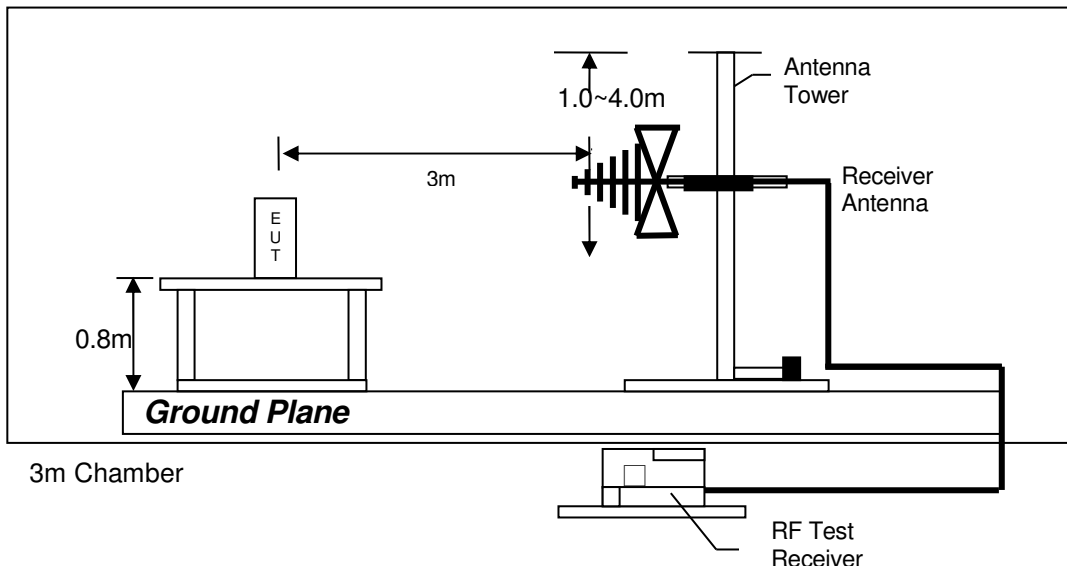
The IF bandwidth used for measurement of radiated signal strength was 100 kHz or greater when frequency is below 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. A discussion 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 3 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.

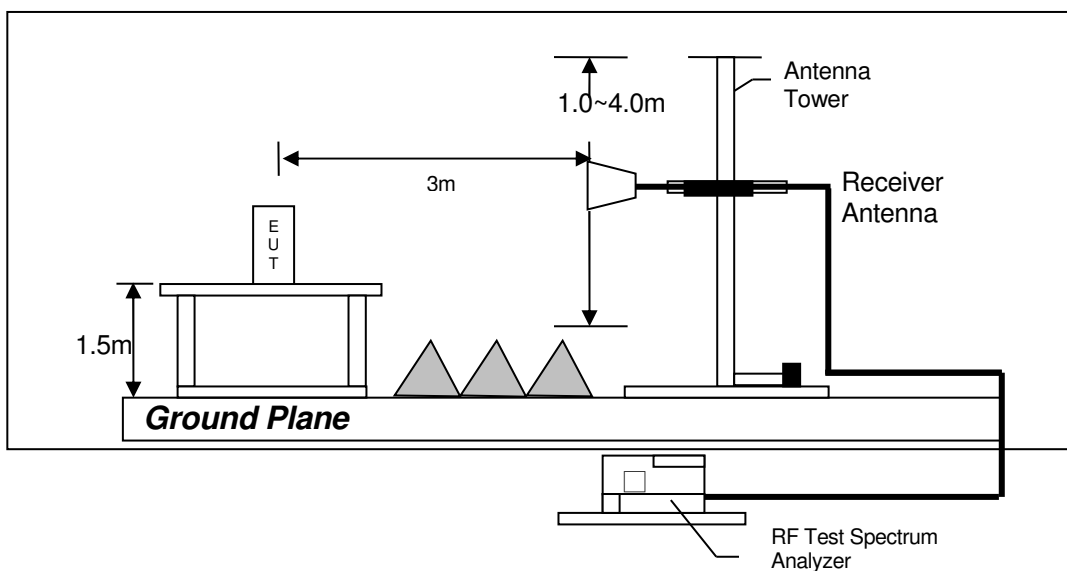
TEST REPORT

8.4.1 Radiated Emission Test Setup

The figure below shows the test setup, which is utilized to make these measurements.



Test setup of radiated emissions up to 1GHz



Test setup of radiated emissions above 1GHz

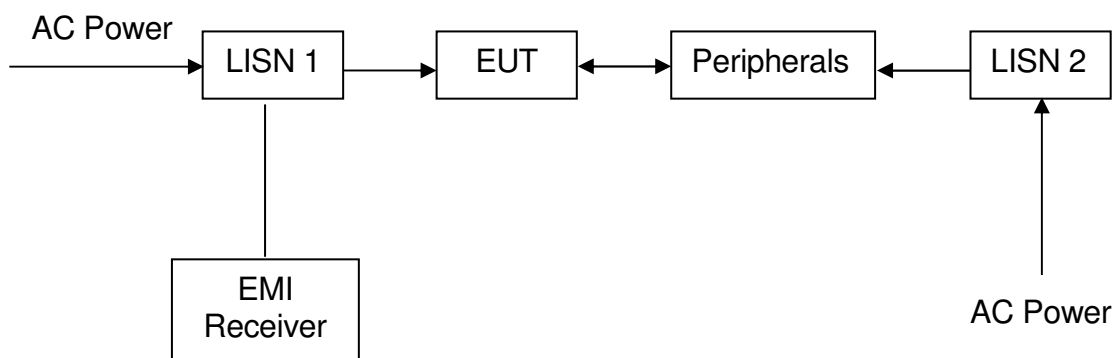
TEST REPORT

8.4.2 Conducted Emission Test Procedures

For tabletop equipment, the EUT along with its peripherals were placed on a 1.0m(W)×1.5m(L) and 0.8m in height wooden table. For floor-standing equipment, the EUT and all cables were insulated, if required, from the ground plane by up to 12 mm of insulating material. The EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN), which provided 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. The excess power cable between the EUT and the LISN was bundled.

All connecting cables of EUT and peripherals were moved to find the maximum emission.

8.4.3 Conducted Emission Test Setup



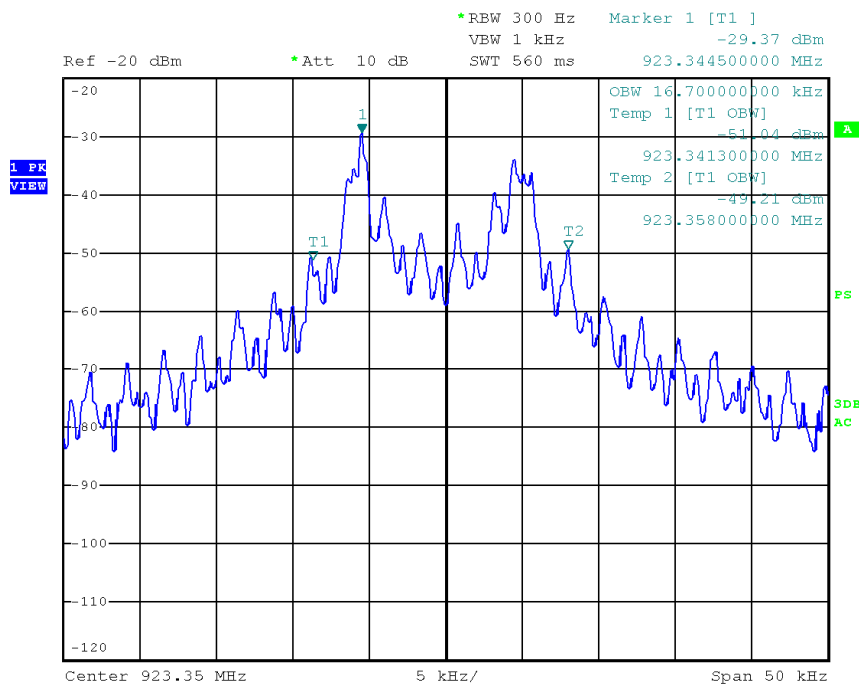
TEST REPORT

8.5 Occupied Bandwidth

Occupied Bandwidth Results:

Frequency (MHz)	Occupied Bandwidth (kHz)
905.355	16.1
911.953	16.6
923.350	16.7

The worst case is shown as below



TEST REPORT

9.0 CONFIDENTIALITY REQUEST

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

10.0 EQUIPMENT LIST

1) Radiated Emissions Test

Equipment	EMI Test Receiver	Spectrum Analyzer	Biconical Antenna
Registration No.	EW-3156	EW-2466	EW-0571
Manufacturer	R&S	ROHDESCHWARZ	EMCO
Model No.	ESR26	FSP30	3104C
Calibration Date	August 01, 2019	January 06, 2019	July 23, 2019
Calibration Due Date	August 01, 2020	January 06, 2020	July 23, 2021

Equipment	Log Periodic Antenna	Double Ridged Guide Antenna	14m Double Shield RF Cable (20MHz - 6GHz)
Registration No.	EW-0447	EW-1133	EW-2074
Manufacturer	EMCO	EMCO	RADIALL
Model No.	3146	3115	Nm-RG142-
Calibration Date	September 25, 2019	November 29, 2018	March 31, 2019
Calibration Due Date	March 25, 2021	May 29, 2020	March 31, 2020

Equipment	15m 40GHz indoor RF Cable	RF Preamplifier (9kHz to 6000MHz)	Solid State Low Noise Preamplifier Assembly (1 - 18)GHz
Registration No.	EW-3032	EW-3424	EW-3229
Manufacturer	GREATBILLION	SCHWARZBECK	BONN ELEKTRO
Model No.	SMA(m) St-SMA (m) St, 15m long	BBV9744	BLMA 0118-5G
Calibration Date	May 14, 2019	July 23, 2019	June 28, 2019
Calibration Due Date	May 14, 2020	July 23, 2020	June 28, 2020

Equipment	Pyramidal Horn Antenna	Active Loop H-field (9kHz to 30MHz)
Registration No.	EW-0905	EW-3326
Manufacturer	EMCO	EMCO
Model No.	3160-09	6502
Calibration Date	July 23, 2019	March 21, 2019
Calibration Due Date	January 23, 2021	September 21, 2020

TEST REPORT

2) Conducted Emissions Test

Equipment	Artificial Mains Network	RF Cable 80cm (RG142) (9kHz to 30MHz)	EMI Test Receiver
Registration No.	EW-2501	EW-2453	EW-2500
Manufacturer	ROHDESCHWARZ	RADIAL	ROHDESCHWARZ
Model No.	ENV-216	RF Cable 120cm (RG142) (9kHz to 30MHz)	ESCI
Calibration Date	May 10, 2019	December 24, 2018	November 28, 2018
Calibration Due Date	May 10, 2020	December 24, 2019	November 28, 2019

3) Bandwidth Measurement

Equipment	40GHz 5m RF Cable	Spectrum Analyzer
Registration No.	EW-2701	EW-2466
Manufacturer	GREATBILLION	ROHDESCHWARZ
Model No.	sma m-m 5m 40G	FSP30
Calibration Date	May 14, 2019	January 06, 2019
Calibration Due Date	May 14, 2020	January 06, 2020

END OF TEST REPORT