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# TEST REPORT

**Report No.: 18101359HKG-001**

Hasbro Far East Ltd.

Application For Certification
(Original Grant)

**FCC ID: RS4-E5241**

Transmitter

| **Prepared and Checked by:** | **Approved by:** |
|---|---|
| Signed On File<br>Lee Yee Yat, Adrian<br>Assistant Engineer | Digitally signed by Kenneth Wong Location: Intertek Testing Services Hong Kong Ltd.<br>Wong Kwok Yeung, Kenneth<br>Senior Lead Engineer<br>Date: December 17, 2018 |

# TEST REPORT

## GENERAL INFORMATION

| | |
|---|---|
| **Grantee:** | Hasbro Far East Ltd. |
| **Grantee Address:** | 1308 World Commerce Centre, Harbour City,<br>11 Canton Road, Tsim Sha Tsui,<br>Kowloon, Hong Kong. |
| **Contact Person:** | Freddie Fong |
| **Tel:** | (852) 2737 7447 |
| **Fax:** | (852) 2737 7447 |
| **e-mail:** | Freddie.Fong@ap.hasbro.com |
| **Manufacturer:** | Hasbro SA |
| **Manufacturer Address:** | Rue Emile-Boechat 31,<br>2800 Delemont CH, CH-2800 Delemont,<br>Switzerland. |
| **Vendor:** | WST |
| **Buyer:** | Hasbro |
| **Vendor Code :** | ZC-015 |
| **Factory Code:** | C |
| **Brand Name:** | BA SNIP N Style Baby BLD Hair |
| **Model:** | E5241 |
| **Additional Model:** | E5242, E5243 |
| **Type of EUT:** | Transmitter |
| **Description of EUT:** | BA SNIP N Style Baby BLD Hair (E5241),<br>BA SNIP N Style Baby BRN Hair (E5242),<br>BA SNIP N Style Baby BLK Hair (E5243) |
| **Serial Number:** | N/A |
| **FCC ID:** | RS4-E5241 |
| **Date of Sample Submitted:** | October 31, 2018 |
| **Date of Test:** | October 31, 2018 to December 11, 2018 |
| **Report No.:** | 18101359HKG-001 |
| **Report Date:** | December 17, 2018 |
| **Environmental Conditions:** | Temperature: +10 to 40°C<br>Humidity: 10 to 90% |
| **Conclusion:** | Test was conducted by client submitted sample. The submitted sample as received complied with the 47 CFR Part 15 Certification. |

# TEST REPORT

## SUMMARY OF TEST RESULT

| Test Specification | Reference | Results |
|---|---|---|
| Transmitter Field Strength<br>Frequency Stability | 15.225 | Pass |
| Radiated Emission<br>Radiated Emission on the Bandedge | 15.209 | Pass |
| Radiated Emission in Restricted Bands | 15.205 | Pass |

The equipment under test is found to be complying with the following standards:
FCC Part 15, October 1, 2017 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.

## TEST REPORT

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# TEST REPORT

## 1.0 GENERAL DESCRIPTION

### 1.1 Product Description

The Equipment Under Test (EUT) is a toy baby set, which contains a 13MHz RFID module. The RFID is for the tag function. After placing the tags on the EUT, the EUT will recognize the tags by giving different sound and motor effects. The EUT is powered by DC 4.5V (3 X 1.5V AA batteries).

The Model: E5242 and E5243 are the same as the Model: E5241 in hardware aspect as declared by client. The difference in model number serves as marketing strategy as declared by client. The models are different in model number, item name, color, packaging and non-conductive accessories only as declared by client.

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 transmitter.

### 1.3 Test Methodology

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 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.

## 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 new DC 4.5V (3 x 1.5V AA batteries).

For maximizing emissions below 30 MHz, the EUT was rotated through 360°, the centre of the loop antenna was placed 1 meter above the ground, and the antenna polarization was changed. For maximizing emission at and above 30 MHz, 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 report 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 transmits 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.

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

Comb and scissors tags.

## 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 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 27 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
FS = RR + LF
FS = 18 + 9 = 27 dBµV/m

RR = 18.0 dBµV
LF = 9.0 dB

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

## TEST REPORT

3.2 Radiated Emission Configuration Photograph

The worst case in radiated emission was found at 81.378 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 2.7 dB

## TEST REPORT

## RADIATED EMISSIONS

Model: E5241
Date of Test: December 11, 2018
Worst-Case Operating Mode: Transmitting

Table 1
**Pursuant to FCC Part 15 Section 15.225 Requirement**

| Polarization | Frequency (MHz) | Reading (dBµV) | Pre-amp (dB) | Antenna Factor (dB) | Net at 3m (dBµV/m) | Distance Factor (-dB) | Calculated at 30m (dBµV/m) | Limit at 30m (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| V | 13.563 | 49.2 | 0 | 10.8 | 60.0 | 40.0 | 20.0 | 84.0 | -64.0 |
| V | 27.126 | 22.7 | 0 | 9.5 | 32.2 | 40.0 | -7.8 | 29.5 | -37.3 |

| Polari-zation | Frequency (MHz) | Reading (dBµV) | Pre-Amp (dB) | Antenna Factor (dB) | Net at 3m (dBµV/m) | Limit at 3m (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| V | 40.689 | 40.3 | 16 | 10.0 | 34.3 | 40.0 | -5.7 |
| V | 54.252 | 27.2 | 16 | 11.0 | 22.2 | 40.0 | -17.8 |
| V | 67.815 | 36.9 | 16 | 8.0 | 28.9 | 40.0 | -11.1 |
| V | 81.378 | 46.3 | 16 | 7.0 | 37.3 | 40.0 | -2.7 |
| V | 94.941 | 25.9 | 16 | 11.0 | 20.9 | 43.5 | -22.6 |
| ***H*** | ***108.504*** | ***23.3*** | ***16*** | ***14.0*** | ***21.3*** | ***43.5*** | ***-22.2*** |
| H | 122.067 | 24.2 | 16 | 14.0 | 22.2 | 43.5 | -21.3 |
| ***H*** | ***135.630*** | ***25.0*** | ***16*** | ***14.0*** | ***23.0*** | ***43.5*** | ***-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. Loop antenna is used for the emissions below 30MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.
6. Measurement Uncertainty is ±5.3dB at a level of confidence of 95%.

## TEST REPORT

Model: E5241
Date of Test: December 11, 2018
Worst-Case Operating Mode: Sound

Table 2
**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 | 32.910 | 33.3 | 16 | 10.0 | 27.3 | 40.0 | -12.7 |
| V | 67.830 | 30.2 | 16 | 8.0 | 22.2 | 40.0 | -17.8 |
| H | 81.410 | 41.0 | 16 | 7.0 | 32.0 | 40.0 | -8.0 |
| ***V*** | ***112.814*** | ***30.5*** | ***16*** | ***14.0*** | ***28.5*** | ***43.5*** | ***-15.0*** |
| ***V*** | ***119.240*** | ***29.2*** | ***16*** | ***14.0*** | ***27.2*** | ***43.5*** | ***-16.3*** |
| V | 150.158 | 24.9 | 16 | 14.0 | 22.9 | 43.5 | -20.6 |
| H | 216.967 | 27.7 | 16 | 17.0 | 28.7 | 46.0 | -17.3 |
| H | 230.547 | 27.2 | 16 | 18.0 | 29.2 | 46.0 | -16.8 |
| H | 298.690 | 23.7 | 16 | 22.0 | 29.7 | 46.0 | -16.3 |
| H | 339.066 | 29.6 | 16 | 24.0 | 37.6 | 46.0 | -8.4 |
| H | 352.525 | 30.5 | 16 | 24.0 | 38.5 | 46.0 | -7.5 |
| H | 366.226 | 30.8 | 16 | 24.0 | 38.8 | 46.0 | -7.2 |
| H | 393.507 | 26.6 | 16 | 25.0 | 35.6 | 46.0 | -10.4 |
| V | 420.546 | 24.2 | 16 | 25.0 | 33.2 | 46.0 | -12.8 |
| H | 569.683 | 23.7 | 16 | 28.0 | 35.7 | 46.0 | -10.3 |
| V | 953.561 | 23.5 | 16 | 33.0 | 40.5 | 46.0 | -5.5 |

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.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.
6. Measurement Uncertainty is ±5.3dB at a level of confidence of 95%.

## TEST REPORT

3.4 Frequency Stability

**FCC Part 15 Section 15.225**
**Data Table**
**Frequency Deviation with Voltage Variation**

| Operating frequency | | 13.562080MHz | | |
|---|---|---|---|---|
| Test Voltage (V) | Temperature (°C) | Measured frequency (MHz) | Frequency error (%) | Limit (%) |
| 4.5 | + 50 | 13.562243 | 0.001202 | ±0.01 |
| 4.5 | + 40 | 13.562204 | 0.000914 | ±0.01 |
| 4.5 | + 30 | 13.562762 | 0.005028 | ±0.01 |
| 4.5 | + 20 | 13.562080 | 0 | ±0.01 |
| 4.5 | + 10 | 13.561918 | -0.00119 | ±0.01 |
| 4.5 | 0 | 13.561602 | -0.00352 | ±0.01 |
| 4.5 | - 10 | 13.561404 | -0.00498 | ±0.01 |
| 4.5 | - 20 | 13.562037 | -0.00032 | ±0.01 |

| **Nominal frequency Temperature (°C) Humidity (%)** | **Voltage** | **Frequency (MHz)** | **Frequency error (ppm)** | **Limit (ppm)** | **Result** |
|---|---|---|---|---|---|
| 20°C 50% | 4.50 | 13.562080 | 0 | 100 | Pass |
| 20°C 50% | 4.00 | 13.562766 | 50.582 | 100 | Pass |
| 20°C 50% | 3.55 | 13.561566 | -37.900 | 100 | Pass |

The device is deemed to comply with requirement of FCC15.225(e).

**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.

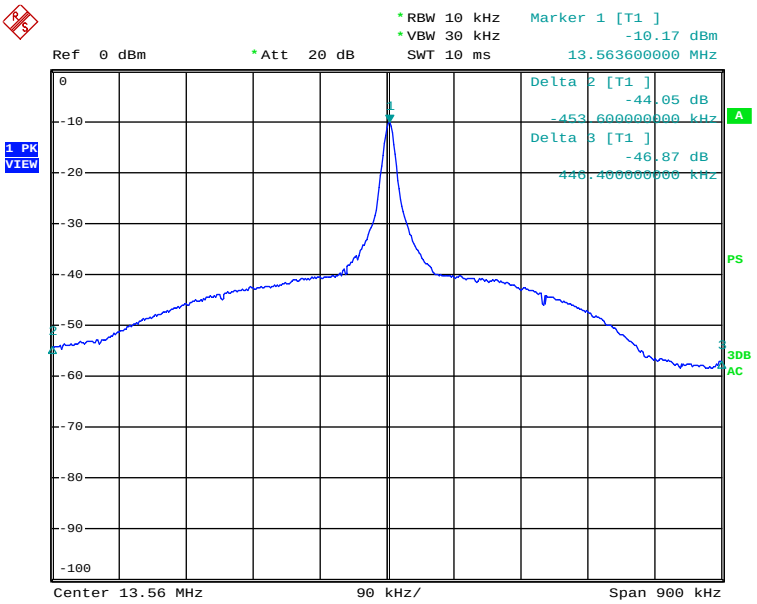
# TEST REPORT

## 8.0 MISCELLANEOUS INFORMATION

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

### 8.1 Measured Bandwidth

The plot saved in bw.pdf which shows the fundamental emission is confined in the specified band. The emission of the fundamental is 20.0 dBµV/m and it is below the limit of 50.5 dBµV/m in the range of (13.410-13.553MHz) and (13.710-14.010MHz) and the limit of 40.5 dBµV/m in the frequency range of (13.110-14.410MHz) and (13.710-14.010MHz). In the frequency range from 13.110-14.010MHz, we can not find any emission higher than the fundamental emission. Therefore, they meet the requirement of Section 15.225(a), (b), (c), & (d).



## TEST REPORT

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

The average factor is not applicable for this device as the transmitted signal is a continuously signal.

## 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 axes 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.

## 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).

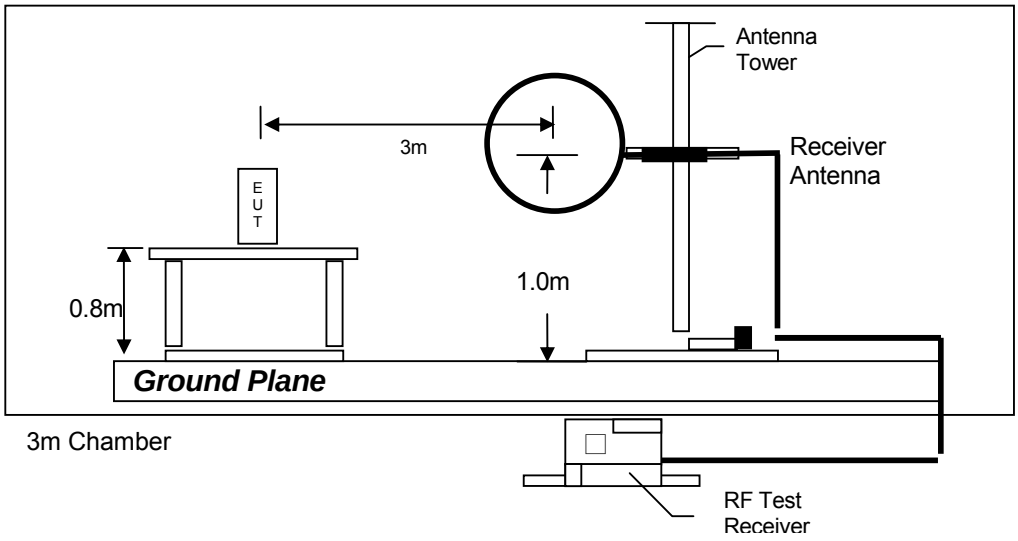
The IF bandwidth used for measurement of radiated signal strength was 100 kHz or greater when frequency is below 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. A discussion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

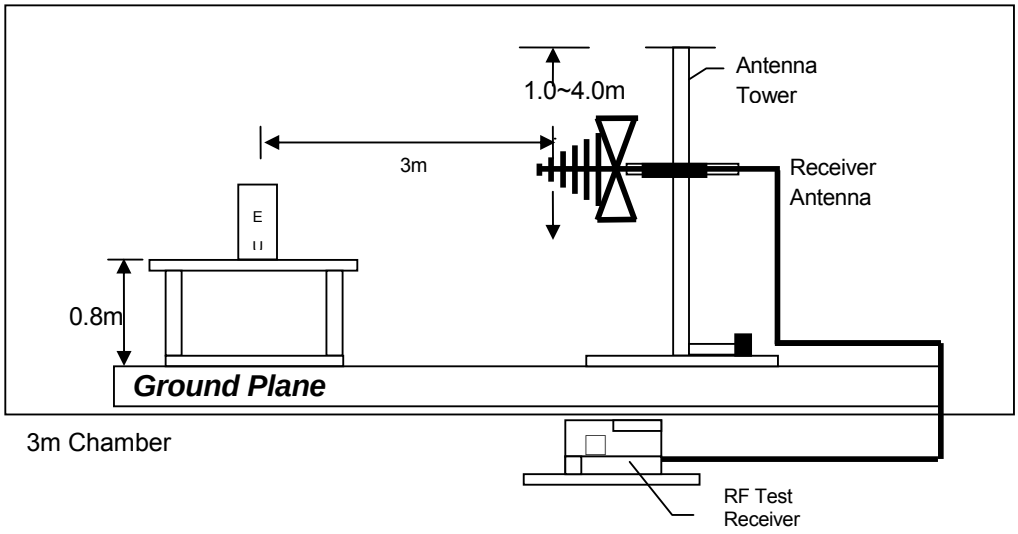
## TEST REPORT

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 30MHz




Test setup of radiated emissions above 1GHz

## 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-3095 | EW-2839 | EW-0571 |
| Manufacturer | ROHDESCHWARZ | R&S | EMCO |
| Model No. | ESCI | FSP13 | 3104C |
| Calibration Date | February 15, 2018 | March 16, 2018 | February 27, 2018 |
| Calibration Due Date | February 15, 2019 | March 16, 2019 | August 27, 2019 |

| Equipment | Log Periodic Antenna | 12m 40GHz RF Cable 40GHz | 14m Double Shield RF Cable |
|---|---|---|---|
| Registration No. | EW-0447 | EW-2774 | EW-2074 |
| Manufacturer | EMCO | GREATBILLION | RADIALL |
| Model No. | 3146 | SMA m-m ra | N(m)-RG142-BNC(m) L= 14M |
| Calibration Date | January 17, 2018 | January 16, 2018 | March 27, 2018 |
| Calibration Due Date | July 17, 2019 | January 16, 2019 | March 27, 2019 |

| Equipment | Active Loop H-field Antenna (9kHz to 30MHz) | RF Pre-amplifier 3 pcs | Notch Filter (cutoff frequency 2.4GHz to 2.5GHz) 2 pieces |
|---|---|---|---|
| Registration No. | EW-2313 | EW-3229 | EW-2213 |
| Manufacturer | ELECTROMETRI | BONN ELEKTRO | MICROTRONICS |
| Model No. | EM-6876 | BLMA 0118-5G | BRM50701-02 |
| Calibration Date | March 08, 2018 | January 30, 2018 | May 24, 2018 |
| Calibration Due Date | March 08, 2019 | January 30, 2019 | May 24, 2019 |

2) Bandedge Measurement and Frequency Stability Measurement

| Equipment | Temperature & Humidity Chamber (2 chamgbers inside) (Top + Bottom) | Spectrum Analyzer |
|---|---|---|
| Registration No. | EW-2395 | EW-2839 |
| Manufacturer | GIANT FORCE | R&S |
| Model No. | GTH-210-40-SP-AR | FSP13 |
| Calibration Date | September 18, 2018 | March 16, 2018 |
| Calibration Due Date | September 18, 2019 | March 16, 2019 |

**END OF TEST REPORT**