

**TEST REPORT****Report No.: 16120755HKG-001R1****Fabricas Agrupadas de Munecas de Onil SA**

Application  
For  
Certification  
(Original Grant)  
**(FCC ID: 2AI5U-800011020)**

Transceiver

This report supersedes previous report with report number 16120755HKG-001 dated January 10, 2017.

Prepared and Checked by:

Signed On File  
Lok Chi Hang, Wil  
Assistant Engineer

Approved by:

---

Wong Kwok Yeung, Kenneth  
Senior Lead Engineer  
Date: January 26, 2017

- 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.

© 2016 Intertek

## INTERTEK TESTING SERVICES

---

### GENERAL INFORMATION

Grantee:	Fabricas Agrupadas de Munecas de Onil SA
Grantee Address:	Poligono Industrial Las Atalayas C/Del Franco S/N 03114 Alicante, Spain
Contact Person:	Jose Antonio Lopez-Santacruz Ripoll
Tel:	+ 34 966 544 600
Fax:	+ 34 96 654 46 75
e-mail:	joseantonio@famosa.es
Manufacturer:	FAMOSA
Manufacturer Address:	Pol. Ind. Las Atalayas C/Del Franco S/N 03114 Alicante, Spain
Brand Name:	FAMOSA
Model:	800011020
Type of EUT:	Transceiver
Description of EUT:	Range Rover
Serial Number:	N/A
FCC ID:	2AI5U-800011020
Date of Sample Submitted:	December 16, 2016
Date of Test:	December 16, 2016 to January 03, 2017
Report No.:	16120755HKG-001R1
Report Date:	January 26, 2017
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

## INTERTEK TESTING SERVICES

---

### SUMMARY OF TEST RESULT

TEST SPECIFICATION	REFERENCE	RESULTS
Radiated Emission	15.249, 15.209	Pass
Radiated Emission on the Bandedge		
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, 2015 Edition

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 expected variations in temperature and supply voltage were considered.
3. Please refer TY-S17-0016 Letter issued on January 26, 2017 for amendment/ supersede notification.

# INTERTEK TESTING SERVICES

---

## Table of Contents

1.0	<b><u>General Description</u></b>	1
1.1	Product Description.....	1
1.2	Related Submittal(s) Grants.....	1
1.3	Test Methodology.....	1
1.4	Test Facility.....	1
2.0	<b><u>System Test Configuration</u></b>	2
2.1	Justification.....	2
2.2	EUT Exercising Software.....	2
2.3	Special Accessories.....	2
2.4	Measurement Uncertainty.....	2
2.5	Support Equipment List and Description.....	2
3.0	<b><u>Emission Results</u></b>	3
3.1	Field Strength Calculation.....	3
3.2	Radiated Emission Configuration Photograph.....	4
3.3	Radiated Emission Data.....	4
8.0	<b><u>Miscellaneous Information</u></b>	9
8.1	Measured Bandwidth / Radiated Emission on the Bandedge.....	9
8.2	Discussion of Pulse Desensitization.....	12
8.3	Calculation of Average Factor.....	12
8.4	Emissions Test Procedures .....	14
9.0	<b><u>Equipment List</u></b>	17

## INTERTEK TESTING SERVICES

---

### 1.0 General Description

#### 1.1 Product Description

The Equipment Under Test (EUT) is a Bluetooth version 4.0 for a Ride On Car operating from 2402-2480MHz with 2MHz channel spacing. The EUT is powered by 1X6.0VDC rechargeable battery. After switch on the EUT and paired with smart device, EUT can be controlled to move forward/backward and turn left/right.

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

Radiated emission measurements was 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.

## INTERTEK TESTING SERVICES

---

### 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 1X6.0VDC rechargeable battery.

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.

For this floor-stand equipment, The unit was operated standalone and placed on insulating material to prevent direct metallic contact of the EUT and reference ground plane.

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.

#### 2.5 Support Equipment List and Description

N/A.

## INTERTEK TESTING SERVICES

---

### 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  $\text{dB}\mu\text{V}/\text{m}$

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

$CF$  = 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  $\text{dB}\mu\text{V}/\text{m}$

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

$LF$  =  $CF + AF$  in dB

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

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

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

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

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

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

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

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

$$FS = RR + LF$$

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

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

## INTERTEK TESTING SERVICES

---

### 3.2 Radiated Emission Configuration Photograph

The worst case in radiated emission was found at 4804 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 15.5 dB

## INTERTEK TESTING SERVICES

---

Company: Fabricas Agrupadas de Munecas de Onil SA Date of Test: January 03, 2017

Model: 800011020

Worst-Case Operating Mode: Transmitting (Bluetooth 4.0 BLE)

**Table 1**  
**Radiated Emissions**  
**Pursuant to FCC Part 15 Section 15.249 Requirement**

Lowest Channel

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB $\mu$ V/m)	Average Factor (dB)	Calculated at 3m (dB $\mu$ V/m)	Average Limit at 3m (dB $\mu$ V/m)	Margin (dB)
H	2402.000	97.9	33	29.4	94.3	48.9	45.4	94.0	-48.6
<b>V</b>	<b>4804.000</b>	<b>56.6</b>	<b>33</b>	<b>34.9</b>	<b>58.5</b>	<b>48.9</b>	<b>9.6</b>	<b>54.0</b>	<b>-44.4</b>
V	7206.000	46.9	33	37.9	51.8	48.9	2.9	54.0	-51.1
V	9608.000	44.9	33	40.4	52.3	48.9	3.4	54.0	-50.6
<b>H</b>	<b>12010.000</b>	<b>44.4</b>	<b>33</b>	<b>40.5</b>	<b>51.9</b>	<b>48.9</b>	<b>3.0</b>	<b>54.0</b>	<b>-51.0</b>
V	14412.000	46.7	33	40.0	53.7	48.9	4.8	54.0	-49.2

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB $\mu$ V/m)	Peak Limit at 3m (dB $\mu$ V/m)	Margin (dB)
H	2402.000	97.9	33	29.4	94.3	114.0	-19.7
<b>V</b>	<b>4804.000</b>	<b>56.6</b>	<b>33</b>	<b>34.9</b>	<b>58.5</b>	<b>74.0</b>	<b>-15.5</b>
V	7206.000	46.9	33	37.9	51.8	74.0	-22.2
V	9608.000	44.9	33	40.4	52.3	74.0	-21.7
<b>H</b>	<b>12010.000</b>	<b>44.4</b>	<b>33</b>	<b>40.5</b>	<b>51.9</b>	<b>74.0</b>	<b>-22.1</b>
V	14412.000	46.7	33	40.0	53.7	74.0	-20.3

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.
6. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.

## INTERTEK TESTING SERVICES

---

Company: Fabricas Agrupadas de Munecas de Onil SA Date of Test: January 03, 2017  
 Model: 800011020  
 Worst-Case Operating Mode: Transmitting (Bluetooth 4.0 BLE)

Table 2  
**Radiated Emissions**  
**Pursuant to FCC Part 15 Section 15.249 Requirement**

Middle Channel

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB $\mu$ V/m)	Average Factor (dB)	Calculated at 3m (dB $\mu$ V/m)	Average Limit at 3m (dB $\mu$ V/m)	Margin (dB)
H	2440.000	96.2	33	29.4	92.6	48.9	43.7	94.0	-50.3
<b>V</b>	<b>4880.000</b>	<b>54.3</b>	<b>33</b>	<b>34.9</b>	<b>56.2</b>	<b>48.9</b>	<b>7.3</b>	<b>54.0</b>	<b>-46.7</b>
<b>V</b>	<b>7320.000</b>	<b>46.4</b>	<b>33</b>	<b>37.9</b>	<b>51.3</b>	<b>48.9</b>	<b>2.4</b>	<b>54.0</b>	<b>-51.6</b>
V	9760.000	45.0	33	40.4	52.4	48.9	3.5	54.0	-50.5
<b>H</b>	<b>12200.000</b>	<b>44.1</b>	<b>33</b>	<b>40.5</b>	<b>51.6</b>	<b>48.9</b>	<b>2.7</b>	<b>54.0</b>	<b>-51.3</b>
V	14640.000	48.0	33	38.4	53.4	48.9	4.5	54.0	-49.5

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB $\mu$ V/m)	Peak Limit at 3m (dB $\mu$ V/m)	Margin (dB)
H	2440.000	96.2	33	29.4	92.6	114.0	-21.4
<b>V</b>	<b>4880.000</b>	<b>54.3</b>	<b>33</b>	<b>34.9</b>	<b>56.2</b>	<b>74.0</b>	<b>-17.8</b>
<b>V</b>	<b>7320.000</b>	<b>46.4</b>	<b>33</b>	<b>37.9</b>	<b>51.3</b>	<b>74.0</b>	<b>-22.7</b>
V	9760.000	45.0	33	40.4	52.4	74.0	-21.6
<b>H</b>	<b>12200.000</b>	<b>44.1</b>	<b>33</b>	<b>40.5</b>	<b>51.6</b>	<b>74.0</b>	<b>-22.4</b>
V	14640.000	48.0	33	38.4	53.4	74.0	-20.6

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.

6. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.

## INTERTEK TESTING SERVICES

---

Company: Fabricas Agrupadas de Munecas de Onil SA Date of Test: January 03, 2017  
 Model: 800011020  
 Worst-Case Operating Mode: Transmitting (Bluetooth 4.0 BLE)

Table 3  
**Radiated Emissions**  
**Pursuant to FCC Part 15 Section 15.249 Requirement**

### Highest Channel

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB $\mu$ V/m)	Average Factor (dB)	Calculated at 3m (dB $\mu$ V/m)	Average Limit at 3m (dB $\mu$ V/m)	Margin (dB)
H	2480.000	93.7	33	29.4	90.1	48.9	41.2	94.0	-52.8
<b>V</b>	<b>4960.000</b>	<b>52.4</b>	<b>33</b>	<b>34.9</b>	<b>54.3</b>	<b>48.9</b>	<b>5.4</b>	<b>54.0</b>	<b>-48.6</b>
<b>V</b>	<b>7440.000</b>	<b>46.1</b>	<b>33</b>	<b>37.9</b>	<b>51.0</b>	<b>48.9</b>	<b>2.1</b>	<b>54.0</b>	<b>-51.9</b>
V	9920.000	45.2	33	40.4	52.6	48.9	3.7	54.0	-50.3
<b>H</b>	<b>12400.000</b>	<b>43.8</b>	<b>33</b>	<b>40.5</b>	<b>51.3</b>	<b>48.9</b>	<b>2.4</b>	<b>54.0</b>	<b>-51.6</b>
V	14880.000	48.4	33	38.4	53.8	48.9	4.9	54.0	-49.1

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB $\mu$ V/m)	Peak Limit at 3m (dB $\mu$ V/m)	Margin (dB)
H	2480.000	93.7	33	29.4	90.1	114.0	-23.9
<b>V</b>	<b>4960.000</b>	<b>52.4</b>	<b>33</b>	<b>34.9</b>	<b>54.3</b>	<b>74.0</b>	<b>-19.7</b>
<b>V</b>	<b>7440.000</b>	<b>46.1</b>	<b>33</b>	<b>37.9</b>	<b>51.0</b>	<b>74.0</b>	<b>-23.0</b>
V	9920.000	45.2	33	40.4	52.6	74.0	-21.4
<b>H</b>	<b>12400.000</b>	<b>43.8</b>	<b>33</b>	<b>40.5</b>	<b>51.3</b>	<b>74.0</b>	<b>-22.7</b>
V	14880.000	48.4	33	38.4	53.8	74.0	-20.2

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative sign in the column shows value below limit.

4. Horn antenna is used for the emission over 1000MHz.

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  $\pm 5.3$ dB at a level of confidence of 95%.

## INTERTEK TESTING SERVICES

---

Company: Fabricas Agrupadas de Munecas de Onil SA Date of Test: January 03, 2017

Model: 800011020

Worst-Case Operating Mode: Transmitting (Bluetooth 4.0 BLE)

Table 4  
**Radiated Emissions**  
**Pursuant to FCC Part 15 Section 15.209 Requirement**

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
V	31.212	22.3	16	10.0	16.3	40.0	-23.7
V	<b>112.935</b>	<b>27.5</b>	<b>16</b>	<b>14.0</b>	<b>25.5</b>	<b>43.5</b>	<b>-18.0</b>
V	<b>119.118</b>	<b>27.7</b>	<b>16</b>	<b>14.0</b>	<b>25.7</b>	<b>43.5</b>	<b>-17.8</b>
H	549.677	11.0	16	28.0	23.0	46.0	-23.0
H	672.018	11.7	16	29.0	24.7	46.0	-21.3
V	925.795	11.4	16	33.0	28.4	46.0	-17.6

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.
6. Measurement Uncertainty is  $\pm 5.3$ dB at a level of confidence of 95%.

## INTERTEK TESTING SERVICES

---

### 4.0 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).

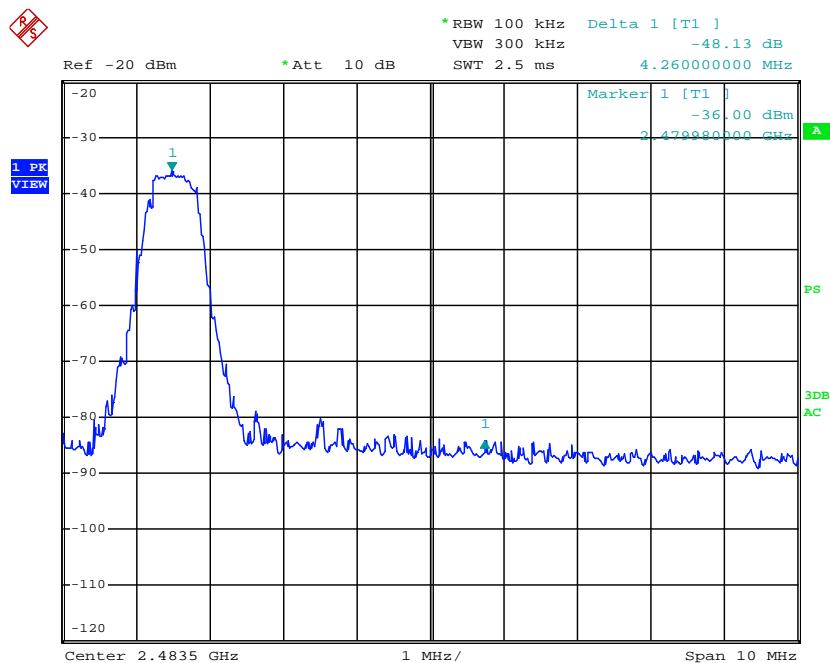
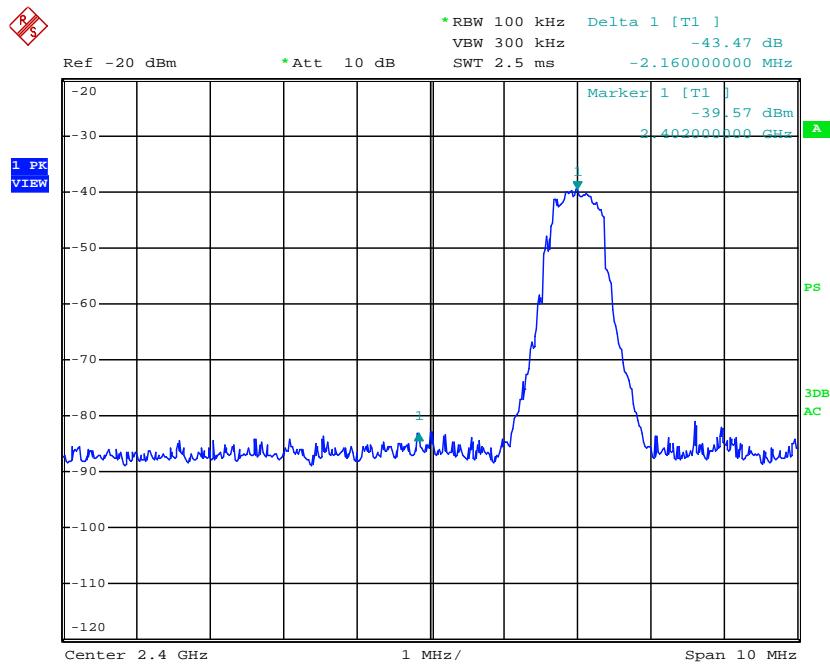
#### 4.1 Radiated Emission on the Bandedge

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 C63.10 (2013) 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).

# INTERTEK TESTING SERVICES

## Peak Measurement



## INTERTEK TESTING SERVICES

---

### Peak Measurement

Bandedge compliance is determined by applying marker-delta method, i.e. (Bandedge Plot).

#### Lower bandedge

Peak Resultant field strength = Fundamental emissions (peak value) – delta from the plot

$$=94.3 \text{ dB}\mu\text{V/m} - 43.5 \text{ dB}$$

$$=50.8 \text{ dB}\mu\text{V/m}$$

Average Resultant field strength = Fundamental emissions (average value) – delta from the plot

$$=45.4 \text{ dB}\mu\text{V/m} - 43.5 \text{ dB}$$

$$=1.9 \text{ dB}\mu\text{V/m}$$

#### Upper bandedge

Peak Resultant field strength = Fundamental emissions (peak value) – delta from the plot

$$=90.1 \text{ dB}\mu\text{V/m} - 48.1 \text{ dB}$$

$$=42.0 \text{ dB}\mu\text{V/m}$$

Average Resultant field strength = Fundamental emissions (average value) – delta from the plot

$$=41.2 \text{ dB}\mu\text{V/m} - 48.1 \text{ dB}$$

$$=-6.9 \text{ dB}\mu\text{V/m}$$

The resultant field strength meets the general radiated emission limit in Section 15.209, which does not exceed 74 dB $\mu$ V/m (Peak Limit) and 54 dB $\mu$ V/m (Average Limit).

## INTERTEK TESTING SERVICES

---

### 4.2 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device. The effective period ( $T_{eff}$ ) is approximately 0.36ms for a digital "1" bit which illustrated on technical specification, with a resolution bandwidth (3dB) of 1MHz, so the pulse desensitivity factor is 0dB.

### 4.3 Calculation of Average Factor – worst case

The duty cycle is simply the on-time divided by the period:

The duration of one cycle = 100ms

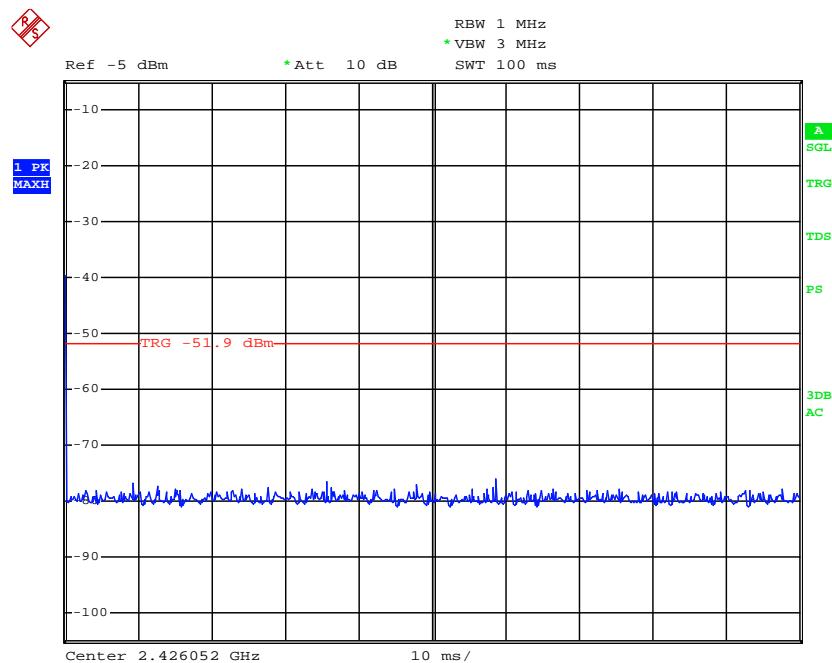
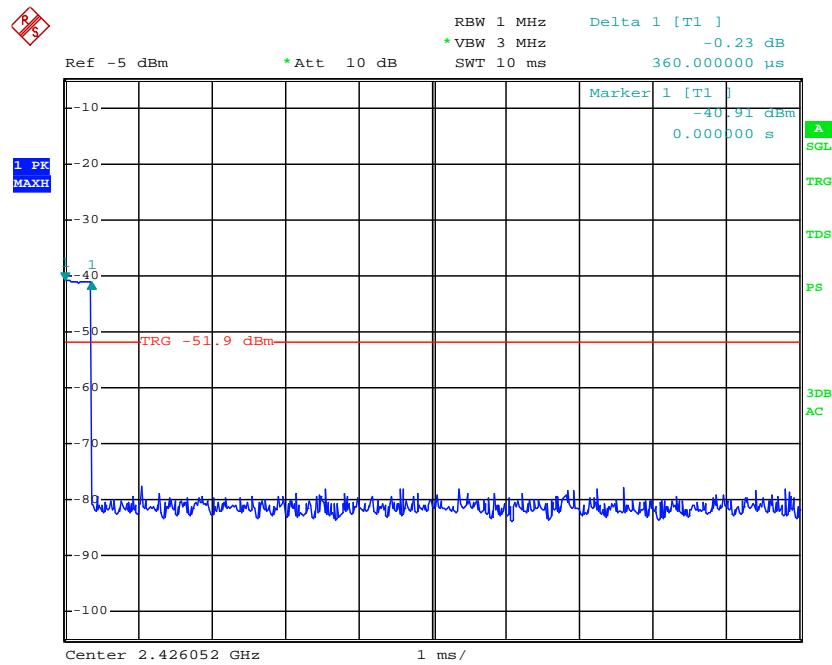
Effective period of the cycle =  $0.36*1=0.36\text{ms}$

$DC = 0.36/100 = 0.0036$

Therefore, the averaging factor is found by  $20\log 0.0036 = -48.9\text{dB}$ .

# INTERTEK TESTING SERVICES

## Average Factor



## INTERTEK TESTING SERVICES

---

### 4.4 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) that is normally insulated from the ground shall be insulated from the reference ground plane by up to 12mm of insulation material for emission measurement. 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.

## INTERTEK TESTING SERVICES

---

### 4.4 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).

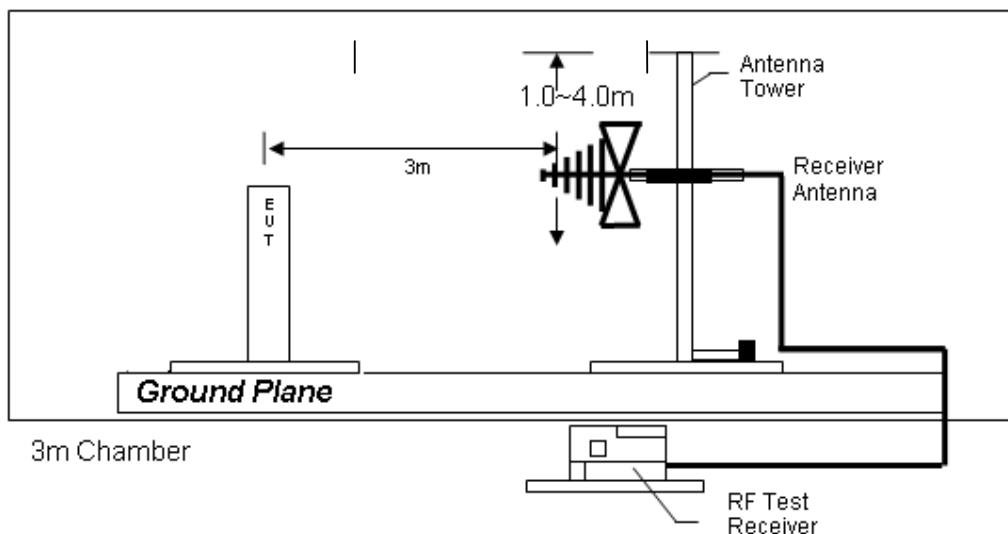
The IF bandwidth used for measurement of radiated signal strength was 100 kHz or greater when frequency is below 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. A discussion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

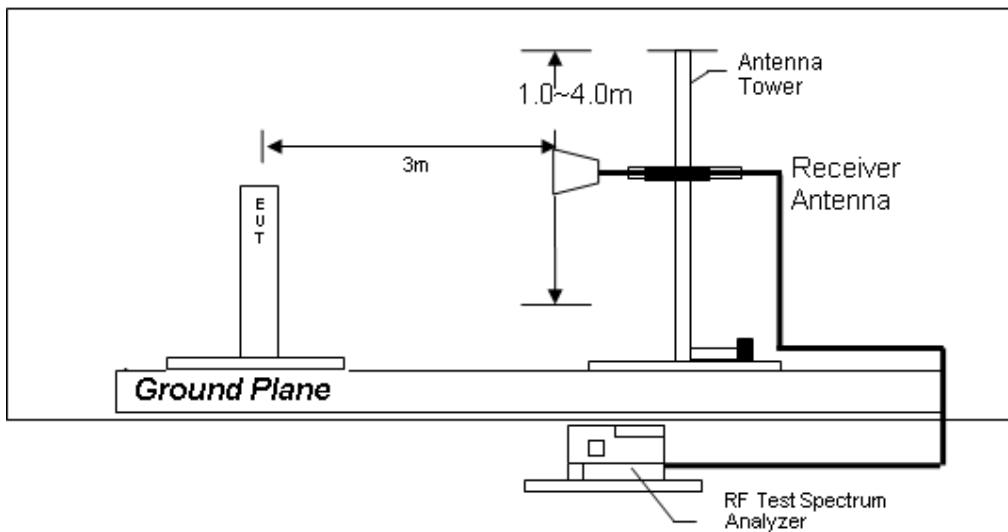
## INTERTEK TESTING SERVICES

### 4.4.1 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 1 GHz



Test setup of radiated emissions above 1GHz

## INTERTEK TESTING SERVICES

---

### 5.0 Equipment List

#### 1) Radiated Emissions Test

Equipment	EMI Test Receiver	Spectrum Analyzer
Registration No.	EW-3095	EW-2253
Manufacturer	R&S	R&S
Model No.	ESCI	FSP40
Calibration Date	Oct. 25, 2016	Jun. 15, 2016
Calibration Due Date	Oct. 25, 2017	Jun. 15, 2017

Equipment	Log Periodic Antenna	Biconical Antenna	Double Ridged Guide Antenna
Registration No.	EW-0447	EW-0571	EW-1133
Manufacturer	EMCO	EMCO	EMCO
Model No.	3146	3104C	3115
Calibration Date	May. 18, 2016	May. 18, 2016	Nov. 05, 2015
Calibration Due Date	Nov. 18, 2017	Nov. 18, 2017	May 05, 2017

#### 2) Bandedge & Average Factor Measurement

Equipment	Spectrum Analyzer
Registration No.	EW-2329
Manufacturer	R&S
Model No.	FSP3
Calibration Date	Aug. 26, 2016
Calibration Due Date	Aug. 26, 2017

END OF TEST REPORT