

## **TEST REPORT**

Date: 2013-06-15

Report No.: 60.870.12.047.02F

Applicant: SVAT ELECTRONICS

4080 Montrose Road, Niagara Falls, ON, L2H1J9

Canada

**Description of Samples:** Model name: Ovia™ Digital Baby Video Monitor

(Parent Unit)

Brand name: Levana

Model no.: Ovia™30024PU FCCID: SMH-30024PU

Date Samples Received: 2013-05-07

**Date Tested:** 2013-05-08 to 2013-06-15

Investigation Requested: FCC Part 15 Subpart C, Section 15.247

**Conclusions:** The submitted product <u>COMPLIED</u> with the requirements of

Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on

Section 2.2 in this Test Report.

Remarks: ----

Checked by: Approved by:-

Ray Cheung Jeff Pong
Project Engineer Operation Manager

Wireless & Telecom Department Wireless & Telecom Department



### **CONTENT:**

|            | Cover<br>Content  | Page 1 of 30<br>Page 2-3 of 30 |
|------------|---|--------------------------------|
| <u>1.0</u> | General Details   |                                |
| 1.1        | Test Laboratory   | Page 4 of 30                   |
| 1.2        | Applicant Details                                       | Page 4 of 30                   |
| 1.3        | Equipment Under Test [EUT]                              | Page 5 of 30                   |
| 1.4        | Related Submittal(s) Grants                             | Page 5 of 30                   |
| <u>2.0</u> | Technical Details                                       |                                |
| 2.1        | Investigations Requested                                | Page 6 of 30                   |
| 2.2        | Test Standards and Results Summary                      | Page 6 of 30                   |
| <u>3.0</u> | Test Methodology  |                                |
| 3.1        | Radiated Emission                                       | Page 7 of 30                   |
| 3.2        | Field Strength Calculation                              | Page 7 of 30                   |
| 3.3        | Conducted Emission                                      | Page 7 of 30                   |
| <u>4.0</u> | <u>Test Results</u>                                     |                                |
| 4.1        | Number of Frequency Hopping                             | Page 8 of 30                   |
| 4.2        | 20dB Bandwidth Measurement                              | Page 9-10 of 30                |
| 4.3        | Hopping Channel Carrier Frequency Separation            | Page 11 of 30                  |
| 4.4        | Average Time of Occupancy                               | Page 12-14 of 30               |
| 4.5        | Pseudorandom Hopping Algorithm                          | Page 15 of 30                  |
| 4.6        | Band Edge Measurement                                   | Page 16-17 of 30               |
| 4.7        | Maximum Output Power                                    | Page 18-20 of 30               |
| 4.8        | Out of Band Emissions and Emissions in Restricted Bands | Page 20-25 of 30               |
| 4.9        | Conducted Emission on AC Mains                          | Page 26-28 of 30               |



5.0 RF Exposure Compliance Requirement Page 29 of 30

6.0 <u>List of Measurement Equipments</u>

Page 30 of 30

#### Appendix A

Photos of Test Setup

### Appendix B

External EUT Photos

### Appendix C

Internal EUT Photos



### 1.0 General Details

### 1.1 Test Laboratory

SEM. Test Compliance Service Co., Ltd 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen Registration Number: 994117

Test By:

1.2 Applicant Details

Applicant

#### **SVAT ELECTRONICS**

4080 Montrose Road, Niagara Falls, ON, L2H 1J9 Canada

Manufacturer

#### **Alford Industries Ltd**

Unit 02, 6<sup>th</sup> Floor, Yen Sheng Centre, 64 Hoi Yuen Road, Kwun Tong, Kowloon, Hong Kong



#### 1.3 Equipment Under Test [EUT]

#### **Description of EUT**

Product Description: Ovia™ Digital Baby Video Monitor (Parent Unit)

Model No.: Ovia™ 30024PU

Brand Name: Levana

FCCID: SMH-30024PU

Rating: - DC 5.9V, 1000mA powered by AC/DC power adaptor

or

- DC 3.7V, Li-ion Rechargeable Battery

Operated Frequency: 2408.625 – 2473.875 MHz

No. of Operated Channel:

Accessories and Auxiliary Equipments: - AC/DC power adaptor.

Antenna Type: Integral

Manufacture of Antenna: Alford Industries Ltd.

Antenna Gain: 0 dBi Antenna Model: N/A

#### **General Operation of EUT**

The Equipment Under Test (EUT) is a monitor of wireless baby monitor system which operated at 2.4GHz.

#### FHSS Operation Principle:

This module is controlled by microchip to generate Pseudorandom Frequency Hopping Sequence, this module support 24 hopping channels. Refer to section 4.5 of this report to have more detail of Pseudorandom Hopping Algorithm.

#### 1.4 Related Submittal(s) Grants

This is a signal application subjected to Certificate Authorization.



#### 2.0 Technical Details

### 2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 and ANSI C63.4: 2003

### 2.2 Test Standards and Results Summary Tables

| Test Condition                                  | Test Requirement      | Test Re         | sult |
|---|-----------------------|-----------------|------|
|   |                       | Pass            | N/A  |
| Number of Frequency<br>Hopping                  | Section 15.247 ( a1 ) |                 |      |
| 20dB Bandwidth<br>Measurement                   | Section 15.247 ( a1 ) |                 |      |
| Hopping Channel Carrier<br>Frequency Separation | Section 15.247 ( a1 ) |                 |      |
| Average Time of Occupancy                       | Section 15.247 ( a1 ) |                 |      |
| Pseudorandom Hopping<br>Algorithm               | Section 15.247 ( a1 ) |                 |      |
| Band Edge Measurement                           | Section 15.247        |                 |      |
| Maximum Output Power                            | Section 15.247 (b1)   |                 |      |
| Out of Band Emission                            | Section 15.247 ( d )  |                 |      |
| Radiated Emission in Restricted Band            | Section 15.247 ( d )  |                 |      |
| Conducted Emission on AC Mains                  | Section 15.207        |                 |      |
| RF Exposure                                     | Section 15.247 (i)    |                 |      |
| Antenna Requirement                             | Section 15.203        | ⊠<br>See note 1 |      |

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.

Remark: N/A - Not Applicable



#### 3.0 Test Methodology

#### 3.1 Radiated Emission

The sample was placed 0.8m above the ground plane on a standard emission test site \*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

#### 3.2 Field Strength Calculation

The field strength at 3 m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

FS = R + System Factor System Factor = AF + CF + FA - PA

Where FS = Net Field Strength in dBuV/m at 3 meters.

R = Reading of Spectrum Analyzer / Test Receiver in dBuV.

AF = Antenna Factor in dB.

CF = Cable Attenuation Factor in dB.

FA = Filter Attenuation Factor in dB.

PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

#### 3.3 Conducted Emissions

The test was performed in accordance with ANSI C63.4: 2003, with the following: initial measurements were performed in peak and average detection modes on the live line of personal computer, any emissions recorded within 30dB of the relevant limit lines were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.



#### 4.0 Test Results

#### 4.1 Number of Hopping Frequency

Test Requirement: FCC part 15 section 15.247 (a1)(iii)

Test Date: 2013-05-08

Mode of Operation: Transmitting mode.

Detector Function: Max Hold

**Result: PASS** 

#### Measured Result:

Operating Channel Frequency in sequence (MHz):

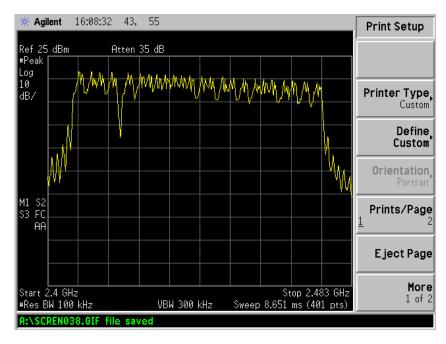
2408.625; 2412.000; 2414.250; 2417.625; 2422.125; 2425.500; 2427.750; 2430.000; 2432.500; 2436.750; 2439.000; 2442.375; 2444.625; 2448.000; 2450.250; 2453.625; 2457.000; 2459.250'

2461.500; 2464.875; 2467.125; 2470.500; 2473.875

#### Limit for Number of Hopping Channel [ Section 15.247 (a1)(iii) ]

At least 15 non-overlapping channels for 2400-2483.5MHz.

#### Result data graph shows the number of operation channels:





#### 4.2 20dB Bandwidth Measurement

Test Requirement: FCC part 15 section 15.247 (a1)

Test Date: 2013-05-08

Mode of Operation: Transmitting mode.

Detector Function: Max Hold

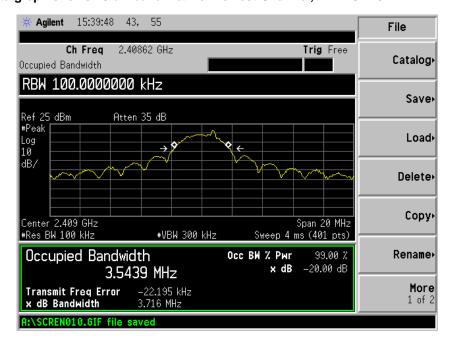
#### **Test Setup:**

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

| Channel | Measured frequency (MHz) | 20dB Bandwidth<br>(MHz) |
|---------|--------------------------|-------------------------|
| Lowest  | 2408.625                 | 3.716                   |
| Middle  | 2442.375                 | 3.584                   |
| Highest | 2473.875                 | 3.646                   |

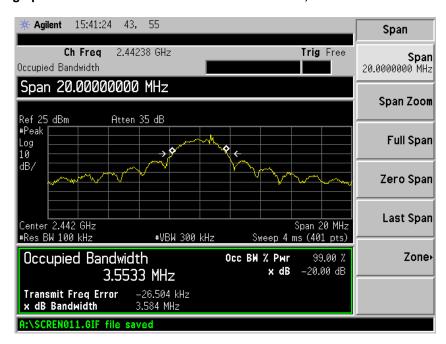
This result is used for checking the hopping channel carrier frequencies separation.

#### Result data graph shows 20 dB bandwidth of Lowest Channel, BW = 3.716MHz

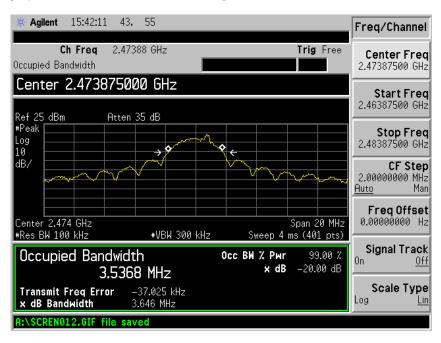




#### Result data graph shows 20 dB bandwidth of Middle Channel, BW = 3.584MHz



#### Result data graph shows 20 dB bandwidth of Highest Channel, BW = 3.646MHz





#### 4.3 Hopping Channel Carrier Frequency Separation

Test Requirement: FCC part 15 section 15.247 (a1)

Test Date: 2013-05-08

Mode of Operation: Transmitting mode.

Detector Function: Max Hold

**Result: PASS** 

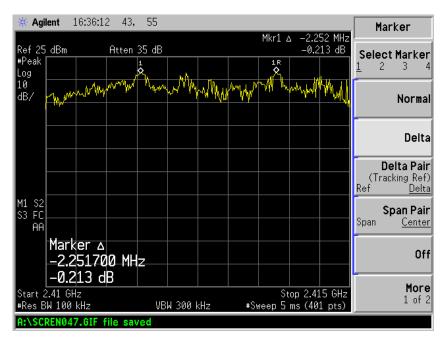
#### Measured Result:

Refer to the delta marker, the worst frequency separation between two adjacent channels is 2.252MHz, therefore, the requirement of channel separated by a minimum of 25kHz of the hopping channel is applied.

#### Limits for Hopping Channel Separation [Section 15.247 (a1)]:

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5MHz band may have hopping channel carrier frequencies that are separated by 25KHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater.

#### Result data graph shows the channel separation:





#### 4.4 Average Time of Channel Occupancy

Test Requirement: FCC part 15 section 15.247 (a1)(iii)

Test Date: 2013-05-08

Mode of Operation: Transmitting mode.

Detector Function: Zero span, Sweep time 1s

**Result: PASS** 

#### Measured Result:

Each transmission only 24 channels will be used.

Observe time = 24 channels  $\times$  0.4s = 9.6s

There are 17 pulses within 9.6s

And one set of pulses = 220us

Therefore, the average channel occupancy times (ms)

= 220us x 17 x 9.6s/9.6s

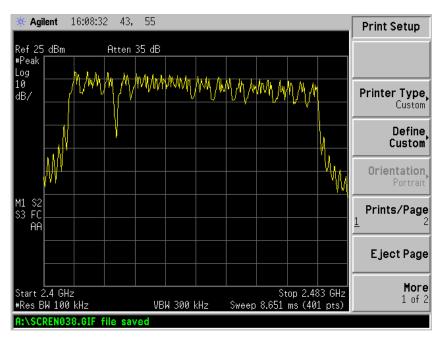
So, total transmitting time is 0.0374s. (<0.4s).

#### Limits for Average Time of Occupancy [ Section 15.247 (a1)(iii) ]:

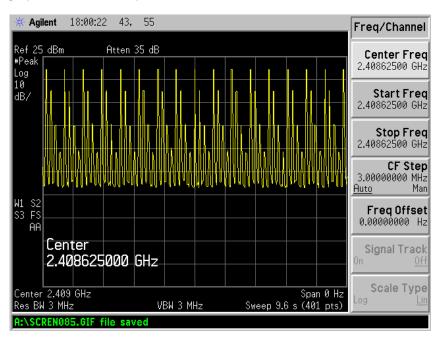
The average time of occupancy on any channel shall not be greater than 0.4 second within a period of 0.4 seconds multiplied by the number of hopping channels employed.



#### Result data graph shows total 24 channels are used

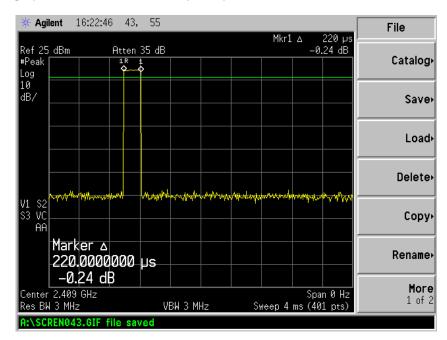


#### Result data graph shows total 17 pulses with 9.6s





## Result data graph zooms into detail, one pulse period is 220us





#### 4.5 Pseudorandom Hopping Algorithm

#### **Pseudorandom Frequency Hopping**

Ovia<sup>™</sup> 30024PU uses FHSS technology with 24 hopping frequencies. Each channel frequency is selected from a pseudorandom ordered list of hopping frequencies, from 2408.625MHz to 2473.875MHz. A single data frame is transmitted on each frequency location before skipping to the next hopping frequency in the list.

Pseudorandom Frequency Hopping Sequence

```
2408.625; 2412.000; 2414.250; 2427.625; 2422.125; 2425.500; 2427.750; 2430.000; 2432.250; 2434.500; 2436.750; 2439.000; 2442.375; 2444.625; 2448.000; 2450.250; 2453.625; 2457.000; 2459.250; 2461.500; 2464.875; 2467.125; 2470.500; 2473.875
```

#### Requirement for Pseudorandom Hopping Algorithm [Section 15.247 (a1)]:

The channel frequencies shall be selected from a pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on average by the transmitter.



#### 4.6 Band Edge Measurement

Test Requirement: FCC part 15 section 15.247

Test Date: 2013-05-08

Mode of Operation: Transmitting mode.

Detector Function: Max Hold

**Result: PASS** 

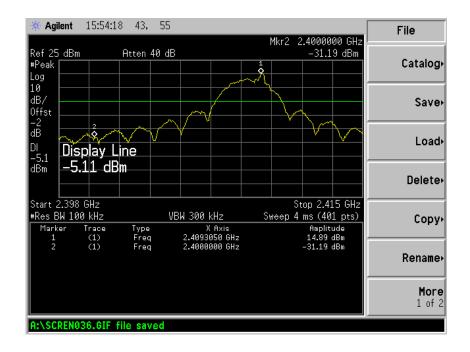
#### Measured Result:

Refer to the figure, it shows the frequency of lower band edge and upper band edge separately.

#### Limits of Band Edge for Carrier Frequencies Operated within the Bands [ Section 15.247 ]:

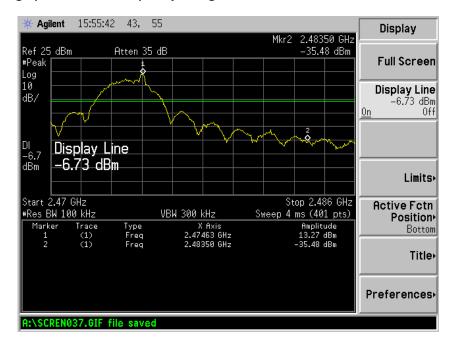
The carrier frequencies should operate within 2400-2483.5MHz.

Result data graph shows the frequency of lowest channel.





#### Result data graph shows the frequency of highest channel.





#### 4.7 Maximum Output Power

Test Requirement: FCC part 15 section 15.247 (a1)

Test Method: ANSI C63.4:2003
Test Date: 2013-05-08
Mode of Operation: Transmitting mode.

Detector Function: Peak

Measurement BW: RBW 1MHz ; VBW 1MHz

#### Test Setup:



**Result: PASS** 

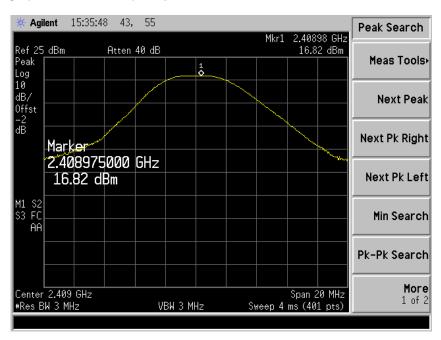
| Frequency                  | Peak Out | Peak Output Power |       | imit  |
|----------------------------|----------|-------------------|-------|-------|
| (MHz)                      | (dBm)    | (W)               | (dBm) | (W)   |
| Lowest Channel: 2408.625   | 16.82    | 0.048             | 21    | 0.125 |
| Middle Channel : 2442.375  | 16.76    | 0.047             | 21    | 0.125 |
| Highest Channel : 2473.875 | 14.74    | 0.030             | 21    | 0.125 |

#### Limits for Maximum Output Power [ Section 15.247 (a1)(iii) ]:

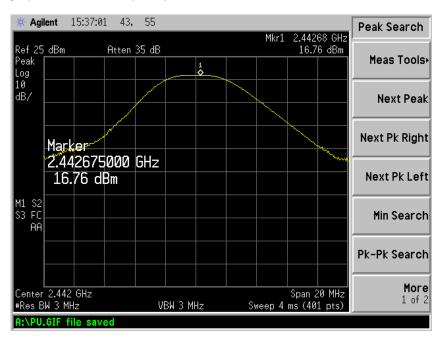
For frequency hopping systems employing at least 75 hopping channels: 1 Watt For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 Watts



#### Result data graph shows the frequency of lowest channel

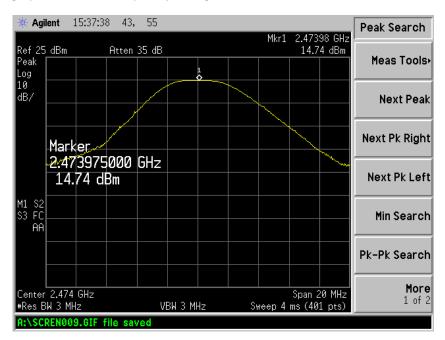


#### Result data graph shows the frequency of middle channel





## Result data graph shows the frequency of highest channel





#### 4.8 Out of Band Emissions and Emissions in Restricted Bands

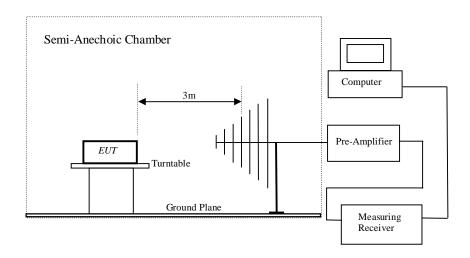
Test Requirement: FCC part 15 section 15.247 (d )

Test Method: ANSI C63.4:2003
Test Date: 2013-05-08
Mode of Operation: Transmitting mode.

Detector Function: Peak

Measurement BW: RBW 100KHz ; VBW 300KHz

#### **Test Setup:**





**Result: PASS** 

#### **Out of Frequency Band Emissions:**

For out of band emissions that are close to or exceed 20dB attenuation requirement, and emission falls into restricted band, radiated emission was performed in order to show compliance with the general radiated emission requirement.

#### **Result Summary:**

Refer to the emission data graph, result shows that the significant emissions detected are with more than 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

#### Limits for Out of Frequency Band Emission [ Section 15.247 (d) ]:

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power. Attenuation below the general limits specified in Section 15.209(a) is not required.

#### Limit for Radiated Emission Falling in Restricted Bands [ Section 15.209 ]:

| Frequency (MHz) | Field Strength [μV/m] | Field Strength [dB <sub>µ</sub> V/m] |
|-----------------|-----------------------|--------------------------------------|
| 30-88           | 100                   | <u>[αΒμν/π]</u><br>40.0              |
| 88-216          | 150                   | 43.5                                 |
| 216-960         | 200                   | 46.0                                 |
| Above 960       | 500                   | 54.0                                 |

Radiated emissions, which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209.

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.



Result: PASS All Emission and Emissions Fall into Restricted Band were recorded as below:

|    | Radiated Emissions     |                     |         |                  |                            |        |                   |  |  |
|----|------------------------|---------------------|---------|------------------|----------------------------|--------|-------------------|--|--|
|    | Emissions<br>Frequency | E-Field<br>Polarity | Reading | System<br>Factor | Field<br>strength at<br>3m | Limit  | Delta to<br>Limit |  |  |
|    | MHz                    |                     | dBuV/m  | dB               | dBuV/m                     | dBuV/m | dBuV/m            |  |  |
|    | Lowest Chann           | nel                 |         |                  |                            |        |                   |  |  |
| PK | 4830.50                | V                   | 51.92   | 0.57             | 52.49                      | 74.00  | -21.51            |  |  |
| PK | 7227.50                | V                   | 42.37   | 3.68             | 46.05                      | 74.00  | -27.95            |  |  |
| PK | 4830.50                | Н                   | 50.14   | 0.57             | 50.71                      | 74.00  | -23.29            |  |  |
| PK | 7227.50                | Н                   | 38.26   | 3.68             | 41.94                      | 74.00  | -32.06            |  |  |
|    |                        |                     |         |                  |                            |        |                   |  |  |
|    | Middle Chann           | el                  |         |                  |                            |        |                   |  |  |
| PK | 4877.50                | V                   | 51.47   | 0.64             | 52.11                      | 74.00  | -21.89            |  |  |
| PK | 7321.50                | V                   | 40.35   | 3.76             | 44.11                      | 74.00  | -29.89            |  |  |
| PK | 4877.50                | Н                   | 50.27   | 0.64             | 50.91                      | 74.00  | -23.09            |  |  |
| PK | 7321.50                | Н                   | 38.95   | 3.76             | 42.71                      | 74.00  | -31.29            |  |  |
|    |                        |                     |         |                  |                            |        |                   |  |  |
|    | <b>Highest Chann</b>   | nel                 |         |                  |                            |        |                   |  |  |
| PK | 4948.00                | V                   | 49.52   | 0.75             | 50.27                      | 74.00  | -23.73            |  |  |
| PK | 7415.50                | V                   | 40.50   | 3.83             | 44.33                      | 74.00  | -29.67            |  |  |
| PK | 4948.00                | Н                   | 47.39   | 0.75             | 48.14                      | 74.00  | -25.86            |  |  |
| PK | 7415.50                | Н                   | 25.98   | 3.83             | 29.81                      | 74.00  | -44.19            |  |  |
|    |                        |                     |         |                  |                            |        |                   |  |  |
|    | Spurious Emis          | ssions              |         |                  |                            |        |                   |  |  |
| QP | 52.95                  | V                   | 25.96   | 6.34             | 32.30                      | 40.00  | -7.70             |  |  |
| QP | 128.11                 | V                   | 37.00   | 4.27             | 41.27                      | 43.50  | -2.23             |  |  |
| QP | 133.62                 | V                   | 35.53   | 3.86             | 39.39                      | 43.50  | -4.11             |  |  |
| QP | 197.89                 | V                   | 24.08   | 4.55             | 28.63                      | 43.50  | -14.87            |  |  |
| QP | 267.55                 | V                   | 19.89   | 8.28             | 28.17                      | 46.00  | -17.83            |  |  |
| QP | 729.26                 | V                   | 17.05   | 17.31            | 34.36                      | 46.00  | -11.64            |  |  |
| QP | 121.98                 | Н                   | 29.86   | 4.71             | 34.57                      | 43.50  | -8.93             |  |  |
| QP | 128.11                 | Н                   | 29.08   | 4.27             | 33.35                      | 43.50  | -10.15            |  |  |
| QP | 136.46                 | Н                   | 25.65   | 3.65             | 29.30                      | 43.50  | -14.20            |  |  |
| QP | 273.23                 | Н                   | 21.12   | 8.72             | 29.84                      | 46.00  | -16.16            |  |  |
| QP | 385.28                 | Н                   | 20.39   | 10.87            | 31.26                      | 46.00  | -14.74            |  |  |
| QP | 578.67                 | Н                   | 25.20   | 14.12            | 39.32                      | 46.00  | -6.68             |  |  |

Refer to Figures shows the worst case channel's emission data graph from 30MHz-26GHz.



#### **Result Summary:**

- 1) Communication mode: All other emissions are more than 20dB below FCC part 15.209 limit.
- 2) No further spurious emissions found between 30 MHz and lowest internal used/generated frequency and from 30MHz to 1GHz.

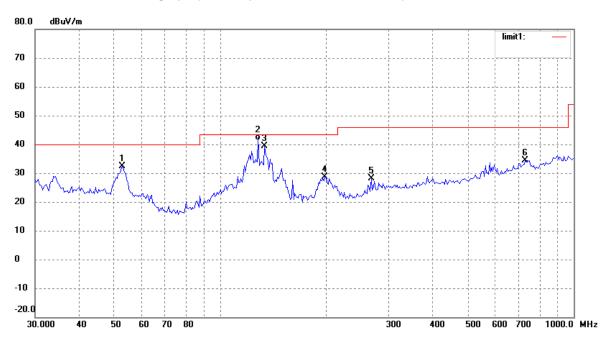
#### Remarks:

- 1. "\*" Radiated emissions which fall in the restricted bands as defined in Section 15.205(a).
- 2. Emission level with more than 20dB below the FCC required limit is not mentioned in table.
- 3. Delta to Limit = Field strength  $(dB\mu V/m)$  Limit  $(dB\mu V/m)$ .
- 4. Calculated measurement uncertainty: 9kHz -30MHz: 1.8dB.

30MHz -1GHz: 5.2dB. 1GHz -18GHz: 5.1dB.

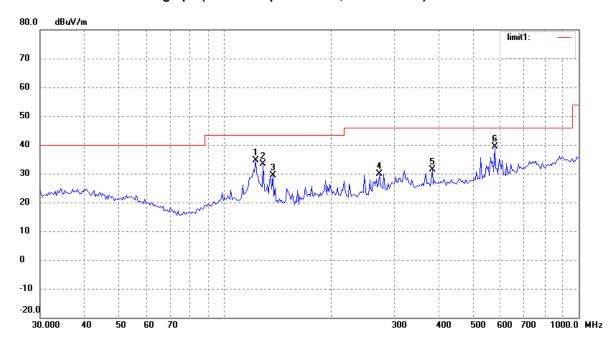


#### Radiated emission data graph (Vertical polarization, 30MHz-1GHz)



Remark: Only background noise was measured from 1GHz-26GHz excluding the operation frequency relational.

#### Radiated emission data graph (Horizontal polarization, 30MHz-1GHz)



Remark: Only background noise was measured from 1GHz-26GHz excluding the operation frequency relational.



#### 4.9 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement: FCC part 15 Section 15.207 Class B

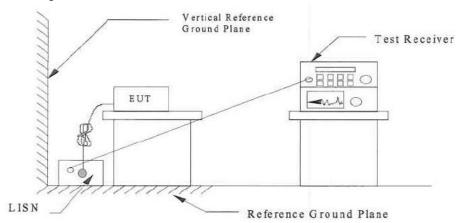
Test Method: ANSI C63.4:2003 Test Date: 2013-05-08

Mode of Operation: -Transmitting mode
Detector Function: CISPR Quasi Peak

Measurement BW: 100 kHz

Worst Case Channel: 1

#### **Test Setup:**



**Results: PASS** 

- Refer Figure and tables the result.

#### Limits for Conducted Emission [ Section 15.207]:

| Frequency Range<br>[MHz] | Quasi-Peak Limit<br>[dBμV] | Average Limit<br>[dBμV] |
|--------------------------|----------------------------|-------------------------|
| 0.15-0.5                 | 66 to 56*                  | 56 to 46*               |
| 0.5-5.0                  | 56                         | 46                      |
| 5.0-30.0                 | 60                         | 50                      |

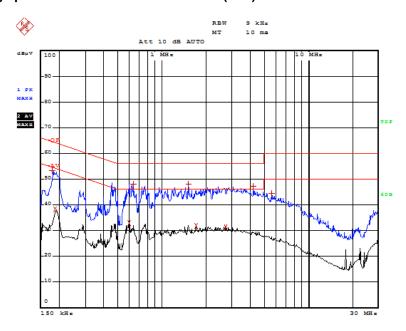
<sup>\*</sup> Decreases with the logarithm of the frequency.

Remarks:

Calculated measurement uncertainty: ±2.8dB



### Result data graph shows the conducted emission (Live).

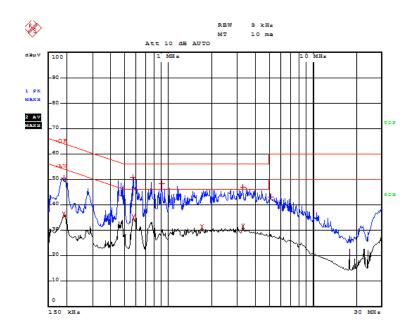


Refer to the following table for the result details:

| Conducted Emission |          |       |        |        |        |  |  |
|--------------------|----------|-------|--------|--------|--------|--|--|
| Frequency          | Detector | Phase | Result | Limit  | Margin |  |  |
| (MHz)              | (QP/AV)  |       | (dBµV) | (dBµV) |        |  |  |
| 0.182              | QP       | L     | 53.28  | 64.39  | -11.11 |  |  |
| 0.190              | AV       | اـ    | 38.22  | 54.03  | -15.81 |  |  |
| 0.598              | AV       | ال    | 32.95  | 46.00  | -13.05 |  |  |
| 0.638              | QP       | L     | 48.27  | 56.00  | -7.73  |  |  |
| 1.518              | QP       | L     | 48.18  | 56.00  | -7.82  |  |  |
| 1.714              | AV       | ال    | 31.96  | 46.00  | -14.04 |  |  |
| 2.718              | AV       | Ĺ     | 31.29  | 46.00  | -14.71 |  |  |
| 4.198              | QP       | L     | 47.28  | 56.00  | -8.72  |  |  |
| 5.614              | QP       | L     | 44.59  | 60.00  | -15.41 |  |  |



### Result data graph shows the conducted emission (Neutral).



Refer to the following table for the result details:

| Conducted Emission |          |       |        |        |        |  |  |
|--------------------|----------|-------|--------|--------|--------|--|--|
| Frequency          | Detector | Phase | Result | Limit  | Margin |  |  |
| (MHz)              | (QP/AV)  |       | (dBµV) | (dBµV) | -      |  |  |
| 0.194              | QP       | N     | 50.49  | 63.86  | -13.37 |  |  |
| 0.194              | AV       | N     | 36.19  | 53.85  | -17.66 |  |  |
| 0.570              | QP       | N     | 50.84  | 56.00  | -5.16  |  |  |
| 0.578              | AV       | N     | 35.01  | 46.00  | -10.99 |  |  |
| 0.902              | QP       | N     | 48.38  | 56.00  | -7.62  |  |  |
| 1.718              | AV       | N     | 31.29  | 46.00  | -14.71 |  |  |
| 3.298              | QP       | N     | 47.22  | 56.00  | -8.78  |  |  |
| 3.298              | AV       | N     | 31.62  | 46.00  | -14.38 |  |  |
| 5.178              | QP       | N     | 43.26  | 60.00  | -16.74 |  |  |



#### 5.0 RF Exposure Compliance Requirement

Test Requirement: FCC part 15 section 15.247 (i)
Test Method: FCC part 15 section 1.1307 (b1)
OET Bulletin 65, Edition 01-01

**Results: PASS** 

Systems operation under the provision of this section shall be operated in a manner that ensures the public is not exposed to radio frequency energy levels in excess of the Commission's guideline,

The EUT is considered as a mobile device according to OET Bulletin 65, Edition 01-01, therefore distance to human body of min. 20cm is determined.

| Frequency Band:          | 2408.625 MHz ~2473.875MHz  |
|--------------------------|--|
| Device Category:         | ☐ Portable (< 20cm separation ) ☐ Mobile ( >20cm separation ) ☐ Others :                                   |
| Exposure Classification: | <ul><li>☐ Occupational/ Controlled exposure</li><li>☒ General Population / Uncontrolled exposure</li></ul> |
| Max. Output Power        | 48.08mW  |
| Antenna Gain             | 0 dBi ( Numeric gain:1)  |
| Evaluation Applied:      | <ul><li>✓ MPE Evaluation</li><li>☐ SAR Evaluation</li></ul>  |

MPE calculation:

The radiated (EIRP) = 48.08 mW

The power density at 20cm from the antenna : = EIRP /  $4\pi$  R<sup>2</sup> = 0.0096mW / cm<sup>2</sup>

#### Limits for General Population/Uncontrolled Exposure [OET Bulletin 65, Edition 01-01]:

| Frequency<br>Range<br>(MHz) | Electric Field<br>Strength (E)<br>(V/m) | Magnetic Field<br>Strength (H)<br>(A/m) | Power Density (S) (mW/cm²) | Averaging Time $ E ^2$ , $ H ^2$ or S (minutes) |
|-----------------------------|---|---|----------------------------|---|
| 0.3-1.34                    | 614                                     | 1.63                                    | (100)*                     | 30  |
| 1.34-30                     | 824/f                                   | 2.19/f                                  | $(180/f^2)*$               | 30  |
| 30-300                      | 27.5                                    | 0.073                                   | 0.2                        | 30  |
| 300-1500                    |   |   | f/1500                     | 30  |
| 1500-100,000                |   |   | 1.0                        | 30  |



#### <u>6.0</u> **List of Measurement Equipment**

#### **Radiated Emission and Bandwidth Emissions**

| Description              | Manufacturer         | Model no. | Serial no. | CAL due     |
|--------------------------|----------------------|-----------|------------|-------------|
| Spectrum Analyzer        | Agilent              | E4402B    | US41192821 | 27 Mar 2014 |
| Test Receiver            | R&S                  | ESI26     | 838786/013 | 27 Mar 2014 |
| DC Power Supply          | LW                   | APR-3003  | N/A        | 15 Jul 2013 |
| Spectrum Analyzer        | R&S                  | FSP30     | 836079/035 | 27 Mar 2014 |
| Positioning Controller   | C&C                  | CC-C-1F   | N/A        | 19 Dec 2013 |
| RF Switch                | EM                   | EMSW18    | SW060023   | 19 Dec 2013 |
| Pre-amplifier            | Agilent              | 8447F     | 3113A06717 | 27 Mar 2014 |
| Pre-amplifier            | Compliance Direction | PAP-1G18  | 24002      | 27 Mar 2014 |
| Trilog Broadband Antenna | SCHWARZBECK          | VULB9163  | 9163-333   | 24 Feb 2014 |
| Horn Antenna             | ETS                  | 3117      | 00086197   | 24 Feb 2014 |
| Anechoic chamber         | Albatross Projects   | MCDC      | SW060023   | 19 Mar 2014 |

#### **Conducted Emissions**

| Description   | Manufacturer    | Model no. | Serial no. | CAL due     |
|---------------|-----------------|-----------|------------|-------------|
| Test Receiver | Rohde & Schwarz | ESPI      | 101611     | 27 Mar 2014 |
| L.I.S.N       | Schwarzbeck     | NSLK8126  | 8126-224   | 27 Mar 2014 |
| Pulse Limiter | Rohde & Schwarz | ESH3-Z2   | 100911     | 27 Mar 2014 |
| AMN           | EMCO            | 3825/2    | 11967C     | 27 Mar 2014 |

N/A Not Applicable or Not Available



## **Appendix A**

Date: 2013-06-15

Report No.: 60.870.12.047.02F Model No.: Ovia™30024PU

**Photo of Test Setup:** 

## **Radiated Emissions**





## **Appendix A**

Date: 2013-06-15

Report No.: 60.870.12.047.02F Model No.: Ovia™30024PU

**Photo of Test Setup:** 

## **Conducted Emissions**





Date: 2013-06-15

Report No.: 60.870.12.047.02F Model No.: Ovia™30024PU







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Report No.: 60.870.12.047.02F Model No.: Ovia™30024PU





AC/DC Adaptor



Date: 2013-06-15

Report No.: 60.870.12.047.02F Model No.: Ovia™30024PU



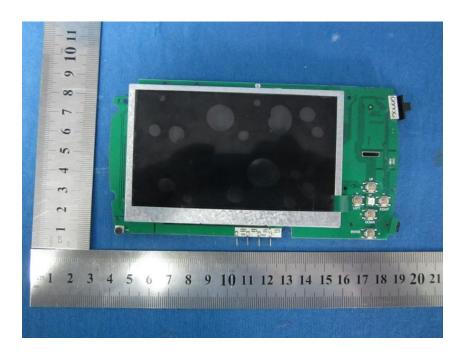




Date: 2013-06-15

Report No.: 60.870.12.047.02F Model No.: Ovia™30024PU







Date: 2013-06-15

Report No.: 60.870.12.047.02F Model No.: Ovia™30024PU



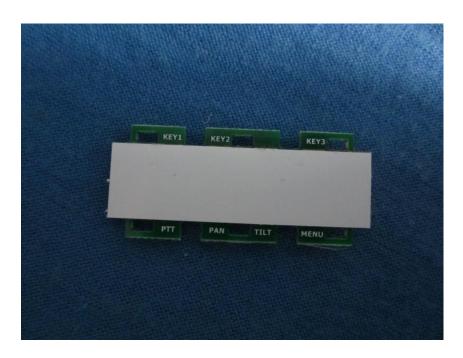




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