



**SLG Asia Test Labs & Service (HK) Limited**

# **Test Report**

**According to**

**FCC PART 15 Subpart C**

**FCC ID: S29DEVO7**

**Test Report Number: H1M21109-9465-P-15**



## TEST REPORT

### Summary | FCC Part 15C

Test Report No. ....: H1M21109-9465-P-15

Date of issue.....: 23.09.2011

**Testing Laboratory name** .....: SLG Asia Test Labs & Service (HK) Limited

Address.....: 26/F., Tamson Plaza, 161 Wai Yip Street,  
Kwun Tong, Kowloon, Hong Kong

**Applicant's name** .....: GUANGZHOU Walkera Technology Co., Ltd.

Address.....: Taishi Industrial Park, Dongchong Town, Panyu District, 511475  
Guangzhou, China

**Manufacturer's name** .....: GUANGZHOU Walkera Technology Co., Ltd.

Address.....: Taishi Industrial Park, Dongchong Town, Panyu District, 511475  
Guangzhou, China

#### Test specification

Standard(s) applied .....: FCC Rules 47 CFR Part 15 Subpart C

**Test item description** .....: Transmitter for R/C Helicopter

Brand Name .....: devention, WALKERA

Model and/or type reference.....: DEVO 7

Rating(s) .....: 12 VDC (8 x AA size batteries)

#### Summary of Test Results

**Pass**

*The Summary of Test Results based on a technical opinion belongs to the applied standard(s).*

#### Disclaimer

*Further details of testing are provided in particular chapters of this Test Report.*

*This document base on General Terms and Conditions of SLG Asia Test Labs & Service (HK) Limited, which the applicant accepted with order confirmation.*

#### Emphasized conditions or project related conditions:

*Released Test Reports apply only to the specific samples tested under stated test conditions. It is the applicant's responsibility to assure that additional production units of the tested model(s) are manufactured in same construction and with identical electrical and mechanical components to meet the same quality as tested model(s). The applicant/manufacturer/importer is responsible for any modifications made to the production units which result in non-compliance to the applied and/or relevant regulations. SLG Asia Test Labs & Service (HK) Limited shall have no liability for any deductions, inferences or generalizations drawn by the client or others from any kind of issued reports. Reports are confidential property of the client. As a mutual protection to the applicant, the clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval.*



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## 1 General Information

### 1.1 Test Report

Prepared and tested by:

23.09.2011

Mr. Karl Lau

Date

Test Engineer

Signature

Approved by:

23.09.2011

Mr. F. Schulz

Date

Laboratory Manager

Signature



## 1.2 Test Location

### *All tests were carrying by personnel from:*

Name: SLG Asia Test Labs & Service (HK) Limited  
Address: 26/F., Tamson Plaza, 161 Wai Yip Street  
Kwun Tong, Kowloon, Hong Kong

Telephone: +852 2389 2200  
Fax: +852 2389 3073  
E-mail: [service@slg.asia](mailto:service@slg.asia)  
Website: [www.slg.asia](http://www.slg.asia)

The test facility is accredited by A2LA (The American Association for Laboratory Accreditation) with Testing Certificate number 3175.01. The details of accreditation information with the recognized International Standard EN ISO/IEC 17025 are showing in the website [www.slg.asia](http://www.slg.asia).

### *The Test facility for radiated measurements is located at:*

Name : Hong Kong Productivity Council  
Address: EMC Centre, LG1, HKPC Building, 78 Tat Chee Avenue  
Kowloon, Hong Kong

### **The Hong Kong Laboratory Accreditation Scheme (HOKLAS)**

Reg. No.082

### **FCC registered measurement facility**

Reg. No.90656

## 1.3 Details of applicant

Name: GUANGZHOU Walkera Technology Co., Ltd.  
Address: Taishi Industrial Park, Dongchong Town, Panyu District  
511475 Guangzhou, China

Contact: Mr. Ya  
Telephone: +86 20 8491 5116  
Fax: +86 20 8491 5117

## 1.4 Manufacturer

Name: GUANGZHOU Walkera Technology Co., Ltd.  
Address: Taishi Industrial Park, Dongchong Town, Panyu District  
511475 Guangzhou, China

Contact: Mr. Ya  
Telephone: +86 20 8491 5116  
Fax: +86 20 8491 5117



## 1.5 Application details

Date of receipt of application: 06.09.2011  
Date of receipt of test item: 06.09.2011  
Date (s) of performance of tests: 06.09.2011 - 23.09.2011

## 1.6 Test item

Description of test item: Transmitter for R/C Helicopter  
Type identification: DEVO 7  
Brand Name: devention, WALKERA

Equipment category: 2.4GHZ Spread Spectrum Transmitter  
Equipment classification: Portable use  
Permitted frequency range: 2400 – 2483.5 MHz  
Operation frequency range: 2405 – 2479 MHz  
Lowest Operation frequency: 2405 MHz  
Middles Operation frequency: 2441 MHz  
Highest Operation frequency: 2479 MHz  
Emission designator: F7D  
Antenna gain: ≤ 0 dBi  
Type of modulation: DSSS  
Operation mode: simplex  
Type of antenna: integral  
Power supply: 12 VDC (8 x AA size batteries)

All information was provided by the applicant)



## 1.7 General Test Conditions

### Environmental reference conditions

If not defined otherwise by the Technical Committee responsible for the generic standard and/or the product standard the climatic conditions during the tests are to be within the limits specified by the manufacturer for the operation of the EUT and the test equipment.

The climatic conditions during the tests were within the following limits:

| Temperature   | Humidity    | Atmospheric pressure |
|---------------|-------------|----------------------|
| 15 °C - 35 °C | 30 % - 60 % | 860 hPa - 1060 hPa   |

If explicitly required in the test base (basic) the climatic values are recorded and documented separately for the respective test.

### Calibration of measurement and test equipment

All measurement and testing equipment that has a significant influence on the accuracy of qualitative measurements and tests is subject to a periodical in-house system of calibration and servicing that is part of the quality management system of the EMC laboratory of SLG Asia Test Labs & Service (HK) Limited.

### Measurement uncertainties

All tests are subject to measurement uncertainties. The overall measurement uncertainty of a measurement is defined as the range of which can be supposed that it contains the true value with a specified probability. This probability is 95 % for the generally specified measurement uncertainty (so-called expanded measurement uncertainty).

The limits for emission measurements and the test levels for immunity tests in the applied standards were defined taking into consideration the accuracy limits for measurement and testing equipment required by the basic standards.

All measurement and test results of the EMC laboratory of SLG Asia Test Labs & Service (HK) Limited fulfil the requirements for measurement uncertainties according to the standards applied.



## 2 Test result Summary

### *Digital Transmission system (2400-2483.5MHz)*

| Requirements according standard: |  |  |   |         |
|----------------------------------|--|--|---|---------|
| FCC Rule                         | Test description                             | Results/Notes  | Limits/Requirements                             | Verdict |
| 15.247(a)                        | Digital modulation                           | System uses DSSS techniques                              |   | P       |
| 15.247(a)<br>(2)                 | 6dB Bandwidth                                | > 874.3 KHz  | > 500kHz  | P       |
| 15.247(b)<br>(3)                 | Output power                                 | 13.05 dBm<br>(0.020 W)                                   | 1W, EIRP limited to 4W                          | P       |
| 15.247(d)                        | Power Spectral Density                       | 2.77 dBm/3kHz  | < 8dBm/3kHz                                     | P       |
| 15.247(c) /<br>15.209            | Radiated Spurious Emissions<br>30MHz – 25GHz | All signals below Limits                                 | 15.207 restricted bands, all<br>others < -20dBc | P       |
| 15.203                           | RF Connector                                 | EUT has integral antenna                                 |   | P       |
| 15.247 (b)/<br>15.407 (f)        | RF Exposure requirements                     | Refer to MPE calculation<br>and User manual<br>statement | Refer to OET 65                                 | P       |

### Test case verdicts

*P* - Pass                      *Test item does meet the requirement*  
*F* - Fail                        *Test item does not meet the requirement*  
*N.A.* - Not Applicable      *Test case does not apply to the test object*





## 3 Test results

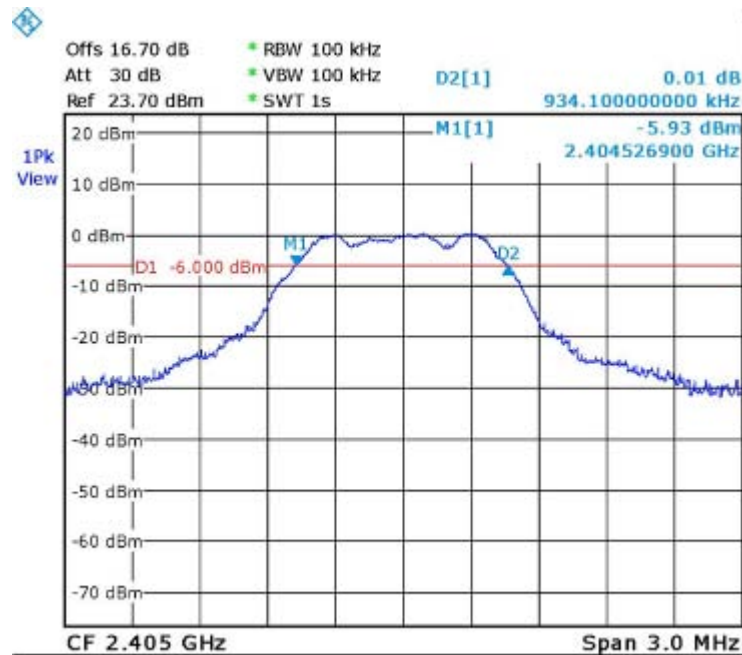
### 3.1. 6dB Bandwidth

#### Measurement Results:

FCC part 15.247 (a) (2): Signal Bandwidth

| Frequency (MHz) | Resolution bandwidth | 6dB bandwidth (kHz) | Limit (kHz) | Results |
|-----------------|----------------------|---------------------|-------------|---------|
| 2405            | 100kHz               | 934.0               | >500        | Pass    |
| 2441            | 100kHz               | 916.2               | >500        | Pass    |
| 2479            | 100kHz               | 874.3               | >500        | Pass    |

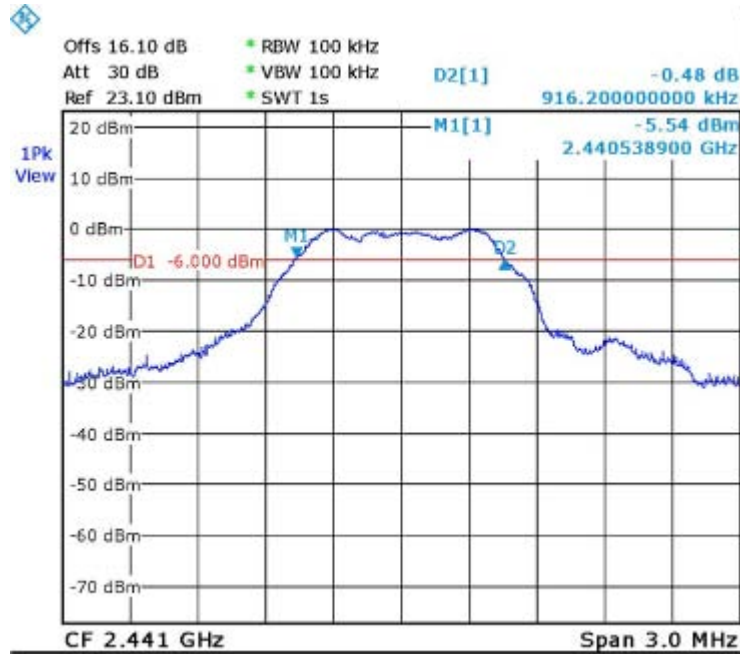
Lowest Operation frequency: 2405 MHz



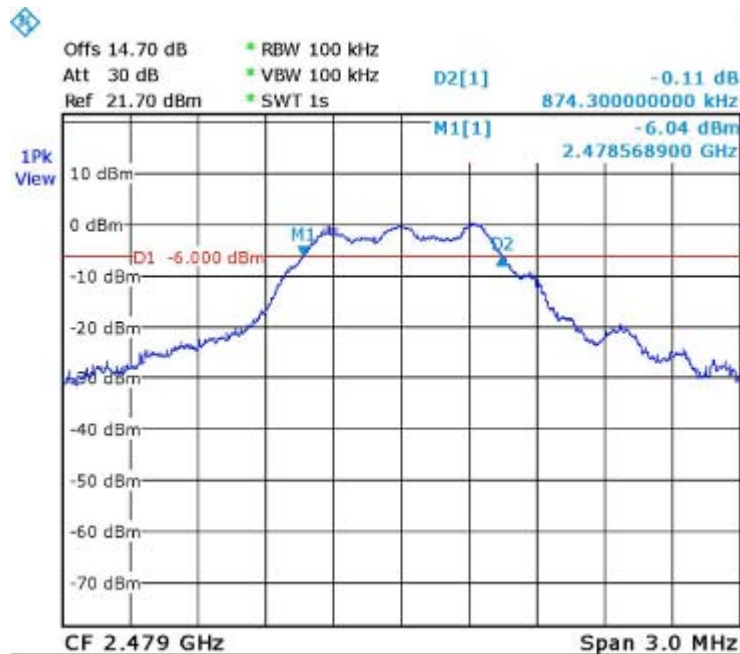
# SLG Asia Test Labs & Service (HK) Limited



Middles Operation frequency: 2441 MHz



Highest Operation frequency: 2479 MHz





## 3.2. Output power

### Measurement Results:

FCC part 15.247 (b) (3): Output Power

| Frequency<br>MHz | Output Power |       | Antenna Gain<br>dBi | Results | EIRP  |       |
|------------------|--------------|-------|---------------------|---------|-------|-------|
|                  | dBm          | mW    |                     |         | dBm   | W     |
| 2405             | 9,76         | 9,46  | 0                   | Pass    | 9,76  | 0.009 |
| 2441             | 10,36        | 10,86 | 0                   | Pass    | 10,36 | 0.010 |
| 2479             | 13,05        | 20,18 | 0                   | Pass    | 13,05 | 0.020 |

All results were measured with peak power meter.

### Measurement Equipment Used:

| Test equipment    | Type    | S/N        | Manufacturer    | Cal Due Date |
|-------------------|---------|------------|-----------------|--------------|
| Spectrum Analyzer | FSEK 20 | 836043/003 | Rohde & Schwarz | Sep 11       |



### 3.3. Power Spectral Density

#### Measurement Results:

FCC part 15.247 (d): Power spectral Density

| Frequency<br>MHz | PSD<br>dBm/3kHz | Limit<br>dBm/3kHz | Results |
|------------------|-----------------|-------------------|---------|
| 2405             | 2.77            | 8                 | Pass    |
| 2441             | 2.45            | 8                 | Pass    |
| 2479             | 2.61            | 8                 | Pass    |

|         |   |
|---------|---|
| Note 1: | Power spectral density measured using RBW=3kHz, VBW=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from preliminary scans using |
|---------|---|

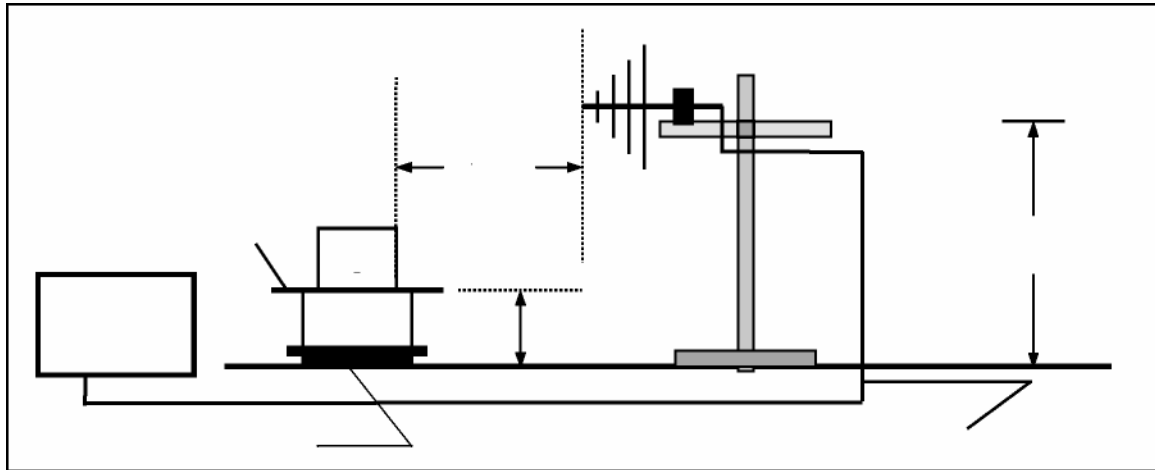
#### Measurement Equipment Used:

| Test equipment    | Type    | S/N        | Manufacturer    | Cal Due Date |
|-------------------|---------|------------|-----------------|--------------|
| Spectrum Analyzer | FSEK 20 | 836043/003 | Rohde & Schwarz | Sep 11       |



## 3.4. Radiated spurious emission

### Measurement Procedure



The equipment under test is placed on a non metallic table with 0.8 m height. The power supply and the RF connection points are close to the equipment under test at the floor inside a connection box. The cables to this connection box are shielded and below the double floor. The receiving antenna is placed in a height at 1.0 m to 4.0 m and in a distance of 3 m.

### Measurement Equipment Used:

| Test equipment        | Type   | S/N        | Manufacturer    | Cal Due Date |
|-----------------------|--------|------------|-----------------|--------------|
| Semi-anechoic Chamber | Nil    | Nil        | Frankonia       | May 12       |
| Test Reciever         | ESU 26 | 100050     | Rohde & Schwarz | Aug 12       |
| Bi-conical Antenna    | HK116  | 841489/016 | Rohde & Schwarz | Mar 12       |
| Log.-Periodic Antenna | HL223  | 841516/020 | Rohde & Schwarz | Feb 12       |
| Horn Antenna          | 3115   | 9002-3351  | EMCO            | Feb 12       |
| Active Loop Antenna   | 6502   | 9107-2651  | EMCO            | Dec 11       |

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## Measurement Results:

### Low Frequency @ 2405 MHz

| <b>Fundamental emission level @3m in 100khz RBV</b>   |               |            | 104,04               |               | dB $\mu$ V/m     |                 |
|---|---------------|------------|----------------------|---------------|------------------|-----------------|
| <b>Limit for emission outside of restricted bands:</b>  |               |            | 84,04                |               | dB $\mu$ V/m     |                 |
|   |               |            |                      |               |                  |                 |
| <b>Frequency</b>  | <b>Level</b>  | <b>Pol</b> | <b>15.209/15.247</b> |               | <b>Detector</b>  | <b>Comments</b> |
| <b>MHz</b>  | <b>dBmV/m</b> | <b>V/H</b> | <b>Limit</b>         | <b>Margin</b> | <b>Pk/QP/Avg</b> |                 |
| 78,377  | 32,36         | V          | 40                   | 7,64          | Pk               | RB/VB 100kHz    |
| 80,42   | 31,20         | H          | 40                   | 8,80          | Pk               | RB/VB 100kHz    |
| 371,54  | 41,50         | V          | 46                   | 4,50          | Pk               | RB/VB 100kHz    |
| 371,54  | 31,52         | H          | 46                   | 14,48         | Pk               | RB/VB 100kHz    |
| 4810  | 53,39         | V          | 74                   | 20,61         | Pk               | RB/VB 1MHz      |
| 4810  | 55,55         | H          | 74                   | 18,45         | Pk               | RB/VB 1MHz      |
| 7214  | 36,16         | V          | 74                   | 37,84         | Pk               | RB/VB 1MHz      |
| 7214  | 39,41         | H          | 74                   | 34,59         | Pk               | RB/VB 1MHz      |
| 12740   | 49,46         | V          | 84,04                | 34,58         | Pk               | RB/VB 1MHz      |
| 12750   | 49,79         | H          | 84,04                | 34,25         | Pk               | RB/VB 1MHz      |
|   |               |            |                      |               |                  |                 |
|   |               |            |                      |               |                  |                 |
|   |               |            |                      |               |                  |                 |
| For emission in restricted band, the limit of 15,209 was used. For all other emission, the limit was set 20dB below the level of fundamental and measured in 100kHz |               |            |                      |               |                  |                 |

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## Middle Frequency @ 2441 MHz

|  |        |              |
|--|--------|--------------|
| <b>Fundamental emission level @3m in 100kHz RBV</b>    | 105,71 | dB $\mu$ V/m |
| <b>Limit for emission outside of restricted bands:</b> | 85,71  | dB $\mu$ V/m |

| Frequency<br>MHz | Level<br>dBmV/m | Pol<br>V/H | 15.209/15.247 |        | Detector<br>Pk/QP/Avg | Comments     |
|------------------|-----------------|------------|---------------|--------|-----------------------|--------------|
|                  |                 |            | Limit         | Margin |                       |              |
| 79,399           | 32,42           | V          | 40            | 7,58   | Pk                    | RB/VB 100kHz |
| 80,08            | 31,85           | H          | 40            | 8,15   | Pk                    | RB/VB 100kHz |
| 395,591          | 40,28           | V          | 46            | 5,72   | Pk                    | RB/VB 100kHz |
| 347,495          | 31,16           | H          | 46            | 14,84  | Pk                    | RB/VB 100kHz |
| 4882             | 52,28           | V          | 74            | 21,72  | Pk                    | RB/VB 1MHz   |
| 4882             | 51,68           | H          | 74            | 22,32  | Pk                    | RB/VB 1MHz   |
| 7326             | 36,26           | V          | 74            | 37,74  | Pk                    | RB/VB 1MHz   |
| 7326             | 37,54           | H          | 74            | 36,46  | Pk                    | RB/VB 1MHz   |
| 12207            | 49,50           | V          | 85,71         | 36,21  | Pk                    | RB/VB 1MHz   |
| 12750            | 50,11           | H          | 85,71         | 35,6   | Pk                    | RB/VB 1MHz   |
|                  |                 |            |               |        |                       |              |
|                  |                 |            |               |        |                       |              |

For emission in restricted band, the limit of 15.209 was used. For all other emission. the limit was set 20dB below the level of fundamental and measured in 100kHz

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## High Frequency @ 2479 MHz

|  |        |              |
|--|--------|--------------|
| <b>Fundamental emission level @3m in 100kHz RBV</b>    | 109,03 | dB $\mu$ V/m |
| <b>Limit for emission outside of restricted bands:</b> | 89,03  | dB $\mu$ V/m |

| Frequency<br>MHz | Level<br>dBmV/m | Pol<br>V/H | 15.209/15.247 |        | Detector<br>Pk/QP/Avg | Comments     |
|------------------|-----------------|------------|---------------|--------|-----------------------|--------------|
|                  |                 |            | Limit         | Margin |                       |              |
| 55,21            | 34,70           | V          | 40            | 5,3    | Pk                    | RB/VB 100kHz |
| 67,475           | 33,20           | H          | 40            | 6,8    | Pk                    | RB/VB 100kHz |
| 377,956          | 42,22           | V          | 46            | 3,78   | Pk                    | RB/VB 100kHz |
| 347,495          | 30,96           | H          | 46            | 15,04  | Pk                    | RB/VB 100kHz |
| 4954             | 58,31           | V          | 74            | 15,69  | Pk                    | RB/VB 1MHz   |
| 4954             | 59,07           | H          | 74            | 14,93  | Pk                    | RB/VB 1MHz   |
| 7438             | 35,82           | V          | 74            | 38,18  | Pk                    | RB/VB 1MHz   |
| 7438             | 39,22           | H          | 74            | 34,78  | Pk                    | RB/VB 1MHz   |
| 12750            | 49,91           | V          | 89,03         | 39,12  | Pk                    | RB/VB 1MHz   |
| 12740            | 49,42           | H          | 89,03         | 39,61  | Pk                    | RB/VB 1MHz   |
|                  |                 |            |               |        |                       |              |
|                  |                 |            |               |        |                       |              |

For emission in restricted band the limit of 15.209 was used. For all other emission. the limit was set 20dB below the level of fundamental and measured in 100kHz

**Note: Testing is carried out with frequency rang 30MHz to the tenth harmonics which above 5th Harmonics is close to the noise base even antenna close up to 1meter distance according the measurement of ANSI C63.4. Emissions 20dB lower than the limit are not reported.**



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FCC Part 15. Subpart C. §15.209. Radiated Emission Limits

| Frequency of Emission [MHz] | Field strength [ $\mu\text{V/m}$ ] | Field Strength [ $\text{dB}\mu\text{V/m}$ ] |
|-----------------------------|------------------------------------|---|
| 30 – 88                     | 100                                | 40.0  |
| 88 – 216                    | 150                                | 43.5  |
| 216 – 960                   | 200                                | 46.0  |
| Above 960                   | 500                                | 54.0  |

FCC Part 15. Subpart C. §15.205. Restricted bands of operation

| MHz                 | MHz                   | MHz             | GHz           |
|---------------------|-----------------------|-----------------|---------------|
| 0.090 - 0.110       | 16.42 - 16.423        | 399.9 - 410     | 4.5 - 5.15    |
| 10.495 - 0.505      | 16.69475 - 16.69525   | 608 - 614       | 5.35 - 5.46   |
| 2.1735 - 2.1905     | 16.80425 - 16.80475   | 960 - 1240      | 7.25 - 7.75   |
| 4.125 - 4.128       | 25.5 - 25.67          | 1300 - 1427     | 8.025 - 8.5   |
| 4.17725 - 4.17775   | 37.5 - 38.25          | 1435 - 1626.5   | 9.0 - 9.2     |
| 4.20725 - 4.20775   | 73 - 74.6             | 1645.5 - 1646.5 | 9.3 - 9.5     |
| 6.215 - 6.218       | 74.8 - 75.2           | 1660 - 1710     | 10.6 - 12.7   |
| 6.26775 - 6.26825   | 108 - 121.94          | 1718.8 - 1722.2 | 13.25 - 13.4  |
| 6.31175 - 6.31225   | 123 - 138             | 2200 - 2300     | 14.47 - 14.5  |
| 8.291 - 8.294       | 149.9 - 150.05        | 2310 - 2390     | 15.35 - 16.2  |
| 8.362 - 8.366       | 156.52475 - 156.52525 | 2483.5 - 2500   | 17.7 - 21.4   |
| 8.37625 - 8.38675   | 156.7 - 156.9         | 2690 - 2900     | 22.01 - 23.12 |
| 8.41425 - 8.41475   | 162.0125 - 167.17     | 3260 - 3267     | 23.6 - 24.0   |
| 12.29 - 12.293      | 167.72 - 173.2        | 3332 - 3339     | 31.2 - 31.8   |
| 12.51975 - 12.52025 | 240 - 285             | 3345.8 - 3358   | 36.43 - 36.5  |
| 12.57675 - 12.57725 | 322 - 335.4           | 3600 - 4400     |               |
| 13.36-13.41         |                       |                 |               |

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## 4 Normative references

- /1/ FCC Rules 47 CFR PART 15 Subpart: 2010  
Radio Frequency Devices
- /2/ ANSI C63.4-2003  
Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and  
Electronic Equipment in the Range of 9 kHz to 40 GHz



## 5 Disclaimer

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Emphasized conditions or project related conditions:

Released Test Reports apply only to the specific samples tested under stated test conditions. It is the applicant's responsibility to assure that additional production units of the tested model(s) are manufactured in same construction and with identical electrical and mechanical components to meet the same quality as tested model(s). The applicant/manufacturer/importer is responsible for any modifications made to the production units which result in non-compliance to the applied and/or relevant regulations.

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The test results of this test report relate exclusively to the item tested as specified in clause 1.6 of this report. The test report may only be reproduced or published in full.

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### 5.1 Revision Notes

This revised Report replaces the all former Test Reports based on number H1M21109-9465-P-15. These former Test Reports are not longer valid. Every Revision of the original report is recorded below and identified by the || symbol beside the text.

| Revision No.       | Revision             |
|--------------------|----------------------|
| H1M21109-9465-P-15 | Original Test Report |
|                    |                      |
|                    |                      |
|                    |                      |