SLG Asia Test Labs & Service (HK) Limited

Test Report

According to

FCC PART 15 Subpart C

FCC ID: S29DEVO12

Test Report Number: H1M21103-8996-P-15

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

Phone +852 2389 2200
Fax +852 2389 3073

SLG Asia Test Labs & Service (HK) Limited

TEST REPORT

Summary | FCC Part 15C

Test Report No. ..... :	H1M21103-8996-P-15
Date of issue..... :	20.06.2011
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 12
Rating(s) ..... :	3.7V / 3000mAh rechargeable Li-Po) battery

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.

TABLE OF CONTENTS

1 General Information

1.1 Test Report

Tested by:

20.06.2011	Mr. Karl Lau	
Date	Test Engineer	Signature

Approved by:

20.06.2011	Mr. F. Schulz	
Date	Laboratory Manager	Signature

1.2 Test Location

All tests was performend 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

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
E-mail: yazuan2010@163.com

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:	31.03.2011	
Date of receipt of test item:	31.03.2011	
Date (s) of performance of tests:	31.03.2011	- 20.06.2011

1.6 Test item

Description of test item:	Transmitter for R/C Helicopter
Type identification:	DEVO 12
Brand Name:	CPS
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:	3 dBi
Type of modulation:	DSSS
Operation mode:	simplex
Type of antenna:	integral
Power supply:	3.7V / 3000mAh rechargeable Li-Po) battery

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) (2)	6dB Bandwidth	> 677 KHz	> 500kHz	P
15.247(b) (3)	Output power	19,21 dBm (0.083 W)	1W, EIRP limited to 4W	P
15.247(d)	Power Spectral Density	4.33dBm/3kHz	< 8dBm/3kHz	P
15.247(c) / 15.209	Radiated Spurious Emissions 30MHz – 25GHz	All signals below Limits	15.207 restricted bands, all others < -20dBc	P
15.203	RF Connector	EUT has integral antenna		P
15.247 (b)/ 15.407 (f)	RF Exposure requirements	Refer to MPE calculation and User manual 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

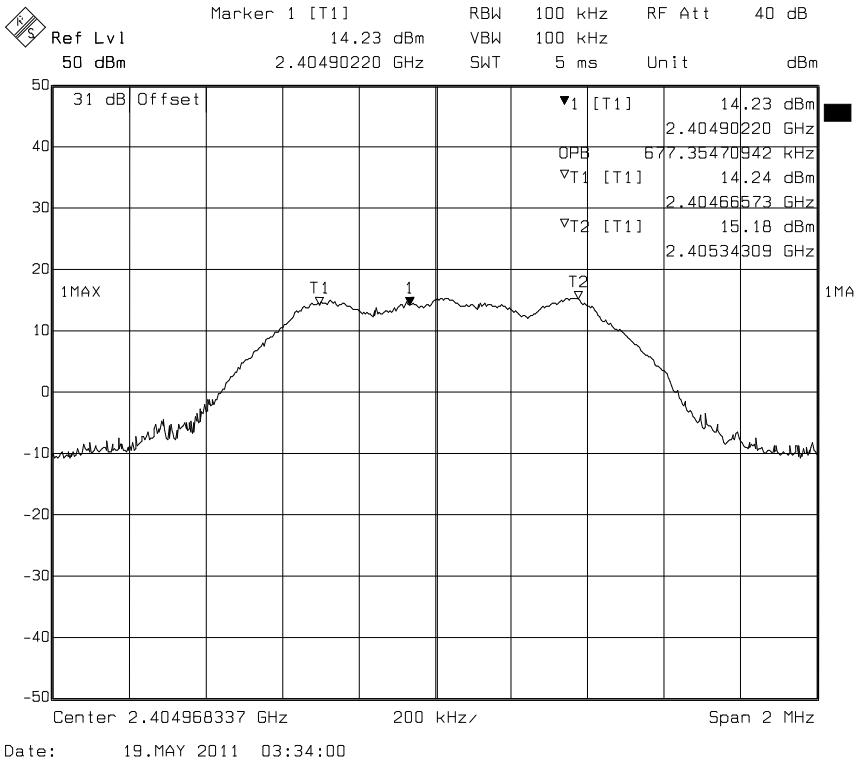
3.1. 6dB Bandwidth

Measurement Results:

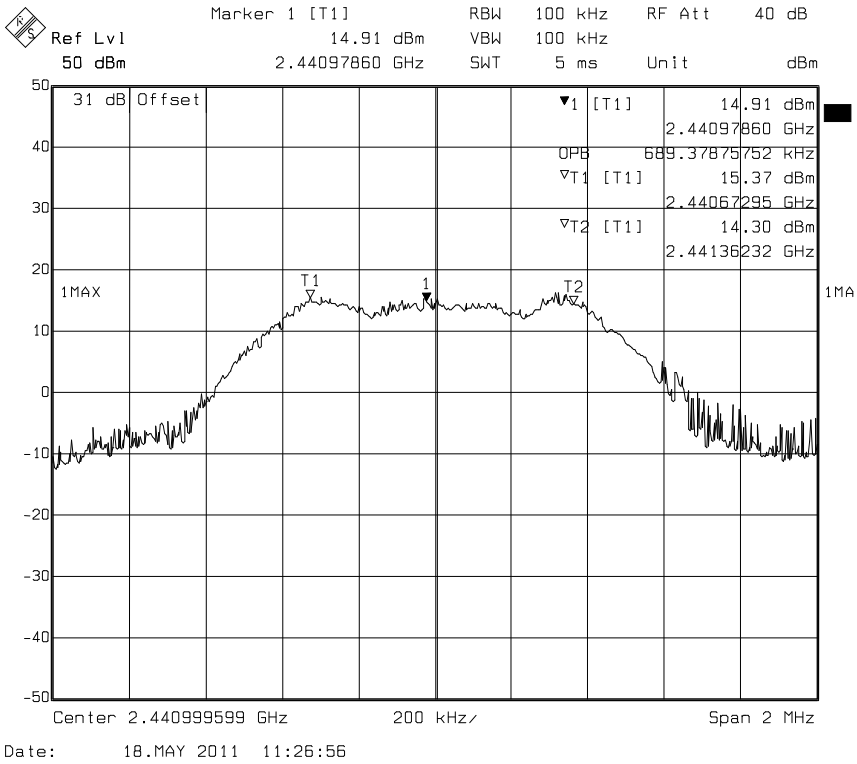
FCC part 15.247 (a) (2): Signal Bandwidth

Frequency (MHz)	Resolution bandwidth	Bandwidth (kHz) 6dB	Limit (kHz)	Results
2405	100kHz	677	>500	Pass
2441	100kHz	689	>500	Pass
2479	100kHz	685	>500	Pass

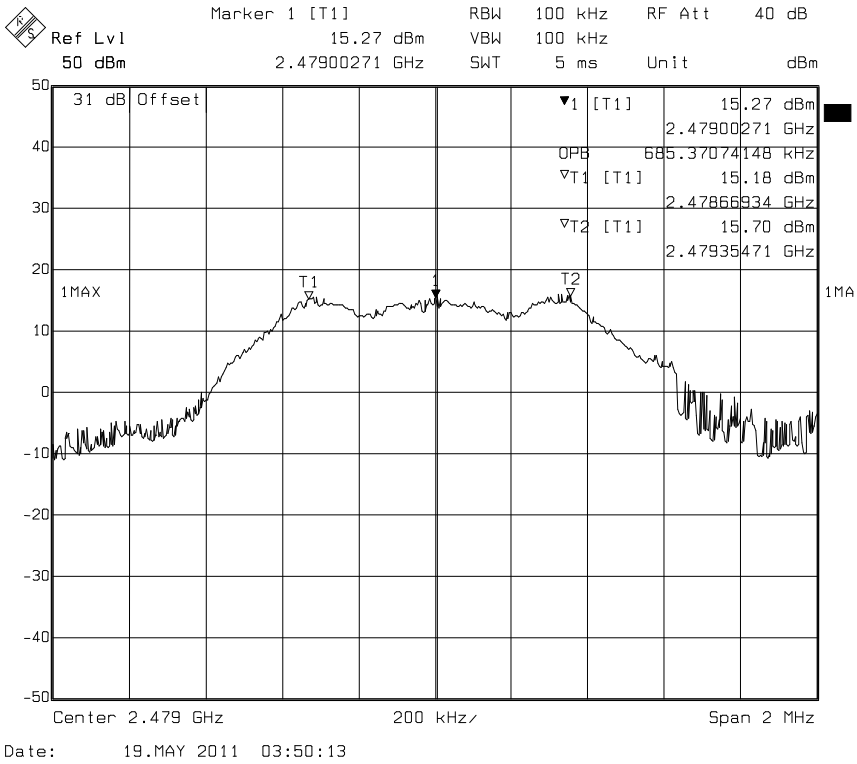
Lowest Operation frequency: 2405 MHz



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	Output Power		Antenna Gain	Results	EIRP	
MHz	dBm	mW	dBi		dBm	W
2405	15,85	38,459	3	Pass	18,85	0,077
2441	14,12	25,822	3	Pass	17,12	0,052
2479	16,21	41,783	3	Pass	19,21	0,083

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 MHz	PSD dBm/3kHz	Limit dBm/3kHz	Results
2405	2,50	8	Pass
2441	4,33	8	Pass
2479	4,06	8	Pass

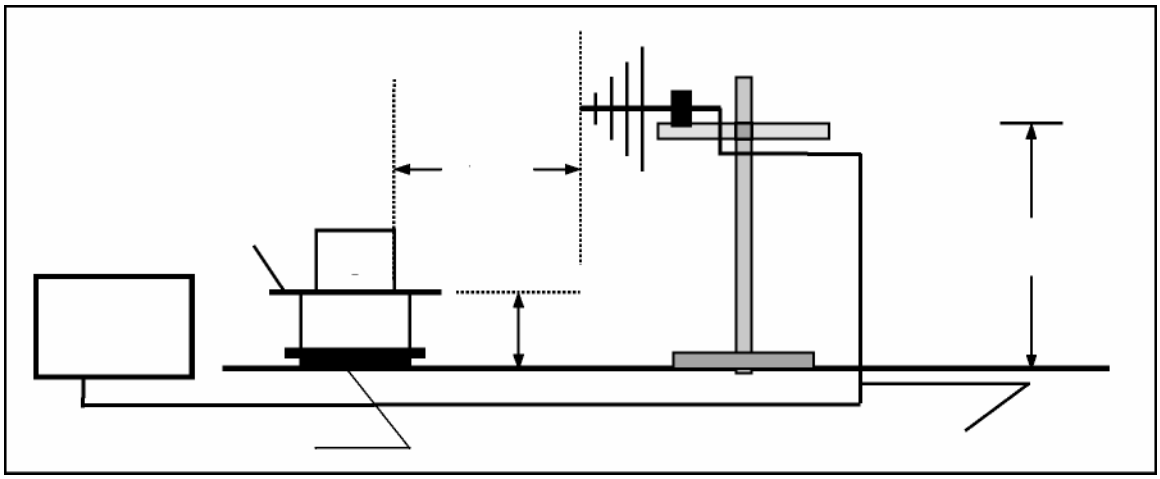
Note 1:	Power spectral density measured using RBW=3kHz, VBW=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from preliminary scans using

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 11
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

Measurement Results:

Low Frequency @ 2405 MHz

Fundamental emission level @3m in 100khz RBV				108,66		dBμV/m
Limit for emission outside of restricted bands:				88,66		dBμV/m
Frequency	**Level**	**Pol**	**15.209/15.247**		**Detector**	**Comments**
MHz	**dBμV/m**	**V/H**	**Limit**	**Margin**	**Pk/QP/Avg**	
126	31,6	V	43,5	11,90	QP	RB/VB 100kHz
126	27	H	43,5	16,50	QP	RB/VB 100kHz
280	44,30	V	46	1,70	QP	RB/VB 100kHz
4810	61,25	V	74	12,75	Pk	RB/VB 1MHz
4810	60,63	H	74	13,37	Pk	RB/VB 1MHz
7214	49,44	V	88,66	39,22	Pk	RB/VB 1MHz
7222	47,02	H	88,66	41,64	Pk	RB/VB 1MHz
9619	46,91	V	88,66	41,75	Pk	RB/VB 1MHz
9619	45,29	H	88,66	43,37	Pk	RB/VB 1MHz
12012	53,74	V	74	20,26	Pk	RB/VB 1MHz
12024	54,28	H	74	19,72	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						

Middle Frequency @ 2441 MHz

Fundamental emission level @3m in 100khz RBV	107,43	dBμV/m
Limit for emission outside of restricted bands:	87,43	dBμV/m

Frequency	Level	Pol	15.209/15.247		Detector	Comments
MHz	dBmV/m	V/H	Limit	Margin	Pk/QP/Avg	
140	33,00	V	43,5	10,50	QP	RB/VB 100kHz
170	28,00	H	43,5	15,50	QP	RB/VB 100kHz
280	44.30	V	46	1,70	QP	RB/VB 100kHz
294	30,00	H	46	16,00	QP	RB/VB 100kHz
4882	61,55	V	74	12,45	Pk	RB/VB 1MHz
4882	63,15	H	74	10,85	Pk	RB/VB 1MHz
7326	54,99	V	74	19,01	Pk	RB/VB 1MHz
7326	52,11	H	74	21,89	Pk	RB/VB 1MHz
9763	49,18	V	87,43	38,25	Pk	RB/VB 1MHz
9763	47,05	H	87,43	40,38	Pk	RB/VB 1MHz
12132	53,09	V	74	20,91	Pk	RB/VB 1MHz
12192	53,13	H	74	20,87	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

High Frequency @ 2479 MHz

Fundamental emission level @3m in 100khz RBV	106,76	dBμV/m
Limit for emission outside of restricted bands:	86,76	dBμV/m

Frequency	Level	Pol	15.209/15.247		Detector	Comments
MHz	dBmV/m	V/H	Limit	Margin	Pk/QP/Avg	
130	32	V	43,5	11,50	QP	RB/VB 100kHz
280	44,30	V	46	1,70	QP	RB/VB 100kHz
4954	59,96	V	74	14,04	Pk	RB/VB 1MHz
4954	55,7	H	74	18,3	Pk	RB/VB 1MHz
7438	52,53	V	74	21,47	Pk	RB/VB 1MHz
7438	50,31	H	74	23,69	Pk	RB/VB 1MHz
9915	48,77	V	86,76	37,99	Pk	RB/VB 1MHz
9915	49,04	H	86,76	37,72	Pk	RB/VB 1MHz
12384	53,16	V	74	20,84	Pk	RB/VB 1MHz
12372	53,04	H	74	20,96	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.

4 Normative references

/1/ FCC Rules 47 CFR PART 15 Subpart: 2009
Radio Frequency Devises

/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

This document based 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.

The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate. The complexity of the technical specifications means that full and thorough testing is impractical for both technical and economic reasons. Furthermore, there is no guarantee that a test sample which has passed all the relevant tests conforms to a specification. Neither is there any guarantee that such a test sample will interact with other genuinely open systems. The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that its performance generally conforms to representative cases of communications equipment.

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.

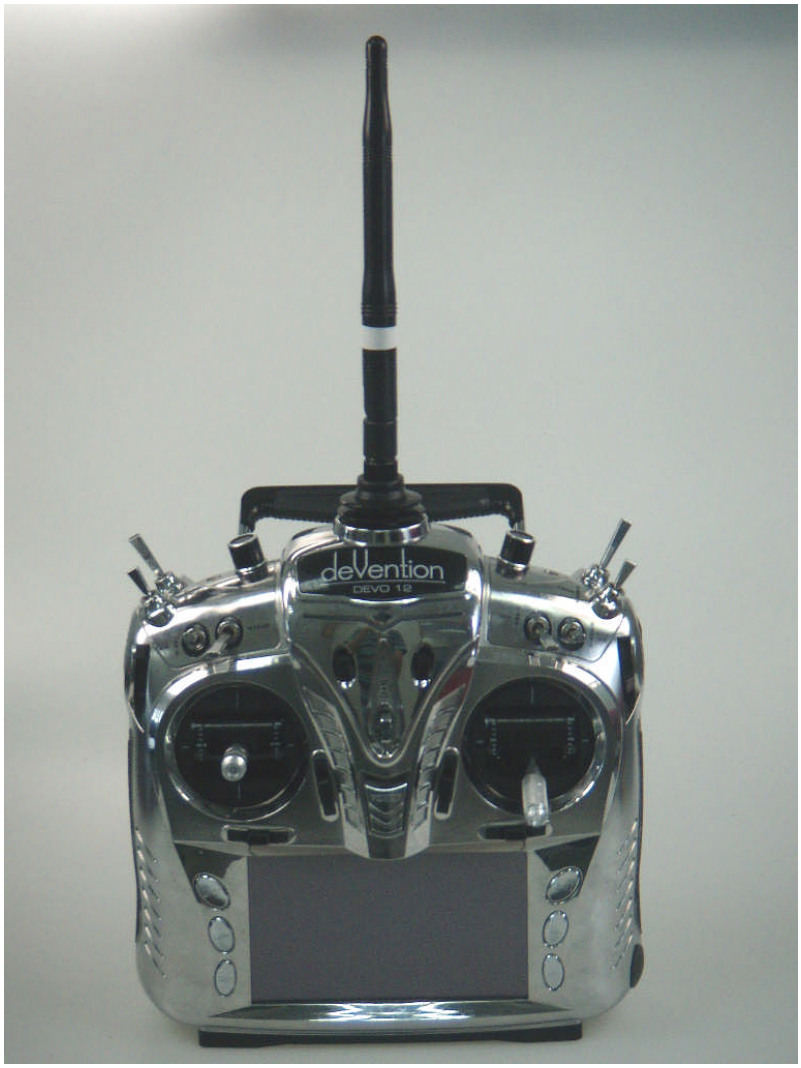
Reproducing or publishing extracts of the report requires the prior written approval of SLG Asia Test Labs & Service (HK) Limited.

5.1 Revision Notes

This revised Report replaces the all former Test Reports based on number H1M21103-8996-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.

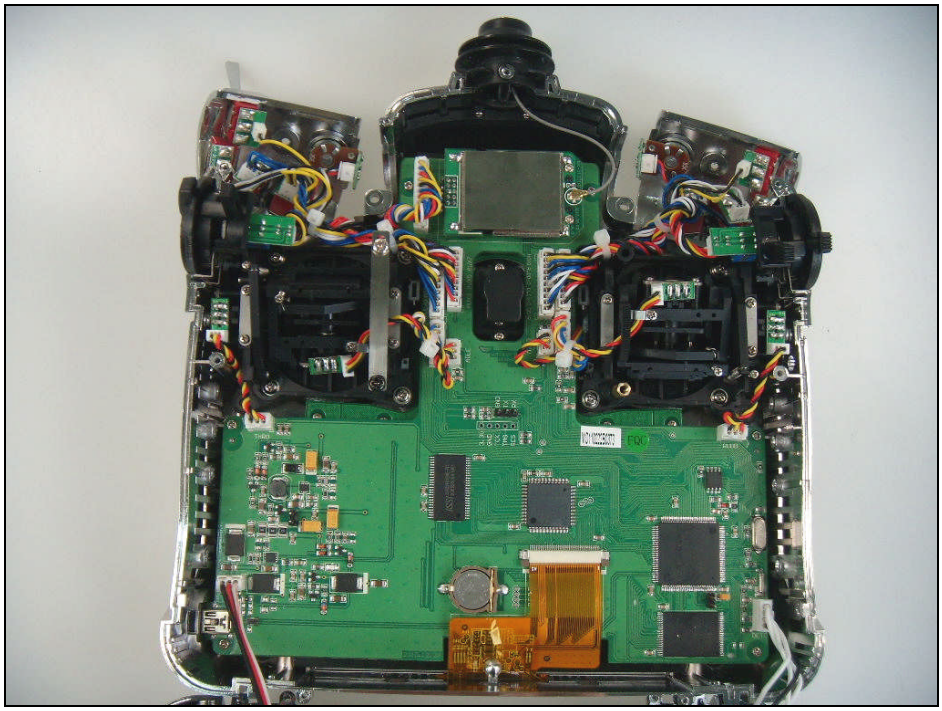
Revision No.	Revision
H1M21103-8996-P-15	Original Test Report

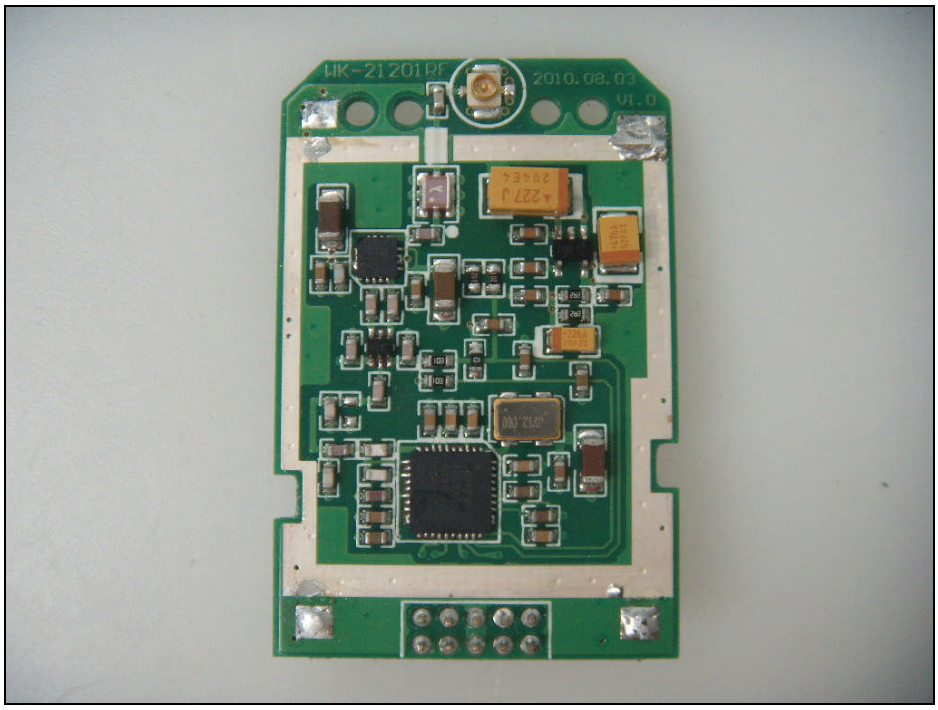
Annex A: External Photos of test item

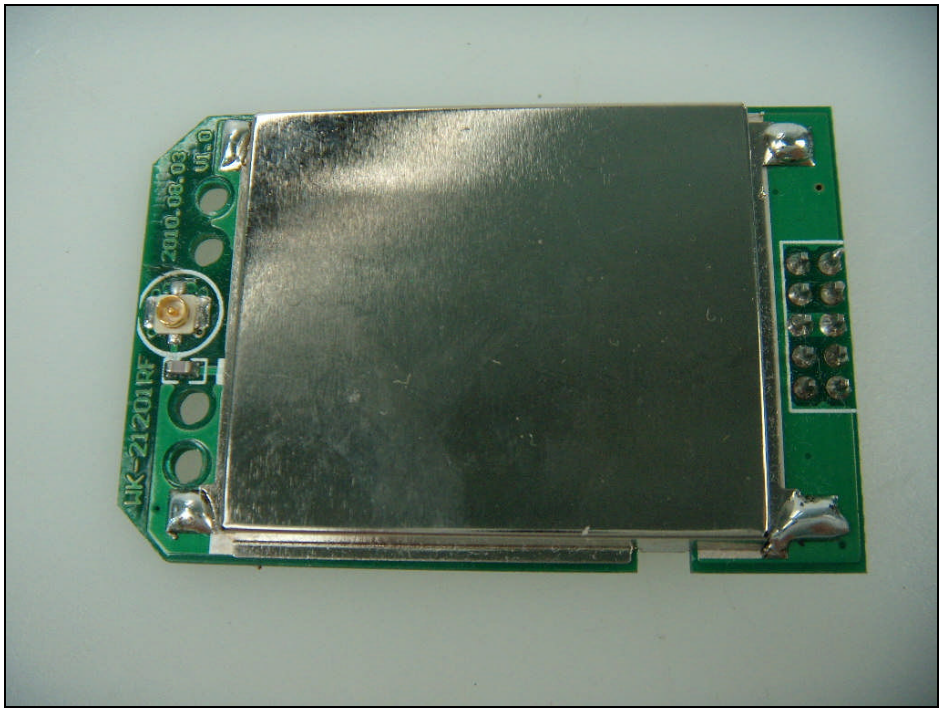


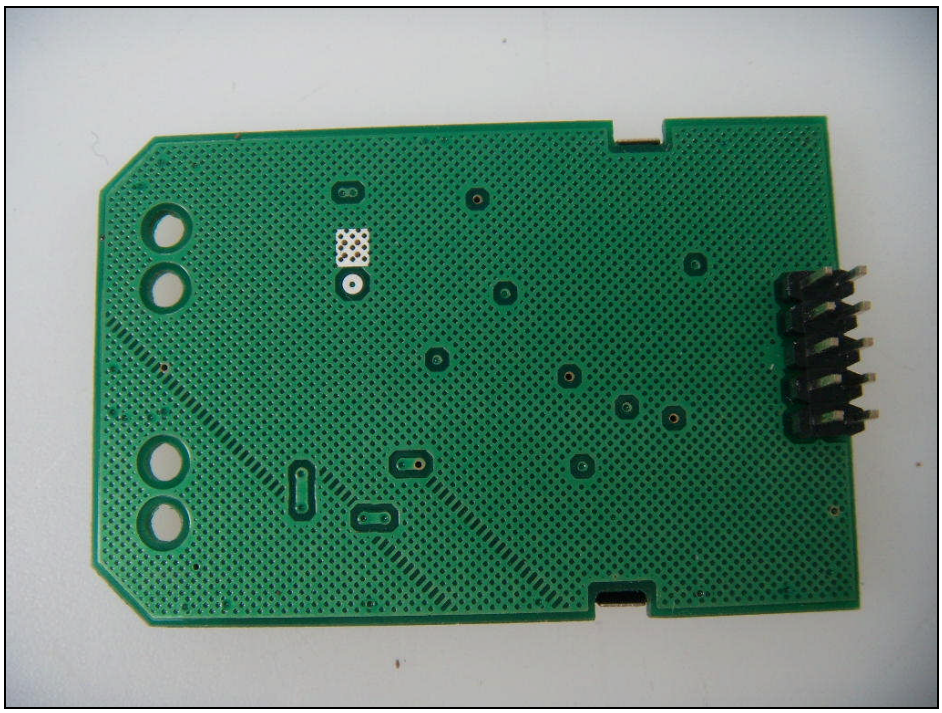

deVention
DEVO 12

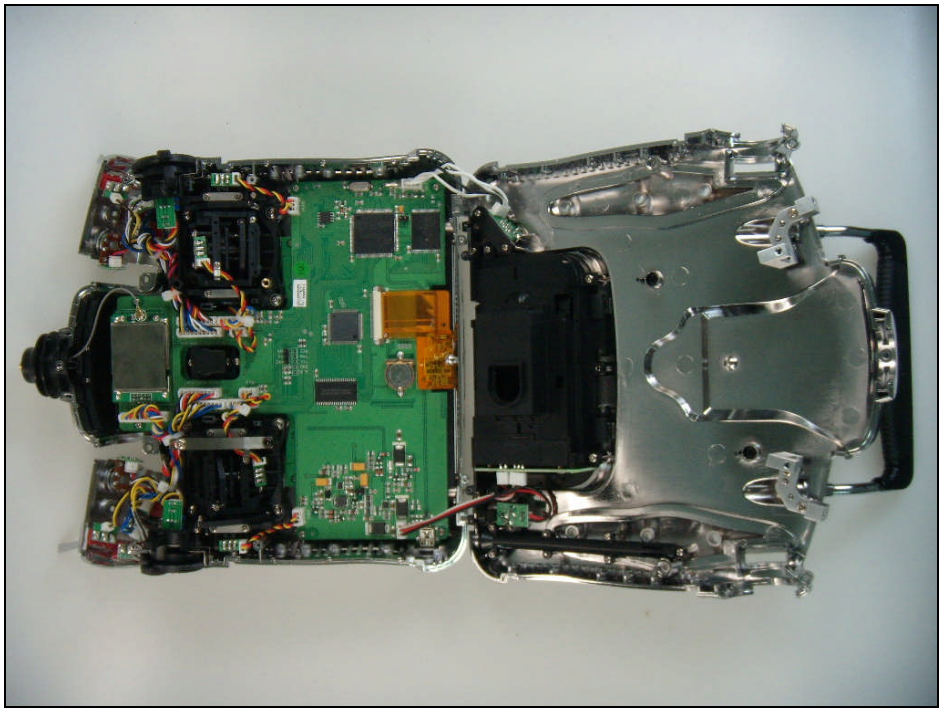
Annex B: Internal Photos of test item

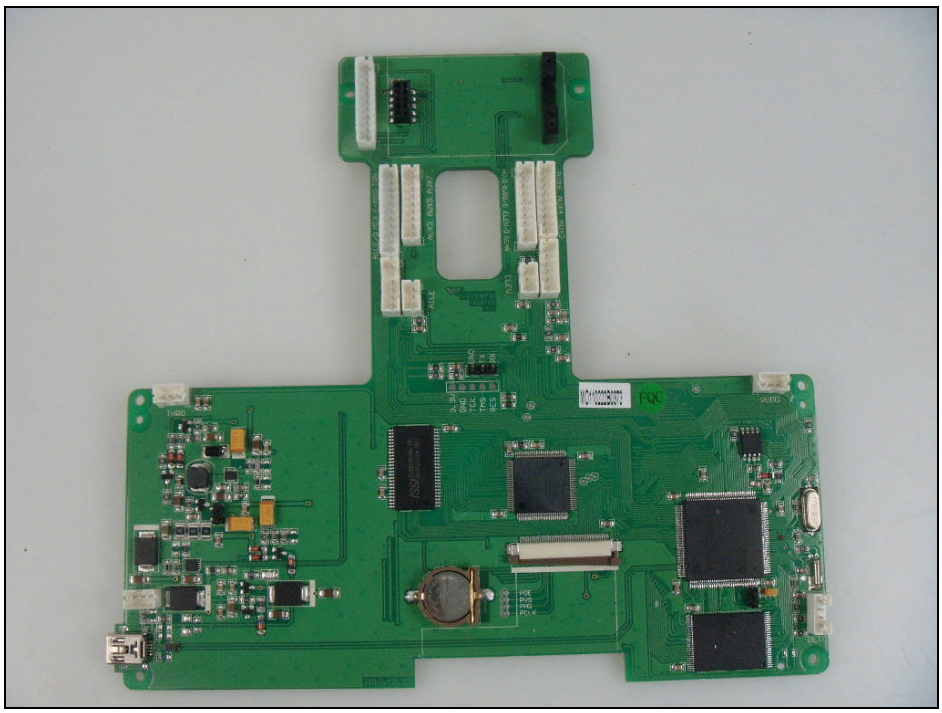


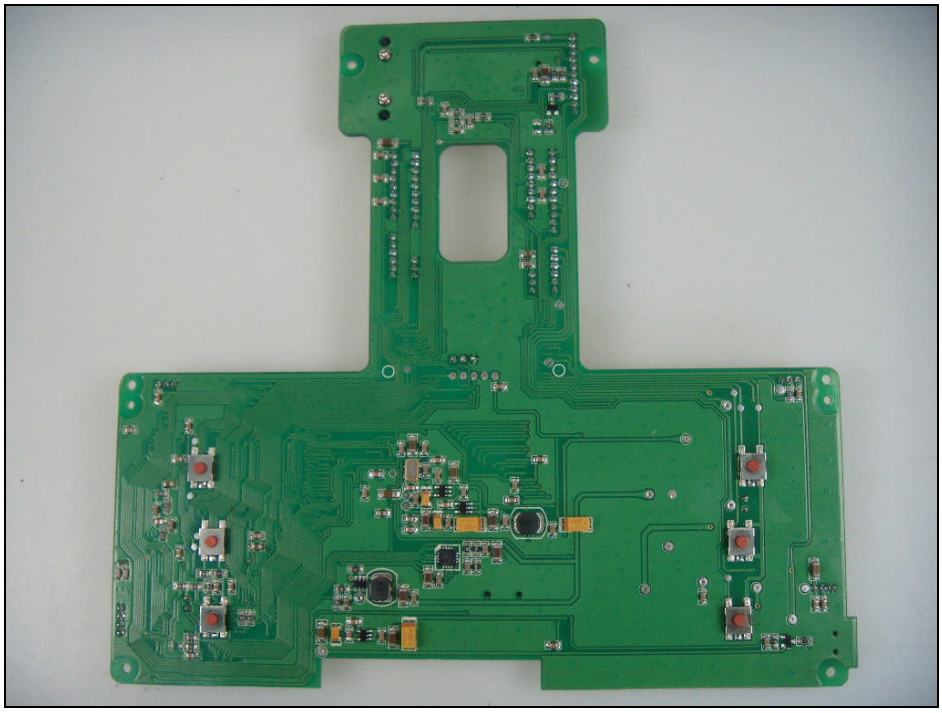



AK-2120RF
2010.08.03
V1.0





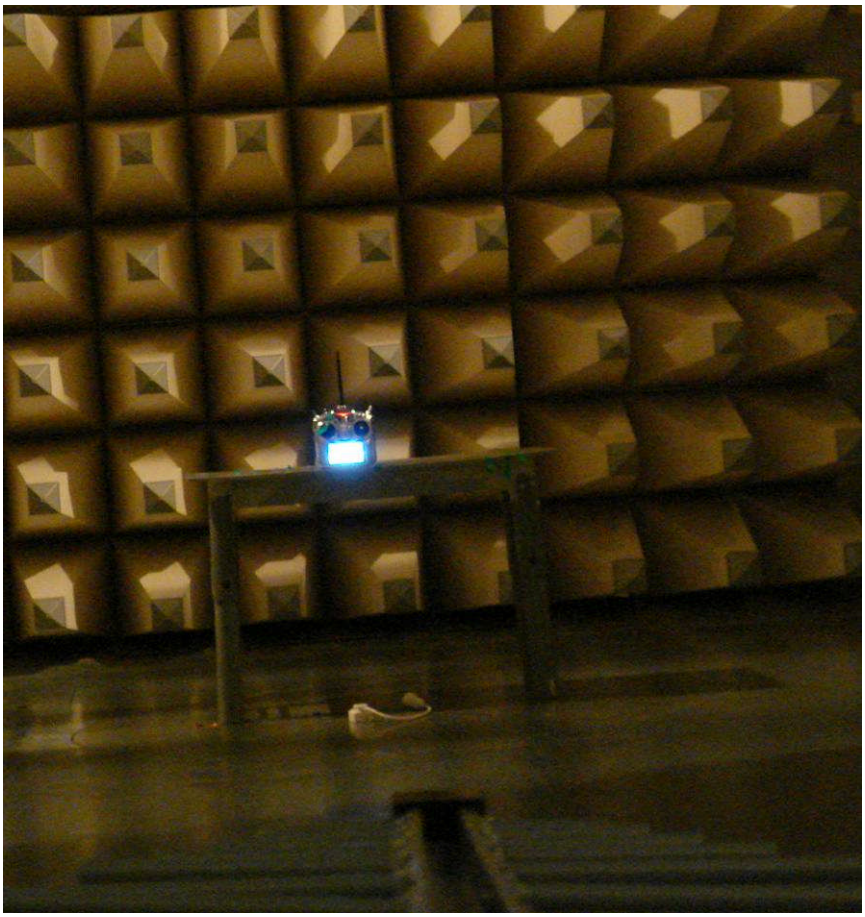





deVention
BT3000
Caution:
Rated capacity: 3000mAh
Nominal voltage: 3.7V
Li-Polymer
• Use the appointed charger
• Do not through battery into fire
• The positive and negative pole of battery can not be of short circuit
• Limiting voltage 4.2V

Annex C: Photos of test setup

Radiated emission Test-setup in
3m measurement distance in semi anechoic chamber



EUT on the turn table which rotate 360° during the testing to find the maximum field-strength readings