

FCC ID TEST REPORT

for

2.4G transmitter/20082/16063/16065

Model: i6S 20082/16063/16065

FCC ID: R7AI6S

Prepared for: SHENZHEN JIABAOTIAN TRADING LTD

B7018 Hunlai business building, Liutang Rd, Baoan district

Shenzhen city.

Prepared by: Shenzhen TCT Testing Technology Co.,Ltd

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Report Number: TCS1211004-1

Date of Test: November 19~22, 2012 Date of Issue: November 22, 2012

The results detailed in this test report relate only to the specific sample(s) tested. It is the Application's responsibility to ensure that all production units are manufactured with equivalent EMC characteristics. This report is not to be reproduced except in full, without written approval from TCT Testing Technology.



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1.0 General Details

1.1 Test Lab Details

Name: Shenzhen TCT Testing Technology Co., Ltd

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Emitel (Shenzhen) Limited

Building 2, 171 Meihua Road, Futian District, Shenzhen, P.R. China

Site on File with the Federal Communications Commission – United Sates

Registration Number: 746887

1.2 Applicant Details

Applicant: SHENZHEN JIABAOTIAN TRADING LTD

Address: B7018 Hunlai business building, Liutang Rd, Baoan district Shenzhen city.

Telephone: 13798448494 Fax: 0755-33513601

Manufacturer: SHENZHEN JIABAOTIAN TRADING LTD

Address: B7018 Hunlai business building, Liutang Rd, Baoan district Shenzhen city.

Telephone: 13798448494 Fax: 0755-33513601

1.3 Description of EUT

Product: 2.4G transmitter/20082/16063/16065

Brand Name: stormrchobby

Model No.: i6S 20082/16063/16065

Additional Model No. N/A
Additional Trade Name N/A

Rating: DC 6V (1.5*4 AA batteries)

Modulation Type: DSSS
Channel number: 78
Channel spacing 1 MHz

Chamier spacing 1 WHZ

Operation Frequency 2403 MHz-2480 MHz

Antenna Designation An external antenna and the maximum gain is 2.0 dBi

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1.4 Submitted Sample

1 Sample(s)

1.5 Test Duration

2012-11-19 to 2012-11-22

1.6 Test Engineer

The sample tested by

Jack beg

Printed name: Jack Kang

2.0	Test Equipments					
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date	
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2012-12-03	2013-12-02	
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	2012-12-03	2013-12-02	
System Controller	CT	SC100	-	2012-02-17	2013-02-16	
Spectrum Analyzer	ROHDE&SCHWARZ	FSU	-	2012-02-17	2013-02-16	
Pre-amplifier	Teseq	LAN6900		2012-02-17	2013-02-16	
Pre-amplifier	Agilent	8447D	83153007374	2012-02-17	2013-02-16	
Pre-amplifier	Agilent	8449B	3008A01738	2012-02-17	2013-02-16	
Triple-loop antenna	ROHDE&SCHWARZ	HM020	843885/002	2012-02-17	2013-02-16	
Horn Antenna	ETS LINDGREN	3117		2012-02-17	2013-02-16	
Horn Antenna	ETS LINDGREN	3160		2012-02-17	2013-02-16	



3.0 Technical Details

3.1 Summary of test results

The EUT has been tested according to the following specifications:					
Standard	Test Type	Result	Notes		
FCC Part 15:2011, Paragraph 15.207	Conducted Emission Test	PASS	N/A		
FCC Part 15:2011 Subpart C Paragraph 15.249(a)	Radiated Emission Test	PASS	Complies		
FCC Part 15:2011 Subpart C Paragraph 15.249(d) Limit	Band Edge Test	PASS	Complies		
FCC Part 15:2011 Subpart C Paragraph 15.215(c)	20 dB Bandwidth	PASS	Complies		

Note: N/A=Not Applicable

3.2 Test Standards

FCC Part 15:2011 Subpart C, Paragraph 15.249

4.0 EUT Modification

No modification by Shenzhen TCT Testing Technology Co., Ltd

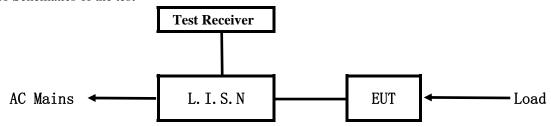
5.0 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	MU
1.	Radio Frequency	$\pm 1 \times 10^{-9}$
2.	Temperature	±0.1℃
3.	Humidity	$\pm 1.0\%$
4.	RF power, conducted	±0.34dB
5.	Spurious emissions, conducted	±3.70dB
6.	All emissions, radiated	±4.50dB



6. Power Line Conducted Emission Test

6.1 Schematics of the test

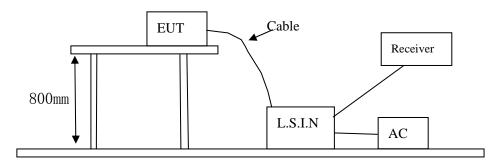


EUT: Equipment Under Test

6.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.10-2009. The Frequency spectrum From 0.15MHz to 30MHz was investigated.

Test Voltage: 120V~, 60Hz Block diagram of Test setup



6.3 EUT Operating Condition

Operating condition is according to ANSI C63.10 -2009

- 1) Setup the EUT and simulators as shown on the following
- 2) Enable AF signal and confirm EUT active to normal condition

6.4 Test Equipment

Please refer to the Section 2



6.5 Power line conducted Emission Limit according to Paragraph 15.207

Fraguenay(MHz)	Class A Lir	mits (dB μ V)	Class B Lim	its (dB μ V)
Frequency(MHz)	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
$0.15 \sim 0.50$	79.0	66.0	66.0~56.0*	56.0~46.0*
$0.50 \sim 5.00$	73.0	60.0	56.0	46.0
5.00 ~ 30.00	73.0	60.0	60.0	50.0

Notes:

- 1. *Decreasing linearly with logarithm of frequency.
- 2. The tighter limit shall apply at the transition frequencies

6.6 Photo documentation of the test set	.0 Filoto documentation	ni oi me test set	-ալ
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Please refer to the Section 12

6.7	Test	specification	:
· ·		ppedimention	٠

Environmental conditions: Temperature: 23° C Humidity: 51% Atmospheric pressure: 103kPa

Frequency range: 0.15 MHz – 30 MHz

The test was carried out in the following operation mode(s):

- Normal wireless communication

6.8 Test result

Min. limit margin

The requirements are FULFILLED

Remarks: The EUT is powered by batteries, so the test item is not applicable.



A Conducted Emission on Line Terminal of the power line (150kHz to 30MHz)

EUT Description:

Operation Mode:

Tested By:

Test date:

Start Frequency Stop Frequency Step IF BW Detector Final M-Time

0.15 MHz 30 MHz 4.5 KHz 10 KHz QP+AV 1s

Eraguanav		Reading(dB µ V)			Limit	
Frequency (MHz)	Line	Neutral		(dB µ V)		
(MITIZ)	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average



$B\quad Conducted\ Emission\ on\ Neutral\ Terminal\ of\ the\ power\ line\ (150kHz\ to\ 30MHz)$

EUT Description:

Operation Mode:

Tested By:

Test Data:

Start Frequency Stop Frequency Step IF BW Detector Final M-Time

0.15 MHz 30 MHz 4.5 KHz 10 KHz QP+AV 1s

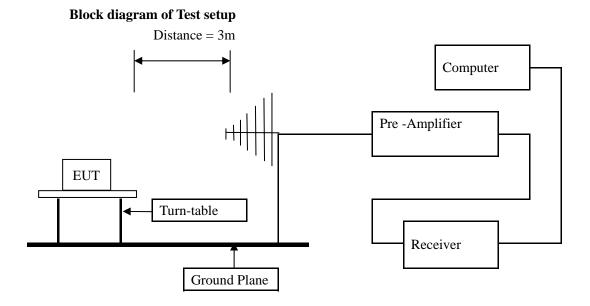
Enaguanav		Reading	(dB µ V)	Limit		
Frequency (MHz)	Live	;	Neutral		(dB µ V)	
(MHZ)	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average

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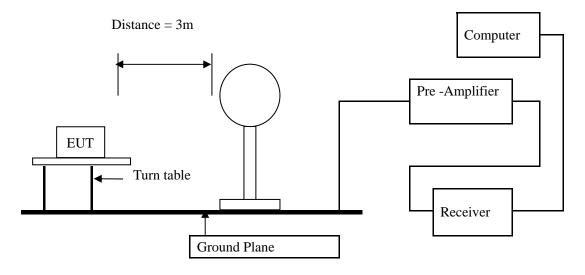
7 Radiated Emission Test

- 7.1 Test Method and test Procedure:
- 1) The EUT was tested according to ANSI C63.10 –2009.
- 2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.10-2009.
- 3) The frequency spectrum from 30 MHz to 25 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz. Measurements were made at 3 meters.
- 4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- 5) The antenna polarization: Vertical polarization and Horizontal polarization.

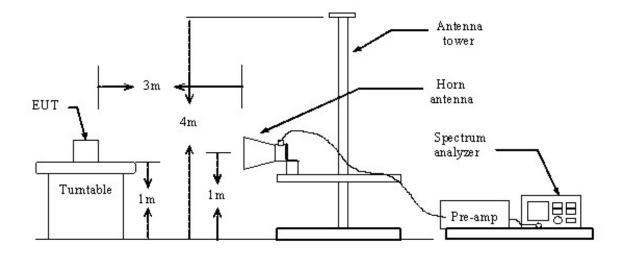




Block diagram of Test setup for frequency below 30MHz



Block diagram of Test setup for frequency above 1GHz



7.2 EUT Operating Condition

Operating condition is according to ANSI C63.10 -2009



7.3 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

A FCC Part 15:2011 Subpart C Paragraph 15.249(a) Limit

Fundamental Frequency	Field Stre	Field Strength of Fundamental (3m)			trength of Harmo	onics (3m)
(MHz)	mV/m	dBuV/m		uV/m	dBu	V/m
2400-2483.5	50	94 (Average)	114 (Peak)	500	54 (Average)	74 (Peak)

Note:

- 1) RF Field Strength (dBuV) = 20 log RF Voltage (uV)
- 2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
- 3) The emission limit in this paragraph is based on measurement instrumentation employing an average detector.

B Frequencies in restricted band are complied to limit on Paragraph 15.209.

Frequency Range (MHz)	Distance (m)	Field strength (dB µ V/m)
0.009-0.490	3	20log 2400/F (kHz) + 80
0.490-1.705	3	20log 24000/F (kHz) + 40
1.705-30	3	20log 30 + 40
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note:

- 1) RF Voltage $(dBuV) = 20 \log RF \text{ Voltage } (uV)$
- 2) In the Above Table, the tighter limit applies at the band edges.
- 3) Distance refers to the distance in meters between the measuring instrument antenna and the EUT
- 4) This is a handhold device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.
- 5) All scanning using PK detector. And the final emission level was get using QP detector for frequency range from 30-1000MHz.As to 1G-25G, the final emission level got using PK and AV detector.
- 6) If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula Ld1 = Ld2 * (d2/d1)

7.4 Photo documentation of the test set-up

Please refer to the Section 12

7.5 Test Equipment:

Please refer to the Section 2

7.6 Test specification:

Environmental conditions: Temperature 24° C Humidity: 51% Atmospheric pressure: 103kPa

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Shenzhen TCT Testing Technology Co., Ltd. 7.7 Test result

A Radiated Emission (9 kHz----30 MHz)

Note: 1) Emission Level=Reading+ Cable loss-Antenna factor-Amp factor

2) The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement

Result: Pass

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB µ V/m)
	1	V	
	1	Н	
		V	
		Н	



B General Radiated Emissions Data Radiated Emission In Horizontal (30MHz----1000MHz)

Please refer to following diagram for individual

Low channel: 2403 MHz



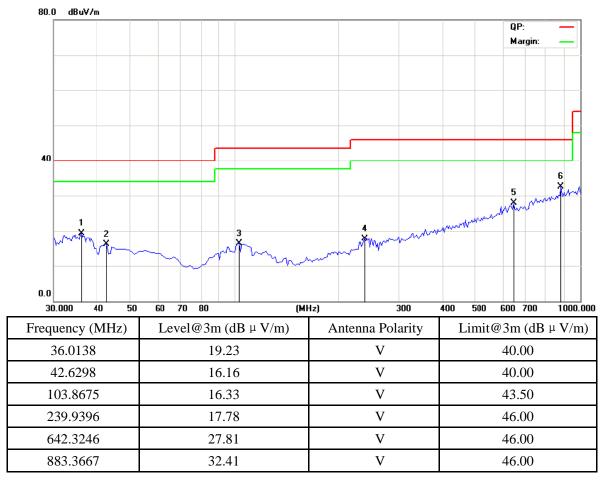
Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \(\mu \)V/m)
42.3314	20.24	Н	40.00
64.9899	16.98	Н	40.00
96.0922	15.75	Н	43.50
107.7553	15.87	Н	43.50
255.4910	17.40	Н	46.00
879.4790	32.33	Н	46.00



Radiated Emission In Vertical (30MHz----1000MHz)

Please refer to following diagram for individual

Low channel: 2403 MHz



Note: Measurements were conducted in all channels (high, middle, low), and the worst case (low channel) was submitted only.



C Fundamental & Harmonics Radiated Emission Data (1000MHz-25000MHz)

Low channel: 2403 MHz				
Frequency (MHz)	Emission PK/AV (dBuV/m)	Horizontal / Vertical	Limits PK/AV (dBuV/m)	Margin (dB)
2403	81.23(PK)	Н	114/94	12.77
2403	77.85(PK)	V	114/94	16.15
4806	40.41(PK)	Н	74/54	13.59
4806	39.52(PK)	V	74/54	14.48
7209		Н	74/54	
7209		V	74/54	
9612		H/V	74/54	
12015		H/V	74/54	
14418		H/V	74/54	
16821		H/V	74/54	
19224		H/V	74/54	
21627		H/V	74/54	
24030		H/V	74/54	

Middle channel:	Middle channel: 2441 MHz				
Frequency	Emission PK/AV	Horizontal /	Limits PK/AV	Margin	
(MHz)	(dBuV/m)	Vertical	(dBuV/m)	(dB)	
2441	79.89 (PK)	Н	114/94	14.11	
2441	72.57 (PK)	V	114/94	21.43	
4882	40.83 (PK)	Н	74/54	13.17	
4882	39.39 (PK)	V	74/54	14.61	
7323		Н	74/54		
7323		V	74/54		
9764		H/V	74/54		
12205		H/V	74/54		
14646		H/V	74/54		
17087		H/V	74/54		
19528		H/V	74/54		
21969		H/V	74/54		
24410		H/V	74/54		



High channel: 2480 MHz				
Frequency	Emission PK/AV	Horizontal/	Limits PK/AV	Margin
(MHz)	(dBuV/m)	Vertical	(dBuV/m)	(dB)
2480	78.64 (PK)	Н	114/94	15.36
2480	73.27 (PK)	V	114/94	20.73
4960	40.82 (PK)	Н	74/54	13.18
4960	39.03 (PK)	V	74/54	14.97
7440		H/V	74/54	
9920		H/V	74/54	
12400		H/V	74/54	
14880		H/V	74/54	
17360		H/V	74/54	
19840		H/V	74/54	
22320		H/V	74/54	
24800		H/V	74/54	

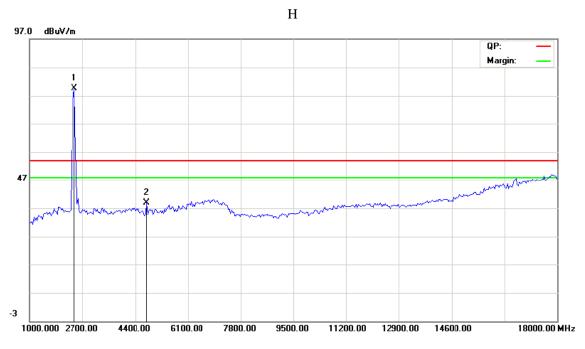
Note:

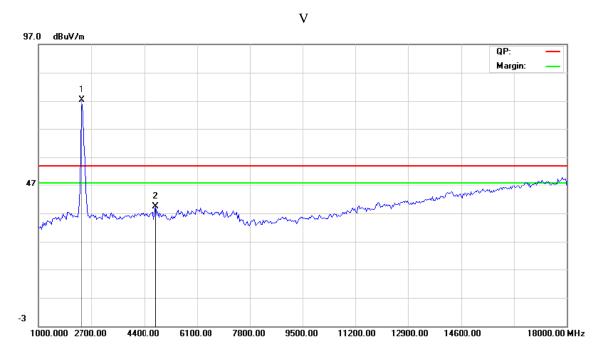
- 1) PK= Peak, AV= Average
- 2) Emission Level = Reading Level + Antenna Factor + Cable Loss.
- 3) Margin= Limit(AV) Emission Level
- 4) According to section 15.35(b), the peak limit is 20dB higher than the average limit
- 5) If the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.
- 6) It is the floor noise from 18-25GHz, which is deemed to comply with the requirement of the rule.



Please refer to the following diagram for individual

Low Channel: 2403 MHz







Please refer to following diagram for individual

Middle Channel: 2441 MHz

97.0 dBuV/n

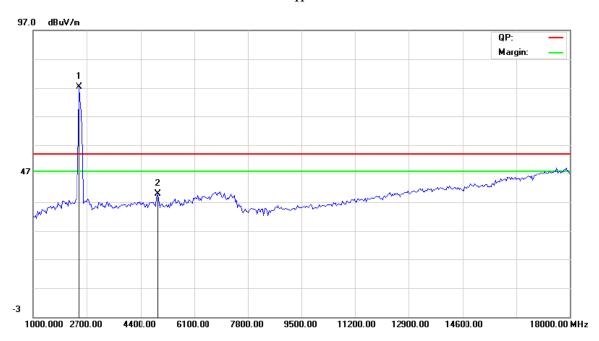
1
2
3
1000.000 2700.00 4400.00 6100.00 7800.00 9500.00 11200.00 12900.00 14600.00 18000.00 MHz



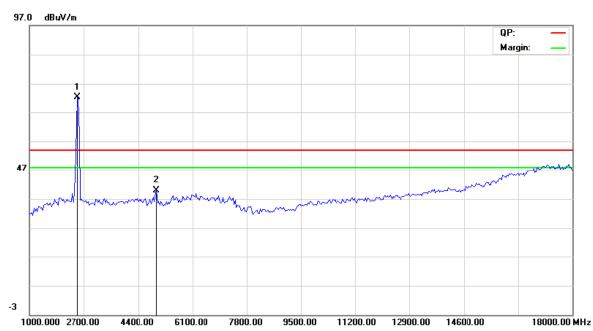
Please refer to following diagram for individual

High Channel: 2480 MHz

Н



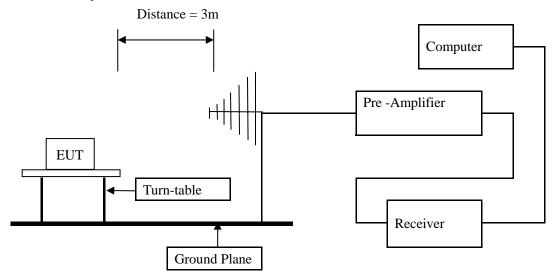
V





8. Band Edge

8.1 Radiated Test Setup



For the actual test configuration, please refer to the related items – Photos of Testing

8.2 Band Edge Limit

- 1) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.
- 2) For Emissions in Restricted band, the limit is below the general radiated emission limits in Section 15.209. The provisions in Section 15.35 apply to these measurements.

8.3 Test Equipment

Please refer to the Section 2

8.4 Test Produce

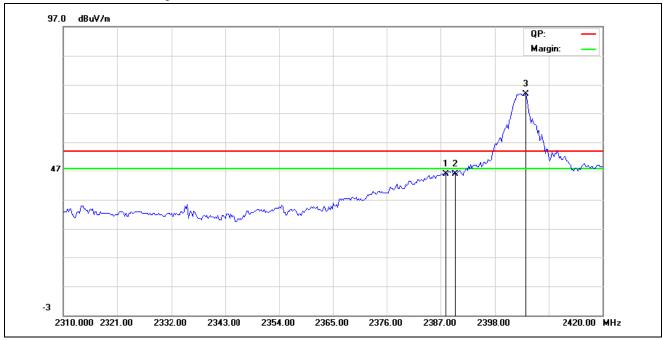
According to KDB 913591:

- 1) Perform an in-band field strength measurement of the fundamental emission using the RBW and detector function for the frequency being measured, as required by C63.4 and FCC Rules.
- 2) Choose the span that encompasses both the peak of the fundamental emission and the band edge emission under investigation. Set the analyzer RBW to 1% of the total span (but never less than 30 kHz) with a video bandwidth equal to or greater than the RBW. Observe the amplitude delta between the peak of the fundamental and the peak of the band edge emission and record.
- 3) Subtract the delta measured in step 2) from the field strengths measured in step 1). The resultant field strengths (CISPR QP, average, or peak, as appropriate) are then used to determine band edge compliance as required by Section 15.205.



8.5 Test Result

Low channel in Horizontal polarization



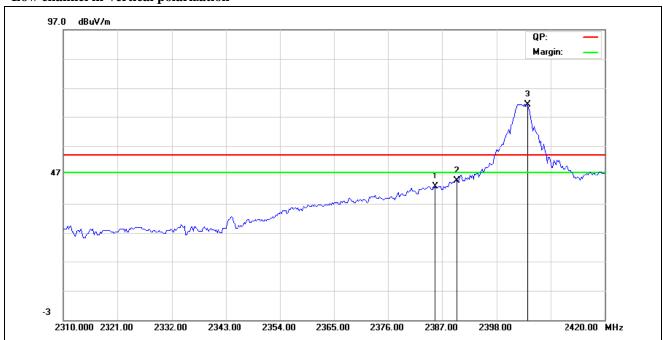
Frequency (MHz)	Level@3m (dB μ V/m)	Detector	Limit@3m (dB µ V/m)
2388.036	45.96	Peak	74.00
2390.000	45.97	Peak	74.00
2404.349	73.58	Peak	114.00

Note: 1) As the table shown above, emissions radiated outside of the specified frequency bands are met the requirements in Section 15.209.

2) Marker-delta method was used to get the final result; the maximum emission in the restricted band is 53.61 dBuv/m at 2388.036 MHz, which meets the average limit in section 15.209. It is deemed to comply with the requirements.



Low channel in Vertical polarization



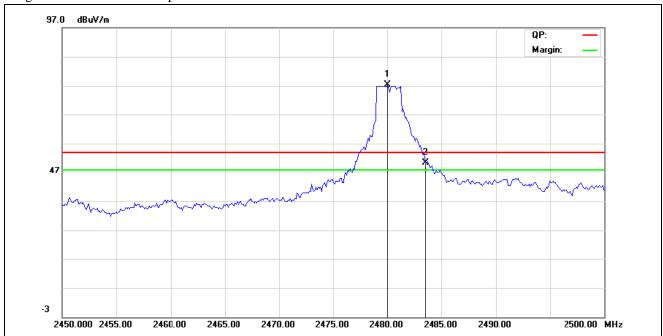
Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Detector	Limit@3m (dB \(\mu \)V/m)
2385.611	42.94	Peak	74.00
2390.000	44.97	Peak	74.00
2404.349	71.08	Peak	114.00

Note: 1) As the table shown above, emissions radiated outside of the specified frequency bands are met the requirements in Section 15.209.

2) Marker-delta method was used to get the final result; the maximum emission in the restricted band is 51.74 dBuv/m at 2390 MHz, which meets the average limit in section 15.209. It is deemed to comply with the requirements.



High channel in Horizontal polarization



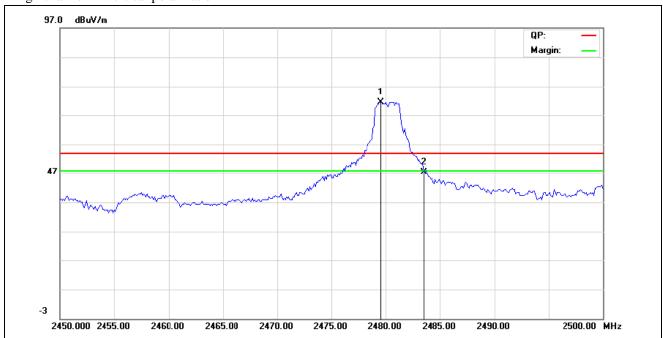
Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Detector	Limit@3m (dB \(\mu \)V/m)
2480.060	77.35	peak	114.00
2483.500	50.36	peak	74.00

Note: 1) As the table shown above, emissions radiated outside of the specified frequency bands are met the requirements in Section 15.209.

2) Marker-delta method was used to get the final result; the maximum emission in the restricted band is 51.65 dBuv/m at 2483.5 MHz, which meets the average limit in section 15.209. It is deemed to comply with the requirements.



High channel in Vertical polarization



Frequency (MHz)	Level@3m (dB \(\mu \)V/m)	Detector	Limit@3m (dB \(\mu \)V/m)
2479.459	71.35	peak	114.00
2483.500	47.36	peak	74.00

Note: 1) As the table shown above, emissions radiated outside of the specified frequency bands are met the requirements in Section 15.209.

2) Marker-delta method was used to get the final result; the maximum emission in the restricted band is 49.28 dBuv/m at 2483.5 MHz, which meets the average limit in section 15.209. It is deemed to comply with the requirements.



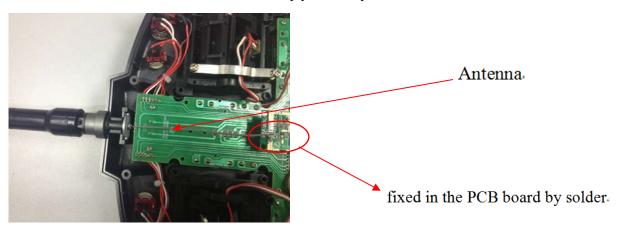
9.0 Antenna Requirement

9.1 Applicable Standard

According to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

9.2 Antenna Specification

The EUT has an external antenna, which is fixed in the PCB board, and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.



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10.0 20dB Bandwidth Measurement

10.1 Test Equipment

Please refer to the Section 2

10.2 Test specification:

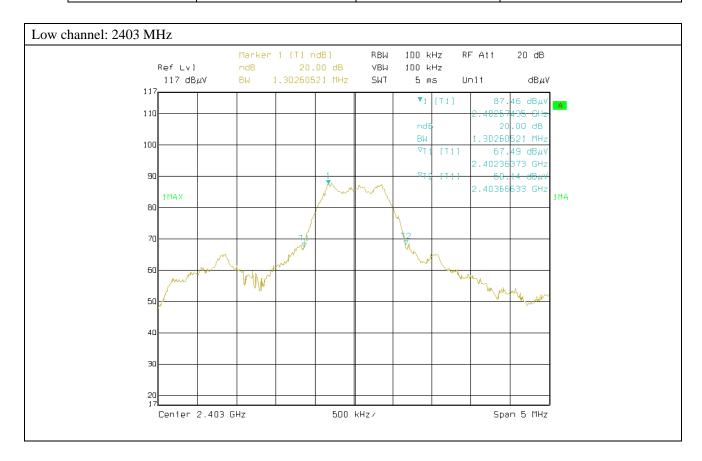
Environmental conditions: Temperature 24° C Humidity: 52% Atmospheric pressure: 103kPa

10.3 Limit

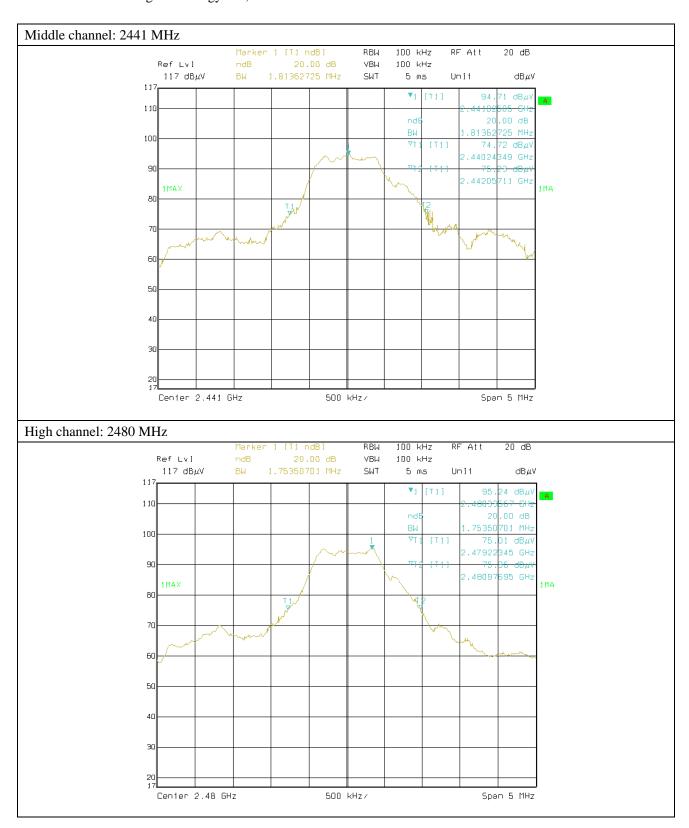
Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

10.4 Test Result:

Channel number	20dB Bandwidth (kHz)	Limit (kHz)	Conclusion
(Low)	1302.6		PASS
(Middle)	1813.6		PASS
(High)	1753.5		PASS









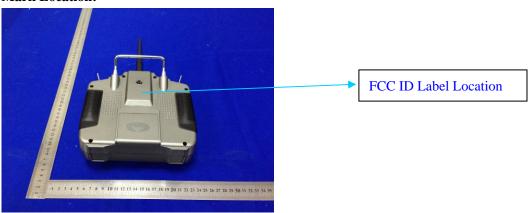
11.0 FCC ID Label

FCC ID: R7AI6S

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:





12.0 Photos of testing

12.1 Conducted test View

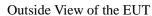
N/A

12.2 Radiated emission test view





13.0 Photos for the EUT

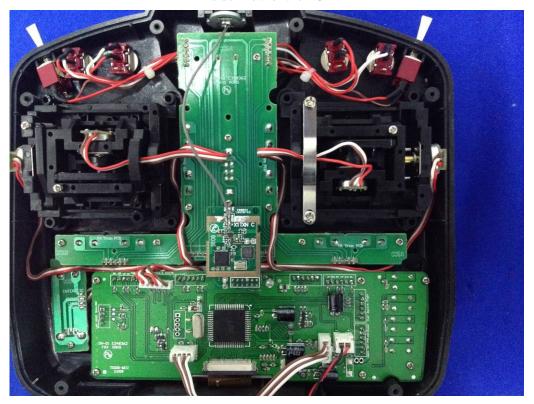


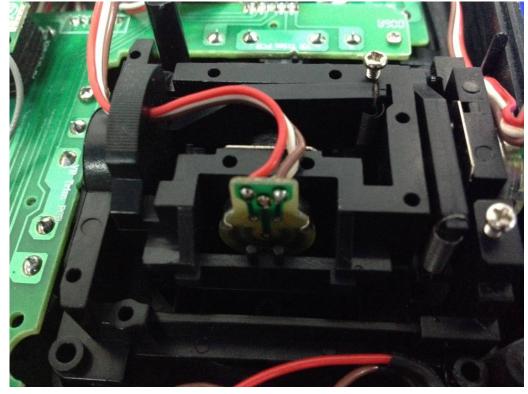






Inside View of the EUT

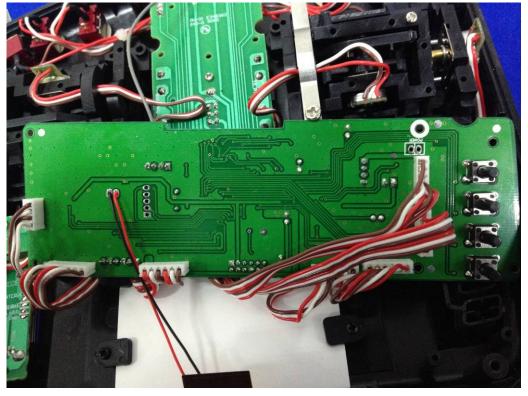






Inside View of the EUT

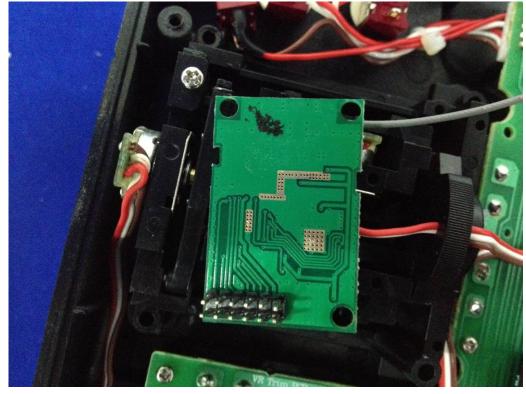






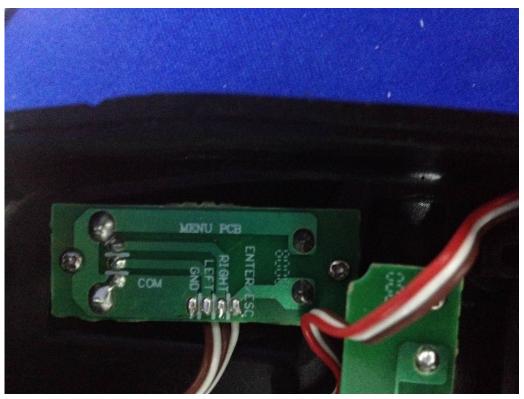
Inside View of the EUT

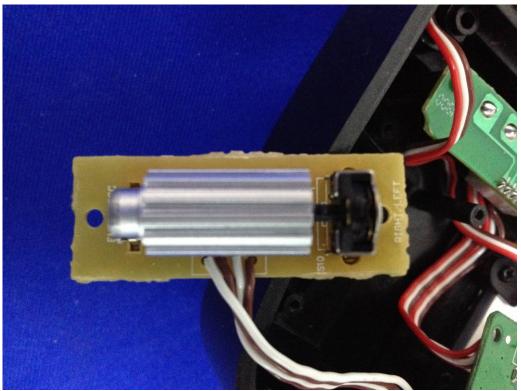






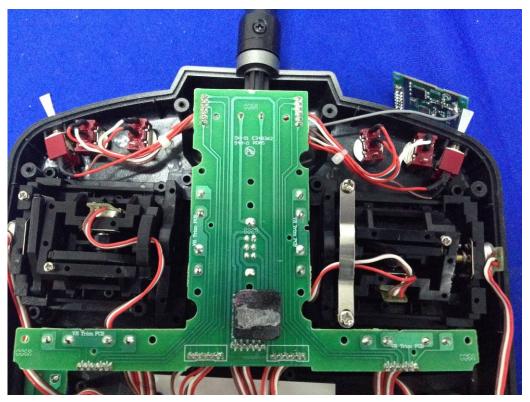
Inside View of the EUT

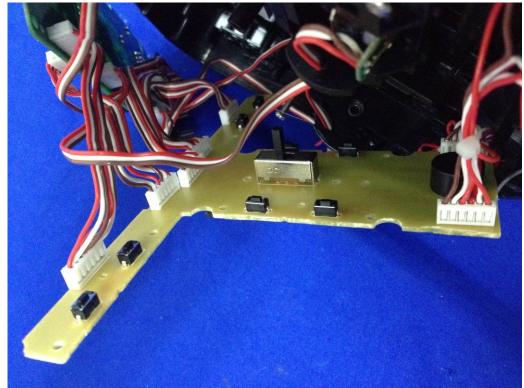






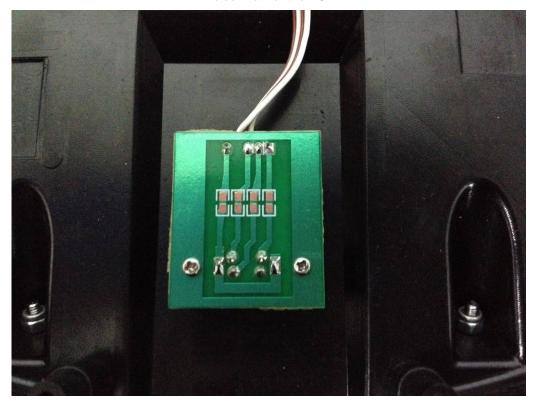
Inside View of the EUT

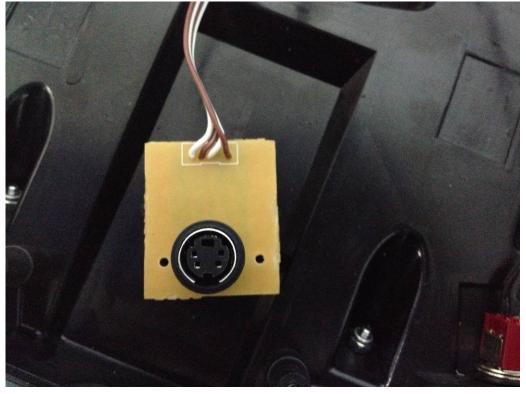






Inside View of the EUT





--End of the report--