

APPLICATION CERTIFICATION On Behalf of China Industries Ltd T/A Wow! Stuff.

Hybrid Remote Control Attacknid, Combat Creatures Model No.: CC-1007

FCC ID: YCRCC-1007

Prepared for : China Industries Ltd T/A Wow! Stuff.

Address : Creative Industries Centre, Wolverhampton Science Park,

Wolverhampton, WV10 9TG,UK

Prepared by : ACCURATE TECHNOLOGY CO. LTD

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Report Number : ATE20131342

Date of Test : July 01-Aug 26, 2013

Date of Report : Aug 26, 2013



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Test Report Certification

Applicant : China Industries Ltd T/A Wow! Stuff.

Manufacturer : Hui Xing Cheng(Shenzhen) Technology Company Limited.

EUT Description : Hybrid Remote Control Attacknid, Combat Creatures

(A) MODEL NO.: CC-1007

(B) SERIAL NO.: N/A

(C) POWER SUPPLY: DC 6V

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247 ANSI C63.4- 2009

The device described above is tested by ACCURATE TECHNOLOGY CO. LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.247 limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY CO. LTD is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of ACCURATE TECHNOLOGY CO. LTD.

Date of Test :	July 01-Aug 26, 2013
Prepared by :	(Tim.zhang, Engineer)
Approved & Authorized Signer :	Lemil
	(Sean Liu, Manager)



1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT : Hybrid Remote Control Attacknid, Combat Creatures

Model Number : CC-1007

Bluetooth version : Bluetooth V3.0 Frequency Band : 2402MHz-2480MHz

Number of Channels : 79

Modulation type : GFSK, $\pi/4$ DQPSK, 8DPSK

Antenna Gain : 0dBi

Antenna type : PCB Antenna

Power Supply : DC 6V

Applicant : China Industries Ltd T/A Wow! Stuff.

Address : Creative Industries Centre, Wolverhampton Science Park,

Wolverhampton, WV10 9TG,UK

Manufacturer : Hui Xing Cheng(Shenzhen) Technology Company

Limited.

Address : Block 83rd, NianTian YangGang Industry Road,

NianTian, FuYong, BaoAn, Shenzhen, China

Date of sample received: June 29, 2013

Date of Test : July 1-15, 2013



1.2.Description of Test Facility

EMC Lab : Accredited by TUV Rheinland Shenzhen

Listed by FCC

The Registration Number is 752051

Listed by Industry Canada

The Registration Number is 5077A-2

Accredited by China National Accreditation Committee

for Laboratories

The Certificate Registration Number is L3193

Name of Firm : ACCURATE TECHNOLOGY CO. LTD

Site Location : F1, Bldg. A, Changyuan New Material Port, Keyuan Rd.

Science & Industry Park, Nanshan, Shenzhen, Guangdong

P.R. China

1.3. Measurement Uncertainty

Conducted Emission Expanded Uncertainty = 2.23dB, k=2

Radiated emission expanded uncertainty = 3.08dB, k=2

(9kHz-30MHz)

Radiated emission expanded uncertainty = 4.42dB, k=2

(30MHz-1000MHz)

Radiated emission expanded uncertainty = 4.06dB, k=2

(Above 1GHz)



2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Туре	S/N	Calibrated dates	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 12, 2013	Jan. 11, 2014
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 12, 2013	Jan. 11, 2014
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 12, 2013	Jan. 11, 2014
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	Jan. 12, 2013	Jan. 11, 2014
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Feb. 06, 2013	Feb. 05, 2014
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Feb. 06, 2013	Feb. 05, 2014
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Feb. 06, 2013	Feb. 05, 2014
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1067	Feb. 06, 2013	Feb. 05, 2014
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 12, 2013	Jan. 11, 2014
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 12, 2013	Jan. 11, 2014



3. OPERATION OF EUT DURING TESTING

3.1. Operating Mode

The mode is used: Transmitting mode

Low Channel: 2402MHz Middle Channel: 2441MHz High Channel: 2480MHz

Hopping

3.2. Configuration and peripherals



(EUT: Hybrid Remote Control Attacknid, Combat Creatures)



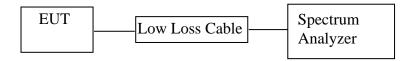
4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.207	Conducted Emission Test	N/A
Section 15.247(a)(1)	20dB Bandwidth Test	Compliant
Section 15.247(a)(1)	Carrier Frequency Separation Test	Compliant
Section 15.247(a)(1)(iii)	Number Of Hopping Frequency Test	Compliant
Section 15.247(a)(1)(iii)	Dwell Time Test	Compliant
Section 15.247(b)(1)	Maximum Peak Output Power Test	Compliant
Section 15.247(d) Section 15.209	Radiated Emission Test	Compliant
Section 15.247(d)	Band Edge Compliance Test	Compliant
Section 15.203	Antenna Requirement	Compliant



5. 20DB BANDWIDTH TEST

5.1.Block Diagram of Test Setup



(EUT: Hybrid Remote Control Attacknid, Combat Creatures)

5.2. The Requirement For Section 15.247(a)(1)

Section 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

5.3.EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

5.4. Operating Condition of EUT

- 5.4.1. Setup the EUT and simulator as shown as Section 5.1.
- 5.4.2. Turn on the power of all equipment.
- 5.4.3.Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.



5.5.Test Procedure

- 5.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 5.5.2.Set RBW of spectrum analyzer to 30 kHz and VBW to 100 kHz.
- 5.5.3.The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

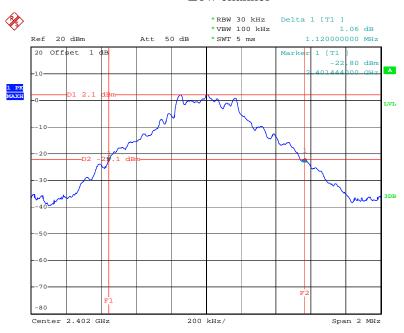
5.6.Test Result

Channel	Frequency (MHz)	GFSK 20dB Bandwidth (MHz)	∏/4-DQPSK 20dB Bandwidth (MHz)	8DPSK 20dB Bandwidth (MHz)	Result
Low	2402	1.120	1.308	1.302	Pass
Middle	2441	1.128	1.302	1.308	Pass
High	2480	1.120	1.318	1.300	Pass

The spectrum analyzer plots are attached as below.

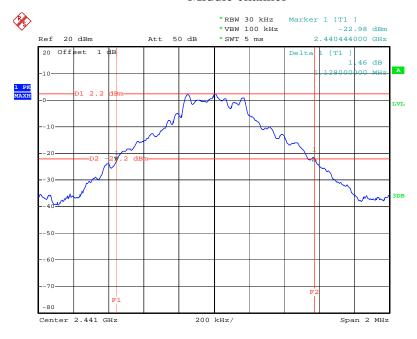


Low channel



Date: 4.JUL.2013 14:26:24

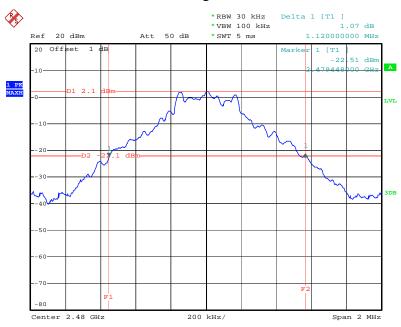
Middle channel



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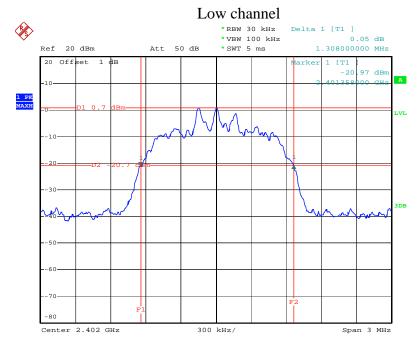


High channel



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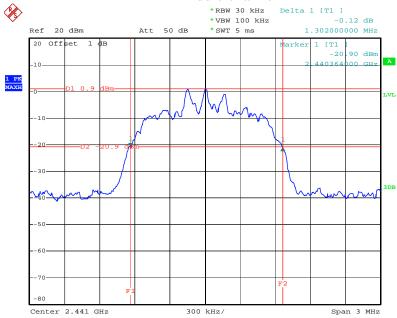
Π /4-DQPSK Mode



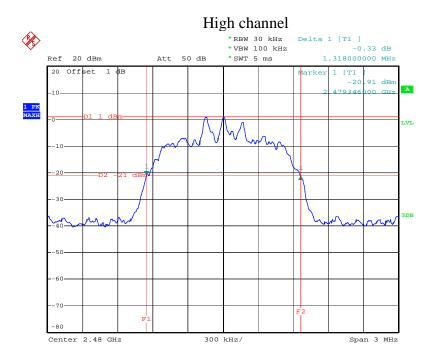
Date: 4.JUL.2013 14:37:00



Middle channel



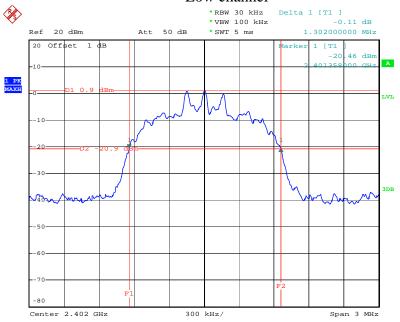
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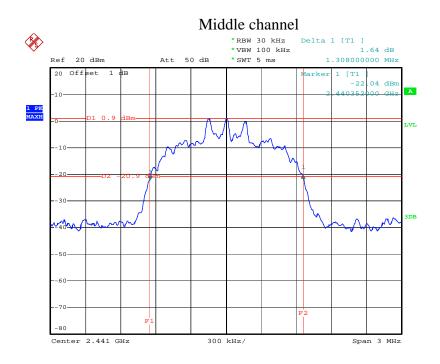
Date: 4.JUL.2013 14:33:42







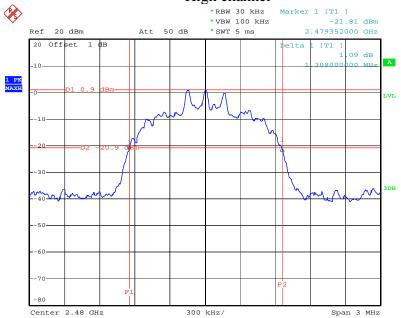
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Date: 4.JUL.2013 14:40:11



High channel

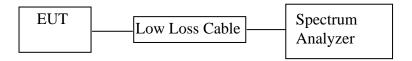


Date: 4.JUL.2013 14:42:25



6. CARRIER FREQUENCY SEPARATION TEST

6.1.Block Diagram of Test Setup



(EUT: Hybrid Remote Control Attacknid, Combat Creatures)

6.2. The Requirement For Section 15.247(a)(1)

Section 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

6.3.EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.4. Operating Condition of EUT

- 6.4.1. Setup the EUT and simulator as shown as Section 6.1.
- 6.4.2. Turn on the power of all equipment.
- 6.4.3.Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.



6.5. Test Procedure

- 6.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.
- $6.5.2. Set\ RBW$ of spectrum analyzer to $100\ kHz$ and VBW to $300\ kHz.$ Adjust Span to $3\ MHz.$
- 6.5.3.Set the adjacent channel of the EUT maxhold another trace.
- 6.5.4. Measurement the channel separation

6.6.Test Result

GFSK

Channel	Frequency	Channel	Limit	Result
CHAINE	(MHz)	Separation(MHz)	(MHz)	1105411
Low	2402	1.000	25KHz or 2/3*20dB	PASS
Low	2403	1.000	bandwidth	rass
Middle	2440	1.000	25KHz or 2/3*20dB	PASS
Middle	2441	1.000	bandwidth	LASS
High	2479	1.000	25KHz or 2/3*20dB	PASS
	2480	1.000	bandwidth	LASS

$\Pi/4$ -DQPSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.002	25KHz or 2/3*20dB	PASS
Low	2403	1.002	bandwidth	rass
Middle	2440	1.008	25KHz or 2/3*20dB	PASS
Middle	2441	1.008	bandwidth	rass
High	2479	1.002	25KHz or 2/3*20dB	PASS
	2480	1.002	bandwidth	rass

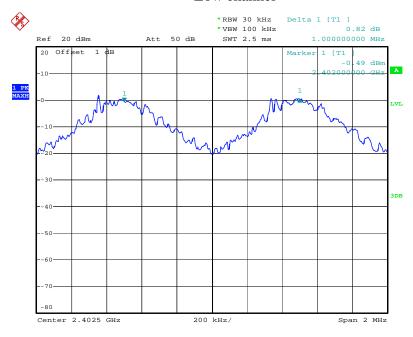
8DPSK

ODIBIE				
Channel	Frequency	Channel	Limit	Result
Chamiei	(MHz)	Separation(MHz)	(MHz)	Kesuit
Low	2402	1.000	25KHz or 2/3*20dB	PASS
	2403	1.000	bandwidth	rass
Middle	2440	1.004	25KHz or 2/3*20dB	PASS
	2441		bandwidth	PASS
High	2479	1.002	25KHz or 2/3*20dB	PASS
	2480	1.002	bandwidth	PA33

The spectrum analyzer plots are attached as below.

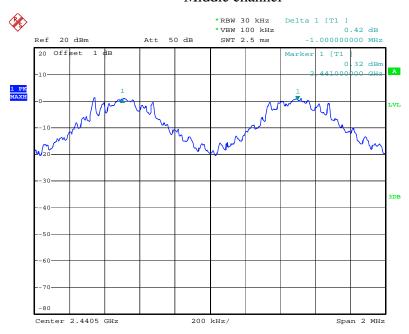


Low channel



Date: 4.JUL.2013 11:39:11

Middle channel



Date: 4.JUL.2013 11:42:04

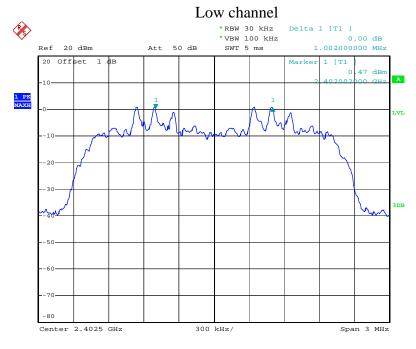


High channel



Date: 4.JUL.2013 11:44:22

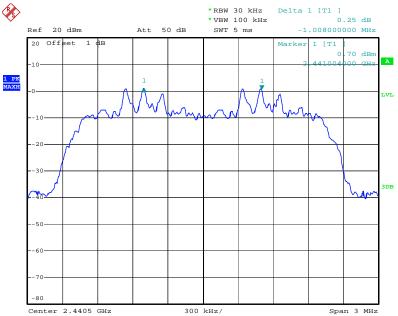
∏/4-DQPSK Mode



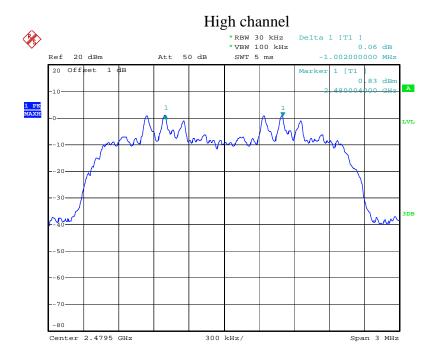
Date: 4.JUL.2013 14:12:37



Middle channel



Date: 4.JUL.2013 14:14:03

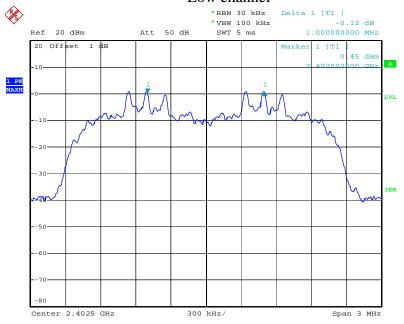


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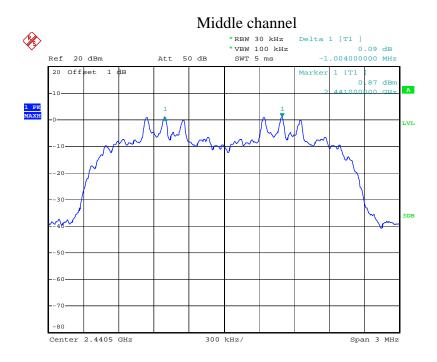


8DPSK Mode

Low channel

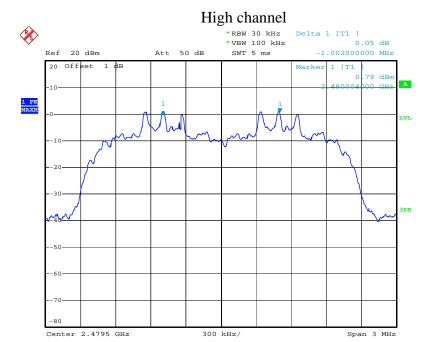


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Date: 4.JUL.2013 14:18:52



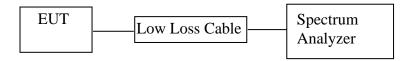


Date: 4.JUL.2013 14:17:19



7. NUMBER OF HOPPING FREQUENCY TEST

7.1.Block Diagram of Test Setup



(EUT: Hybrid Remote Control Attacknid, Combat Creatures)

7.2. The Requirement For Section 15.247(a)(1)(iii)

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

7.3.EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.4. Operating Condition of EUT

- 7.4.1. Setup the EUT and simulator as shown as Section 7.1.
- 7.4.2. Turn on the power of all equipment.
- 7.4.3.Let the EUT work in TX (Hopping on) modes measure it.



7.5.Test Procedure

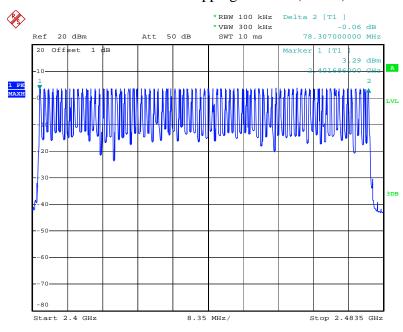
- 7.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 7.5.2.Set the spectrum analyzer as Span=83.5MHz, RBW=100 kHz, VBW=300 kHz.
- 7.5.3.Max hold, view and count how many channel in the band.

7.6.Test Result

Total number of	Measurement result	Limit (CH)
hopping channel	79	>15

The spectrum analyzer plots are attached as below.

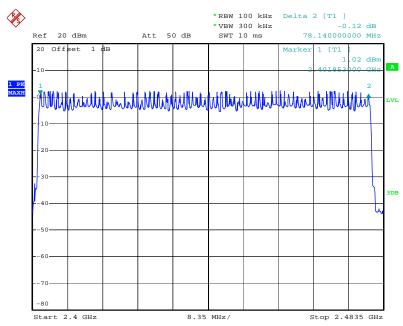
Number of hopping channels(GFSK)



Date: 4.JUL.2013 11:12:33

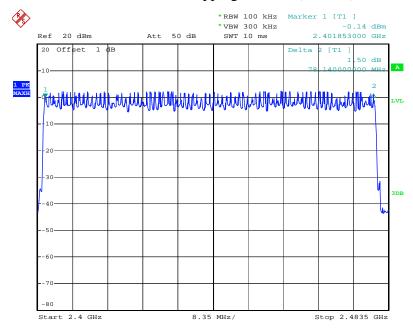


Number of hopping channels $(\Pi/4-DQPSK)$



Date: 4.JUL.2013 11:15:32

Number of hopping channels(8DPSK)

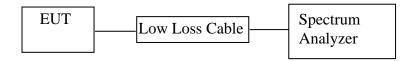


Date: 4.JUL.2013 11:18:47



8. DWELL TIME TEST

8.1.Block Diagram of Test Setup



(EUT: Hybrid Remote Control Attacknid, Combat Creatures)

8.2. The Requirement For Section 15.247(a)(1)(iii)

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

8.3.EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

8.4. Operating Condition of EUT

- 8.4.1. Setup the EUT and simulator as shown as Section 8.1.
- 8.4.2. Turn on the power of all equipment.
- 8.4.3.Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.



8.5.Test Procedure

- 8.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 8.5.2.Set center frequency of spectrum analyzer = operating frequency.
- 8.5.3.Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Span=0Hz, Adjust Sweep=1s. Get the burst (in 1 sec.).
- 8.5.4.Set the spectrum analyzer as RBW=1MHz, VBW=3MHz, Span=0Hz, Adjust Sweep=2ms. Get the pulse time.
- 8.5.5.Repeat above procedures until all frequency measured were complete.

8.6.Test Result

GFSK Mode

Of SK Mode					
Mode	Channel Frequency	Pulse Time	Dwell Time	Limit	
	(MHz)	(ms)	(ms)	(ms)	
	2402	0.440	140.80	400	
DH1	2441	0.430	137.60	400	
	2480	0.425	136.00	400	
A period transr	$mit time = 0.4 \times 79 = 31.6$	5 Dwell time = pulse t	time $\times (1600/(2*79))$	×31.6	
	2402	1.705	272.80	400	
DH3	2441	1.705	272.80	400	
	2480	1.745	279.20	400	
A period transr	mit time = $0.4 \times 79 = 31.6$	5 Dwell time = pulse t	time $\times (1600/(4*79))$	×31.6	
	2402	3.085	329.07	400	
DH5	2441	3.085	329.07	400	
	2480	3.025	322.67	400	
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6*79)) \times 31.6$					



$\Pi/4$ -DQPSK

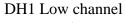
Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)	
	2402	0.470	150.40	400	
DH1	2441	0.445	142.40	400	
	2480	0.445	142.40	400	
A period to	ransmit time = $0.4 \times 79 =$	31.6 Dwell time = pu	alse time \times (1600/(2*)	79))×31.6	
	2402	1.765	282.40	400	
DH3	2441	1.745	279.20	400	
	2480	1.745	279.20	400	
A period to	ransmit time = 0.4×79 =	31.6 Dwell time = pu	ulse time \times (1600/(4*7)	79))×31.6	
	2402	2.965	316.27	400	
DH5	2441	3.025	322.67	400	
	2480	2.995	319.47	400	
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6*79)) \times 31.6$					

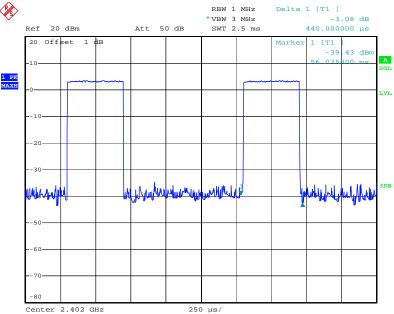
8DPSK Mode

Mode	Channel Frequency	Pulse Time	Dwell Time	Limit
	(MHz)	(ms)	(ms)	(ms)
DH1	2402	0.445	142.40	400
	2441	0.440	140.80	400
	2480	0.440	140.80	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2*79)) \times 31.6$				
DH3	2402	1.780	284.80	400
	2441	1.780	284.80	400
	2480	1.760	281.60	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4*79)) \times 31.6$				
DH5	2402	3.010	321.07	400
	2441	3.010	321.07	400
	2480	3.040	324.27	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6*79)) \times 31.6$				

The spectrum analyzer plots are attached as below.

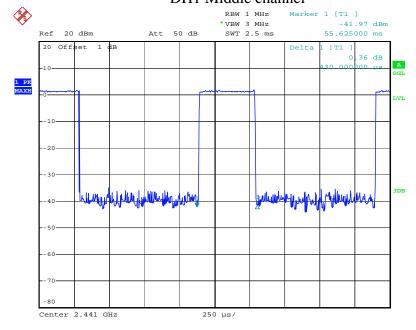






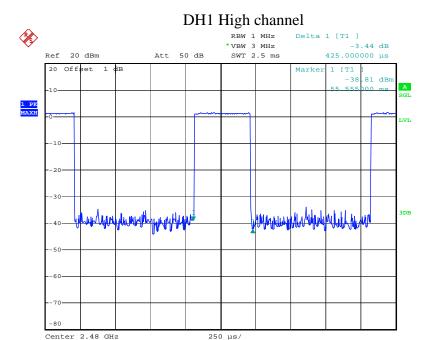
Date: 4.JUL.2013 15:21:10

DH1 Middle channel

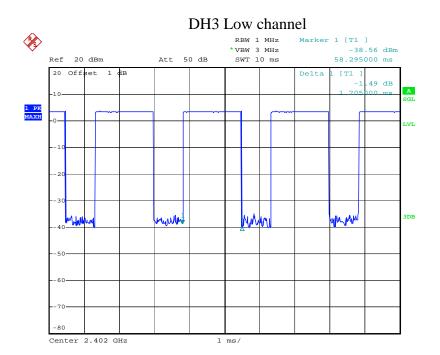


Date: 4.JUL.2013 15:22:08



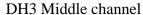


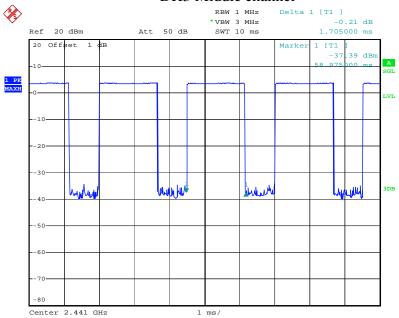
Date: 4.JUL.2013 15:22:44



Date: 4.JUL.2013 15:26:10



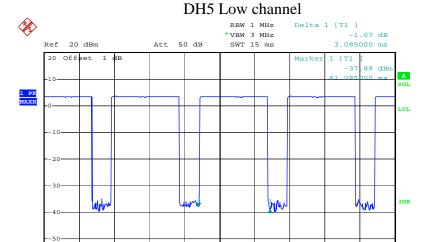




Date: 4.JUL.2013 15:25:04

Date: 4.JUL.2013 15:24:08



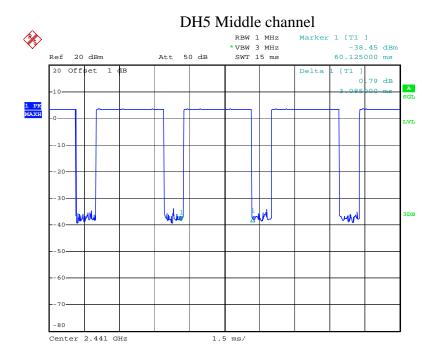


1.5 ms/

Date: 4.JUL.2013 15:27:34

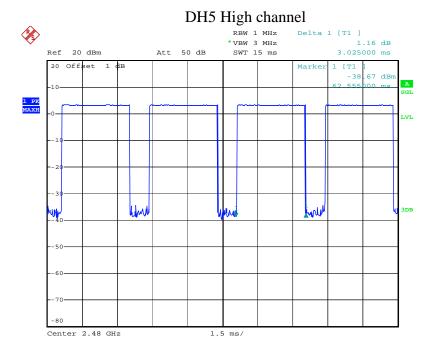
Center 2.402 GHz

-70-

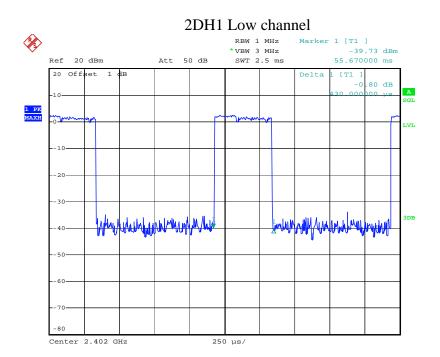


Date: 4.JUL.2013 15:29:25





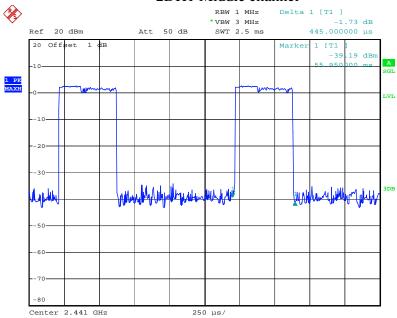
Date: 4.JUL.2013 15:30:33



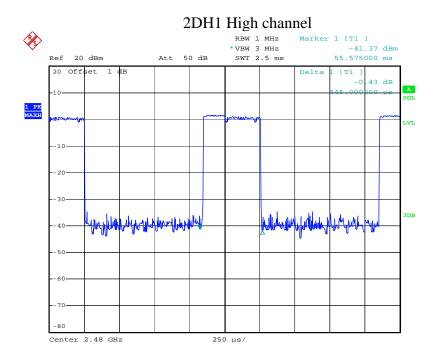
Date: 4.JUL.2013 15:33:06





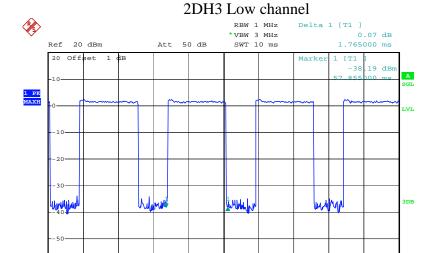


Date: 4.JUL.2013 15:34:01



Date: 4.JUL.2013 15:34:36



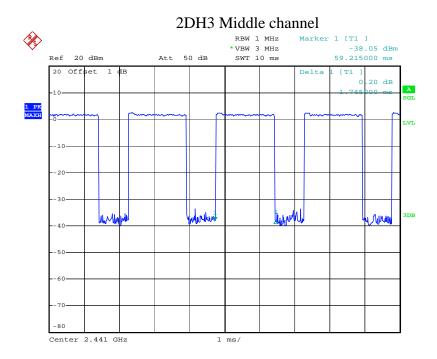


1 ms/

Date: 4.JUL.2013 15:37:33

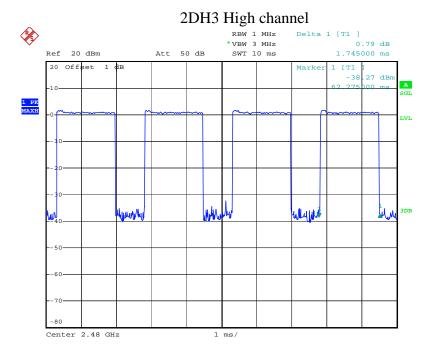
Center 2.402 GHz

-70-

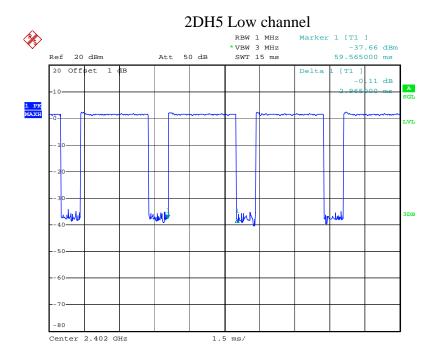


Date: 4.JUL.2013 15:36:24





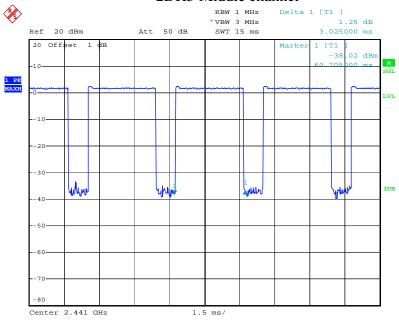
Date: 4.JUL.2013 15:35:48



Date: 4.JUL.2013 15:38:29







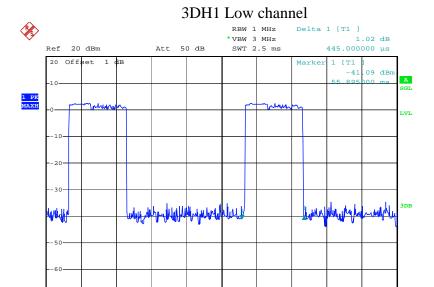
Date: 4.JUL.2013 15:39:02

1.5 ms/

Date: 4.JUL.2013 15:40:24

Center 2.48 GHz

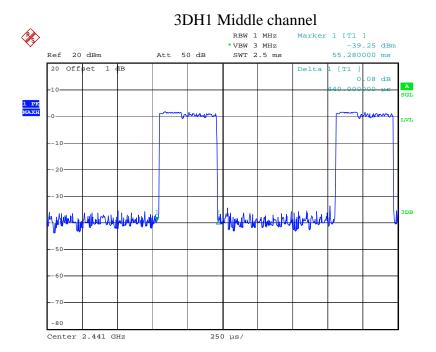




250 μs/

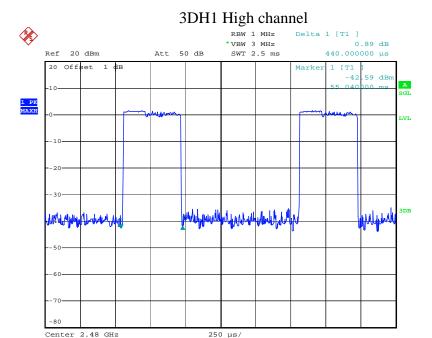
Date: 4.JUL.2013 16:12:31

Center 2.402 GHz

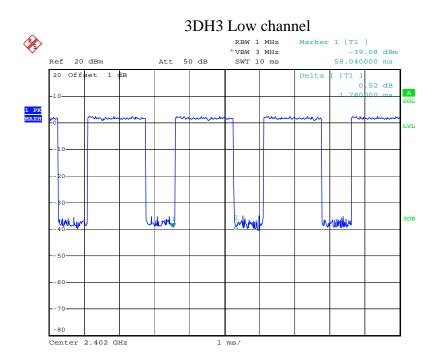


Date: 4.JUL.2013 16:13:16





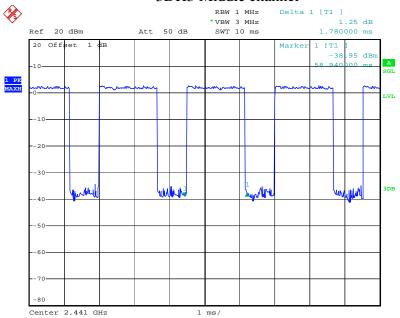
Date: 4.JUL.2013 16:13:57



Date: 4.JUL.2013 16:17:35





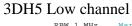


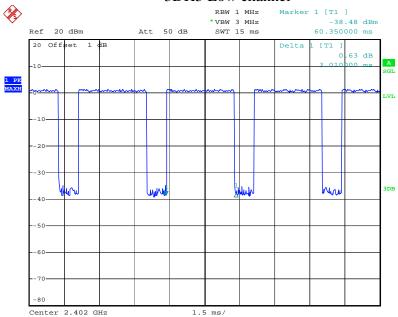
Date: 4.JUL.2013 16:16:43

3DH3 High channel RBW 1 MHz Marker 1 [T1] *VBW 3 MHz -37.80 dBm Ref 20 dBm Att 50 dB SWT 10 ms 60.040000 ms Delta 1 [T1] -1 16 dB 1.760000 ms SGL LVL Center 2.48 GHz 1 ms/

Date: 4.JUL.2013 16:15:28

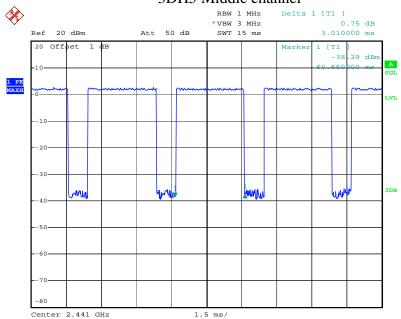






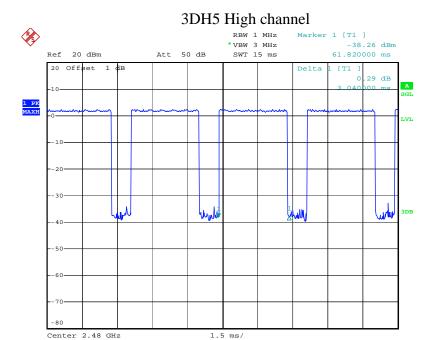
Date: 4.JUL.2013 16:18:42

3DH5 Middle channel



Date: 4.JUL.2013 16:19:29



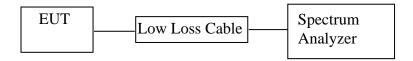


Date: 4.JUL.2013 16:20:03



9. MAXIMUM PEAK OUTPUT POWER TEST

9.1.Block Diagram of Test Setup



(EUT: Hybrid Remote Control Attacknid, Combat Creatures)

9.2. The Requirement For Section 15.247(b)(1)

Section 15.247(b)(1): For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

9.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

9.4. Operating Condition of EUT

- 9.4.1. Setup the EUT and simulator as shown as Section 9.1.
- 9.4.2. Turn on the power of all equipment.
- 9.4.3.Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.



9.5.Test Procedure

- 9.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 9.5.2.Set RBW of spectrum analyzer to 3MHz and VBW to 3MHz.
- 9.5.3.Measurement the maximum peak output power.

9.6.Test Result

GFSK Mode

OI DII I/IOGC					
Channel	Frequency (MHz)	Peak Output Power (dBm)	Limits dBm / W		
Low	2402	3.61	21 / 0.125		
Middle	2441	1.72	21 / 0.125		
High	2480	3.53	21 / 0.125		

∏/4-DQPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm)	Limits dBm / W
Low	2402	2.42	21 / 0.125
Middle	2441	1.64	21 / 0.125
High	2480	2.43	21 / 0.125

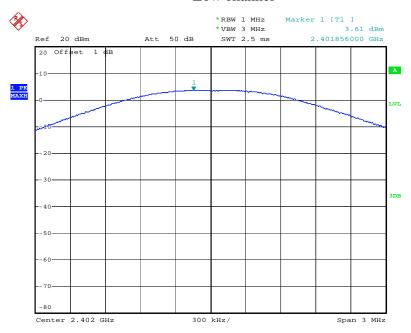
8DPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm)	Limits dBm / W
Low	2402	2.33	21 / 0.125
Middle	2441	2.48	21 / 0.125
High	2480	2.43	21 / 0.125

The spectrum analyzer plots are attached as below.



Low channel



Date: 4.JUL.2013 10:39:22

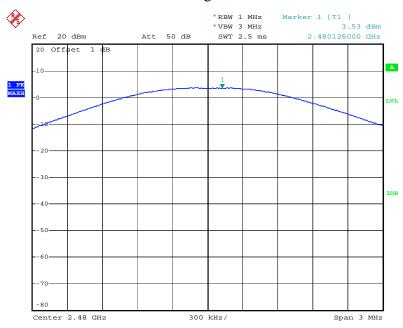
Middle channel



Date: 4.JUL.2013 10:41:14



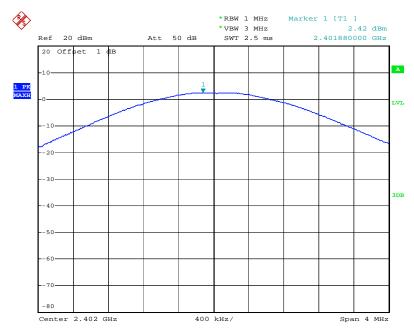
High channel



Date: 4.JUL.2013 10:43:00

Π /4-DQPSK Mode

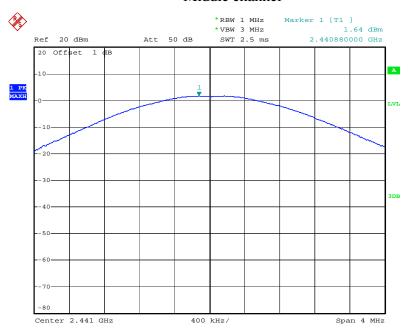
Low channel



Date: 4.JUL.2013 10:48:57

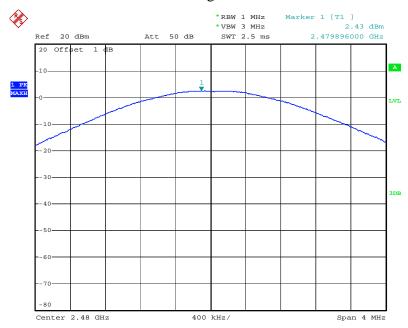


Middle channel



Date: 4.JUL.2013 10:52:19

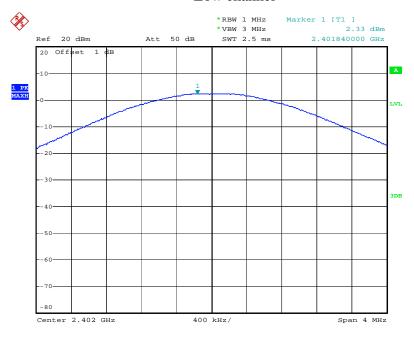
High channel



Date: 4.JUL.2013 10:55:20

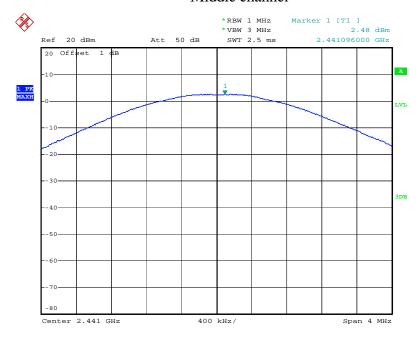


Low channel



Date: 4.JUL.2013 10:59:41

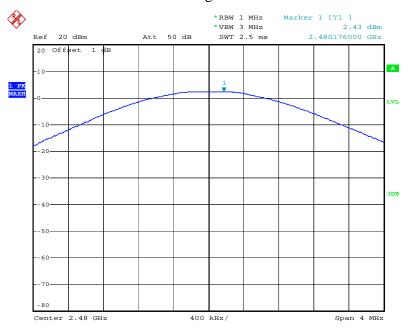
Middle channel



Date: 4.JUL.2013 11:00:18



High channel



Date: 4.JUL.2013 11:00:56



10. RADIATED EMISSION TEST

10.1.Block Diagram of Test Setup

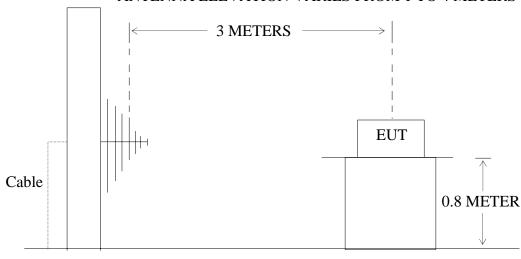
10.1.1.Block diagram of connection between the EUT and simulators



(EUT: Hybrid Remote Control Attacknid, Combat Creatures)

10.1.2. Anechoic Chamber Test Setup Diagram





(EUT: Hybrid Remote Control Attacknid, Combat Creatures)

10.2. The Limit For Section 15.247(d)

GROUND PLANE

Section 15.247(d): In any 100 kHz 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 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, 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(a).



10.3.Restricted bands of operation

10.3.1.FCC Part 15.205 Restricted bands of operation

(a) Except as shown in paragraph (d) of this section, Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz		
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15		
¹ 0.495-0.505	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	$\binom{2}{}$		
13.36-13.41					

¹Until February 1, 1999, this restricted band shall be 0.490-0.510

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

10.4. Configuration of EUT on Measurement

The equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

²Above 38.6



10.5.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4- 2009 on radiated emission measurement.

The bandwidth of test receiver (R&S ESI26) is set at 120 KHz in 30-1000MHz. and set at 1MHz in above 1000MHz.

The frequency range from 30MHz to 25000MHz is checked.

The final measurement in band 9-90 kHz, 110-490 kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

The field strength is calculated by adding the antenna factor, and cable loss, and subtracting the amplifier gain from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

Where Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain



10.6. The Field Strength of Radiation Emission Measurement Results

Polarization:

Date: 2013-7-3

Time: 17:28:28

Distance: 3m

Engineer Signature:

Power Source: DC 6V

Note: 1.We tested GFSK mode, $\Pi/4$ -DQPSK Mode & 8DPSK mode and recored the worst case data (GFSK mode) for all test mode.

2. The fundamental radiated emissions were reduced by 2.4G Band Reject Filter in the attached plots.



ACCURATE TECHNOLOGY CO., LTD.

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Horizontal

Job No.: STAR #4831 Standard: FCC Class B 3M Radiated

Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %

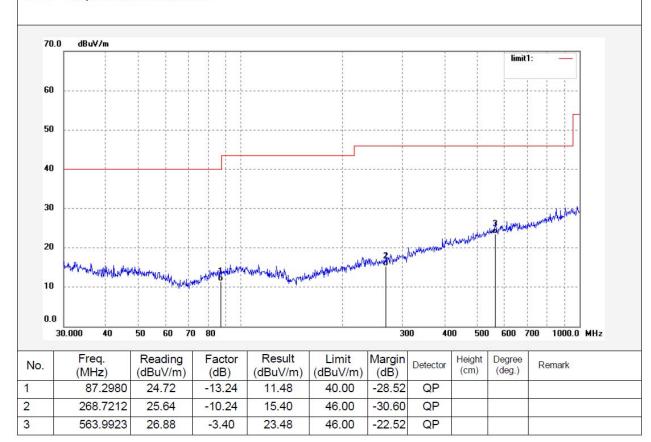
EUT: Hybrid Remote Control Attacknid, Combat Creatures

Mode: TX 2402MHz (GFSK)

Model: CC-1007

Manufacturer: Hui Xing Cheng

Note: Report No.:ATE201231342







F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 2# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: STAR #4832

Standard: FCC Class B 3M Radiated

Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Hybrid Remote Control Attacknid, Combat Creatures

Mode: TX 2402MHz (GFSK)

Model: CC-1007

Manufacturer: Hui Xing Cheng

504.0151

25.66

-4.71

20.95

Note: Report No.:ATE201231342

Polarization: Vertical

Power Source: DC 6V Date: 2013-7-3

Time: 17:29:01 Engineer Signature:

Distance: 3m

									limit	1: —
60										
50										-
40										
30										or market that we have
20			1,			2 reliablehan	y Jenstylman der	Mille Harry Br.	ryentlysty, styrteninge	And the state of t
10	howevery	naphy vy przy przy przy przy przy przy przy prz	March of March 1984	morphish which which	Milholy Man John Man	W 1				
0.0 3	30.000 40	50 60 7	0 80			30	0 40	0 500	600	700 1000.0 M
	Freq.	Reading	Factor	Result	Limit	Margin	Detector	Height (cm)	Degree (deg.)	Remark
).	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)		(CIII)	(deg.)	

46.00

-25.05

QP

3





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 2# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: STAR #4901

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 45 %

EUT: Hybrid Remote Control Attacknid, Combat Creatures

Mode: TX 2402MHz (GFSK)

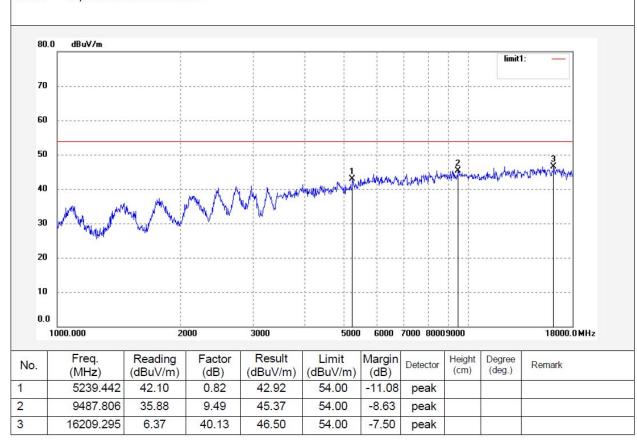
Model: CC-1007

Manufacturer: Hui Xing Cheng

Note: Report No.:ATE201231342

Polarization: Horizontal Power Source: DC 6V

Date: 2013/07/11 Time: 16:56:34 Engineer Signature:







F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: STAR #4902

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 45 %

EUT: Hybrid Remote Control Attacknid, Combat Creatures

Mode: TX 2402MHz (GFSK)

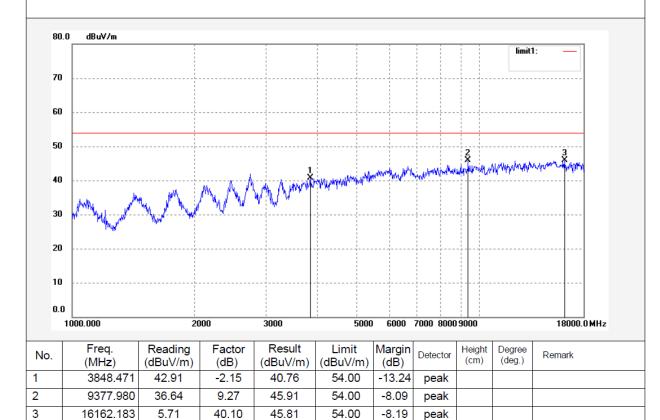
Model: CC-1007

Manufacturer: Hui Xing Cheng

Note: Report No.:ATE201231342

Polarization: Vertical Power Source: DC 6V

Date: 2013/07/11
Time: 16:57:11
Engineer Signature:





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 2# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: STAR #4849

Standard: FCC Class B 3M Radiated
Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Hybrid Remote Control Attacknid, Combat Creatures

Mode: TX 2402MHz (GFSK)

Model: CC-1007

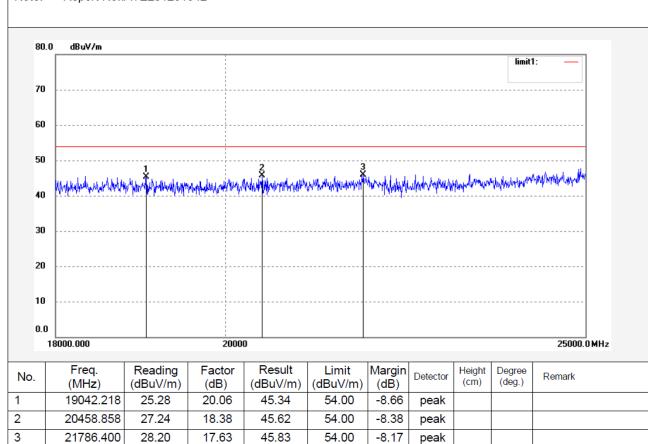
Manufacturer: Hui Xing Cheng

Note: Report No.:ATE201231342

Polarization: Horizontal Power Source: DC 6V

Date: 2013-7-3

Time: 17:40:12 Engineer Signature:





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 2# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: STAR #4850

Standard: FCC Class B 3M Radiated

Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Hybrid Remote Control Attacknid, Combat Creatures

Mode: TX 2402MHz (GFSK)

Model: CC-1007

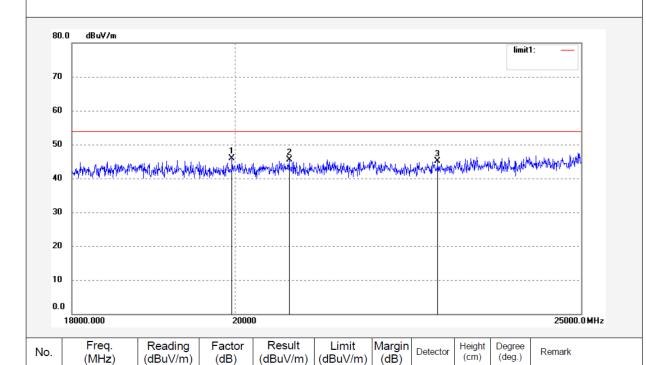
Manufacturer: Hui Xing Cheng

Note: Report No.:ATE201231342

Polarization: Vertical Power Source: DC 6V

Date: 2013-7-3 Time: 17:40:20 Engineer Signature:

Distance: 3m



54.00

54.00

54.00

-8.13

-8.57

-8.81

peak

peak

peak

1

2

3

19959.970

20709.550

22791.353

26.55

27.17

27.67

19.32

18.26

17.52

45.87

45.43

45.19





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Site: 2# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

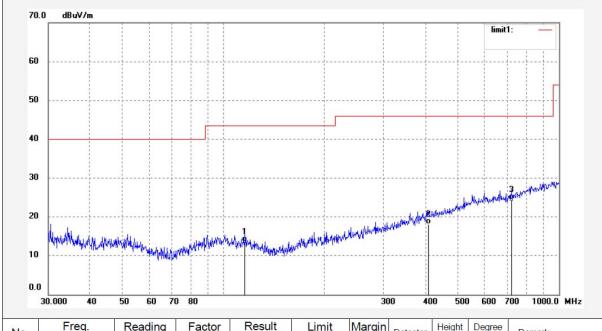
Job No.: STAR #4833 Polarization: Vertical Standard: FCC Class B 3M Radiated Power Source: DC 6V

Date: 2013-7-3 Test item: Radiation Test Temp.(C)/Hum.(%) 25 C / 55 % Time: 17:29:31 EUT: Hybrid Remote Control Attacknid, Combat Creatures Engineer Signature: Mode: TX 2441MHz (GFSK) Distance: 3m

Model: CC-1007

Manufacturer: Hui Xing Cheng

Note: Report No.:ATE201231342



	No.	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Detector	(cm)	(deg.)	Remark
1		115.6321	26.80	-13.15	13.65	43.50	-29.85	QP			
2	2	408.2137	24.67	-6.62	18.05	46.00	-27.95	QP			
3		723.7930	25.93	-1.43	24.50	46.00	-21.50	QP			



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Site: 2# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: STAR #4834

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Hybrid Remote Control Attacknid, Combat Creatures

Mode: TX 2441MHz (GFSK)

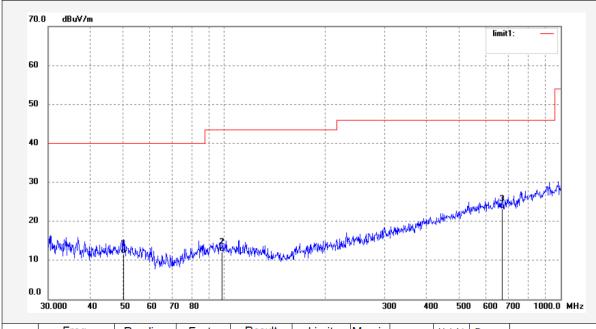
Model: CC-1007

Manufacturer: Hui Xing Cheng

Note: Report No.:ATE201231342

Polarization: Horizontal Power Source: DC 6V

Date: 2013-7-3
Time: 17:29:51
Engineer Signature:
Distance: 3m



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)		Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	50.2843	24.33	-12.63	11.70	40.00	-28.30	QP			
2	98.7215	24.50	-12.30	12.20	43.50	-31.30	QP			
3	669.9523	25.36	-2.14	23.22	46.00	-22.78	QP			





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Job No.: STAR #4903

Standard: FCC Class B 3M Radiated

Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 45 %

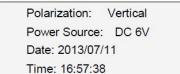
EUT: Hybrid Remote Control Attacknid, Combat Creatures

Mode: TX 2441MHz (GFSK)

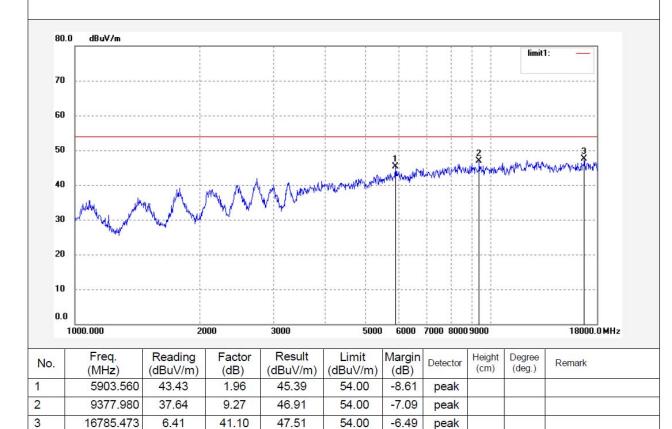
Model: CC-1007

Manufacturer: Hui Xing Cheng

Note: Report No.:ATE201231342



Engineer Signature: Distance: 3m





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Job No.: STAR #4904

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 45 %

EUT: Hybrid Remote Control Attacknid, Combat Creatures

Mode: TX 2441MHz (GFSK)

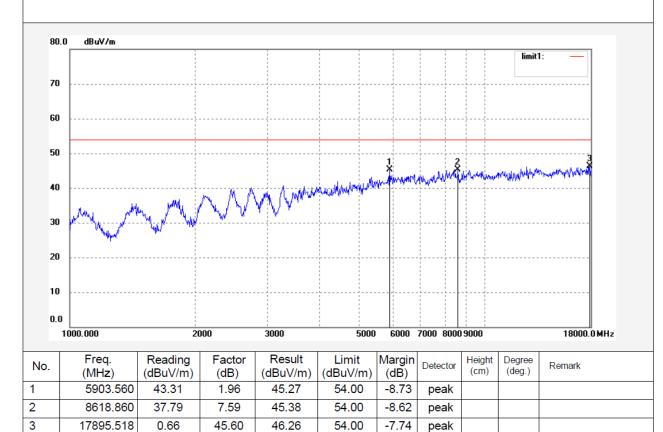
Model: CC-1007

Manufacturer: Hui Xing Cheng

Note: Report No.:ATE201231342

Polarization: Horizontal
Power Source: DC 6V

Date: 2013/07/11 Time: 16:58:08 Engineer Signature: Distance: 3m





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Job No.: STAR #4851

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Hybrid Remote Control Attacknid, Combat Creatures

Mode: TX 2441MHz (GFSK)

Model: CC-1007

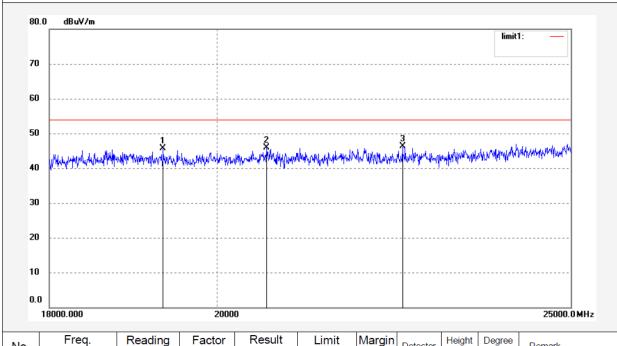
Manufacturer: Hui Xing Cheng

Note: Report No.:ATE201231342

Polarization: Vertical Power Source: DC 6V

Date: 2013-7-3 Time: 17:40:28

Engineer Signature: Distance: 3m







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Site: 2# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

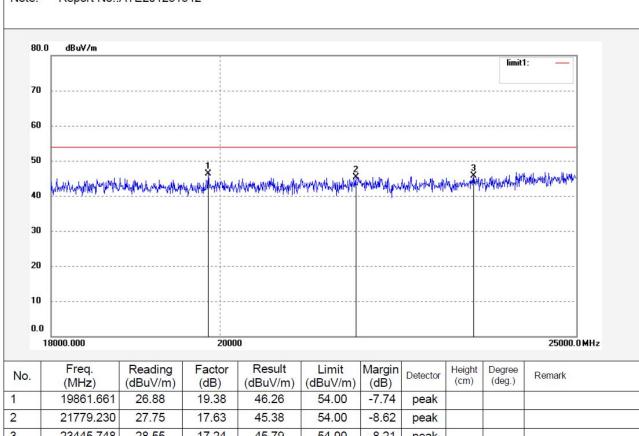
Job No.: STAR #4852 Polarization: Horizontal Standard: FCC Class B 3M Radiated Power Source: DC 6V

Test item: Radiation Test Date: 2013-7-3 Temp.(C)/Hum.(%) 25 C / 55 % Time: 17:40:36 EUT: Hybrid Remote Control Attacknid, Combat Creatures Engineer Signature: Mode: TX 2441MHz (GFSK) Distance: 3m

Model: CC-1007

Manufacturer: Hui Xing Cheng

Note: Report No.:ATE201231342



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	(dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	19861.661	26.88	19.38	46.26	54.00	-7.74	peak			
2	21779.230	27.75	17.63	45.38	54.00	-8.62	peak			
3	23445.748	28.55	17.24	45.79	54.00	-8.21	peak			





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Job No.: STAR #4835 Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Hybrid Remote Control Attacknid, Combat Creatures

Mode: TX 2480MHz (GFSK)

Model: CC-1007

Manufacturer: Hui Xing Cheng

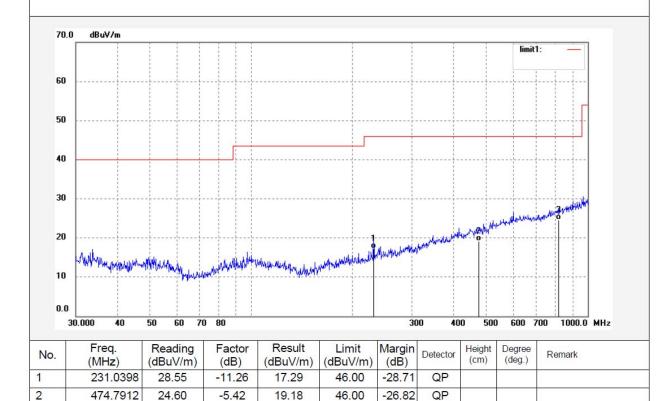
Note: Report No.:ATE201231342

Polarization: Horizontal

Power Source: DC 6V

Date: 2013-7-3 Time: 17:30:31 Engineer Signature:

Distance: 3m



3

818.5062

24.30

0.30

24.60

46.00

-21.40

QP



F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 2# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: STAR #4836

Standard: FCC Class B 3M Radiated

Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Hybrid Remote Control Attacknid, Combat Creatures

Mode: TX 2480MHz (GFSK)

Model: CC-1007

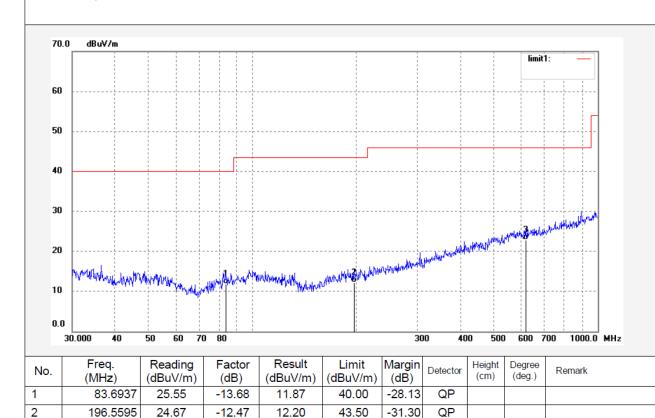
Manufacturer: Hui Xing Cheng

Note: Report No.:ATE201231342

Polarization: Vertical

Power Source: DC 6V Date: 2013-7-3

Time: 17:31:04
Engineer Signature:
Distance: 3m



3

617.9416

25.63

-2.73

22.90

46.00

-23.10

QP



F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 2# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: STAR #4905

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 45 %

EUT: Hybrid Remote Control Attacknid, Combat Creatures

Mode: TX 2480MHz (GFSK)

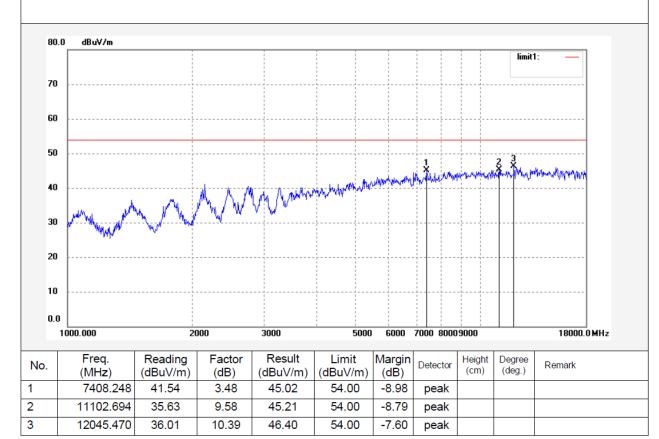
Model: CC-1007

Manufacturer: Hui Xing Cheng

Note: Report No.:ATE201231342

Polarization: Horizontal
Power Source: DC 6V

Date: 2013/07/11 Time: 16:58:43 Engineer Signature: Distance: 3m





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Job No.: STAR #4906

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 45 %

EUT: Hybrid Remote Control Attacknid, Combat Creatures

Mode: TX 2480MHz (GFSK)

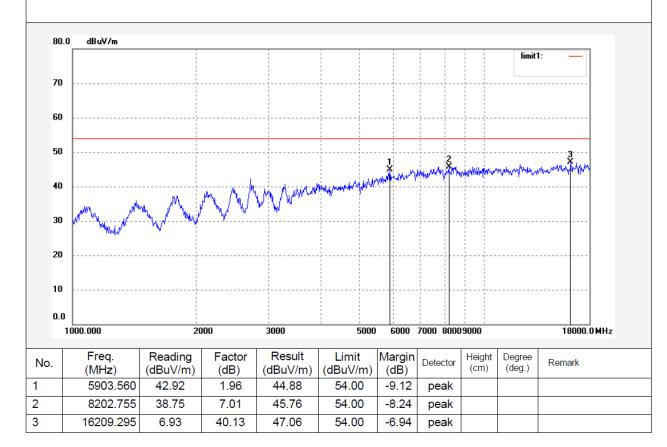
Model: CC-1007

Manufacturer: Hui Xing Cheng

Note: Report No.:ATE201231342

Polarization: Vertical Power Source: DC 6V

Date: 2013/07/11 Time: 16:59:27 Engineer Signature:





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Job No.: STAR #4853

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

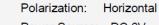
EUT: Hybrid Remote Control Attacknid, Combat Creatures

Mode: TX 2480MHz (GFSK)

Model: CC-1007

Manufacturer: Hui Xing Cheng

Note: Report No.:ATE201231342



Power Source: DC 6V

Date: 2013-7-3 Time: 17:40:45

Engineer Signature:
Distance: 3m

peak

-6.53

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70										
70										
60	·									
50			1		2					3
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20										
10										
10										
0.0										
	18000.000		2000	0						25000.0 MH
				ı						
	Freq.	Reading	Factor	Result	Limit	Margin	Detector	Height	Degree	Remark
_	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)		(cm)	(deg.)	
	19946.834	26.58	19.33	45.91	54.00	-8.09	peak			

54.00

3

24358.284

29.61

17.86

47.47





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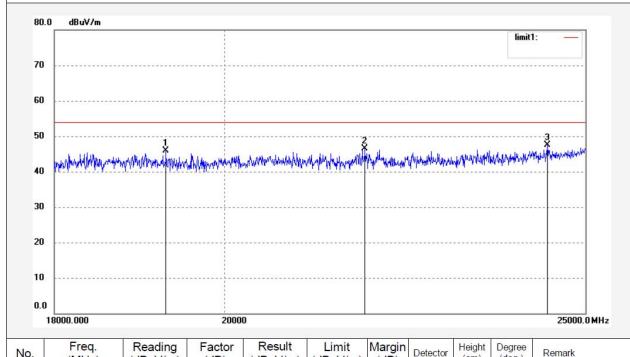
Job No.: STAR #4854 Polarization: Vertical Standard: FCC Class B 3M Radiated Power Source: DC 6V

Test item: Radiation Test Date: 2013-7-3
Temp.(C)/Hum.(%) 25 C / 55 % Time: 17:40:54
EUT: Hybrid Remote Control Attacknid, Combat Creatures Engineer Signature:
Mode: TX 2480MHz (GFSK) Distance: 3m

Model: CC-1007

Manufacturer: Hui Xing Cheng

Note: Report No.:ATE201231342

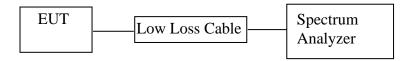


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)		Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark	
1	19288.245	26.08	19.81	45.89	54.00	-8.11	peak				
2	21815.105	28.87	17.61	46.48	54.00	-7.52	peak				
3	24422.511	29.59	18.01	47.60	54.00	-6.40	peak				



11.BAND EDGE COMPLIANCE TEST

11.1.Block Diagram of Test Setup



(EUT: Hybrid Remote Control Attacknid, Combat Creatures)

11.2.The Requirement For Section 15.247(d)

Section 15.247(d): In any 100 kHz 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 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, 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(a).

11.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

11.4. Operating Condition of EUT

- 11.4.1. Setup the EUT and simulator as shown as Section 11.1.
- 11.4.2. Turn on the power of all equipment.
- 11.4.3.Let the EUT work in TX (Hopping off, Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2480MHz TX frequency to transmit.



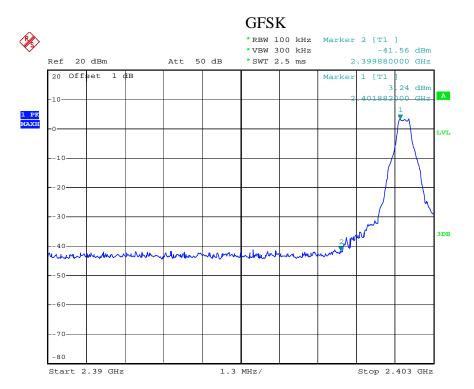
11.5.Test Procedure

- 11.5.1.The transmitter output was connected to the spectrum analyzer via a low loss cable.
- 11.5.2.Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz with convenient frequency span including 100 kHz bandwidth from band edge.
- 11.5.3.The band edges was measured and recorded.

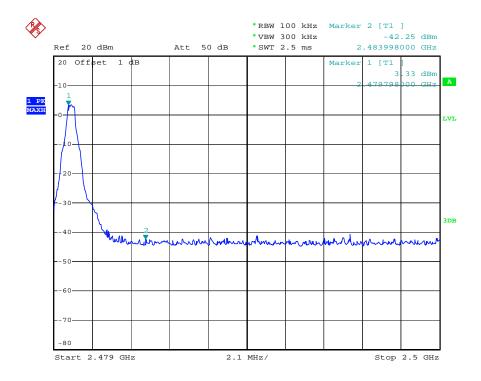
11.6.Test Result

Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)									
	GFSK										
2399.880	44.80	> 20dBc									
2483.998	45.58	> 20dBc									
	П/4-DQPSK Mode										
2399.802	43.79	> 20dBc									
2484.838	44.09	> 20dBc									
	8DPSK	,									
2399.750	43.26	> 20dBc									
2483.788	44.32	> 20dBc									





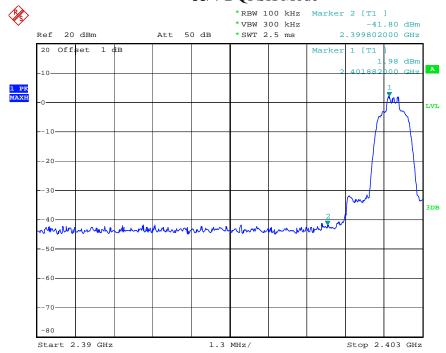
Date: 4.JUL.2013 15:00:14



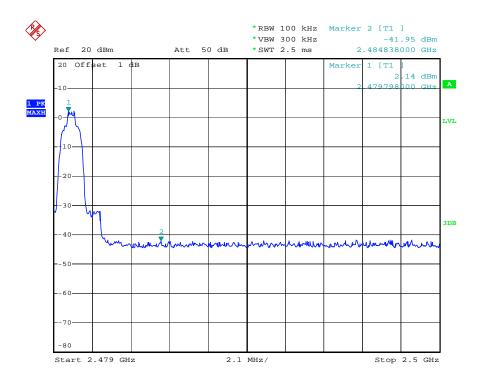
Date: 4.JUL.2013 14:58:14



∏/4-DQPSK Mode



Date: 4.JUL.2013 14:52:42



Date: 4.JUL.2013 14:51:07