INTERNATRIX, LLC

TWO-WAY MOTORCYCLE ALARM SYSTEM

Model: TW-1000

9 Jan 2009
Report No.: SL08112010-ITX-001
(This report supersedes： None)

EMC Test Report
To: FCC Part 15.231 :2008
SIEMIC, INC.
Accessing global markets

CERTIFICATE OF TEST

Date of Issue : **9 Jan 2009**

Company Name : **InterNatrix, LLC**

Product Name/Model : **Two-way Motorcycle Alarm System/ TW-1000**

Stipulated Standard : **47 CFR § 15.231**
47 CFR § 15.203
47 CFR § 15.207
47 CFR § 15.35

Equipment complied with the specification **[X]**

Equipment did not comply with the specification **[ ]**

The submission documentation to a National Regulatory Body for type approval **Purposes shall consist of two parts;**

Part one: Application Form;
Part two: Test Report;

Modifications made to the product : None

This Test Report is Issued Under the Authority of:

Tom Tang	Jackson.chen
Tom Tang **Test Engineer**	**Jackson Chen** **Engineering Reviewer**

SIEMIC ACCREDITATION DETAILS: A2LA Certificate

THE AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION

ACCREDITED LABORATORY

A2LA has accredited

SIEMIC LABORATORIES

San Jose, CA

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 18 June 2005*).

Presented this 11th day of July 2008.

President
For the Accreditation Council
Certificate Number 2742.01
Valid to September 30, 2010

For the tests or types of tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

SIEMIC ACCREDITATION DETAILS: ISO Guide 65 for US TCB

CERTIFICATE OF ACCREDITATION
PRODUCT CERTIFICATION PROGRAM

The American National Standards Institute hereby affirms that

SIEMIC INC.
SAN JOSE, CA

Accreditation ID #0759

meets the ANSI accreditation program requirements
and those set forth in

ISO/IEC GUIDE 65:1996
GENERAL REQUIREMENTS FOR BODIES OPERATING PRODUCT CERTIFICATION SYSTEMS
AND
FEDERAL COMMUNICATIONS COMMISSION REQUIREMENTS RELATED TO TCB PROGRAMS

for programs within the following

SCOPE OF ACCREDITATION

Radio Frequency Devices, Unlicensed (A1, A2, A3, A4)

Radio Frequency Devices, Licensed (B1, B2, B3)

ANSI Accredited Since 2007

June 14, 2009
Valid Through

Lane Hallenbeck
ANSI Vice President, Accreditation Services

June 15, 2007
Date

ANSI
ANSI Accredited Program
PRODUCT CERTIFICATION

SIEMIC ACCREDITATION DETAILS: FCC Registration NO:986914

LABORATORY RECOGNITION

SIEMIC, INC.
Accessing global markets

Presented To:

SIEMIC (NANJING) INFOTECH CO. LTD.

Nanjing Laboratories

2-1 Longcang Avenue, Yuhua Economic Development Zone
Nanjing, Jiangsu Province, People's Republic of China

This is to certify that SIEMIC Nanjing Laboratories has been assessed per ISO 17025 and listed as SIEMIC Recognized Laboratory for acceptance of Test Reports for TCB Certifications for the following scopes:

FCC Unlicensed Scope A1, A2, A3, A4
FCC Licensed Scope B1, B2, B3

Leslie Bai
Director of Certification

This certificate of recognition is valid through December 31, 2009

2206 Ringwood Avenue, San Jose, California 95131 U.S.A.
Tel. No.: +1 (408) 526 1188 Fax No.: +1 (408) 526 1068 www.siemic.com

SIEMIC ACCREDITATION DETAILS: FCC Listing, Registration NO:986914

FEDERAL COMMUNICATIONS COMMISSION
Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046

April 25, 2008

Registration Number: 986914

SIEMIC Nanjing (China) Laboratories
2-1 Longcang Avenue,
Yuhua Economic and Technology Development Park,
Nanjing, 210039
China

Attention: Leslie Bai

Re: Measurement facility located at 2-1 Longcang Avenue, Nanjing, China
Anechoic chamber (3 meters) and 3&10 meter OATS
Date of Listing: April 25, 2008

Dear Sir or Madam:

Your request for registration of the subject measurement facility has been reviewed and found to be in compliance with the requirements of Section 2.948 of the FCC rules. The information has, therefore, been placed on file and the name of your organization added to the list of facilities whose measurement data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Please note that the file must be updated for any changes made to the facility and the registration must be renewed at least every three years.

Measurement facilities that have indicated that they are available to the public to perform measurement services on a fee basis may be found on the FCC website www.fcc.gov under E-Filing, OET Equipment Authorization Electronic Filing, Test Firms.

Sincerely,

Katie Hawkins
Electronics Engineer

SIEMIC ACCREDITATION DETAILS: Industry of Canada Registration No. 4842-1

Industry Canada Industrie Canada

May 23rd, 2008

OUR FILE: 46405-4842
Submission No: 126429

Siemic Inc.
2206 Ringwood Ave.
San Jose CA 95131
USA

Attention: Leslie Bai

Dear Sir/Madame:

The Bureau has received your application for the registration / renewal of a 3/10m OATS. Be advised that the information received was satisfactory to Industry Canada. The following number(s) is now associated to the site(s) for which registration / renewal was sought **(4842A-1).** Please reference the appropriate site number in the body of test reports containing measurements performed on the site. In addition, please be informed that the Bureau is now utilizing a **new site numbering scheme** in order to simplify the electronic filing process. Our goal is to reduce the number of secondary codes associated to one particular company. The following changes have been made to your record.

- Your primary code is: **4842**

- The company number associated to the site(s) located at the above address is: **4842A**

- The table below is a summary of the changes made to the unique site registration number(s):

New Site Number	Obsolete Site Number	Description of Site	Expiry Date (YYYY-MM-DD)
4842A-1	4842-1	3m Chamber	2010-05-23

Furthermore, to obtain or renew a unique site number, the applicant shall demonstrate that the site has been accredited to ANSI C63.4-2003 or later. A scope of accreditation indicating the accreditation by a recognized accreditation body to ANSI C63.4-2003 shall be accepted. Please indicate in a letter the previous assigned site number if applicable and the type of site (example: 3 meter OATS or 3 meter chamber). If the test facility is not accredited to ANSI C63.4-2003 or later, the test facility shall submit test data demonstrating full compliance with the ANSI standard. The Bureau will evaluate the filing to determine if recognition shall be granted.

The frequency for re-validation of the test site and the information that is required to be filed or retained by the testing party shall comply with the requirements established by the accrediting organization. However, in all cases, test site re-validation shall occur on an interval not to exceed two years. There is no fee or form associated with an OATS filing. OATS submissions are encouraged to be submitted electronically to the Bureau using the following URL;
http://strategis.ic.gc.ca/epic/internet/inceb-bhst.nsf/en/h_tt00052e.html.

If you have any questions, you may contact the Bureau by e-mail at certification.bureau@ic.gc.c
Please reference our file and submission number above for all correspondence.

Yours sincerely,

S. Proulx
Test & Measurement Specialist
Certification and Engineering Bureau
3701 Carling Ave., Building 94
Ottawa, Ontario K2H 8S2

SIEMIC ACCREDITATION DETAILS: Japan RF Technologies Accreditation No. MRF050927

RFT

Certificate

This is to certify that the
Quality Management System
of

SIEMIC , Inc.

2206 Ringwood Avenue
San Jose, California 95131 U.S.A

has been authorized to carry out Japan Specified Radio Equipment test by order and under supervision of RF Technologies Co., Ltd. according to Notification No.88 of Radio Law.

An assessment of the laboratory was conducted according to the "Procedure and Conditions for Appointments of 2.4GHz Band Low power data communications system that Bluetooth and Wireless LAN test with reference to ISO/IEC 17025 by an RF Technologies Co., Ltd. auditor.

Audit Report No. MRF050927

Kazuyuki Sarashina
Auditor
RF Technologies Co., Ltd.

Toshihiro Ikegami
President
RF Technologies Co., Ltd.

Audit Date
September 27th, 2005

Issued Date
October 5th, 2005

This Certificate is valid until **September 26th 2006 or next schedule audit.**

No:006 Registered Certification Body
RF Technologies Co., Ltd.
472, Nippa-cho,Kohoku-ku, Yokohama, 223-0057, Japan

SIEMIC ACCREDITATION DETAILS: Korea CAB ID: US0160

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-

October 1, 2008

Mr. Leslie Bai
SIEMIC, Inc.
2206 Ringwood Avenue
San Jose, CA 95131

Dear Mr. Bai:

NIST is pleased to inform you that your laboratory has been recognized by the Radio Research Agency (RRA) Korea Communications Commission (KCC) under the Asia Pacific Economic Cooperation for Telecommunications Equipment Mutual Recognition Arrangement (APEC Tel MRA). Your laboratory is now designated to act as a Conformity Assessment Body (CAB) under Appendix B, **Phase I** Procedures, of the APEC Tel MRA. The pertinent information about your laboratory's designation is as follows:

CAB Name:	SIEMIC, Inc.
Physical Location:	2206 Ringwood Avenue, San Jose, CA 95131
Identification No.:	US0160
Recognized Scope:	**EMI:** KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI KN22: Test Method for EMI **EMS:** KCC Notice 2008-38, RRL Notice 2008-4: CA Procedures for EMS KN24, KN-61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11: Test Method for EMS **Wireless:** RRL Notice 2008-26, RRL Notice 2008-2, RRL Notice 2008-10, RRL Notice 2007-49, RRL Notice 2007-20, RRL Notice 2007-21, RRL Notice 2007-80, RRL Notice 2004-68 **Wired:** President Notice 20664, RRL Notice 2007-30, RRL Notice 2008-7 with attachments 1, 3, 5, 6 President Notice 20664, RRL Notice 2008-7 with attachment 4

You may submit test data to RRA/KCC to verify that the equipment to be imported into Korea satisfies the applicable requirements. The designation of your organization will remain in force as long as its accreditation for the designated scope remains valid and comply with the designation requirements.

Recognized CABs are listed on the NIST website at http://ts.nist.gov/mra. If you have any questions please contact Ramona Saar at (301) 975-5521 or ramona.saar@nist.gov.

Sincerely,

David F. Alderman
Group Leader, Standards Coordination and Conformity Group
Standards Services Division

Enclosure

cc: Ramona Saar

NIST

SIEMIC ACCREDITATION DETAILS: Taiwan BSMI Accreditation No. SL2-IN-E-1130R

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-

May 3, 2006

Mr. Leslie Bai
SIEMIC Laboratories
2206 Ringwood Avenue
San Jose, CA 95131

Dear Mr. Bai:

I am pleased to inform you that your laboratory has been recognized by the Chinese Taipei's Bureau of Standards, Metrology, and Inspection (BSMI) under the Asia Pacific Economic Cooperation (APEC) Mutual Recognition Arrangement (MRA). Your laboratory is now designated to act as a Conformity Assessment Body (CAB) under Appendix B, **Phase I** Procedures, of the APEC Tel MRA. You may submit test data to BSMI to verify that the equipment to be imported into Chinese Taipei satisfies the applicable requirements. The designation of your organization will remain in force as long as its accreditation for the designated scope remains valid and comply with the designation requirements. The pertinent designation information is as follows:

- BSMI number: **SL2-IN-E-1130R** (Must be applied to the test reports)
- U.S Identification No: **US0160**
- Scope of Designation: **CNS 13438**
- Authorized signatory: **Mr. Leslie Bai**

The names of all recognized CABs will be posted on the NIST website at http://ts.nist.gov/mra. If you have any questions, please contact Mr. Dhillon at 301-975-5521. We appreciate your continued interest in our international conformity assessment activities.

Sincerely,

David F. Alderman
Group Leader, Standards Coordination and Conformity Group

cc: Jogindar Dhillon

NIST

SIEMIC ACCREDITATION DETAILS: Taiwan NCC CAB ID: US0160

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-

November 25, 2008

Mr. LeslieBai
SIEMIC, Inc.
2206 Ringwood Avenue
San Jose, CA 95131

Dear Mr. Bai:

NIST is pleased to inform you that your laboratory has been recognized by the National Communications Commission (NCC) for the requested scope expansion under the Asia Pacific Economic Cooperation for Telecommunications Equipment Mutual Recognition Arrangement (APEC Tel MRA). Your laboratory is designated to act as a Conformity Assessment Body (CAB) under Appendix B, **Phase I** Procedures, of the APEC Tel MRA. The pertinent information about your laboratory's designation is as follows:

CAB Name:	SIEMIC, Inc.
Physical Location:	2206 Ringwood Avenue, San Jose, CA 95131
Identification No.:	US0160
Current Scope:	LP0002
Additional Scope:	PSTN01, ADSL01, ID0002, IS6100 and CNS 14336

You may submit test data to NCC to verify that the equipment to be imported into China satisfies the applicable requirements. The designation of your organization will remain in force as long as its accreditation for the designated scope remains valid and comply with the designation requirements.

Recognized CABs are listed on the NIST website at http://ts.nist.gov/mra. If you have any questions please contact Ramona Saar at (301) 975-5521 or ramona.saar@nist.gov.

Sincerely,

David F. Alderman
Group Leader, Standards Coordination and Conformity Group
Standards Services Division

Enclosure

cc: Ramona Saar

NIST

SIEMIC ACCREDITATION DETAILS: Mexico NOM Recognition

CANIETI

CAMARA NACIONAL DE LA INDUSTRIA ELECTRONICA, DE TELECOMUNICACIONES E INFORMATICA

Laboratorio Valentín V. Rivero

México D.F. a 16 de octubre de 2006.

LESLIE BAI
DIRECTOR OF CERTIFICATION
SIEMIC LABORATORIES, INC.
ACCESSING GLOBAL MARKETS
P R E S E N T E

En contestación a su escrito de fecha 5 de septiembre del año en curso, le comento que estamos muy interesados en su intención de firmar un Acuerdo de Reconocimiento Mutuo, para lo cual adjunto a este escrito encontrara el Acuerdo en idioma ingles y español prellenado de los cuales le pido sea revisado y en su caso corregido, para que si esta de acuerdo poder firmarlo para mandarlo con las autoridades Mexicanas para su visto bueno y así poder ejercer dicho acuerdo.

Aprovecho este escrito para mencionarle que nuestro intermediario gestor será la empresa Isabel de México, S. A. de C. V., empresa que ha colaborado durante mucho tiempo con nosotros en lo relacionado a la evaluación de la conformidad y que cuenta con amplia experiencia en la gestoría de la certificación de cumplimiento con Normas Oficiales Mexicanas de producto en México.

Me despido de usted enviándole un cordial saludo y esperando sus comentarios al Acuerdo que nos ocupa.

Atentamente:

Ing. Faustino Gómez González
Gerente Técnico del Laboratorio de CANIETI.

Culiacán 71
Hipódromo Condesa
06100 México, D.F.
Tel. 5264-0305 con 12 líneas
Fax 5264-0306
www.canieti.org

SIEMIC ACCREDITATION DETAILS: Hong Kong OFTA Recognition No. D23/16V

OFTA
電訊管理局

Your Ref 來函檔號： D23/16 V
Our Ref 本局檔號：

Telephone 電話： (852) 2961 6320
Fax No 圖文傳真： (852) 2838 5004
E-mail 電郵地址：

20 July 2005

Mr. Leslie Bai
Director of Certification,
SIEMIC Laboratories
2206 Ringwood Avenue
San Jose, California 95131
USA

Dear Mr. Bai,

Application of Recognised Testing Agency (RTA)

Referring your submission of 28 June 2005 in relation to the application of RTA, I am pleased to inform you that OFTA has appointed SIEMIC Laboratories (SIEMIC) as a Recognised Testing Agency (RTA) :

Please note that, under the Hong Kong Telecommunications Equipment Evaluation and Certification (HKTEC) Scheme, SIEMIC is authorized to conduct evaluation tests on telecommunications equipment against the following HKTA specifications :

Scope of recognition (HKTA Specifications) :
1001, 1002, 1004, 1006, 1007, 1008
1010, 1015, 1016
1022, 1026, 1027, 1029
1030, 1031, 1032, 1033, 1034, 1035, 1039
1041, 1042, 1043, 1045, 1047, 1048
2001

You are requested to refer to and comply with the code of practice and guidelines for RTA as given in the Information Note OFTA I 411 "Recognised Testing Agency (RTA) for Conducting Evaluation Test of Telecommunications Equipment", which can be downloaded from OFTA's homepage at http://www.ofta.gov.hk/tec/information-notes.html.

If you have any queries, please do not hesitate to contact me.

Yours sincerely,

(K K Sin)
for Director-General
of Telecommunications

Office of the Telecommunications Authority
29/F Wu Chung House 213 Queen's Road East Wan Chai Hong Kong
電 訊 管 理 局
香港灣仔皇后大道東 213 號胡忠大廈 29 字樓
http://www.ofta.gov.hk

SIEMIC ACCREDITATION DETAILS: Hong Kong OFTA ID: US0160

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-

December 8, 2008

Mr. Leslie Bai
SIEMIC, Inc.
2206 Ringwood Avenue
San Jose, CA 95131

Dear Mr. Bai:

NIST is pleased to inform you that your laboratory has been recognized by the Office of the Telecommunications Authority (OFTA) under the Asia Pacific Economic Cooperation for Telecommunications Equipment Mutual Recognition Arrangement (APEC Tel MRA). Your laboratory is now designated to act as a Conformity Assessment Body (CAB) under Appendix B, **Phase I** Procedures, of the APEC Tel MRA. The pertinent information about your laboratory's designation is as follows:

CAB Name:	SIEMIC, Inc.
Physical Location:	2206 Ringwood Avenue, San Jose, California 95131 USA
Identification No.:	US0160
Recognized Scope:	**Radio:** HKTA 1002, 1007, 1008, 1010, 1015, 1016, 1020, 1022, 1026, 1027, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1039, 1041, 1042, 1043, 1044, 1046, 1047, 1048, 1049, 1051 **Telecom:** HKTA 2011, 2012, 2013, 2014, 2017, 2018, 2022, 2024, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033

You may submit test data to OFTA to verify that the equipment to be imported into Hong Kong satisfies the applicable requirements. The designation of your organization will remain in force as long as its accreditation for the designated scope remains valid and comply with the designation requirements.

Recognized CABs are listed on the NIST website at http://ts.nist.gov/mra. If you have any questions please contact Ramona Saar at (301) 975-5521 or ramona.saar@nist.gov.

Sincerely,

David F. Alderman

David F. Alderman
Group Leader, Standards Coordination and Conformity Group
Standards Services Division

Enclosure

cc: Ramona Saar

NIST

SIEMIC ACCREDITATION DETAILS: Australia NATA Recognition

Leslie Bai
SIEMIC, Inc.
2206 Ringwood Avenue
San Jose, CA 95131

November 4, 2008

Under Australian government legislation, the Australian Communications and Media Authority (ACMA) has determined the National Association of Testing Authorities, Australia (NATA) as an accreditation body as per Section 409(1) of the Telecommunications Act 1997 (Cth). Pursuant to Section 409(2) of the Telecommunications Act 1997 (Cth), I am pleased to advise that your laboratory has been determined as a Recognised Testing Authority (RTA).

This determination has been made on the basis of your accreditation by A2LA accreditation no. 2742.01 and the Mutual Recognition Agreement between NATA and A2LA. It is effective from 11 July 2008. RTA status applies only to the following standards and is contingent upon their continued inclusion in your laboratory's scope of accreditation.

AS/ACIF S002, AS/ACIF S003, AS/ACIF S004,
AS/ACIF S006, AS/ACIF S016, AS/ACIF S031,
AS/ACIF S038, AS/ACIF S041 and
AS/ACIF S043.2

As an RTA, your laboratory has the following obligations:
1. the laboratory shall continue to meet all of the accreditation criteria of A2LA;
2. the authorised representative of the laboratory shall notify NATA of changes to the staff or operations of the laboratory which would affect the performance of the tests for which the laboratory has been determined;
3. compliance of equipment shall be reported on test reports bearing the A2LA logo/endorsement.

Current information on the Australian Communications and Media Authority and regulatory requirements for telecommunications products within Australia can be obtained from the ACMA's web-site at "http://www.acma.gov.au". Further information about NATA may be gained by visiting "http://www.nata.asn.au".

Please note that AS/ACIF S040 and New Zealand standards do not form part of the RTA scheme.

Your RTA listing will appear on the NATA website shortly.

Kind Regards

Chris Norton,
Senior Scientific Officer
Measurement Science and Technology
National Association of Testing Authorities (NATA)
71-73 Flemington Road
North Melbourne Vic 3051
Australia
Ph: +61 3 9329 1633 Fx: +61 3 9326 5148
E-Mail: Christopher.Norton@nata.asn.au
Internet: www.nata.asn.au

CONTENTS

1 Executive Summary & EUT information

The purpose of this test programme was to demonstrate compliance of the Two-way Motorcycle Alarm System against the current Stipulated Standards. The Two-way Motorcycle Alarm System has demonstrated compliance with the 47 CFR FCC Part 15.231.

EUT Information

EUT Description	The TW-1000 is a Motorcycle security system based on the ATA5812 Transceiver chip and a microprocessor controller. The whole system consists of the Brain unit and antenna, a sensitivity adjustment module, an LED, a piezoelectric siren module that mounts on the motorcycle and a Remote Control.
EUT Operational Description	When the system works, the Remote Control will send a signal to the Brian Unit, such as Arm, Disarm, Remote engine start and so on. Also the Brain Unit can send a signal to the Remote Control, such as Shocking warning, it means when the Brain Unit is triggered by shocking, to remind the owner ,the Remote Control will beep for 5 times ,then it will be vibrating with blinking of icons(shock and headlight icon).
Model No	TW-1000
Serial No	N/A
Classification Per Stipulated Test Standard	Motorcycle Alarm System

Specification	the Brain Unit	the Remote Control
Emission Frequency(MHz)	433.92±0.005	433.92±0.005
Input Voltage(V)	12±3	1.1-1.6
Emission Current(mA)	180	130
Output Power(mW)	5	0.3
Frequency Tolerance(KHz)	⩽20	⩽20
Receive Frequency(MHz)	433.92	433.92
Receive Current(mA)	18	18
Receive sensitivity(dB)	-105	-105
Static Current	⩽6mA	⩽100uA
Siren Volume(dB)	110-125	N/A

2 TECHNICAL DETAILS

Purpose	**Compliance testing of Two-way Motorcycle Alarm System with stipulated standard**
Applicant / Client	**InterNatrix, LLC.**
Manufacturer	**InterNatrix, LLC.**
Laboratory performing the tests	**SIEMIC Nanjing (China) Laboratories, 2-1 Longcang Avenue, Yuhua Economic and Technology Development Zone Tel:(86)(25)86730128**
Test report reference number	**SL08112010-ITX-001**
Date EUT received	**16 Dec 2008**
Standard applied	**See page 2**
Dates of test (from – to)	**16 Dec 2008 to 9 Jan 2009**
Equipment Category:	**Motorcycle Alarm**
Trade Name:	**InterNatrix, LLC.**
Microprocessor (s)	**unidentified**
Modulation:	**FSK**
FCC ID:	**WW6TW-1000**

3 MODIFICATION

NONE

4 TEST SUMMARY

The product was tested in accordance with the following specifications. All Testing has been performed according to below product classification.

Motorcycle Alarm System

Test Results Summary

Test standard	Description	Pass/Fail	
47 CFR Part 15 :2008		Remote Control	Brain Unit
15.203	Antenna Requirement	Pass	Pass
15.231c	Bandwidth	Pass	Pass
15.231b	Radiated Emission	Pass	Pass
15.207c	Conducted Emission	N/A	N/A
PS: All measurement uncertainties are not taken into consideration for all presented test result.			

5 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

5.1 Antenna Requirement

Standard Requirements: 47 CFR §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.

Antenna requirement must meet at least one of the following:

a) Antenna must be permanently attached to the device.

b) Antenna must use a unique type of connector to attach to the device.

c) Device must be professionally installed. Installer shall be responsible for ensuring that the correct antenna is employed with the device.

Both the Remote Control antenna and the Brain Unit antenna are permanently attached to the device.

5.2 Bandwidth

1. The Transmitter bandwidth measurements were performed in a shielded chamber.

2. Radiated Emissions Measurement Uncertainty.
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence factor level of approximately 95 %(in the case where distributions are normal), with coverage factor of 2, in the range 30MHz-40GHz is ±1.5dB.

3. Environmental Conditions

Temperature	23℃-25℃
Relative Humidity	50%
Atmospheric Pressure	1019mbar

4. Test Date: 29 Dec 2008
   Tested BY: Tom Tang

Standard Requirements: 47 CFR §15.231c

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Procedures:

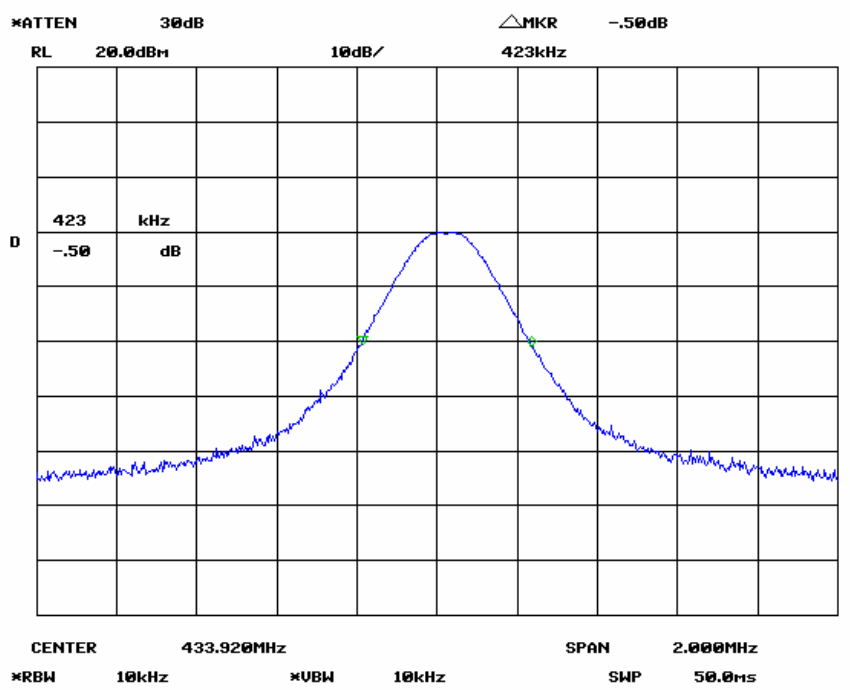
The EUT was placed on top of a 0.8m high, non-metallic table and an isotropic field probe was used at a distance about 3m for receiving. The spectrum analyzer was connected to the isotropic field probe terminal. While testing, EUT was set to transmit continuously. The resolution bandwidth of the spectrum analyzer was set to 10 KHz. The detector function was set to peak and hold mode to clearly observe the components.

Test Result:

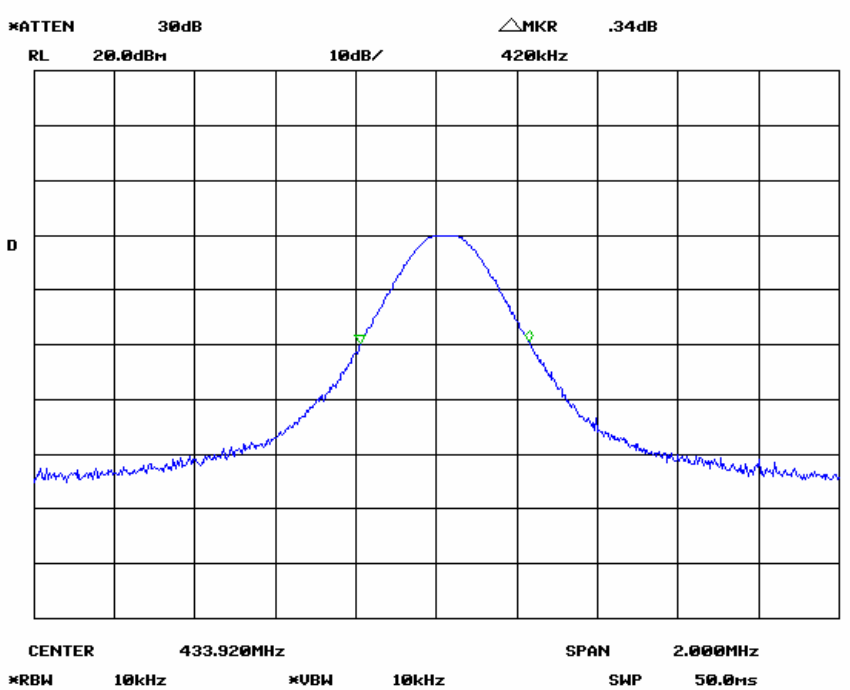
EUT	Permitted Maximum Bandwidth(KHz)	Bandwidth Measurement(KHz)
Remote Control	1084.8	423
Brain Unit	1084.8	420

Test Graphs:

The Bandwidth Plot for Remote Control



The Bandwidth plot for Brain Unit



5.3 Radiated Emission

5.3.1 Radiated Emission < 1GHz

1 All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.

2 A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.

3 Radiated Emissions Measurement Uncertainty
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 1GHz (QP only @ 3m & 10m) is +5.6dB/-4.5dB (for EUTs < 0.5m X 0.5m X 0.5m).

4 Environmental Conditions

Temperature	23℃-25℃
Relative Humidity	50%
Atmospheric Pressure	1019mbar

5

Test Date:	29 Dec 2008
Tested BY:	Tom Tang

Standard Requirements: 47 CFR §15.231b

Procedures: Equipment was setup in a semi-anechoic chamber. Radiated emissions were measured according to ANSI C63.4. The EUT was set to transmitting mode.
The EUT should set to three orientations (EUT Orthogonal Axes: X denotes Laid on Table; Y denotes Vertical Stand; Z denotes Side Stand).

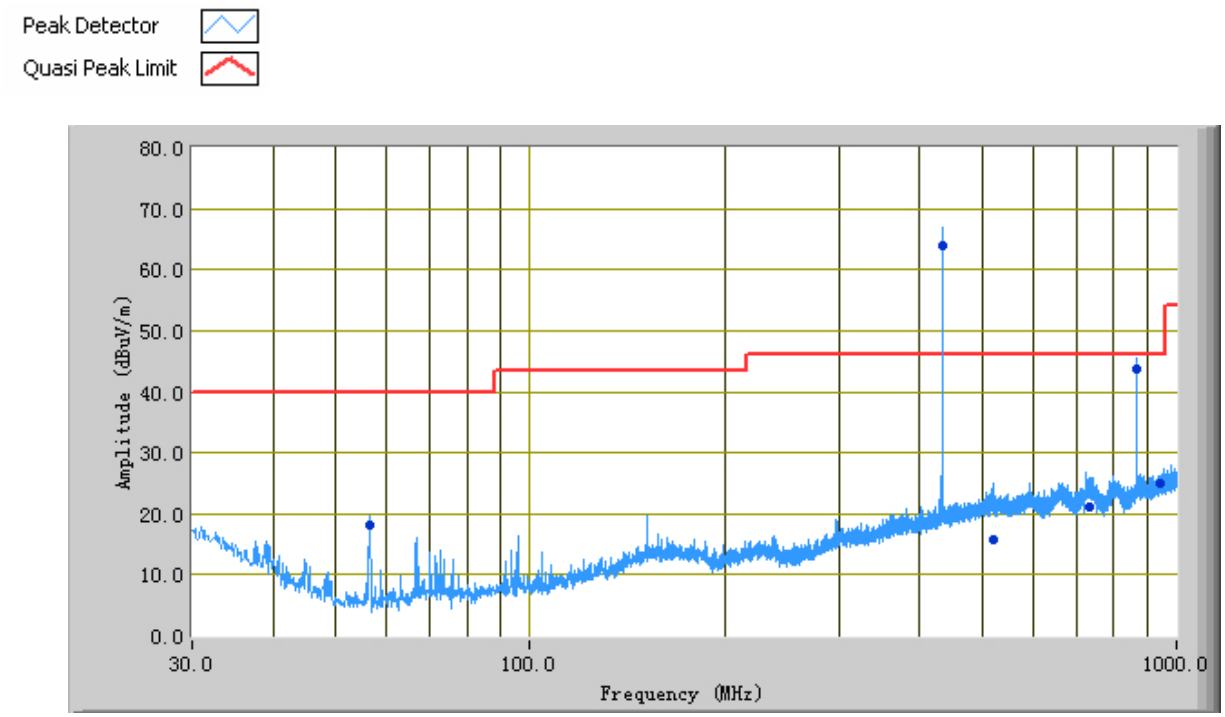
The limit is converted from microvolts/meter to decibel microvolts/meter.

Sample Calculation: Corrected Amplitude = Raw Amplitude (dBμV/m) + ACF (dB) + Cable Loss (dB)

Test Result:

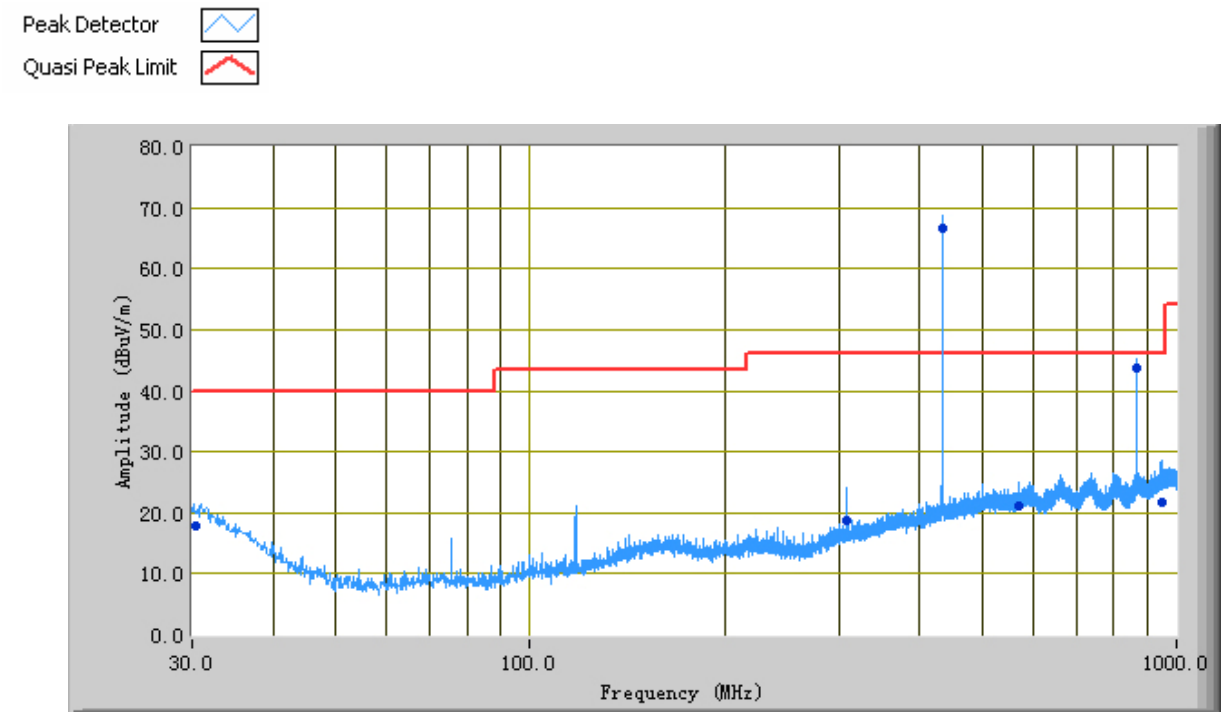
Radiated Emission Plot for Remote Control (X-axis)

In the three orientations, EUT set to X-axis is the worst case.



Test Data

Frequency (MHz)	Quasi Peak (dBuV/m)	Azimuth	Polarity(H /V)	Height (cm)	Factors (dB)	Limit (dBuV/m)	Margin (dB)
433.88	63.99	218.80	V	100.00	-28.76	80.80	-16.81
867.84	43.08	203.30	V	101.00	-22.87	46.00	-2.92
957.32	25.33	352.20	V	400.00	-21.54	46.00	-20.67
722.58	20.66	351.10	V	354.00	-24.02	46.00	-25.34
57.69	19.10	81.30	V	100.00	-22.74	46.00	-26.90
518.95	16.80	39.20	V	224.00	-21.68	46.00	-29.20

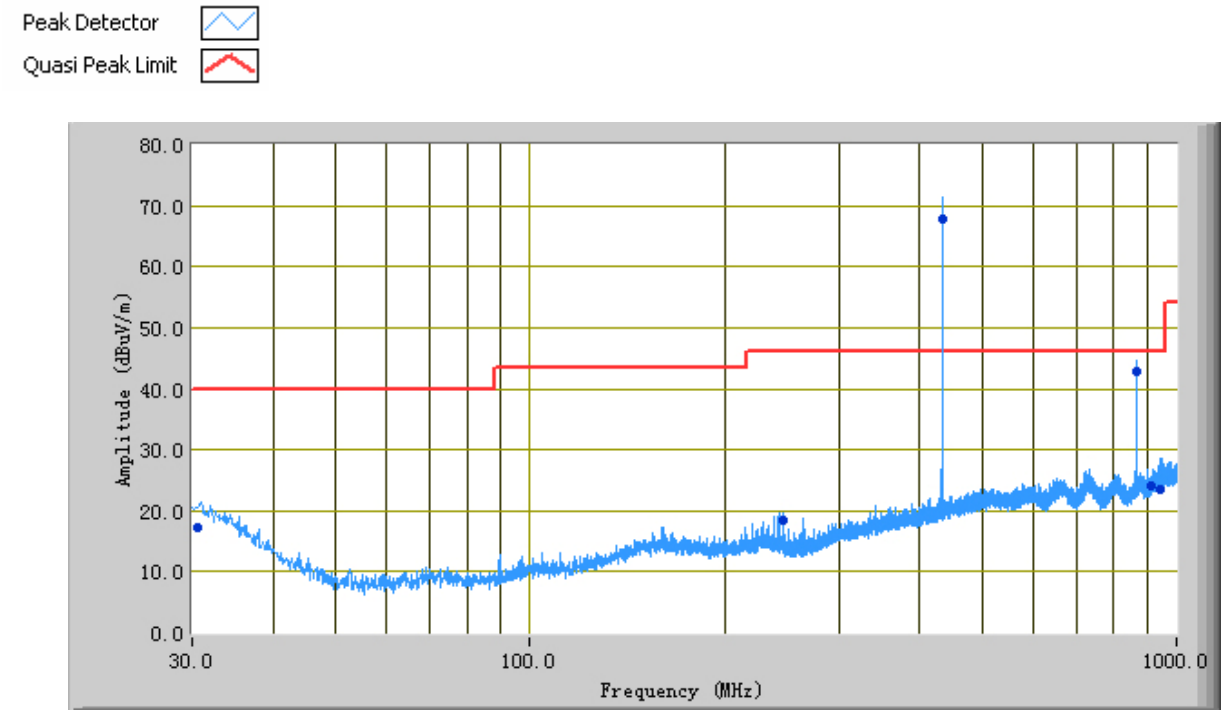


Test Data

Frequency (MHz)	Quasi Peak (dBuV/m)	Azimuth	Polarity(H /V)	Height (cm)	Factors (dB)	Limit (dBuV/m)	Margin (dB)
434.00	67.19	349.80	H	105.00	-28.75	80.80	-13.61
867.96	43.32	13.00	H	110.00	-22.87	46.00	-2.68
947.98	21.63	280.90	H	253.00	-21.70	46.00	-24.37
30.12	18.37	245.10	H	178.00	-25.38	40.00	-21.63
308.02	19.13	345.80	H	142.00	-21.52	46.00	-26.87
577.71	20.81	291.30	H	304.00	-21.82	46.00	-25.19

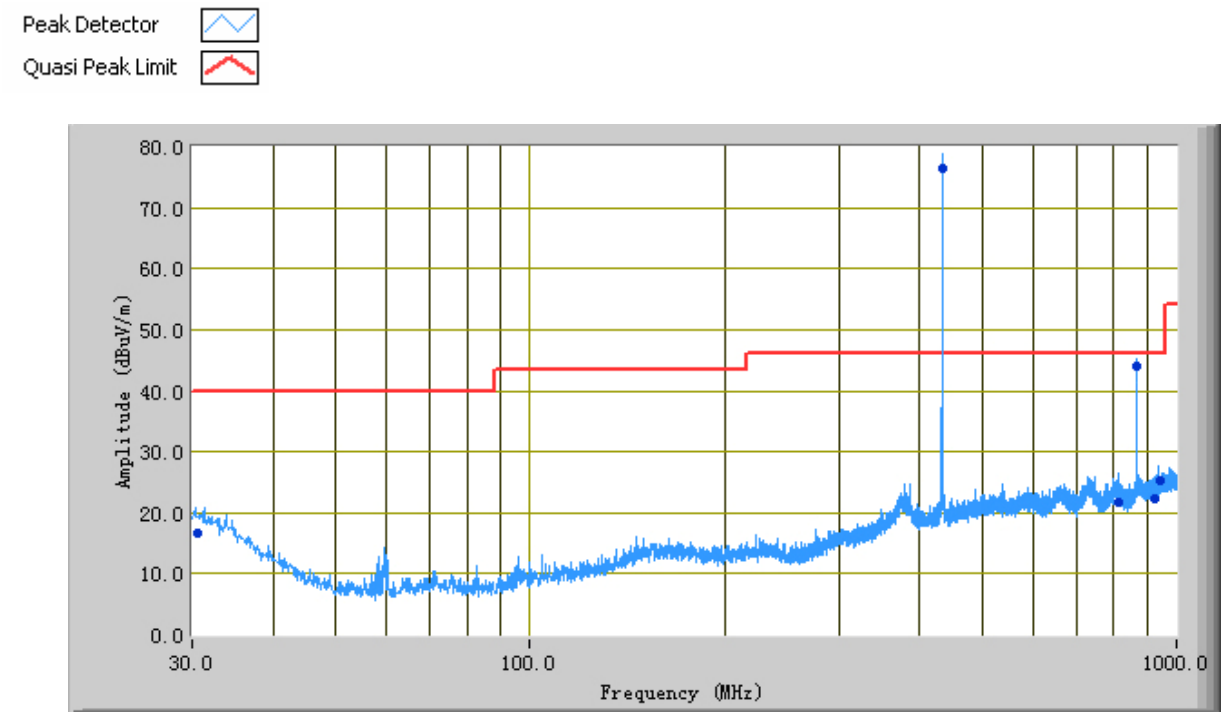
Radiated Emission Plot for Brain Unit (X-axis)

In the three orientations, EUT set to X-axis is the worst case.



Test Data

Frequency (MHz)	Quasi Peak (dBuV/m)	Azimuth	Polarity(H /V)	Height (cm)	Factors (dB)	Limit (dBuV/m)	Margin (dB)
434.00	68.28	324.20	V	100.00	-28.75	80.80	-12.52
867.96	43.36	6.50	V	112.00	-22.87	46.00	-2.64
912.98	24.53	90.60	V	340.00	-21.70	46.00	-21.47
953.80	23.65	143.50	V	155.00	-21.60	46.00	-22.35
30.97	17.51	87.50	V	180.00	-25.99	40.00	-22.49
251.68	19.32	321.20	V	216.00	-21.80	46.00	-26.68



Test Data

Frequency (MHz)	Quasi Peak (dBuV/m)	Azimuth	Polarity(H /V)	Height (cm)	Factors (dB)	Limit (dBuV/m)	Margin (dB)
433.88	76.37	93.50	H	121.00	-28.76	80.80	-4.43
867.84	44.05	98.00	H	114.00	-22.87	46.00	-1.95
923.59	23.57	265.80	H	300.00	-21.89	46.00	-22.43
30.86	17.27	252.20	H	244.00	-25.55	40.00	-22.73
814.00	22.57	286.70	H	137.00	-23.50	46.00	-23.43
948.71	25.86	325.60	H	176.00	-21.62	46.00	-20.14

5.3.2 Radiated Emission> 1GHz & Band Edge

1 All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.

2 A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.

3 Radiated Emissions Measurement Uncertainty
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 1GHz – 40GHz (QP only @ 3m & 10m) is +5.6dB/-4.5dB (for EUTs < 0.5m X 0.5m X 0.5m).

4 Environmental Conditions

Temperature	23℃-25℃
Relative Humidity	50%
Atmospheric Pressure	1019mbar

5 Test Date: 29 Dec 2008
Tested BY: Tom Tang

Standard Requirements: 47 CFR §15.231b

Procedures: Equipment was setup in a semi-anechoic chamber. For measurements above 1 GHz a peak measurement was taken with a 1MHz video bandwidth. The EUT was tested at transmitting mode. Investigated up to 10th harmonic of the operating frequency.
The EUT should set to three orientations (EUT Orthogonal Axes: X denotes Laid on Table; Y denotes Vertical Stand; Z denotes Side Stand).

Sample Calculation:

EUT Field Strength = Raw Amplitude (dBμV/m) – Amplifier Gain (dB) + Antenna Factor (dB) + Cable Loss (dB) + Filter Attenuation (dB, if used)

Average= EUT Field Strength + Duty Cycle Factor

Test Result:

Radiated Emission Plot for Remote Control (X-axis)

In the three orientations, EUT set to X-axis is the worst case.

The Peak Value:

Frequency (MHz)	Reading (dBuV/m)	Azimuth (Degrees)	Antenna Polarity (H/V)	Height (cm)	Antenna Loss	Cable loss(dB)	Amplifier (dB)	Corrected Reading (dBuV/m)	Limit @ 3m (dBuV/m)	Margin (dBuV/m)	Detector
1301	56.76	0	V	100	25.2	1.82	31.99	51.79	74	-22.21	Peak
1301	57.15	0	H	100	25.2	1.82	31.99	52.18	74	-21.82	Peak
1735	50.52	15	V	125	26.8	2.16	31.98	47.50	74	-26.50	Peak
1735	51.38	15	H	125	26.8	2.16	31.98	48.36	74	-25.64	Peak
2169	50.33	350	V	100	27.4	2.44	32.08	48.09	74	-25.91	Peak
2169	50.10	350	H	100	27.4	2.44	32.08	47.86	74	-26.14	Peak
2603	48.29	5	V	120	28.8	2.72	32.14	47.67	74	-26.33	Peak
2603	49.64	5	H	120	28.8	2.72	32.14	49.02	74	-24.98	Peak
3037	40.39	0	V	155	31.6	2.94	32.22	42.71	74	-31.29	Peak
3037	41.15	0	H	155	31.6	2.94	32.22	43.47	74	-30.53	Peak
3471	38.15	342	V	125	31.9	3.32.	32.30	41.07	74	-32.93	Peak
3471	38.68	342	H	125	31.9	3.32	32.30	41.60	74	-32.40	Peak
3905	37.52	53	V	225	32.5	3.68	32.35	41.35	74	-32.65	Peak
3905	38.11	53	H	225	32.5	3.68	32.35	41.94	74	-32.06	Peak
4339	37.62	12	V	150	33.0	3.96	32.49	42.09	74	-31.91	Peak
4339	37.96	12	H	150	33.0	3.96	32.49	42.43	74	-31.57	Peak

The Average Value:

Frequency (MHz)	Peak (dBuV/m)	Azimuth (Degrees)	Antenna Polarity (H/V)	Height (cm)	Duty Cycle Factor (dB)	Corrected Reading (dBuV/m)	Limit @ 3m (dBuV/m)	Margin (dBuV/m)
1301	51.79	0	V	100	0	51.79	54	-2.21
1301	52.18	0	H	100	0	52.18	54	-1.82
1735	47.50	15	V	125	0	47.50	54	-6.50
1735	48.36	15	H	125	0	48.36	54	-5.64
2169	48.09	350	V	100	0	48.09	54	-5.91
2169	47.86	350	H	100	0	47.86	54	-6.14
2603	47.67	5	V	120	0	47.67	54	-6.33
2603	49.02	5	H	120	0	49.02	54	-4.98
3037	42.71	0	V	155	0	42.71	54	-11.29
3037	43.47	0	H	155	0	43.47	54	-10.53
3471	41.07	342	V	125	0	41.07	54	-12.93
3471	41.60	342	H	125	0	41.60	54	-12.40
3905	41.35	53	V	225	0	41.35	54	-12.65
3905	41.94	53	H	225	0	41.94	54	-12.06
4339	42.09	12	V	150	0	42.09	54	-11.91
4339	42.43	12	H	150	0	42.43	54	-11.57

Radiated Emission Plot for Brain Unit (X-axis)

In the three orientations, EUT set to X-axis is the worst case.

The Peak Value:

Frequency (MHz)	Reading (dBuV/m)	Azimuth (Degrees)	Antenna Polarity (H/V)	Height (cm)	Antenna Loss	Cable loss(dB)	Amplifier (dB)	Corrected Reading (dBuV/m)	Limit @ 3m (dBuV/m)	Margin (dBuV/m)	Detector
1301	52.32	8	V	125	25.2	1.82	31.99	47.35	74	-26.65	Peak
1301	53.17	8	H	125	25.2	1.82	31.99	48.20	74	-25.80	Peak
1735	50.58	30	V	110	26.8	2.16	31.98	47.56	74	-26.44	Peak
1735	51.44	30	H	110	26.8	2.16	31.98	48.42	74	-25.58	Peak
2169	47.26	352	V	200	27.4	2.44	32.08	45.05	74	-28.95	Peak
2169	48.17	352	H	200	27.4	2.44	32.08	45.93	74	-28.07	Peak
2603	41.19	17	V	155	28.8	2.72	32.14	40.57	74	-33.43	Peak
2603	42.61	17	H	155	28.8	2.72	32.14	41.99	74	-32.01	Peak
3037	43.10	0	V	125	31.6	2.94	32.22	45.42	74	-28.58	Peak
3037	43.88	0	H	125	31.6	2.94	32.22	46.20	74	-27.80	Peak
3471	36.49	330	V	100	31.9	3.32.	32.30	39.41	74	-34.59	Peak
3471	36.63	330	H	100	31.9	3.32	32.30	39.55	74	-34.45	Peak
3905	36.59	360	V	115	32.5	3.68	32.35	40.42	74	-33.58	Peak
3905	37.42	360	H	115	32.5	3.68	32.35	41.25	74	-32.75	Peak
4339	35.25	52	V	125	33.0	3.96	32.49	39.72	74	-34.28	Peak
4339	35.93	52	H	125	33.0	3.96	32.49	40.40	74	-33.60	Peak

The Average Value:

Frequency (MHz)	Peak (dBuV/m)	Azimuth (Degrees)	Antenna Polarity (H/V)	Height (cm)	Duty Cycle Factor (dB)	Corrected Reading (dBuV/m)	Limit @ 3m (dBuV/m)	Margin (dBuV/m)
1301	47.35	8	V	125	0	47.35	54	-6.65
1301	48.20	8	H	125	0	48.20	54	-5.80
1735	47.56	30	V	110	0	47.56	54	-6.44
1735	48.42	30	H	110	0	48.42	54	-5.58
2169	45.05	352	V	200	0	45.05	54	-8.95
2169	45.93	352	H	200	0	45.93	54	-8.07
2603	40.57	17	V	155	0	40.57	54	-13.43
2603	41.99	17	H	155	0	41.99	54	-12.01
3037	45.42	0	V	125	0	45.42	54	-8.58
3037	46.20	0	H	125	0	46.20	54	-7.80
3471	39.41	330	V	100	0	39.41	54	-14.59
3471	39.55	330	H	100	0	39.55	54	-14.45
3905	40.42	360	V	115	0	40.42	54	-13.58
3905	41.25	360	H	115	0	41.25	54	-12.75
4339	39.72	52	V	125	0	39.72	54	-14.28
4339	40.40	52	H	125	0	40.40	54	-13.60

5.4 Conducted Emission

The EUT operates solely by the battery. According to the rule of Section 15.207c, the EUT exempt to the power line conducted test.

Standard Requirements: 47 CFR §15.207c

5.5 Transmitter Duty Cycle

1. The Transmitter Duty Cycle Measurement was performed in a shielded chamber. The EUT system was placed on a 0.8m high, non-metallic table and an isotropic field probe was used at a distance about 3m for receiving. While testing, EUT was set to transmit mode. Various key configurations were also investigated to find the maximum duty cycle. The spectrum analyzer was connected to the isotropic field probe terminal to measure the pulse width.

2. Radiated Emissions Measurement Uncertainty.
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence factor level of approximately 95 %(in the case where distributions are normal), with coverage factor of 2, in the range 30MHz-40GHz is ±1.5dB.

3. Environmental Conditions

Temperature	23℃-25℃
Relative Humidity	50%
Atmospheric Pressure	1019mbar

4 Test Date: 29 Dec 2008
Tested BY: Tom Tang

Standard Requirements: 47 CFR §15.35c

The radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

Procedures:

The spectrum analyzer resolution bandwidth and video bandwidth were set to 120 KHZ and 300 KHz to encompass all significant spectral components during the test. The analyzer was operated in linear scale and zero span modes after tuning to the Transmitter carrier frequency.

The duty cycle was determined by the following equation:

To calculate the actual field intensity, the duty cycle correction factor in decibel is needed for later use and can be obtained from following conversion:

Duty Cycle %=[(Total on Interval in a Complete Pulse Train)/ (Length of a Complete Pulse Train)] X100%

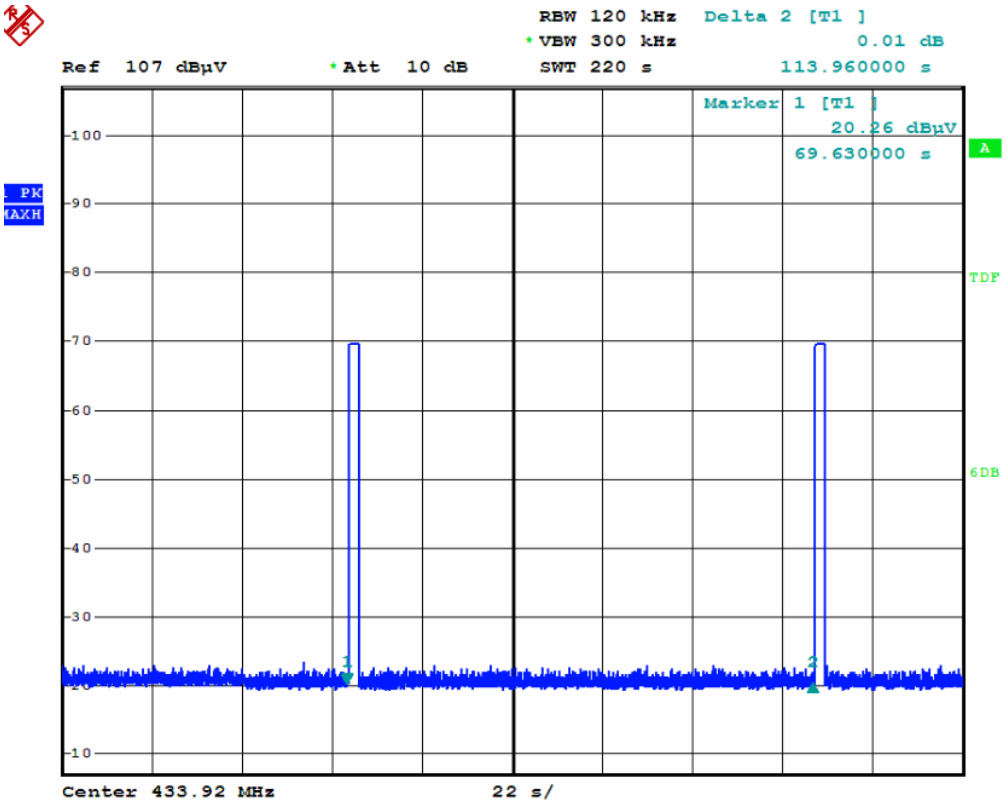
Duty Cycle Factor (dB) = 20 X Log10 (Duty Cycle %)

Test Result:

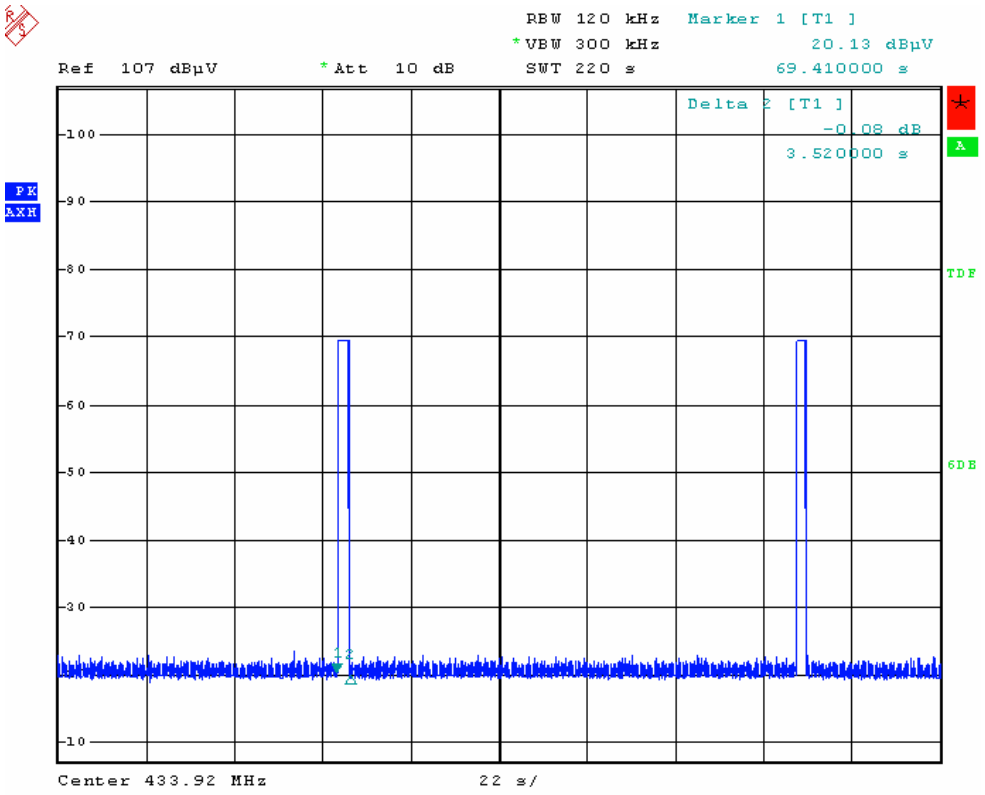
Total on interval in a complete pulse train	3.52s
Length of a complete pulse train	113.96s
Duty Cycle (%)	100%
Duty Cycle Factor (dB)	0

Test Graphs:

Length of a Complete Pulse Train



Total on interval in a complete pulse train



Annex A. TEST INSTRUMENT & METHOD

Annex A.i. TEST INSTRUMENTATION & GENERAL PROCEDURES

Instrument	Model	Serial #	Calibration Due
Bandwidth			
R&S EMI Test Receiver	ESIB 40	100179	04/25/2009
Amplifier	8447F	1937A01160	04/24/2009
SUNOL Science,Inc.antenna(30MHz~2GHz)	JB1	A03072	10/04/2009
Radiated Emissions			
R&S EMI Test Receiver	ESIB 40	100179	04/25/2009
Amplifier	8447F	1937A01160	04/24/2009
Pre-Amplifier(1 ~ 26GHz)	8449	N/A	04/24/2009
SUNOL Science,Inc.antenna(30MHz~2GHz)	JB1	A03072	10/04/2009
Horn Antenna	JXTXLB-10180	J2031081120092	10/04/2009
Spectrum Analyzer	8564E	3626A00557	04/26/2009

Annex A.ii. CONDUCTED EMISSIONS TEST DESCRIPTION

Test Set-up

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table, as shown in Annex B.

2. The power supply for the EUT was fed through a 50Ω/50μH EUT LISN, connected to filtered mains.

3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.

4. All other supporting equipments were powered separately from another main supply.

Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition.

2. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver.

3. High peaks, relative to the limit line, were then selected.

4. The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 KHz. For FCC tests, only Quasi-peak measurements were made; while for CISPR/EN tests, both Quasi-peak and Average measurements were made.

5. Steps 2 to 4 were then repeated for the LIVE line (for AC mains) or DC line (for DC power).

Sample Calculation Example

At 20 MHz limit = 250 μV = 47.96 dBμV

Transducer factor of LISN, pulse limiter & cable loss at 20 MHz = 11.20 dB

Q-P reading obtained directly from EMI Receiver = 40.00 dBμV
(Calibrated for system losses)

Therefore, Q-P margin = 47.96 – 40.00 = 7.96 i.e. **7.96 dB below limit**

Annex A. iii RADIATED EMISSIONS TEST DESCRIPTION

EUT Characterisation

EUT characterisation, over the frequency range from 30MHz to 10th harmonic, was done in order to minimise radiated emissions testing time while still maintaining high confidence in the test results.

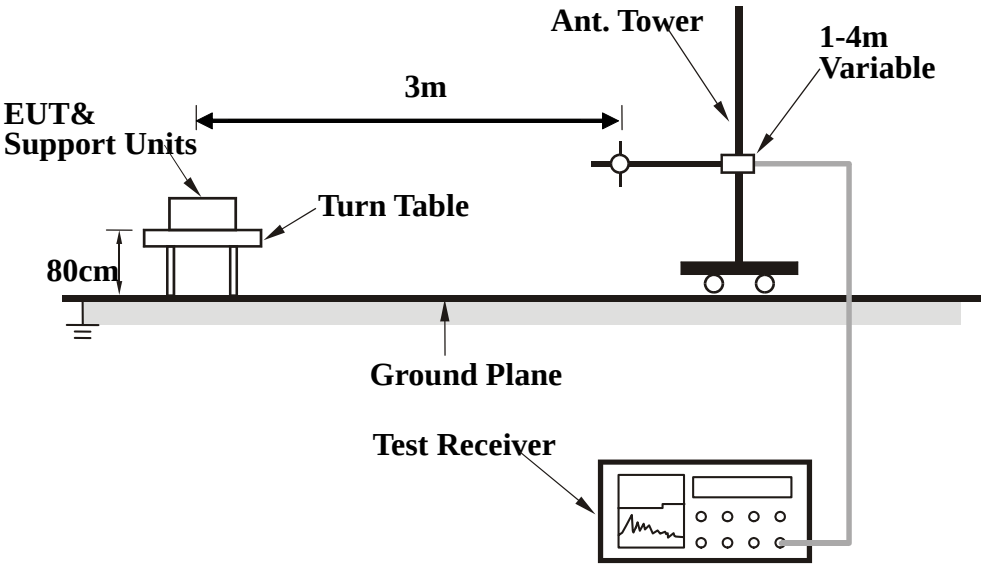
The EUT was placed in the chamber, at a height of about 0.8m on a turntable. Its radiated emissions frequency profile was observed, using a spectrum analyzer /receiver with the appropriate broadband antenna placed 3m away from the EUT.
Radiated emissions from the EUT were maximised by rotating the turntable manually, changing the antenna polarisation and manipulating the EUT cables while observing the frequency profile on the spectrum analyzer / receiver. Frequency points at which maximum emissions occurred; clock frequencies and operating frequencies were then noted for the formal radiated emissions test at the Open Area Test Site (OATS).

Test Set-up

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table as shown in Annex B.

2. The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.

3. The relevant broadband antenna was set at the required test distance away from the EUT and supporting equipment boundary.



Test Method

The following procedure was performed to determine the maximum emission axis of EUT:
1. With the receiving antenna is H polarization; rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
2. With the receiving antenna is V polarization; rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
3. Compare the results derived from above two steps. So, the axis of maximum emission from EUT was determined and the configuration was used to perform the final measurement.

Final Radiated Emission Measurement
1. Setup the configuration according to figure 1. Turn on EUT and make sure that it is in normal function.

2. For emission frequencies measured below 1 GHz, a pre-scan is performed in a shielded chamber to determine the accurate frequencies of higher emissions will be checked on an open test site. As the same purpose, for emission frequencies measured above 1 GHz, a pre-scan also be performed with a 1 meter measuring distance before final test.

3. For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 100 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.

4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0° to 360°with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading.

5. Repeat step 4 until all frequencies need to be measured were complete.

6. Repeat step 5 with search antenna in vertical polarized orientations.

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	Peak	100 kHz	100 kHz
Above 1000	Peak	1 MHz	1 MHz

Sample Calculation Example

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. For the limit is employed average value, therefore the peak value can be transferred to average value by subtracting the duty factor. The basic equation with a sample calculation is as follows:

Peak = Reading + Corrected Factor

Where
Corr. Factor = Antenna Factor + Cable Factor - Amplifier Gain (if any)
And the average value is

Average = Peak Value + Duty Cycle Factor

Note:
If the measured frequencies are fall in the restricted frequency band, the limit employed must be quasi peak value when frequencies are below or equal to 1 GHz. And the measuring instrument is set to quasi peak detector function.

Annex B EUT AND TEST SETUP PHOTOGRAPHS

Please see the attachment

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

EUT TEST CONDITIONS

Annex C. i. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Equipment Description (Including Brand Name)	Model & Serial Number	Cable Description (List Length, Type & Purpose)
N/A	N/A	N/A

Annex C.ii. EUT OPERATING CONDITIONS

The following is the description of how the EUT is exercised during testing.

Test	Description Of Operation
Bandwidth Testing	EUT is configured to transmit full power to simulate worst case.
Emissions Testing	EUT is configured to transmit full power to simulate worst case.
Other Testing	EUT is configured to transmit full power to simulate worst case.

Annex D USER MANUAL, BLOCK & CIRCUIT DIAGRAM

Please see attachment