

Shanghai Smarfid Security Equipment Co.,Ltd

Card Reader

Model: MW322

11 April, 2011


Report No.: 11020308-FCC-IC

(This report supersedes NONE)



Modifications made to the product : None

This Test Report is Issued Under the Authority of:

	
Peter Cai Test Engineer	Spring Zhou Technical Manager

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RF Test Report

T0: FCC Part 15.225: 2010, RSS-210 Issue 8 December 2010

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Country/Region	Accreditation Body	Scope
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Canada	IC, A2LA, NIST	EMC, RF/Wireless , Telecom
Taiwan	BSMI , NCC , NIST	EMC, RF, Telecom , Safety
Hong Kong	OFTA , NIST	RF/Wireless ,Telecom
Australia	NATA, NIST	EMC, RF, Telecom , Safety
Korea	KCC/RRA, NIST	EMI, EMS, RF , Telecom, Safety
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	Safety, EMC , RF/Wireless, Telecom
Europe	A2LA, NIST	EMC, RF, Telecom , Safety

Accreditations for Product Certifications

Country	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC , RF , Telecom
Canada	IC FCB , NIST	EMC , RF , Telecom
Singapore	iDA, NIST	EMC , RF , Telecom
EU	NB	EMC & R&TTE Directive

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1 Executive Summary & EUT information

The purpose of this test programme was to demonstrate compliance of the Shanghai Smarfid Security Equipment Co.,Ltd, Card Reader, and model: MW322 against the current Stipulated Standards. The Card Reader has demonstrated compliance with the FCC Part 15.225: 2010,RSS-210 Issue 8 December 2010.

EUT Information

EUT : Card Reader
Description
Model No : MW322 (Note)
Serial No : N/A
Input Power : Voltage:10-15Vdc, Current:70mA
Classification
Per Stipulated : Class B Emission Product
Test Standard

Note: Other model

MW522,MW382,MW523,MD523,MX523,FD523,MD322,MD522,MD382,MX322,MX522,
MX382, FD322,FD522 and FD382, only look different other identical.

2 TECHNICAL DETAILS

Purpose	Compliance testing of Card Reader with stipulated standard
Applicant / Client	Shanghai Smarfid Security Equipment Co.,Ltd Rm.206,4th Bldg,No.471 Guiping Road,Shanghai
Manufacturer	Shanghai Smarfid Security Equipment Co.,Ltd Rm.206,4th Bldg,No.471 Guiping Road,Shanghai
Laboratory performing the tests	SIEMIC Nanjing (China) Laboratories NO.2-1,Longcang Dadao, Yuhua Economic Development Zone, Nanjing, China Tel:+86(25)86730128/86730129 Fax:+86(25)86730127 Email:info@siemic.com
Test report reference number	11020308-FCC-IC
Date EUT received	28 March, 2011
Standard applied	FCC Part 15.225: 2010,RSS-210 Issue 8 December 2010
Dates of test (from – to)	31 March to 11 April, 2011
No of Units :	#1
Equipment Category :	DXT
Trade Name :	Vitto
Model :	MW322
RF Operating Frequency (ies) :	13.56MHz
Number of Channels :	1
Modulation :	N/A
FCC ID :	X3A-SMARFID
IC ID :	9237A-SMARFID

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:

Class B Emission Product

Test Results Summary

Test Standard		Description	Pass/Fail
FCC Part 15.225:2010	RSS-210 Issue 8 December 2010		
15.203		Antenna Requirement	Pass
15.207(a)	RSS Gen(7.2.2)	Conducted Emissions Voltage	N/A
15.225(a)	RSS210(A2.6)	Limit in the band of 13.553-13.567MHz	Pass
15.225(b)	RSS210(A2.6)	Limit in the band of 13.410-13.553MHz and 13.567-13.710MHz	Pass
15.225(c)	RSS210(A2.6)	Limit in the band of 13.110-13.410MHz	Pass
15.225(d),15.209	RSS210(A2.6)	Limit outside the band of 13.110-14.010MHz	Pass
15.225(e)	RSS210(A2.6)	Frequency Stability	Pass
	RSS210(5.9.1)	Occupied Bandwidth	Pass
	RSS-Gen(4.8)	Receiver Spurious Emissions	Pass

ANSI C63.4: 2009/RSS-Gen Issue 3 December 2010

PS: All measurement uncertainties are not taken into consideration for all presented test result.

5 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

5.1 Antenna Requirement

Requirement(s): 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.

The antenna is permanently attached to the device.

5.2 Conducted Emissions Voltage

Requirement:

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

*Decreases with the logarithm of the frequency.

Procedures:

1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR and Average 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. Conducted 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 9kHz – 30MHz (Average & Quasi-peak) is ±3.5dB.
4. Environmental Conditions Temperature 15°C
Relative Humidity 50%
Atmospheric Pressure 1019mbar
5. Test date : 8 April, 2011
Tested By : Peter Cai

Note: Not applicable

5.3 Radiated Emission <30MHz(9KHz – 30MHz,H-Field)

Requirement(s): 47 CFR § 15.225 & RSS-210(A2.6)

Procedures: For <30MHz, Radiated emissions were measured according to ANSIC63.4. The EUT was set to transmit at the highest output power. The EUT was set 10 meter away from the measuring antenna. The loop antenna was positioned 1 meter above the ground from the centre of the loop. The measuring bandwidth was set to 10KHz. (Note: During testing the receive antenna was rotated about its axis to maximize the emission from the EUT.)

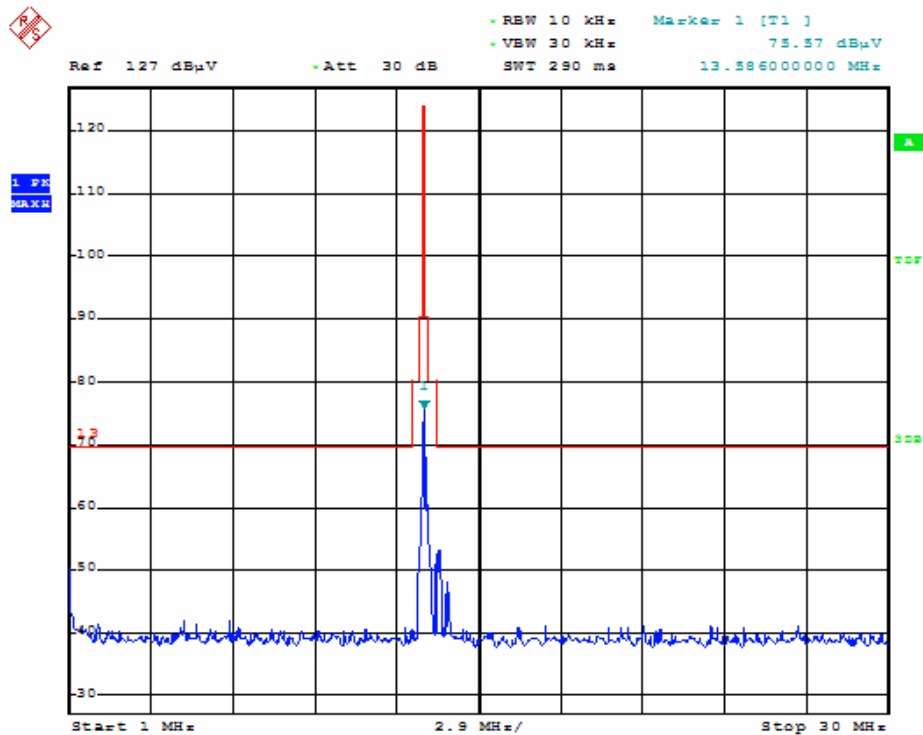
The limit is converted from microvolt/meter to decibel microvolt/meter.

Sample Calculation: Corrected Amplitude=Raw Amplitude(dBuV/m)+ACF(dB)+Cable Loss(dB)-Distance Correction Factor

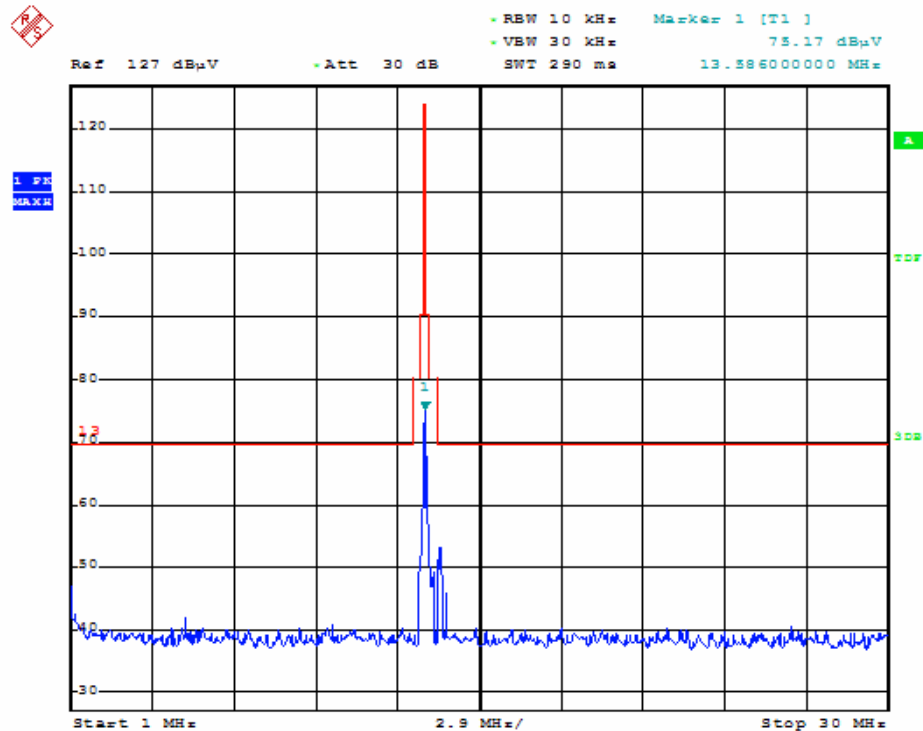
1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors are reported. All other emissions were relatively insignificant.
2. A “-ve” margin indicates a PASS as it refers to the margin present below the limit line at the particular 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, is +/-6dB.
4. Environmental Conditions Temperature 15°C
 Relative Humidity 50%
 Atmospheric Pressure 1019mbar
5. Test date : 8 April, 2011
Tested By : Peter Cai

The result: Pass

Loop Antenna Positioned at 0 degree



Loop Antenna Positioned at 90 degree



Note:

- (1) Emissions from 9KHz to 1MHz is very low under transmit mode so test data is not presented in this report.
- (2) Emissions from 9KHz to 30MHz is very low under receiver mode so test data is not presented in this report.

5.4 Radiated Emissions >30MHz(30MHz-1GHz,E-Field)

Requirement(s): 47 CFR § 15.209; 47 CFR § 15.225(d) & RSS-210(A2.6)


Procedures: For >30MHz, Radiated emissions were measured according to ANSIC63.4. The EUT was set to transmit at the highest output power. The EUT was set 10 meter away from the measuring antenna. The Log periodic antenna was positioned 1 meter above the ground from the centre of the antenna. The measuring bandwidth was set to 120KHz. (Note: During testing the receive antenna was raise from 1-4meters to maximize the emission from the EUT.)


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

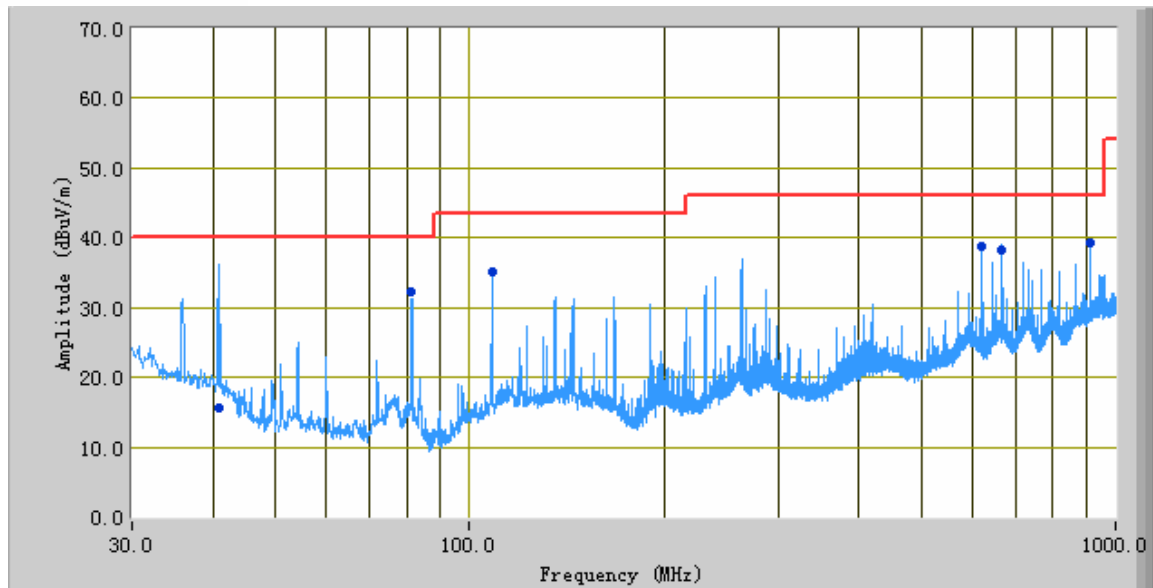
Sample Calculation: Corrected Amplitude=Raw Amplitude(dBuV/m)+ACF(dB)+Cable Loss(dB)-Distance Correction Factor

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, is +/-6dB.
4. Environmental Conditions Temperature 15°C
 Relative Humidity 50%
 Atmospheric Pressure 1019mbar
5. Test date : 8 April, 2011
Tested By : Peter Cai

The result: Pass


Peak Detector 


Quasi Peak Limit 

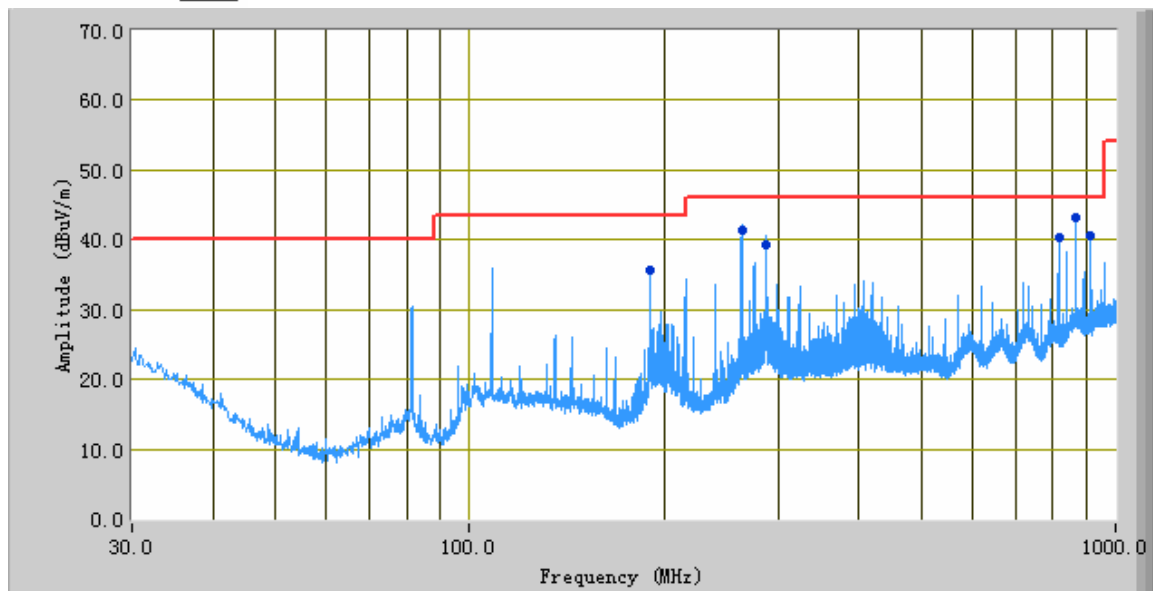


Test Data

Frequency (MHz)	Quasi Peak (dBuV/m)	Azimuth	Polarity(H /V)	Height (cm)	Factors (dB)	Limit (dBuV/m)	Margin (dB)
41.02	15.61	25.00	V	177.00	-30.28	40.00	-24.39
667.81	38.15	162.00	V	100.00	-22.18	46.00	-7.85
915.17	39.30	23.00	V	120.00	-17.61	46.00	-6.70
618.37	38.74	17.00	V	100.00	-23.15	46.00	-7.26
108.49	35.21	44.00	V	110.00	-32.32	43.50	-8.29
81.37	32.38	38.00	V	123.00	-37.74	40.00	-7.62

Peak Detector 

Quasi Peak Limit 



Test Data

Frequency (MHz)	Quasi Peak (dBuV/m)	Azimuth	Polarity(H/V)	Height (cm)	Factors (dB)	Limit (dBuV/m)	Margin (dB)
865.68	43.19	319.00	H	100.00	-18.58	46.00	-2.81
263.65	41.45	317.00	H	105.00	-28.08	46.00	-4.55
915.18	40.49	316.00	H	100.00	-18.65	46.00	-5.51
287.68	39.41	326.00	H	110.00	-27.14	46.00	-6.59
816.27	40.32	308.00	H	107.00	-20.39	46.00	-5.68
189.85	35.65	306.00	H	122.00	-32.23	43.50	-7.85

Note: Emissions were very low when EUT was under receiver mode from 30MHz to 1GHz, so test result is not presented in the report.

5.5 Frequency Stability

Requirement(s): 47 CFR § 15.225(e) & RSS-210(A2.6)

Procedures: Frequency Stability was measured according to 47 CFR § 2.1055. Measurement was taken with spectrum analyzer. The spectrum analyzer bandwidth and span was set to read in hertz. A voltmeter was used to monitor when varying the voltage.

Limit: $\pm 0.01\%$ of 13.56MHz=1356Hz

- | | | |
|------------------------------|----------------------|----------|
| 1. Environmental Conditions | Temperature | 18°C |
| | Relative Humidity | 50% |
| | Atmospheric Pressure | 1019mbar |
| 2. Test date : 8 April, 2011 | | |
| Tested By : Peter Cai | | |

The result: Pass

Frequency Stability versus Input Voltage: The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$, the frequency of the transmitter was measured at 85% and at 115% of the rated power supply voltage at 20°C environmental temperature.

Carrier Frequency: 13.56MHz at 18°C 0 minutes later

Measured Voltage $\pm 15\%$ of nominal (DC)	Measured Freq. (MHz)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
10.2	13.5607	700	<0.01	Pass
13.8	13.5608	800	<0.01	Pass

Carrier Frequency: 13.56MHz at 18°C 2 minutes later

Measured Voltage $\pm 15\%$ of nominal (DC)	Measured Freq. (MHz)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
10.2	13.5606	600	<0.01	Pass
13.8	13.5608	800	<0.01	Pass

Carrier Frequency: 13.56MHz at 18°C 5 minutes later

Measured Voltage $\pm 15\%$ of nominal (DC)	Measured Freq. (MHz)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
10.2	13.5607	700	<0.01	Pass
13.8	13.5607	700	<0.01	Pass

Carrier Frequency: 13.56MHz at 18°C 10 minutes later

Measured Voltage $\pm 15\%$ of nominal (DC)	Measured Freq. (MHz)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
10.2	13.5607	700	<0.01	Pass
13.8	13.5608	800	<0.01	Pass

Frequency Stability versus Temperature: The Frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20°C to $+50^{\circ}\text{C}$ at normal supply voltage.

Reference Frequency: 13.56MHz at -20°C to $+50^{\circ}\text{C}$ at 12Vdc 0 minutes later

Temperature (oC)	Measured Freq. (MHz)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
50	13.5610	1000	<0.01	Pass
40	13.5609	900	<0.01	Pass
30	13.5610	1000	<0.01	Pass
20	Reference			
10	13.5611	1100	<0.01	Pass
0	13.5608	800	<0.01	Pass
-10	13.5607	700	<0.01	Pass
-20	13.5608	800	<0.01	Pass

Reference Frequency: 13.56MHz at -20°C to $+50^{\circ}\text{C}$ at 12Vdc 2 minutes later

Temperature (oC)	Measured Freq. (MHz)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
50	13.5609	900	<0.01	Pass
40	13.5609	900	<0.01	Pass
30	13.5610	1000	<0.01	Pass
20	Reference			
10	13.5610	1000	<0.01	Pass
0	13.5608	800	<0.01	Pass
-10	13.5608	800	<0.01	Pass
-20	13.5609	900	<0.01	Pass

Reference Frequency: 13.56MHz at -20°C to $+50^{\circ}\text{C}$ at 12Vdc 5 minutes later

Temperature (oC)	Measured Freq. (MHz)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
50	13.5610	1000	<0.01	Pass
40	13.5610	1000	<0.01	Pass
30	13.5609	900	<0.01	Pass
20	Reference			
10	13.5610	1000	<0.01	Pass
0	13.5609	900	<0.01	Pass
-10	13.5609	900	<0.01	Pass
-20	13.5608	800	<0.01	Pass

Reference Frequency: 13.56MHz at -20°C to $+50^{\circ}\text{C}$ at 12Vdc 10 minutes later

Temperature (oC)	Measured Freq. (MHz)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
50	13.5608	800	<0.01	Pass
40	13.5607	700	<0.01	Pass
30	13.5607	700	<0.01	Pass
20	Reference			
10	13.5608	800	<0.01	Pass
0	13.5608	800	<0.01	Pass
-10	13.5607	700	<0.01	Pass
-20	13.5607	700	<0.01	Pass

5.6 Fundamental Field Strength Test Result

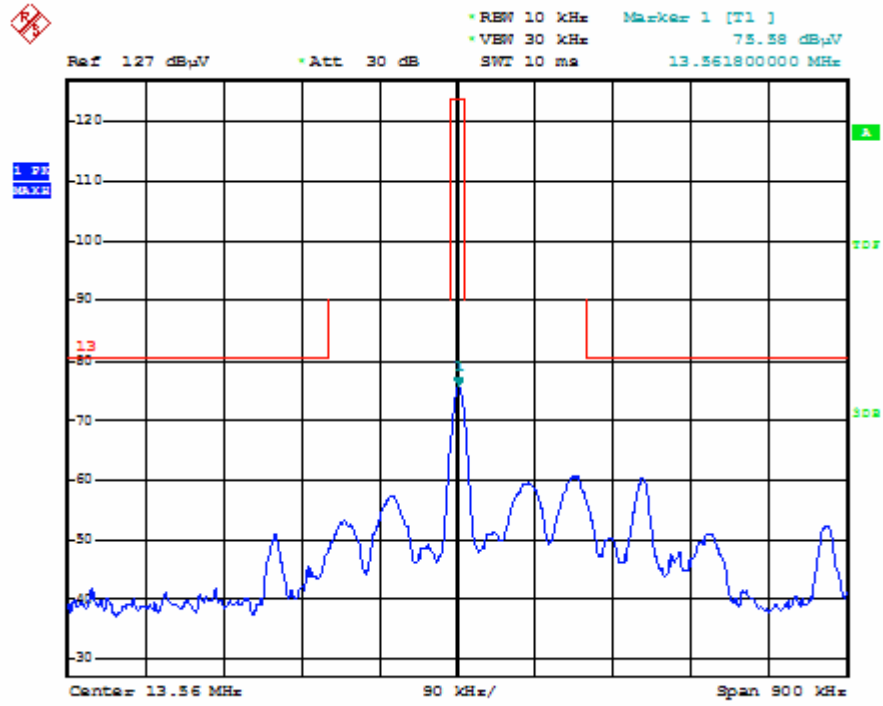
1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors are reported. All other emissions were relatively insignificant.
2. A “-ve” margin indicates a PASS as it refers to the margin present below the limit line at the particular 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, is +5.6/-4.5dB.
4. Environmental Conditions

Temperature	15°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar
5. Test date : 8 April, 2011
Tested By : Peter Cai

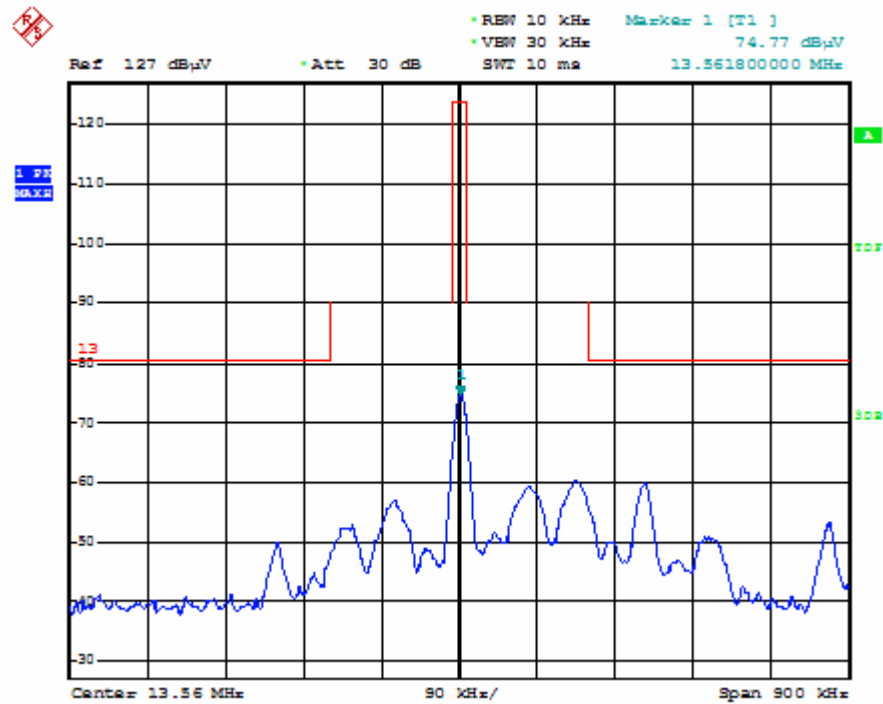
Test Requirement:

13.56MHz – The field strength of any emissions within allowed operating band shall not exceed 10mV/m at 30meters.

Loop Antenna Positioned at 0 degree



Loop Antenna Positioned at 90 degree



5.7 Occupied Bandwidth

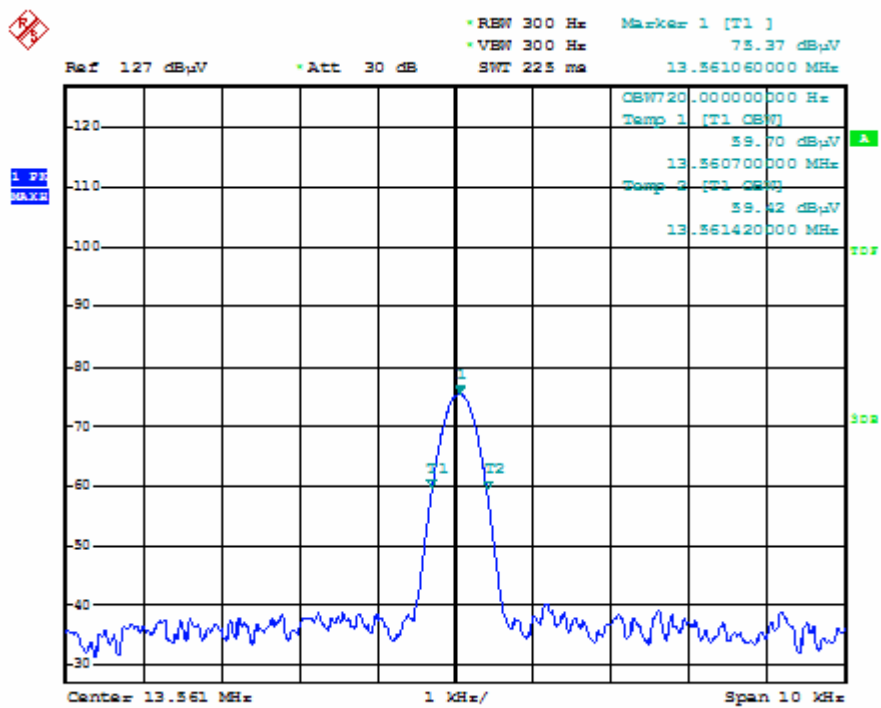
Requirement(s): RSS-210(5.9.1)

Procedures: Occupied Bandwidth was measured according to RSS-210(5.9.1). Measurement was taken with spectrum analyzer. The spectrum analyzer bandwidth and span was set to read in hertz.

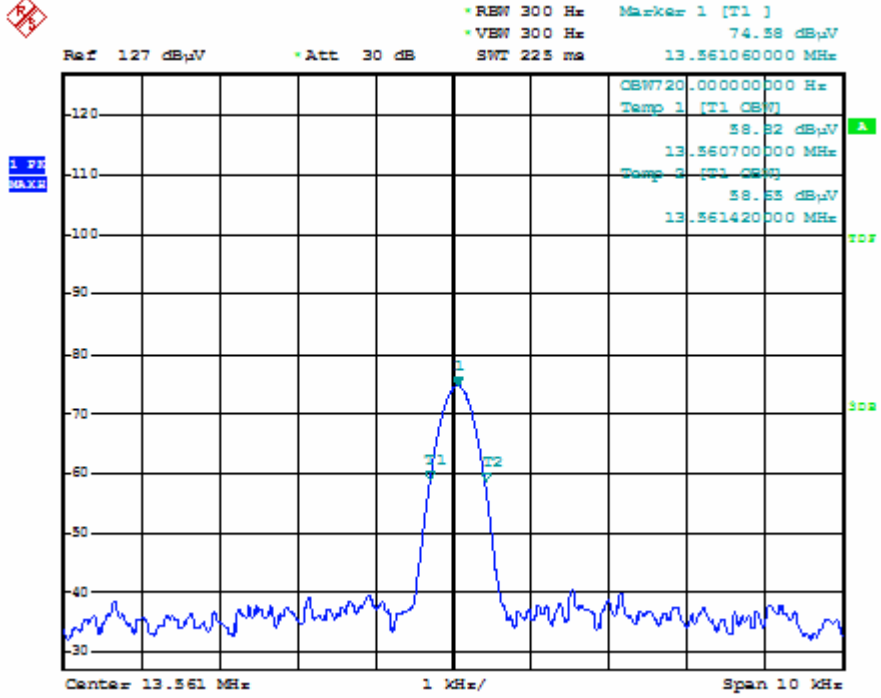
1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors are reported. All other emissions were relatively insignificant.
2. A “-ve” margin indicates a PASS as it refers to the margin present below the limit line at the particular 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, is +/-6dB.
4. Environmental Conditions Temperature 15°C
 Relative Humidity 50%
 Atmospheric Pressure 1019mbar
5. Test date : 8 April, 2011
Tested By : Peter Cai

Test Result: Pass

Loop Antenna Positioned at 0 degree



Loop Antenna Positioned at 90 degree



Annex A. TEST INSTRUMENT & METHOD

Annex A.i. TEST INSTRUMENTATION & GENERAL PROCEDURES

Instrument	Manufacturer	Model	CAL Due Date
Spectrum Analyzer	HP	8563 E	2012.01.10
EMI Receiver	Rohde & Schwarz	ESPI 3	2011.05.25
Passive Loop Antenna	EMCO	6509	2011.10.05
Antenna (30MHz~2GHz)	Sunol Sciences	JB1	2011.10.04
Horn Antenna (1~18GHz)	A-INFOMW	JXTXLB-10180	2011.06.24
Horn Antenna (1~18GHz)	ETS-Lindgren	3115	2011.10.03
Pre-Amplifier(0.01 ~ 1.3GHz)	HP	8447F	2011.05.25
Pre-Amplifier(0.1 ~ 18GHz)	MITEQ	AMF-7D-00101800-30- 10P	2011.05.25
Horn Antenna (18~40GHz)	Com Power	AH-840	2011.05.21
Microwave Pre-Amp (18~40GHz)	Com Power	PA-840	2011.05.21
RF POWER METER	BOONTON	4231A	2011.04.23
POWER SENSOR	BOONTON	51011-EMC	2011.04.23

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

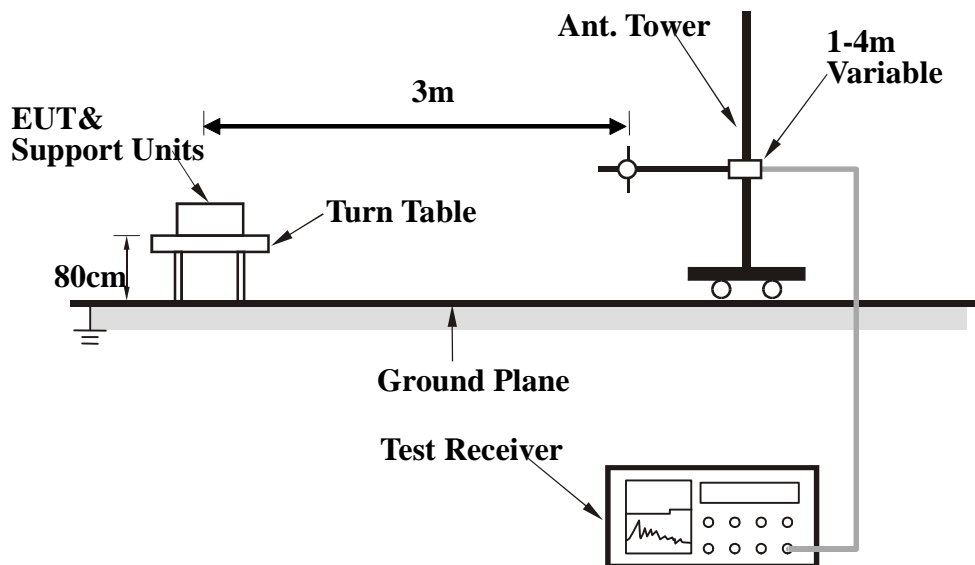
EUT Characterisation

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.
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 a 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
	Average	1 MHz	10 Hz

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:

$$\text{Peak} = \text{Reading} + \text{Corrected Factor}$$

where

Corr. Factor = Antenna Factor + Cable Factor - Amplifier Gain (if any)

And the average value is

$$\text{Average} = \text{Peak Value} + \text{Duty Factor or}$$

$$\text{Set RBW} = 1\text{MHz, VBW} = 10\text{Hz.}$$

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

Annex B.i. Photograph: EUT External Photo



Top View of EUT



Bottom View of EUT



Front View of EUT



Rear View of EUT

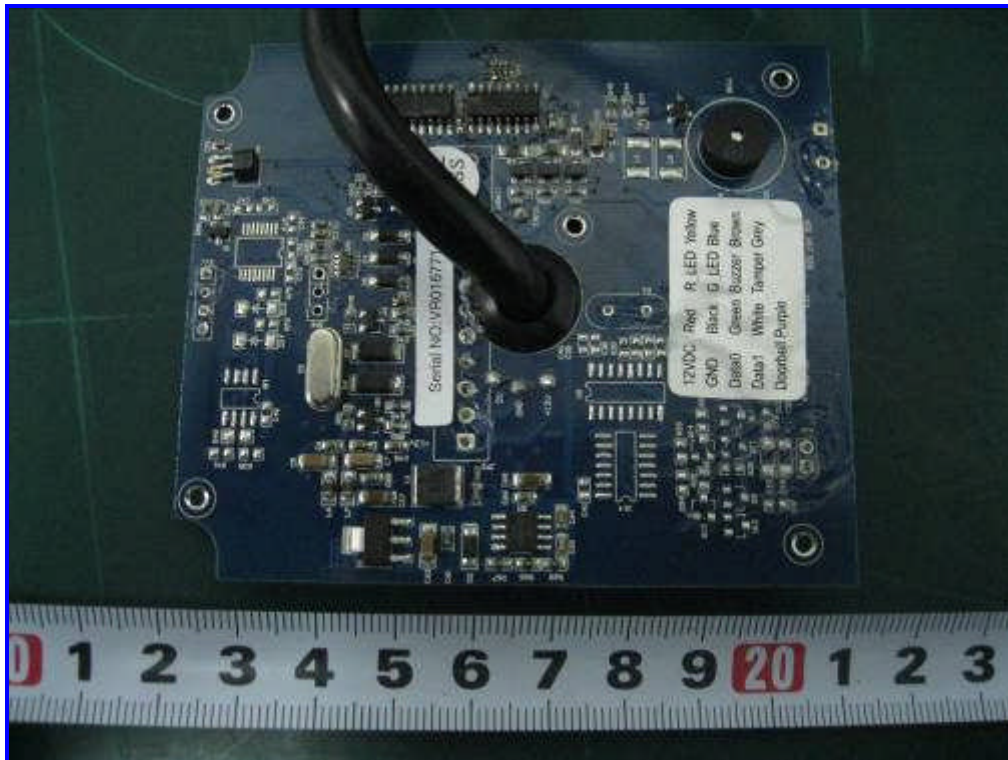


Left View of EUT

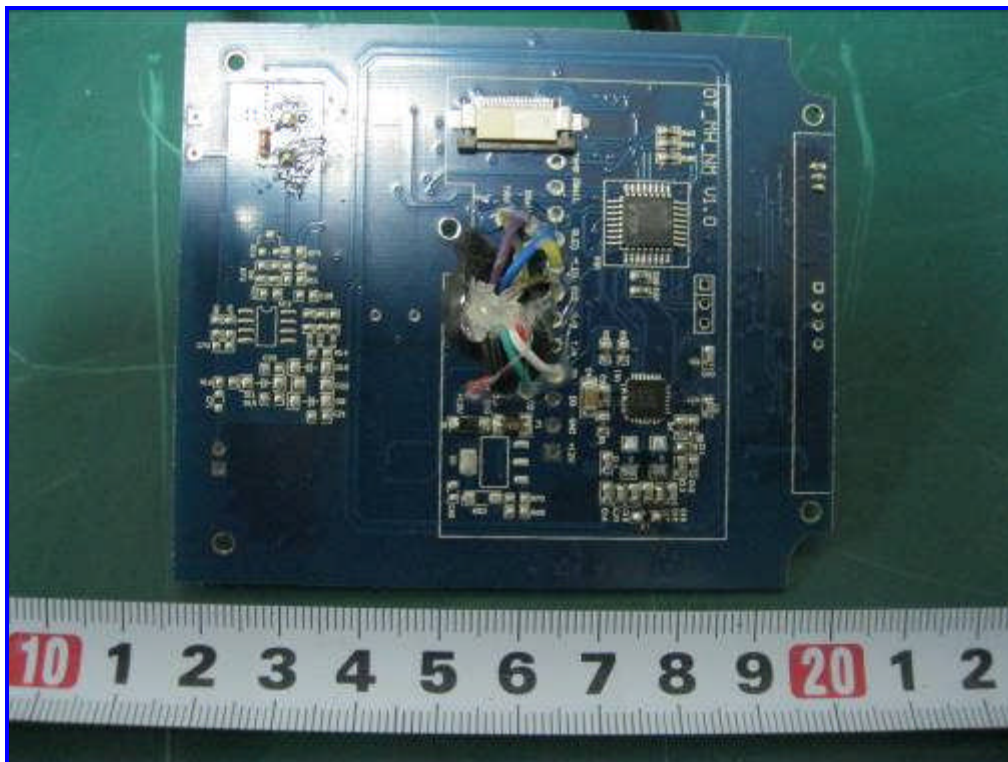


Right View of EUT

Annex B.ii. Photograph: EUT Internal Photo



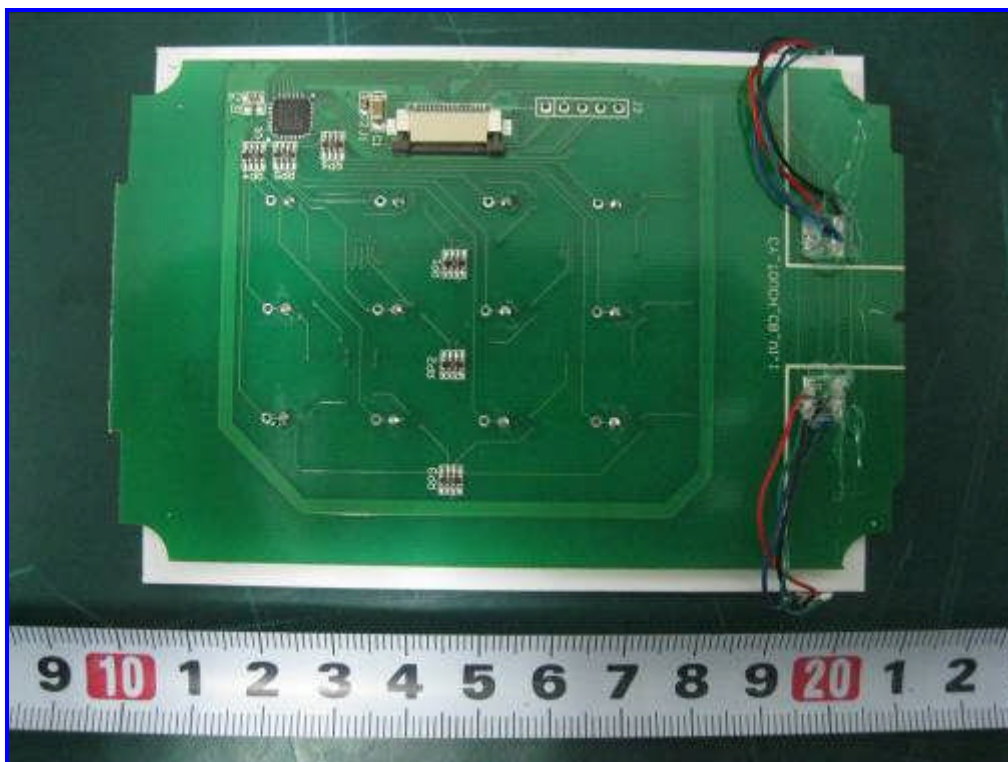
Front View of Main PCB Board



Rear View of Main PCB Board



Front View of Keyboard PCB Board



Rear View of Keyboard PCB Board

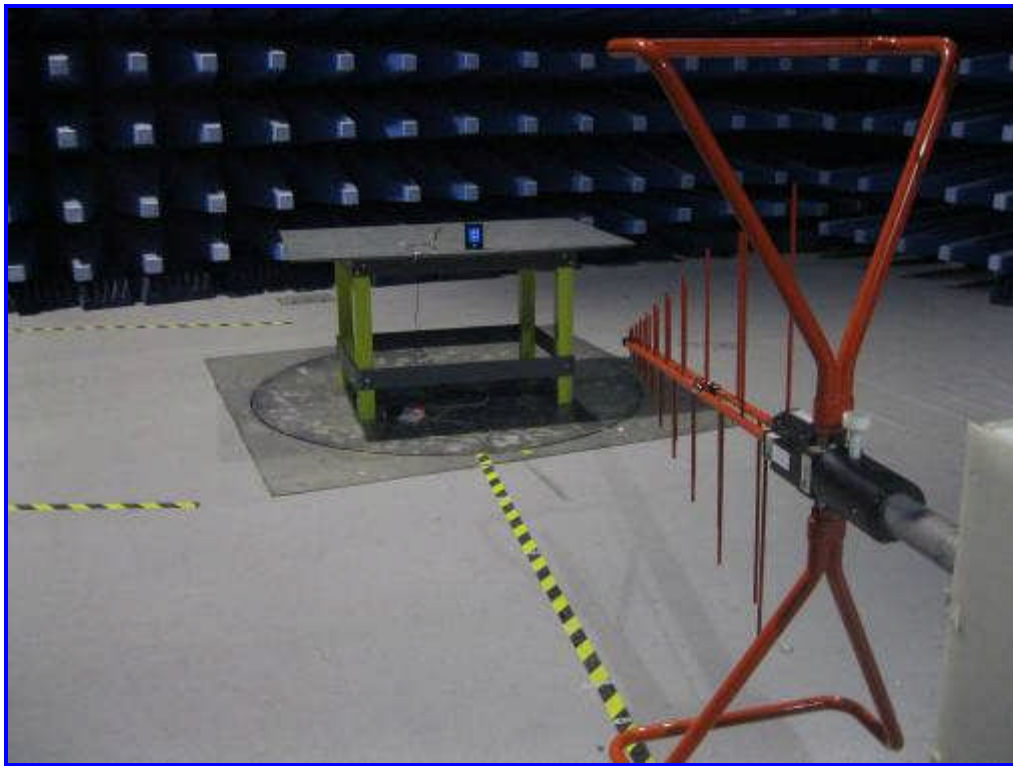
Annex B.iii. Photograph: Test Setup Photo



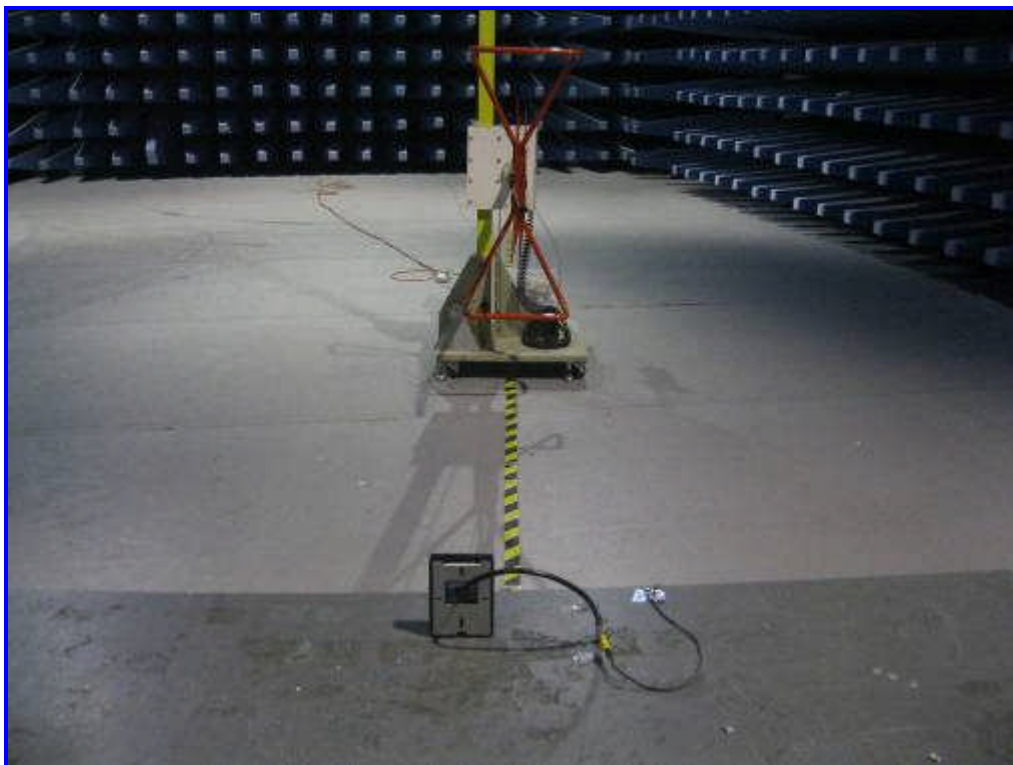
Front View of Radiated Emission Test Setup below 30MHz



Rear View of Radiated Emission Test Setup below 30MHz



Front View of Radiated Emission Test Setup above 30MHz



Rear View of Radiated Emission Test Setup above 30MHz

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

EUT TEST CONDITIONS

Annex C. i. SUPPORTING EQUIPMENT DESCRIPTION

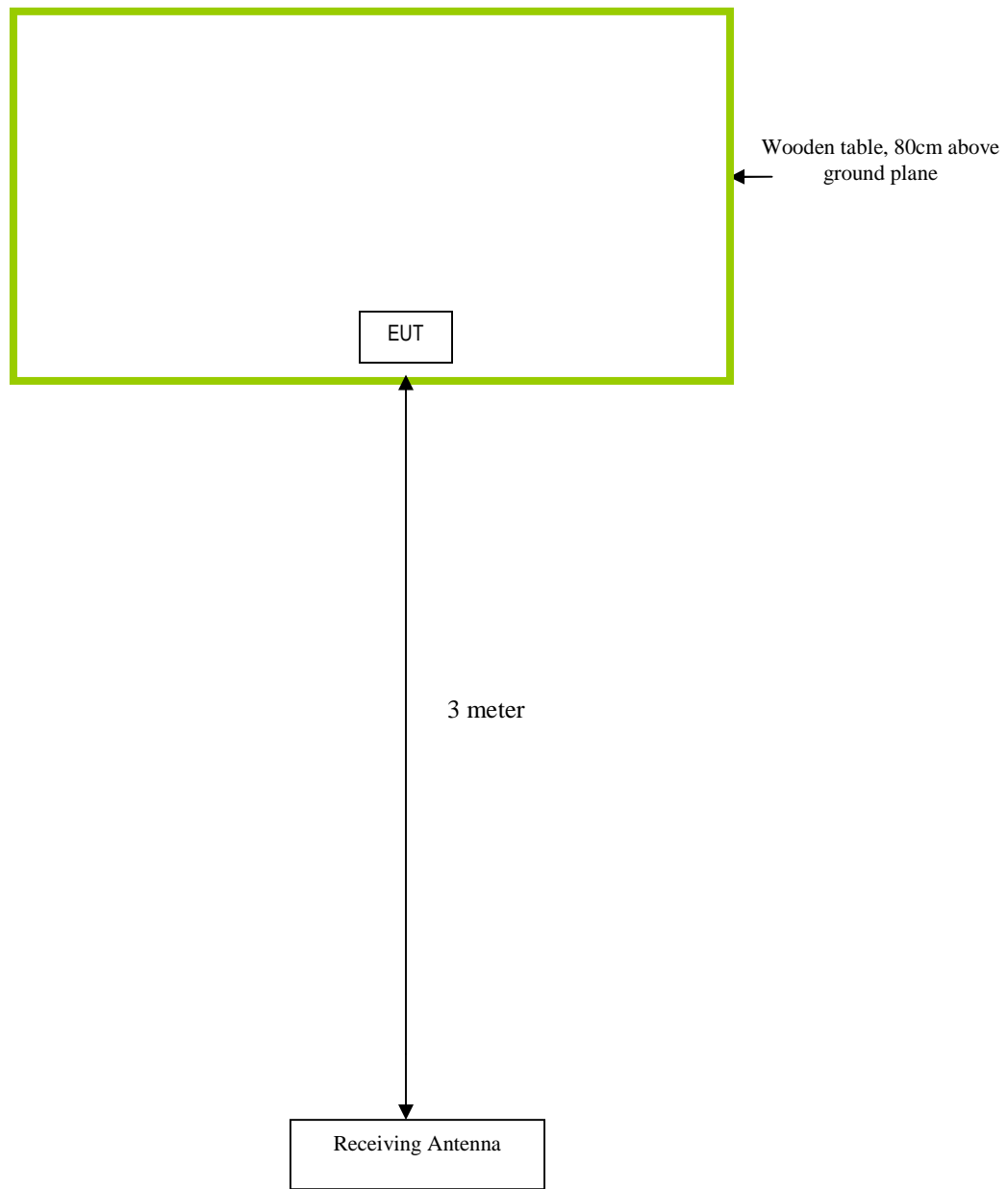
The following is a description of supporting equipment and details of cables used with the EUT.

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

Block Configuration Diagram for Conducted Emissions

N/A

Block Configuration Diagram for Radiated Emissions



Annex C.ii. EUT OPERATING CONDITIONS

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

Test	Description Of Operation
Emissions Testing	The EUT was continuously transmitting to stimulate the worst case.

Annex D. USER MANUAL / BLOCK DIAGRAM / SCHEMATICS / PART LIST

Please see attachment

Annex E. SIEMIC ACCREDITATION CERTIFICATES

SIEMIC ACREDITATION DETAILS: A2LA Certificate Number: 2742.01



SIEMIC ACCREDITATION DETAILS: FCC Registration NO:986914



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 3x10 meter OATS
Date of Listing: April 25, 2008

Dear Sir or Madam:

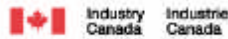
Your request for registration of the subject measurement facility has been reviewed and found to be in compliance with the requirements of Section 2.948 of the FCC rules. The information has, therefore, been placed on file and the name of your organization added to the list of facilities whose measurement 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



January 25, 2011

OUR FILE: 46405-4842
Submission No: 145222

Siemic Nanjing (China) Laboratories
2-1 Longgang Avenue
Yuhua Economic & Technology Dev. Park, Nanjing
China

Attention: Leslie Bai

Dear Sir/Madame:

The Bureau has received your application for the registration 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 (Site# 4842B-2). Please reference the appropriate site number in the body of test reports containing measurements performed on the site. In addition, please keep for your records the following information;

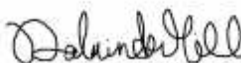
- The company address code associated to the site(s) located at the above address is: **4842B**

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 or later shall be accepted. Please indicate in a letter the previous assigned site number if applicable and the type of site (example: 3 metre OATS or 3 metre 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 three 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_tr00052e.html.

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

Yours sincerely,



Dalwinder Gill
For: Wireless Laboratory Manager
Certification and Engineering Bureau
3701 Carling Ave., Building 94
P.O. Box 11490, Station "H"
Ottawa, Ontario K2H 8S2
Email: dalwinder.gill@ic.gc.ca
Tel. No. (613) 998-8363
Fax. No. (613) 990-4752

SIEMIC ACCREDITATION DETAILS: Korea CAB from NIST: 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 CAB 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

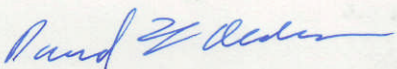
Dear Mr. Bai:

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

March 16, 2009

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 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, PSTN01, ADSL01, ID0002, IS6100 and CNS 14336
Additional Scope: PLMN07

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,

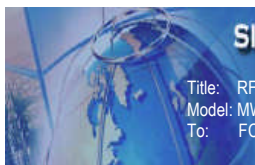


David F. Alderman
Group Leader, Standards Coordination and Conformity Group
Standards Services Division

Enclosure

cc: Ramona Saar

NIST



SIEMIC, Inc.

Accessing global markets

Title: RF Test Report for Card Reader
Model: MW322
To: FCC Part 15.225: 2010, RSS-210 Issue 8 December 2010

Serial#: 11020308-FCC-IC
Issue Date: 11 April, 2011
Page: 45 of 51
www.siemic.com.cn

SIEMIC ACCREDITATION DETAILS: Mexico NOM Recognition



CAMARA NACIONAL
DE LA INDUSTRIA
ELECTRONICA DE
TELECOMUNICACIONES
E INFORMACION

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 inglés y español prellenado de los cuales le pido sea revisado y en su caso corregido, para que al este 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 Isotel 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 gestión 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

Calle 11
Paseo de la
Cruz de México, D.F.
Tel: 5284-0000 con 12 líneas
Fax: 5284-0000
www.canietl.org

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



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: OFTA CAB from NIST: 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
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

SIEMIC ACCREDITATION DETAILS: VCCI Radiated Test Site Registration No. R-3083



SIEMIC ACCREDITATION DETAILS: VCCI Conducted (Telecom Port) Test Site Registration No. T-1597




VCCI Council

CERTIFICATE

Company: SIEMIC Laboratories
<Member No. 3081 >
Facility: SIEMIC Laboratories
(Telecommunication Ports Conducted Disturbance Measurement)
Location of Facility:
2206 Ringwood Ave San Jose, CA 95131, USA

*This is to certify that the following measuring facility
has been registered in accordance with the Rules
for Voluntary Control Measures*

Registration No.: T-1597
Date of Registration: October 01 , 2010
This Certificate is valid until September 30 , 2012

VCCI Council 

