# **HID GLOBAL CORPORATION**

# **RFID READER, OPERATING ON 125 KHZ AND 13.56 MHZ**

# Model: RMP40C, RM40C

April 26th 2010 Report No.: SL10040902-HID-006(FCC,IC)-RMP40C (This report supersedes None)



Modifications made to the product : None	
This Test Report is Issued Under the Authority of:	
David Theny	Buis
David Zhang	Leslie Bai
Test Engineer	Engineering Reviewer

. RSS-210 & RSS-310 15,209, 15,225, RSS-GEI To: FCC Part 15.20 C, INC. SIEMIC

This test report may be reproduced in full only. Test result presented in this test report is applicable to the representative sample only.



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# 1 Executive Summary & EUT information

The purpose of this test programmed was to demonstrate compliance of the HID Global Corp., Model:RMP40C, RM40C against the current Stipulated Standards.

The equipment under test radio operating frequency is 125 kHz and 13.56 MHz.

The test has demonstrated that this unit complies with stipulated standards.

	EUT Information							
EUT Description	:	The RMP40C, RM40C is an inductive RFID card reader intended to be used in access control systems, parking systems and other applications using RFID readers. It is capable of reading 125 kHz and 13.56 MHz inductive tags.						
Model No	:	RMP40C, RM40C						
Serial No	:	N/A						
Input Power	:	12 VDC						
Classification Per Stipulated Test Standard	:	RFID Reader						

PS: Both models are 100% electrically identical. Different model is due to slightly different firmware which does not alter RF parameters.



SIEMIC, INC. Accessing global markets RF Test Report of HID Global Corporation Model : RMP40C, RM40C FCC 15.225 2009, RSS-210 Issue 7 : 2007

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2 TECHNICAL DETAILS

Purpose	Compliance testing of RFID Reader, operating on 125 KHz and 13.56 MHz with stipulated standard
Applicant / Client	HID Global Corporation
Manufacturer	HID Global Corporation 15730 Barranca Parkway Irvine, CA 92618 USA
Laboratory performing the tests	SIEMIC Laboratories
Test report reference number	SL10040902-HID-006(FCC,IC)-RMP40C
Date EUT received	April 19 <sup>th</sup> 2010
Standard applied	47 CFR §15.207, 15.209, 15.225: 2009 & Canadian Standards RSS-GEN Issue 2: 2007, RSS-210 Issue 7: 2007 & RSS-310 Issue 2: 2007
Dates of test (from – to)	April 19 -23 2010
No of Units:	1
Equipment Category:	DXX & DCD
Model :	RMP40C, RM40C
RF Operating Frequency (ies)	125 kHz and 13.56 MHz (RFID)
Number of Channels :	125 kHz (1 ) & 13.56 MHz (1)
FCC ID :	JQ6- RMP40C
IC ID :	2236B- RMP40C



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# 3 MODIFICATION

NONE



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# **TEST SUMMARY**

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

#### **RFID Reader**

#### **Test Results Summary**

Test Standard				
47 CFR Part 15.225: 2009	RSS 210 Issue 7: 2007 & RSS-310 Issue 2: 2007	Description	Pass / Fail	
15.203		Antenna Requirement	Pass	
15.207(a)	RSS Gen(7.2.2)	Conducted Emissions Voltage	Pass	
15.225(a)	RSS210(A2.6)	Limit in the band of 13.553 – 13.567 MHz	Pass	
15.225(b)	RSS210(A2.6)	Limit in the band of 13.410 – 13.553 MHz and 13.567 – 13.710 MHz	Pass	
15.225(c)	RSS210(A2.6)	Limit in the band of 13.110 – 13.410 MHz and 13.710 – 14.010 MHz	Pass	
15.225(d), 15.209	RSS210(A2.6)	Limit outside the band of 13.110 – 14.010 MHz	Pass	
15.225(e)	RSS210(A2.6)	Frequency Stability	Pass	
	RSS-210(5.9.1)	Occupied Bandwidth	Pass	
	RSS-310 (3.7)	Very Low Power Devices Operating Below 490 kHz	Pass	

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



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# 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.
- 1) The RFID antenna is integral to the main board permanently to the device which meets the requirement.



## 5.2 Conducted Emissions Voltage

Requirement(s): 47 CFR §15.207

Requirement:

	Conducted limit (dBµV)			
Frequency of emission (MHz)	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.

 <u>Conducted Emissions Measurement Uncertainty</u> 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.
 Environmental Conditions

4.	Environmental Conditions	Temperature	28°C
		Relative Humidity	50%
		Atmospheric Pressure	1019mbar
	Test Date: April 19-23 2010		

Tested By : David Zhang

Results: Pass

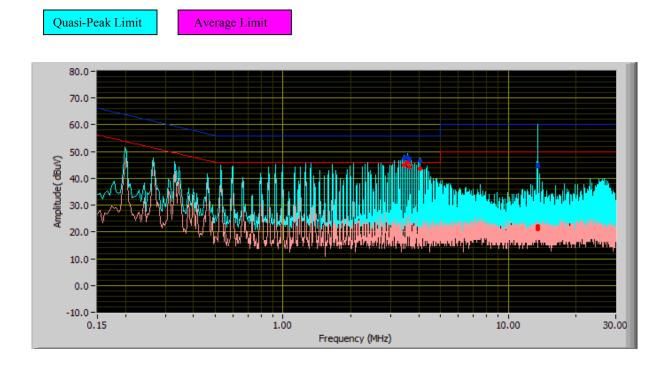


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#### Test Result with POE AC adapter



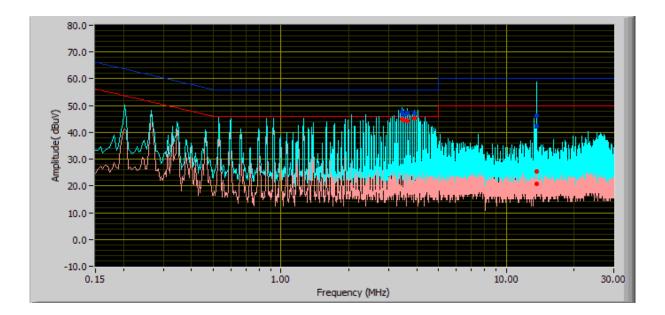
Frequency (MHz)	QP Value (dBμV)	Class B Limit (dB)	Pass / Fail	Margin (dB)	Avg Value (dBμV)	Class B Limit (dB)	Pass / Fail	Margin (dB)	Line
13.49	44.80	60.00	Pass	-15.20	21.17	50.00	Pass	-28.83	L
13.52	44.62	60.00	Pass	-15.38	22.19	50.00	Pass	-27.81	L
3.58	47.80	56.00	Pass	-8.20	45.90	46.00	Pass	-0.10	L
3.45	47.50	56.00	Pass	-8.50	44.79	46.00	Pass	-1.21	L
3.65	47.13	56.00	Pass	-8.87	44.14	46.00	Pass	-1.86	L
4.04	46.67	56.00	Pass	-9.33	43.64	46.00	Pass	-2.36	L

#### 110V, 60Hz, Neutral Line



Quasi-Peak Limit

Average Limit



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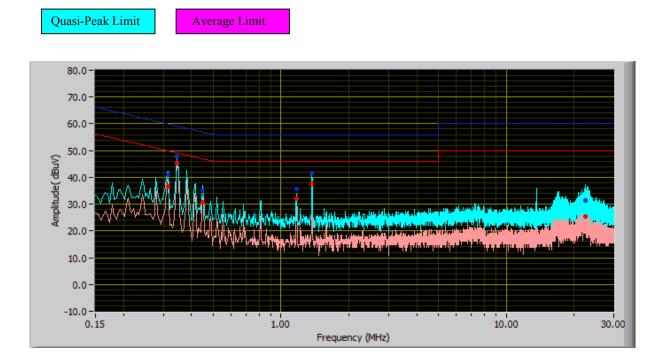
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Frequency (MHz)	QP Value (dBµV)	Class B Limit (dB)	Pass / Fail	Margin (dB)	Avg Value (dBμV)	Class B Limit (dB)	Pass / Fail	Margin (dB)	Line
13.59	46.37	60.00	Pass	-13.63	25.40	50.00	Pass	-24.60	Ν
13.62	42.20	60.00	Pass	-17.80	20.62	50.00	Pass	-29.38	Ν
3.45	47.47	56.00	Pass	-8.53	44.86	46.00	Pass	-1.14	Ν
3.65	47.21	56.00	Pass	-8.79	44.25	46.00	Pass	-1.75	Ν
3.51	46.64	56.00	Pass	-9.36	44.58	46.00	Pass	-1.42	Ν
3.91	47.13	56.00	Pass	-8.87	45.36	46.00	Pass	-0.64	Ν

#### 110V, 60Hz, Phase Line



#### Test Result with DC supply



Frequency (MHz)	QP Value (dBμV)	Class B Limit (dB)	Pass / Fail	Margin (dB)	Avg Value (dBμV)	Class B Limit (dB)	Pass / Fail	Margin (dB)	Line
0.35	47.93	59.11	Pass	-11.18	45.10	49.11	Pass	-4.01	L
1.37	41.71	56.00	Pass	-14.29	37.65	46.00	Pass	-8.35	L
0.31	40.91	59.94	Pass	-19.02	36.71	49.94	Pass	-13.22	L
0.45	34.92	56.89	Pass	-21.97	30.85	46.89	Pass	-16.03	L
1.17	35.68	56.00	Pass	-20.32	32.01	46.00	Pass	-13.99	L
22.52	31.28	60.00	Pass	-28.72	25.43	50.00	Pass	-24.57	L

## 12VDC, Positive Line



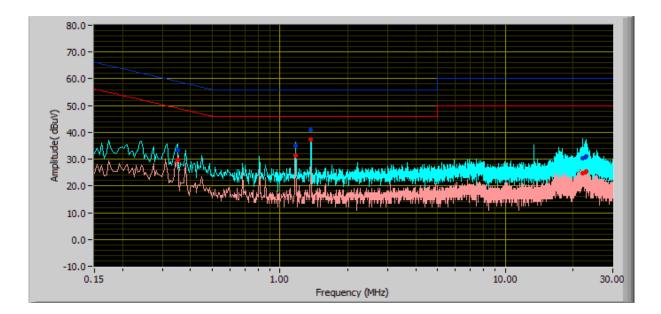
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Quasi-Peak Limit

Average Limit



Frequency (MHz)	QP Value (dBμV)	Class B Limit (dB)	Pass / Fail	Margin (dB)	Avg Value (dBμV)	Class B Limit (dB)	Pass / Fail	Margin (dB)	Line
1.37	41.11	56.00	Pass	-14.89	37.38	46.00	Pass	-8.62	Ν
1.17	35.08	56.00	Pass	-20.92	31.51	46.00	Pass	-14.49	Ν
22.08	30.46	60.00	Pass	-29.54	24.63	50.00	Pass	-25.37	Ν
22.78	31.03	60.00	Pass	-28.97	25.37	50.00	Pass	-24.63	Ν
22.62	30.85	60.00	Pass	-29.15	25.01	50.00	Pass	-24.99	Ν
0.35	33.37	59.02	Pass	-25.65	29.72	49.02	Pass	-19.29	Ν

### 12VDC, Negative Line

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## 5.3 Radiated Emission < 30MHz (9kHz - 30MHz, H-Field)

Requirement(s): 47 CFR §15.225 & RSS-210 (A2.6) & RSS-310 (3.7)

Procedures: For < 30MHz, Radiated emissions were measured according to ANSI C63.4. 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 10 kHz. (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 (dBµV/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.

**Environmental Conditions** 4.

Temperature	
Relative Humidity	
Atmospheric Pressure	

50% 1019mbar

23°C

Test Date : April 19-23 2010 Tested By : David Zhang

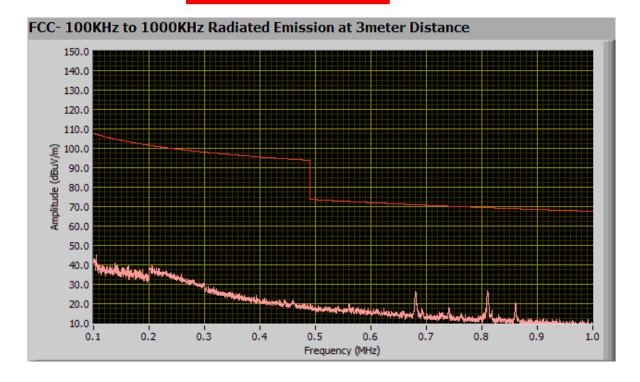
Results: Pass



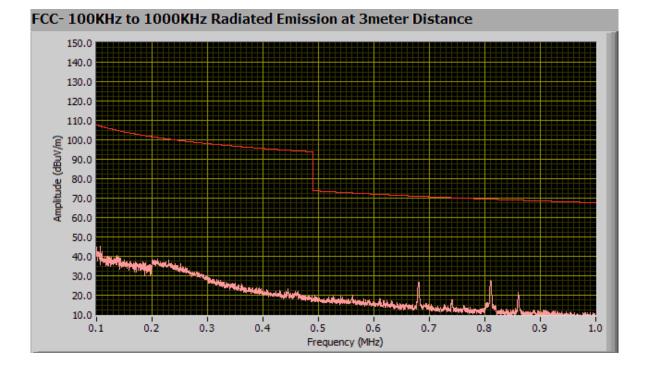
### 100KHz ~ 1MHz

Dipole Antenna at 0 degree

General Emission Limit @ 3 Meter



## Dipole Antenna at 90 degree

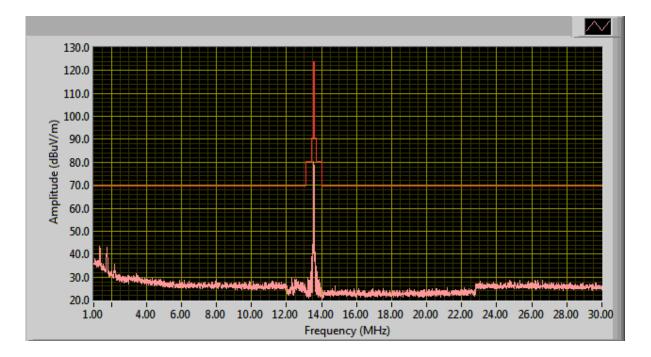




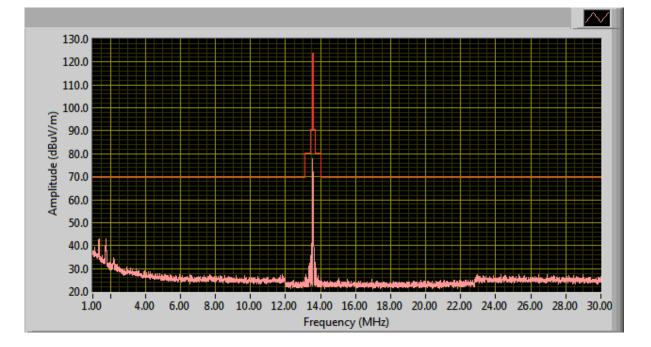
### 1MHz ~ 30MHz

Dipole Antenna at 0 degree

General Emission Limit @ 3 meter



### Dipole Antenna at 90 degree





 
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## 5.4 Radiated Emissions > 30 MHz (30MHz - 1 GHz, 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 ANSI C63.4. 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 120 kHz. (Note: During testing the receive antenna was raise from 1~4 meters to maximize the emission from the EUT.)

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

Sample Calculation: Corrected Amplitude = Raw Amplitude (dBµV/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.
- 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

Relative Humidity Atmospheric Pressure

Temperature

23°C 50% 1019mbar

Tested By : David Zhang

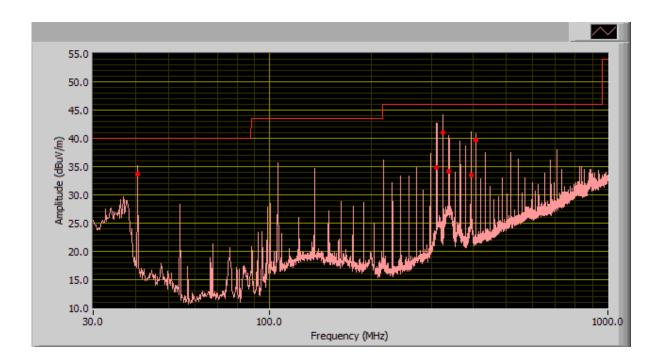
Test Date : April 19-23 2010

Results: Pass



## 30MHz ~ 1000MHz

General Emission Limit @ 3 meter



## Radiated Emission Test Table 30MHz ~ 1000MHz

Frequency (MHz)	Amplitude @ 3m	Azimuth (degree)	Antenna Polarity	Antenna Height (cm)	Limit @ 3 meter	margin (dB)
325.41	41.02	129.00	Н	132.00	46.00	-4.98
311.82	34.82	115.00	Н	193.00	46.00	-11.18
393.24	33.54	147.00	Н	234.00	46.00	-12.46
40.67	33.60	271.00	V	105.00	40.00	-6.40
406.79	39.64	290.00	Н	104.00	46.00	-6.36
338.97	34.11	24.00	Н	351.00	46.00	-11.89



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## 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: ±0.01% of 13.56 MHz = 1356 Hz, ±0.01% of 125 kHz = 125 Hz

Environmental Conditions	Temperature	23°C
	Relative Humidity	50%
	Atmospheric Pressure	1019mbar
Test Date : April 19-23 2010		

Tested By : David Zhang

Results: Pass



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#### Reference Frequency: 125kHz at -20°C and +50°C

Temperature	Measured Freq.	Freq. Drift	Freq. Deviation	Pass/Fail
(°C)	(KHz)	(Hz)	(Limit: 0.01%)	Fa55/Fall
50	125.070	17	<0.01	Pass
20		Reference(125.053K	Hz)	
-20	125.048	-5	<0.01	Pass

Note: The EUT met the applicable requirement throughout the temperature range. Only the extremes are reported

**Frequency Stability versus Input Voltage:** The Frequency tolerance of the carrier signal shall be maintained within ± 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: 125kHz at 20°C at 12VDC

Measured Voltage ±15% of nominal (DC)	Measured Freq. (KHz)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
10.8	125.048	-5	<0.01	Pass
13.2	125.012	-41	<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°C at normal supply voltage.

Temperature	Measured Freq.	Freq. Drift	Freq. Deviation	Pass/Fail
(°C)	(MHz)	(Hz)	(Limit: 0.01%)	Pass/Fall
50	13.56015	30	<0.01	Pass
40	13.560133	13	<0.01	Pass
30	13.56012	0	<0.01	Pass
20		Reference (13.56012)	MHz)	
10	13.56012	0	<0.01	Pass
0	13.560133	13	<0.01	Pass
-10	13.560093	27	<0.01	Pass
-20	13.560097	23	<0.01	Pass

Reference Frequency: 13.560012 MHz at -20°C and +50°C

**Frequency Stability versus Input Voltage:** The Frequency tolerance of the carrier signal shall be maintained within ± 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: 13.560012 MHz at 20°C at 24VDC

Measured Voltage ±15% of nominal (DC)	Measured Freq. (MHz)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
10.2	13.56013	10	<0.01	Pass
13.8	13.560097	23	<0.01	Pass



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## 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.
- A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
   <u>Radiated Emissions Measurement Uncertainty</u> 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 Terr Rela Atm Test Date : April 19-23 2010

Temperature Relative Humidity Atmospheric Pressure 23°C 50% 1019mbar

Test Date : April 19-23 2010 Tested By : David Zhang

## **Test Requirement :**

- 13.56 MHz ---The field strength of any emissions within allowed operating band shall not exceed 10mV/m at 30 meters.
- 125KHz ----- The fundamental field strength should not exceed general spurious emission requirement.

Dipole Antenna at 0 degree

Frequency	Measure	Ant. Height	Factor	Amplitude @ 3m	Limits @ 3m	Margin
(MHz)	(Avg/QP)	(m)	(dB)	(dBµV/m)	(dBµV/m)	(dBµV/m)
0.125	Peak	1.00	64.76	50.82	105.67	-54.85

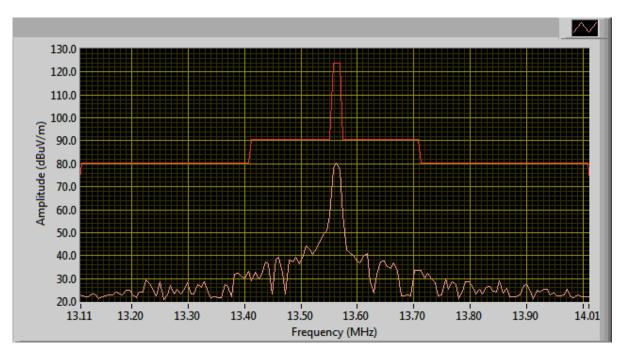
Dipole Antenna at 90 degree

Frequency	Measure	Ant. Height	Factor	Amplitude @ 3m	Limits @ 3m	Margin
(MHz)	(Avg/QP)	(m)	(dB)	(dBµV/m)	(dBµV/m)	(dBµV/m)
0.125	Peak	1.00	64.76	43.59	105.67	-62.08

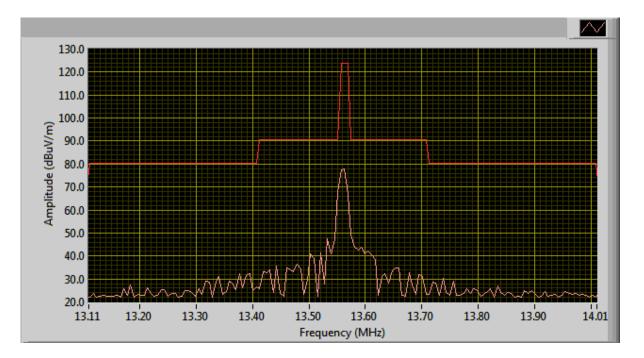


Dipole Antenna at 0 degree

General Emission Limit @ 3 meter



Dipole Antenna at 90 degree





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## 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.

Environmental Conditions Temperature 23°C Relative Humidity 50% Atmospheric Pressure 1019mbar

Test Date : April 19-23 2010 Tested By : David Zhang

Results: Pass

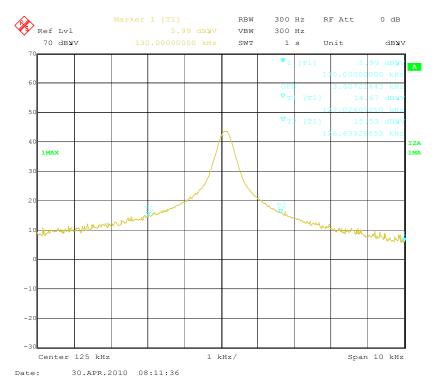


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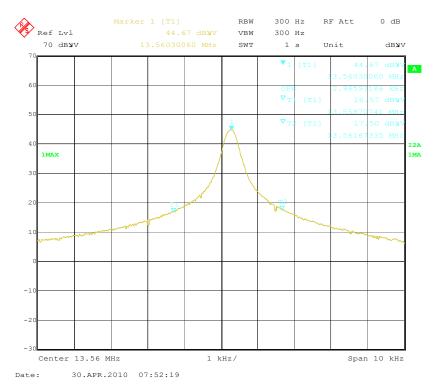
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Plots: 125 kHz



Plots: 13.56 MHz





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Annex A. TEST INSTRUMENT & METHOD

## Annex A.i. TEST INSTRUMENTATION & GENERAL PROCEDURES

Instrument	Model	Calibration Due
AC Conducted Emissions		
R&S EMI Test Receiver	ESIB40	04/25/2011
R&S LISN	ESH2-Z5	04/24/2011
CHASE LISN	MN2050B	04/24/2011
Radiated Emissions		
Spectrum Analyzer	8564E	04/26/2011
EMI Receiver	ESIB 40	04/25/2011
R&S LISN	ESH2-Z5	04/24/2011
CHASE LISN	MN2050B	04/24/2011
Antenna(1 ~18GHz)	3115	10/04/2010
Antenna (30MHz~2GHz)	JB1	10/04/2010
Chamber	3m	04/18/2011
Pre-Amplifier(1 ~ 26GHz)	8449	04/24/2011
Horn Antenna (18~40GHz)	AH-840	03/19/2011
Microwave Pre-Amp (18~40GHz)	PA-840	03/19/2011*



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### 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 <u>Annex B</u>.
- 2. The power supply for the EUT was fed through a  $50\Omega/50\mu$ H 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 dB $\mu$ V (Calibrate	ed for system losses)
Therefore, Q-P margin = 47.96 – 40.00 = 7.96	i.e. 7.96 dB below limit



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## Annex A. iii RADIATED EMISSIONS TEST DESCRIPTION

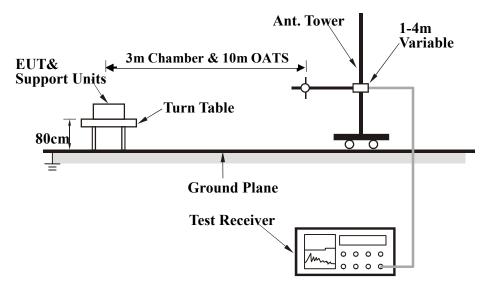
#### **EUT Characterisation**

EUT characterisation, over the frequency range from 100kHz – 1GHz to 10<sup>th</sup> 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) at 10m distance.

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





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#### 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 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
0001 940dA	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:

Peak = Reading + Corrected Factor

where

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

Average = Peak Value + Duty Factor or Set RBW = 1MHz, VBW = 10Hz.

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.



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Annex B. TEST SETUP PHOTOGRAPHS

Please See Attachment



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Annex B. i. EUT INTERNAL PHOTOGRAPHS

Please see attachment



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Annex B. ii. EUT EXTERNAL PHOTOGRAPHS

Please see attachment

## Annex C. SUPPORTING EQUIPMENT DESCRIPTION

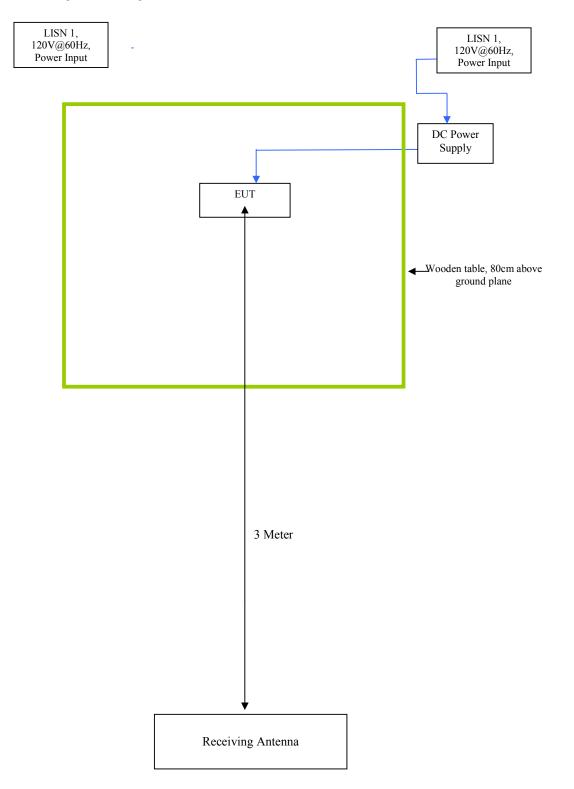
The following is a description of supporting equipment and details of cables used with the EUT.

Equipment Description (Including Brand Name)	Model & Serial Number	Cable Description (List Length, Type & Purpose)
POE Injector /Planet	POE-151/AF00107300297(000)	Ethernet Cable , 2m
Laptop/IBM	R32	-
RFID Controller/HIC	E400E	Ethernet Cable, 2m

NOTE: No special supporting equipment are used or needed during testing to achieve compliance.

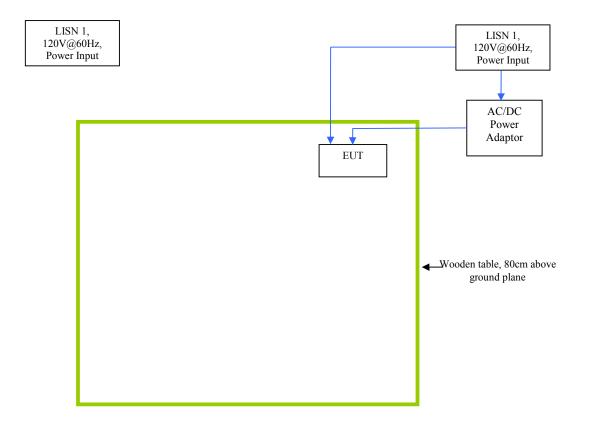


## Block Configuration Diagram for Radiated Emission



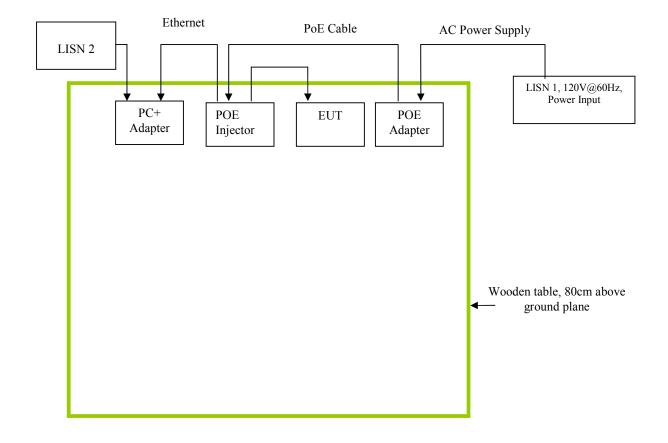


## Block Configuration Diagram for DC Conducted Emission





Block Configuration Diagram for AC Conducted Emission





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## Annex C. EUT OPERATING CONDITIONS

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

Description Of Operation
The EUT was controlled by itself.
The EUT was controlled by itself.



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# Annex D USER MANUAL, BLOCK & CIRCUIT DIAGRAM

Please see attachment



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# Annex E SIEMIC ACCREDITATION

## SIEMIC ACCREDITATION DETAILS: A2LA 17025 & ISO Guide 65 : 2742.01 , 2742.2



Title: To	RF Test Report of HID Glob Model : RMP40C, RM40C FCC 15.225 2009, RSS-210		Serial# Issue Date Page	SL10040902-HID-006(FCC,IC)-RMP40C April 26th 2010 41 of 55 www.siemic.com
				SOCIATION FOR REDITATION
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SIEN San Jo for tech	has accredited AIC INC. ose, CA mical competence as a act Certification Bo			
65:1996 ( competen	General requirements for be	dus operating product certij he operation of a quality au	theattow granms. This a anagement system for a	mational Standard ISO/IEC Guide accreditation demonstrates technical a Telecommunications Certification
A THE CONTRACT	AMMAIN AND AND AND AND AND AND AND AND AND AN	Pres For Cert	serged this 9 <sup>th</sup> day of Is <u>lite</u> <u>Morge</u> sident the Accredition Coun- the Accredition Coun- the Course Number 2742.6 id to: September 30, 20	acii D2
		fact certification schemes to refer to the certification bod		

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SIEMIC, INC. Accessing global markets



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#### SCOPE OF ACCREDITATION TO ISO/IEC GUIDE 63 1996

SIEMIC INC.

2206 Ringwood Ave San Jose, CA 95131 Mr. Snell Leong (Authorized Representative) Phone: 408 526 1188 www.siemic.com

## PRODUCT CERTIFICATION CONFORMITY ASSESSMENT BODY (CAB)

Valid to September 30, 2010

Certificate Number: 2742.02

In recognition of the successful completion of the A2LA Certification Body Accreditation Program evaluation including the US Federal Communications Commission (FCC), industry Canada (IC) and Singapore (IDA) requirements for the indicated types of product certifications, accreditation is granted to this organization to perform the following product certification schemes.

Economy

Scope

#### Federal Communication Commission - (FCC)

Unlicensed Radio Frequency Devices	AI, A2, A3, A4
Licensed Radio Frequency Devices	B1. B2. B3. B4
Telephone Terminal Equipment	C

\*Please refer to FCC TCB Program Roles and Responsibilities, v04, released February 14, 2003 detailing scoperoles and responsabilities. <u>http://www.dcr.gom/pet/ea/FCC-Overview-TCB-Program.vdf</u>

#### Industry Canada - (IC)

Rádio

All Radio Standards Specifications (RSS) in Category I Equipment Standards List Radio

Please refer to Industry Canada (IC) website at: http://www.ie.ge.ca/epiessiterant-gst.inst/en/h\_s/01542e.html

#### IDA - Singapore

 Line Terminal Equipment
 All Technical Specifications for Line Terminal Equipment – Table 1 of IDA MRA Recognition Scheme: 2008, Annex 2

 Radio-Communication Equipment
 All Technical Specifications for Radio-Communication Equipment – Table 2 of IDA MRA Recognition Scheme: 2008, Annex 2

\*Please refer to Info-Communication Development Authority (IDA) Singapore website at, http://www.fda.gov.sg/doc/Pallcov2%2DomP%20Regulation/Policies\_and\_Regulation\_Level2/200806009145118/MRA RecScheme.pdj

(A2LA Cert. No. 2742 02) 01/09/09

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## SIEMIC ACCREDITATION DETAILS: FCC Test Site Registration No. 783147

## FEDERAL COMMUNICATIONS COMMISSION

Laboratory Division 7435 Oakland Mills Road Columbia, MD 21046

December 20, 2007

Registration Number: 783147

SIEMIC Laboratories 2206 Ringwood Avenue, San Jose, CA 95131

Attention: Leslie Bai

Re: Measurement facility located at San Jose 3 & 10 meter site Date of Renewal: December 20, 2007

Dear Sir or Madam:

Your request for renewal of the registration of the subject measurement facility has been received. The information submitted has been placed in your file and the registration has been renewed. The name of your organization will remain on 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 <u>www.fcc.gov</u> under E-Filing, OET Equipment Authorization Electronic Filing, Test Firms.

Sincerely,

Phyllis Parrish Industry Analyst



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## SIEMIC ACCREDITATION DETAILS: Industry of Canada CAB ID : US0160



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

March 4, 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 Industry Canada (IC), 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 USA
Identification No .:	US0160
Recognized Scope:	CS-03 Part I, II, V, VI, VII and VIII

You may submit test data to IC to verify that the equipment to be imported into Canada 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. Please contact Ms. Ramona Saar at (301) 975-5521 or ramona.saar@nist.gov if you have any questions.

Sincerely,

Parial In Ald

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

Enclosure

cc: CAB Program Manager





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

#### Canada Canada

May 23rd, 2008

Siemic Inc.

OUR FILE: 46405-4842 Submission No: 126429

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 fifting process. Our goal is to reduce the number of secondary codes associated to one particular company. The following charges 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	Obsolete Site	Description of Site	Expiry Date
Number	Number		(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 <u>certification.bureaufatic.gc.c</u> Please reference our file and submission number above for all correspondence.

Yours succerely,

S. Prodx Test & Messurement Specialist Certification and Engineering Buscus 3701 Corling Ave., Building 94 Ottows, Outprin K211 SS2



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SIEMIC ACCREDITATION DETAILS: FCC DOC CAB Recognition : US1109

## FEDERAL COMMUNICATIONS COMMISSION

Laboratory Division 7435 Oakland Mills Road Columbia, MD 21046

August 28, 2008

Siemic Laboratories 2206 Ringwood Ave., San Jose, CA 95131

Attention: Leslie Bai

Re: Accreditation of Siemic Laboratories Designation Number: US1109 Test Firm Registration #: 540430

Dear Sir or Madam:

We have been notified by American Association for Laboratory Accreditation that Siemic Laboratories has been accredited as a Conformity Assessment Body (CAB).

At this time Siemic Laboratories is hereby designated to perform compliance testing on equipment subject to Declaration Of Conformity (DOC) and Certification under Parts 15 and 18 of the Commission's Rules.

This designation will expire upon expiration of the accreditation or notification of withdrawal of designation.

Sincerely,

Grence Tanashill

George Tannahill Electronics Engineer



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#### SIEMIC ACCREDITATION DETAILS: Australia CAB ID : US0160



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

November 20, 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 Australian Communications and Media Authority (ACMA) 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:	EMC: AS/NZS 4251.1 (until 5/31/2009), AS/NZS 4251.2 (until 5/31/2009),
	AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR 22, AS/NZS
	61000.6.3, AS/NZS 61000.6.4
	Radiocommunications: AS/NZS 4281, AS/NZS 4268, AS/NZS 4280.1, AS/NZS
	4280.2, AS/NZS 4295, AS/NZS 4582, AS/NZS 4583, AS/NZS 4769.1, AS/NZS
	4769.2, AS/NZS 4770, AS/NZS 4771
	Telecommunications: AS/ACIF S002:05, AS/ACIF S003:06, AS/ACIF S004:06,
	AS/ACIF S006:01, AS/ACIF S016:01, AS/ACIF S031:01, AS/ACIF S038:01,
	AS/ACIF S040:01, AS/ACIF S041:05, AS/ACIF S043.2:06, AS/NZS 60950.1

You may submit test data to ACMA to verify that the equipment to be imported into Australia 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. Please contact Ms. Ramona Saar, at (301) 975-5521 or ramona.saar@nist.gov if you have questions.

Sincerely,

Daniel I. alder

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

Enclosure

cc: Snell Leong, Siemic, Inc.; Ramona Saar, NIST





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#### SIEMIC ACCREDITATION DETAILS: Korea CAB ID: US0160



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

October 1, 2008

Τo

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: Physical Location: Identification No.: Recognized Scope: SIEMIC, Inc.
2206 Ringwood Avenue, San Jose, CA 95131
US0160
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,

Pand In alde

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

Enclosure



cc: Ramona Saar



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



UNITED STATES DEPARTMENT OF COMMERCE National Institute of Standards and Technology Dathendurg, Maylard 20985

May 3, 2006

Mr. Leslie Bai SIEMIC Laboratories 2206 Ringwood Avenue San Jose, CA 93131

Dear Mr. Buit

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 sequirements. The designated scope remains valid and comply with the designation requirements. The pertinent designation information is as follows:

BSMI mumber:

SL2-IN-E-1130R (Must be applied to the test reports)

- U.S Identification No:
- US0160 CNS 13438
- Scope of Designation:
  - Authorized signatory: Mr. Leslie Bal

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

Sincerely,

Part & accus

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

eet Jogindar Dhillon





Accessing good markets RF Test Report of HID Global Corporation Model : RMP40C, RM40C FCC 15.225 2009, RSS-210 Issue 7 : 2007

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#### SIEMIC ACCREDITATION DETAILS: Taiwan NCC CAB ID: US0160



NATIONAL DISTALLES 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,

Ramid Z. alda

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

Enclosure

cc: Ramona Saar





То

RF Test Report of HID Global Corporation Model : RMP40C, RM40C FCC 15.225 2009, RSS-210 Issue 7 : 2007

ing global markets

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## SIEMIC ACCREDITATION DETAILS: Mexico NOM Recognition

Laboratorio Valentin V. Rivero ANTE CARLAND MACCORD DE LA INDUSTRIO ELECTRICACA, DE ELECTRICACA, DE POMUNICACIONEL DI INFOMMATICA Maxico D F. a 16 de octubre de 2006. LESLIE BAI DIRECTOR OF CERTIFICATION SIEMIC LABORATORIES, INC. ACCESSING GLOBAL MARKETS PRESENTE En contestación a su escrito de fecha 5 de septiembre del año en curso, le comento que estamos muy interessidos en su intención de firmar un Acuerdo de Reconocimiento Mutuo, para lo cual adjunto a este escrito encontrara el Acuardo an idioma ingles y español prellemado de los quales la 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 escillo para mencionarle que nuestro intermediano gestor será la empresa lisitel 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 gastoria de la cartificación de cumplimiento con Normas. Oficiales Mexicanas de producto en México. Me despido de usted enviêndole un condial satudo y esperando sus comentanos al Acuerdo que nos ocupa Atentamente: Ing. Faustino 85 noz González Gerente Ferrico del Laboratorio de GANIEPT CARAGE (1) Humieren Contista Denn Masen, D.F. Schrobb con 12 Anon Pas 5264 0043 weather that had a lot



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## SIEMIC ACCREDITATION DETAILS: Hong Kong OFTA CAB 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:

)26,
, 1041,
· ·
2026,
,

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 I. alden

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

Enclosure

cc: Ramona Saar





Title

Τo

RF Test Report of HID Global Corporation Model : RMP40C, RM40C FCC 15.225 2009, RSS-210 Issue 7 : 2007

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





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SIEMIC ACCREDITATION DETAILS: VCCI Conducted (Main Port) Test Site Registration No. C-3421





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

