Test Report

For

Applicant	:	**SUMMIT AUTOMATION CO., LTD.**
Equipment Type	:	**E-LOCK**
Model	:	**E-LOCK-002**
FCC ID	:	**PI3-E-LOCK-002**

Report No. : 012H009FI

Test Report Certification

QuieTek Corporation

No.75-1, Wang-Yeh Valley, Yung-Hsing, Chiung-Lin,
Hsin-Chu County, Taiwan, R.O.C.
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E-Mail : quietek@ms24.hinet.net

Accredited by NIST(NVLAP), VCCI, BSMI, DNV, TUV

Applicant	: SUMMIT AUTOMATION CO., LTD.
Address	: 2F, No. 68, Chungkuang 1st Rd., Taichung City, Taiwan, R.O.C.
Equipment Type	: E-LOCK
Model	: E-LOCK-002
FCC ID.	: PI3-E-LOCK-002
Measurement Standard	: FCC Part 15 Subpart C Paragraph 15.209
Measurement Procedure	: ANSI C63.4 /1992
Operation Voltage	: DC 6V
Test Result	: Complied
Test Date	: Feb. 13, 2001
Report No.	: 012H009FI

NVLAP®

The Test Results relate only to the samples tested.
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This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

Documented by: Kim Hung	Test Engineer: Vincent Lin	Approved: Gene Chang

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1. General Information

1.1 EUT Description

Applicant	:	SUMMIT AUTOMATION CO., LTD.
Address	:	2F, No. 68, Chungkuang 1st Rd., Taichung City, Taiwan, R.O.C.
Equipment Type	:	E-LOCK
Model	:	E-LOCK-002
FCC ID	:	PI3-E-LOCK-002
Operation Voltage	:	DC 6V
Frequency Range	:	134.2kHz
Operator Selection of Operating Frequency	:	Manual Switch

Remark:
1. This device is an E-LOCK.
2. This device is a composite device in accordance with Part 15 regulations. The function for the receiver was, measured and made a test report that the report number is 012H009F, certified under verification.

1.2 Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

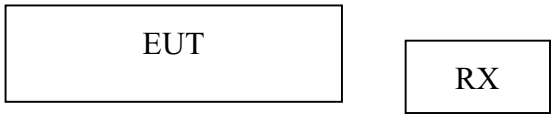
1.2.1 E-LOCK(EUT)-TX

Model Number	: E-LOCK-002
Serial Number	: N/A
FCC ID	: PI3-E-LOCK-002
Manufacturer	: SUMMIT AUTOMATION CO., LTD.

1.2.2 E-LOCK-RX

Model Number	: E-KEY
Serial Number	: N/A
FCC ID	: Vartification
Manufacturer	: SUMMIT AUTOMATION CO., LTD.

1.3 EUT Configuration



1.4 EUT Exercise Software

The EUT exercise program used during conducted testing was designed to exercise the EUT in a manner similar to a typical use. The exercise sequence is listed as below:

1.4.1 Setup the EUT and display as shown on 1.3.

1.4.2 Turn on the power of all equipment.

1.5 Test performed

Conducted emissions were invested over the frequency range from **0.45MHz to 30MHz** using a receiver bandwidth of 9kHz.

Radiated emissions were invested over the frequency range from **30MHz to 1000MHz** using a receiver bandwidth of 120kHz.
Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.6 Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

Site Description: November 3, 1998 File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Reference 31040/SIT1300F2

September 30, 1998 Accreditation on NVLAP
NVLAP Lab Code: 200347-0

February 23, 1999 Accreditation on DNV
Statement No. : 413-99-LAB11

December 8, 1998 Registration on VCCI
Registration No. for No.2 Shielded Room C-858
Registration No. for No.1 Open Area Test Site R-823
Registration No. for No.2 Open Area Test Site R-835

January 04, 1999 Accreditation on TUV Rheinland
Certificate No.: I9865712-9901

Name of firm : QuieTek Corporation

Site location : No.75-1, Wang-Yeh Valley, Yung-Hsing Tsuen,
Chiung-Lin, Hsin-Chu County, Taiwan, R.O.C.

2. Radiated Emission

2.1 Test Equipment

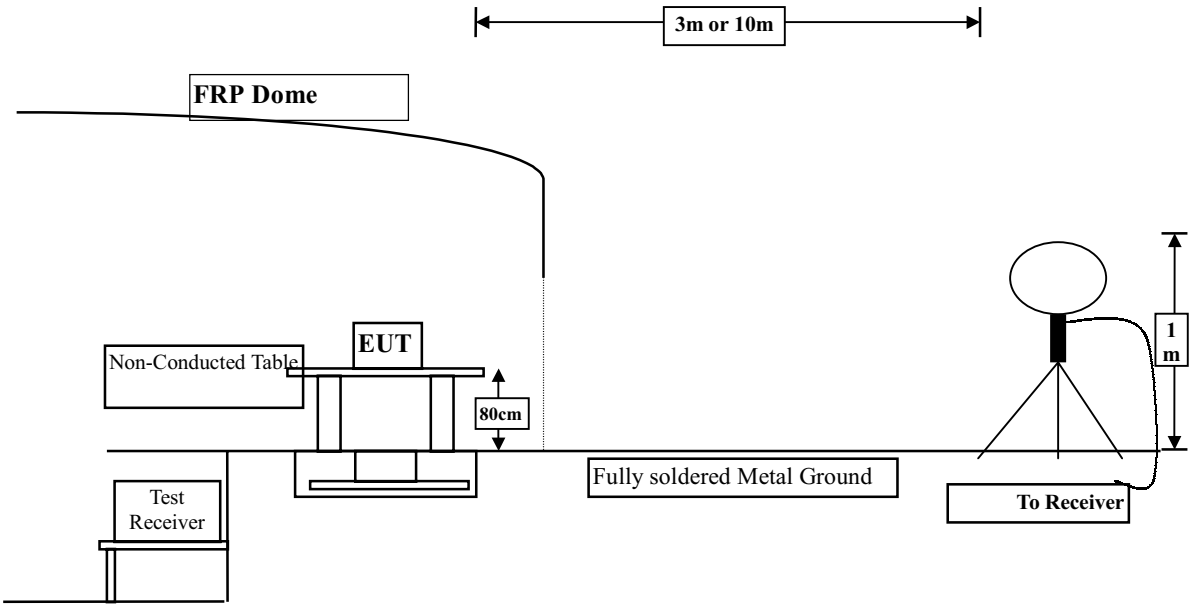
The following test equipment are used during the radiated emission test:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 1	X	Test Receiver	R & S	ESCS 30 / 825442/14	May, 2000
		Spectrum Analyzer	Advantest	R3261C / 71720140	May, 2000
		Pre-Amplifier	HP	8447D/3307A01812	May, 2000
	X	Bilog Antenna	Chase	CBL6112B / 12452	Sep., 2000
	X	Horn Antenna	EM	EM6917 / 103325	May, 2000
	X	Loop Antenna	R&S	HFH2-Z2/833799/004	July, 2000
Site # 2	X	Test Receiver	R & S	ESCS 30 / 825442/17	May, 2000
		Spectrum Analyzer	Advantest	R3261C / 71720609	May, 2000
		Pre-Amplifier	HP	8447D/3307A01814	May, 2000
	X	Bilog Antenna	Chase	CBL6112B / 2455	Sep., 2000
	X	Horn Antenna	EM	EM6917 / 103325	May, 2000
	X	Loop Antenna	R&S	HFH2-Z2/833799/004	July, 2000

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.

2. Mark "X" test instruments are used to measure the final test results.

2.2 Test Setup



2.3 Limits

➢ Radiated Emission Limits

Regarding to FCC §15.209

Frequency MHz	Field Strength (Microvolts/meter)	Measurement Distance (Meters)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	24000/F (kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remarks : 1. RF Line Voltage (dBuV) = 20 log RF Line Voltage (uV)

2. In the Above Table, the tighter limit applies at the band edges.
3. The operation frequency of EUT is 134kHz. So the field strength allowed will be 2400/134=17.9μV/m (25dBμV/m).
4. Owing to the very low emission of EUT, the 3m measurement distance was performed. Regards to an inverse linear extrapolation 40dB/dec is adopted. The collection factor will be 8dB for this case.

So, radiation limit is 105 dBμV/m.

2.4 Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level.
The EUT was positioned such that the distance from antenna to the EUT was 3 meters .
The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.
Regard to the characterstic and operation band of EUT, loop antenna was used for this measurement. The measurement method is hosed or ANSI C63.4 section 8.
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4 /1992 on radiated measurement.
The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCS 30) is 120 kHz and above 1GHz is 1MHz.

2.5 Test Results

The radiated emission from the EUT is measured and shown in Attachment 1. The acceptance criterion was met and the EUT passed the test.

3. EMI Reduction Method During Compliance Testing

No modification was made during testing.

4. Attachment

Attachment 1: Summary of Test Results	Number of Pages: 3
Attachment 2: EUT Test Photographs	Number of Pages: 2
Attachment 3: EUT Detailed Photographs	Number of Pages: 9

Attachment 1 : Summary of Test Results

The test results in the emission were performed according to the requirements of measurement standard and process. QuieTek Corporation is assumed full responsibility for the accuracy and completeness of these measurements. The test data of the emission are listed as the attached data.

All the tests were carried out with the EUT in normal operation, which was defined as:

Mode 1: Normal Operation

The EUT passed all the tests.

The uncertainty is calculated in accordance with NAMAS NIS 81, The total uncertainty for this test is as follows:

➢ **Emission Test**

- Uncertainty in the Conducted Emission Test: < ± 2.0 dB
- Uncertainty in the field strength measured: < ± 4.0 dB

General Radiated Emission Data

Date of Test	:	Feb. 13, 2001	EUT	:	E-LOCK
Test Mode	:	Mode 1	Test Site	:	Chamber 1

Freq.	Cable Loss	Probe Factor	PreAMP	Reading Level	Measurement	Margin	Limit	Ant	Turn
MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m	cm	deg
Horizontal:									
*49.400	1.10	6.64	26.00	38.60	20.34	19.66	40.00	0	0
77.530	1.21	8.46	26.00	34.20	17.87	22.13	40.00	0	0
206.540	1.74	9.36	26.00	32.40	17.50	26.00	43.50	0	0
224.000	1.81	9.58	26.00	33.80	19.19	26.81	46.00	0	0
243.400	1.89	11.44	26.00	33.60	20.93	25.07	46.00	0	0
528.580	3.06	14.96	26.00	31.40	23.42	22.58	46.00	0	0
Vertical:									
66.860	1.17	6.16	26.00	39.00	20.33	19.67	40.00	0	0
143.490	1.48	11.06	26.00	34.60	21.15	22.35	43.50	0	0
156.100	1.54	10.67	26.00	39.00	25.21	18.29	43.50	0	0
214.300	1.77	9.05	26.00	35.60	20.42	23.08	43.50	0	0
*426.730	2.64	14.05	26.00	38.00	28.69	17.31	46.00	0	0
450.980	2.74	14.12	26.00	35.40	26.27	19.73	46.00	0	0

Remarks:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. " * ", means this data is the worst emission level.
3. Emission Level = Reading Level + Antenna Factor + Cable loss