

FCC PART 15 SUBPART C

EMI MEASUREMENT AND TEST REPORT

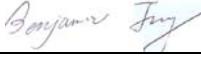
For

Jiangsu Nikota Electrical Commodity CO., Ltd

Miaozhuang Bridge, Xiagang Town
JiangYin City, JiangSu, China

FCC ID: RQOGDO

2004-02-04

This Report Concerns: <input checked="" type="checkbox"/> Original Report	Equipment Type: Garage door opener
Test Engineer: Jerry Wang / 	
Report No.: R0312012 (T)	
Test Date: 2003-12-03	
Reviewed By: Ming Jing / 	
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endorsement by NVLAP or any agency of the U.S. Government.

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Jiangsu Nikota*'s product, model number: *GDO* or the "EUT" as referred to in this report is a transmitter for a Garage door opener which measures approximately 3.0" L x 1.75" W x 0.5" H, rated input voltage: DC 6V battery.

* *The test data gathered are from a production sample provided by the manufacturer.*

Objective

This Type approval report is prepared on behalf of *Jiangsu Nikota Electrical Commodity CO., Ltd* in accordance with Part 2, Subpart J, and Part 15, Subparts B and C of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC rules, Part 15, Sec 231 for conducted and radiated margin.

Related Submittal(s)/Grant(s)

No Related Submittals

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4 –2001, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. All radiated and conducted emissions measurement was performed at BACL. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Open Area Test site used by BACL to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Sunnyvale, California, USA.

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2001.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code:200167-0). The scope of the accreditation covers the FCC Method - 47 CFR Part 15 - Digital Devices, IEC/CISPR 22: 1997, and AS/NZS 3548: Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment test methods.

Test Equipment List

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	8568B	Panel 2408A00105 Display 2403A06544	2003-05-01
HP	Spectrum Analyzer	8593A	29190A00242	2003-05-01
HP	Amplifier	8447E	1937A01054	2003-05-01
HP	Quasi-Peak Adapter	85650A	2521A00718	2003-05-01
Com-Power	Biconical Antenna	AB-100	14012	2003-05-01
Com-Power	LISN	LI-200	12005	2003-03-28
Com-Power	LISN	LI-200	12008	2003-03-28
Com-Power	Log Periodic Antenna	AL-100	16091	2003-05-01
Com-Power	Log Periodic Antenna	AB-900	15049	2003-05-01
HP	Voltmeter	6236B	2003A05705	Not Required

* **Statement of Traceability:** BACL certifies that all calibration has been performed using suitable standards traceable to NIST.

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to ANSI C63.4-2001.

The final qualification test was performed with the EUT operating at normal mode.

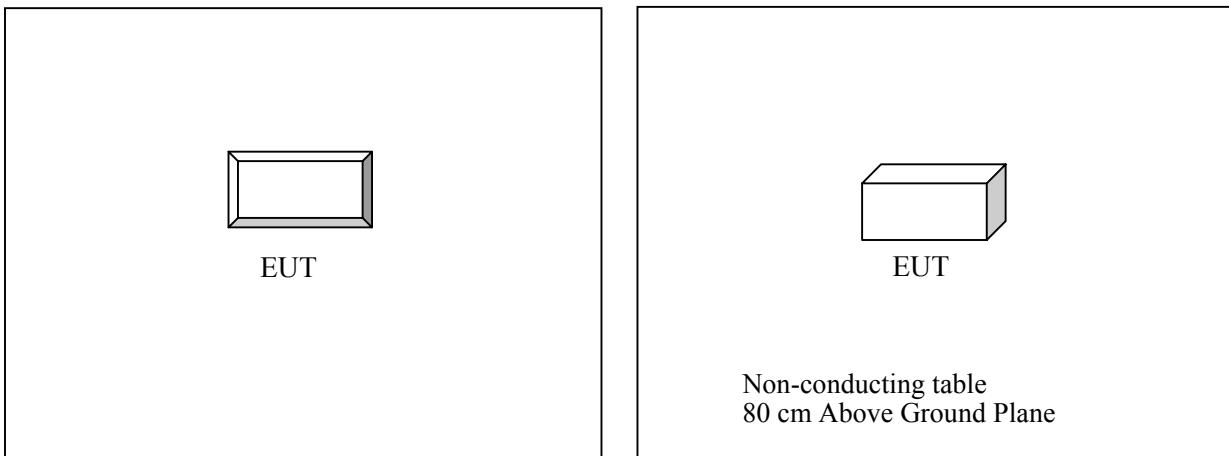
Block Diagram

Appendix A contains a copy of the EUT's block diagram as reference.

Test Configuration Setup

No Modifications were made to the EUT.

Test Setup Block Diagram



SUMMARY OF TEST RESULTS

FCC Rules	REQUIREMENTS	RESULT
§15.203	Antenna Requirement	Pass
§15.205, §15.209, §15.231	Spurious Radiated Emissions	Pass
§15.207 (a)	Conducted Emissions	Pass
§15.231(a)(1)	Deactivation	Pass
§15.231(c)	20dB Bandwidth	Pass
§15.231(b)(2)	Pulse desensitization or derating was not required because peak measurements were employed	N/A

§15.203 - ANTENNA REQUIREMENT

Standard Applicable

For intentional device, according to § 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.

Refer to statement below for compliance.

“The antenna for the device is an integral antenna that the end user cannot access. Further the device is for outdoor use as detailed in the Users Manual and Operational Description, which are included in this application.”

Antenna Connected Construction

The antenna connector is designed with permanent attachment and no consideration of replacement

§15.205, §15.209, §15.231 - Radiated Emission Data

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at BACL is ± 4.0 dB.

EUT Setup

The radiated emission tests were performed in the open area 10-meter test site, using the setup accordance with the ANSI C63.4-2001. The specification used was the FCC Class B limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

Fresh batteries were used for all radiated emissions testing.

Spectrum Analyzer Setup

According to FCC Rules, 47 CFR 15.33, the EUT was tested to 4 GHz.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

<u>Frequency Range</u>	<u>RBW</u>	<u>Video B/W</u>
Below 30MHz	10kHz	10kHz
30 – 1000MHz	100kHz	100kHz
Above 1000MHz	1MHz	1MHz

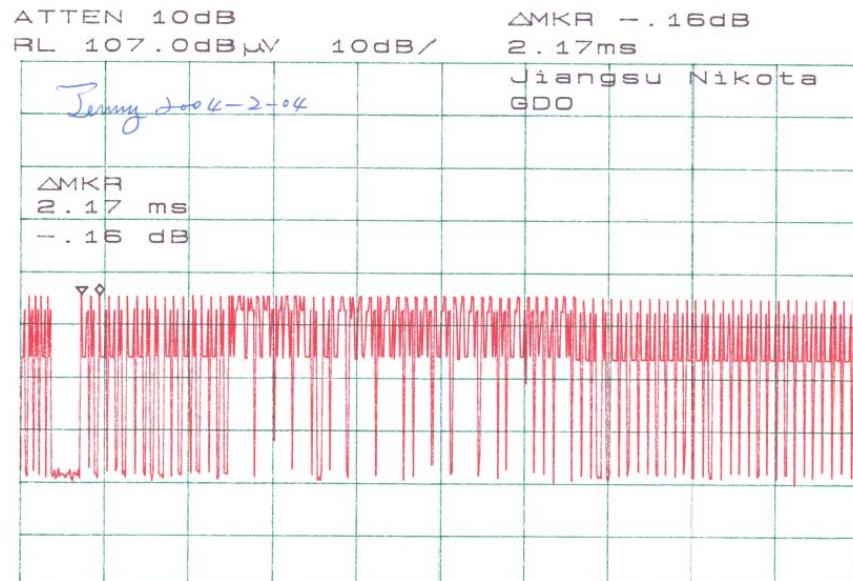
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	8568B	2601A02165	2003-07-03
HP	Amplifier	8447E	2944A10187	2003-09-23
HP	Quasi-Peak Adapter	85650A	3019A05393	2003-06-13
EMCO	Biconical Antenna	3110B	9309-1165	2003-10-11
EMCO	Log Periodic Antenna	3146	2101	2003-10-11

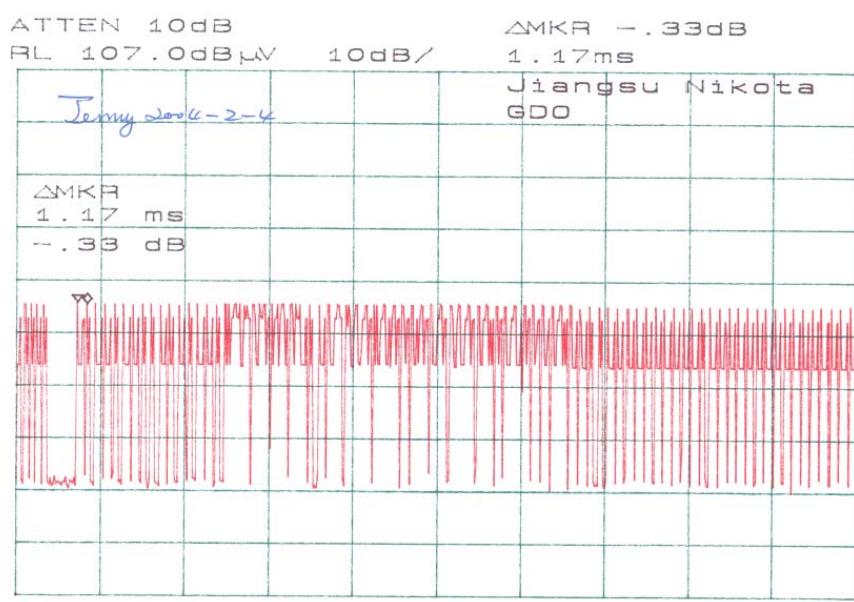
* **Statement of Traceability:** BACL Corp. certifies that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Results

According to the final data in following table, the EUT complied with the FCC 15.205, 15.207, 15.209, 15.231 (b) standards and had the worst margin of:



CENTER 433.550000MHz SPAN 0Hz
RBW 100kHz VBW 100kHz *SWP 100ms



CENTER 433.550000MHz SPAN 0Hz
*RBW 100KHz VBW 100KHz *SWP 100ms

- 20.56 dB μ V at 867.76 MHz in the **Horizontal** polarization, 30 MHz to 4 GHz, 3 meters

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.231		Mode
Frequency	Ampl.		Angle	Height	Polar	Antenna	Cable		Corr. Ampl.	Limit	
MHz	dB μ V /m	Degree	Meter	H/ V	dB μ V/m	dB	dB	dB μ V/m	dB μ V/m	dB	
867.76	42.3	30	1.5	H	22.8	4.27	28	41.37	61.93	-20.56	Ave
1301.68	38.9	45	1.5	H	24.2	4.55	27.4	40.25	61.93	-21.68	Ave
867.75	40.1	120	1.2	V	22.8	4.27	28	39.17	61.93	-22.76	Ave
1301.68	37.2	90	1.2	V	24.2	4.55	27.4	38.55	61.93	-23.38	Ave
867.76	53.4	30	1.5	H	22.8	4.27	28	52.47	81.93	-29.46	Peak
867.75	51.2	120	1.2	V	22.8	4.27	28	50.27	81.93	-31.66	Peak
1301.68	48.3	45	1.5	H	24.2	4.55	27.4	49.65	81.93	-32.28	Peak
1301.68	48.2	90	1.2	V	24.2	4.55	27.4	49.55	81.93	-32.38	Peak
433.80	72.6	0	1.5	H	16.2	2.83	28.3	63.33	100.82	-37.49	Fund/ Peak
433.80	71.5	90	1.2	V	16.2	2.83	28.3	62.23	100.82	-38.59	Fund/ Peak

The EUT was tested in all three orthogonal axis.

Note:

Fund: Fundamental

§15.207 - AC Line Conducted Emissions

Not applicable because of battery powered.

§15.231(a)(1) - Deactivation

Requirement

Per 15.231(a)(1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

Test Equipment

HP, Amplifier, Cal Date: 2003-05-01

HP, Spectrum Analyzer, Cal Date: 2003-05-01

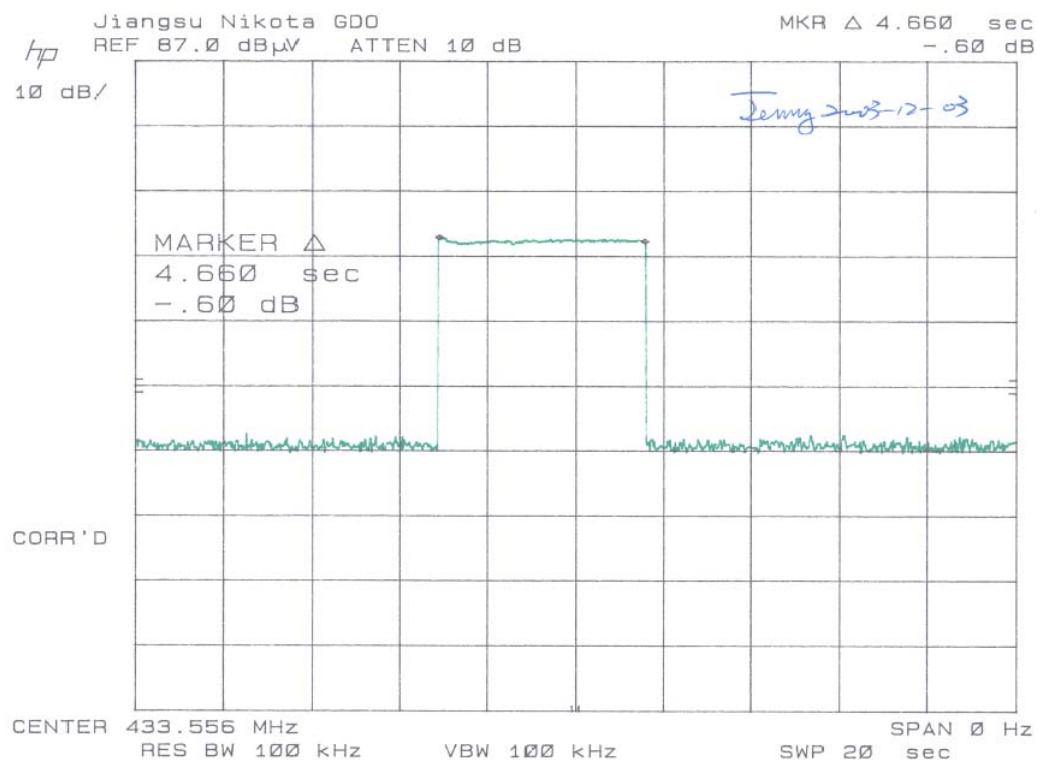
HP, Quasi-Peak Adapter, Cal Date: 2003-05-01

Com-Power, Log Periodic Antenna, Cal. Date: 2003-05-01

Test Result

Transmitting Time	Limit
MS	MS
4660	5000

Complies with the requirement.



§15.231(c) - 20dB Bandwidth

Requirement

Per 15.231(c), the bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz. For devices operating above 900MHz, the emission shall be no wider than 0.5% of the center frequency bandwidth is determined at the points 20 dB down from the modulated carrier.

Equipment List

HP, Amplifier, Cal Date: 2003-05-01

HP, Spectrum Analyzer, Cal Date: 2003-05-01

HP, Quasi-Peak Adapter, Cal Date: 2003-05-01

Com-Power, Log Periodic Antenna, Cal. Date: 2003-05-01

Test Result

72 kHz < 0.25% of 433.556 MHz

Complies with the requirement.

