



243 Jubug-Ri, Yangji-Myeon, Yongin-Si, Gyeonggi-Do, Korea 449-822

Tel: +82-31-323-6008 Fax: +82-31-323-6010

<http://www.ltalab.com>

Dates of Tests: May 21~26, 2009

Test Report S/N: LR500190905E

Test Site : LTA CO., LTD.

CERTIFICATION OF COMPLIANCE

FCC ID.

WLHBDS212K

APPLICANT

BNB Solutions Co., Ltd.

FCC Classification	:	Part 15 Low Power Communication Device Transmitter
Manufacturing Description	:	Digital Doorlock
Manufacturer	:	BNB Solutions Co., Ltd.
Model name	:	BDS-212K
Variant Model name	:	BDS-212
Test Device Serial No.:	:	Identical prototype
Rule Part(s)	:	FCC Part 15.225 Subpart C; ANSI C-63.4-2003
Frequency Range	:	13.56MHz
RF power	:	40.82dBuV/m @ 3m
Data of issue	:	May 28, 2009

This test report is issued under the authority of:

The test was supervised by:

Dong -Min JUNG, Technical Manager

Kyung-Taek LEE, Test Engineer

This test result only responds to the tested sample. It is not allowed to copy this report even partly without the allowance of the test laboratory. This report must not be used by the applicant to claim product endorsement by any agency.



NVLAP LAB Code.: 200723-0

TABLE OF CONTENTS

1. GENERAL INFORMATION’S ----- 3

2. INFORMATION’S ABOUT TEST ITEM ----- 4

3. TEST REPORT ----- 5

 3.1 SUMMARY OF TESTS ----- 5

 3.2 TECHNICAL CHARACTERISTICS TEST ----- 6

 3.2.1 ELECTRIC FIELD STRENGTH ----- 6

 3.2.1.1 FUNDAMENTAL EMISSION ----- 7

 3.2.1.2 OUTSIDE the EMISSION ----- 8

 3.2.1.3 SPURIOUS EMISSION ----- 9

 3.2.2 FREQUENCY TOLERANCE ----- 10

 3.2.3 AC CONDUCTED EMISSIONS ----- 11

APPENDIX

 APPENDIX TEST EQUIPMENT USED FOR TESTS ----- 12

1. General information's

1-1 Test Performed

Company name : LTA Co., Ltd.
Address : 243, Jubug-ri, Yangji-Myeon, Youngin-Si, Kyunggi-Do, Korea. 449-822
Web site : <http://www.ltalab.com>
E-mail : chahn@ltalab.com
Telephone : +82-31-323-6008
Facsimile : +82-31-323-6010

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the “General requirements for the competents of calibration and testing laboratory”.

1-2 Accredited agencies

LTA Co., Ltd. is approved to perform EMC testing by the following agencies:

Agency	Country	Accreditation No.	Validity	Reference
NVLAP	U.S.A	200723-0	2009-09-30	ECT accredited Lab.
RRL	KOREA	KR0049	2009-06-20	EMC accredited Lab.
FCC	U.S.A	610755	2011-04-22	FCC filing
VCCI	JAPAN	R2133, C2307	2011-06-21	VCCI registration
IC	CANADA	IC5799	2010-05-03	IC filing

2. Information's about test item

2-1 Client

Company name : BNB Solutions Co., Ltd.
 Address : 169-1, Jubuk-ri, Yangji-Myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea
 Tel / Fax : TEL: +82-31-337-1203 FAX: +82-31-337-1209

2-2 Manufacturer

Company name : BNB Solutions Co., Ltd.
 Address : 169-1, Jubuk-ri, Yangji-Myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea

2-3 Equipment Under Test (EUT)

Trade name : Digital Doorlock
 Model name : BDS-212K
 Variant Modelname : BDS-212
 Serial number : Identical prototype
 Date of receipt : May 20, 2008
 EUT condition : Pre-production, not damaged
 Antenna type : Loop Antenna
 Frequency Range : 13.56 MHz
 RF output power : 40.82dBuV/m @ 3m
 Temperature range : -20℃ ~ 55℃
 Power Source : 6.0V (AA Size * 4)

2-4 Tested frequency

	LOW	MID	HIGH
Frequency (MHz)	-	13.56	-

2-5 Ancillary Equipment

Equipment	Model No.	Serial No.	Manufacturer
-	-	-	-
-	-	-	-

3. Test Report

3.1 Summary of tests

FCC Part Section(s)	Parameter	Test Condition	Status (note 1)
15.225(a)	Electric Field Strength - Fundamental Emission	Radiated	C
15.225(b) (c)	Electric Field Strength - Outside the Band		C
15.225(d) / 15.209	Electric Field Strength - Spurious Emission		C
15.225(e)	Frequency Tolerance		C
15.207 /15.107	AC Conducted Emissions	Line Conducted	NA

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: This device is only operated by battery.

Note 3: The data in this test report are traceable to the national or international standards.

The sample was tested according to the following specification:

FCC Parts 15.225; ANSI C-63.4-2003

3.2 Transmitter requirements

3.2.1 Electric Field Strength

Procedure: About the Fundamental Emission, Outside the Band and Spurious Emission

The Radiated Electric Field Strength intensity has been measured with a ground plane and at a distance of 3m.

→ From 9kHz to 30MHz at distance 3m

The EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for each antenna angle 0deg., 45deg. and 90deg.

→ From 30MHz to 1000MHz at distance 3m

The measuring antenna height was varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for both vertical and horizontal antenna polarization.

Bandwidth settings per frequency range;

	From 9kHz to 150kHz	From 150kHz to 30MHz	From 30MHz to 1000MHz
IF Bandwidth	200Hz	9kHz	120kHz

Part 15 Section 15.31 (f)(2) (9kHz ~ 30MHz)

9kHz ~ 490kHz [Limit at 3m] = [Limit at 300m]-20log(3[m]/300[m])

490kHz ~ 30MHz [Limit at 3m] = [Limit at 30m]-20log(3[m]/30[m])

3.2.1.1 Electric Field Strength - Fundamental Emission

Test method : Part 15.225(a)
 Tx Frequency : 13.56 MHz
 Result : **Complies**

Measurement data:

Freq (MHz)	Pol.	Reading (dBμV/m)	T.F (dB)	Field Strength @3m (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
13.56	H	52.32	-11.5	40.82	104	83.18
13.56	V	51.96	-11.5	40.46	104	83.54

-- Note 1--

Field strength of 13.553MHz to 13.567MHz Limit@3m = 84dBuV/m + 20log30m/3m
 = 104dBuV/m

-- Note 2--

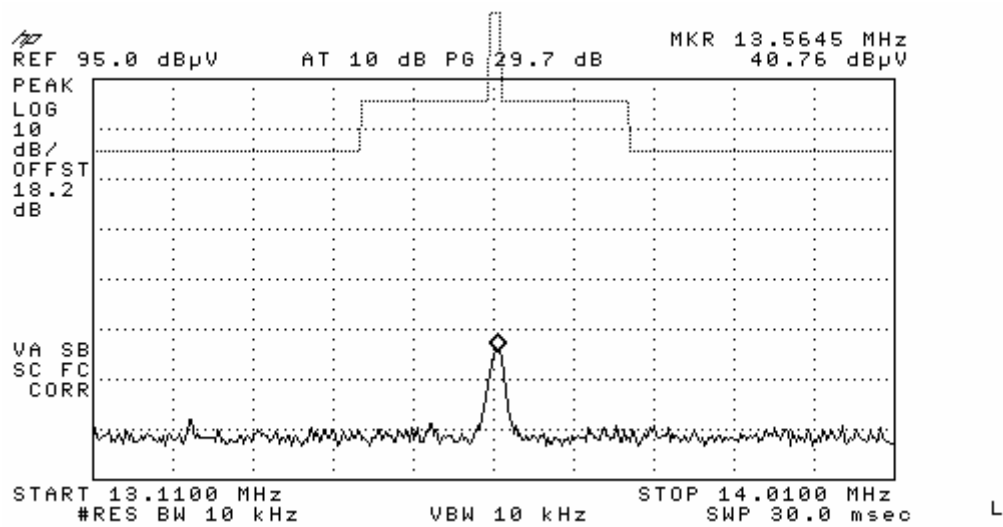
T.F(Total Factor) = Antenna Factor + Cable Loss –Amp Gain

Field Strength @3m = Reading + T.F

3.2.1.2 Electric Field Strength - Outside the Allocated Band

Test method : Part 15.225(b) (c)
Tx Frequency : 13.56 MHz
Result : **Complies**

Measurement Data:



3.2.1.3 Electric Field Strength – Spurious Emission

Test method : Part 15.225(d) / Part 15.209
 Tx Frequency : 13.56 MHz
 Result : **Complies**

Measurement Data:

Freq (MHz)	Pol.	Reading (dBμV/m)	T.F (dB)	Field Strength @3m (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
54.26	H	37.33	13.73	23.60	40	16.40
379.79	H	38.86	10.15	28.71	46	17.29
406.92	H	40.03	9.69	30.34	46	15.66
434.05	H	37.50	9.16	28.34	46	17.66
529.00	H	37.70	7.98	29.72	46	16.28
569.69	H	42.01	7.07	34.94	46	11.06
583.25	H	44.16	6.75	37.41	46	8.59
596.82	H	42.52	6.68	35.84	46	10.16
610.38	H	39.51	6.27	33.24	46	12.76
678.20	H	39.59	5.63	33.96	46	12.04
759.58	H	40.37	3.85	36.52	46	9.48
786.71	H	44.46	3.53	40.93	46	5.07
800.28	H	39.73	3.28	36.45	46	9.55
813.84	H	42.62	3.15	39.47	46	6.53
827.40	H	39.67	3.02	36.65	46	9.35
840.97	H	43.03	2.92	40.11	46	5.89
895.22	H	40.31	2.33	37.98	46	8.02
908.79	H	41.21	2.02	39.19	46	6.81
922.35	H	43.19	1.72	41.47	46	4.53
935.92	H	40.98	1.36	39.62	46	6.38
949.48	H	42.82	0.99	41.83	46	4.17

-- Note 1--

T.F(Total Factor) = Antenna Factor + Cable Loss –Amp Gain

Field Strength @3m = Reading + T.F

-- Note 2--

No other emissions were detected at a level greater than 20dB below limit.

3.2.2 Frequency Tolerance

Procedure:

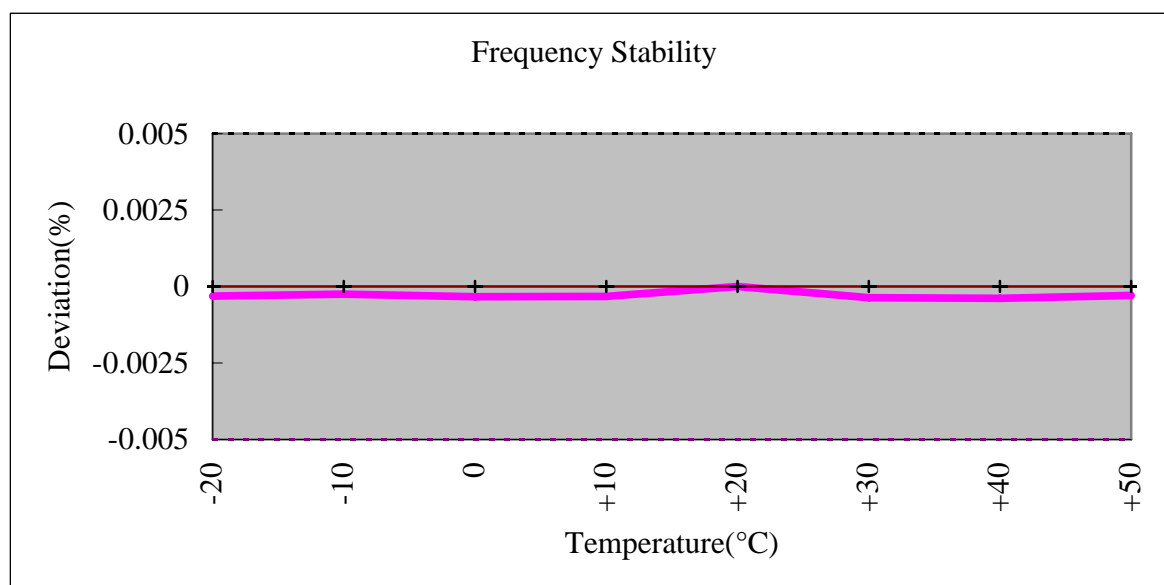
The temperature test was started after the temperature stabilization time of 30 minutes.

Test method : Part 15.225(e)
 Tx Frequency : 13.56 MHz
 Result : **Complies**

Measurement Data:

OPERATING FREQUENCY: 13,562,079 Hz
 Freq. Tolerance Limit: ± 0.01% %

VOLTAGE (%)	POWER (V)	TEMP (°C)	FREQ (Hz)	Deviation (%)
NewBattery	6.0	-20	13,562,037	-0.000310
NewBattery		-10	13,562,045	-0.000251
NewBattery		0	13,562,034	-0.000332
NewBattery		10	13,562,035	-0.000324
NewBattery		20	13,562,079	0
NewBattery		30	13,562,030	-0.000361
NewBattery		40	13,562,026	-0.000391
NewBattery		50	13,562,040	-0.000288



3.2.3 AC Conducted Emissions

Procedure:

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. While the measurement, EUT had its hopping function disabled at the middle channels in line with Section 15.31(m). Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation and Exerciser operation. The highest emissions relative to the limit are listed.

Measurement Data:

→ **Not Applicable** (-This product is operated by battery.)

Minimum Standard: FCC Part 15.107/EN 55022 Class A

Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 ~ 0.5	79	66
0.5 ~ 30	73	60

* Decreases with the logarithm of the frequency

APPENDIX

TEST EQUIPMENT USED FOR TESTS

	Description	Model No.	Serial No.	Manufacturer	Next Cal. Date
1	Spectrum Analyzer	FSV-30	100757	R&S	Feb-10
2	Spectrum Analyzer	8563E	3425A02505	HP	Apr-10
3	Spectrum Analyzer	8594E	3710A04074	HP	Oct-09
4	Signal Generator	8648C	3623A02597	HP	Apr-10
5	Signal Generator	83711B	US34490456	HP	Apr-10
6	Attenuator (3dB)	8491A	37822	HP	Oct-09
7	Attenuator (10dB)	8491A	63196	HP	Oct-09
8	Attenuator (30dB)	8498A	1801A06689	HP	Oct-09
9	EMI Test Receiver	ESVD	843748/001	R&S	Apr-10
10	Horn Antenna(18 ~ 40GHz)	SAS-574	154	Schwarzbeck	Nov-10
11	Horn Antenna(18 ~ 40GHz)	SAS-574	155	Schwarzbeck	Nov-10
12	RF Amplifier	8447D	2949A02670	HP	Oct-10
13	RF Amplifier	8449B	3008A02126	HP	Apr-10
14	Test Receiver	ESHS10	828404/009	R&S	Apr-10
15	TRILOG Antenna	VULB 9160	9160-3212	SCHWARZBECK	Apr-11
16	Log.-Per. Antenna	VULP 9118	9118 A 401	SCHWARZBECK	Apr-11
17	Biconical Antenna	BBA 9106	VHA 9103-2315	SCHWARZBECK	Apr-11
18	Horn Antenna	3115	00055005	ETS LINDGREN	Mar-11
19	Horn Antenna	BBHA 9120D	9120D122	SCHWARZBECK	Dec-11
20	Dipole Antenna	VHA9103	2116	SCHWARZBECK	Nov-09
21	Dipole Antenna	VHA9103	2117	SCHWARZBECK	Nov-09
22	Dipole Antenna	VHA9105	2261	SCHWARZBECK	Nov-09
23	Dipole Antenna	VHA9105	2262	SCHWARZBECK	Nov-09
24	Hygro-Thermograph	THB-36	0041557-01	ISUZU	Apr-10
25	Splitter (SMA)	ZFSC-2-2500	SF617800326	Mini-Circuits	-
26	RF Switch	MP59B	6200414971	ANRITSU	-
27	Power Divider	11636A	6243	HP	Oct-09
28	DC Power Supply	6622A	3448A03079	HP	Oct-09
29	Frequency Counter	5342A	2826A12411	HP	Apr-10
30	Power Meter	EPM-441A	GB32481702	HP	Apr-10
31	Power Sensor	8481A	2702A64048	HP	Apr-10
32	Audio Analyzer	8903B	3729A18901	HP	Oct-09
33	Modulation Analyzer	8901B	3749A05878	HP	Oct-09
34	TEMP & HUMIDITY Chamber	YJ-500	LTAS06041	JinYoung Tech	Oct-09
35	LOOP-ANTENNA	FMZB 1516	151602/94	SCHWARZBECK	Mar-11
36	Stop Watch	HS-3	601Q09R	CASIO	Apr-10
37	LISN	ENV216	100408	R&S	Oct-09