

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
INTENTIONAL RADIATOR CERTIFICATION TO
FCC PART 15 SUBPART C REQUIREMENT**

OF

Smart key

MODEL No.: DNYS-2C

FCC ID: Z5FDNYS-2C

Trademark: 

REPORT NO: ES141027332E2

ISSUE DATE: November 07, 2014

Prepared for
Zhuhai Unitech Power Technology Co., Ltd.
No. 102, Yinhua Road, Xiangzhou, Zhuhai, Guangdong

Prepared by
SHENZHEN EMTEK CO., LTD

**Bldg 69, Majialong Industry Zone, Nanshan District,
Shenzhen, Guangdong, China
TEL: 86-755-26954280
FAX: 86-755-26954282**

VERIFICATION OF COMPLIANCE

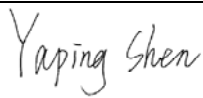
Applicant:	Zhuhai Unitech Power Technology Co., Ltd. No. 102, Yinhua Road, Xiangzhou, Zhuhai, Guangdong
Manufacturer:	Zhuhai Unitech Power Technology Co., Ltd. No. 102, Yinhua Road, Xiangzhou, Zhuhai, Guangdong
Product Name:	Smart key
Model Number:	DNYS-2C
Serial Number:	N/A
File Number:	ES141027332E2

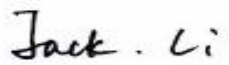
We hereby certify that:

The above equipment was tested by SHENZHEN EMTEK CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2009) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.247.

The test results of this report relate only to the tested sample identified in this report.

Date of Test : October 27, 2014 to November 11, 2014

Prepared by : 
Yaping Shen/Editor

Reviewer : 
Jack Li/Supervisor

Approve & Authorized Signer : 
Lisa Wang/Manager

Table of Contents

1.	GENERAL INFORMATION.....	4
1.1	PRODUCT DESCRIPTION.....	4
1.2	RELATED SUBMITTAL(S) / GRANT (S).....	4
1.3	TEST METHODOLOGY	4
1.4	SPECIAL ACCESSORIES	4
1.5	EQUIPMENT MODIFICATIONS	4
1.6	TEST FACILITY	5
2.	SYSTEM TEST CONFIGURATION.....	6
2.1	EUT CONFIGURATION	6
2.2	EUT EXERCISE.....	6
2.3	TEST PROCEDURE	6
2.4	LIMITATION	6
2.6	EQUIPMENT USED IN TESTED SYSTEM	7
3.	SUMMARY OF TEST RESULTS	7
4.	RADIATED EMISSION TEST	8
4.1	MEASUREMENT PROCEDURE	8
4.2	TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....	9
4.3	MEASUREMENT EQUIPMENT USED:.....	9
4.4	MEASUREMENT RESULT	10
5.	ANTENNA APPLICATION.....	13
5.1	ANTENNA REQUIREMENT	错误！未定义书签。

1. GENERAL INFORMATION

1.1 Product Description

A major technical descriptions of EUT is described as following:

RFID Frequency: 125KHz
Overall dimensions: 120*52*26mm
Display: 1.45" OLED
Battery capacity: 1150mAh / 3.7V
Built-in memory: 8GB
Hardware platform: STM32F407
Charging voltage: 5V
Charging current: 500mA
Standby operating current: $\leq 40\text{mA}$
Operating temperature: $-25^{\circ}\text{C} \sim 70^{\circ}\text{C}$
Relative humidity: 5% ~ 90%
USB support: USB 2.0 (FULL SPEED)
Antenna type: Probe
Antenna gain: 0 dBi

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: Z5FDNYS-2C filing to comply with Section 15.207&15.209 of the FCC Part 15 Subpart C Rules.

1.3 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4 (2009) and FCC Public Notice DA 00-705. Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Special Accessories

Not available for this EUT intended for grant.

1.5 Equipment Modifications

Not available for this EUT intended for grant.

1.6 Test Facility

Site Description
EMC Lab.

: Accredited by CNAS, 2013.10.29
The certificate is valid until 2016.10.28
The Laboratory has been assessed and proved to be in compliance with CNAS/CL01:2006(identical to ISO/IEC17025:2005)
The Certificate Registration Number is L2291

Accredited by TUV Rheinland Shenzhen 2010.5.25
The Laboratory has been assessed according to the requirements ISO/IEC 17025

Accredited by FCC, April 17, 2013
The Certificate Registration Number is 406365.

Accredited by Industry Canada, March 5, 2010
The Certificate Registration Number is 4480A-2.

Name of Firm
Site Location

: SHENZHEN EMTEK CO., LTD
: Bldg 69, Majialong Industry Zone,
Nanshan District, Shenzhen, Guangdong, China

2. System Test Configuration

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Radiated Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4-2009.

2.4 Limitation

(1) Radiated Emission

FCC Part 15, Subpart C Section 15.209 limit of radiated emission for frequency below 1000GHz. The emissions from an intentional radiator shall not exceed the field strength level specified in the following table:

Frequency (MHz)	Field strength $\mu\text{V/m}$	Distance(m)	Field strength at 3m dB $\mu\text{V/m}$
0.009~0.490	2400/F(KHz)	300	See the remark
0.490~1.705	2400/F(KHz)	30	
1.705~30.0	30	30	
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

Remark 1. Emission level in dBuV/m=20 log (uV/m)
:
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

2.6 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
1.	High-voltage presence indicating system		GSN2S	N/A	Support equipment

Note:

(1) Unless otherwise denoted as EUT in 『Remark』 column , device(s) used in tested system is a support equipment.

3. Summary of Test Results

FCC Rule	Description Of Test	Result
15.207	AC Power Conducted Emission	N/A*
15.209	Radiated Emission	Pass

Remark*: The EUT is powered by battery.

4. Radiated Emission Test

4.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured was complete.

When spectrum scanned from 9KHz to 150KHz setting resolution bandwidth 200Hz and video bandwidth 1kHz.

EMI Test Receiver	Setting
Attenuation	Auto
RB	200Hz
VB	1kHz
Detector	QP
Trace	Max hold

When spectrum scanned from 150KHz to 30MHz setting resolution bandwidth 9 kHz and video bandwidth 30kHz.

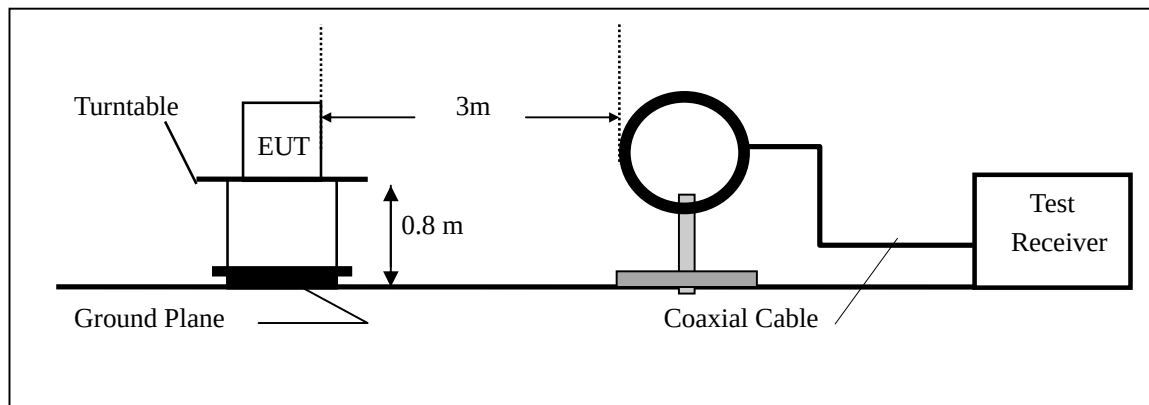
EMI Test Receiver	Setting
Attenuation	Auto
RB	9kHz
VB	30kHz
Detector	QP
Trace	Max hold

When spectrum scanned from 30 MHz to 1GHz setting resolution bandwidth 120 kHz and video bandwidth 300kHz.

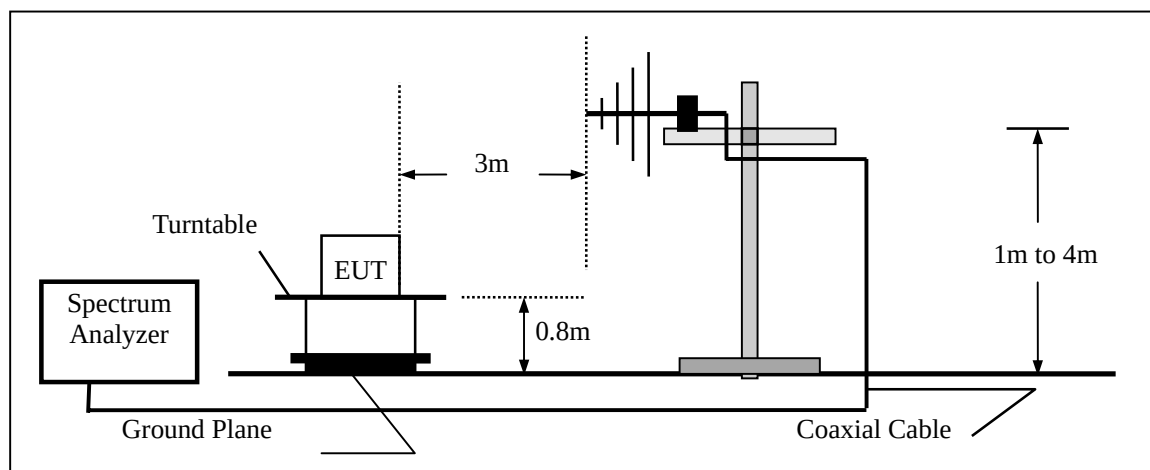
EMI Test Receiver	Setting
Attenuation	Auto
RB	120kHz
VB	300kHz
Detector	QP
Trace	Max hold

4.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



4.3 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Rohde & Schwarz	FSP7	839511/010	05/17/2014	05/16/2015
Spectrum Analyzer	HP	E4407B	839840481	05/17/2014	05/16/2015
EMI Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/17/2014	05/16/2015
Pre-Amplifier	HP	8447D	2944A07999	05/17/2014	05/16/2015
Bilog Antenna	Schwarzbeck	VULB9163	142	05/17/2014	05/16/2015
Loop Antenna	ARA	PLA-1030/B	1029	05/17/2014	05/16/2015

4.4 Measurement Result

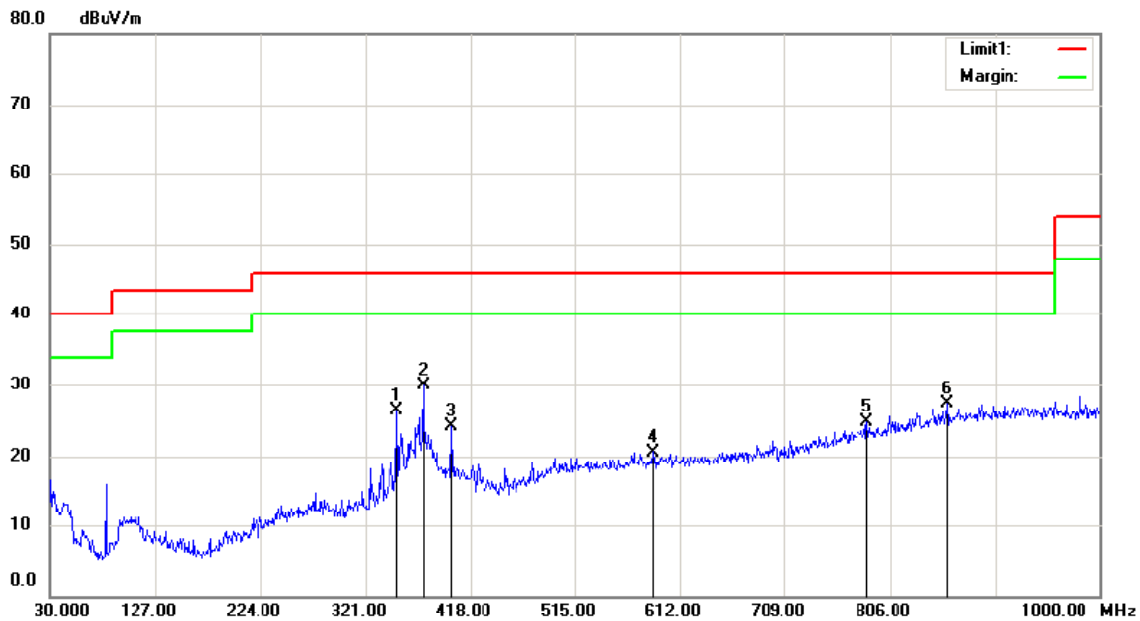
Operation Mode: Bluetooth Mode Test Date : October 31, 2014
Frequency Range: 9KHz~30MHz Temperature : 24℃
Test Result: PASS Humidity : 53 %
Measured Distance: 3m Test By: KK

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)
--	--	--	--	--

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Operation Mode: TX
Frequency Range: 30~1000MHz
Test Result: PASS
Measured Distance: 3m

Test Date : October 31, 2014
Temperature : 24℃
Humidity : 53 %
Test By: KK

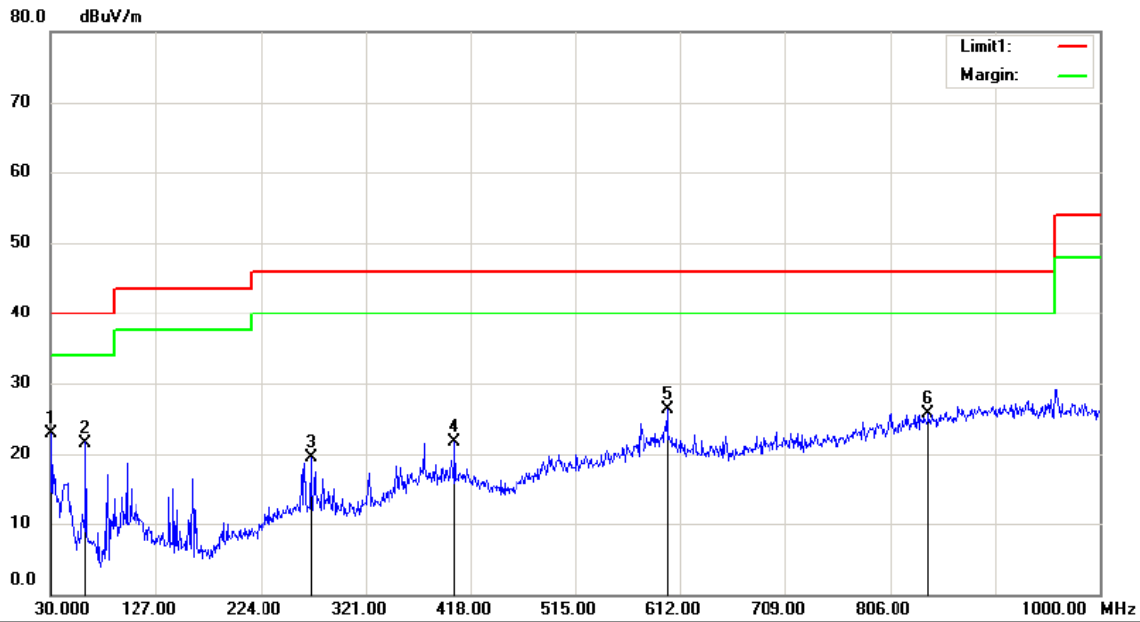


Site 3m Chamber #2 Polarization: **Horizontal** Temperature: 24 C
Limit: (RE)FCC PART 15 C Power: DC 3.7V by battery Humidity: 53 %
Mode:Data collection(TX 125KHz)
Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		350.1000	37.06	-10.69	26.37	46.00	-19.63	QP		
2	*	375.3200	39.32	-9.41	29.91	46.00	-16.09	QP		
3		400.5400	32.32	-8.18	24.14	46.00	-21.86	QP		
4		587.7500	26.45	-5.85	20.60	46.00	-25.40	QP		
5		784.6600	26.33	-1.70	24.63	46.00	-21.37	QP		
6		859.3500	27.44	-0.05	27.39	46.00	-18.61	QP		

*:Maximum data x:Over limit !:over margin

Operator: RJB



Site 3m Chamber #2 Polarization: **Vertical** Temperature: 24 C
Limit: (RE)FCC PART 15 C Power: DC 3.7V by battery Humidity: 53 %
Mode:Data collection(TX 125KHz)
Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	30.9700	37.87	-14.92	22.95	40.00	-17.05	QP		
2		62.0100	38.19	-16.59	21.60	40.00	-18.40	QP		
3		270.5600	32.22	-12.65	19.57	46.00	-26.43	QP		
4		403.4500	29.97	-8.29	21.68	46.00	-24.32	QP		
5		600.3600	31.93	-5.71	26.22	46.00	-19.78	QP		
6		841.8900	26.09	-0.40	25.69	46.00	-20.31	QP		

*:Maximum data x:Over limit !:over margin

Operator: RJB

5. Antenna Application

Antenna Requirement

Standard	Requirement
FCC CRF Part 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR Section 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Result

The EUT'S antenna is probe, The antenna's gain is 0dBi and meets the requirement. and the antenna can't be replaced by the user, which in accordance to section 15.203.