

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
INTENTIONAL RADIATOR CERTIFICATION TO
FCC PART 15 SUBPART B
REQUIREMENTS**

Zhuhai Unitech Power Technology Co., Ltd.

Smart key

Model No.: DNYS-2C

FCC ID: Z5FDNYS-2C

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

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

Tel: (0755) 26954280
Fax: (0755) 26954282

Report Number : ES141027332E1
Date of Test : October 27, 2014 to November 11, 2014
Date of Report : November 11, 2014

TABLE OF CONTENT

Test Report Description	Page
1. SUMMARY OF TEST RESULT	5
2. GENERAL INFORMATION	6
2.1. DESCRIPTION OF DEVICE (EUT)	6
2.2. DESCRIPTION OF TEST FACILITY	6
2.3. DESCRIPTION OF SUPPORT DEVICE.....	7
2.4. MEASUREMENT UNCERTAINTY.....	7
3. MEASURING DEVICE AND TEST EQUIPMENT	8
3.1. FOR POWER LINE CONDUCTED EMISSION MEASUREMENT.....	8
3.2. FOR RADIATED EMISSION MEASUREMENT.....	8
4. POWER LINE CONDUCTED EMISSION MEASUREMENT	9
4.1. BLOCK DIAGRAM OF TEST SETUP	9
4.2. MEASURING STANDARD.....	9
4.3. POWER LINE CONDUCTED EMISSION LIMITS (CLASS B).....	9
4.4. EUT CONFIGURATION ON MEASUREMENT	9
4.5. OPERATING CONDITION OF EUT	9
4.6. TEST PROCEDURE.....	10
4.7. MEASURING RESULTS	10
5. RADIATED EMISSION MEASUREMENT	15
5.1. BLOCK DIAGRAM OF TEST SETUP	15
5.2. MEASURING STANDARD.....	15
5.3. RADIATED EMISSION LIMITS (CLASS B).....	15
5.4. EUT CONFIGURATION ON MEASUREMENT	16
5.5. OPERATING CONDITION OF EUT	16
5.6. TEST PROCEDURE	16
5.7. MEASURING RESULTS	16
6. PHOTOGRAPHS	23
6.1. PHOTOS OF CONDUCTED EMISSION MEASUREMENT	23
6.2. PHOTOS OF RADIATION EMISSION MEASUREMENT	25

APPENDIX (Photos of EUT) (6 Pages)

TEST REPORT DESCRIPTION

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

Trade Mark : 

EUT : Smart key

Model No. : DNYS-2C

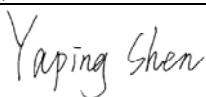
Power Supply : DC 3.7V(Internal rechargeable lithium battery) or DC 5V supplied by charging device.

Measurement Procedure Used:

FCC Rules and Regulations Part 15: 2013 Subpart B & FCC / ANSI C63.4:2009

The device described above is tested by SHENZHEN EMTEK CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and SHENZHEN EMTEK CO., LTD. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of SHENZHEN EMTEK CO., LTD.

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

Prepared by : Yaping Shen
Reviewed by : Joe Xia
Reviewer : Joe Xia/Supervisor

Approved & Authorized Signer : 
Lisa Wang/Manager

Modified History

Ver.	Summary	Date of Ver.	Report No.
V1.0	Original Report	/	ES141027332E1

1. SUMMARY OF TEST RESULT

EMISSION		
Description of Test Item	Standard & Limits	Results
Conducted Disturbance at Mains Terminals	FCC Part 15, Subpart B, ANSI C63.4:2009	Pass
Radiated Disturbance	FCC Part 15, Subpart B, ANSI C63.4:2009	Pass
Note: N/A is an abbreviation for Not Applicable.		

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT : Smart key
Model Number : DNYS-2C
Applicant : Zhuhai Unitech Power Technology Co., Ltd.
Address : No. 102, Yinhua Road, Xiangzhou, Zhuhai, Guangdong
Manufacturer : Zhuhai Unitech Power Technology Co., Ltd.
Address : No. 102, Yinhua Road, Xiangzhou, Zhuhai, Guangdong
Date of Received : October 27, 2014
Date of Test : October 27, 2014 to November 11, 2014

2.2. Description of 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/IEC 17025:2005)
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, November 29, 2012
The Certificate Registration Number is 4480A-2.

Name of Firm : SHENZHEN EMTEK CO., LTD.
Site Location : Bldg 69, Majialong Industry Zone,
Nanshan District, Shenzhen, Guangdong, China

2.3. Description of Support Device

Transmission Adaptor	:	Manufacturer: Unitech M/N: WJBS7E-2HC S/N: N/A FCC,
PC	:	Manufacturer: Lenovo M/N: ThinkCentre 8701 CE, FCC
Monitor	:	Manufacturer: DELL M/N: E2013HC CE, FCC
Mouse	:	Manufacturer: Lenovo M/N: MO28UOL CE, FCC
Keyboard	:	Manufacturer: Lenovo M/N: KB-0225 CE, FCC
	:	

2.4. Measurement Uncertainty

Conducted Emission Uncertainty	:	2.79dB
Radiated Emission Uncertainty (3m Chamber)	:	4.56dB (30M~1GHz Polarize: H) 4.58dB (30M~1GHz Polarize: V)

3. MEASURING DEVICE AND TEST EQUIPMENT

3.1. For Power Line Conducted Emission Measurement

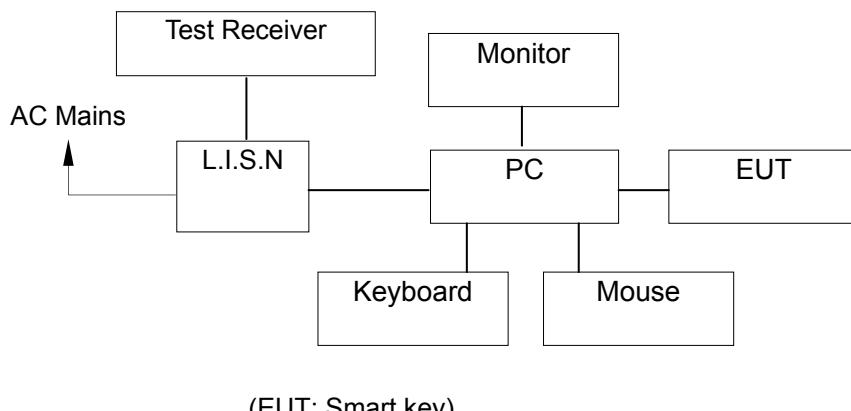
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	Test Receiver	Rohde & Schwarz	ESCS30	100162	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	L.I.S.N.	Rohde & Schwarz	ENV216	101161	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	50Ω Coaxial Switch	Anritsu	MP59B	6100214550	N/A	N/A
<input type="checkbox"/>	Voltage Probe	Rohde & Schwarz	TK9416	N/A	May 17, 2014	1 Year
<input type="checkbox"/>	I.S.N	Teseq GmbH	ISN T800	30327	May 17, 2014	1 Year
<input type="checkbox"/>	LCL adaoter	Teseq GmbH	ADT800-Cat. 5	30327.01	May 17, 2014	1 Year
<input type="checkbox"/>	LCL adaoter	Teseq GmbH	ADT800-Cat. 3	30327.02	May 17, 2014	1 Year
<input type="checkbox"/>	LCL adaoter	Teseq GmbH	ADT800-R	30327.02	May 17, 2014	1 Year

3.2. For Radiated Emission Measurement

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	Pre-Amplifier	HP	8447D	2944A07999	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	Bilog Antenna	Schwarzbeck	VULB9163	142	May 17, 2014	1 Year
<input type="checkbox"/>	Loop Antenna	ARA	PLA-1030/B	1029	May 17, 2014	1 Year
<input type="checkbox"/>	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	May 17, 2014	1 Year
<input type="checkbox"/>	Horn Antenna	Schwarzbeck	BBHA 9120	D143	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	Cable	Schwarzbeck	AK9513	ACRX1	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	Cable	Rosenberger	N/A	FP2RX2	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	Cable	Schwarzbeck	AK9513	CRPX1	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	Cable	Schwarzbeck	AK9513	CRRX2	May 17, 2014	1 Year
<input type="checkbox"/>	Pre-Amplifier	A.H.	PAM-0126	1415261	May 17, 2014	1 Year

4. POWER LINE CONDUCTED EMISSION MEASUREMENT

4.1. Block Diagram of Test Setup



4.2. Measuring Standard

FCC Part 15, Subpart B, ANSI C63.4: 2009

4.3. Power Line Conducted Emission Limits

Frequency (MHz)	Limit (dB μ V)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50 ~ 5.00	56.0	46.0
5.00 ~ 30.00	60.0	50.0

NOTE1-The lower limit shall apply at the transition frequencies.
NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

4.4. EUT Configuration on Measurement

The following equipments are installed on Conducted Emission Measurement to meet FCC requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

EUT : Smart key
Model Number : DNYS-2C

4.5. Operating Condition of EUT

- 4.5.1. Setup the EUT as shown on Section 4.1.
- 4.5.2. Turn on the power of all equipments.
- 4.5.3. Let the EUT work in measuring mode (Data exchange, Charging) and measure it.

4.6. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through Line Impedance Stability Network (L.I.S.N). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the FCC regulations during conducted emission measurement.

The bandwidth of the field strength meter (R&S Test Receiver ESCS30) is set at 9kHz in 150kHz~30MHz and 200Hz in 9kHz~150kHz.

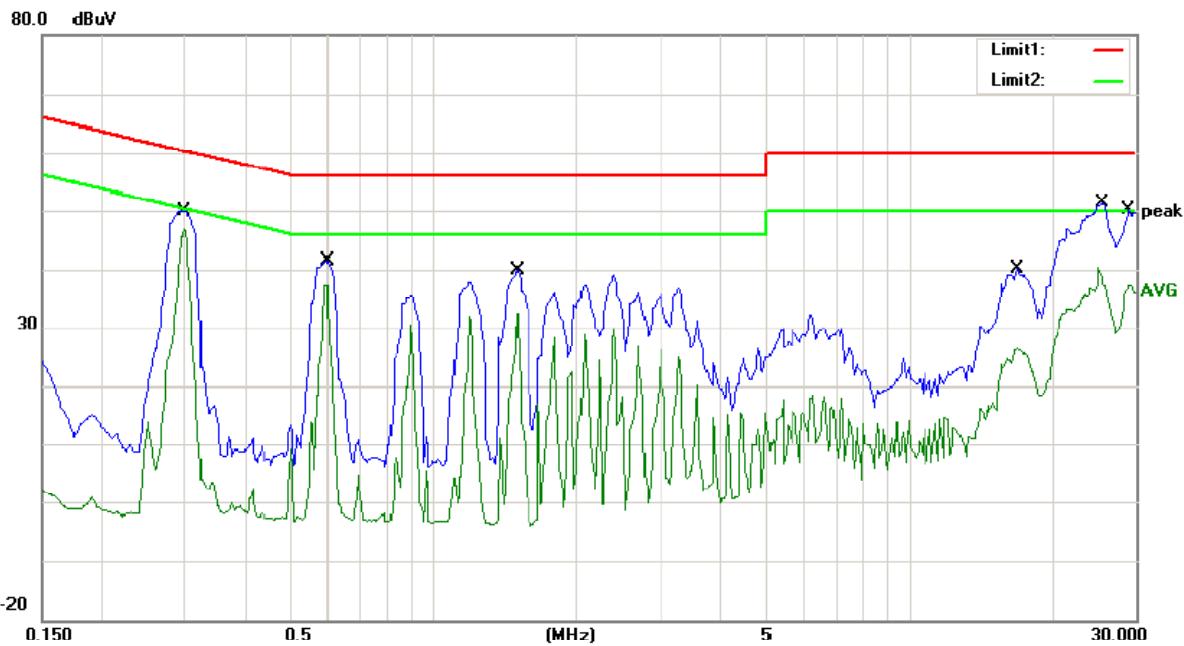
The frequency range from 150kHz to 30MHz is investigated.

All of the modes were tested and the scanning waveforms of the worst modes (Data exchange, Charging) are put in the following pages.

4.7. Measuring Results

PASS.

Please refer to following pages.



Site Conduction #1

Phase: **L1**

Temperature: 24

Limit: (CE)FCC PART 15 B

Power: AC 120V/60Hz

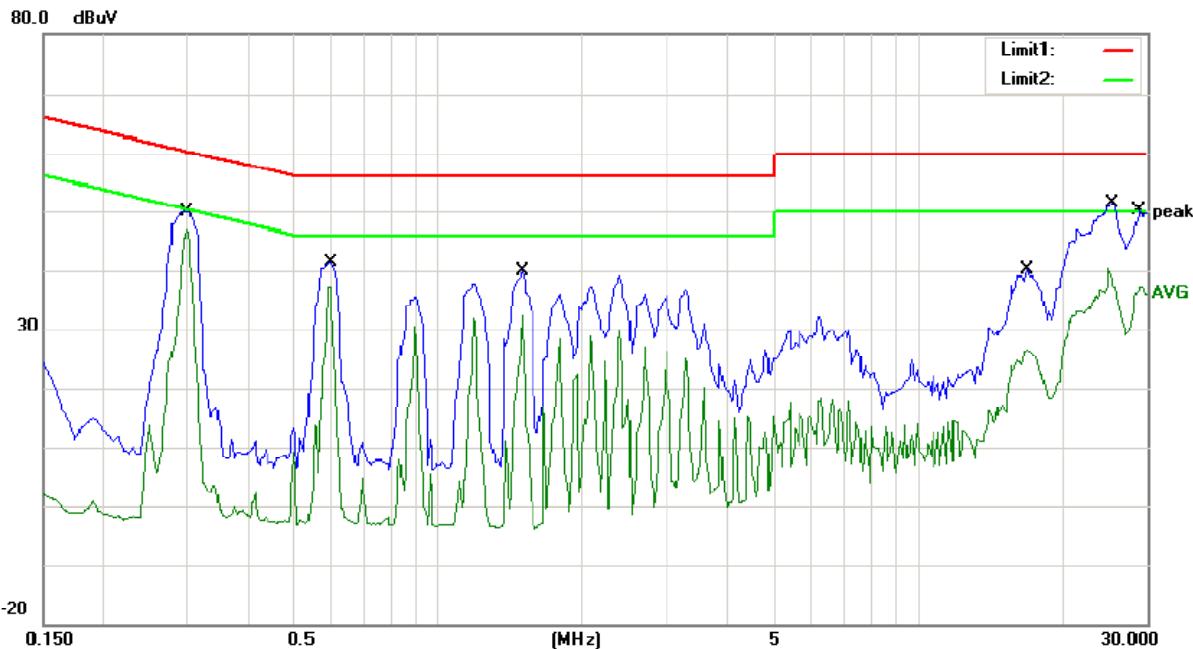
Humidity: 53 %

Mode: Charging

Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.3000	49.95	0.00	49.95	60.24	-10.29	QP	
2 *		0.3000	46.97	0.00	46.97	50.24	-3.27	AVG	
3		0.5950	41.36	0.00	41.36	56.00	-14.64	QP	
4		0.5950	37.44	0.00	37.44	46.00	-8.56	AVG	
5		1.5000	39.80	0.00	39.80	56.00	-16.20	QP	
6		1.5000	32.39	0.00	32.39	46.00	-13.61	AVG	
7		16.8750	40.19	0.00	40.19	60.00	-19.81	QP	
8		16.8750	26.28	0.00	26.28	50.00	-23.72	AVG	
9		25.5250	51.43	0.00	51.43	60.00	-8.57	QP	
10		25.5250	40.45	0.00	40.45	50.00	-9.55	AVG	
11		29.0000	50.01	0.00	50.01	60.00	-9.99	QP	
12		29.0000	37.41	0.00	37.41	50.00	-12.59	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: LB



Site Conduction #1

Phase: **N**

Temperature: 24

Limit: (CE)FCC PART 15 B

Power: AC 120V/60Hz

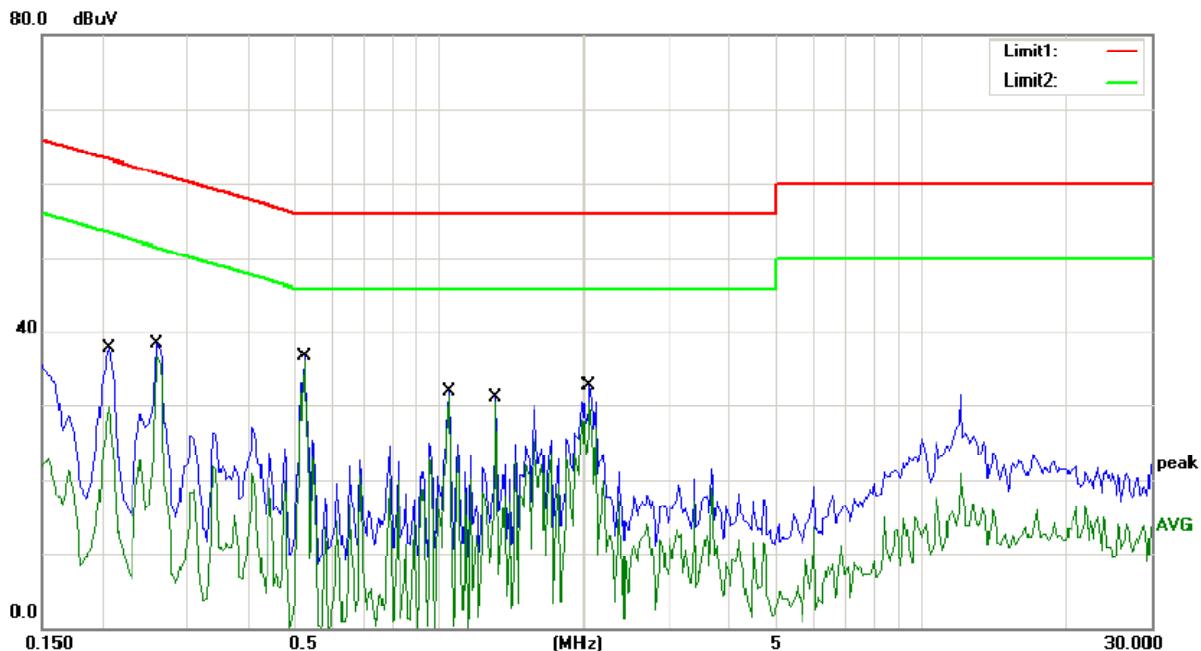
Humidity: 53 %

Mode: Charging

Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV	dBuV	dB		
1	*	0.2900	50.00	0.00	50.00	50.52	-0.52	AVG	
2		0.2950	52.67	0.00	52.67	60.38	-7.71	QP	
3		0.5900	44.52	0.00	44.52	56.00	-11.48	QP	
4		0.5900	40.77	0.00	40.77	46.00	-5.23	AVG	
5		0.8800	39.50	0.00	39.50	56.00	-16.50	QP	
6		0.8800	34.40	0.00	34.40	46.00	-11.60	AVG	
7		1.1800	41.25	0.00	41.25	56.00	-14.75	QP	
8		1.1800	35.36	0.00	35.36	46.00	-10.64	AVG	
9		21.3250	45.90	0.00	45.90	60.00	-14.10	QP	
10		21.3250	32.78	0.00	32.78	50.00	-17.22	AVG	
11		24.2250	51.31	0.00	51.31	60.00	-8.69	QP	
12		24.2250	39.74	0.00	39.74	50.00	-10.26	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: LB



Site Conduction #1

Phase: **L1**

Temperature: 24

Limit: (CE)FCC PART 15 B

Power: AC 120V/60Hz

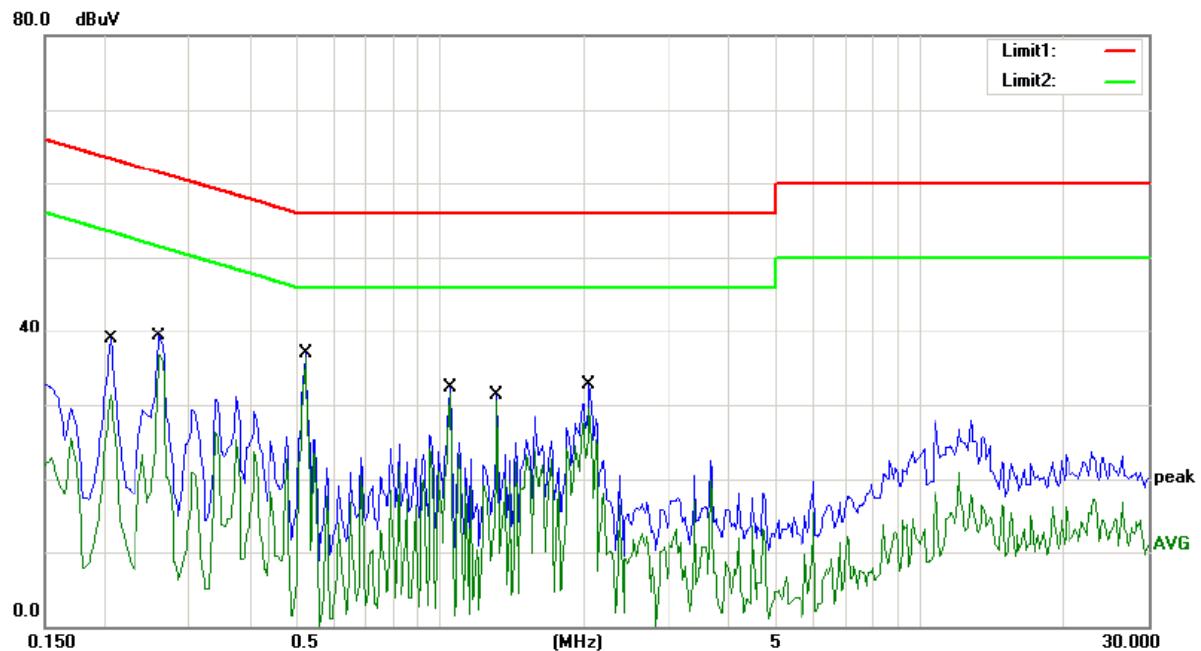
Humidity: 53 %

Mode: Data exchange

Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV	dB			
1		0.2050	37.78	0.00	37.78	63.41	-25.63	QP	
2		0.2050	29.65	0.00	29.65	53.41	-23.76	AVG	
3		0.2600	38.33	0.00	38.33	61.43	-23.10	QP	
4		0.2600	36.35	0.00	36.35	51.43	-15.08	AVG	
5		0.5250	36.45	0.00	36.45	56.00	-19.55	QP	
6	*	0.5250	36.00	0.00	36.00	46.00	-10.00	AVG	
7		1.0500	31.81	0.00	31.81	56.00	-24.19	QP	
8		1.0500	31.29	0.00	31.29	46.00	-14.71	AVG	
9		1.3100	31.03	0.00	31.03	56.00	-24.97	QP	
10		1.3100	30.51	0.00	30.51	46.00	-15.49	AVG	
11		2.0500	32.74	0.00	32.74	56.00	-23.26	QP	
12		2.0500	30.37	0.00	30.37	46.00	-15.63	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: LB



Site Conduction #1

Phase: **N**

Temperature: 24

Limit: (CE)FCC PART 15 B

Power: AC 120V/60Hz

Humidity: 53 %

Mode: Data exchange

Note:

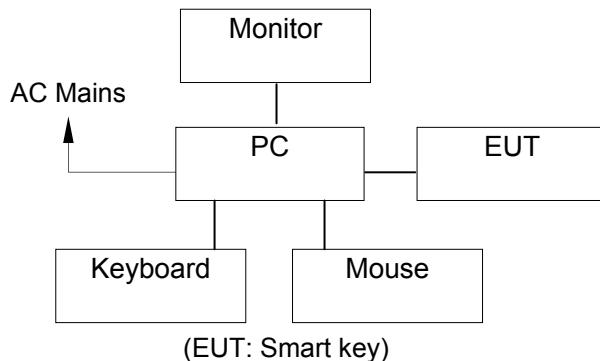
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
							dBuV	dB
1		0.2050	38.88	0.00	38.88	63.41	-24.53	QP
2		0.2050	31.37	0.00	31.37	53.41	-22.04	AVG
3		0.2600	39.33	0.00	39.33	61.43	-22.10	QP
4		0.2600	36.73	0.00	36.73	51.43	-14.70	AVG
5		0.5250	36.93	0.00	36.93	56.00	-19.07	QP
6	*	0.5250	36.24	0.00	36.24	46.00	-9.76	AVG
7		1.0500	32.25	0.00	32.25	56.00	-23.75	QP
8		1.0500	31.52	0.00	31.52	46.00	-14.48	AVG
9		1.3100	31.31	0.00	31.31	56.00	-24.69	QP
10		1.3100	30.59	0.00	30.59	46.00	-15.41	AVG
11		2.0500	32.62	0.00	32.62	56.00	-23.38	QP
12		2.0500	27.99	0.00	27.99	46.00	-18.01	AVG

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: LB

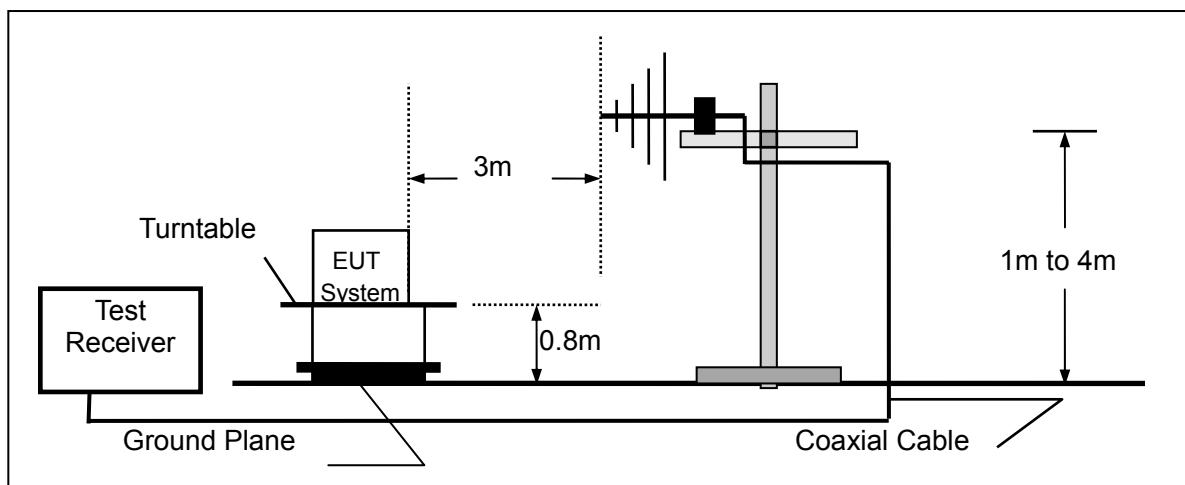
5. RADIATED EMISSION MEASUREMENT

5.1. Block Diagram of Test Setup

5.1.1. Block diagram of EUT System



5.1.2. Block diagram of test setup (In chamber)



(EUT: Smart key)

5.2. Measuring Standard

FCC Part 15, Subpart B, ANSI C63.4: 2009

5.3. Radiated Emission Limits

Frequency MHz	Distance Meters	Field Strengths Limit	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0

Remark: (1) Emission level ($\text{dB}(\mu\text{V})$) = $20 \log_{10}$ Emission level ($\mu\text{V}/\text{m}$)

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

5.4. EUT Configuration on Measurement

The FCC regulations test method must be used to find the maximum emission during radiated emission measurement.

EUT : Smart key
Model Number : DNYS-2C

5.5. Operating Condition of EUT

- 5.5.1. Setup the EUT as shown on Section 5.1.
- 5.5.2. Turn on the power of all equipments.
- 5.5.3. Let the EUT work in measuring mode (Data exchange, Charging) and measure it.

5.6. Test Procedure

The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on test.

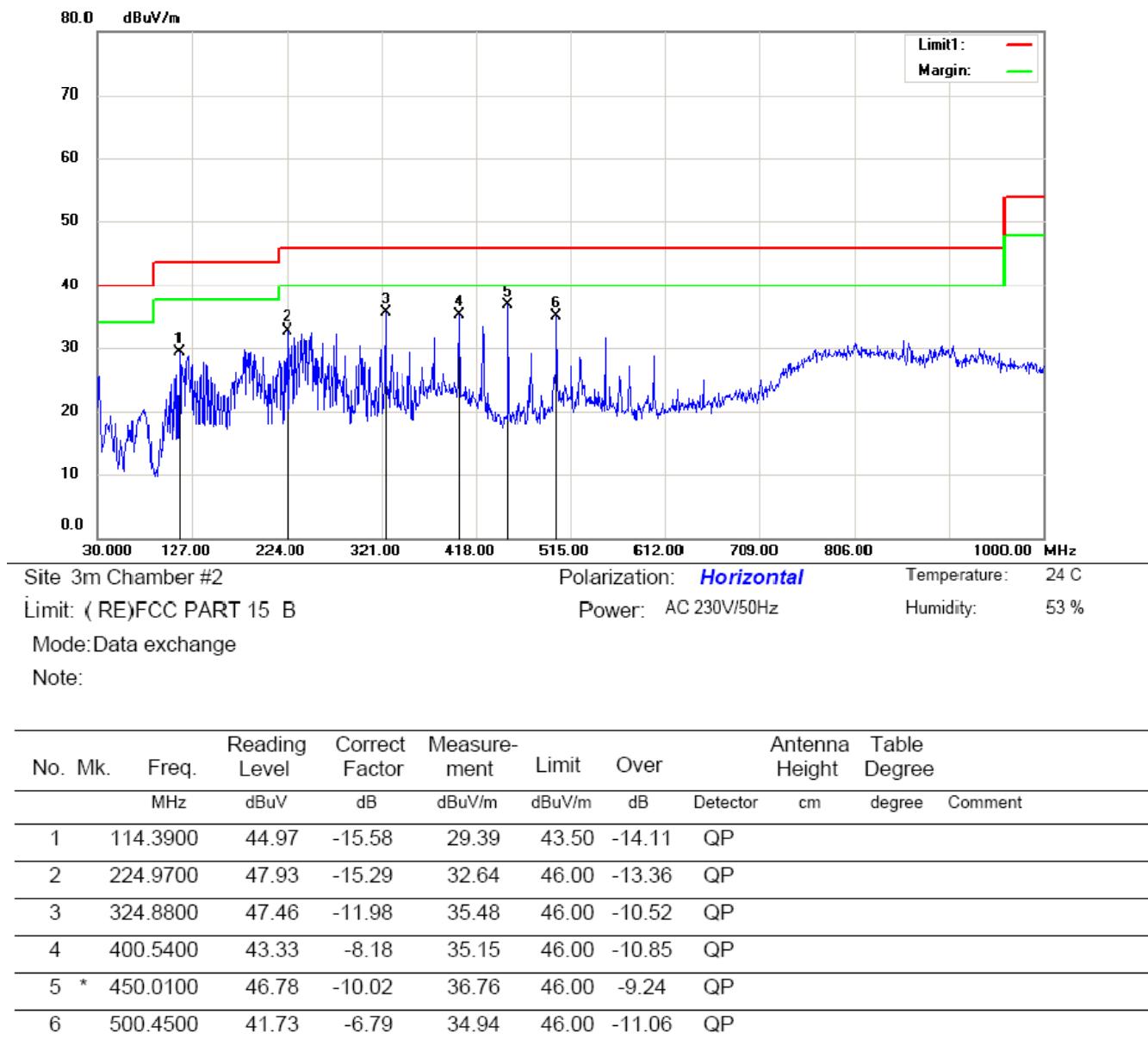
The bandwidth of the Receiver (ESU26) is set at 120kHz.

5.7. Measuring Results

PASS.

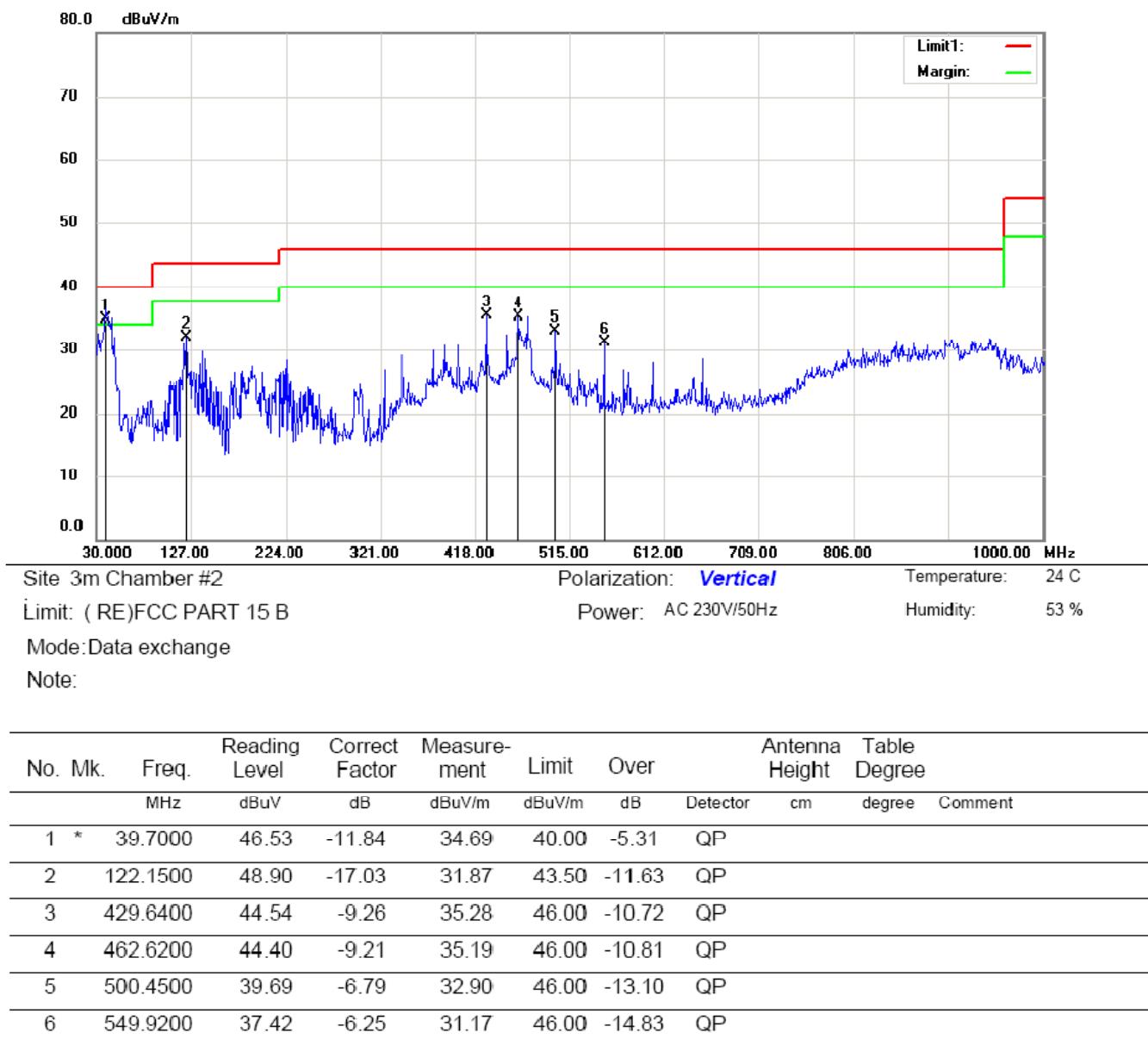
The frequency range from 30MHz to 1000MHz is investigated.

Please refer to following pages.



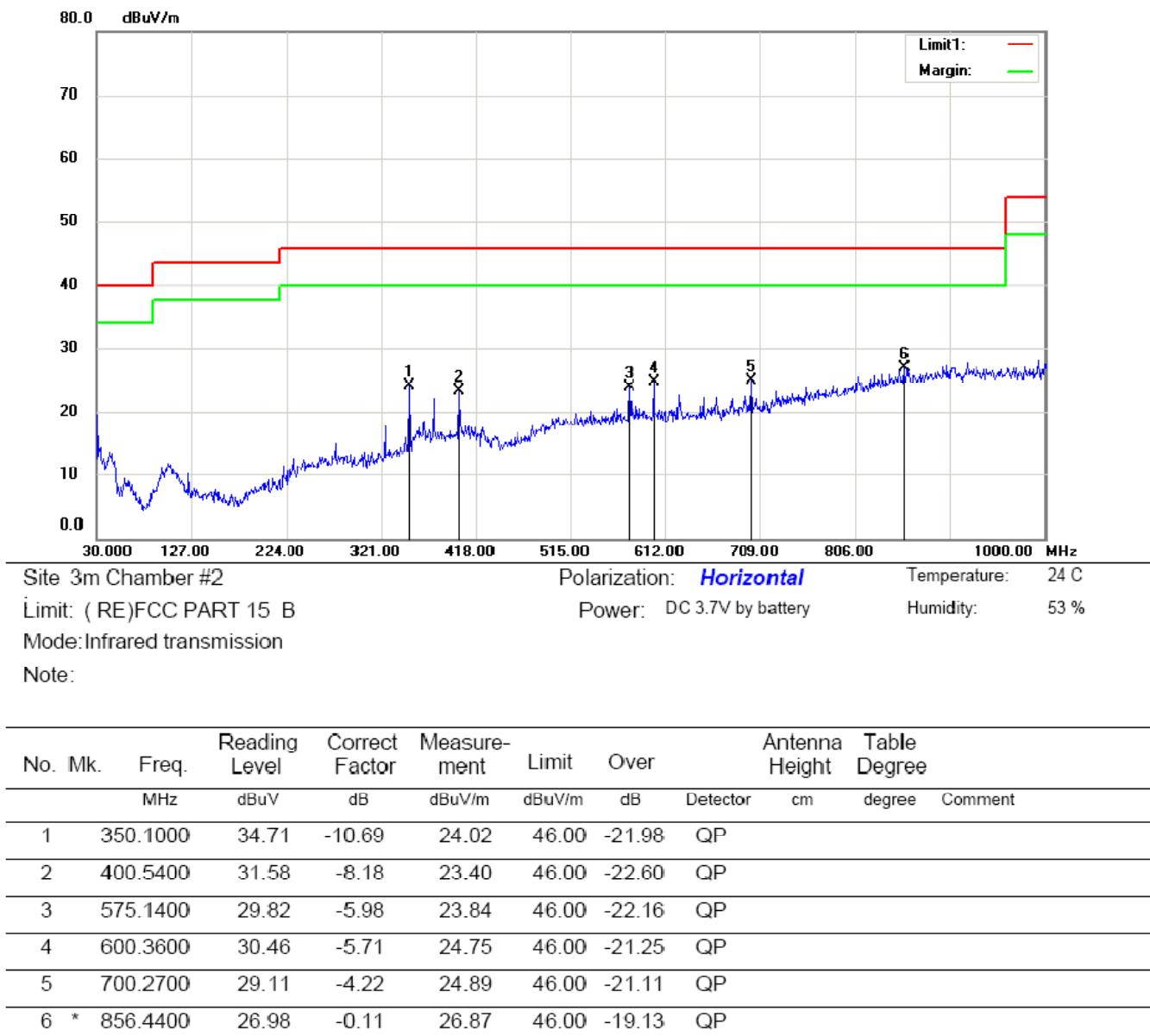
*:Maximum data x:Over limit !:over margin

Operator: Wang



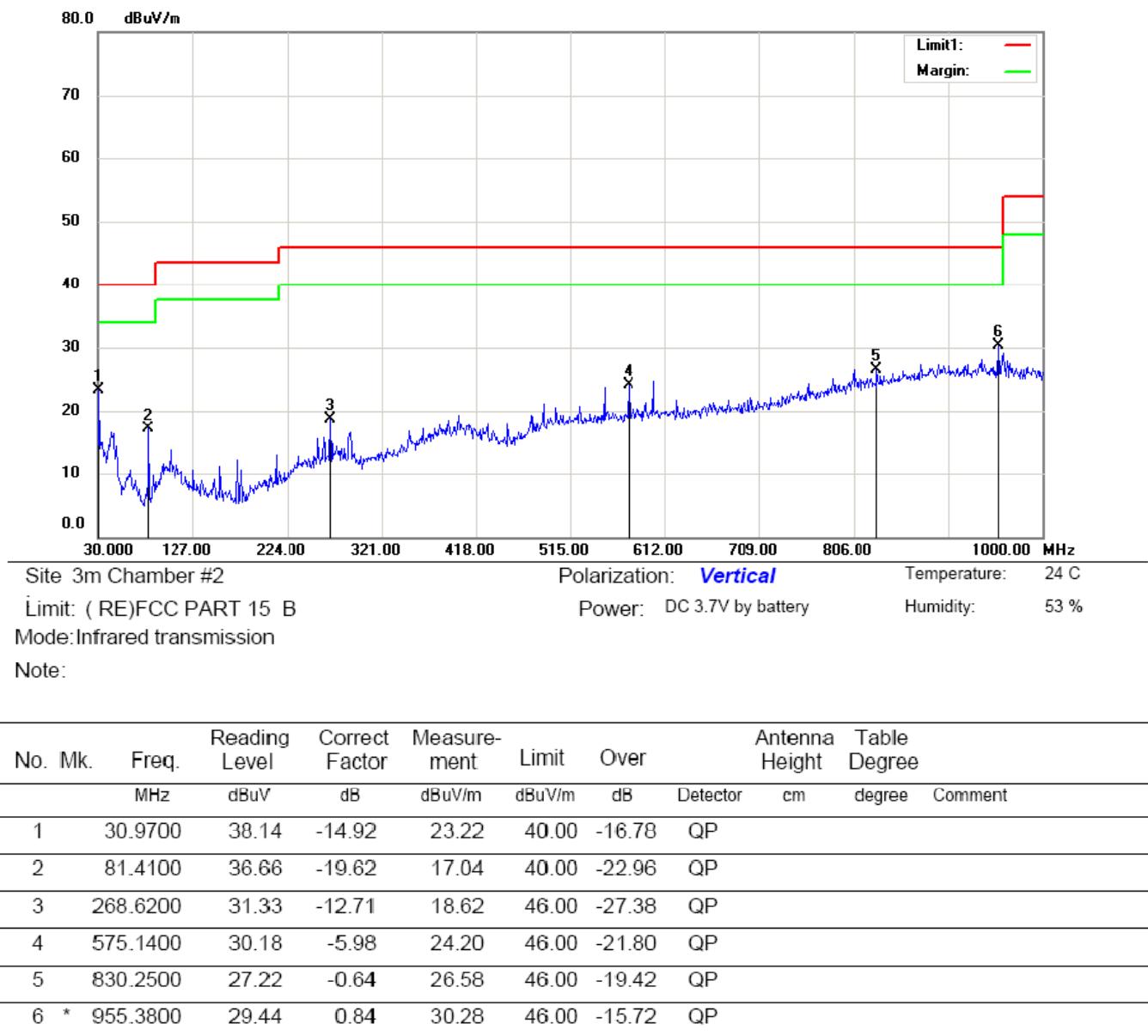
*:Maximum data x:Over limit !:over margin

Operator: Wang



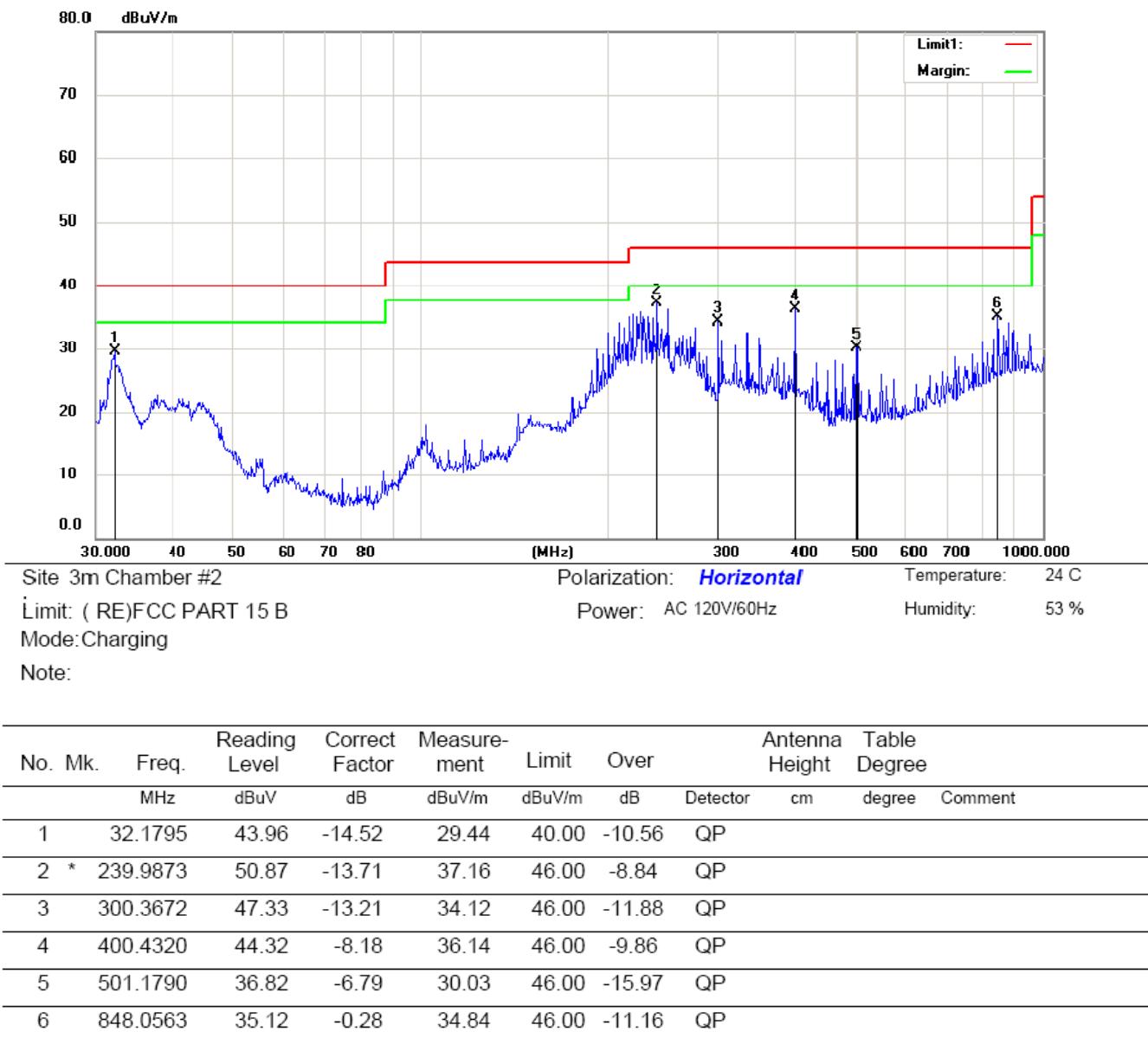
*:Maximum data x:Over limit !:over margin

Operator: RJB



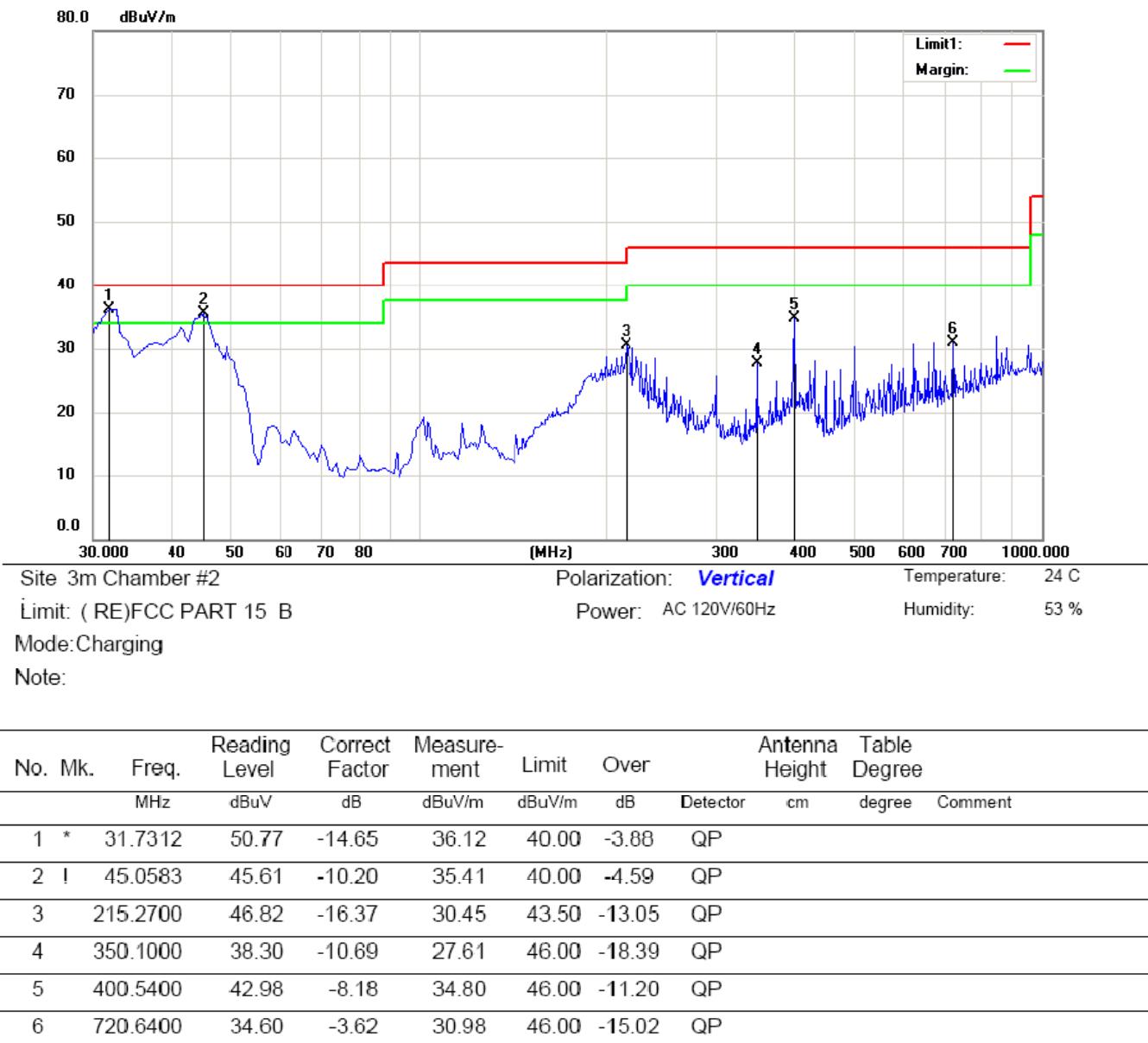
*:Maximum data x:Over limit !:over margin

Operator: RJB



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

Operator: KK



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

Operator: KK

6. PHOTOGRAPHS

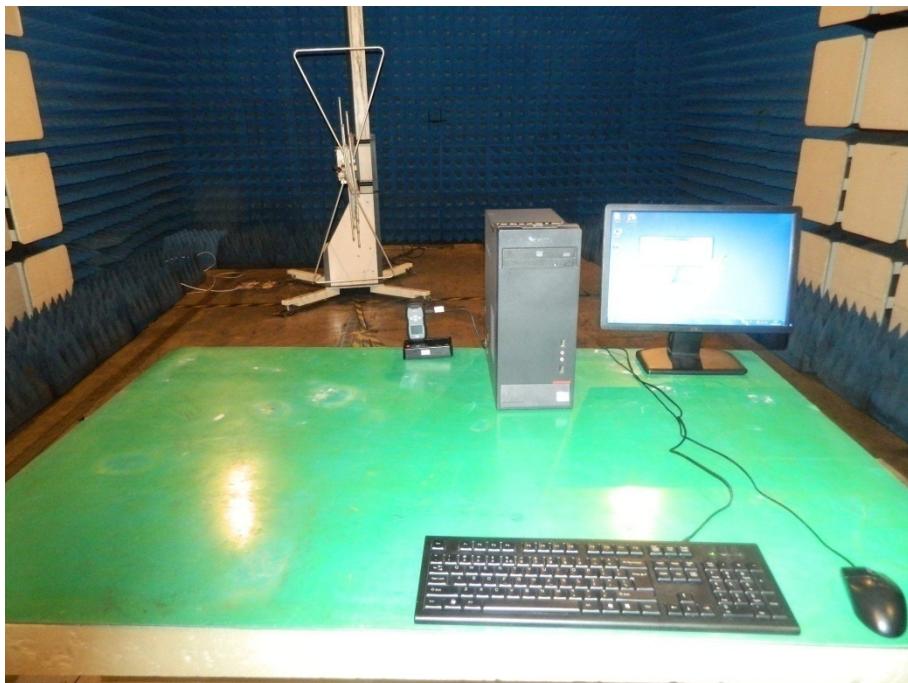
6.1. Photos of Conducted Emission Measurement





6.2. Photos of Radiation Emission Measurement





APPENDIX (Photos of EUT)









