FCC PART 15 SUBPART B

MEASUREMENT AND TEST REPORT

For

Kaba GmbH

Product description:	**RFID Time Attendance, Access Control, Data Collection Terminal**
Model No.:	**B-web 96 00-Mifare**
Supplementary Model:	**Kaba Terminal 96 00,B-web 96 00, Kaba Terminal 96 00 - K5, Kaba Terminal 96 05，Kaba Terminal 96 05 - K5，Kaba Terminal 96 10，Kaba Terminal 96 10 - K5**
FCC ID:	**NVIB-WEB9600MIFARE**

Prepared for: **Kaba GmbH**

Albertistraße 3 Villingen-Schwenningen 78056 Germany

Prepared by: **Bontek Compliance Laboratory Co., Ltd**

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Report No.: BCT14HR307E-1

Issue Date: **August 19, 2014**

Test Date: August 7~19, 2014

Tested by: Jiankuai.Li **Reviewed by:** Lv yi

Approved by: Owen.Yang

TABLE OF CONTENTS

1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	**Kaba GmbH**
Address of applicant:	Albertistraße 3 Villingen-Schwenningen 78056 Germany
Manufacturer:	**DongGuan ZKSoftware Electronic Technology Co.,Ltd**
Address of manufacturer:	No.26,Pingshan 188 Industry zone,Tangxia Town,Dongguan City,Guangdong Province,China 523728

General Description of E.U.T

EUT Description:	**RFID Time Attendance, Access Control, Data Collection Terminal**
Model No.:	**B-web 96 00-Mifare**
Supplementary Model:	**Kaba Terminal 96 00,B-web 96 00, Kaba Terminal 96 00 - K5, Kaba Terminal 96 05，Kaba Terminal 96 05 - K5，Kaba Terminal 96 10，Kaba Terminal 96 10 - K5**
Trade Mark:	**N/A**
Power Supply:	**Input: DC 48V from POE**
Adapter description:	**N/A**

Remark: * *The test data gathered are from the production sample provided by the manufacturer.*
** Supplementary models have the same circuit, the only difference between 9600-K5，9605，9605-K5，9610 and 9610-K5 is the firmware, running on that devices。*
** Products can be no internal RFID reader.*

1.2 Test Standards

The following Declaration of Conformity report of EUT is prepared in accordance with
FCC Rules and Regulations Part 15 Subpart B 2011

The objective of the manufacturer is to demonstrate compliance with the described above standards.

1.3 Test Summary

For the EUT described above. The standards used were FCC Part 15 Subpart B for Emissions

Table 1 : Tests Carried Out Under FCC Part 15 Subpart B

Standard	Test Items	Status
FCC Part 15 Subpart B	Conduction Emission, 0.15MHz to 30MHz	√
FCC Part 15 Subpart B	Radiation Emission, 30MHz to 1000MHz	√

√ Indicates that the test is applicable
× Indicates that the test is not applicable

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, 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.

The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

The maximum emission levels emanating from the device are compared to the FCC Part 15 Subpart B limits for radiation emissions and the measurement results contained in this test report show that EUT is to be technically compliant with FCC requirements.

All measurement required was performed at Shenzhen Bontek Compliance Testing Laboratory Co., Ltd at 1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China

1.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC – Registration No.: 970318

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 970318, December, 2013.

IC Registration No.: 7631A

The 3m alternate test site of Shenzhen Bontek Compliance Testing Laboratory Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 7631A on January 2011.
The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

CNAS - Registration No.: L3923

Shenzhen Bontek Compliance Testing Laboratory Co., Ltd. to ISO/IEC 17025:25 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.The acceptance letter from the CNAS is maintained in our files: Registration: L3923, March, 2012.

TUV - Registration No.: UA 50242657-0001

Shenzhen Bontek Compliance Testing Laboratory Co.,Ltd. An assessment of the laboratory was conducted according to the"Procedures and Conditions for EMC Test Laboratories"with reference to EN ISO/IEC 17025 by a TUV Rheinland auditor. Audit Report NO.17010783-003

1.6 Test Equipment List and Details

Test equipments list of Shenzhen Bontek Compliance Testing Laboratory Co., Ltd .

No.	Instrument no.	Equipment	Manufacturer	Model No.	S/N	Last Calculator	Due Calculator
1	BCT-EMC001	EMI Test Receiver	R&S	ESCI	100687	2014-4-25	2015-4-24
2	BCT-EMC002	EMI Test Receiver	R&S	ESPI	100097	2013-10-31	2014-10-30
3	BCT-EMC003	Amplifier	HP	8447D	1937A02492	2014-4-25	2015-4-24
4	BCT-EMC004	Single Power Conductor Module	R&S	NNBM 8124	242	2014-4-25	2015-4-24
5	BCT-EMC005	Single Power Conductor Module	R&S	NNBM 8124	243	2014-4-25	2015-4-24
6	BCT-EMC006	Power Clamp	SCHWARZBECK	MDS-21	3812	2013-11-4	2014-11-3
7	BCT-EMC007	Positioning Controller	C&C	CC-C-1F	MF7802113	N/A	N/A
8	BCT-EMC008	Electrostatic DisCharging Simulator	TESEQ	NSG437	125	2013-11-1	2014-10-31
9	BCT-EMC009	Fast Transient Burst Generator	SCHAFFNER	MODULA6150	34572	2014-4-25	2015-4-24
10	BCT-EMC010	Fast Transient Noise Simulator	Noiseken	FNS-105AX	10501	2014-6-26	2015-6-25
11	BCT-EMC011	Color TV Pattern Genenator	PHILIPS	PM5418	TM209947	N/A	N/A
12	BCT-EMC012	Power Frequency Magnetic Field Generator	EVERFINE	EMS61000-8K	608002	2014-4-25	2015-4-24
14	BCT-EMC014	Capacitive Coupling Clamp	TESEQ	CDN8014	25096	2014-4-25	2015-4-24
15	BCT-EMC015	High Field Biconical Antenna	ELECTRO-METRICS	EM-6913	166	2013-11-27	2014-11-26
16	BCT-EMC016	Log Periodic Antenna	ELECTRO-METRICS	EM-6950	811	2013-11-27	2014-11-26
17	BCT-EMC017	Remote Active Vertical Antenna	ELECTRO-METRICS	EM-6892	304	2013-11-27	2014-11-26
18	BCT-EMC018	TRILOG Broadband Test-Antenna	SCHWARZBECK	VULB9163	9163-324	2014-4-25	2015-4-24
19	BCT-EMC019	Horn Antenna	SCHWARZBECK	BBHA9120A	0499	2013-11-27	2014-11-26
20	BCT-EMC020	Teo Line Single Phase Module	SCHWARZBECK	NSLK8128	8128247	2013-10-31	2014-10-30
21	BCT-EMC021	Triple-Loop Antenna	EVERFINE	LLA-2	711002	2013-11-14	2014-11-13
22	BCT-EMC022	Electric bridge	Jhai	JK2812C	803024	N/A	N/A
23	BCT-EMC026	RF POWER AMPLIFIER	FRANKONIA	FLL-75	1020A1109	2014-4-25	2015-4-24
24	BCT-EMC027	CDN	FRANKONIA	CDN M2+M3	A3027019	2014-4-25	2015-4-24

25	BCT-EMC029	6DB Attenuator	FRANKONIA	N/A	1001698	2014-4-25	2015-4-24
26	BCT-EMC030	EM Injection clamp	FCC	F-203I-23mm	091536	2014-4-25	2015-4-24
27	BCT-EMC031	9kHz-2.4GHz signal generator 2024	MARCONI	10S/6625-99-457-8730	112260/042	2014-4-25	2015-4-24
28	BCT-EMC032	10dB attenuator	ELECTRO-METRICS	EM-7600	836	2014-4-25	2015-4-24
29	BCT-EMC033	ISN	TESEQ	ISN-T800	30301	2013-11-14	2014-11-13
30	BCT-EMC034	10KV surge generator	SANKI	SKS-0510M	048110003E 321	2013-10-31	2014-10-30
31	BCT-EMC035	HRMONICS&FLICK RE ANALYSER	VOLTECH	PM6000	200006700433	2013-11-19	2014-11-18
32	BCT-EMC036	Spectrum Analyzer	R&S	FSP	100397	2013-10-31	2014-10-30
33	BCT-EMC037	Broadband preamplifier	SCH WARZBECK	BBV9718	9718-182	2014-4-25	2015-4-24

2 - SYSTEM TEST CONFIGURATION

2.1 Justification

The system was configured for testing in a typical fashion (as only used by a typical user).

2.2 EUT Exercise Software

The EUT exercising program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software offered by manufacture, can let the EUT being ON operation.

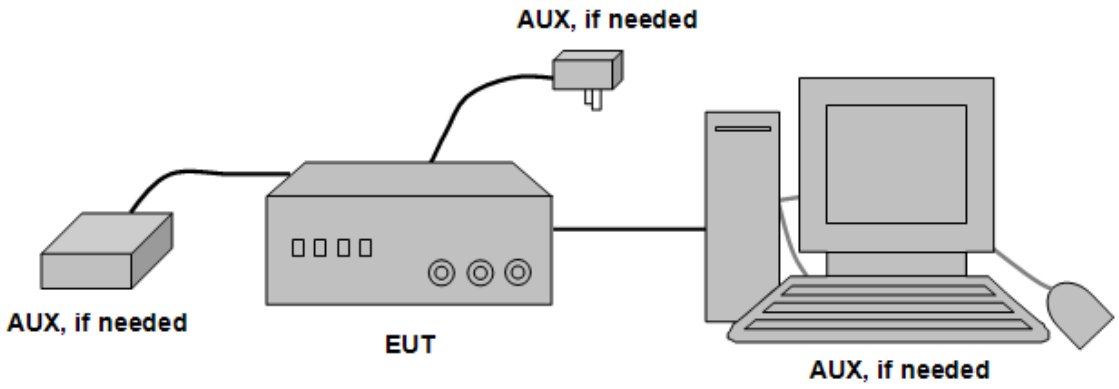
2.3 Special Accessories

As shown in section 2.5, interface cable used for compliance testing is shielded as normally supplied by **Kaba GmbH** and its respective support equipment manufacturers.

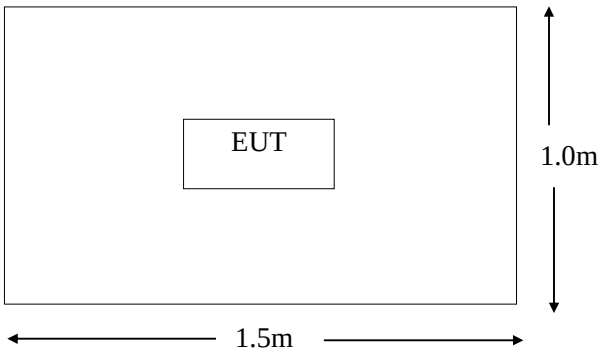
2.4 Equipment Modifications

The EUT tested was not modified by BCT.

2.5 Configuration of Test System



2.6 Test Setup Diagram



3 - DISTURBANCE VOLTAGE AT THE MAINS TERMINALS

3.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is 3.4 dB.

3.2 Limit of Disturbance Voltage at The Mains Terminals

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.150～0.500	66～56	56～46
0.500～5.000	56	46
5.000～30.00	60	50

Note: (1)The tighter limit shall apply at the edge between two frequency bands.

3.3 EUT Setup

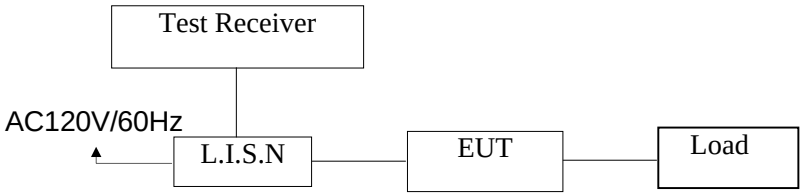
The setup of EUT is according with ANSI C63.4-2009 measurement procedure. The specification used was the FCC Rules and Regulations Part 15 Subpart B limits.

The EUT was placed center and the back edge of the test table.

The AV cables were draped along the test table and bundled to 30-40cm in the middle.

The spacing between the peripherals was 10 cm.

Maximum emission emitted from EUT was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation and the levels in the final result of the test were recorded with the EUT running in the operating mode that maximum emission was emitted.



3.4 Instrument Setup

The test receiver was set with the following configurations:

Test Receiver Setting:

Frequency Range……150 KHz to 30 MHz
Detector……Peak & Quasi-Peak & Average
Sweep Speed……Auto
IF Band Width……9 KHz

3.5 Test Procedure

During the conducted emission test, the EUT power cord was connected to the auxiliary outlet of the first Artificial Mains.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

All data was recorded in the peak detection mode. Quasi-peak and Average readings were only performed when an emission was found to be marginal (within -10 dB μ V of specification limits). Quasi-peak readings are distinguished with a "**QP**". Average readings are distinguished with a "**AV**".

3.6 Summary of Test Results

According to the data in section 3.6, the EUT complied with the FCC Part 15 B Conducted margin, with the *worst* margin reading of:

3.7 Disturbance Voltage Test Data

Temperature (℃)	22~25
Humidity (%RH)	50~55
Barometric Pressure (mbar)	950~1000
EUT	RFID Time Attendance, Access Control, Data Collection Terminal
M/N	B-web 96 00-Mifare
Operating Mode	Connect to PC

Test data see following pages

Remark: (1) When PK reading is less than relevant limit 20dB, the QP reading and AV reading will not be recorded.
(2) Where QP reading is less than relevant AV limit, the AV reading will not be measured

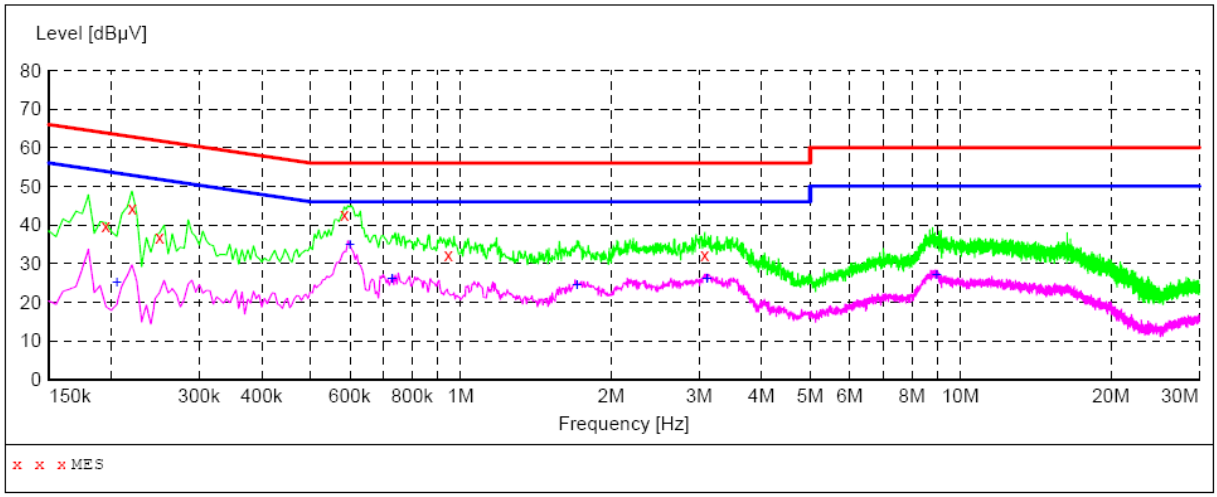
3.8 Test Result

PASS

Conducted Emission:

EUT:	RFID Time Attendance, Access Control, Data Collection Terminal
M/N:	B-web 96 00-Mifare
Operating Condition:	Connect to PC
Test Site:	Shielded Room
Operator:	Yang
Test Specification:	AC 120V/60Hz for adapter
Comment:	L Line

SCAN TABLE: "Voltage(150K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.195000	39.90	11.5	64	23.9	QP	L1	GND
0.220000	44.50	11.3	63	18.3	QP	L1	GND
0.250000	36.70	11.1	62	25.1	QP	L1	GND
0.585000	42.70	10.4	56	13.3	QP	L1	GND
0.945000	32.40	10.4	56	23.6	QP	L1	GND
3.080000	32.30	10.4	56	23.7	QP	L1	GND

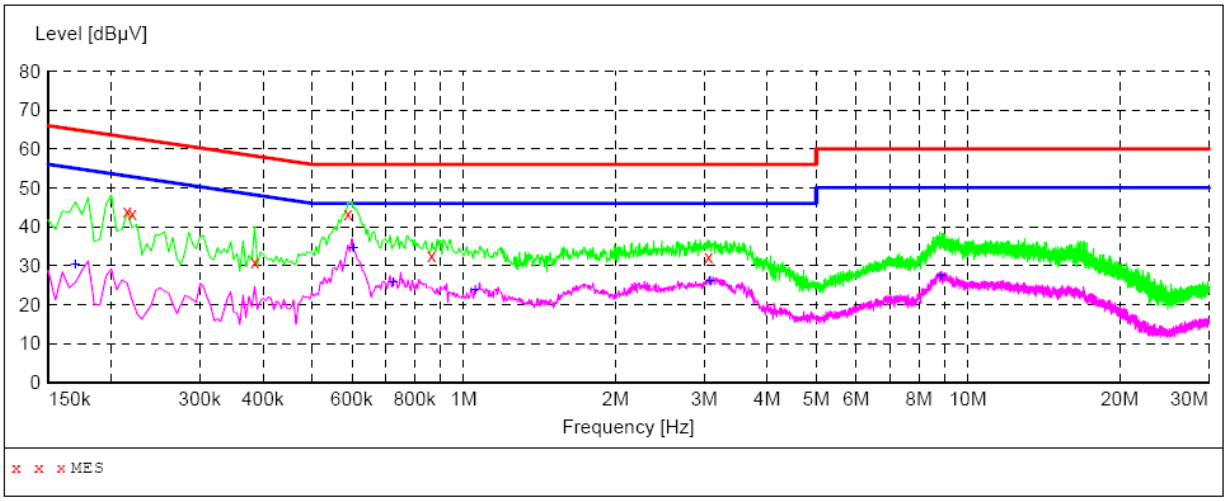
MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.205000	25.00	11.3	53	28.4	AV	L1	GND
0.600000	34.90	10.4	46	11.1	AV	L1	GND
0.730000	26.10	10.4	46	19.9	AV	L1	GND
1.710000	24.40	10.4	46	21.6	AV	L1	GND
3.110000	26.20	10.4	46	19.8	AV	L1	GND
8.960000	27.20	10.6	50	22.8	AV	L1	GND

Conducted Emission:

EUT:	RFID Time Attendance, Access Control, Data Collection Terminal
M/N:	B-web 96 00-Mifare
Operating Condition:	Connect to PC
Test Site:	Shielded Room
Operator:	Yang
Test Specification:	AC 120V/60Hz for adapter
Comment:	N Line

SCAN TABLE: "Voltage(150K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.215000	43.90	11.3	63	19.1	QP	N	GND
0.220000	43.40	11.3	63	19.4	QP	N	GND
0.385000	30.90	10.7	58	27.3	QP	N	GND
0.590000	43.30	10.4	56	12.7	QP	N	GND
0.865000	32.60	10.4	56	23.4	QP	N	GND
3.060000	32.30	10.4	56	23.7	QP	N	GND

MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.170000	30.40	12.5	55	24.6	AV	N	GND
0.605000	34.60	10.4	46	11.4	AV	N	GND
0.725000	25.90	10.4	46	20.1	AV	N	GND
1.055000	23.70	10.5	46	22.3	AV	N	GND
3.085000	26.20	10.4	46	19.8	AV	N	GND
8.860000	27.30	10.6	50	22.7	AV	N	GND

4 - RADIATED DISTURBANCES

4.1 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.

The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is 4.0 dB.

4.2 Limit of Radiated Disturbances

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dB μ V/m)
30 ~ 88	3	40
88~216	3	43.5
216 ~ 960	3	46
960 ~ 1000	3	54

Note: (1) The tighter limit shall apply at the edge between two frequency bands.
(2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

4.3 EUT Setup

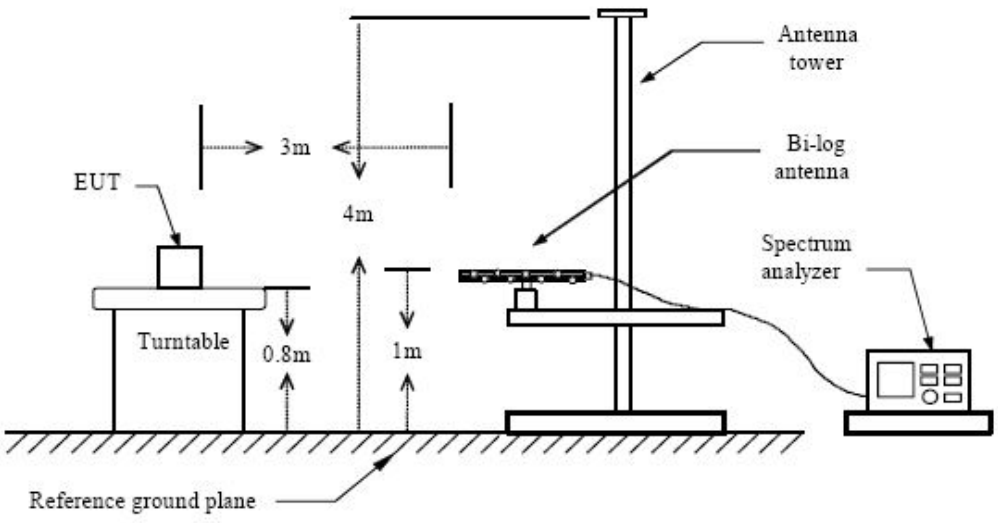
The radiated emission tests were performed in the in the 3-meter anechoic chamber, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC Part 15 Subpart B limits.

The EUT was placed on the center of the test table.

Maximum emission emitted from EUT was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation and the levels in the final result of the test were recorded with the EUT running in the operating mode that maximum emission was emitted.

Block diagram of test setup (In chamber)

Below 1 GHz



4.4 Test Receiver Setup

According to FCC Part 15 rule, the frequency was investigated from 30 to 1000 MHz. During the radiated emission test, the test receiver was set with the following configurations:

Test Receiver Setting:

Detector……..Peak & Quasi-Peak
IF Band Width……..120KHz
Frequency Range……30MHz to 1000MHz
Turntable Rotated……0 to 360 degrees

Antenna Position:

Height……1m to 4m
Polarity……...Horizontal and Vertical

4.5 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings performed only when an emission was found to be marginal (within -10 dB μV of specification limits), and are distinguished with a "**QP**" in the data table.

4.6 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB μV means the emission is 7dB μV below the maximum limit for Subpart B. The equation for margin calculation is as follows:

Margin = Limit – Corr. Ampl.

4.7 Radiated Emissions Test Result

Temperature (℃)	22~25
Humidity (%RH)	50~54
Barometric Pressure (mbar)	950~1000
EUT	RFID Time Attendance, Access Control, Data Collection Terminal
M/N	B-web 96 00-Mifare
Operating Mode	Connect to PC/Charging

Test data see following pages

Remark: (1) When PK reading is less than relevant limit 20dB, the QP reading and AV reading will not be recorded.
(2) Where QP reading is less than relevant AV limit, the AV reading will not be measured

4.8 Test Result

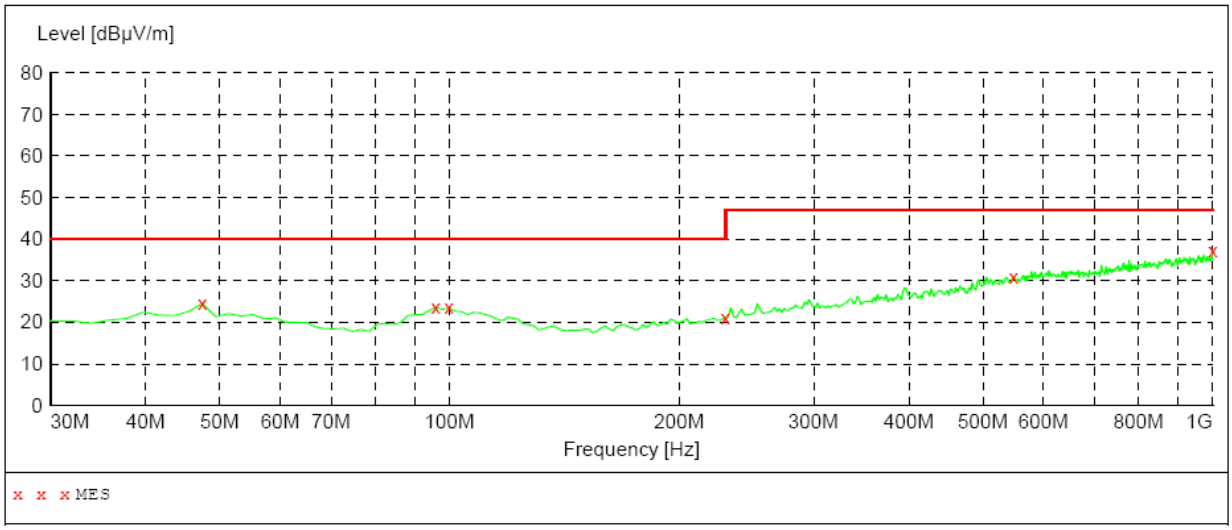
PASS

Radiated Emission Test Data:

EUT:	RFID Time Attendance, Access Control, Data Collection Terminal
M/N:	B-web 96 00-Mifare
Operating Condition:	Connect to PC
Test Site:	3m CHAMBER
Operator:	Chen
Test Specification:	AC 120V/60Hz for adapter
Comment:	Polarization: Horizontal

SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength			
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	VULB9163 NEW



MEASUREMENT RESULT:

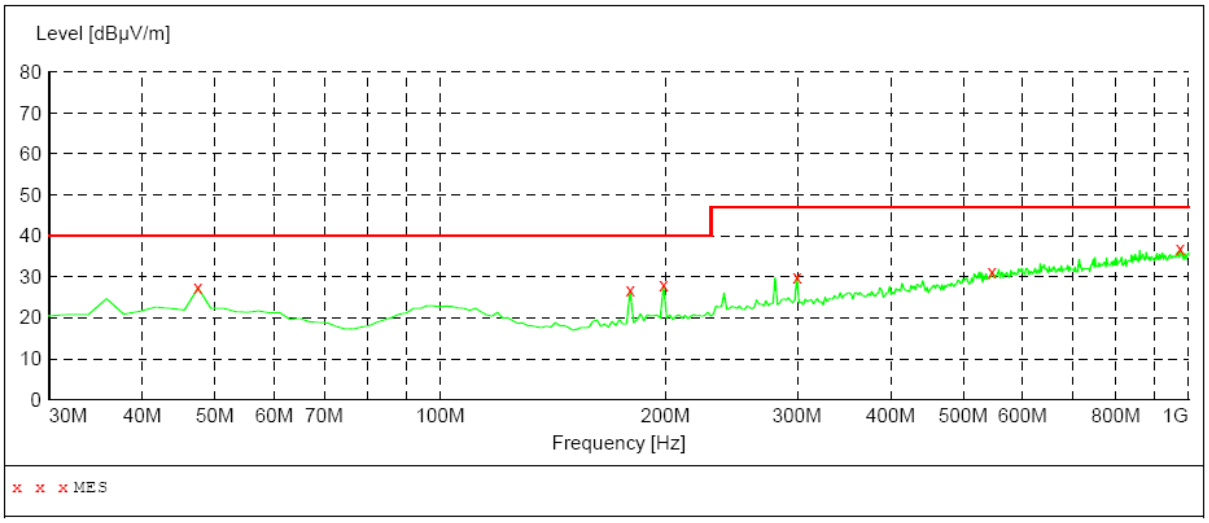
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.460000	24.50	15.8	40.0	15.5	QP	100.0	0.00	HORIZONTAL
95.960000	23.70	17.2	40.0	16.3	QP	100.0	0.00	HORIZONTAL
99.840000	23.50	17.5	40.0	16.5	QP	100.0	0.00	HORIZONTAL
229.820000	21.10	16.1	40.0	18.9	QP	100.0	0.00	HORIZONTAL
547.980000	31.00	24.9	47.0	16.0	QP	100.0	0.00	HORIZONTAL
1000.000000	37.20	30.0	47.0	9.8	QP	100.0	0.00	HORIZONTAL

Radiated Emission Test Data:

EUT:	RFID Time Attendance, Access Control, Data Collection Terminal
M/N:	B-web 96 00-Mifare
Operating Condition:	Connect to PC
Test Site:	3m CHAMBER
Operator:	Chen
Test Specification:	AC 120V/60Hz for adapter
Comment:	Polarization: Vertical

SWEEP TABLE: "test (30M-1G)"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	VULB9163 NEW



MEASUREMENT RESULT:

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.460000	27.30	15.8	40.0	12.7	QP	100.0	0.00	VERTICAL
179.380000	26.70	13.8	40.0	13.3	QP	100.0	0.00	VERTICAL
198.780000	28.00	14.9	40.0	12.0	QP	100.0	0.00	VERTICAL
299.660000	30.00	18.7	47.0	17.0	QP	100.0	0.00	VERTICAL
546.040000	31.30	24.9	47.0	15.7	QP	100.0	0.00	VERTICAL
974.780000	36.90	29.8	47.0	10.1	QP	100.0	0.00	VERTICAL