Certificate of Test

January 2007

TAIWAN SEMICONDUCTOR CO., LTD.

Product Type	**: HF RFID PRINTER**
Model Number	**: TTP-245HR, TTP-343HR, TT024-50HR, TT024-60HR, DuraLabel PRO**
Test Report Number	**: 0612066 Rev. 1**
Date of Test	**: December 15, 2006 - December 23, 2006**

This Product was tested to the following standards at the laboratory of Global EMC Standard Tech. Corp., and found Compliance.

Standards:
FCC Part 15 Subpart C Paragraph 15.225
ANSI C63.4: 2005

http : //www.gestek.com.tw

Sharon Chang, President

Date: January 10, 2007

GesTek EMC Lab
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200085-0

Test Report Application for Certification
On Behalf Of

TAIWAN SEMICONDUCTOR CO., LTD.

EUT:
HF RFID PRINTER

Model Number:
TTP-245HR, TTP-343HR, TT024-50HR, TT024-60HR, DuraLabel PRO

FCC ID:
UES2006002

Prepared for:

TAIWAN SEMICONDUCTOR CO., LTD.
11F, No.205, Sec.3, Beishin Rd., Shindian City, Taipei, Taiwan 231, R.O.C.

Report By :Global EMC Standard Tech. Corp.
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TABLE OF CONTENTS

1. CERTIFICATION

Applicant : TAIWAN SEMICONDUCTOR CO., LTD.

EUT Description : HF RFID PRINTER
Model Number : TTP-245HR, TTP-343HR, TT024-50HR, TT024-60HR, DuraLabel PRO
Serial Number : N/A
Brade Name : TSC
FCC ID : UES2006002
Tested Power Supply : 120V/60Hz
Manufacturer : TAIWAN SEMICONDUCTOR CO., LTD.

MEASUREMENT PROCEDURES USED:

☑ **CFR 47, Part 15**	Radio Frequency Device Subpart C Intentional Radiators :2003
☑ **ANSI C63.4**	Methods of Measurements of Radio-Noise Emissions from Low- Voltage Electrical and Electronic Equipment in the range of 9kHz To 40GHz. 2005

THE MEASUREMENT SHOWN IN THE ATTACHMENT WAS MADE IN ACCORDANCE WITH THE PROCEDURES INDICATED, AND THE MAXIMUM ENERGY EMITTED BY THE EQUIPMENT WAS FOUND TO BE WITHIN THE ABOVE LIMITS APPLICABLE.

Date of Test : **December 15, 2006** - **December 23, 2006**

In order to ensure the quality and accuracy of this document, the contents have been thoroughly reviewed by the following qualified personnel from GesTek Lab.

Documented By :
Susan Chen
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Tonny Lin
Tonny Lin / General Manager

This test data shown below is traceable to National or international standard such as NIST/USA, etc. The laboratory's NVLAP accreditation in no way constitutes or implies product certification, approval, or endorsement by NVLAP or the United States government.

2. GENERAL INFORMATION

2.1 PRODUCTION DESCRIPTION

Product Name : HF RFID PRINTER
Model Number : TTP-245HR, TTP-343HR, TT024-50HR, TT024-60HR, DuraLabel PRO
Serial Number : N/A
Brade Name : TSC
FCC ID : UES2006002
Modulation Type : FSK
Antenna Type : Loop
Type of Antenna joint Soldered on PCB
Frequencg Range : 13.56 MHz
Channel Number : 1 Channel
Working Voltage : 120V/60Hz

Frequency of Each Channel:

Channel	Frequency (MHz)
1	13.56

Note:
1. This device is printer and included 13.56MHz RFID.
2. This device is one channel and perform the test, then record on this report.
3. The antenna of EUT is solder on PCB and conform to FCC 15.203.
4. These tests were conducted on a sample of the equipment for the purpose of demonstratingcompliance with Part 15 Subpart C Paragraph 15.227.
5. There are five model numbers for this EUT due to the requirement of marketing and different model number of heater elements for dot density.The dot density of TTP-245HR andTT024-50HR is 230dpi, the dot density of TTP-343HR and TT024-60HR is 300dpi andboth of 230dpi and 300dpi is for DuraLable PRO model number.

2.2 OPERATIONAL DESCRIPTION

This device is HF RFID PRINTER included 13.56MHz RFID modular, The RFID is detect tag and determine use correct model of roller in printer, the tag is combined with roller of printer.
This device only one channel and operation in 13.56MHz with FSK modulation.
Another information please refer to users manual.

2.3 TEST MODES & EUT COMPONENTS DESCRIPTION

EUT: HF RFID PRINTER, M/N: TTP-245HR, TTP-343HR, TT024-50HR, TT024-60HR, DuraLabel PRO **The EUT tested with Notebook PC. (DELL, M/N: Latitude D600 PPO5L)**			
Test Mode	**TX Mode-USB Port Link**	**TX Mode-Parallel Port Link**	**TX Mode-Serial Port Link**
Frequency	13.56MHz		

2.4 SUMMARY OF TEST PROCEDURE AND TEST RESULTS

Test Item	Applied Standard Section	Test Resut
Conduction Emission	15.207, ANSI C63.4 Section 7	Pass (refer to section 3.7)
Radistion Emission	15.225(d), ANSI C63.4 Section 8	Pass (refer to section 4.7.3)
Peak Power Output	15.225(a)(b)(c), ANSI C63.4 Section 13 & Annex I	Pass (refer to section 4.7.1)
Band Edge	15.225(d) , ANSI C63.4 Section 13 & Annex I	Pass (refer to section 4.7.2)
Frequency Stability	15.225(e) , ANSI C63.4 Section 13 & Annex I	Pass (refer to section 5.6)

2.5 CONFIGURATION OF THE TESTED SYSTEM

The FCC IDs/Types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards, which have grants) are:

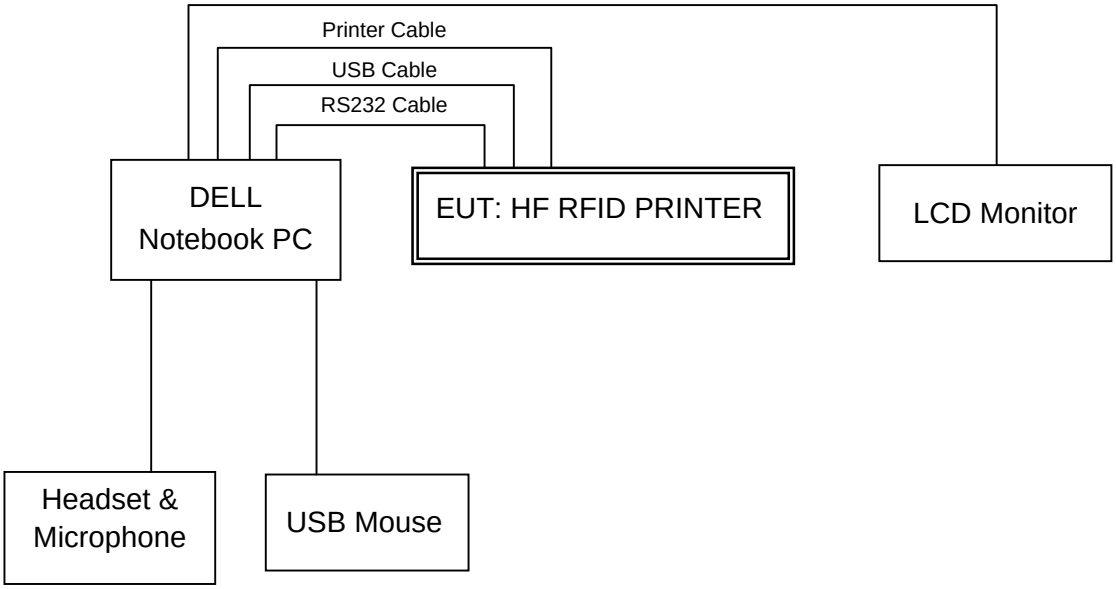
Device	No.	Configuration
LCD MONITOR (DVI&D-SUB)	**M01-045**	Manufacturer : CMV Model Number : CT-723D Serial Number : N/A BSMI ID : R63126 FCC ID : N/A DVI&D-SUB Cable : Shielded, Detachable, 2m,cord Adapter Manufacturer :POTRANS Adapter Model Number : UP060B1190 POWER:AC INPUT :100-240V,50/60HZ ,OUTPUT:DC19V,3.16A Adapter Power Cord : Non-Shielded, Detachable, 3Pin, 1.8m
USB Mouse	**M02-316**	Manufacturer : Microsoft Model Number : X800898-106 BSMI ID : R31264 FCC ID : N/A Data Cable : Shielded, Undetachable, 1.5m
Headset & Earphone	**E01-088**	Manufacturer : Good Vision Model Number : LY-MIC02 Serial Number : N/A Data Cable : Non-Shielded, Undetachable, 1.8 m Power Cord : N/A
NOTEBOOK	**DELL NB 1**	Model Number : Latitude D600 PPO5L BSMI ID : R33002 FCC ID E2K24CLNS Serial Number : 10826163280 C.P.U : Intel Pentium M 1.4G HZ DDR : PC2100 256MB WIRELESS LAN Manufacturer :INTEL, M/N:WM3A2100 CARD FCC ID: E2K24CLNS H.D.D. : Manufacturer : FUJITSU 30G M/N: MHT2030AT, S/N:NN15T421E09C BSMI ID:D33073 DVD-ROM : Manufacturer :DELL, M/N:5W299-A01 BATTERY : Manufacturer :DELL Li-ion MODULE M/N:6Y270 RATING:14.8V 220mAh AC ADAPTOR : Manufacturer :DELL M/N: PA-1650-05D S/N:CN-05U092-48010-39N-227C INPUT:AC 100-240 V~1.5A 50-60HZ Shielded, Undetachable, 2.5m

2.6 TEST FACILITY

Ambient conditions in the laboratory:

ITEMS	Requirement
TEMPERATURE (°C)	15-35
HUMIDITY (%RH)	30-60
BAROMETRIC PRESSURE (mbar)	860-1060
FCC SITE DESCRIPTION	Aug. 10, 1995 /Aug. 25, 1998 File on FCC Engineering Laboratory Federal Communication Commission 7435 Oakland Mills Road Columbia, MD 21046 Reference 31040/SIT1300F2
NVLAP LAB. CODE	200085-0 United Stated Department of commerce National Institute of Standards and Technology National Voluntary Laboratory Accreditation Program Accreditation on NVLAP effective through Sep. 30,2007 For CISPR 22, FCC Method and AS/NZS CISPR 22 Measurement.
Chinese National Laboratory Accreditation Certificate R.O.C.	Recognized by the Council of Chinese National Laboratory Accreditation and confirmed to meet the requirements of ISO/IEC 17025 also has been registered for fifteen items, and meet the requirements of the Article 4 of Measures Governing the Recognition both Approval of Designated Laboratory for Commodities Inspection and has been registered for four items within the field of Electrical Testing. Registration No.: 1082 Registration on CNLA effective through Sep. 19,2009

2.7 TEST SETUP



2.8 EUT OPERATING CONDITIONS

The EUT exercise program used during conducted testing was designed to exercise the EUT in a manner similar to a typical use. The exercise sequence is listed as below:

1. Setup the EUT and simulators as shown on 2.7.
2. Turn on the power of all equipments.
3. The EUT will act continue.
4. Confirm the transmitter is transmit signal continue.
5. Repeat the above steps.

3. CONDUCTION EMISSION DATA

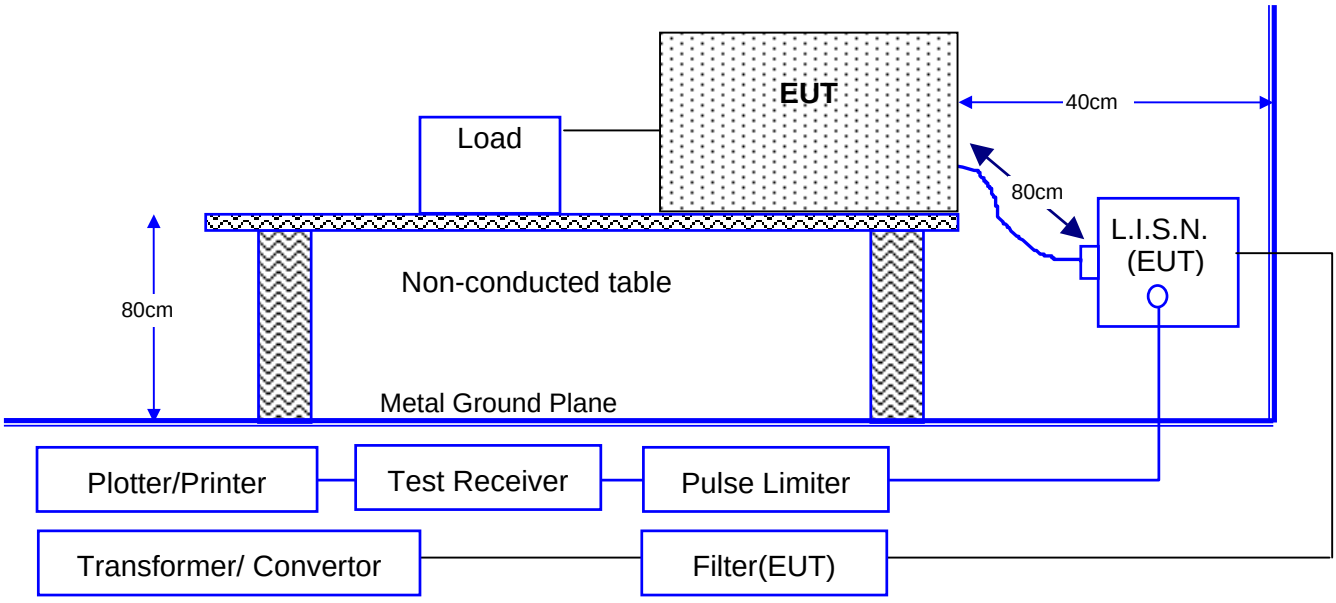
3.1 TEST EQUIPMENTS

The following test equipment are used during the conducted power line tests:

Item	Instrument	Manufacturer	Type	Serial No.	Last Cal.
1	Test Receiver	R & S	ESHS30	828109/010	04/26/06
2	L.I.S.N.	KYORITSU	KNW-407	8-1345-10	10/17/06
3	Pulse Limiter	R & S	ESH3-Z2	357.8810.52	08/03/06
4	RF CABLE	GTK	N/A	GTK-E-A152-01	12/15/06
5	50 Ohm Terminator	GTK	N/A	GTK-E-A124-01	N/A
6	Shielded Room	GTK	N/A	B5	N/A

Note: All measurement critical items of test instrumentation were within their calibration period of 1 year.

3.2 BLOCK DIAGRAM OF TEST SETUP



Note: This is a representive setup diagram for Table-top EUT.
For Floor-standing EUT, the table will be removed with all others setup condition remain the same.

3.3 CONDUCTED EMISSION LIMIT

☒FCC 15.207 Limit

Frequency	Maximum RF Line Voltage dB(μV)	
MHz	QUASI-PEAK	AVERAGE
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5.0	56	46
5.0 to 30	60	50

Remarks : In the Above Table, the tighter limit applies at the band edges.

3.4 OPERATING CONDITION OF EUT

Same as section 2.8.

3.5 EUT CONFIGURATION ON MEASUREMENT

The equipments that are listed 3.2 are installed on Conducted Power Line Test to meet the Commission requirement and operating in a manner, which tends to maximize its emission characteristics in a normal application.

The device under test, installed in a representative system as described in section 3.2, was placed on a non-conductive table whose total height equal to 80cm. Powered from one L.I.S.N. which signal output to receiver, and the other peripherals was powered from another L.I.S.N. which signal output was terminated by 50Ω.

3.6 CONDUCTED EMISSION DATA

The measurement range of conducted emission, which is from **0.15 MHz to 30 MHz**, was investigated. All readings are quasi-peak and average values with a resolution Bandwidth of 9 KHz. The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range for all the test modes. Then the worst modes were reported the following data pages.

3.7 CONDUCTED EMISSIONS MEASUREMENT RESULTS

Date of Test	December 23, 2006	**Temperature**	24 ℃
EUT	HF RFID PRINTER	**Humidity**	53 %
Test Mode	TX Mode- USB Port Link	**Display Pattern**	Program

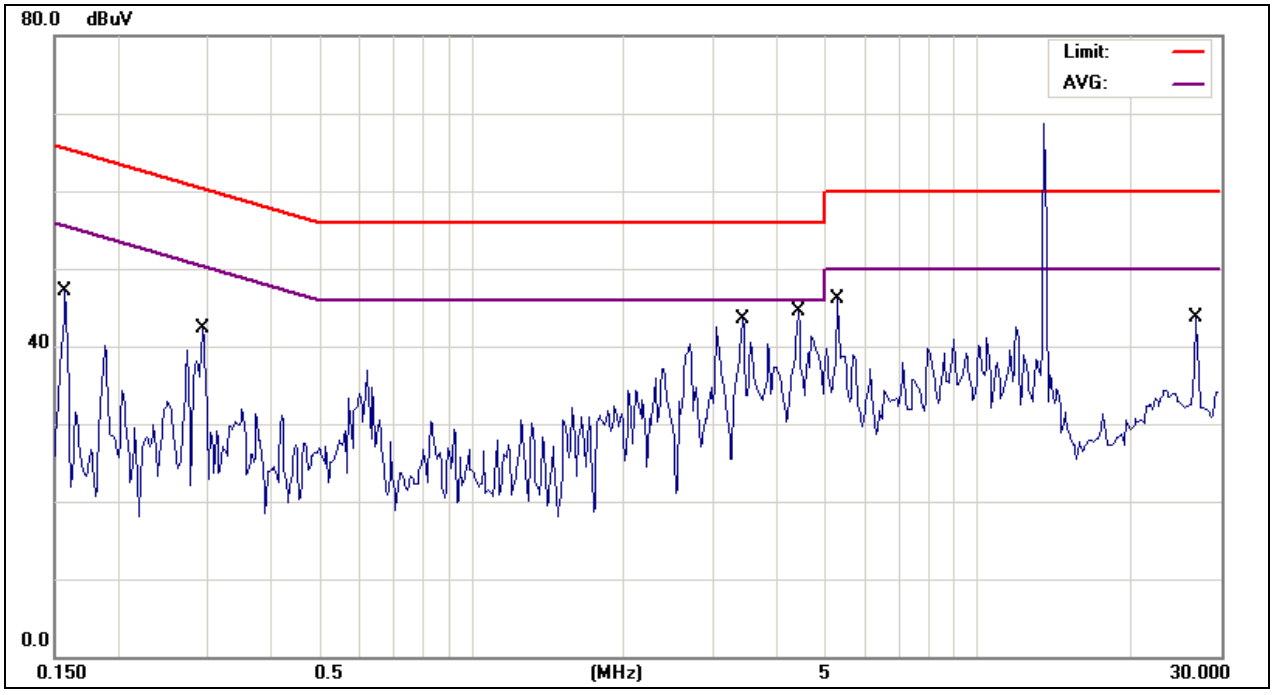
Line

No.	Frequency MHz	Reading Level dBµV	Factor dB	Measurement dBµV	Limit dBµV	Over Limit dB	Detector
1	0.1572	28.36	10.16	38.52	65.61	-27.09	QP
2	0.1572	8.62	10.16	18.78	55.61	-36.83	AVG
3	0.2960	27.82	10.20	38.02	60.35	-22.33	QP
4	0.2960	11.90	10.20	22.10	50.35	-28.25	AVG
5	3.4441	26.84	10.20	37.04	56.00	-18.96	QP
6	3.4441	14.97	10.20	25.17	46.00	-20.83	AVG
7	4.4475	22.73	10.23	32.96	56.00	-23.04	QP
8	4.4475	10.99	10.23	21.22	46.00	-24.78	AVG
9	5.2864	26.08	10.30	36.38	60.00	-23.62	QP
10	5.2864	17.55	10.30	27.85	50.00	-22.15	AVG
11	27.1202	32.46	10.66	43.12	60.00	-16.88	QP
12	★27.1202	32.59	10.66	43.25	50.00	-6.75	AVG

Remarks :

1. All readings are Quasi-peak and Average values.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. " ★ " means that this data is the worse case measurement level.

Line



Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "AVG" refers to the limit of Average.

Date of Test	December 23, 2006	**Temperature**	24 ℃
EUT	HF RFID PRINTER	**Humidity**	53 %
Test Mode	TX Mode- USB Port Link	**Display Pattern**	Program

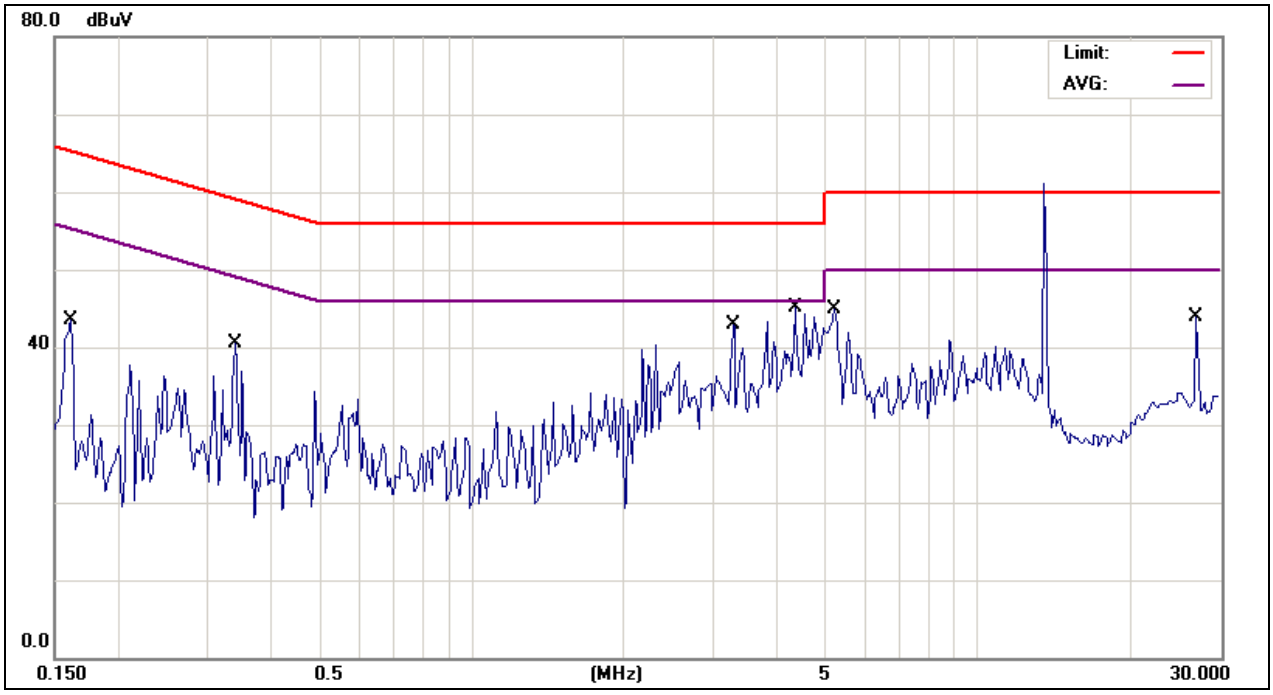
Neutral

No.	Frequency MHz	Reading Level dBµV	Factor dB	Measurement dBµV	Limit dBµV	Over Limit dB	Detector
1	0.1597	29.42	10.16	39.58	65.48	-25.90	QP
2	0.1597	8.04	10.16	18.20	55.48	-37.28	AVG
3	0.3385	22.11	10.21	32.32	59.24	-26.92	QP
4	0.3385	9.56	10.21	19.77	49.24	-29.47	AVG
5	3.2933	17.94	10.20	28.14	56.00	-27.86	QP
6	3.2933	9.64	10.20	19.84	46.00	-26.16	AVG
7	4.3949	22.18	10.22	32.40	56.00	-23.60	QP
8	4.3949	10.24	10.22	20.46	46.00	-25.54	AVG
9	5.2348	27.40	10.29	37.69	60.00	-22.31	QP
10	5.2348	15.83	10.29	26.12	50.00	-23.88	AVG
11	27.1193	31.75	10.62	42.37	60.00	-17.63	QP
12	★27.1193	31.93	10.62	42.55	50.00	-7.45	AVG

Remarks :

1. All readings are Quasi-peak and Average values.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. " ★ " means that this data is the worse case measurement level.

Neutral



Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "AVG" refers to the limit of Average.

Date of Test	December 23, 2006	**Temperature**	24 ℃
EUT	HF RFID PRINTER	**Humidity**	53 %
Test Mode	TX Mode- Parallel Port Link	**Display Pattern**	Program

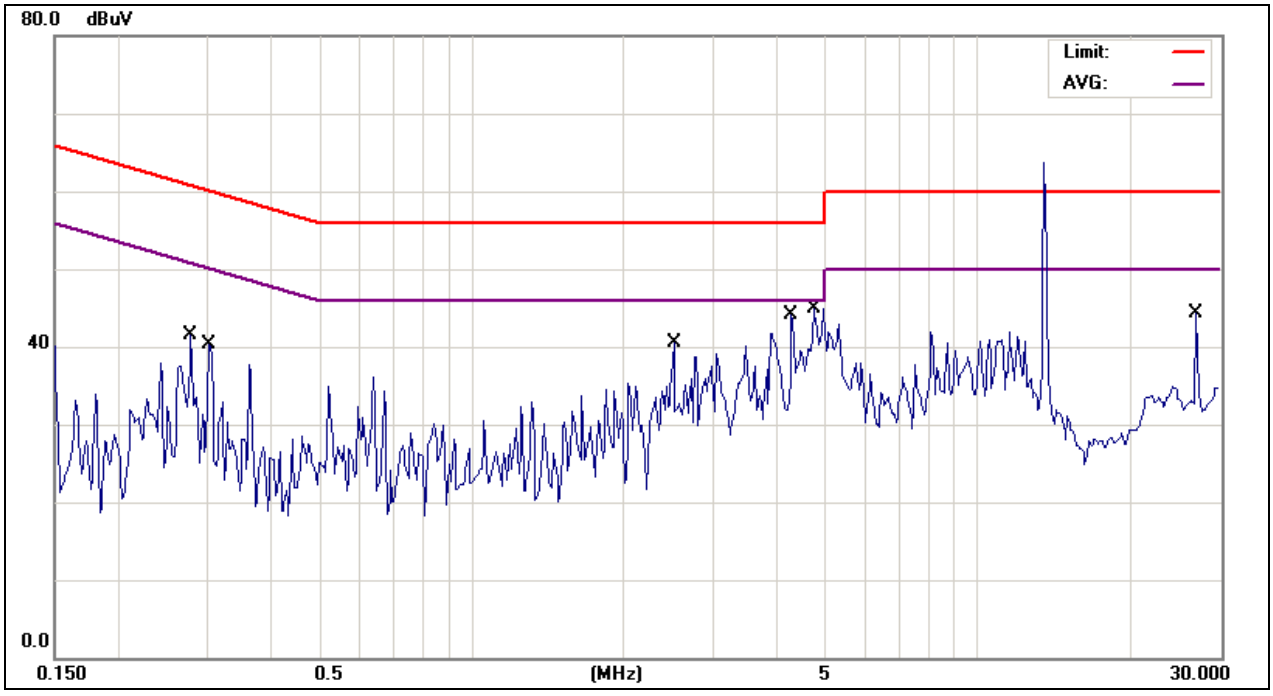
Line

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV	Limit dBμV	Over Limit dB	Detector
1	0.2791	27.08	10.19	37.27	60.84	-23.57	QP
2	0.2791	11.83	10.19	22.02	50.84	-28.82	AVG
3	0.3029	28.83	10.20	39.03	60.16	-21.13	QP
4	0.3029	11.73	10.20	21.93	50.16	-28.23	AVG
5	2.5025	17.31	10.18	27.49	56.00	-28.51	QP
6	2.5025	8.54	10.18	18.72	46.00	-27.28	AVG
7	4.2885	20.47	10.21	30.68	56.00	-25.32	QP
8	4.2885	14.60	10.21	24.81	46.00	-21.19	AVG
9	4.7665	29.05	10.26	39.31	56.00	-16.69	QP
10	4.7665	19.06	10.26	29.32	46.00	-16.68	AVG
11	27.1242	31.01	10.66	41.67	60.00	-18.33	QP
12	★27.1242	30.92	10.66	41.58	50.00	-8.42	AVG

Remarks :

1. All readings are Quasi-peak and Average values.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. " ★ " means that this data is the worse case measurement level.

Line



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Date of Test	December 23, 2006	**Temperature**	24 ℃
EUT	HF RFID PRINTER	**Humidity**	53 %
Test Mode	TX Mode- Parallel Port Link	**Display Pattern**	Program

Neutral

No.	Frequency MHz	Reading Level dBµV	Factor dB	Measurement dBµV	Limit dBµV	Over Limit dB	Detector
1	0.1582	30.79	10.16	40.95	65.56	-24.61	QP
2	0.1582	8.53	10.16	18.69	55.56	-36.87	AVG
3	0.1926	24.59	10.17	34.76	63.92	-29.16	QP
4	0.1926	7.98	10.17	18.15	53.92	-35.77	AVG
5	0.3132	25.40	10.20	35.60	59.89	-24.29	QP
6	0.3132	9.82	10.20	20.02	49.89	-29.87	AVG
7	3.1079	23.88	10.21	34.09	56.00	-21.91	QP
8	3.1079	15.93	10.21	26.14	46.00	-19.86	AVG
9	5.1199	24.26	10.29	34.55	60.00	-25.45	QP
10	5.1199	12.89	10.29	23.18	50.00	-26.82	AVG
11	27.1195	31.94	10.62	42.56	60.00	-17.44	QP
12	★27.1195	32.05	10.62	42.67	50.00	-7.33	AVG

Remarks :

1. All readings are Quasi-peak and Average values.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
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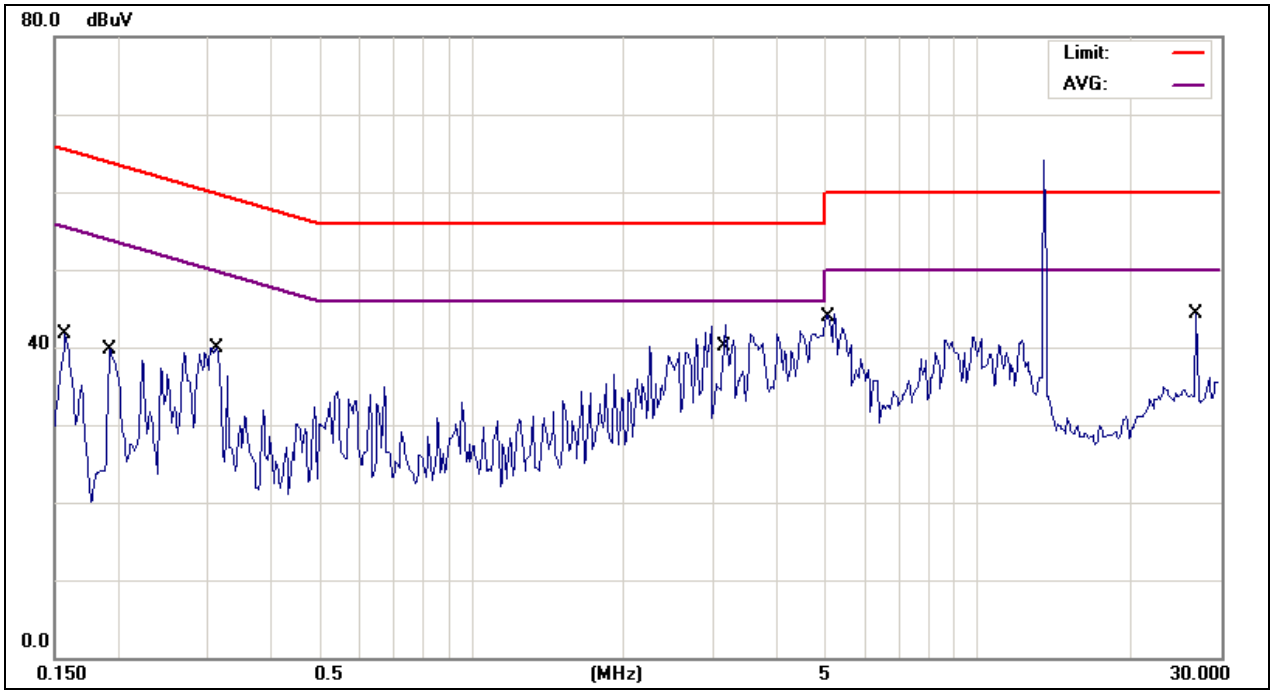
Neutral



Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "AVG" refers to the limit of Average.

Date of Test	December 23, 2006	**Temperature**	24 ℃
EUT	HF RFID PRINTER	**Humidity**	53 %
Test Mode	TX Mode- Serial Port Link	**Display Pattern**	Program

Line

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV	Limit dBμV	Over Limit dB	Detector
1	0.1570	29.02	10.16	39.18	65.62	-26.44	QP
2	0.1570	8.09	10.16	18.25	55.62	-37.37	AVG
3	0.2876	26.92	10.20	37.12	60.59	-23.47	QP
4	0.2876	12.20	10.20	22.40	50.59	-28.19	AVG
5	0.4935	15.29	10.25	25.54	56.11	-30.57	QP
6	0.4935	4.13	10.25	14.38	46.11	-31.73	AVG
7	3.4408	22.50	10.20	32.70	56.00	-23.30	QP
8	3.4408	14.78	10.20	24.98	46.00	-21.02	AVG
9	5.0891	24.23	10.29	34.52	60.00	-25.48	QP
10	5.0891	18.60	10.29	28.89	50.00	-21.11	AVG
11	27.1179	27.47	10.66	38.13	60.00	-21.87	QP
12	★27.1179	27.17	10.66	37.83	50.00	-12.17	AVG

Remarks :

1. All readings are Quasi-peak and Average values.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
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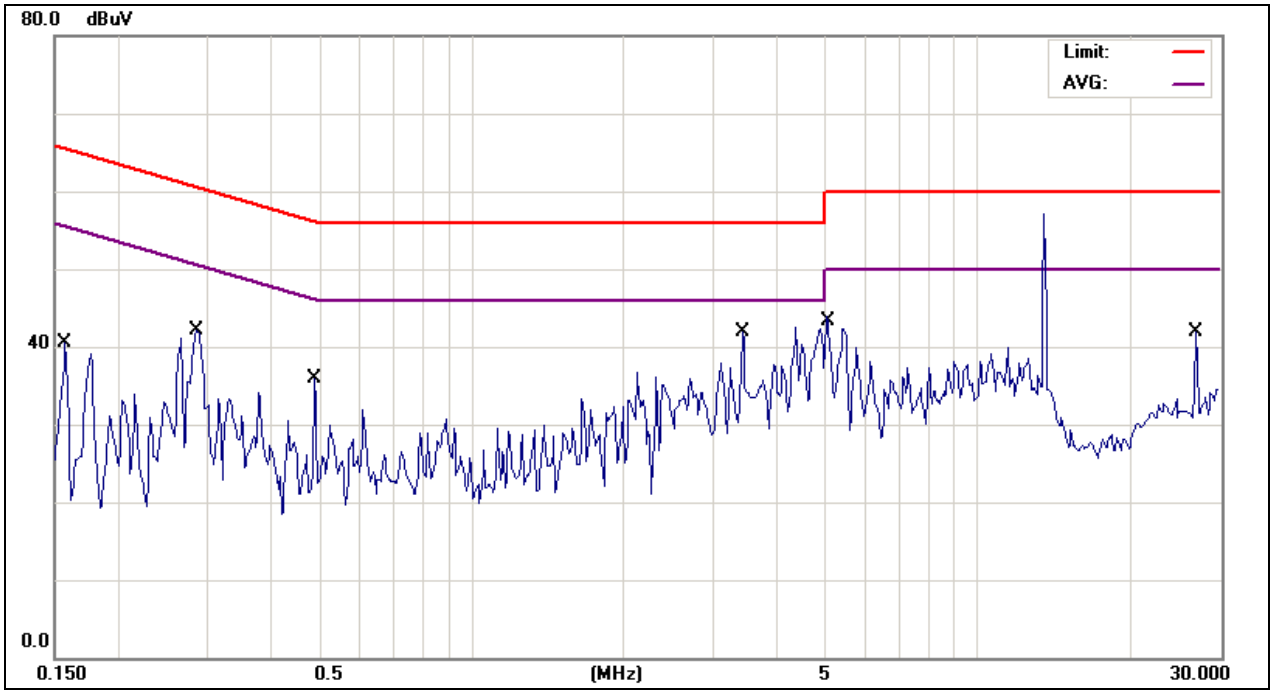
Line



Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "AVG" refers to the limit of Average.

Date of Test	December 23, 2006	**Temperature**	24 ℃
EUT	HF RFID PRINTER	**Humidity**	53 %
Test Mode	TX Mode- Serial Port Link	**Display Pattern**	Program

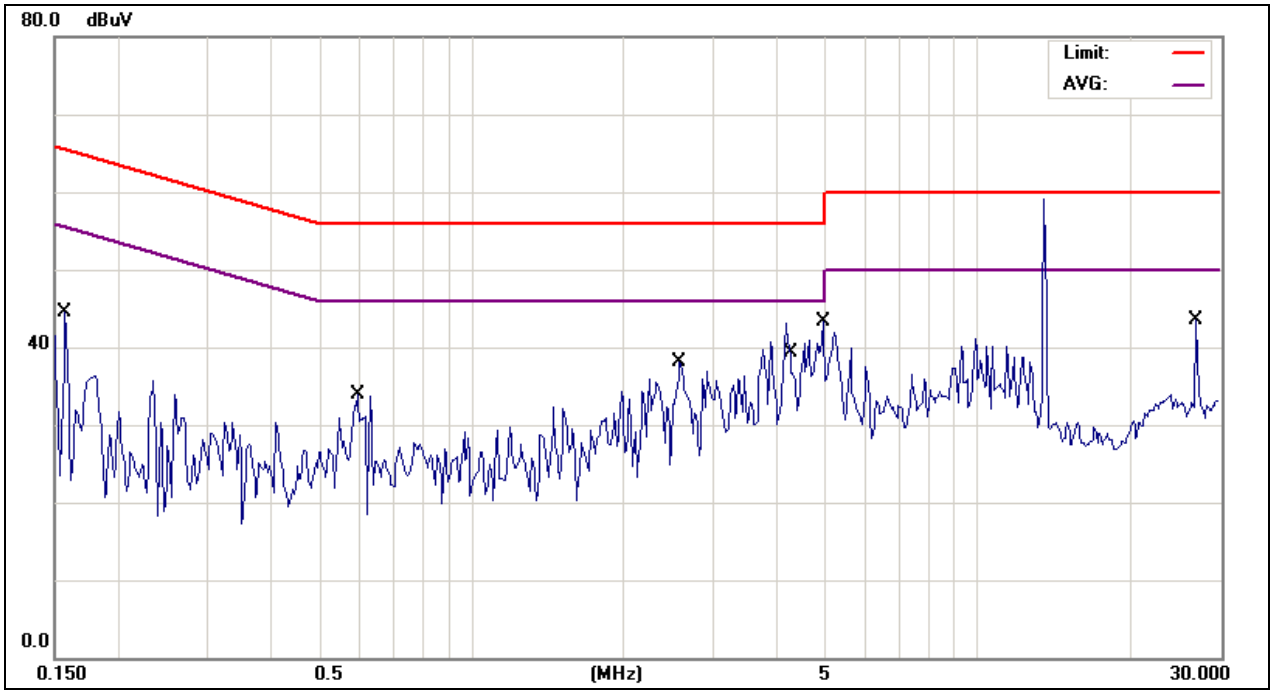
Neutral

No.	Frequency MHz	Reading Level dBµV	Factor dB	Measurement dBµV	Limit dBµV	Over Limit dB	Detector
1	0.1588	30.69	10.16	40.85	65.53	-24.68	QP
2	0.1588	9.30	10.16	19.46	55.53	-36.07	AVG
3	0.5985	17.73	10.23	27.96	56.00	-28.04	QP
4	0.5985	7.63	10.23	17.86	46.00	-28.14	AVG
5	2.5903	20.89	10.18	31.07	56.00	-24.93	QP
6	2.5903	10.07	10.18	20.25	46.00	-25.75	AVG
7	4.3144	23.41	10.21	33.62	56.00	-22.38	QP
8	4.3144	11.94	10.21	22.15	46.00	-23.85	AVG
9	4.9661	28.53	10.28	38.81	56.00	-17.19	QP
10	4.9661	18.83	10.28	29.11	46.00	-16.89	AVG
11	27.1227	30.20	10.62	40.82	60.00	-19.18	QP
12	★27.1227	30.08	10.62	40.70	50.00	-9.30	AVG

Remarks :

1. All readings are Quasi-peak and Average values.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. " ★ " means that this data is the worse case measurement level.

Neutral



Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "AVG" refers to the limit of Average.

4. RADIATION EMISSION DATA

4.1 TEST EQUIPMENT

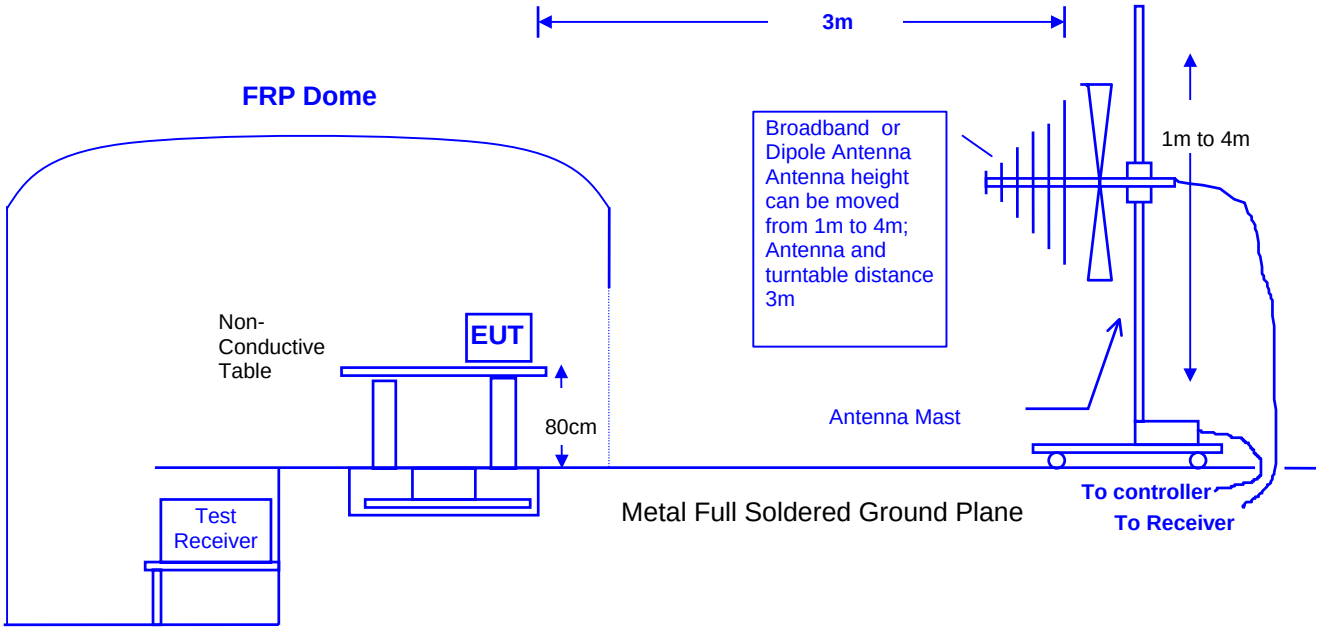
The following test equipments are used during the radiated emission tests:
Radiated test was performed on: ☐Site #1 ☐Site #2 ☐Site #3 ☐Site #4
☒9*6*6 Semi Anechoic Chamber

Item	Instrument	Manufacturer	Model	Serial No.	Last Cal.
1	Test Receiver	R & S	ESCS30	100352	07/17/06
2	Spectrum Analyzer	RS	FSP40	100061	04/03/06
3	Spectrum Analyzer	HP	8594A	3235A00402	10/30/06
4	Power Meter	R & S	NRVS	100666	04/07/06
5	Peak Power Sensor	R & S	NRV-Z32	836019-058	04/07/06
6	AMPLIFIER	EMV-Technik	PA303	N/A	04/21/06
7	BILOG ANTENNA	SCHAFFNER	CBL6112D	22023	06/01/06
8	Loop Antenna	EMCO	6507	9510-1353	08/11/06
9	Loop Antenna	EMCO	6509	9601-1389	10/16/06
10	CABLE	GTK	N/A	GTK-E-A344-01	04/21/06
11	CHAMBER	GTK	N/A	A6	12/04/06
12	Test Program Software	GesTek	N/A	GTK-E-S001-01	N/A

Note: All measurement critical items of test instrumentation were within their calibration period of 1 year.

4.2 OPEN TEST SITE SETUP DIAGRAM

Note: This is a reprehensive setup diagram for Table-top EUT.
For Floor-standing EUT, the table will be removed with all others setup condition remain the same.



4.3 RADIATED EMISSION LIMIT

☒ **FCC 15.225 Fundamental Emission Limits**

Frequency	Distance	Field Strength of Fundamental	
MHz	Meter	μV/m	dBμV/m
13.553 – 13.567	30	15848	84
13.410 – 13.553	30	334	50.4
13.567 – 13.710	30	334	50.4
13.110 – 13.410	30	106	40.5
13.710 – 14.010	30	106	40.5

Remarks :

1. The emission limit is base on measeurement instrumentation employing an average detector.
2. RF Voltage (dBμV/m) = 20 log RF Voltage (μV/m)
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

☒ **General Radiated Emission Limits**

The filed strength of any emissions which appear outside of this band (13.110 – 14.010 MHz) shall not exceed the general radisted emission limits in Section 15.209.

Frequency	Distance	Field Strength	
MHz	Meter	μV/m	dBμV/m
1.705 to 30	30	30	29.5
30 to 88	3	100	40.0
88 to 216	3	150	43.5
216 to 960	3	200	46.0
Above 960	3	500	54.0

Remarks :

1. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.4 EUT CONFIGURATION

The equipment which is listed 2.6 are installed on Radiated Emission Test to meet the Commission requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

The device under test, installed in a representative system as described in section 4.2, was placed on a non-conductive table whose total height equaled 80 cm. This table can be rotated 360 degree. The measurement antenna was mounted to a non-conductive mast. Antenna height was varied from 1 meter to 4 meters and the system under test was rotated from 0 degree through 360 degrees relative to the antenna position and polarization. Also the I/O cable position was investigated to find the maximum emission condition.

4.5 OPERATING CONDITION OF EUT

Same as section 2.7.

4.6 RADIATED EMISSION DATA

The measurement range of radiated emission, which is from **Fundamental frequency to 1GHz,** was investigated. All readings below 1GHz are quasi-peak values with a resolution bandwidth of 120 KHz. Above 1GHz are peak and avg. values with a resolution bandwidth of 1MHz. The initial step in collecting radiated emission data is a spectrum analyzer peak scans of the measurement range for all the test modes and then use test receiver for final measurement. Then the worst modes were reported the following data pages.

4.7 RADIATED EMISSION MEASUREMENT RESULTS

4.7.1 RADIATED OF FUNDAMEDTAL EMISSION

Date of Test	December 19, 2006	**Temperature**	18 deg/C
EUT	HF RFID PRINTER	**Humidity**	72 %RH
Working Cond.	TX Mode		
Antenna distance	3m		

PEAK

Rediation Emission @ 3 m

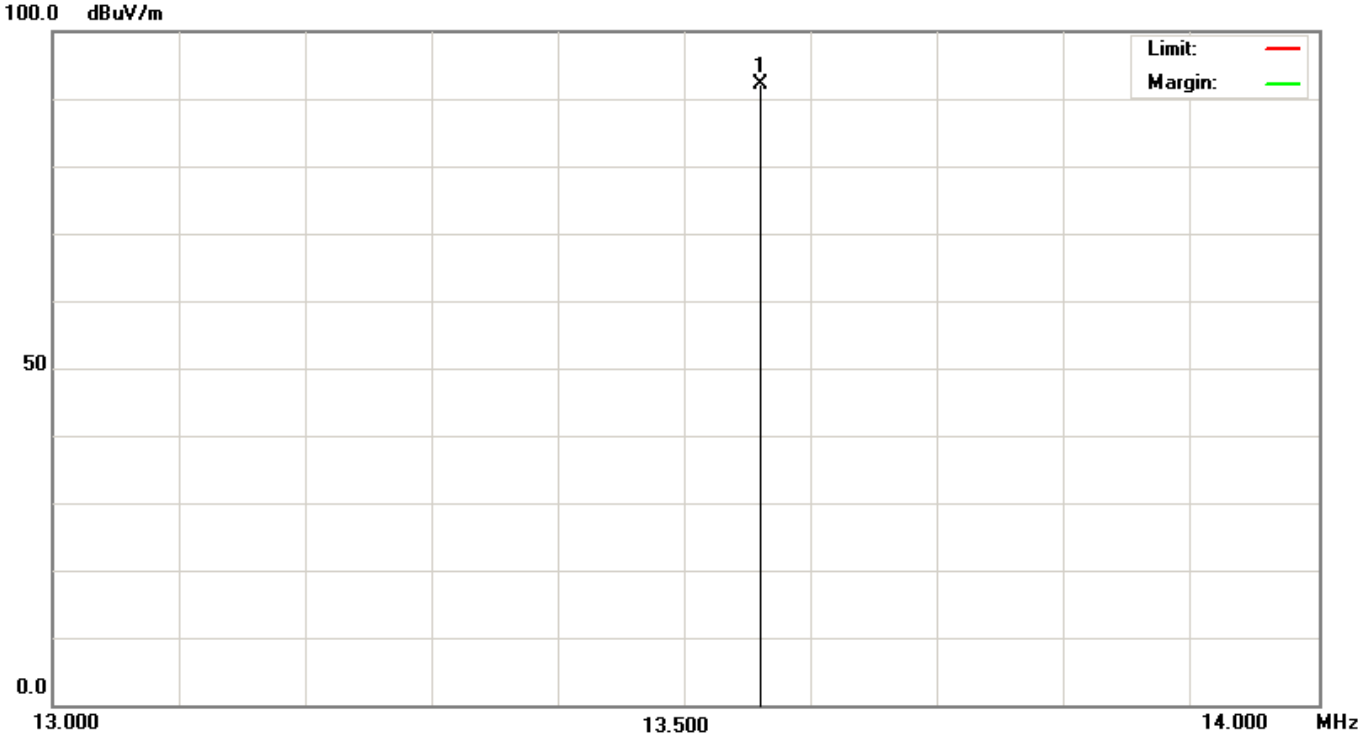
No.	Frequency [MHz]	Reading Level [dBuV]	Correction Factor [dB/m]	Emission Level [dBuV/m]
1	13.56	79.15	13.04	92.19

Radiation Emission @ 30 meter

No.	Frequency [MHz]	Emission Level [dBuV/m]@3m	Emission Level [dBuV/m]@30m	Limit [dBuV/m]	Margin [dB]
1	13.56	92.19	52.19	106	53.81

Remark

1. The Readings are peak or average.
2. Spectrum Analyzer Setting(Peak Detector): RBW=10kHz, VBW=100kHZ.
3. Spectrum Analyzer Setting(AVG Detector): RBW=10kHz, VBW=10HZ.
4. Emission Level= Reading + Correction Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
5. Correction Factor= Antenna Factor + Cable Loss – Amplifier Factor
6. Margin Value=Emission level-Limit value.
7. The average measurement was not performed when the peak measured data under the limit of average detection. If the average value is measured, peak measurement should also be supplied.
8. The measurement distance is 30 meter for 1.703MHz – 30MHz band which required in 15.209. When performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by using the square of an inverse linear distance extrapolated factor (40dB/decade).



4.7.2 BAND EDGE RESULT

Date of Test	December 19, 2006	**Temperature**	18 deg/C
EUT	HF RFID PRINTER	**Humidity**	72 %RH
Working Cond.	TX Mode		
Antenna distance	3m		

Radiated Emission @ 3meter

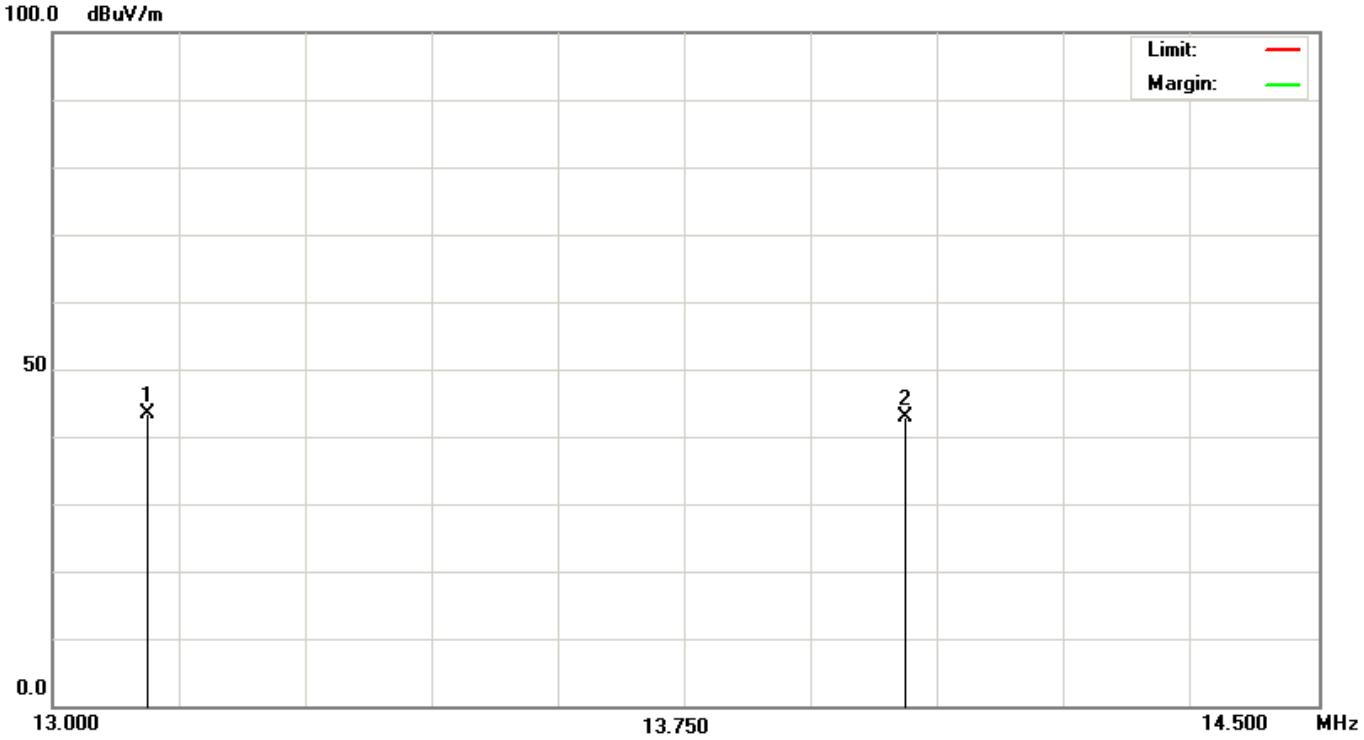
No.	Frequency [MHz]	Reading Level [dBuV]	Correction Factor [dB/m]	Emission Level [dBuV/m]
1	13.11	30.1	13.30	43.40
2	14.01	30.0	12.78	42.78

Radiation Emission @ 30 meter

No.	Frequency [MHz]	Emission Level [dBuV/m]@3m	Emission Level [dBuV/m]@30m	Limit [dBuV/m]	Margin [dB]
1	13.11	43.40	3.40	29.5	26.10
2	14.01	42.78	2.78	29.5	26.72

Remark

1. The Readings are Quasi-peak
2. Spectrum Analyzer Setting(Quasi-peak Detector): RBW=9kHz, VBW=100kHZ.
3. Emission Level= Reading + Correction Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
4. Correction Factor= Antenna Factor + Cable Loss – Amplifier Factor
5. Margin Value=Emission level-Limit value.
6. The measurement distance is 30 meter for 1.703MHz – 30MHz band which required in 15.209. When performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by using the square of an inverse linear distance extrapolated factor (40dB/decade).



4.7.3 RADIATED OF SPURIOUS EMISSION

Date of Test	December 19, 2006	**Temperature**	18 deg/C
EUT	HF RFID PRINTER	**Humidity**	72 %RH
Working Cond.	TX Mode	**Display Pattern**	Program
Antenna distance	3m at **Horizontal**	**Frequency Range**	10 - 30MHz

Radiated Emission @ 3meter

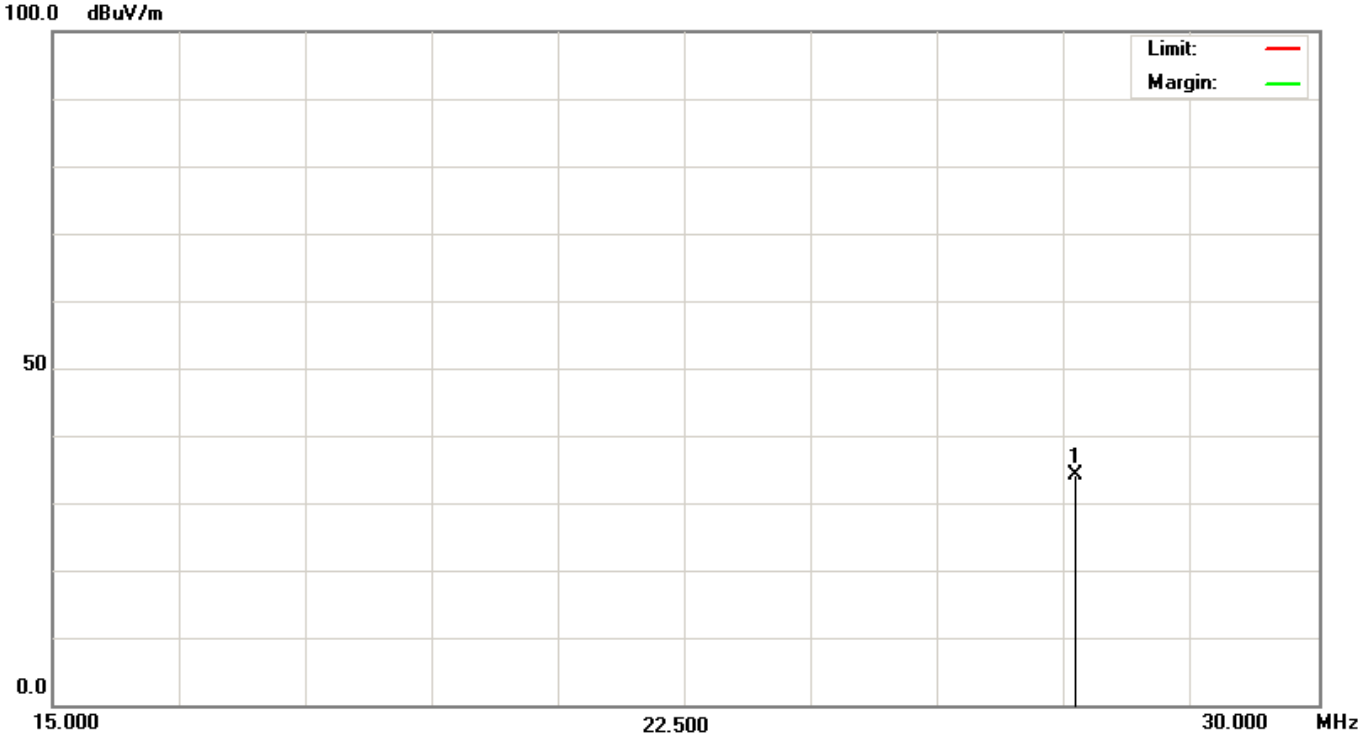
No.	Frequency [MHz]	Reading Level [dBuV]	Correction Factor [dB/m]	Emission Level [dBuV/m]
1	27.12	22.3	11.8	34.10

Radiation Emission @ 30 meter

No.	Frequency [MHz]	Emission Level [dBuV/m]@3m	Emission Level [dBuV/m]@30m	Limit [dBuV/m]	Margin [dB]
1	27.12	34.10	-5.9	29.5	35.4

Remark

1. The Readings are Quasi-peak
2. Spectrum Analyzer Setting(Quasi-peak Detector): RBW=9kHz, VBW=100kHZ.
3. Emission Level= Reading + Correction Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
4. Correction Factor= Antenna Factor + Cable Loss – Amplifier Factor
5. Margin Value=Emission level-Limit value.
6. The measurement distance is 30 meter for 1.703MHz – 30MHz band which required in 15.209. When performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by using the square of an inverse linear distance extrapolated factor (40dB/decade).

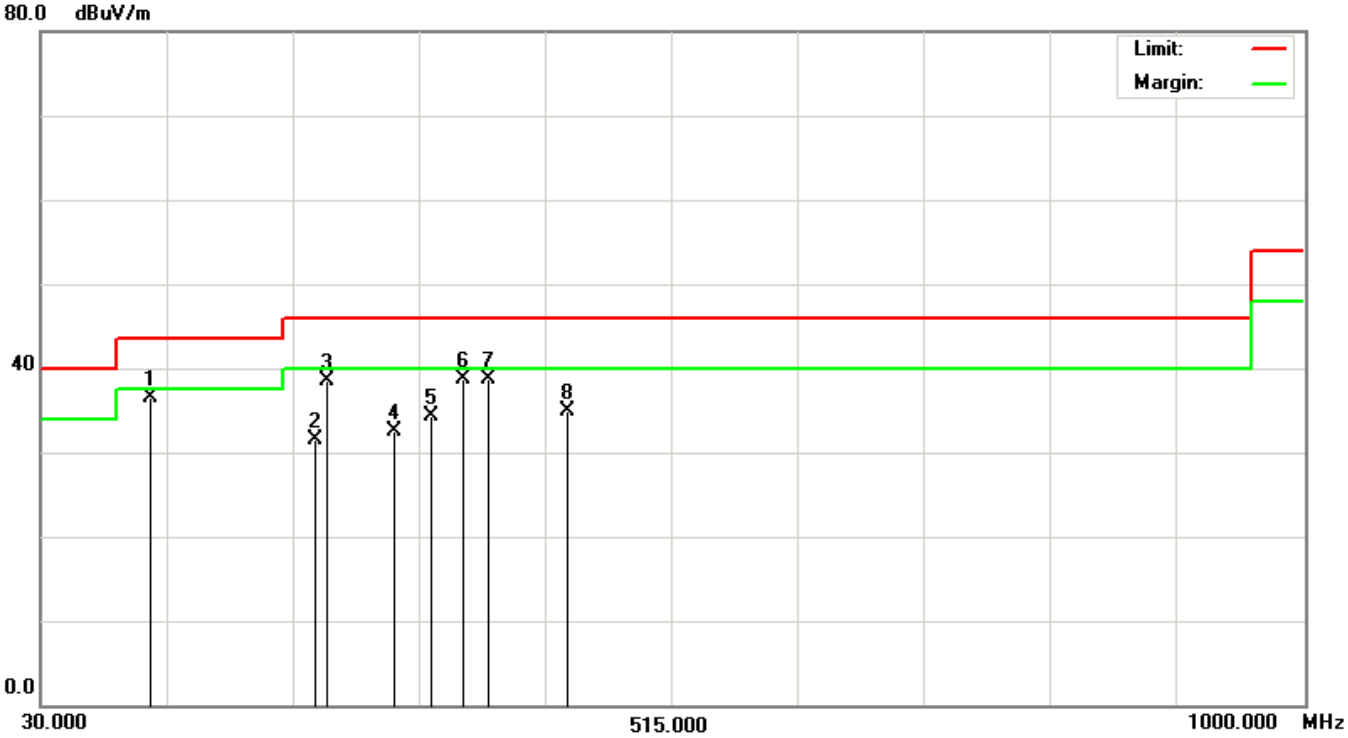


Date of Test	December 20, 2006	**Temperature**	26 deg/C
EUT	HF RFID PRINTER	**Humidity**	60 %RH
Working Cond.	TX Mode-USB Port Link	**Display Pattern**	Program
Antenna distance	3m at **Horizontal**	**Frequency Range**	30-1000MHz

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV/m	Limit dBμV/m	Over Limit dB	Detector
1	★114.7500	53.39	-16.96	36.43	43.50	-7.07	QP
2	239.9850	46.93	-15.36	31.57	46.00	-14.43	QP
3	250.5775	53.33	-14.77	38.56	46.00	-7.44	QP
4	299.9825	46.13	-13.54	32.59	46.00	-13.41	QP
5	329.3300	46.70	-12.49	34.21	46.00	-11.79	QP
6	352.5750	50.26	-11.64	38.62	46.00	-7.38	QP
7	372.2875	49.63	-10.93	38.70	46.00	-7.30	QP
8	433.9350	44.15	-9.21	34.94	46.00	-11.06	QP

Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. " ★ " means that this data is the worse case measurement level.



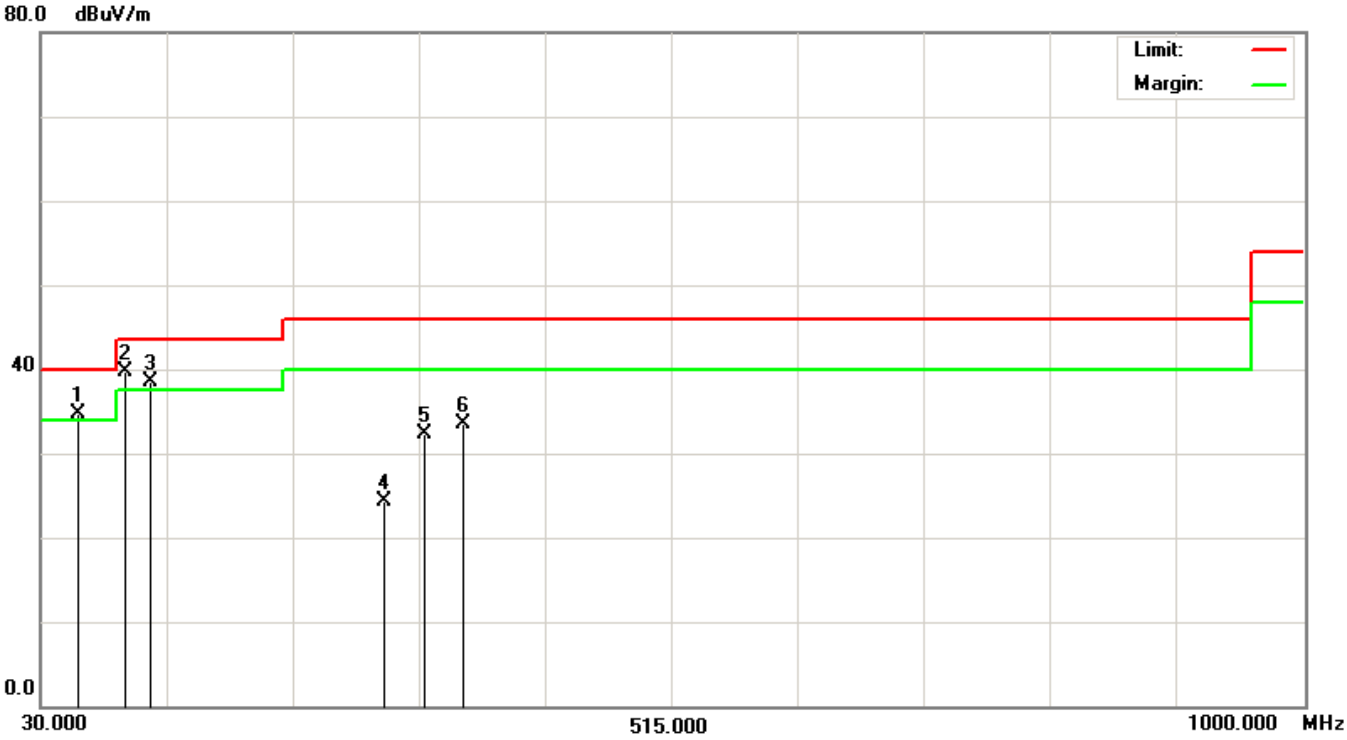
Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "Margin" refers to the data under 6dB.

Date of Test	December 20, 2006	**Temperature**	26 deg/C
EUT	HF RFID PRINTER	**Humidity**	60 %RH
Working Cond.	TX Mode-USB Port Link	**Display Pattern**	Program
Antenna distance	3m at **Vertical**	**Frequency Range**	30-1000MHz

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV/m	Limit dBμV/m	Over Limit dB	Detector
1	57.2700	56.21	-21.58	34.63	40.00	-5.37	QP
2	★94.9225	57.86	-18.21	39.65	43.50	-3.85	QP
3	114.5500	55.46	-16.97	38.49	43.50	-5.01	QP
4	293.5300	38.00	-13.71	24.29	46.00	-21.71	QP
5	325.4525	45.01	-12.62	32.39	46.00	-13.61	QP
6	352.5750	45.08	-11.64	33.44	46.00	-12.56	QP

Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. " ★ " means that this data is the worse case measurement level.



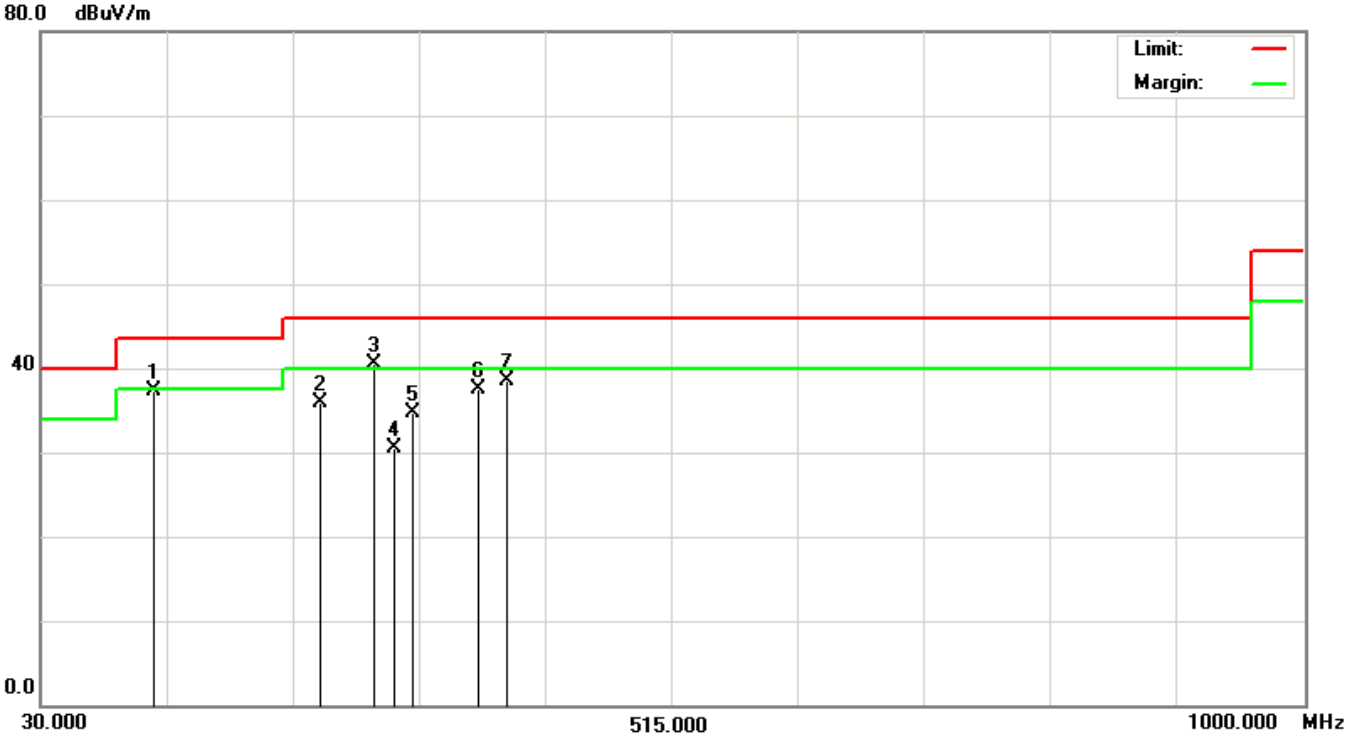
Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "Margin" refers to the data under 6dB.

Date of Test	December 20, 2006	**Temperature**	26 deg/C
EUT	HF RFID PRINTER	**Humidity**	60 %RH
Working Cond.	TX Mode-Parallel Port Link	**Display Pattern**	Program
Antenna distance	3m at **Horizontal**	**Frequency Range**	30-1000MHz

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV/m	Limit dBμV/m	Over Limit dB	Detector
1	114.9000	54.18	-16.96	37.22	43.50	-6.28	QP
2	244.0900	51.00	-15.13	35.87	46.00	-10.13	QP
3	★286.3725	54.43	-13.89	40.54	46.00	-5.46	QP
4	299.9850	44.09	-13.54	30.55	46.00	-15.45	QP
5	315.0075	47.79	-13.00	34.79	46.00	-11.21	QP
6	366.1350	48.74	-11.15	37.59	46.00	-8.41	QP
7	387.3525	48.90	-10.38	38.52	46.00	-7.48	QP

Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. " ★ " means that this data is the worse case measurement level.



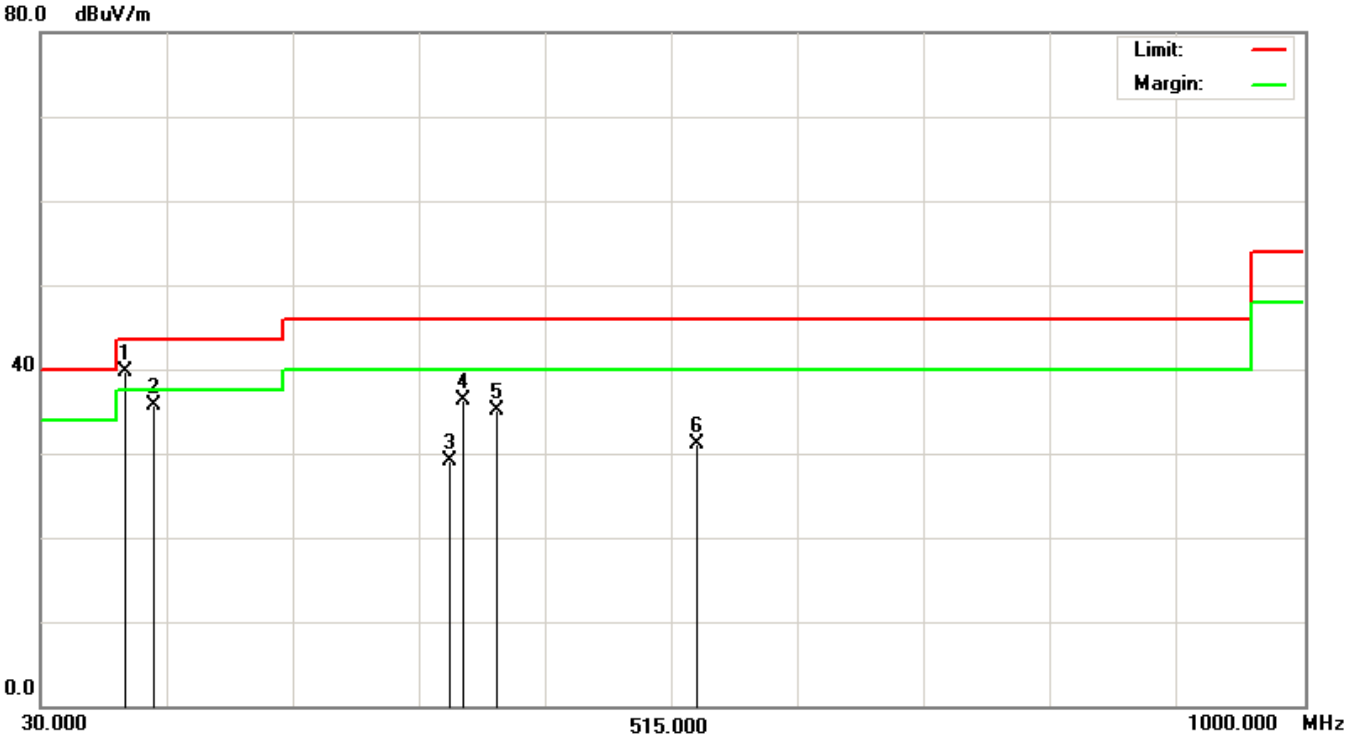
Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "Margin" refers to the data under 6dB.

Date of Test	December 20, 2006	**Temperature**	26 deg/C
EUT	HF RFID PRINTER	**Humidity**	60 %RH
Working Cond.	TX Mode-Parallel Port Link	**Display Pattern**	Program
Antenna distance	3m at **Vertical**	**Frequency Range**	30-1000MHz

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV/m	Limit dBμV/m	Over Limit dB	Detector
1	★94.9225	57.88	-18.21	39.67	43.50	-3.83	QP
2	115.1500	52.67	-16.95	35.72	43.50	-7.78	QP
3	343.6525	41.11	-11.97	29.14	46.00	-16.86	QP
4	352.5725	47.94	-11.64	36.30	46.00	-9.70	QP
5	379.6950	45.67	-10.66	35.01	46.00	-10.99	QP
6	533.9700	38.64	-7.46	31.18	46.00	-14.82	QP

Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. " ★ " means that this data is the worse case measurement level.



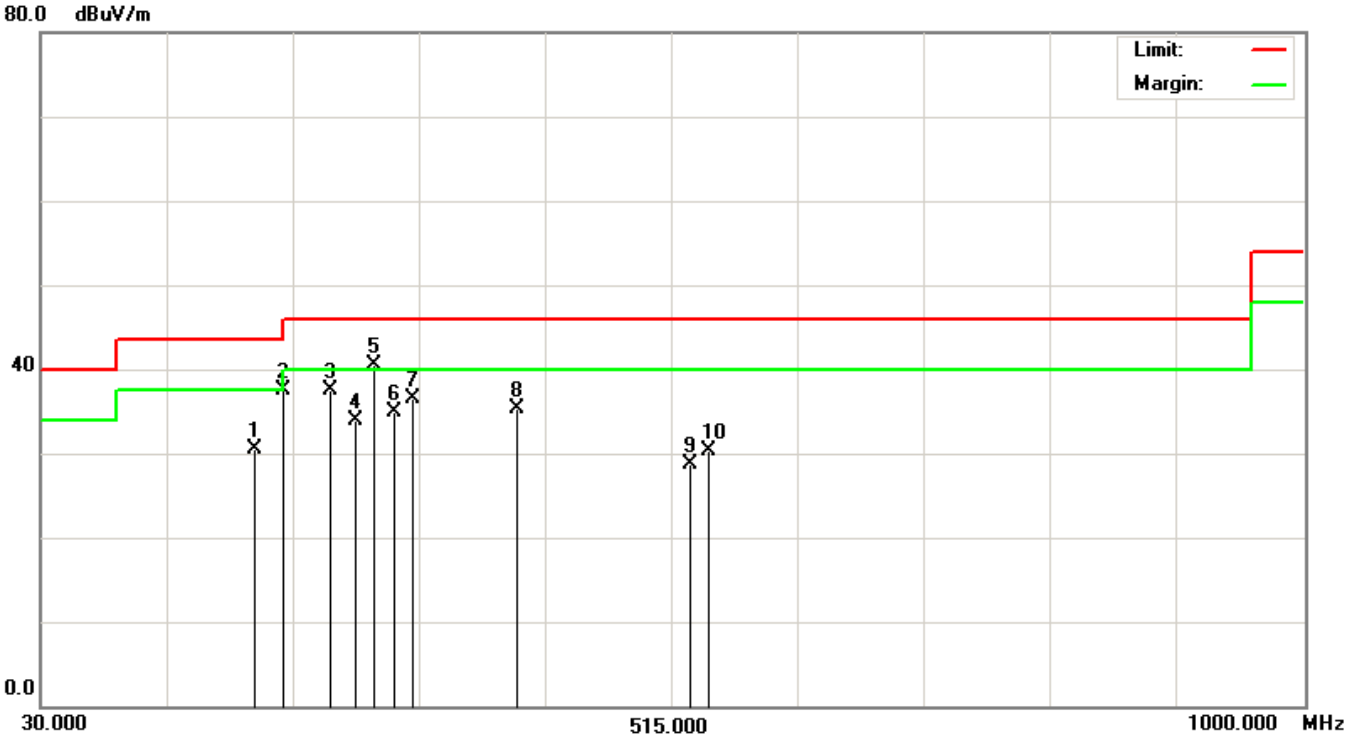
Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "Margin" refers to the data under 6dB.

Date of Test	December 20, 2006	**Temperature**	26 deg/C
EUT	HF RFID PRINTER	**Humidity**	60 %RH
Working Cond.	TX Mode-Serial Port Link	**Display Pattern**	Program
Antenna distance	3m at **Horizontal**	**Frequency Range**	30-1000MHz

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV/m	Limit dBμV/m	Over Limit dB	Detector
1	193.9500	48.40	-17.86	30.54	43.50	-12.96	QP
2	215.8100	54.27	-16.74	37.53	43.50	-5.97	QP
3	251.0076	52.24	-14.76	37.48	46.00	-8.52	QP
4	271.7000	48.24	-14.25	33.99	46.00	-12.01	QP
5	★286.3725	54.33	-13.89	40.44	46.00	-5.56	QP
6	299.9825	48.41	-13.54	34.87	46.00	-11.13	QP
7	315.0100	49.60	-13.00	36.60	46.00	-9.40	QP
8	395.9825	45.29	-10.07	35.22	46.00	-10.78	QP
9	528.8625	36.28	-7.52	28.76	46.00	-17.24	QP
10	542.4225	37.60	-7.37	30.23	46.00	-15.77	QP

Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. " ★ " means that this data is the worse case measurement level.



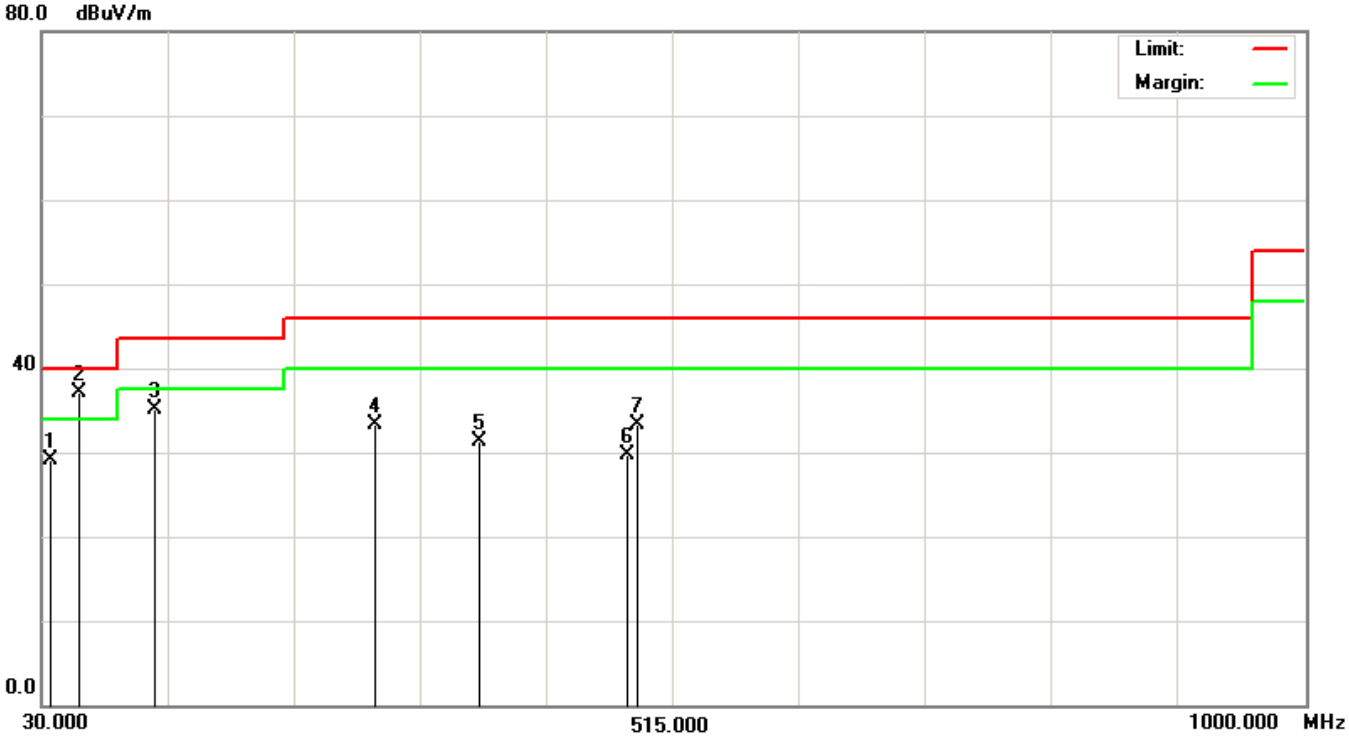
Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "Margin" refers to the data under 6dB.

Date of Test	December 20, 2006	**Temperature**	26 deg/C
EUT	HF RFID PRINTER	**Humidity**	60 %RH
Working Cond.	TX Mode-Serial Port Link	**Display Pattern**	Program
Antenna distance	3m at **Vertical**	**Frequency Range**	30-1000MHz

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV/m	Limit dBμV/m	Over Limit dB	Detector
1	36.4000	42.69	-13.57	29.12	40.00	-10.88	QP
2	★57.2725	58.76	-21.58	37.18	40.00	-2.82	QP
3	114.9000	52.06	-16.96	35.10	43.50	-8.40	QP
4	286.3725	47.19	-13.89	33.30	46.00	-12.70	QP
5	366.1325	42.51	-11.15	31.36	46.00	-14.64	QP
6	479.9750	38.00	-8.24	29.76	46.00	-16.24	QP
7	488.1800	41.40	-8.07	33.33	46.00	-12.67	QP

Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. " ★ " means that this data is the worse case measurement level.



Remark: 1. The "Limit" in right-up corner in above diagram refers to Quasi-peak ; "Margin" refers to the data under 6dB.

5. FREQUENCY STABILITY

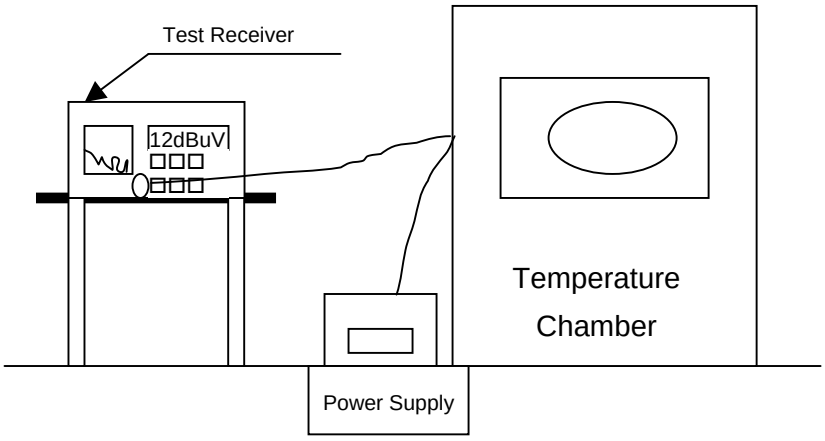
5.1 TEST EQUIPMENT

The following test equipments are used during the radiated emission tests:

Item	Instrument	Manufacturer	Model	Serial No.	Last Cal.
1	Spectrum Analyzer	RS	FSP40	100061	04/03/06
2	Spectrum Analyzer	HP	E4407B	US39240339	07/26/06
3	Temperature Chamber	WIT Scientific	TH-4S-B	W960909	08/18/06

Note: All measurement critical items of test instrumentation were within their calibration period of 1 year.

5.2 OPEN TEST SITE SETUP DIAGRAM



5.3 FREQUENCY STABILITY LIMIT

The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency over a temperature variation of －20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.The emission limit is base on measeurement instrumentation employing an average detector.

5.4 EUT CONFIGURATION

Place the EUT in an environmental temperature test chamber. An antenna should ce connected to the antenna output connector of EUT if possible.
The temperature variation of －20 degrees to +50 degrees C at normal supply voltage
The temperature was initially set to -20 degrees C and raised at intervals of 10 degrees C through range. Observed and record frequency of carrier in each temperature.
Variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. Observed and record frequency of carrier in each voltage.

5.5 OPERATING CONDITION OF EUT

Same as section 2.7.

5.6 FREQUENCY STABILITY MEASUREMENT RESULTS

Date of Test	December 15, 2006	**Temperature**	23.9 deg/C
EUT	HF RFID PRINTER	**Humidity**	63 %RH
Working Cond.	TX Mode		

Temperature (℃)	Voltage (V)	Observe Time	Read Frequency (MHz)	Tolerance (%)	Limit	Margin (%)
-20	120V	**start**	13.5608	0%	±0.01%	0%
		2mins	13.5608	0%		0%
		5mins	13.5608	0%		0%
		10mins	13.5608	0%		0%
-10	120V	**start**	13.5608	0%	±0.01%	0%
		2mins	13.5608	0%		0%
		5mins	13.5608	0%		0%
		10mins	13.5608	0%		0%
0	120V	**start**	13.5608	0%	±0.01%	0%
		2mins	13.5608	0%		0%
		5mins	13.5608	0%		0%
		10mins	13.5608	0%		0%
10	120V	**start**	13.5608	0%	±0.01%	0%
		2mins	13.5608	0%		0%
		5mins	13.5608	0%		0%
		10mins	13.5608	0%		0%
20	120V	**start**	13.5608	**N/A**	±0.01%	N/A
		2mins	13.5608	**N/A**		N/A
		5mins	13.5608	**N/A**		N/A
		10mins	13.5608	**N/A**		N/A
30	120V	**start**	13.5608	0%	±0.01%	0%
		2mins	13.5606	-0.001%		-0.009%
		5mins	13.5608	0%		0%
		10mins	13.5606	-0.001%		-0.009%
40	120V	**start**	13.5606	-0.001%	±0.01%	-0.009%
		2mins	13.5606	-0.001%		-0.009%
		5mins	13.5606	-0.001%		-0.009%
		10mins	13.5606	-0.001%		-0.009%

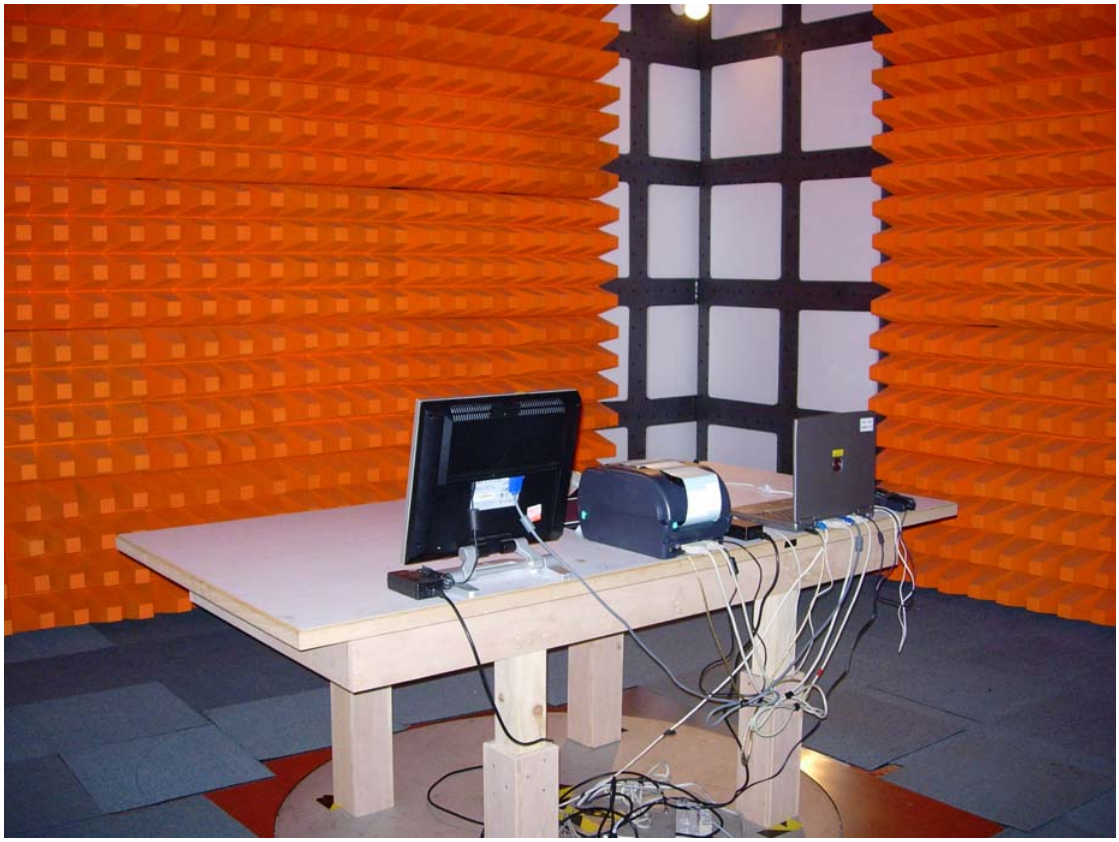
Temperature (℃)	Voltage (V)	Observe Time	Read Frequency (MHz)	Tolerance (%)	Limit	Margin (%)
50	120V	**start**	13.5606	-0.001%	±0.01%	-0.009%
		2mins	13.5606	-0.001%		-0.009%
		5mins	13.5606	-0.001%		-0.009%
		10mins	13.5606	-0.001%		-0.009%
20	102V	**start**	13.5608	0%	±0.01%	0%
		2mins	13.5608	0%		0%
		5mins	13.5608	0%		0%
		10mins	13.5608	0%		0%
20	138V	**start**	13.5608	0%	±0.01%	0%
		2mins	13.5608	0%		0%
		5mins	13.5608	0%		0%
		10mins	13.5608	0%		0%

6. PHOTOGRAPHS FOR TEST

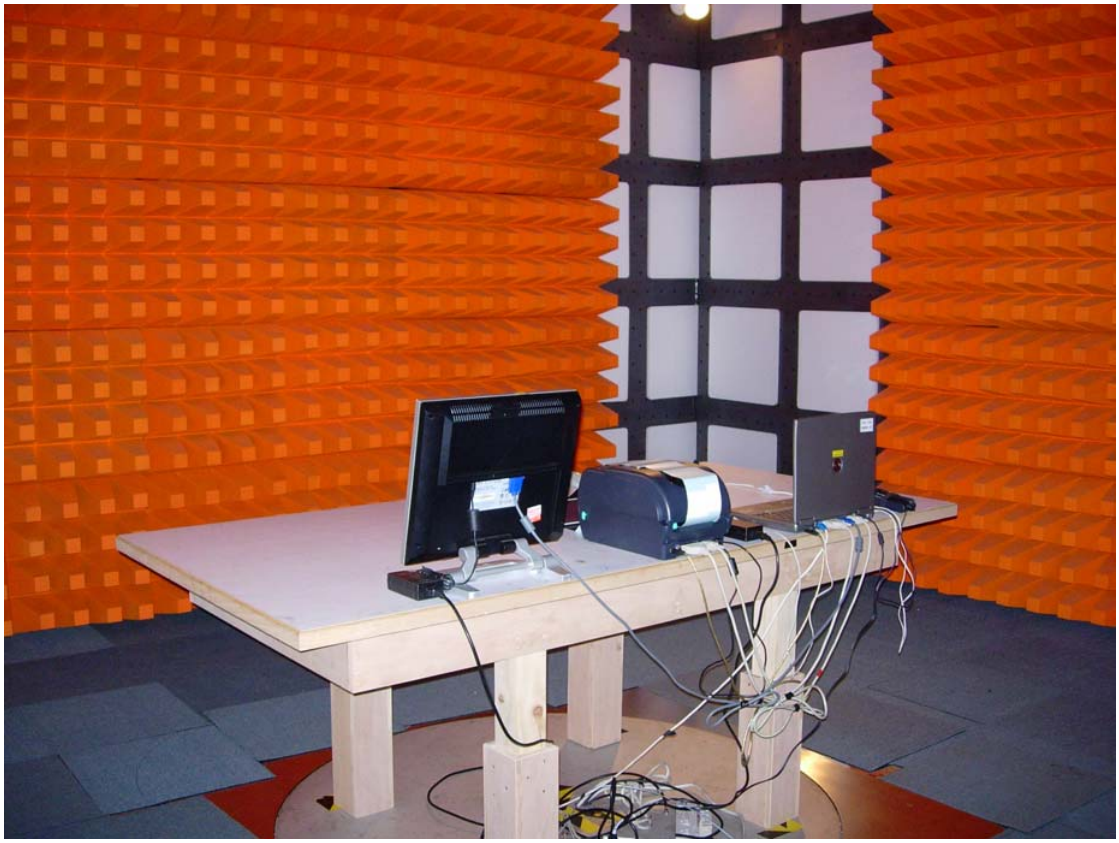
6.1 TEST PHOTOGRAPHS FOR CONDUCTION

6.2 TEST PHOTOGRAPHS FOR RADIATION

Below 30MHz



30-1000MHz



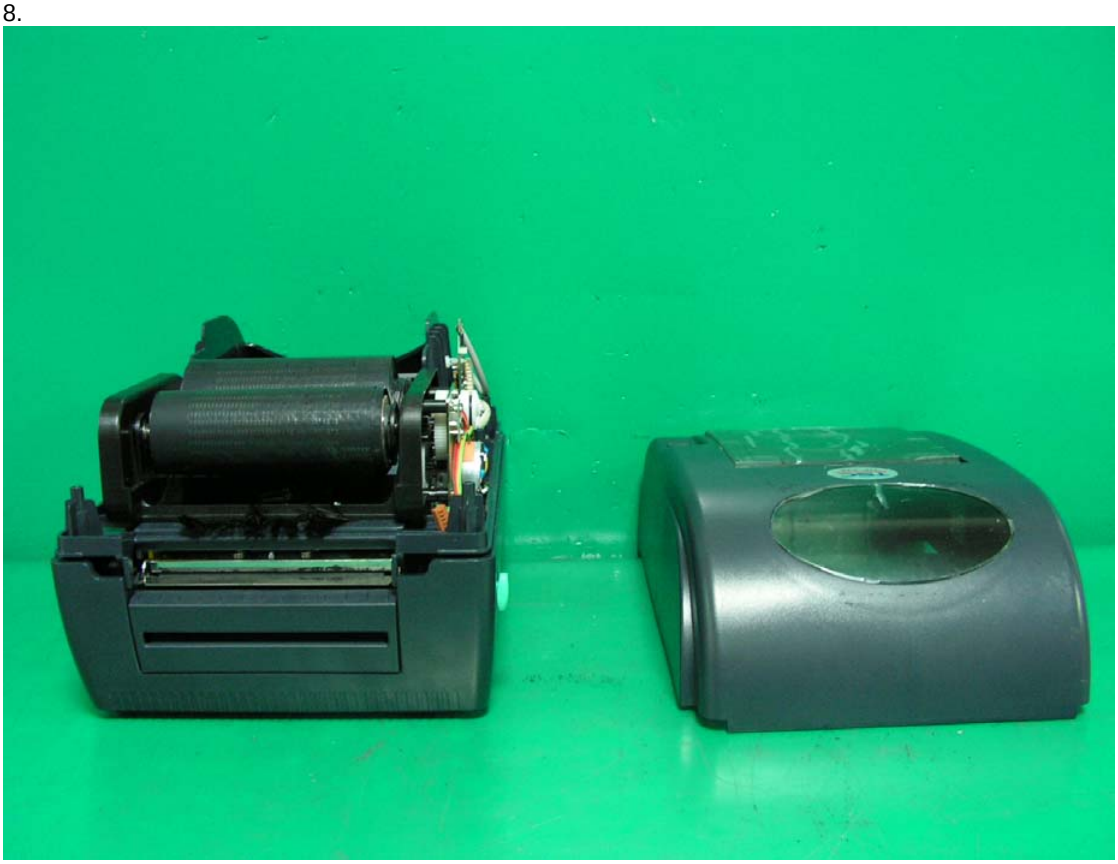
7. PHOTOGRAPHS FOR PRODUCT

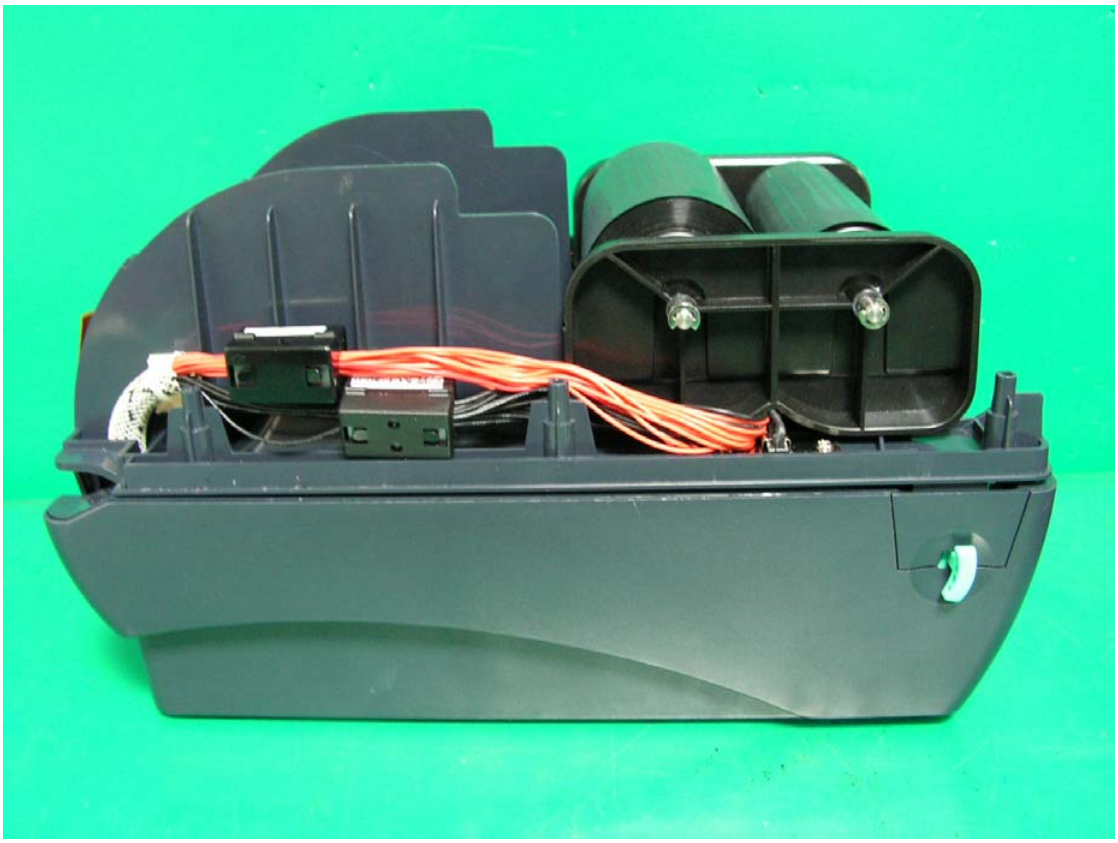
1.
2.

3.
4.

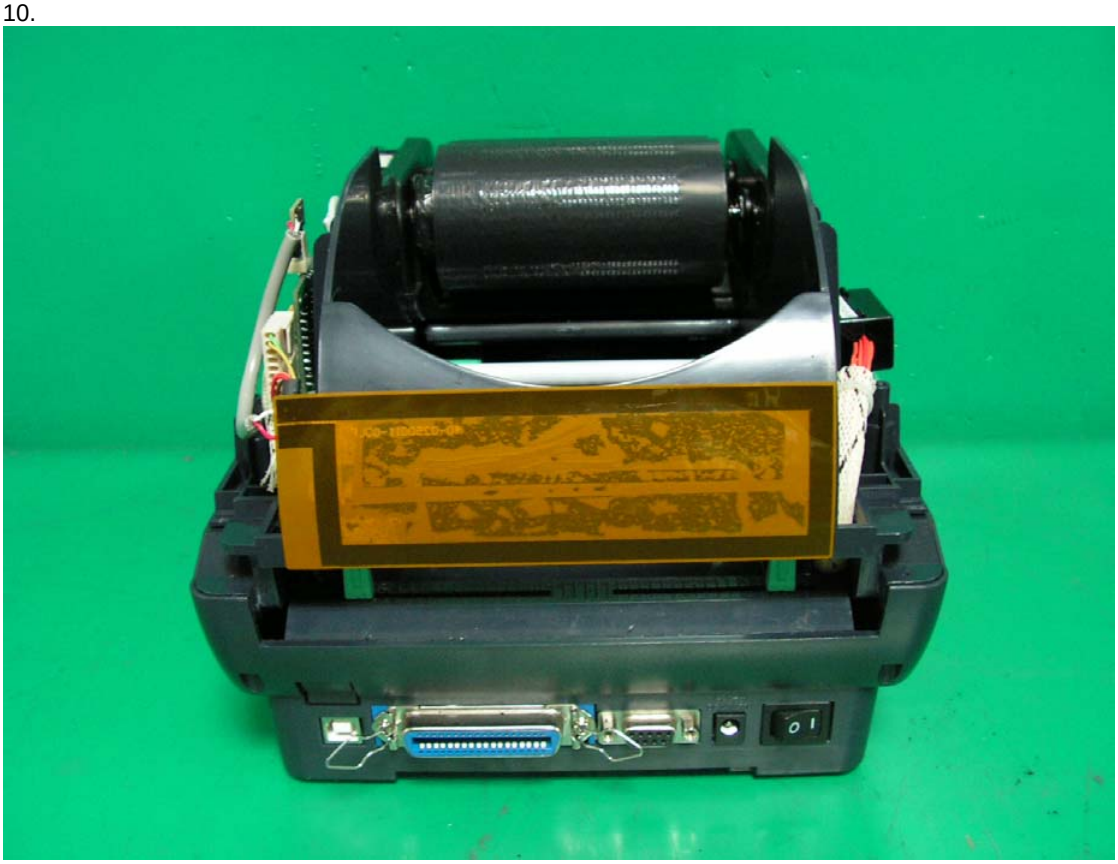
5.
6.

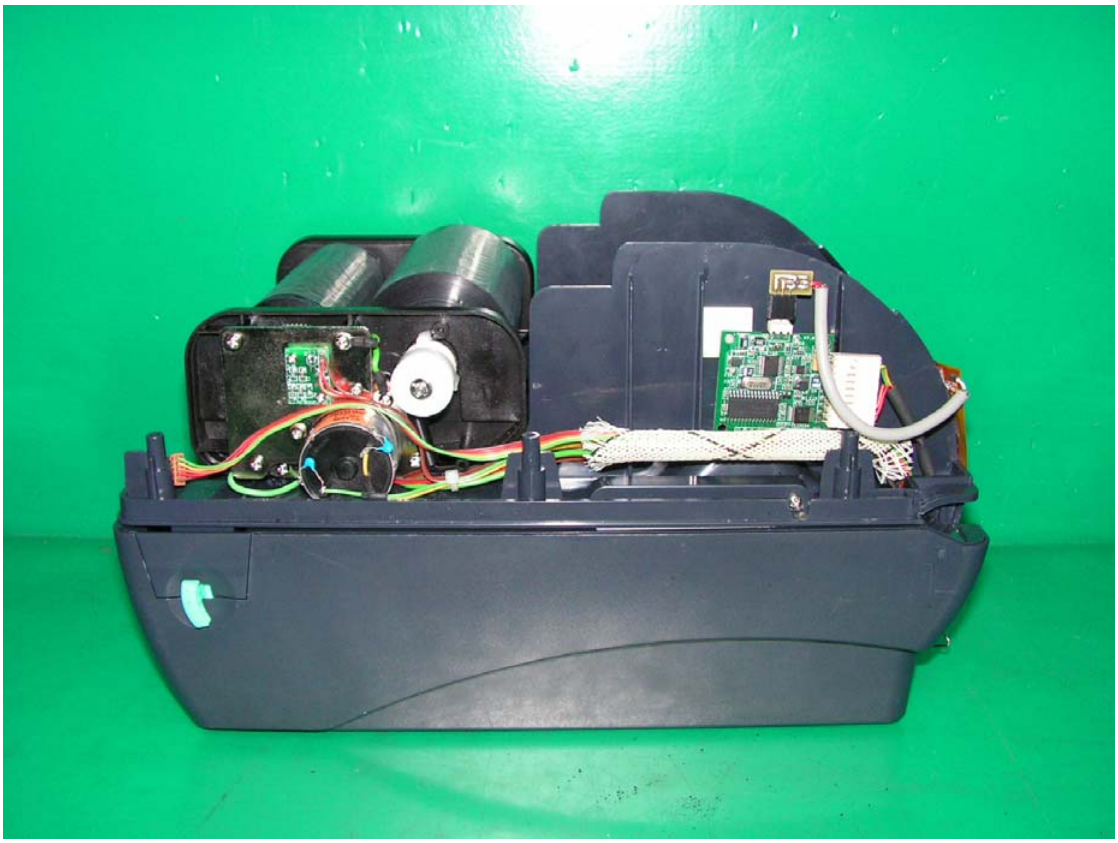
7.
8.



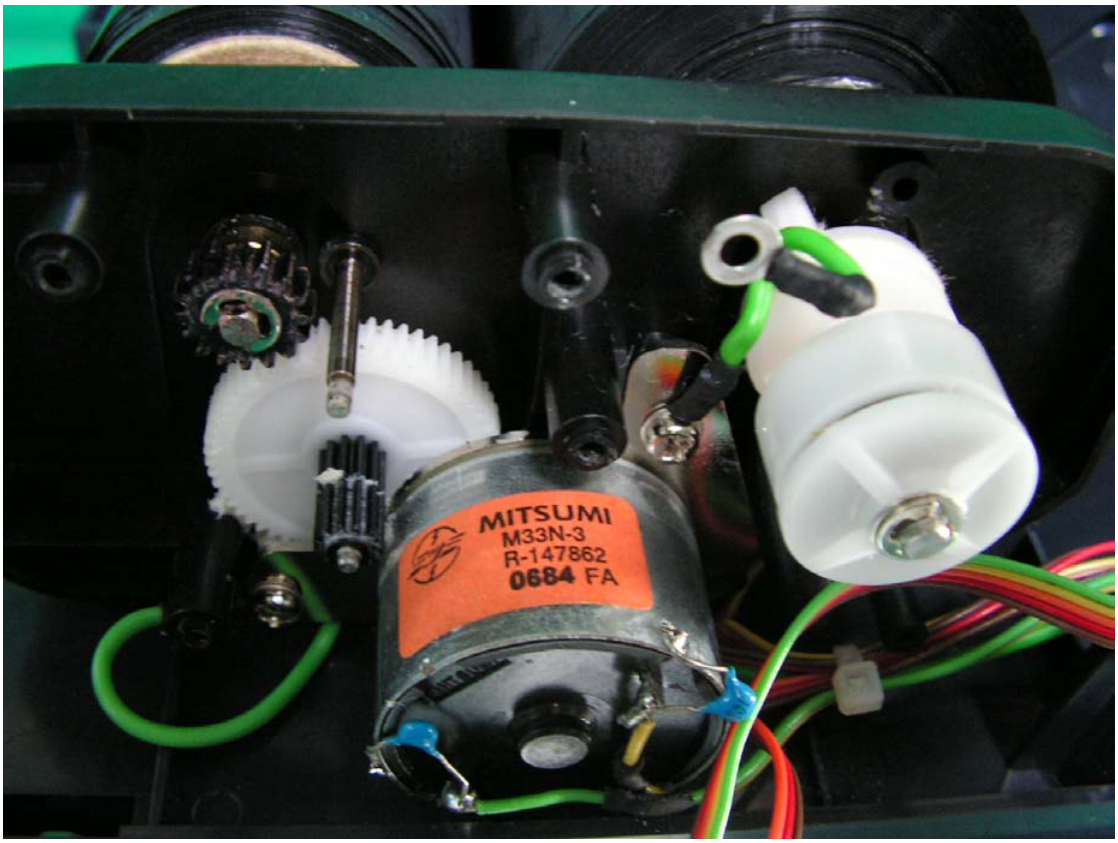


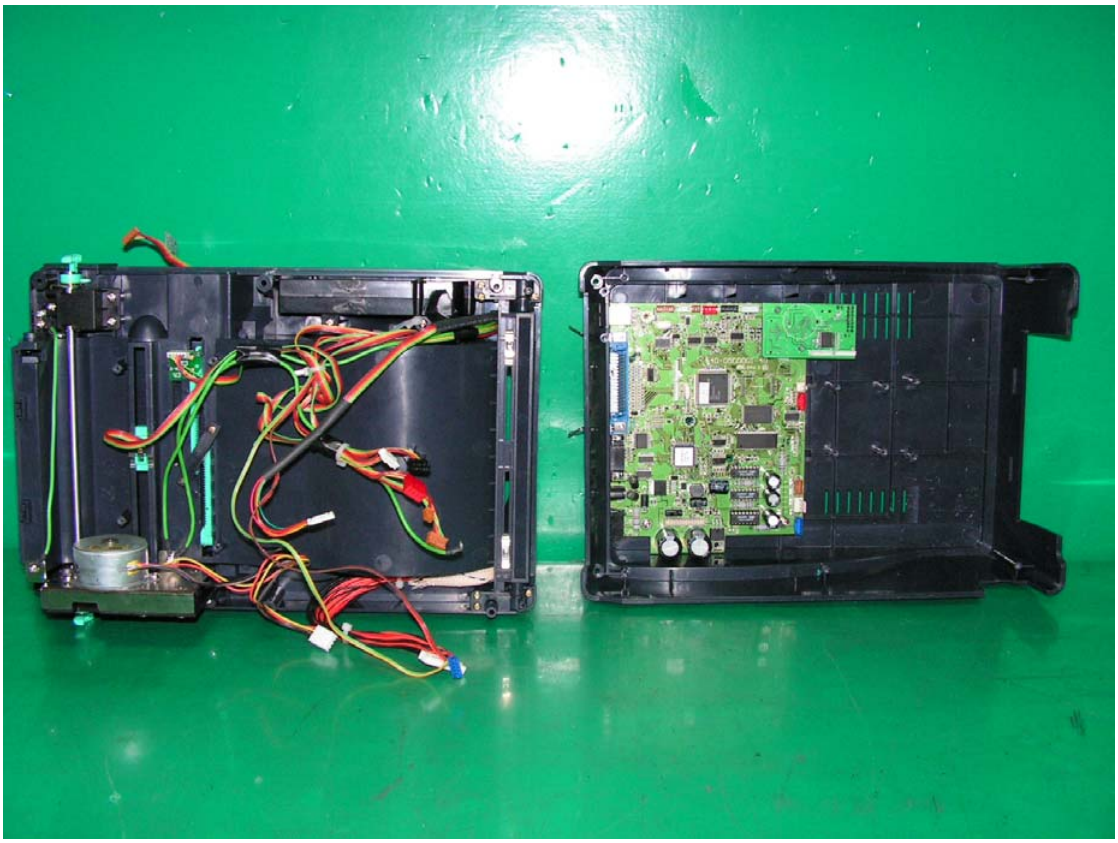
9.
10.



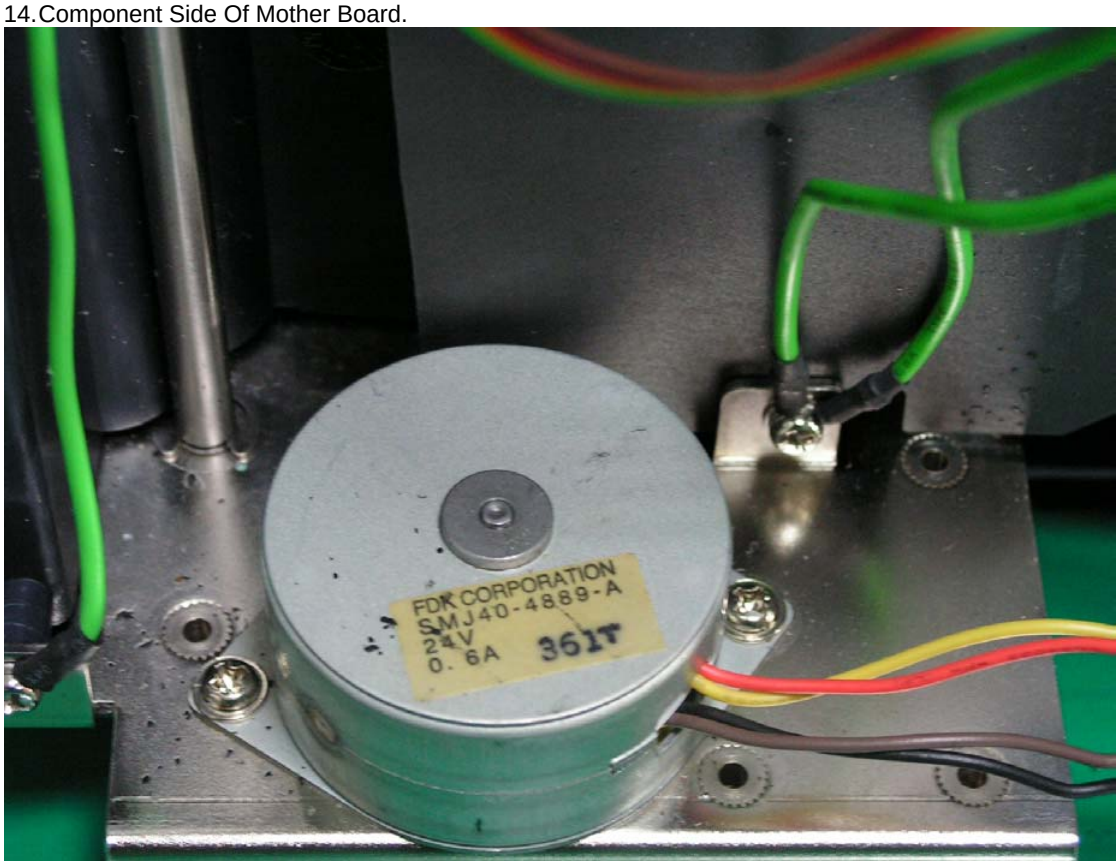


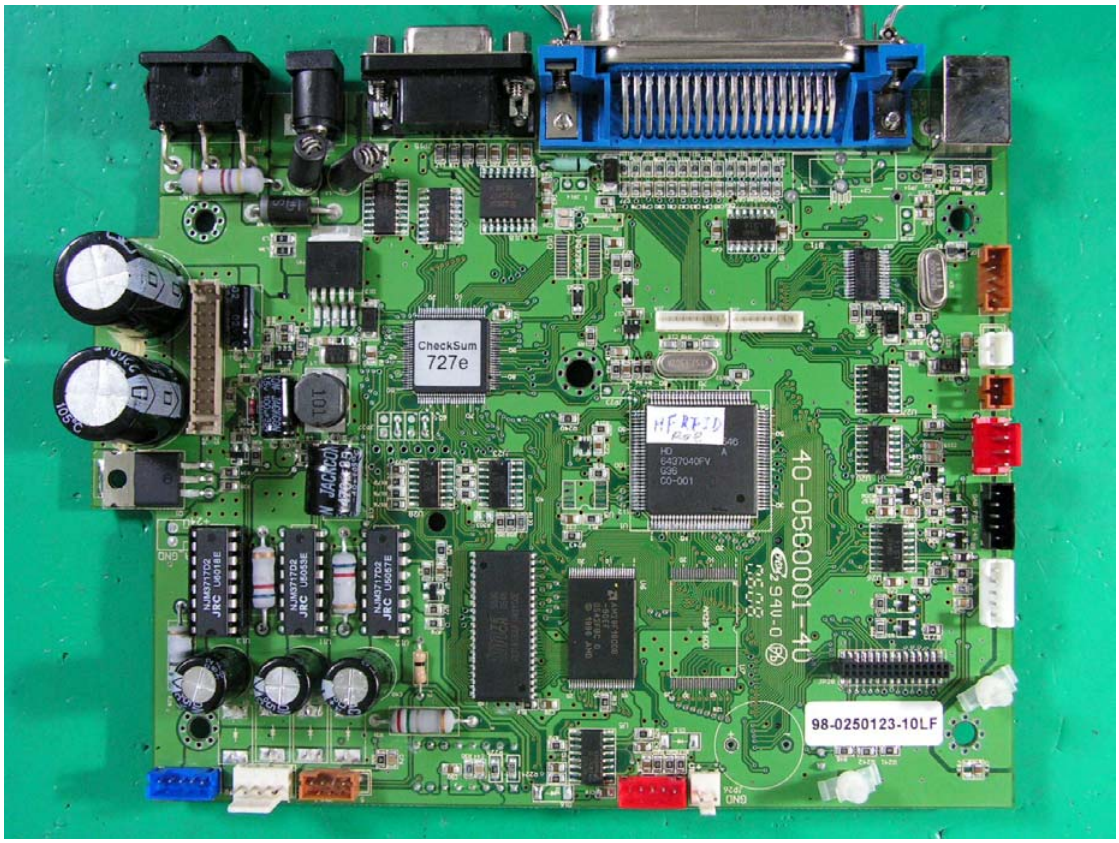
11.
12.



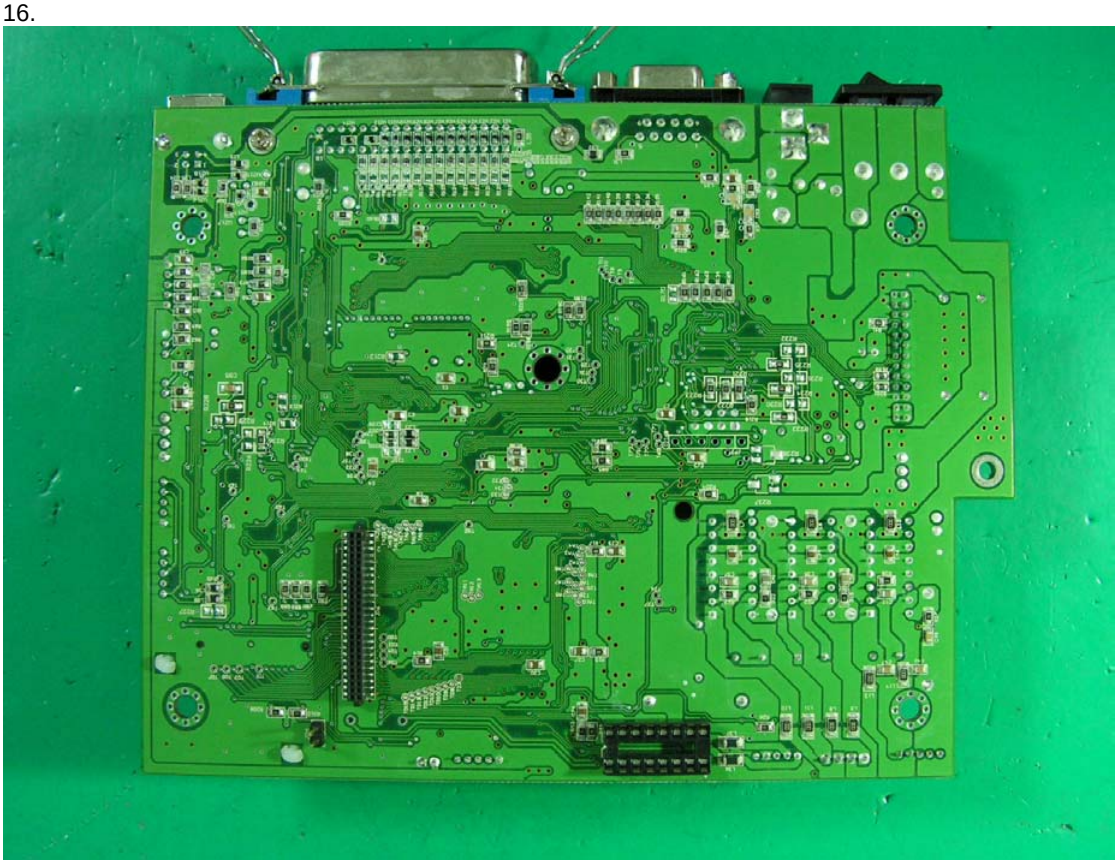


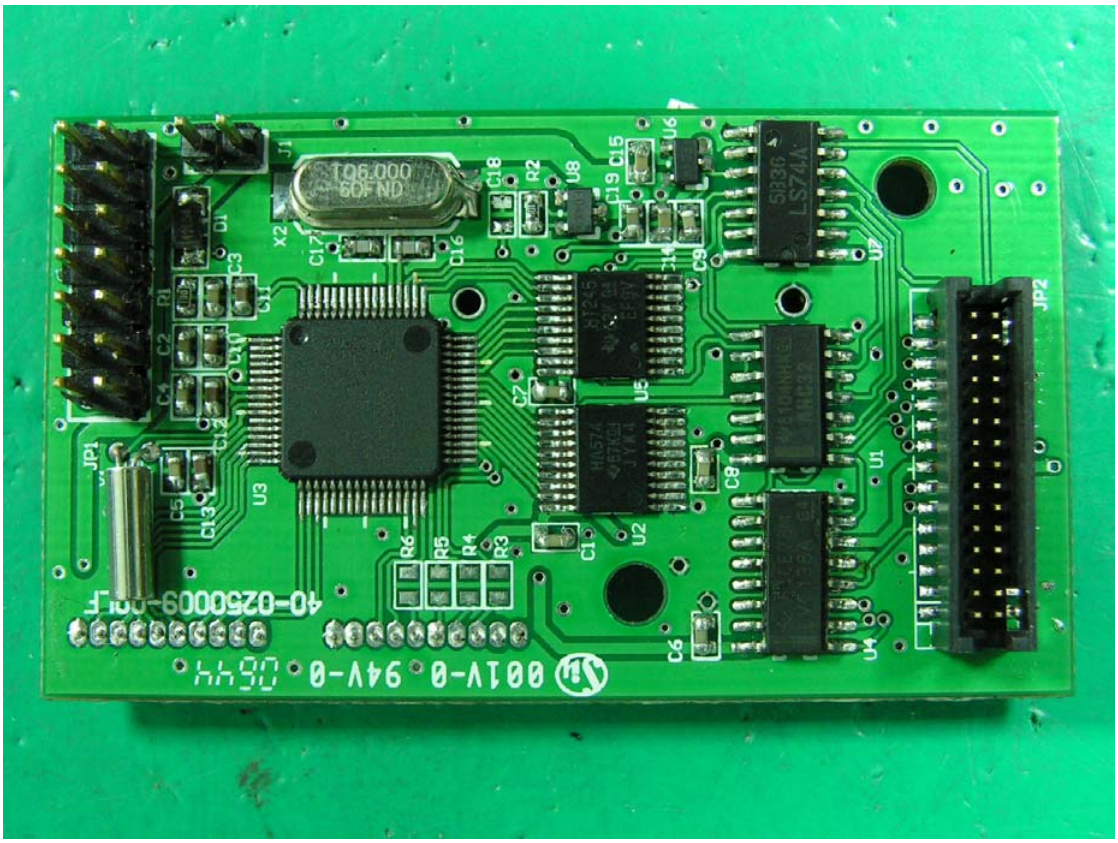
13.
14.Component Side Of Mother Board.



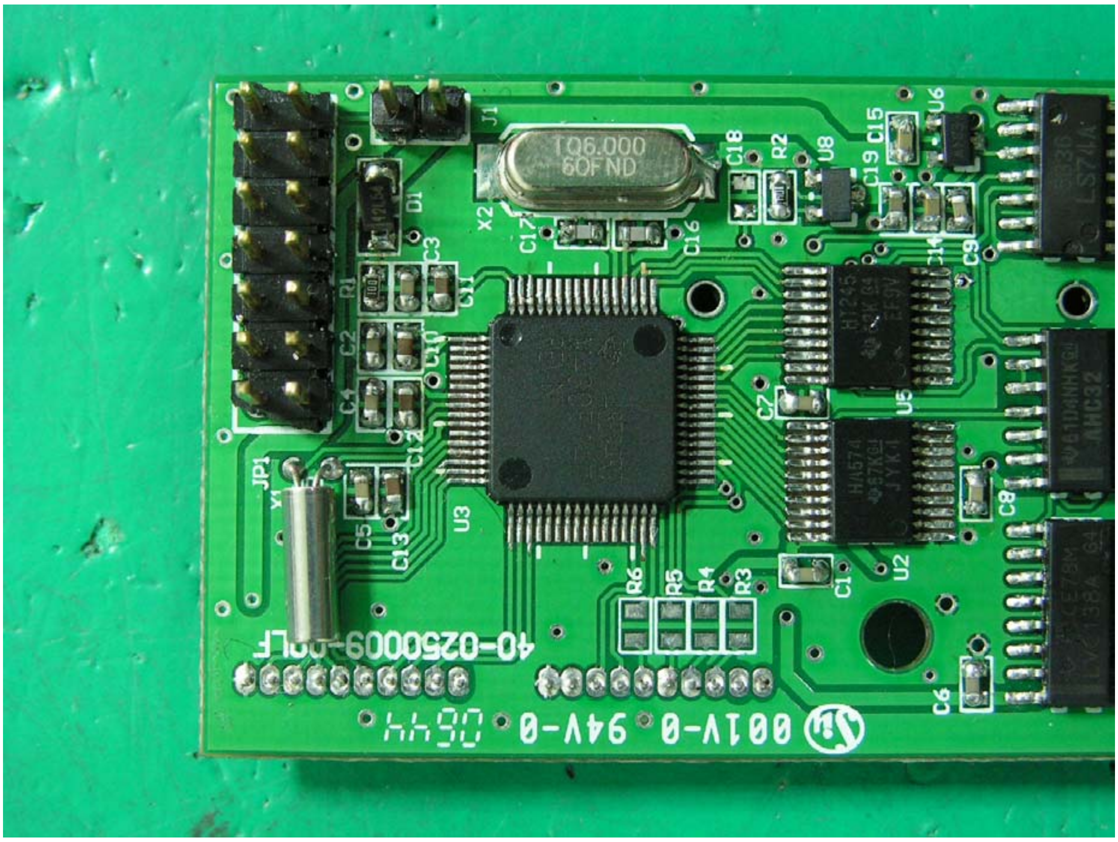


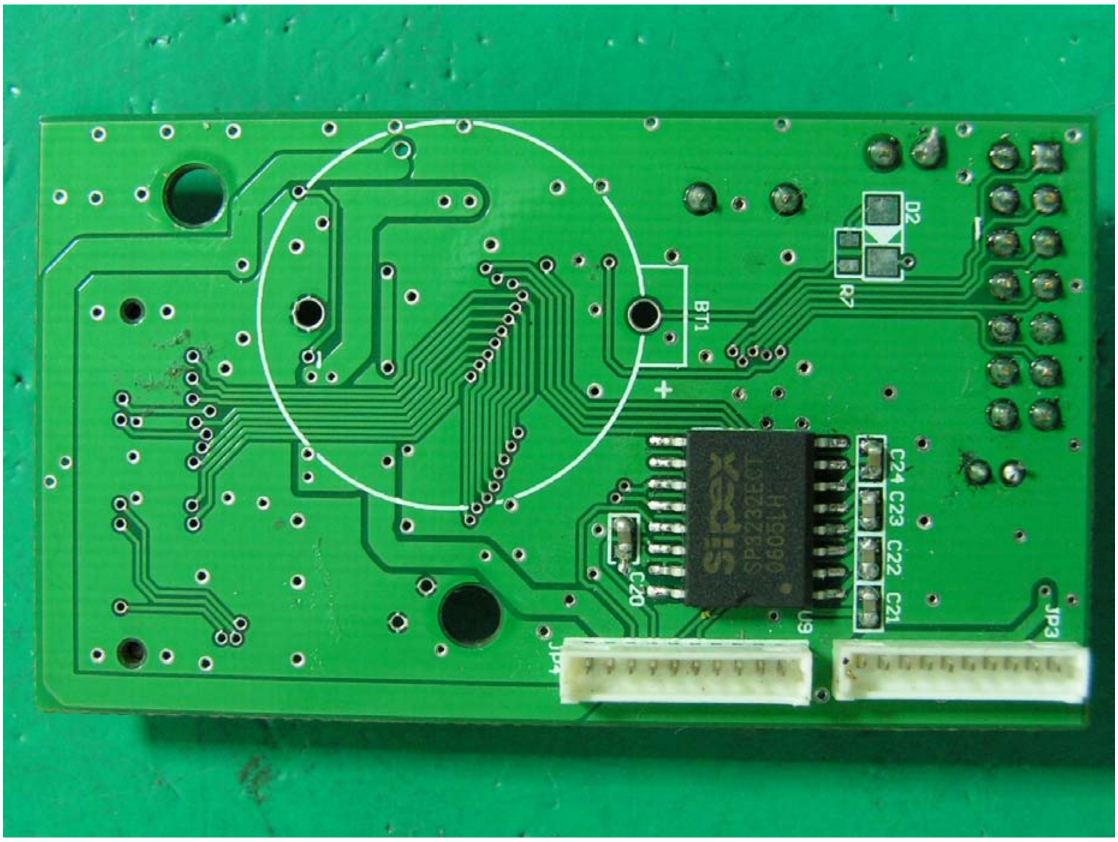
15. Solder Side Of Mother Board.
16.



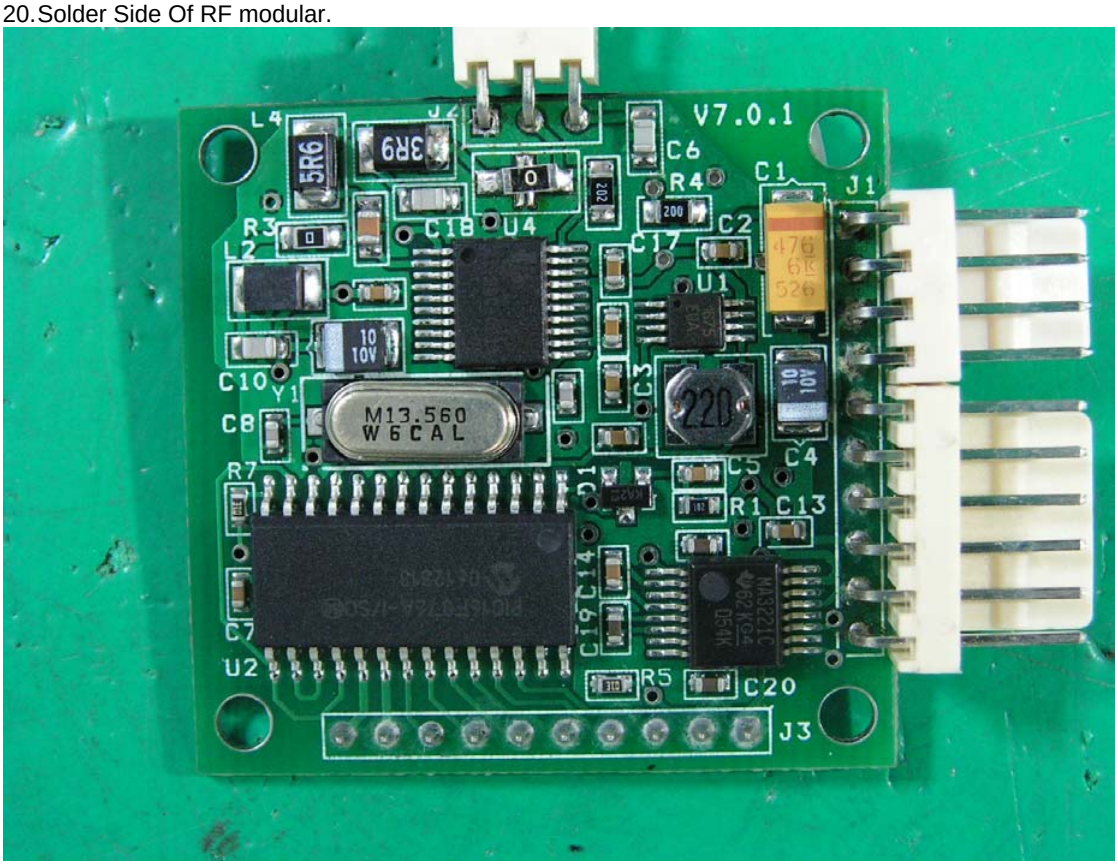


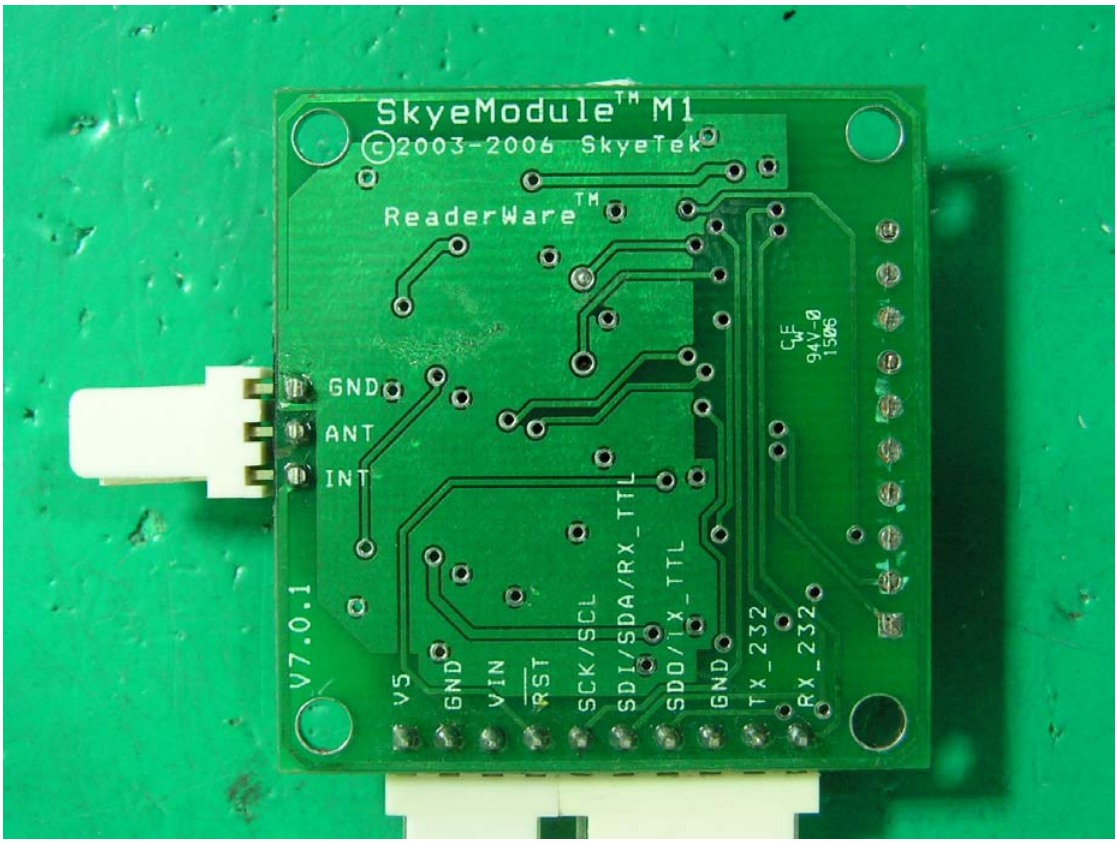
17.
18.



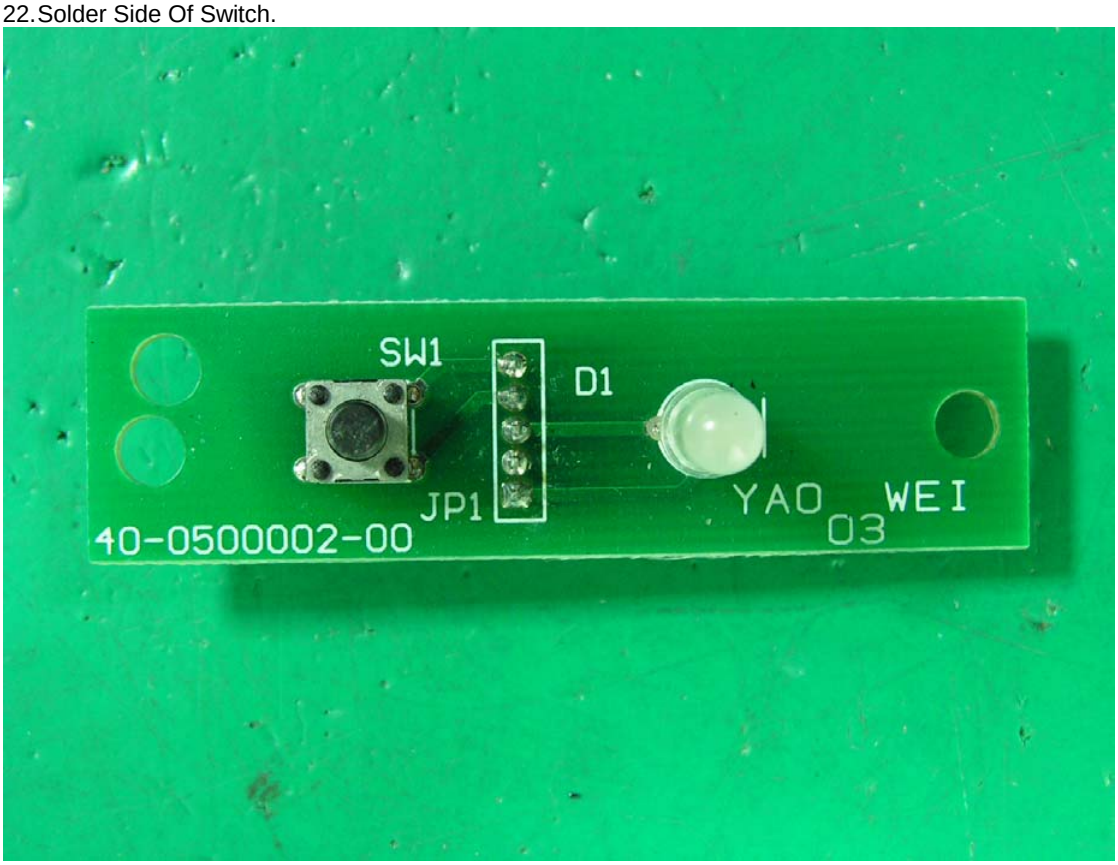


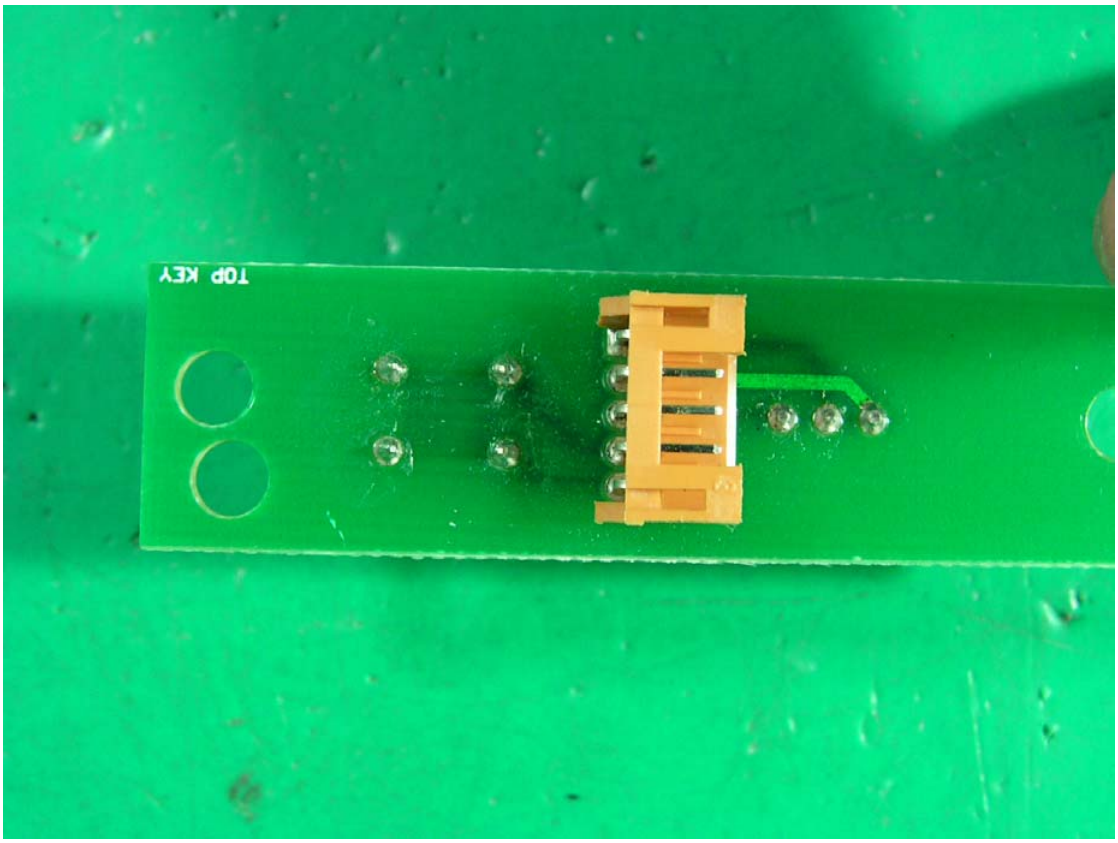
19. Component Side Of RF modular.
20. Solder Side Of RF modular.





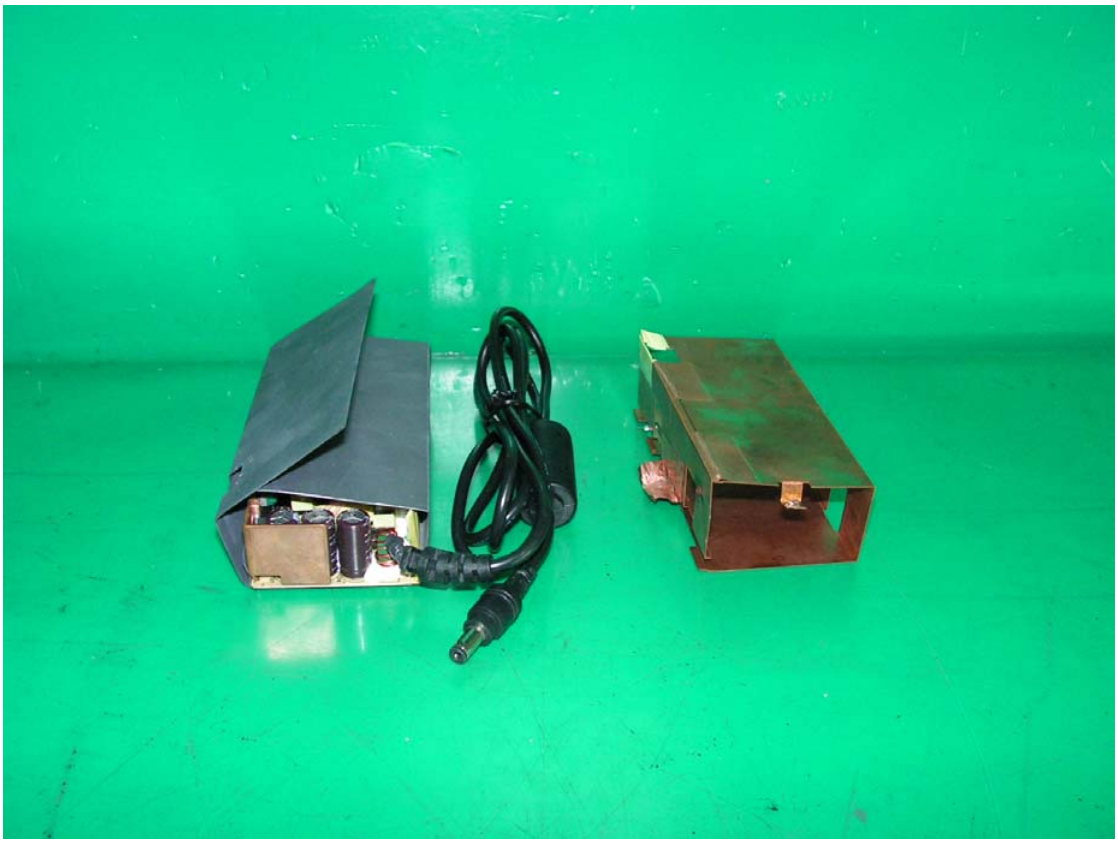
21. Component Side Of Switch.
22. Solder Side Of Switch.



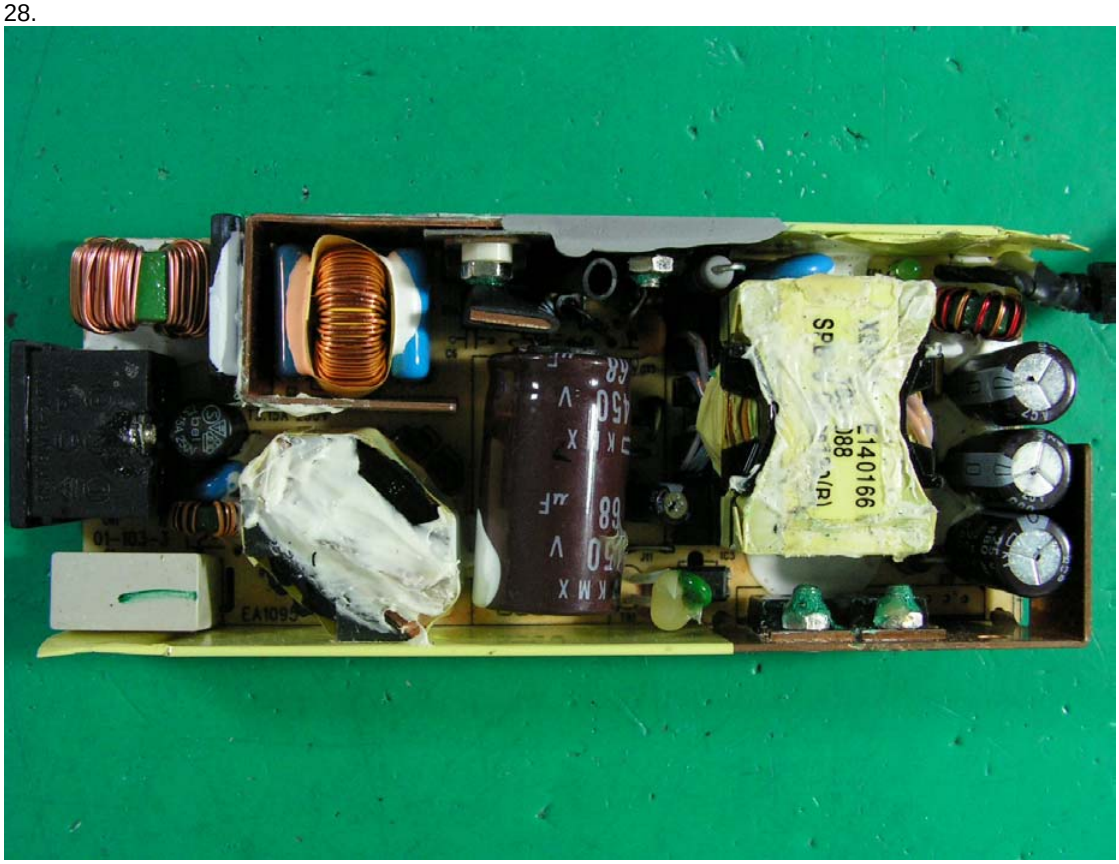


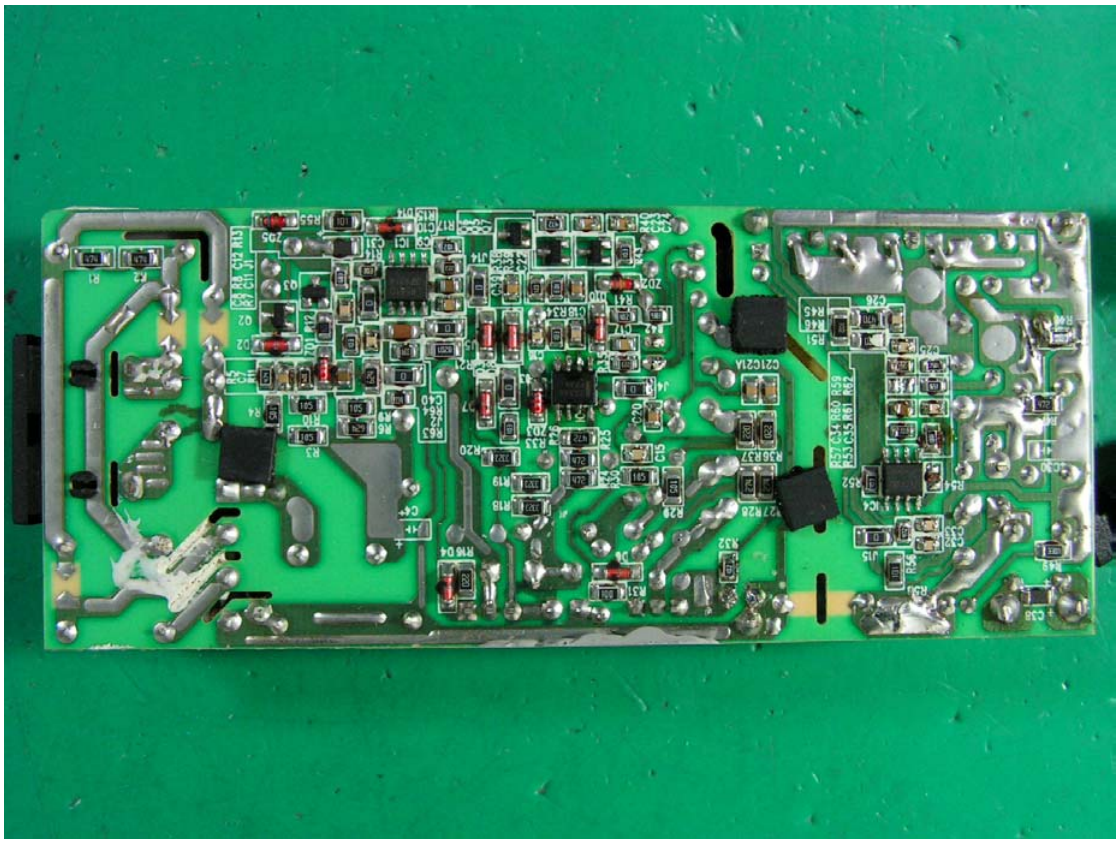
23. Front View Of Adaptor.
24. Back View Of Adaptor.

25.
26.



27.
28.





29. Label Here.

8. EMI REDUCTION METHOD DURING COMPLIANCE TESTING

No modification was made during testing.

Appendix A

Circuit (Block) Diagram

(Shall be added by Applicant)

Appendix B

User Manual

(Shall be added by Applicant)