JQA File No.: 441-120133
Issued Date: September 18, 2012

TEST REPORT

APPLICANT	:	OLYMPUS MEDICAL SYSTEMS CORPORATION
ADDRESS	:	2951 Ishikawa-machi, Hachioji-shi, Tokyo 192-8507, Japan
PRODUCTS	:	Automated Endoscope Leak Tester
MODEL No.	:	ALT-Y0003
SERIAL No.	:	7100012
FCC ID	:	S8Q-RU8354
TEST STANDARD	:	CFR 47 FCC Rules and Regulations Part 15 Subpart A and C
TESTING LOCATION	:	Japan Quality Assurance Organization Safety & EMC Center Testing Dept., Testing Div. 1-21-25, Kinuta, Setagaya-ku, Tokyo 157-8573, Japan Japan Quality Assurance Organization Safety & EMC Center Testing Dept., TSURU EMC Branch 2096, Ohata, Tsuru-shi, Yamanashi-ken 402-0045, Japan
TEST RESULTS	:	**Passed**
DATE OF TEST	:	August 17, 2012 – September 10, 2012

ilac-MRA VLAC Lab Accreditation VLAC-001-4

Kazuhisa Abe
Manager
Japan Quality Assurance Organization
Safety & EMC Center
Testing Dept., TSURU EMC Branch
2096, Ohata, Tsuru-shi, Yamanashi-ken 402-0045, Japan

- The measurement values stated in Test Report was made with traceable to National Institute of Advanced Industrial Science and Technology (AIST) of Japan and National Institute of Information and Communications Technology (NICT) of Japan.
- The applicable standard, testing condition and testing method which were used for the tests are based on the request of the applicant.
- The test results presented in this report relate only to the offered test sample.
- The contents of this test report cannot be used for the purposes, such as advertisement for consumers.
- This test report shall not be reproduced except in full without the written approval of JQA.
- VLAC does not approve, certify or warrant the product by this test report.

Table of Contents

Definitions for Abbreviation and Symbols Used In This Test Report

"EUT" means Equipment Under the Test.
"AE" means Associated Equipment.
"N/A" means that Not Applicable.
"N/T" means that Not Tested.

☒-indicates that the listed condition, standard or equipment is applicable for this report.
☐-indicates that the listed condition, standard or equipment is not applicable for this report.

Documentation

1 Test Regulation

Applied Standard : CFR 47 FCC Rules and Regulations Part 15 Subpart A and C

Test procedure : ANSI C63.4-2003

2 Test Location

2.1 Test Location 1

Japan Quality Assurance Organization
Safety & EMC Center
Testing Dept., Testing Div.
1-21-25, Kinuta, Setagaya-ku, Tokyo 157-8573, Japan

2.2 Test Location 2

Japan Quality Assurance Organization
Safety & EMC Center
Testing Dept., TSURU EMC Branch
2096, Ohata, Tsuru-shi, Yamanashi-ken 402-0045, JAPAN

3 Recognition of Test Laboratory

3.1 Test Laboratory 1

Japan Quality Assurance Organization
Safety & EMC Center
Testing Dept., Testing Div.
is accredited under ISO/IEC 17025 by following accreditation bodies and the test facility of Testing Division is registered by the following bodies .

VLAC Code : VLAC-001-1 (Effective through : March 30, 2014)
VCCI Registration Number : A0001 (Effective through : March 30, 2014)
FCC Registration Number : 349652 (Date of Listing : March 30, 2014)
IC Registration Number : 2079A-1, 2079A-2 (Effective through : October 20, 2012)
Accredited as conformity assessment body for Japan electrical appliances and material law by METI. (Effective through : February 22, 2013)

3.2 Test Laboratory 2

Japan Quality Assurance Organization, Safety & EMC Center Testing Dept.,
TSURU EMC Branch is recognized under ISO/IEC 17025 by following accreditation bodies and the test facility of Testing Division is accredited by the following bodies.

VLAC Code: VLAC-001-4 (Effective through: March 30, 2014)
BSMI Recognition Number:
SL2-IN-E-6004, SL2-IS-E-6004, SL2-A1-E-6004 (Effective through: September 14, 2013)

VCCI Registration Number: A-0004(Effective through: March 30, 2014)
FCC Registration Number: 444763 (Effective through: March 30, 2014)
IC Registration Number: 2079D-1, 2079D-2, 2079D-3 (Effective through: December 16, 2012)

Accredited as conformity assessment body for Japan electrical appliances and material law by METI.
(Effective through: February 22, 2013)

4 Description of the Equipment Under Test

1	Manufacturer	:	OLYMPUS MEDICAL SYSTEMS CORPORATION 2951 Ishikawa-machi, Hachioji-shi, Tokyo 192-8507, Japan
2	Products	:	Automated Endoscope Leak Tester
3	Model No.	:	ALT-Y0003
4	Serial No.	:	7100012
5	Product Type	:	Mass-Production
6	Date of Manufacture	:	July 11, 2012
7	Power Rating	:	5.0VDC * The EUT was operated with the Automated Endoscope Leak Tester. (Input: 120VAC 60Hz, Output: 5.0VDC)
8	EUT Grounding	:	Grounded at the plug end of the power line cord.
9	Received Date of EUT	:	August 7, 2012
10	EUT Authorization	:	Certification
11	EUT Highest Frequency Used/Generated	:	13.56MHz(Section 15.225) Operation within the band 13.110 - 14.010 MHz
12	Modulation	:	Amplitude-Shift Keying (ASK)
13	Antenna type	:	Fixed using (Integral PCB Antenna)
14	Temperature Range	:	10 - 40 degree

5 Test Condition

5.1 AC Powerline Conducted Emission

The requirements are ☒-Applicable [☒-Tested ☐-Not tested by applicant request.]
☐-Not Applicable

Test site & instruments :

Type	Number of test site & instruments (Refer to Appendix A)
Test Site	☐ OS-1 ☐ AC-1 ☒ SR-A ☐ SR-B ☐ SR-C
Test Receiver	☐ R-3 ☐ R-4 ☒ R-5 ☐ R-6 ☐ S-3 ☐ S-5
Cable	☐ CB-3 ☒ CB-4 ☐ CB-5
Network (for EUT)	☐ L-1 ☒ L-2 ☐ L-3 ☐ L-4 ☐ L-5 ☐ L-6 ☐ L-7 ☐ L-9 ☐ L-12 ☐ L-13
Network (for AE)	☒ L-1 ☐ L-2 ☐ L-3 ☐ L-4 ☐ L-5 ☐ L-6 ☐ L-7 ☐ L-9 ☐ L-13
Pulse Limiter	☐ PL-3 ☒ PL-4 ☐ PL-5
Termination	☒ TM-1 ☐ TM-2

5.2 Radiated Emission

5.2.1 Radiated Emission 0.009 MHz - 30 MHz

The requirements are ☒-Applicable [☒-Tested ☐-Not tested by applicant request.]
☐-Not Applicable

Test site & instruments :

Type	Number of test site & instruments (Refer to Appendix A)
Test Site	☐ OS-1 ☒ AC-1
Test Receiver	☐ R-3 ☒ R-4 ☐ R-5 ☐ R-6
Cable	☐ CN-0
Antenna	☒ AL-0

5.2.2 Radiated Emission 30 MHz - 1000 MHz

The requirements are ☒-Applicable [☒-Tested ☐-Not tested by applicant request.]
☐-Not Applicable

Test site & instruments :

Type	Number of test site & instruments (Refer to Appendix A)
Test Site	☐ OS-1 ☒ AC-1
Test Receiver	☐ R-1 ☒ R-6 ☐ R-3 ☐ R-5
Cable	☐ CN-1 ☒ CN-3 ☐ CN-2
Antenna	☐ AB-1 ☒ AB-3 ☐ AD-1 ☐ AL-1 ☒ AL-3 ☐ AD-3

5.2.3 Radiated Emission above 1 GHz

The requirements are ☐-Applicable [☐-Tested ☐-Not tested by applicant request.]
☒-Not Applicable

Test site & instruments :

Type	Number of test site & instruments (Refer to Appendix A)
Test Site	☐ AC-1
Test Receiver	☐ R-3 ☐ R-5 ☐ R-6 ☐ S-3 ☐ S-5
Cable	☐ CS-1 ☐ CS-2 ☐ CS-3 ☐ CS-4
Antenna	☐ AL-6 ☐ AH-12
Pre-Amplifier	☐ PA-1 ☐ PA-2 ☐ PA-3 ☐ PA-5

5.3 Frequency Stability

The requirements are ☒-Applicable [☒-Tested ☐-Not tested by applicant request.]
☐-Not Applicable

Test site & instruments :

Type	Number of test site & instruments (Refer to Appendix C)
Test Receiver	☐ R-1 ☐ R-2 ☐ R-3 ☐ R-4 ☐ R-5 ☐ S-3 ☐ S-5 ☒ 13
Cable	☐ CB-3 ☐ CB-4 ☐ CB-5 ☐ CB-3 ☐ CB-4 ☐ CB-5 ☐ CS-1 ☐ CS-2 ☐ CS-3 ☐ CS-4 ☐ CS-5 ☒ 45
Oven	☒ 76
Frequency Counter	☒ 75
Antenna	☐ AB-1 ☐ AB-2 ☐ AB-3 ☐ AD-1 ☐ AD-2 ☐ AD-3 ☐ AL-1 ☐ AL-2 ☐ AL-3 ☐ AL-4 ☐ AL-5 ☐ AD-4 ☐ AL-0
Multimeter	☒ 165

5.4 Occupied Bandwidth

The requirements are ☒-Applicable [☒-Tested ☐-Not tested by applicant request.]
☐-Not Applicable

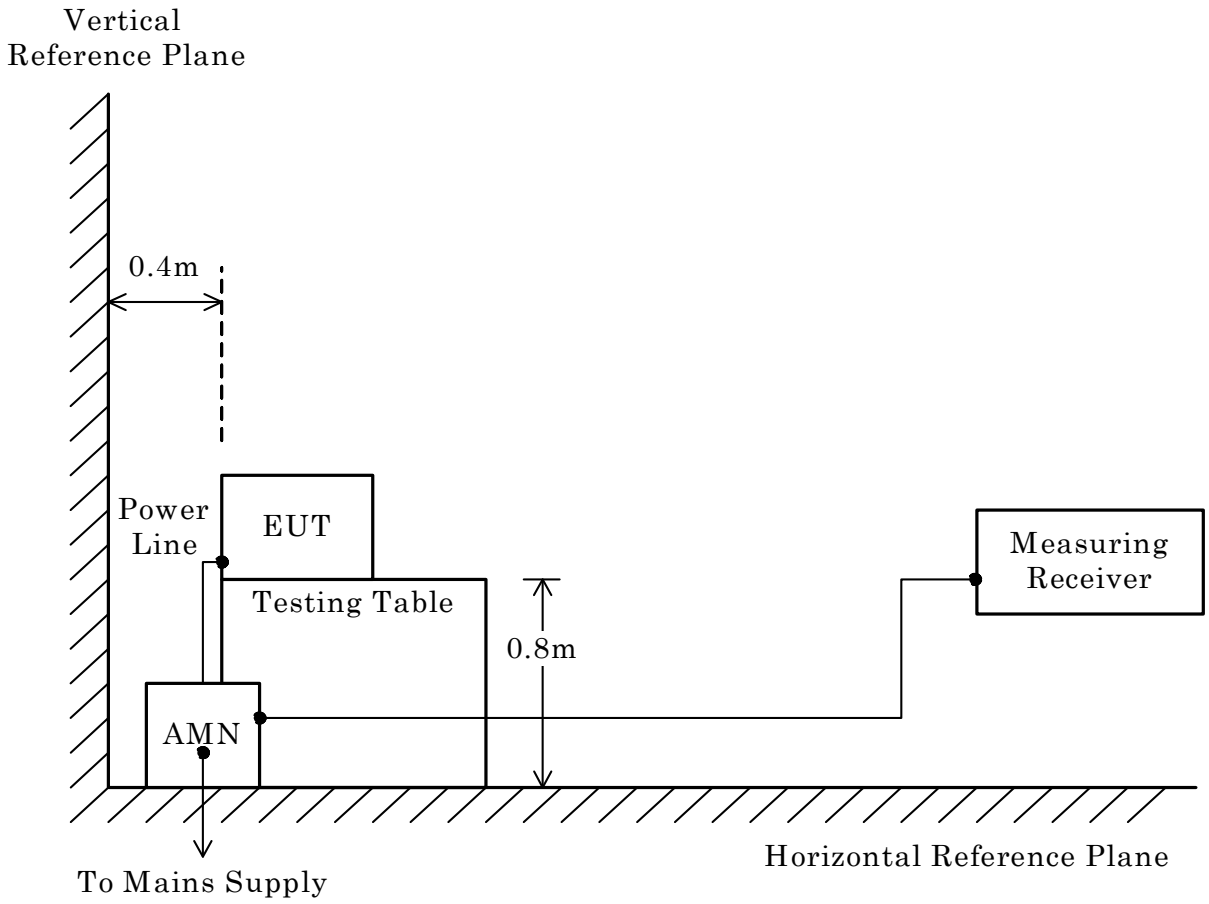
Test site & instruments :

Type	Number of test site & instruments (Refer to Appendix C)
Oven	☒ 76
Test Receiver	☐ R-1 ☐ R-2 ☐ R-3 ☐ R-4 ☐ R-5 ☐ S-3 ☐ S-5 ☒ 13
Cable	☐ CB-3 ☐ CB-4 ☐ CB-5 ☐ CB-3 ☐ CB-4 ☐ CB-5 ☐ CS-1 ☐ CS-2 ☐ CB-3 ☐ CB-4 ☐ CB-5 ☒ 45
Pre-Amplifier	☐ PA-1 ☐ PA-2 ☐ PA-3
Antenna	☐ AB-1 ☐ AB-2 ☐ AB-3 ☐ AD-1 ☐ AD-2 ☐ AD-3 ☐ AL-1 ☐ AL-2 ☐ AL-3 ☐ AL-4 ☐ AL-5 ☐ AD-4 ☐ AL-0

6 Preliminary Test and Test Setup
6.1 AC Powerline Conducted Emission

The preliminary conducted disturbance at the mains ports measurements were carried out.
The preliminary conducted disturbance at the mains ports were performed using the spectrum analyzer to observe the emissions characteristics of the EUT.
The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions. This configurations was used for final conducted disturbance at the mains ports measurements.
(referred documentation is No.G34364I in JQA Tsuru)

- Side View -

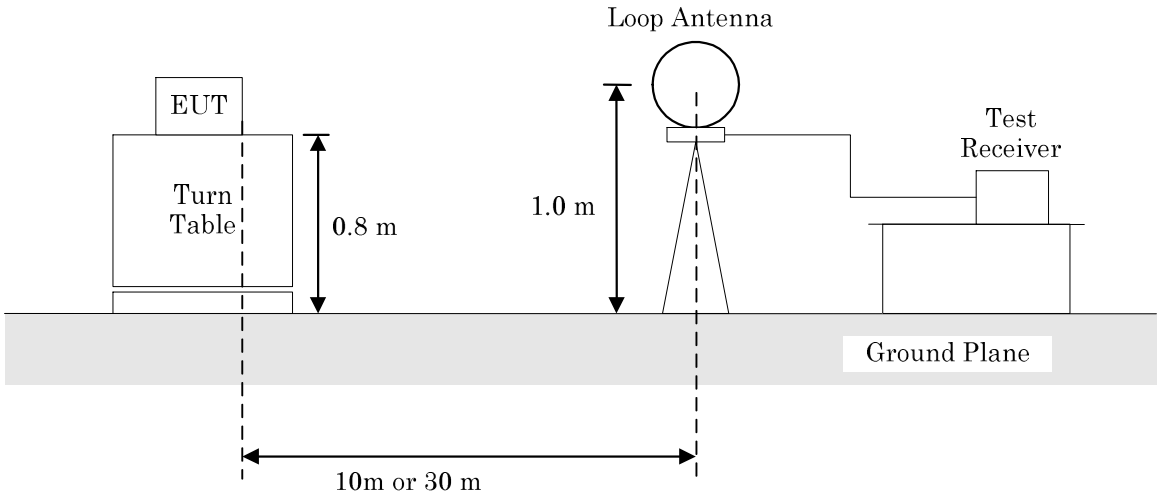


* AMN : Artificial Mains Network

6.2 Radiated Emission

6.2.1 Radiated Emission 0.009 MHz - 30 MHz

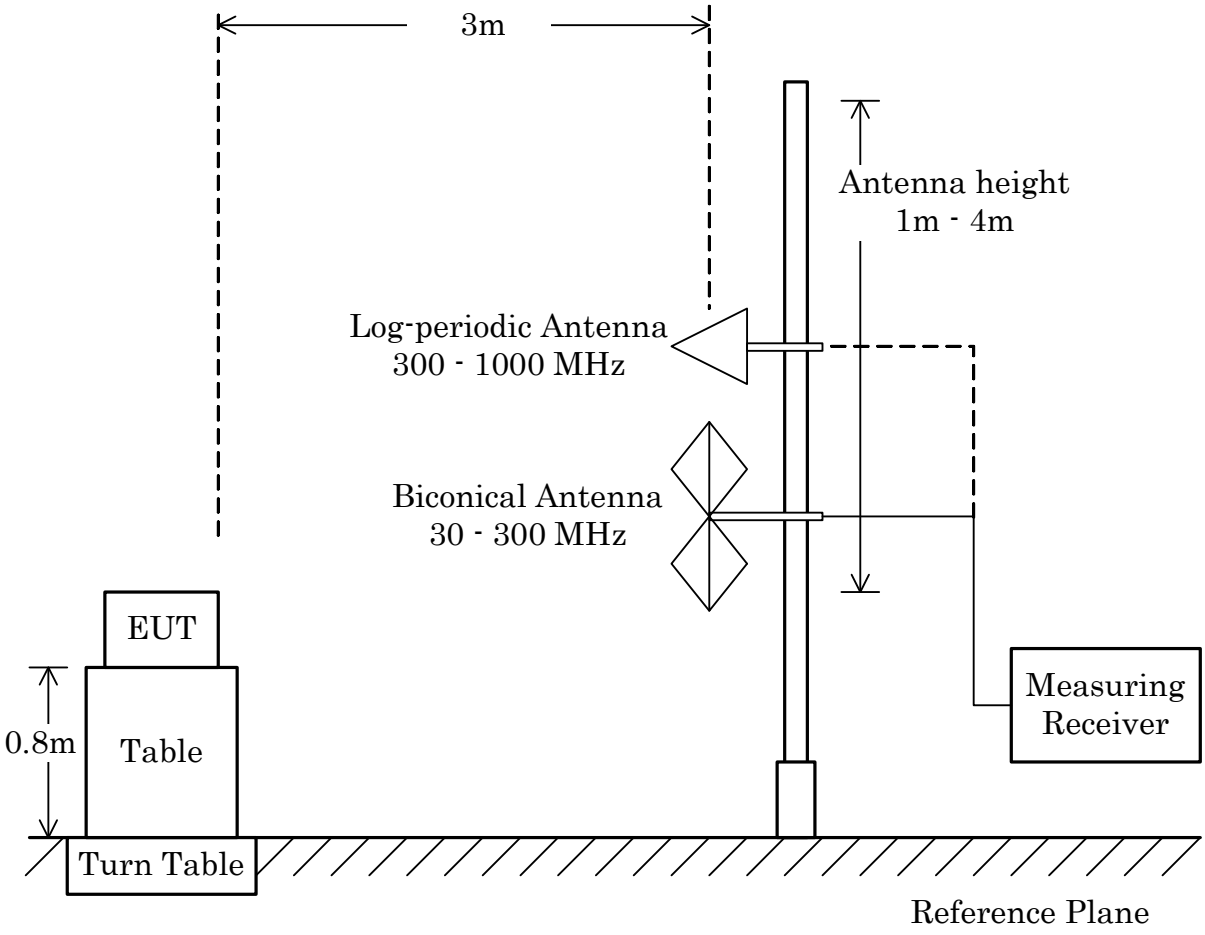
The preliminary radiated disturbance measurements were carried out.
The preliminary radiated disturbance measurements were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.
The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions.
This configurations was used for the final radiated disturbance measurements.
(referred documentation is No.G34364I in JQA Tsuru)



6.2.2 Radiated Emission 30 MHz - 1000 MHz

The preliminary radiated disturbance measurements were carried out.
The preliminary radiated disturbance measurements were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.
The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions.
This configurations was used for the final radiated disturbance measurements.
(referred documentation is No.G34364I in JQA Tsuru)

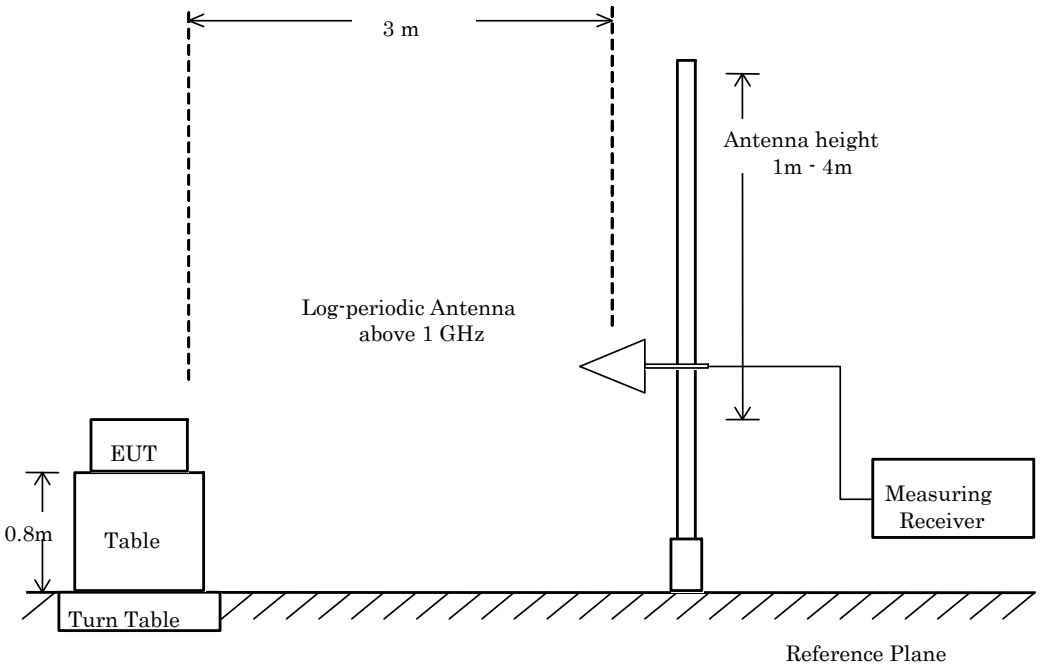
- Side View -



6.2.3 Radiated Emission above 1 GHz

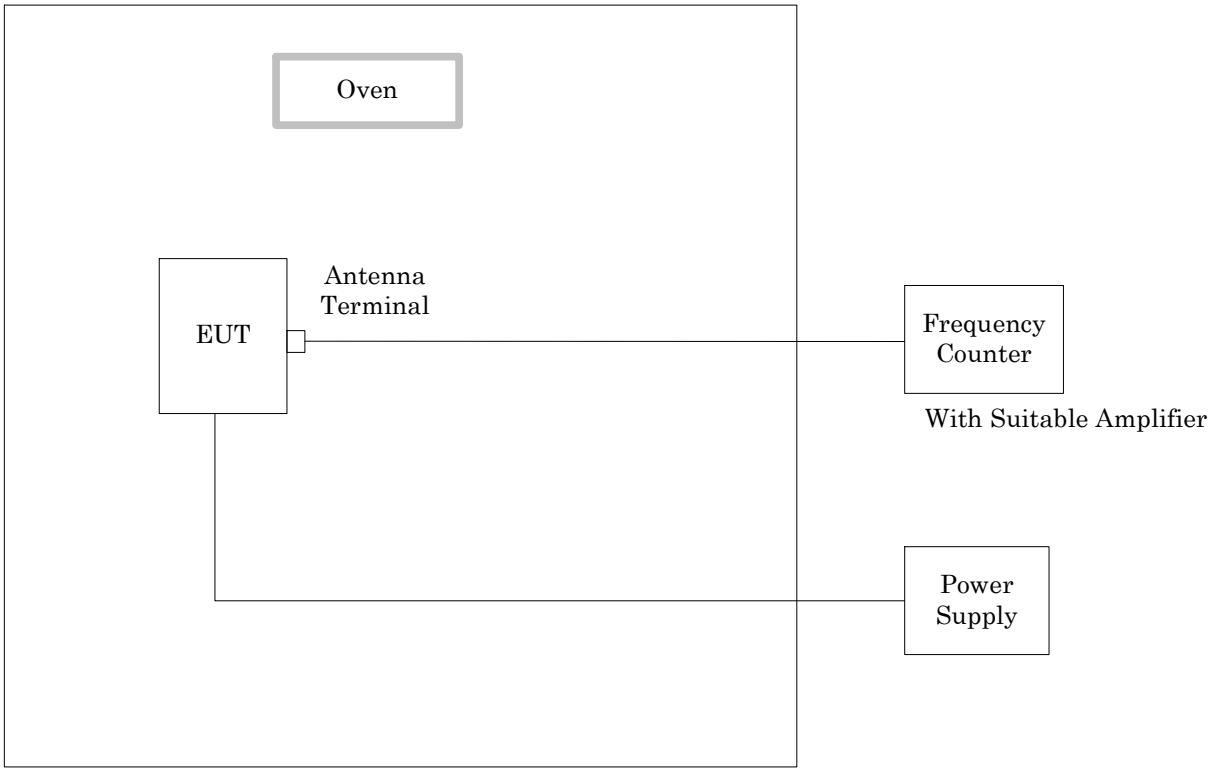
The preliminary radiated disturbance measurements were carried out.
The preliminary radiated disturbance measurements were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.
The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions.
This configurations was used for the final radiated disturbance measurements.
(referred documentation is No.G34364I in JQA Tsuru)

- Side View -



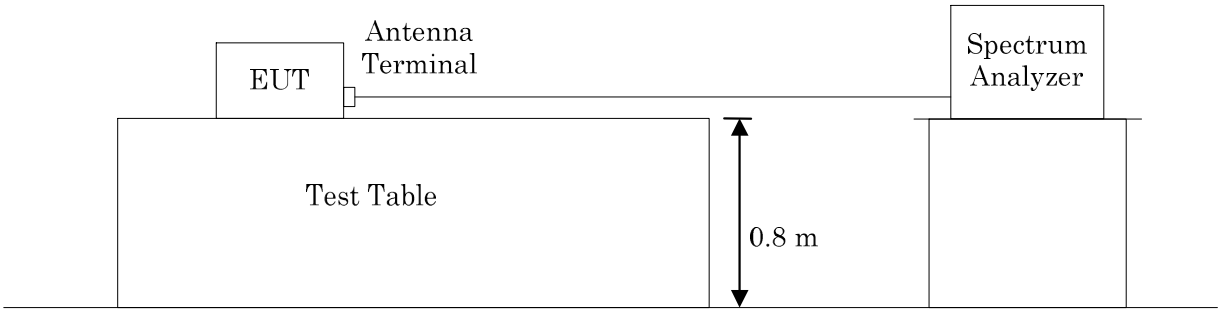
6.3 Frequency Stability

The frequency stability measurements were carried out. By using frequency counter with suitable RF amplifier, the carrier frequency of the transmitter under test was measured with a temperature variation of –20°C to +50°C at the normal supply voltage, and if required, with a variation in the primary voltage from 85% to 115% the rated supply voltage at the temperature of +20°C.
These measurements were carried out after allow sufficient time (approximately 1 hour) for the temperature of the chamber to stabilize.
(referred documentation is No.G34366L in JQA Testing section)



6.4 Occupied Bandwidth

According to description of ANSI C63.4-2003 sec.13.1.7, the occupied bandwidth measurements were carried out. By using a spectrum analyzer with a vertical antenna for picking up the signal, the measurements of the emission were made under the transmitting modes of the EUT.
The resolution bandwidth of spectrum analyzer was set to the value specified in sec.13.1.7.
(referred documentation is No.G34366K in JQA Testing section)



7 Equipment Under Test Modification

☒- No modifications were conducted by JQA to achieve compliance to the limitations.
☐- To achieve compliance to the limitations, the following changes were made by JQA during the compliance test.

The modifications will be implemented in all production models of this equipment.

Applicant : Not Applicable
Date : Not Applicable
Typed Name : Not Applicable Signatory: Not Applicable
Position : Not Applicable

8 Responsible Party

Responsible Party of Test Item (Product)

Responsible Party	:
Contact Person	:

Signatory

9 Deviation from Standard

☒-No deviations from the standard described in clause 1.
☐-The following deviations were employed from the standard described in clause 1.

10 Test Results

10.1 AC Powerline Conducted Emission

The requirements are ☒-Applicable [☒-Tested ☐-Not tested by applicant request.]
☐-Not Applicable

☒-Passed ☐-Failed ☐-Not judged

Min. Limit Margin (QP)	10.1	dB	at	0.18	MHz
Min. Limit Margin (AVE)	N/A	dB	at	N/A	MHz
Max. Limit Exceeding	N/A	dB	at	N/A	MHz
Uncertainty of measurement results	± 2.6	dB(2σ)			

Remarks :

10.2. Radiated Emissions (Section 15.225(a)(b)(c)) / 0.009 MHz - 30 MHz

The requirements are ☒-Applicable [☒-Tested ☐-Not tested by applicant request.]
☐-Not Applicable

☒-Passed ☐-Failed ☐-Not judged

Min. Limit Margin	58.4	dB	at	13.56	MHz
Max. Limit Exceeding	N/A	dB	at	N/A	MHz
Uncertainty of measurement results	± 1.9	dB(2σ)			

☒- 10 meters	0.009-30	MHz	± 1.9	dB(2σ)

Remarks :

10.3 Radiated Emissions (Section 15.225(d))

The requirements are ☒-Applicable [☒-Tested ☐-Not tested by applicant request.]
☐-Not Applicable

☒-Passed ☐-Failed ☐-Not judged

Min. Limit Margin 8.4 dB at 118.7 MHz

Max. Limit Exceeding N/A dB at N/A MHz

Uncertainty of measurement results

☒- 3 meters	30- 300 MHz	± 4.5	dB(2σ)
	300-1000 MHz	± 4.6	dB(2σ)

Remarks :

10.4 Frequency Stability (Section 15.225(e))

The requirements are ☒-Applicable [☒-Tested ☐-Not tested by applicant request.]
☐-Not Applicable

☒-Passed ☐-Failed ☐-Not judged

Remarks :

10.5 Occupied Bandwidth

The requirements are ☒-Applicable [☒-Tested ☐-Not tested by applicant request.]
☐-Not Applicable

☒-Passed ☐-Failed ☐-Not judged

Remarks :

11 Summary

General Remarks :

The EUT was tested according to the requirements of CFR 47 FCC Rules and Regulations Part 15. under the test configuration, as shown in clause 12 to 14.
The conclusion for the test items of which are required by the applied regulation is indicated under the test results.
Determining compliance with the limits in this report was based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

Test Results :

The "as received" sample;
☒-fulfill the test requirements of the regulation mentioned on clause 1.
☐- doesn't fulfill the test requirements of the regulation mentioned on clause 1.

Reviewed by:

Kazuhisa Abe
Manager
TSURU EMC Branch
EMC Engineering Department

Tested by:

Takashi Koyama
Assistant Manager
TSURU EMC Branch
EMC Engineering Department

12 Operating Condition

Power Supply Voltage : 5.0VDC
* The EUT was operated with the Automated Endoscope Leak Tester.
(Input: 120VAC 60Hz, Output: 5.0VDC)

Operation Mode
Transmitting : The Test have been carried out under continuous transmission Mode.

13 Test Configuration

The equipment under test consists of :

Sign	Item	Manufacturer	Model No.	Serial No.	IC No.
A	RF-Module (Automated Endoscope Leak Tester)	OLYMPUS MEDICAL SYSTEMS CORPORATION	ALT-Y0003	7100012	S8Q-RU8354

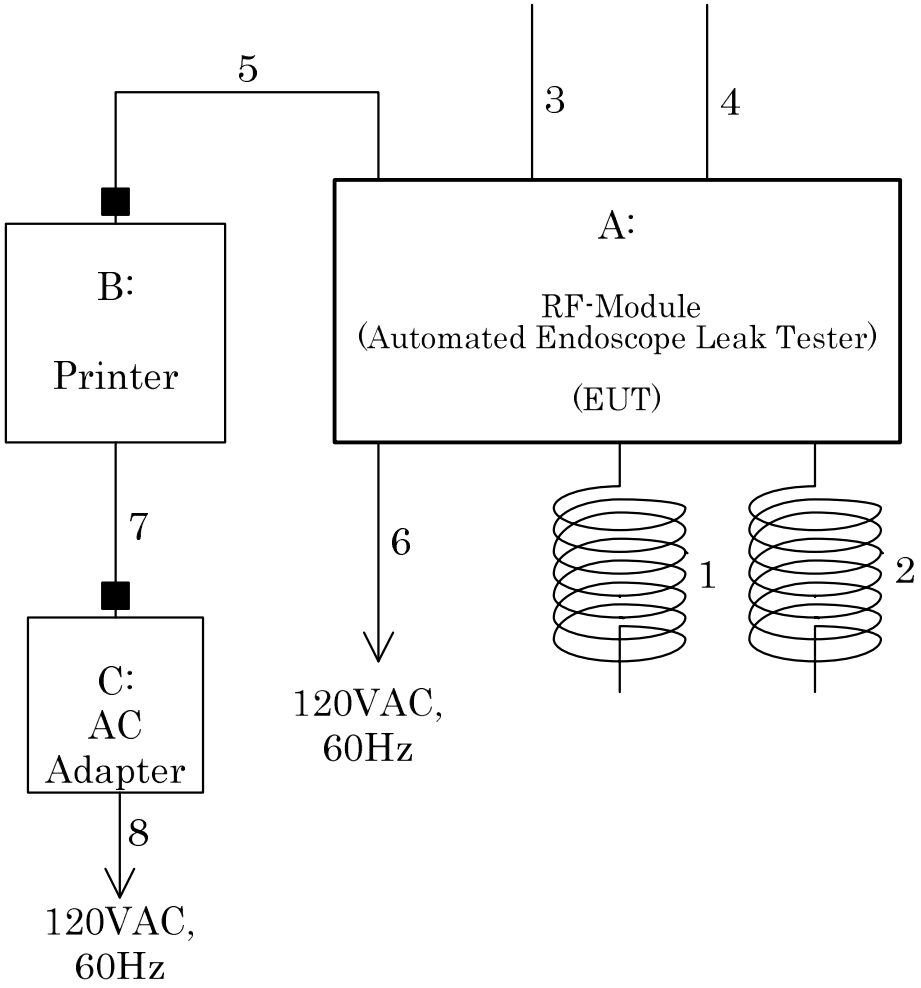
The auxiliary equipment used for testing :

Sign	Item	Manufacturer	Model No.	Serial No.	FCC ID
B	Printer	SANEI ELECTRIC INC.	BL2-58SNWUC	00179	DoC
C	AC Adapter	SANEI ELECTRIC INC.	BP1030509N02	-	-

Type of Cable:

No.	Description	Identification (Manu. etc.)	Connector Shielded	Cable Shielded	Ferrite Core	Length (m)
1	SCOPE1(Curl) Cable	None	No	No	No	3.2
2	SCOPE2(Curl) Cable	None	No	No	No	3.2
3	RS232C Cable	None	Yes	Yes	No	3.0
4	LAN Cable	None	No	No	No	3.0
5	Serial Cable	None	Yes	Yes	Yes	1.5
6	AC Power Cable	None	No	No	No	3.0
7	DC Power Cable	None	No	No	Yes	1.2
8	AC Power Cable	None	No	No	No	1.7

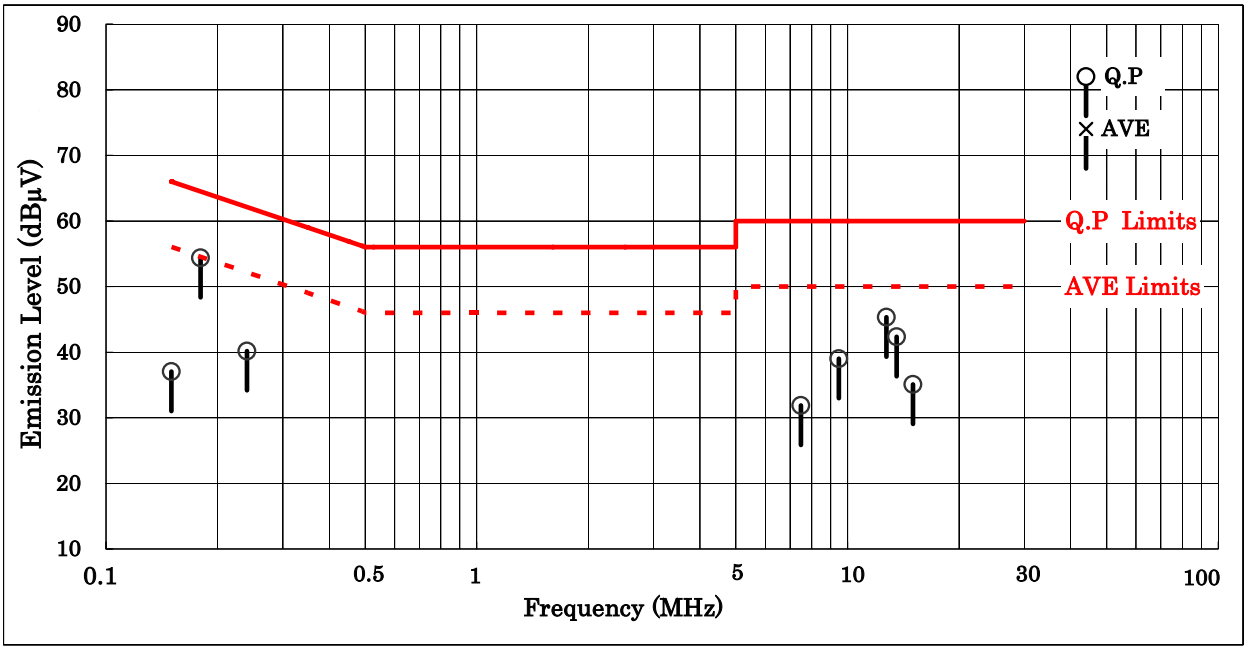
14 Equipment Under Test Arrangement (Drawings)



Appendix A: Test Data
A.1 AC Powerline Conducted Emission

Date : August 17, 2012
Temp : 24℃ Humi : 60% Atom : 949hPa

Frequency	AMN Factor	Meter Reading (dBμV) V-A		V-B		Limits (dBμV)		Max. Emission Level (dBμV)		Margin (dB)	
(MHz)	(dB)	Q.P	AVE	Q.P	AVE	Q.P	AVE	Q.P	AVE	Q.P	AVE
0.15	20.1	16.9	-	< 10.0	-	66.0	56.0	37.0	-	29.0	-
0.18	20.1	34.2	-	34.3	-	64.5	54.5	54.4	-	10.1	-
0.24	20.0	20.2	-	20.2	-	62.1	52.1	40.2	-	21.9	-
0.50	19.9	< 10.0	-	< 10.0	-	56.0	46.0	< 29.9	-	> 26.1	-
1.00	19.9	< 10.0	-	< 10.0	-	56.0	46.0	< 29.9	-	> 26.1	-
7.49	20.1	10.8	-	11.8	-	60.0	50.0	31.9	-	28.1	-
9.47	20.1	18.8	-	18.9	-	60.0	50.0	39.0	-	21.0	-
12.73	20.1	25.2	-	25.1	-	60.0	50.0	45.3	-	14.7	-
13.56	20.1	22.2	-	21.5	-	60.0	50.0	42.3	-	17.7	-
15.02	20.2	14.9	-	14.7	-	60.0	50.0	35.1	-	24.9	-
20.00	20.2	< 10.0	-	< 10.0	-	60.0	50.0	< 30.2	-	> 29.8	-
30.00	20.3	< 10.0	-	< 10.0	-	60.0	50.0	< 30.3	-	> 29.7	-



Notes: 1) The testing location : Shielded Room A
2) The spectrum was checked from 0.15 MHz to 30 MHz
3) AMN(Artificial Mains Network) factor includes the cable loss.
4) V-A : One end & Ground V-B : The other end & Ground
5) Q.P : Quasi-Peak Detector AVE : Average Detector
6) The symbol of "<" means "or less".
7) The symbol of ">" means "more than".
8) The symbol of "-" means "Not applicable".
9) A sample calculation was made at 0.15 MHz
(AMN Factor) + (Meter Reading) = 20.1 + 16.9 = 37.0 dBμV

A.2 Radiated Emissions

A.2.1 Radiated Emission (Section 15.225(a)(b)(c))

Date : August 17, 2012
Temp : 21.8℃ Humi : 61.9% Atom : 949hPa

Frequency (MHz)	Antenna Factor (dB)	Meter Reading/ 10m (dBμV/m) Q.P	Limits/ 30m (dBμV/m) Q.P	Field Strength/ 30m (dBμV/m) Q.P	Margin (dB) Q.P
13.110	-	< 25.0	29.5	< 5.9	> 23.6
13.410	-	< 25.0	40.5	< 5.9	> 34.6
13.553	-	< 25.0	50.5	< 5.9	> 44.6
13.560	-	44.7	84.0	25.6	58.4
13.567	-	< 25.0	50.5	< 5.9	> 44.6
13.710	-	< 25.0	40.5	< 5.9	> 34.6
14.010	-	< 25.0	29.5	< 5.9	> 23.6

Notes: 1) The testing location : Anechoic Chamber No.1 Distance : 10 m

2) Q.P : Quasi-Peak Detector (IF Band width : 9 kHz)

3) The symbol of "<" means "or less".

4) The symbol of ">" means "more than".

5) The symbol of "-" means "Zero", because the used test receiver calculated and displayed in the Meter Reading including the Correction Factor(Antenna and cable loss) directly .

6) The testing loop antenna was rotated at the vertical and horizontal axis to maximize received emissions. The above Meter Reading was maximum emissions level.

7) Calculation :

For fundamental, the measured field strength was extrapolated to distance 30 meters, using the formula that field strength varies as the inverse distance square (40 dB per decade of distance).

Fundamental(13.560MHz): 25.6 dBμV/m – $20\log_{10}((30/10)^2)$= 25.6 – 19.1 = 6.5 dBμV/m at 30 meters

Limits for 13.553-13.567MHz (§15.225(a)) = $20\log_{10}(15848)$ = 84.0 dBμV/m

Limits for 13.410-13.553, 13.567-13.710 MHz (§15.225(b)) = $20\log_{10}(334)$ = 50.5 dBμV/m

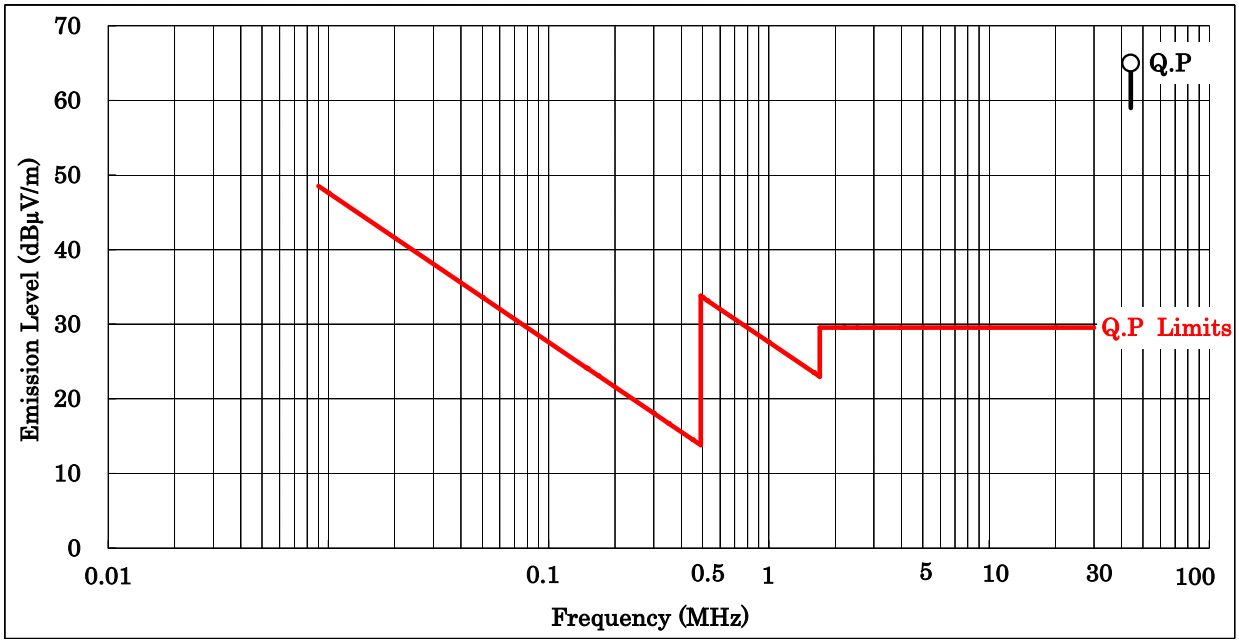
Limits for 13.110-13.410, 13.710-14.010MHz (§15.225(c)) = $20\log_{10}(106)$ = 40.5 dBμV/m

Limits for except for 13.110-14.010MHz(§15.225(d)) = $20\log_{10}(30)$ = 29.5 dBμV/m

A.2.2 Radiated Emission 0.009 MHz - 30 MHz

Date : August 17, 2012
Temp : 21.8℃ Humi : 61.9% Atom : 949hPa

Frequency (MHz)	Antenna Factor (dB)	Meter Reading (dBμV/m) Q.P	Limits (dBμV/m) Q.P	Specified Distance (m)	Extrapolated Emission Level (dBμV/m) Q.P	Margin (dB) Q.P
0.009	-	< 60.0	48.5	300.0	< 0.9	> 47.6
0.01	-	< 60.0	47.6	300.0	< 0.9	> 46.7
0.02	-	< 60.0	41.6	300.0	< 0.9	> 40.7
0.03	-	< 60.0	38.1	300.0	< 0.9	> 37.1
0.05	-	< 60.0	33.6	300.0	< 0.9	> 32.7
0.07	-	< 60.0	30.7	300.0	< 0.9	> 29.8
0.10	-	< 60.0	27.6	300.0	< 0.9	> 26.7
0.20	-	< 60.0	21.6	300.0	< 0.9	> 20.7
0.30	-	< 60.0	18.1	300.0	< 0.9	> 17.1
0.50	-	< 30.0	33.6	30.0	< 10.9	> 22.7
1.00	-	< 30.0	27.6	30.0	< 10.9	> 16.7
2.00	-	< 30.0	29.5	30.0	< 10.9	> 18.6
3.00	-	< 30.0	29.5	30.0	< 10.9	> 18.6
5.00	-	< 30.0	29.5	30.0	< 10.9	> 18.6
10.00	-	< 30.0	29.5	30.0	< 10.9	> 18.6
27.12	-	< 30.0	29.5	30.0	< 10.9	> 18.6
30.00	-	< 30.0	29.5	30.0	< 10.9	> 18.6

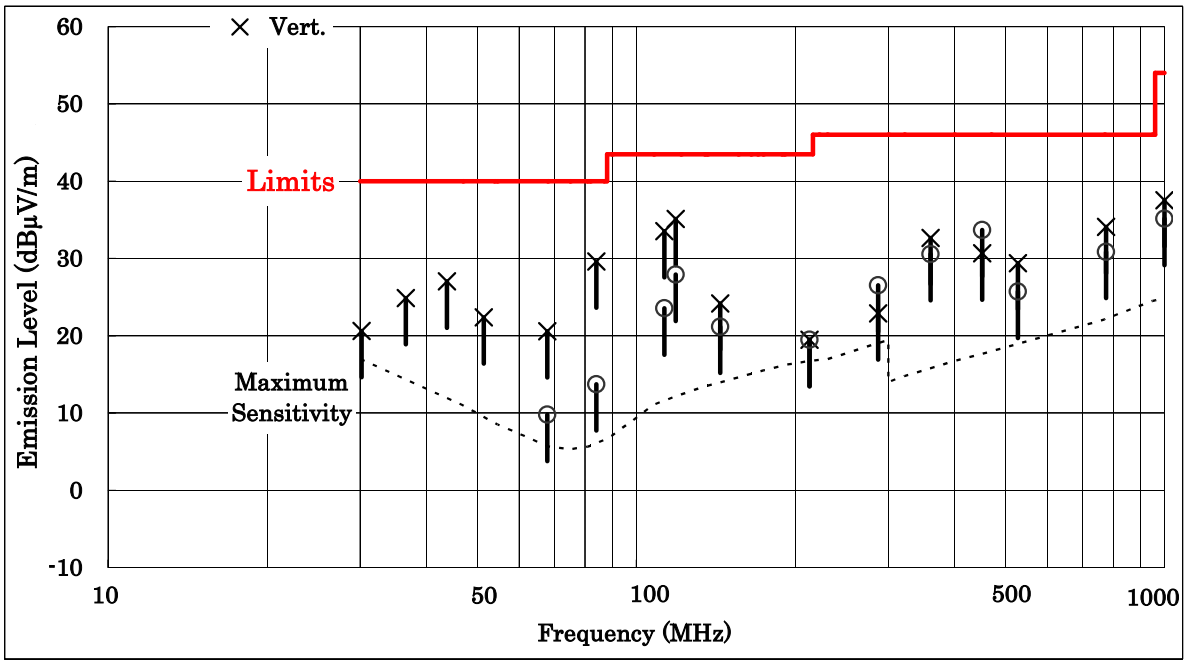


Notes: 1) The testing location : Anechoic Chamber No.1 Distance : 10 m
2) The symbol of "<" means "or less".
3) The symbol of ">" means "more than".
4) The symbol of "-" means "Zero", because the used test receiver calculated and displayed in the Meter Reading including the Correction Factor(Antenna and cable loss) directly
5) A sample calculation was made at 0.009 MHz
60 dBμV/m (at 10m distance) = 60 - $20\log_{10}((300/10)^2)$ = 0.9 dBμV/m (at 300m distance)
6) Setting of measuring instrument :
Quasi-Peak Detector, IF Bandwidth: 9 kHz or 200Hz (9 kHz - 90 kHz, 110-490kHz)
Average Detector, IF Bandwidth: 9 kHz or 200Hz (except for 9 kHz - 90 kHz, 110-490kHz)
7) The spectrum was checked from 0.009 MHz to 30 MHz.

A.2.2 Radiated Emission 30 MHz - 1000 MHz

Date : August 17, 2012
Temp : 23℃ Humi : 60.2% Atom : 949hPa

Frequency (MHz)	Antenna Factor (dB/m)	Meter Reading (dBμV) Hori.	Meter Reading (dBμV) Vert.	Limits (dBμV/m) Q.P	Emission Level (dBμV/m) Hori.	Emission Level (dBμV/m) Vert.	Margin (dB) Hori.	Margin (dB) Vert.
30.2	18.9	< -2.0	1.7	40.0	< 16.9	20.6	> 23.1	19.4
36.6	16.8	< -2.0	8.1	40.0	< 14.8	24.9	> 25.2	15.1
43.8	14.1	< -2.0	12.9	40.0	< 12.1	27.0	> 27.9	13.0
51.4	11.5	< -2.0	10.9	40.0	< 9.5	22.4	> 30.5	17.6
67.8	7.7	2.1	12.9	40.0	9.8	20.6	30.2	19.4
84.0	8.0	5.7	21.6	40.0	13.7	29.6	26.3	10.4
113.0	13.8	9.7	19.7	43.5	23.5	33.5	20.0	10.0
118.7	14.2	13.7	20.9	43.5	27.9	35.1	15.6	8.4
144.1	16.0	5.2	8.2	43.5	21.2	24.2	22.3	19.3
212.9	18.8	0.7	0.7	43.5	19.5	19.5	24.0	24.0
287.0	20.3	6.2	2.6	46.0	26.5	22.9	19.5	23.1
360.8	17.9	12.7	14.8	46.0	30.6	32.7	15.4	13.3
451.8	19.7	14.0	11.0	46.0	33.7	30.7	12.3	15.3
528.0	20.9	4.8	8.5	46.0	25.7	29.4	20.3	16.6
775.0	24.2	6.7	9.9	46.0	30.9	34.1	15.1	11.9
1000.0	26.7	8.4	10.8	54.0	35.1	37.5	18.9	16.5



Notes: 1) The testing location : Anechoic Chamber No.1 Distance : 3 m
2) The spectrum was checked from 30 MHz to 1000 MHz.
3) Antenna factor includes the cable loss.
4) Hori. : Horizontal polarization Vert. : Vertical polarization
5) Q.P: Quasi-Peak Detector
6) The symbol of "<" means "or less", ">" means "more than".
7) A sample calculation was made at 30.2 MHz
(Antenna Factor) + (Meter Reading) = 18.9 + 1.7 = 20.6 dBμV

A.2.3 Radiated Emission above 1 GHz

-Not applicable-

A.3 Frequency Stability

Testing Date : September 10, 2012
Ambient Temperature : 24 (°C), Humidity : 40(%)

Operating Frequency:13.56MHz

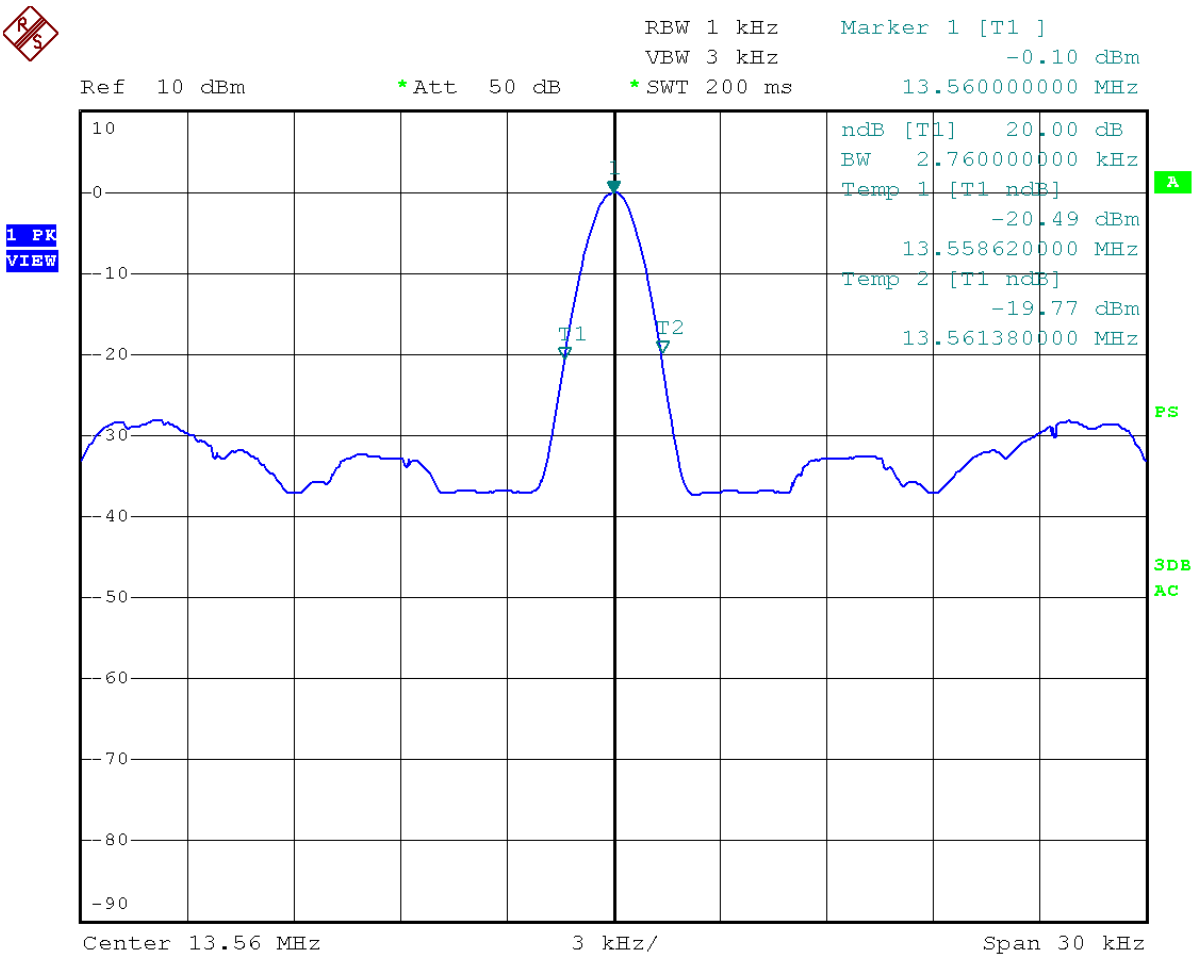
Temperature (°C)	Primary Supply Voltage (V)	Frequency(MHz)			
		0 min. later	2 min. later	5 min. later	10 min. later
-20	102	13.5600091	13.5600237	13.5600279	13.5600318
	120	13.5600168	13.5600241	13.5600280	13.5600318
	138	13.5600190	13.5600246	13.5600283	13.5600320
20	102	13.5600470	13.5600407	13.5600381	13.5600361
	120	13.5600452	13.5600403	13.5600380	13.5600360
	138	13.5600442	13.5600402	13.5600380	13.5600359
50	102	13.5599490	13.5599471	13.5599462	13.5599456
	120	13.5599483	13.5599470	13.5599462	13.5599456
	138	13.5599479	13.5599470	13.5599462	13.5599456

Specified Limit +/-0.01%

Temperature (°C)	Primary Supply Voltage (V)	Frequency deviation with time elapse(%)			
		0 min. later	2 min. later	5 min. later	10 min. later
-20	102	0.0000671	0.0001748	0.0002058	0.0002345
	120	0.0001239	0.0001777	0.0002065	0.0002345
	138	0.0001401	0.0001814	0.0002087	0.0002360
20	102	0.0003466	0.0003001	0.0002810	0.0002662
	120	0.0003333	0.0002972	0.0002802	0.0002655
	138	0.0003260	0.0002965	0.0002802	0.0002647
50	102	-0.0003761	-0.0003901	-0.0003968	-0.0004012
	120	-0.0003813	-0.0003909	-0.0003968	-0.0004012
	138	-0.0003842	-0.0003909	-0.0003968	-0.0004012

A.4 Occupied Bandwidth

Testing Date : September 10, 2012
Ambient Temperature : 25 (°C), Humidity : 40(%)



Date: 14.SEP.2012 11:21:57

Appendix B : Test Arrangement (Photographs)
B.1 AC Powerline Conducted Emission

- Rear View -

- Side View -

*** This photograph present configuration with maximum emission.**

***Refer to other sheet.(Page 25 and Page 26.)**

B.2 Radiated Emissions

- Front View -

- Rear View -

*** This photograph present configuration with maximum emission.**

***Refer to other sheet.(Page 25 and Page 26.)**

Appendix C: Test Instruments

ID No.	Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
OS-1	Open Site	-	Toshiba	-	2012/05	1 Year
OS-2	Open Site	-	Toshiba	-	-	-
AC-1	Anechoic Chamber (L)	-	TDK	-	2012/05	1 Year
AC-2	Anechoic Chamber (S)	-	TDK	-	2011/11	1 Year
SR-A	Shielded Room	-	TDK	-	-	-
SR-B	Shielded Room	-	TDK	-	-	-
SR-C	Shielded Room	-	TDK	-	-	-
TR-1	Tested Room	-	-	-	-	-
R-1	Test Receiver	ESVS10	Rohde & Schwarz	849231/004	2012/02	1 Year
R-3	Test Receiver	ESI7	Rohde & Schwarz	100059/007	2011/10	1 Year
R-4	Test Receiver	ESHS30	Rohde & Schwarz	842053/001	2012/02	1 Year
R-5	Test Receiver	ESCS30	Rohde & Schwarz	100203	2012/05	1 Year
R-6	Test Receiver	ESU40	Rohde & Schwarz	100214	2012/01	1 Year
S-3	Spectrum Analyzer	U3751	Advantest	160100139	2012/03	1 Year
S-5	Spectrum Analyzer	U3751	Advantest	170500170	2012/06	1 Year
CB-3	RF Cable	3D-2W	Suhner	-	2012/05	1 Year
CB-4	RF Cable	3D-2W	Suhner	-	2012/05	1 Year
CB-5	RF Cable	3D-2W	Suhner	-	2012/05	1 Year
CN-1	RF Cable	20D/5D-2W	Fujikura	-	2012/06	1 Year
CN-2	RF Cable	20D/5D-2W	Fujikura	-	2011/10	1 Year
CN-3	RF Cable	20D/5D-2W	Fujikura	-	2011/09	1 Year
CS-1	RF Cable	SUCOFLEX 104P	Huber+Suhner	27290/4P	2011/11	1 Year
CS-2	RF Cable	SUCOFLEX 104P	Huber+Suhner	27289/4P	2011/11	1 Year
CS-3	RF Cable	SUCOFLEX 104P	Huber+Suhner	37027/4P	2012/03	1 Year
CS-4	RF Cable	SUCOFLEX 104P	Huber+Suhner	37028/4P	2012/03	1 Year
L-1	AMN	KNW-407	Kyoritsu Corp.	8-833-5	2012/08	1 Year
L-2	AMN	KNW-407	Kyoritsu Corp.	8-680-14	2011/09	1 Year
L-3	AMN	KNW-407	Kyoritsu Corp.	8-757-1	2012/06	1 Year
L-4	AMN	KNW-242	Kyoritsu Corp.	8-755-1	2012/06	1 Year
L-5	AMN	KNW-242C	Kyoritsu Corp.	8-837-14	2012/06	1 Year
L-6	AMN	KNW-243C	Kyoritsu Corp.	8-692-5	2011/09	1 Year
L-7	AMN	KNW-243C	Kyoritsu Corp.	8-831-3	2012/06	1 Year
L-9	AMN	KNW-244C	Kyoritsu Corp.	8-1373-3	2012/07	1 Year
L-10	ISN	FCC-TLISN-T2-02	FCC	20234	2011/11	1 Year
L-11	ISN	FCC-TLISN-T4-02	FCC	20235	2011/11	1 Year
L-12	High Impedance Probe	KNW-410	Kyoritsu Corp.	8-876-3	2012/07	1 Year
L-13	Artificial Hand	K-9003	Kyoritsu Corp.	7-1639-4	2011/10	1 Year
L-14	Hi-pass Filter	KFL-009D	Kyoritsu Corp.	8-1996-8	2012/07	1 Year
L-15	ISN	F-070306-1057-1	FCC	20591	2012/07	1 Year
L-16	RF Current Probe	KCT-2504	Kyoritsu Corp	8S-3061-5	2012/05	1 Year
L-17	ISN	T8	TESEQ	30809	2012/03	1 Year
L-18	ISN	T8-Cat6	TESEQ	29713	2012/03	1 Year
PL-3	Pulse Limiter	ESH3-Z2	Rohde & Schwarz	-	2011/10	1 Year
PL-4	Pulse Limiter	ESH3-Z2	Rohde & Schwarz	-	2012/02	1 Year
PL-5	Pulse Limiter	ESH3-Z2	Rohde & Schwarz	-	2012/05	1 Year
TM-1	50ohm Termination	BNC-P-1.5	TDC	-	2012/03	1 Year
TM-2	50ohm Termination	-	Y&R	-	2012/03	1 Year
AL-0	Loop Antenna	HFH2-Z2	Rohde & Schwarz	879284/14	2012/04	1 Year
AT-1	Triple Loop Antenna	HXYZ9170	Schwarzbeck	9170-138	2011/12	1 Year
AT-3	Bilog Antenna	CBL6111D	Teseq GmbH	27075	2012/05	1 Year
AB-1	Biconical Antenna	BBA9106	Schwarzbeck	91031741	2012/06	1 Year
AB-3	Biconical Antenna	BBA9106	Schwarzbeck	VHA11905516	2011/09	1 Year
AL-1	Log-Periodic Antenna	UHALP9108-A	Schwarzbeck	0678	2012/06	1 Year
AL-3	Log-Periodic Antenna	UHALP9108-A	Schwarzbeck	0278	2011/09	1 Year
AL-6	Log-Periodic Antenna	ESLP9145	Schwarzbeck	9145-216	2012/03	1 Year
AH-1	Horn Antenna	91888-2	EATON	563	2012/05	1 Year
AH-2	Horn Antenna	91889-2	EATON	569	2012/05	1 Year

ID No.	Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
AH-3	Horn Antenna	94613-1	EATON	575	2012/05	1 Year
AH-4	Horn Antenna	91891-2	EATON	583	2012/05	1 Year
AH-5	Horn Antenna	12-12	Scientific Atlanta	741	2012/05	1 Year
AH-12	Horn Antenna	3117	ETS LINDGREN	00051800	2012/07	1 Year
AD-1	Dipole Antenna	KBA-511A	Kyoritsu Corp.	0-195-5	2012/05	1 Year
AD-3	Dipole Antenna	KBA-611	Kyoritsu Corp.	0-196-8	2012/05	1 Year
CL-1	Absorbing Clamp	MDS21	Rohde & Schwarz	894245/002	2012/05	1 Year
PA-1	Pre-Amplifier	WJ-6811-513	Watkins Johnson	0288	2012/03	1 Year
PA-2	Pre-Amplifier	WJ-6682-824	Watkins Johnson	0052	2012/03	1 Year
PA-3	Pre-Amplifier	WJ-6870-506	Watkins Johnson	0018	2012/03	1 Year
PA-5	Pre-Amplifier	AMF-4D-005080-18-13P	MITEQ, INC.	1218917	2011/11	1 Year
RN-1	Reference Impedance Network	4151	NF ELECTRONIC INSTRUMENTS	3168114151011	2012/05	1 Year
HF-1	Harmonic/Flicker Analyzer	KHA3000	KIKUSUI ELECTRONICS CORPORATION	NB001642	2012/04	1 Year
2-1	ESD Tester	ESD3000	EMC PARTNER	092	2012/06	1 Year
2-2	ESD Tester	ESD3000	EMC PARTNER	428	2012/05	1 Year
3-1	Signal Generator	SMT 02	Rohde & Schwarz	838616/021	2012/03	1 Year
3-2	Signal Generator	83732B	Hewlett Packard	US37101411	2011/10	1 Year
3-3	Function Generator	1941	NF	328730	2011/10	1 Year
3-5	RF Power Amplifier	500A100M1	Amplifier Research	19671	2011/11	1 Year
3-6	RF Power Amplifier	200W1000M2A	Amplifier Research	19572	2011/11	1 Year
3-7	RF Power Amplifier	60S1G3M1	Amplifier Research	0325545	2011/11	1 Year
3-8	Biconical Antenna	3109	EMCO	9607-3014	2011/11	1 Year
3-10	Log-Periodic Antenna	3144	EMCO	9701-1032	2012/05	1 Year
3-11	Log-Periodic Antenna	AT5080	Amplifier Research	322092	2011/11	1 Year
3-12	Horn Antenna	AT4002A	Amplifier Research	0325039	2012/05	1 Year
3-18	Field Probe	FP6001	Amplifier Research	303557	2011/10	1 Year
3-19	Power Meter	4421	Bird	2919	2012/07	1 Year
3-20	Power Head	4022	Bird	6147	2012/07	1 Year
3-21	Power Meter	PM2002	Amplifier Research	25774	2012/07	1 Year
3-22	Power Head	PH2000	Amplifier Research	26413	2012/07	1 Year
3-23	Power Head	PH2000	Amplifier Research	26414	2012/07	1 Year
3-24	Dual Coupler	DC2600	Amplifier Research	19734	2012/07	1 Year
3-25	Dual Coupler	DC6080	Amplifier Research	302555	2012/07	1 Year
3-26	Dual Coupler	DC7144	Amplifier Research	26463	2012/07	1 Year
3-27	Signal Generator	SML 03	Rohde & Schwarz	103413	2011/09	1 Year
3-29	Power Meter	NRT	Rohde & Schwarz	103116	2011/09	1 Year
3-30	Power Head	NRT-Z44	Rohde & Schwarz	102682	2011/09	1 Year
3-31	Field Probe	EP 600	Narda S.T.S.	301WX90609	2012/03	1 Year
3-32	Field Probe	EP 601	Narda S.T.S.	301WX00125	2012/07	1 Year
3-33	Signal Generator	SMB100A	Rohde & Schwarz	103740	2012/07	1 Year
4-1	Immunity Tester	TRA2000	EMC PARTNER	659	2011/12	1 Year
4-2	EFT/B Generator	PEFT-Junior	HAEFELY	083818-13	2012/05	1 Year
4-3	EFT/B Generator	FNS-AXII B50	Noise Laboratory	FNS0620431	2012/05	1 Year
4-4	Coupling Clamp	IP4	HAEFELY	-	-	-
4-5	Coupling Clamp	15-00001A	Noise Laboratory	-	-	-
5-1	Surge Tester	PSURGE4.1	HAEFELY	083665-08	2011/11	1 Year
5-2	Coupling Filter	FP-SURGE 100M	HAEFELY	149163	2011/11	1 Year
5-3	Coupling Network	IP6.2	HAEFELY	083811-10	2011/11	1 Year
5-4	Decoupling Network	DEC1A	HAEFELY	083793-08	2011/11	1 Year
5-5	Pruefpistole	AP 300	HAEFELY	081 438	2011/11	1 Year
6-2	RF Power Amplifier	75A250	Amplifier Research	19502	2012/08	1 Year
6-3	RF Power Amplifier	75A250	Amplifier Research	26255	2012/08	1 Year
6-4	6dB Attenuator	8343-060	Bird	2054	2012/08	1 Year
6-5	6dB Attenuator	65-6-33	Weinschel	LW166	2012/08	1 Year
6-6	CDN	FCC-801-M1-16	FCC	50	2012/05	1 Year

ID No.	Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
6-7	CDN	FCC-801-M1-25A	FCC	04001	2012/06	1 Year
6-8	CDN	FCC-801-M2-25	FCC	59	2012/05	1 Year
6-9	CDN	FCC-801-M2-25A	FCC	03023	2012/06	1 Year
6-10	CDN	FCC-801-M2-25A	FCC	03024	2012/06	1 Year
6-11	CDN	FCC-801-M3-25	FCC	137	2012/05	1 Year
6-12	CDN	FCC-801-M3-25A	FCC	05021	2012/06	1 Year
6-13	CDN	FCC-801-M3-25A	FCC	99133	2012/06	1 Year
6-14	CDN	FCC-801-M4-25	FCC	21	2012/05	1 Year
6-15	CDN	FCC-801-M4-50	FCC	9806	2012/04	1 Year
6-16	CDN	FCC-801-C1	FCC	79	2012/06	1 Year
6-19	CDN	FCC-801-T8	FCC	9956	2012/07	1 Year
6-20	150-50 Ohms Adaptor	FCC-801-150-50	FCC	638	2012/07	1 Year
6-21	150-50 Ohms Adaptor	FCC-801-150-50	FCC	639	2012/07	1 Year
6-22	EM Clamp	F-203I	FCC	220	2012/08	1 Year
6-23	Decoupling Clamp	F-203I-DCN	FCC	105	-	-
6-24	Bulk Current Injection Clamp	F-120-2	FCC	53	2012/08	1 Year
6-25	CDN	FCC-801-M3-25A	FCC	08008	2012/07	1 Year
8-1	Interference Tester	LFP6.1	HAEFELY	083374-03	2012/03	1 Year
8-2	Magnetic Field Tester	MFG100.1	HAEFELY	080136-06	2012/03	1 Year
8-4	Large Coil	L2X1.6	ES Factory	001	2012/03	1 Year
11-1	Voltage Dip Tester	PLINE1610	HAEFELY	148709	2011/10	1 Year
11-3	External Variac Network	VAR-EXT1000	EMC PARTNER	046	2011/12	1 Year
172	Test Receiver	ESCI	Rohde & Schwarz	100408	2011/10	1 Year
45	RF Cable(1.5m 18GHz)	S 04272B	Suhner	-	2012/05	1 Year
75	Frequency Counter	53131A	Hewlett Packard	3546A11807	2012/05	1 Year
76	Oven	-	Ohnishi	-	-	-
165	Multimeter	VOAC7413	Iwatsu Electric	0267973	2012/04	1 Year
13	Test Receiver	ESI26	Rohde & Schwarz	100043	2012/06	1 Year