



JQA File No: 441-41217
Issue Date : February 4, 2005
Page 1 of 39

EMI TEST REPORT
Class II Permissive change for
(FCC ID:BJI-F616, IC ID:1004C-F616)

It is changed that ferrite core is added to the cable between transmitter and antenna. Therefore the measurement was carried out radiated spurious emission and AC Power line conducted emission under the EUT is build-in the specific host.

JQA File No : 441-41217

Model No. : F616

Type of Equipment : Bluetooth Module

Regulations Applied : CFR 47 FCC Rules and Regulations Part 15
: Industry Canada RSS-210 Issue 5(inc. Amendment)

FCC ID : BJI-F616
IC : 1004C-F616

Applicant : TOSHIBA TEC CORPORATION.

Address : 6-78, Minami-Cho, Mishima, Shizuoka, 411-8520 Japan

Manufacturer : TOSHIBA TEC CORPORATION.

Address : 6-78, Minami-Cho, Mishima, Shizuoka, 411-8520 Japan

Received date of EUT : January 31, 2005

Final Judgment : Passed

Test results in this report are obtained in use of equipment that is 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 test results only respond to the tested sample. This report should not be reproduced except in full, without the written approval of JQA EMC Engineering Dept. Testing Div.

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2 Test Data

2.1 Channel Separation	<u>N/A</u>
2.2 Minimum Hopping Channel	<u>N/A</u>
2.3 Occupied Bandwidth	<u>N/A</u>
2.4 Dwell Time	<u>N/A</u>
2.5 Peak Output Power (Conduction)	<u>N/A</u>
2.6 Peak Output Power (Radiation)	<u>N/A</u>
2.7 Peak Power Density (Conduction)	<u>N/A</u>
2.8 Peak Power Density (Radiation)	<u>N/A</u>
2.9 Spurious Emissions (Conduction)	<u>N/A</u>
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1 DOCUMENTATION

1.1 TEST REGULATION

FCC Rules and Regulations Part 15 Subpart B and C Radiated Spurious Emissions and Industry Canada IC RSS-210 (inc. amendment)

Test procedure :

The tests were performed with reference to the FCC Public Notice DA 00-705, released March 30, 2000. The test set-up was made in accordance to the general provisions of ANSIC63.4-2003.

1.2 GENERAL INFORMATION

1.2.1 Test facility :

- 1) Test Facility located at EMC Engineering Dept. Testing Div. :
 - No.2 and 3 Anechoic Chambers(3 meters Site).
 - Shielded Enclosure.

Expiration date of FCC test facility filing : May 27, 2005

Open Area Test Site Industry Canada No.: IC4126-4

- 2) EMC Engineering Dept. Testing Div. is recognized under the National Voluntary Laboratory accreditation Program for satisfactory compliance established in title 15, Part 285 Code of Federal Regulations.

NVLAP Lab Code : 200189-0 (Effective through : June 30, 2005)

1.2.2 Description of the Equipment Under Test (EUT) :

- | | |
|--|-------------------------------|
| 1) Type of Equipment | : Bluetooth Module |
| 2) Product Type | : Production |
| 3) Category | : Transceiver(FHSS type) |
| 4) EUT Authorization | : Certification |
| 5) FCC ID | : BJI-F616 |
| IC | : 1004C-F616 |
| 6) Trade Name | : TOSHIBA |
| 7) Model No. | : F616 |
| 8) Operating Frequency Range | : 2402 MHz - 2480 MHz, 32 MHz |
| 9) Highest Frequency Used in the EUT | : 2480 MHz |
| 10) Serial No. | : - |
| 12) Date of Manufacture | : None |
| 13) Power Rating | : 3.3VDC(*) |
| The DC power is supplied from the USB-bus on the host (MULTI FUNCTION DIGITAL SYSTEM). | |
| 14) EUT Grounding | : None |

1.2.3 Definitions for symbols used in this test report :

- x - 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.

1.3 TEST CONDITION

1.3.1 The measurement of Channel Separation

 - was performed.

 x - was not applicable.

Used test instruments :

Type	Number of test instruments (Refer to Appendix)
Test Receiver	N/A
Spectrum Analyzer	N/A
Cable	N/A
Attenuator	N/A
Antenna	N/A

1.3.2 The measurement of Minimum Hopping Channel

 - was performed.

 x - was not applicable.

Used test instruments :

Type	Number of test instruments (Refer to Appendix)
Test Receiver	N/A
Spectrum Analyzer	N/A
Cable	N/A
Attenuator	N/A
Antenna	N/A

1.3.3 The measurement of Occupied Bandwidth

 - was performed.

 x - was not applicable.

Used test instruments :

Type	Number of test instruments (Refer to Appendix)
Test Receiver	N/A
Spectrum Analyzer	N/A
Cable	N/A
Attenuator	N/A
Antenna	N/A

1.3.4 The measurement of Dwell Time

- ☐ - was performed.
☒ - was not applicable.

Used test instruments :

Type	Number of test instruments (Refer to Appendix)
Test Receiver	N/A
Spectrum Analyzer	N/A
Cable	N/A
Attenuator	N/A
Antenna	N/A

1.3.5 The measurement of Peak Output Power and Density (Conduction)

- ☐ - was performed.
☒ - was not applicable.

Used test instruments :

Type	Number of test instruments (Refer to Appendix)
Test Receiver	N/A
Spectrum Analyzer	N/A
Cable	N/A
Attenuator	N/A
Antenna	N/A
Digitizing Oscilloscope	N/A
RF Detector	N/A
Signal Generator	N/A

1.3.6 The measurement of Peak Output Power and Density (Radiation)

- ☐ - was performed in the following test site.
☒ - was not applicable.

Test location :

JQA Safety & EMC Center EMC Engineering Department TSURU EMC Branch
 2096 Ohata, Tsuru-shi Yamanashi-ken 402-0045, JAPAN

- | | |
|---|--------------------------------------|
| ☐ - Anechoic Chamber | ☐ - 3 meters |
| ☐ - Open Site No.1 | ☐ - 10 meters |
| ☐ - Open Site No.2 | ☐ - 30 meters |

Validation of Site Attenuation :

- 1) Last Confirmed Date : N/A
 2) Interval : N/A

Used test instruments :

Type	Number of test instruments (Refer to Appendix)
Test Receiver	N/A
Spectrum Analyzer	N/A
Cable	N/A
Attenuator	N/A
Antenna	N/A
Power Meter	N/A
Power Sensor	N/A
Signal Generator	N/A

1.3.7 The measurement of Spurious Emissions (Conduction)

- ☐ - was performed.
☒ - was not applicable.

Used test instruments :

Type	Number of test instruments (Refer to Appendix)
Test Receiver	N/A
Spectrum Analyzer	N/A
Cable	N/A
Attenuator	N/A

1.3.8 The measurement of Spurious Emissions (Radiation)(9 kHz - 30 MHz)

- ☐ - was performed in the following test site.
☒ - was not applicable.

Test location :

JQA Safety & EMC Center EMC Engineering Department TSURU EMC Branch
 2096 Ohata, Tsuru-shi Yamanashi-ken 402-0045, JAPAN

- | | |
|---|--------------------------------------|
| ☐ - Anechoic Chamber | ☐ - 3 meters |
| ☐ - Open Site No.1 | ☐ - 10 meters |
| ☐ - Open Site No.2 | ☐ - 30 meters |

Validation of Site Attenuation :

- 1) Last Confirmed Date : N/A
 2) Interval : N/A

Used test instruments :

Type	Number of test instruments (Refer to Appendix)
Test Receiver	N/A
Cable	N/A
Antenna	N/A

1.3.9 The measurement of Spurious Emissions (Radiation) (30 MHz - 1000 MHz)

 x - was performed in the following test site.
 - was not applicable.

Test location :

JQA Safety & EMC Center EMC Engineering Department TSURU EMC Branch
2096 Ohata, Tsuru-shi Yamanashi-ken 402-0045, JAPAN

<u> x </u> - Anechoic Chamber	<u> x </u> - 3 meters
<u> </u> - Open Site No.1	<u> </u> - 10 meters
<u> </u> - Open Site No.2	<u> </u> - 30 meters

Validation of Site Attenuation :

1) Last Confirmed Date : 2004/5
2) Interval : 1 year

Used test instruments :

Type	Number of test instruments (Refer to Appendix)
Test Receiver	TR06
Cable	CA01
Antenna	AN06, AN08
RF Amplifier	N/A

1.3.10 The measurement of Spurious Emissions (Radiation) (Above 1000 MHz)

☒ - was performed in the following test site.
☐ - was not applicable.

Test location :

JQA Safety & EMC Center EMC Engineering Department TSURU EMC Branch
 2096 Ohata, Tsuru-shi Yamanashi-ken 402-0045, JAPAN

☒ - Anechoic Chamber	☒ - 3 meters
☐ - Open Site No.1	☐ - 10 meters
☐ - Open Site No.2	☐ - 30 meters

Validation of Site Attenuation :

1) Last Confirmed Date : 2004/5
 2) Interval : 1 year

Used test instruments :

Type	Number of test instruments (Refer to Appendix)
Test Receiver	TR07
Spectrum Analyzer	N/A
Cable	CA11, CA13
Antenna	AN10, AN12
RF Amplifier	AM09
Band Reject Filter	AU16
High Pass Filter	AU17

1.3.11 The measurement of AC Power Line Conducted Emissions

- ☒ - was performed in the following test site.
☐ - was not applicable.

Test location :

JQA Safety & EMC Center EMC Engineering Department TSURU EMC Branch
2096 Ohata, Tsuru-shi Yamanashi-ken 402-0045, JAPAN

- ☐ - Shielded Room A
☐ - Shielded Room B
☒ - Anechoic Chamber
☐ - Open Site No.1
☐ - Open Site No.2

Used test instruments :

Type	Number of test instruments (Refer to Appendix)
Test Receiver	TR06
Spectrum Analyzer	-
Cable	CA03
AMN(for EUT)	NE01
AMN(for Peripheral)	NE02
Termination	AU01



JQA File No.
Model No.
Standard

:441-41217
:F616
:CFR 47 FCC Rules Part 15

FCC ID:BJI-F616

IC:1004C-F616

Issue Date :February 4, 2005

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1.4 EUT MODIFICATION / Deviation from Standard

1.4.1 EUT MODIFICATION

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

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

Applicant :

Date :

Typed Name :

Position :

1.4.2 Deviation from Standard:

- ☒ - No deviations from the standard described in clause 1.1.
☐ - The following deviations were employed from the standard described in clause 1.1:

1.5 TEST RESULTS

Channel Separation ☐ - Applicable ☒ - NOT Applicable
[§15.247(a)(1)], [§6.2.2(o)(a1)]
The requirements are ☐ - PASSED ☐ - NOT PASSED
Remarks: It is considered that this requirement dose not affect by equipment modifications.

Minimum Hopping Channel ☐ - Applicable ☒ - NOT Applicable
[§15.247(a)(1)], [§6.2.2(o)(a3)]
The requirements are ☐ - PASSED ☐ - NOT PASSED
Remarks: It is considered that this requirement dose not affect by equipment modifications.

Occupied Bandwidth ☐ - Applicable ☒ - NOT Applicable
[§15.247(a)(2)], [§5.9.1]
The requirements are ☐ - PASSED ☐ - NOT PASSED
Remarks: It is considered that this requirement dose not affect by equipment modifications.

Dwell Time ☐ - Applicable ☒ - NOT Applicable
[§15.247(a)(1)(iii)/(g)], [§6.2.2(o)(a3)/(c2)]
The requirements are ☐ - PASSED ☐ - NOT PASSED
Remarks: It is considered that this requirement dose not affect by equipment modifications.

Peak Output Power (Conduction) ☐ - Applicable ☒ - NOT Applicable
[§15.247(b)(3)], [§6.2.2(o)(b)]
The requirements are ☐ - PASSED ☐ - NOT PASSED
Remarks: It is considered that this requirement dose not affect by equipment modifications.

Peak Output Power (Radiation) ☐ - Applicable ☒ - NOT Applicable
[§15.247(b)(1)], [§6.2.2(o)(b)]
The requirements are ☐ - PASSED ☐ - NOT PASSED
Remarks :

Peak Power Density (Conduction) ☐ - Applicable ☒ - NOT Applicable
[§15.247(d)], [§6.2.2(o)(b)]
The requirements are ☐ - PASSED ☐ - NOT PASSED
Remarks: It is considered that this requirement dose not affect by equipment modifications.

Peak Power Density (Radiation) ☐ - Applicable ☒ - NOT Applicable
[§15.247(d)], [§6.2.2(o)(b)]
The requirements are ☐ - PASSED ☐ - NOT PASSED
Remarks:



JQA File No.
Model No.
Standard

:441-41217
:F616
:CFR 47 FCC Rules Part 15

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Spurious Emissions (Conduction) - Applicable X - NOT Applicable
[§15.247(c)], [§6.2.2(o)(e1)]

The requirements are - PASSED - NOT PASSED

Remarks: It is considered that this requirement dose not affect by equipment modifications.

Spurious Emissions (Radiation) X - Applicable - NOT Applicable
[§15.247(c), §15.35(b), §15.209(a)], [§6.2.2(o)(e1)]

The requirements are X - PASSED - NOT PASSED

Remarks:

AC Power Line Conducted Emissions X - Applicable - NOT Applicable
[§15.207(a)], [§6.6]

The requirements are X - PASSED - NOT PASSED

Remarks:

RF Exposure Compliance - Applicable X - NOT Applicable
[§15.247(b)(5)], [§14]

The requirements are - PASSED - NOT PASSED

Remarks: It is considered that this requirement dose not affect by equipment modifications.

Spurious Emissions for Receiver X - Applicable - NOT Applicable
(Radiation)[§15.109(a)], [§7.3]

The requirements are X - PASSED - NOT PASSED

Remarks:

AC Power Line Conducted Emissions X - Applicable - NOT Applicable
for Receiver [§15.107(a)], [§7.4]

The requirements are X - PASSED - NOT PASSED

Remarks:

1.6 SUMMARY

General Remarks :

The EUT was tested according to the requirements of FCC Rules and Regulations Part 15 Subpart B, Subpart C and IC RSS-210 issue 5 (including Amendment) under the test configuration, as shown in clause 1.7 to 1.10.
The conclusion for the test items which are required by the applied regulation is indicated under the final judgment.

Final Judgment :

The "as received" sample;

- x - fulfill the test requirements of the regulation mentioned on clause 1.1.
- fulfill the test requirements of the regulation mentioned on clause 1.1, but with certain qualifications.
- doesn't fulfill the test regulation mentioned on clause 1.1.

Begin of testing : January 31, 2005

End of testing : February 1, 2005

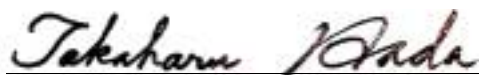
- JAPAN QUALITY ASSURANCE ORGANIZATION -

Tested by:



Yoichi Nakajima
Manager
TSURU EMC Branch
JQA EMC Engineering Dept.

Approved by:



Takaharu Hada
Director
TSURU EMC Branch
JQA EMC Engineering Dept.

1.7 TEST CONFIGURATION / OPERATION OF EUT

1.7.1 Test Configuration

The equipment under test (EUT) consists of :

Symbol	Item	Manufacturer	Model No.	FCC ID	Serial No.
A(*1)	Bluetooth Module	TOSHIBA TEC CORP.	F616	BJI-F616	-

The measurement was carried out with the following support equipment connected :

Symbol	Item	Manufacturer	Model No.	FCC ID	Serial No.
B(*2)	MULTI FUNCTION DIGITAL SYSTEM	TOSHIBA TEC CORP.	DP-8500	N/A	-
C	Personal Computer	TOSHIBA	PAS5280PNKW	DoC	92033364J
D	AC Adapter	TOSHIBA	PA3160U-1ACA	N/A	0221 A 0015127
E	802.11b/g Mini-PCI	TOSHIBA TEC CORP.	F615	BJI-F615	-
G	Antenna	TOSHIBA TEC CORP.	GN-3010	N/A	-

Type of Cable :

Symbol	Description	Identification (Manufacturer etc.)	Connector Shielded YES / NO	Cable Shielded YES / NO	Ferrite Core	Length (m)
1	AC Cable(EUT)	-	NO	NO	NO	2.2
2	DC Cable(PC)	-	NO	NO	NO	1.8
3	AC Cable(PC)	-	NO	NO	NO	1.9
4	USB Cable	-	YES	NO	YES	0.7
5	LAN Cable	-	YES	NO	YES	3.0

(*1) The DC power is supplied from the-USB bus on the host (MULTI FUNCTION DIGITAL SYSTEM below symbol "B").

(*2) The MULTI FUNCTION DIGITAL SYSTEM has the following serial modes:

- DP-8500 (printing speed: 85ppm)
- DP-7200 (printing speed: 72ppm)
- DP-6000 (printing speed: 60ppm)
- DP-5200 (printing speed: 52ppm)

DP-8500 is controlled by two beams, the other models are controlled by one beam.
It is not different for these models except for printing speed depending on software.
Therefore measurements were performed to be used the specific host (DP-8500: high spec. model).

1.7.2 Operating condition

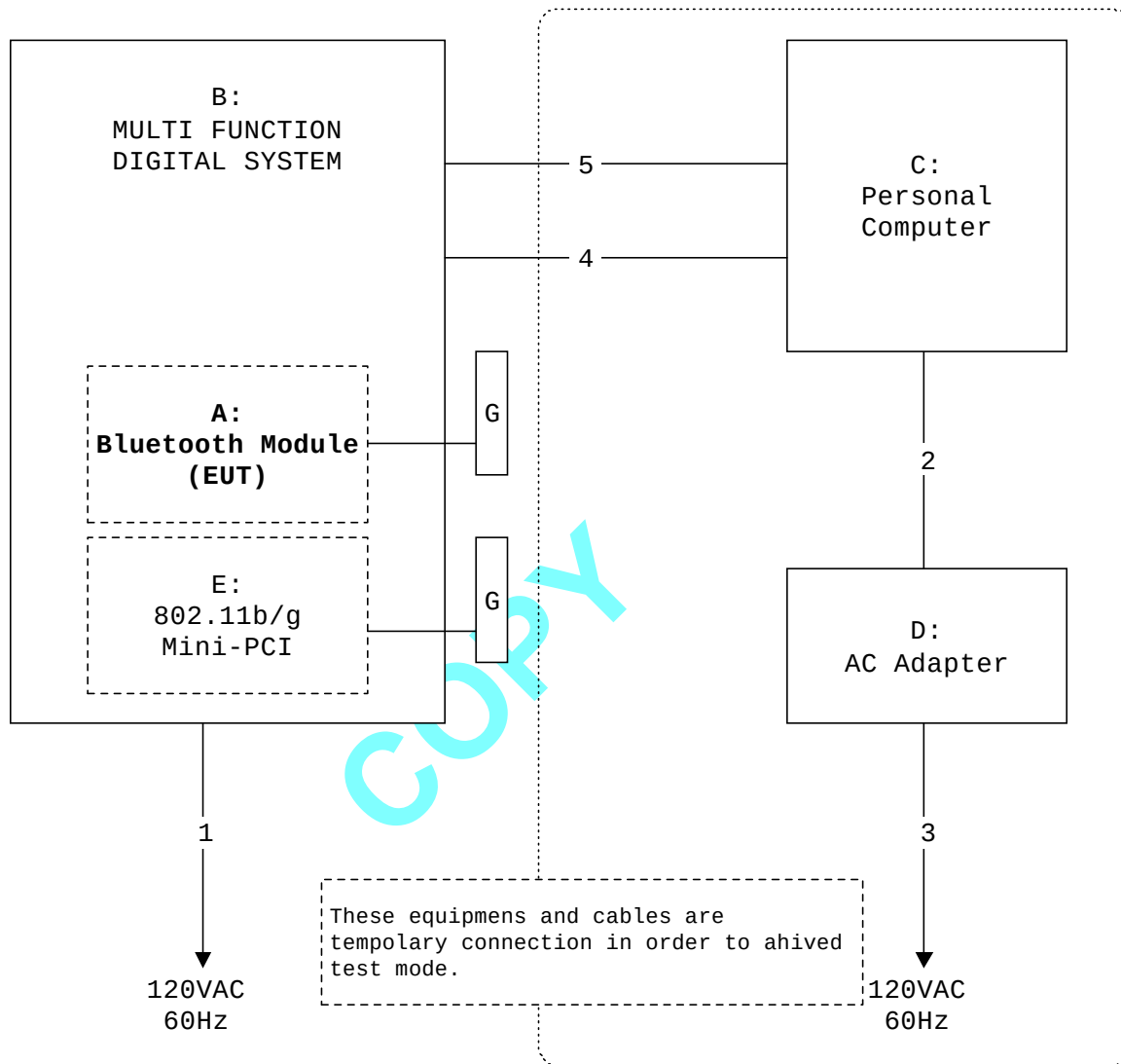
Power supply Voltage: 120VAC, 60 Hz for the HOST

The tests have been carried out the following mode.

- 1) TX mode (2402 MHz)
- 2) TX mode (2441 MHz)
- 3) TX mode (2480 MHz)
- 4) Hopping ON mode
- 5) Hopping OFF/ON mode
- 6) RX mode

COPY

1.8 EUT ARRANGEMENT (DRAWINGS)



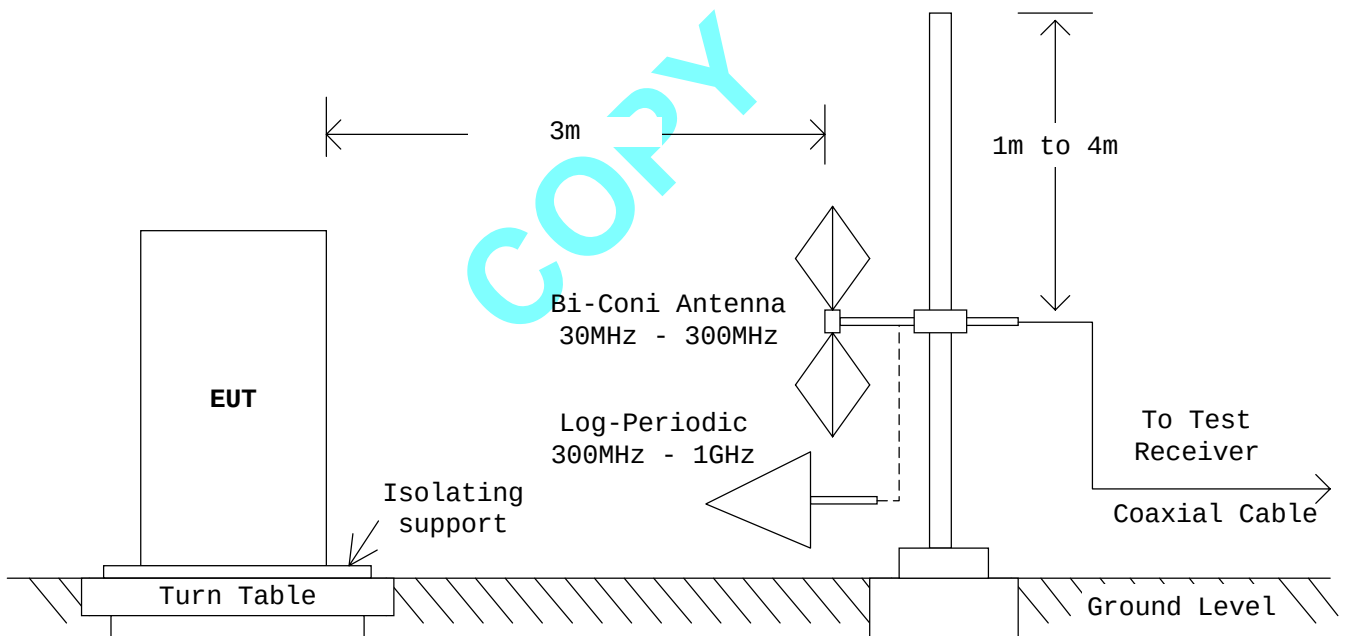
1.9 PRELIMINARY TEST AND TEST-SETUP (DRAWINGS)

1.9.10 Radiated Emission (30 MHz - 1000 MHz) :

According to description of ANSI C63.4-2003 sec.13.1.4, the preliminary radiated emissions measurement were carried out. The preliminary radiated 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. These configurations were used for the final radiated emissions measurements.

- Side View -

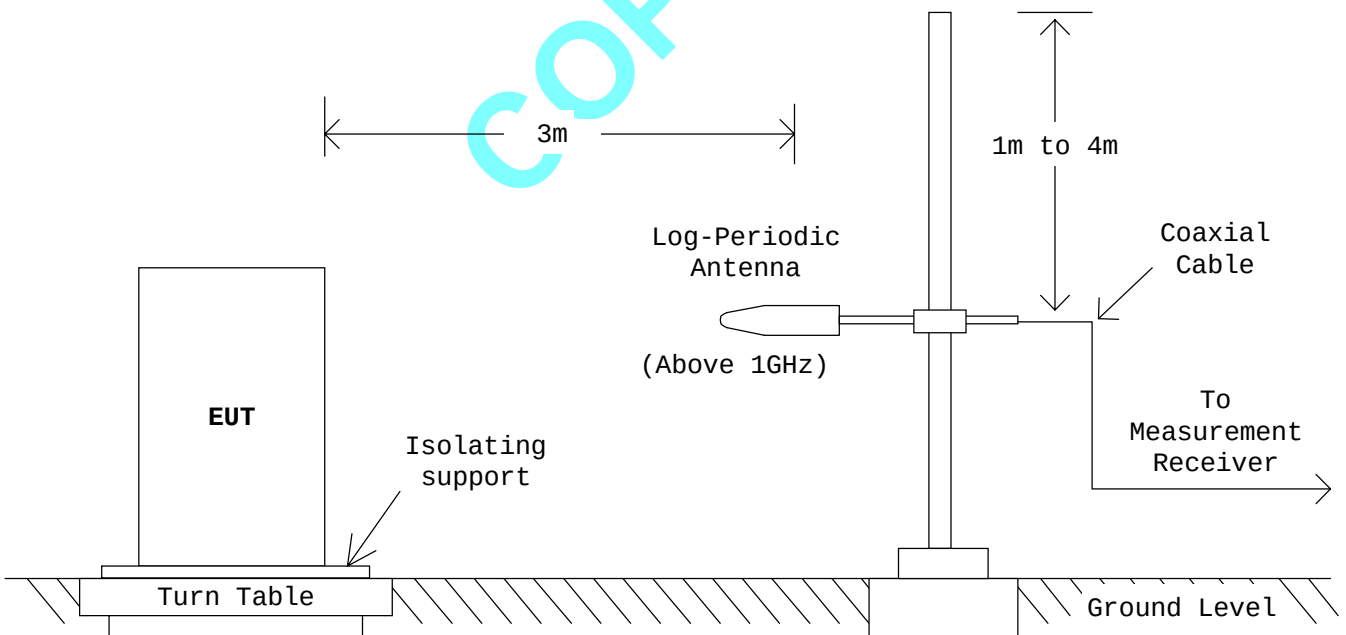


1.9.11 Radiated Emission (Above 1 GHz) :

According to description of ANSI C63.4-2003 sec.13.1.4, the preliminary radiated emissions measurements were carried out. The preliminary radiated 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. These configurations were used for the final radiated emissions measurements.

- Side View -



1.9.12 AC Power Line Conducted Emission (150 kHz - 30 MHz) :

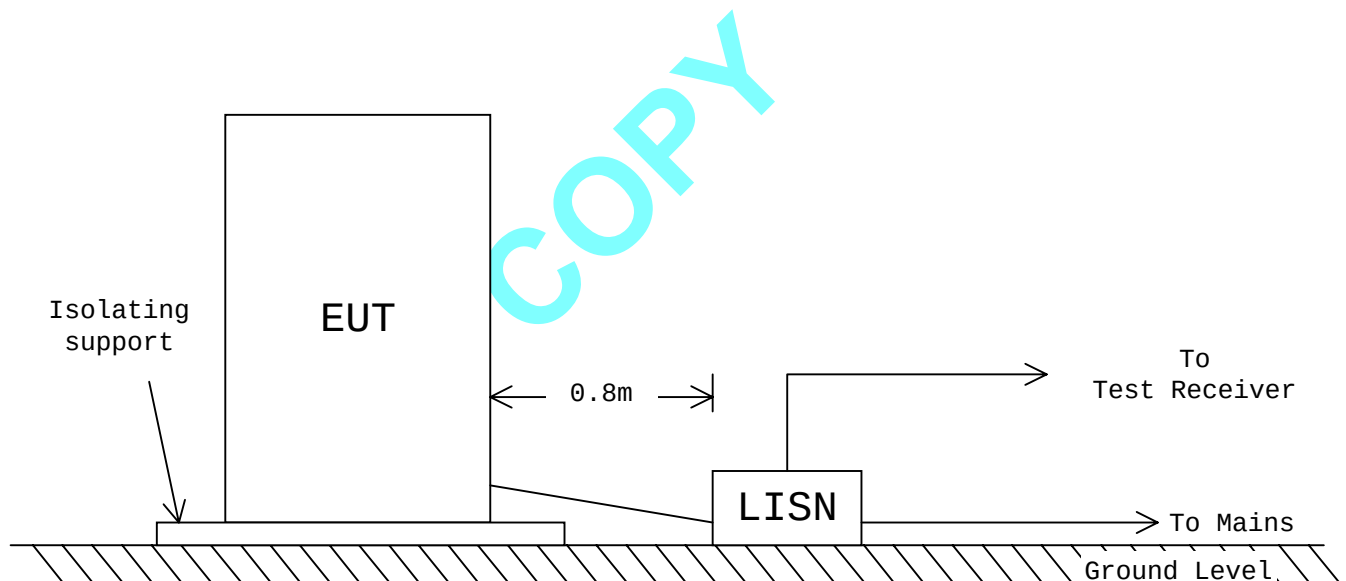
According to description of ANSI C63.4-2003 sec.13.1.3, the AC power line preliminary conducted emissions measurements were carried out.

The preliminary conducted measurements were performed using the spectrum analyzer to observe the emission characteristics of the EUT.

The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions. These configurations were used for final AC power line conducted emissions measurements.

Anechoic Chamber

- Side View -



*EUT : Equipment Under Test

*LISN : Line Impedance Stabilization Network

1.10 TEST ARRANGEMENT (PHOTOGRAPHS)

PHOTOGRAPHS OF EUT CONFIGURATION FOR RADIATED EMISSIONS MEASUREMENT

Photograph present configuration with maximum emission



- Front View -



- Rear View -

PHOTOGRAPHS OF EUT CONFIGURATION FOR AC POWER LINE CONDUCTED EMISSION MEASUREMENT
Photograph present configuration with maximum emission



- Side View -



- Rear View -

2. TEST DATA

2.1 Channel Separation
Not Applicable

2.2 Minimum Hopping Channel
Not Applicable

2.3 Occupied Bandwidth
Not Applicable

2.4 Dwell Time
Not Applicable

2.5 Peak Output Power (Conduction)
Not Applicable

2.6 Peak Output Power (Radiation)
Not Applicable

2.7 Peak Power Density (Conduction)
Not Applicable

2.8 Peak Power Density (Radiation)
Not Applicable

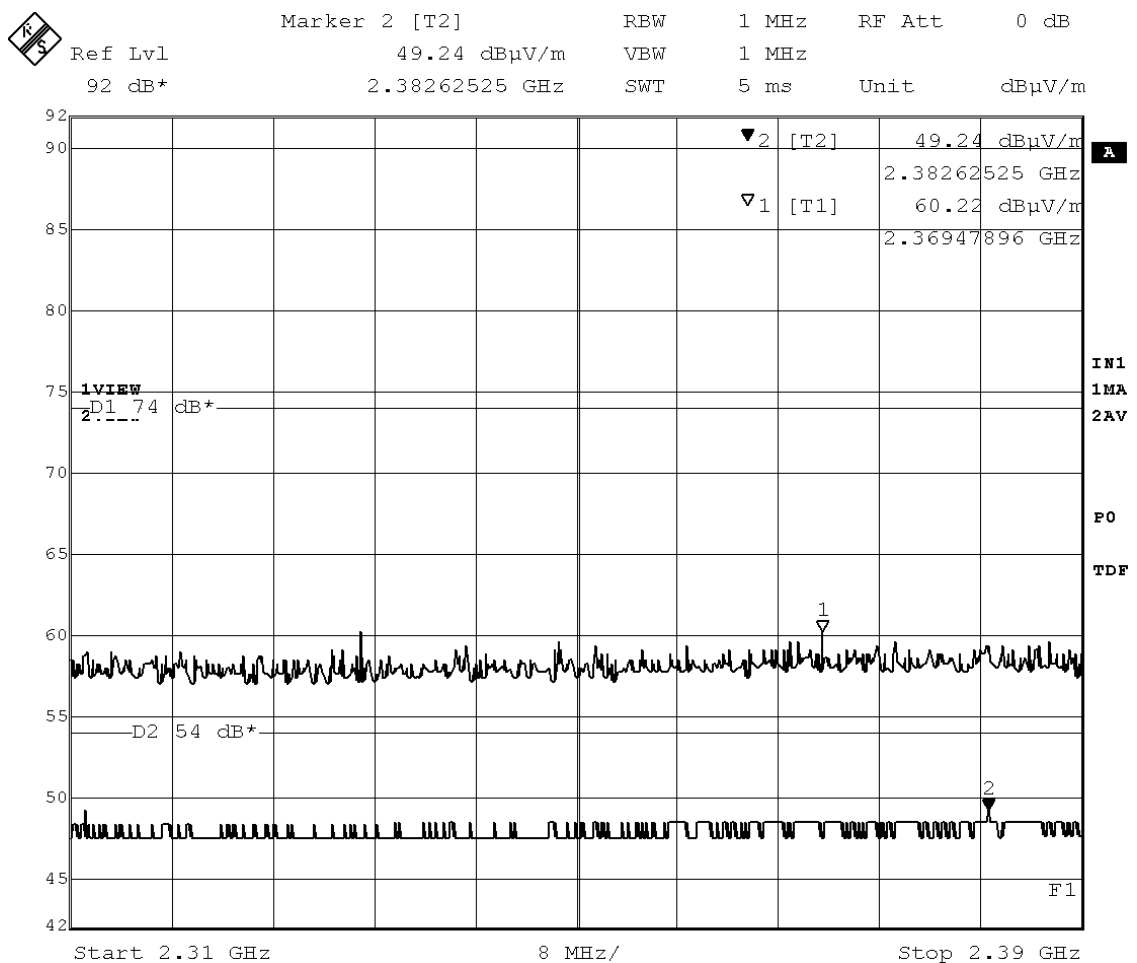
2.9 Spurious Emissions (Conduction)
Not Applicable

2.10 Spurious Emissions (Radiation)

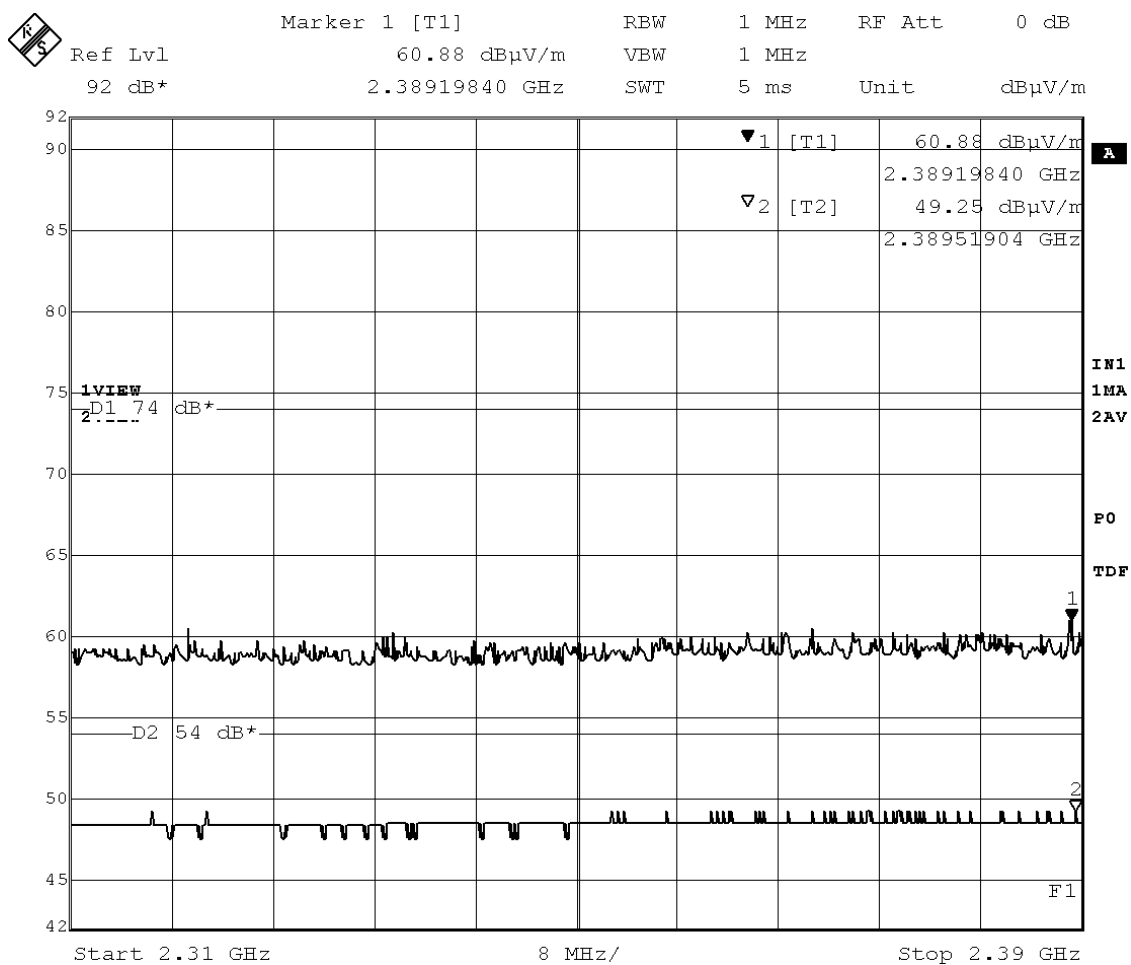
Date : January 31, 2005
 Temp.: 21 °C Humi.: 26 %

2.10.1 Band Edge Compliance

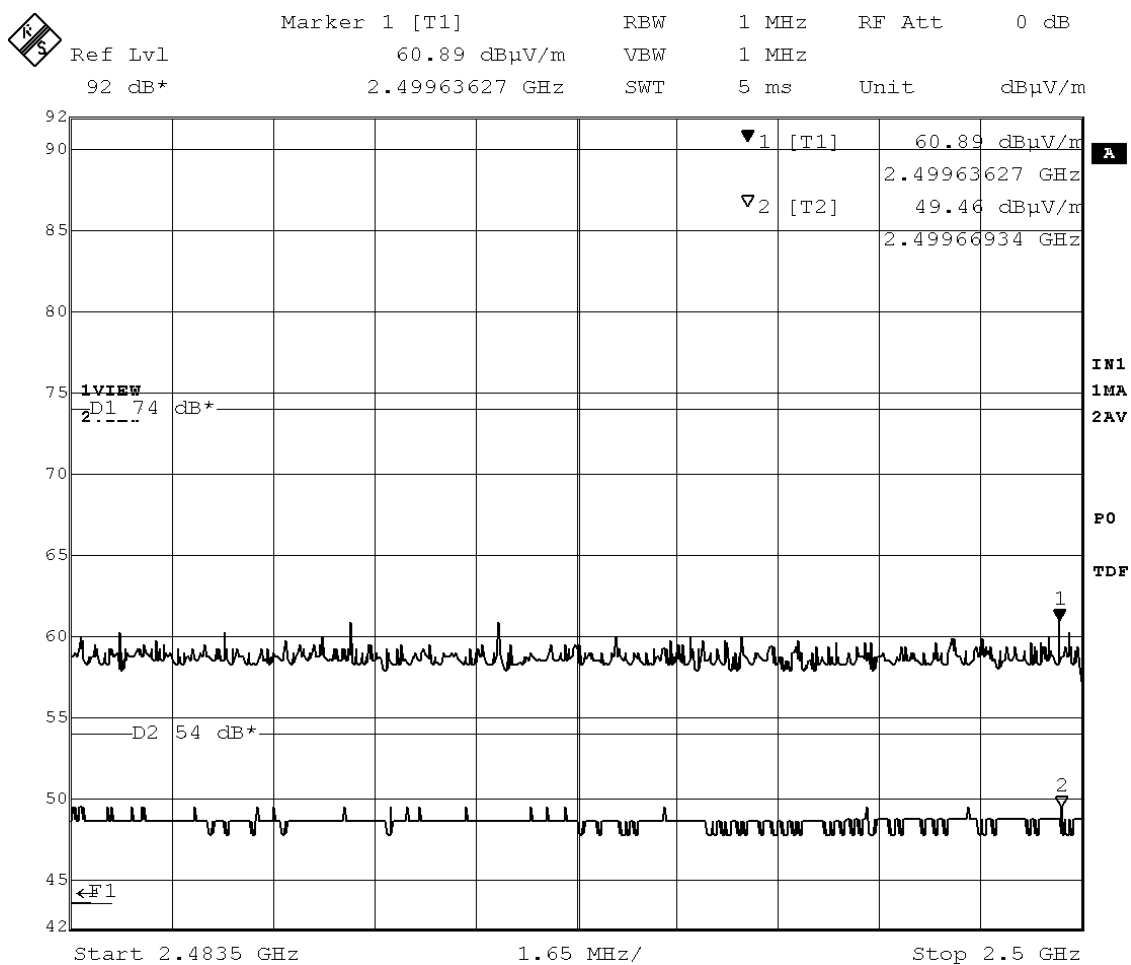
Mode of EUT : Hopping
 Test Port : Enclosure
 Antenna Polarization: Horizontal



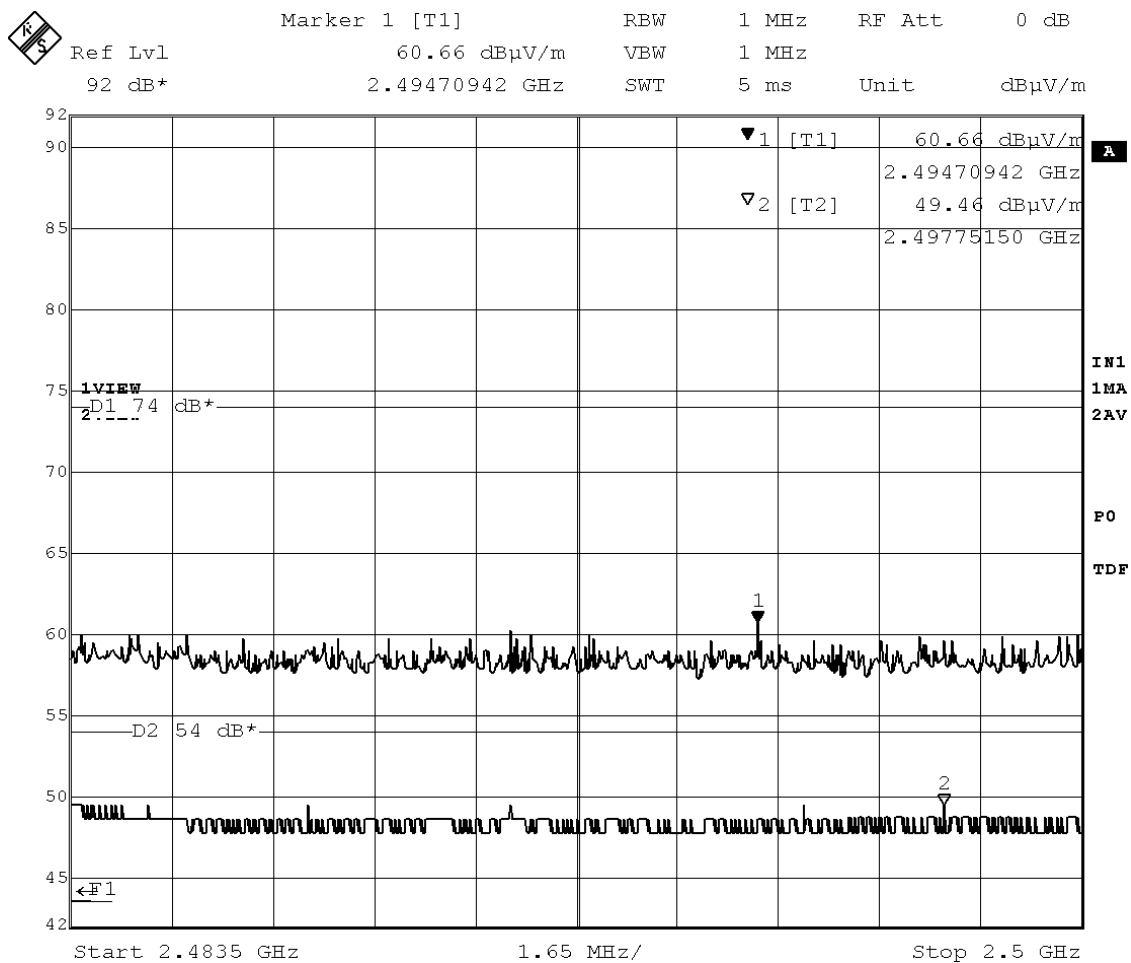
Mode of EUT : Hopping
 Test Port : Enclosure
 Antenna Polarization: Vertical



Mode of EUT : Hopping
 Test Port : Enclosure
 Antenna Polarization: Horizontal



Mode of EUT : Hopping
 Test Port : Enclosure
 Antenna Polarization: Vertical



2.10.2 Other Spurious Emissions

Test Port : Enclosure

Spurious Emissions in the frequency range from 30 MHz to 1000 MHz

Mode of EUT : TX Hopping OFF(Worst Case)

Date : February 1, 2005
 Temp. : 22°C Humi.: 32% Atmo.: 942hPa

Frequency (MHz)	Antenna Factor (dB/m)	Meter Reading (dBμV)		Limits (dBμV/m)	Emission Level (dBμV/m)		Margin (dB)		Comment
		Horiz.	Ver.		Horiz.	Ver.	Horiz.	Ver.	
30.0	19.0	4.3	12.3	40.0	23.3	31.3	16.7	8.7	
50.0	12.1	19.8	25.2	40.0	31.9	37.3	8.1	2.7	
110.0	12.9	19.0	20.0	43.5	31.9	32.9	11.6	10.6	
195.1	18.4	16.8	19.5	43.5	35.2	37.9	8.3	5.6	
210.0	18.7	15.8	18.3	43.5	34.5	37.0	9.0	6.5	
250.0	19.3	19.5	17.0	46.0	38.8	36.3	7.2	9.7	

- Notes:
- 1) Test Location : Anechoic Chamber
 - 2) Test Distance : 3 m
 - 3) The spectrum was checked from 30 MHz to 1000 MHz.
 - 4) Antenna factor includes the cable loss for 33 meter.
 - 5) The symbol of "<" means "or less".
 - 6) The symbol of ">" means "more than".
 - 7) A sample calculation was made at 30.0 MHz
 $Af + Mr = 19.0 + 12.3 = 31.3 \text{ dB}\mu\text{V/m}$
 Af : Antenna Factor Mr : Meter Reading
 - 8) Setting of measuring instrument :
 Detector Function : CISPR Quasi-Peak
 IF Bandwidth : 120 kHz

Spurious Emissions in the frequency above 1000 MHz

Mode of EUT : TX 2402 MHz

Frequency (GHz)	P-A Factor (dB)	Correction Factor (dB)	Polarization	Meter Reading (dBuV)		Limits (dBuV/m)		Emission Levels (dBuV/m)		Margins (dB)	
				AV	Peak	AV	Peak	AV	Peak	AV	Peak
4.8040	0.0	8.8	H/V	< 28.0	< 41.0	54.0	74.0	< 36.8	< 49.8	> 17.2	> 24.2
7.2060	0.0	13.3	H/V	< 28.0	< 41.0	54.0	74.0	< 41.3	< 54.3	> 12.7	> 19.7
9.6080	0.0	16.5	H/V	< 28.0	< 41.0	54.0	74.0	< 44.5	< 57.5	> 9.5	> 16.5
12.0100	0.0	18.1	H/V	< 28.0	< 41.0	54.0	74.0	< 46.1	< 59.1	> 7.9	> 14.9
14.4120	0.0	19.3	H/V	< 28.0	< 41.0	54.0	74.0	< 47.3	< 60.3	> 6.7	> 13.7

Mode of EUT : TX 2441 MHz

Frequency (GHz)	P-A Factor (dB)	Correction Factor (dB)	Polarization	Meter Reading (dBuV)		Limits (dBuV/m)		Emission Levels (dBuV/m)		Margins (dB)	
				AV	Peak	AV	Peak	AV	Peak	AV	Peak
4.8820	0.0	8.9	H/V	< 28.0	< 41.0	54.0	74.0	< 36.9	< 49.9	> 17.1	> 24.1
7.3230	0.0	13.5	H/V	< 28.0	< 41.0	54.0	74.0	< 41.5	< 54.5	> 12.5	> 19.5
9.7640	0.0	16.6	H/V	< 28.0	< 41.0	54.0	74.0	< 44.6	< 57.6	> 9.4	> 16.4
12.2050	0.0	18.3	H/V	< 28.0	< 41.0	54.0	74.0	< 46.3	< 59.3	> 7.7	> 14.7
14.6460	0.0	19.5	H/V	< 28.0	< 41.0	54.0	74.0	< 47.5	< 60.5	> 6.5	> 13.5

Mode of EUT : TX 2480 MHz

Frequency (GHz)	P-A Factor (dB)	Correction Factor (dB)	Polarization	Meter Reading (dBuV)		Limits (dBuV/m)		Emission Levels (dBuV/m)		Margins (dB)	
				AV	Peak	AV	Peak	AV	Peak	AV	Peak
4.9600	0.0	9.0	H/V	< 28.0	< 41.0	54.0	74.0	< 37.0	< 50.0	> 17.0	> 24.0
7.4400	0.0	13.7	H/V	< 28.0	< 41.0	54.0	74.0	< 41.7	< 54.7	> 12.3	> 19.3
9.9200	0.0	16.7	H/V	< 28.0	< 41.0	54.0	74.0	< 44.7	< 57.7	> 9.3	> 16.3
12.4000	0.0	18.5	H/V	< 28.0	< 41.0	54.0	74.0	< 46.5	< 59.5	> 7.5	> 14.5
14.8800	0.0	19.7	H/V	< 28.0	< 41.0	54.0	74.0	< 47.7	< 60.7	> 6.3	> 13.3

- Notes :
- 1) The spectrum was checked from 1.0 GHz to 26.5 GHz.
 - 2) The cable loss, amp. gain and antenna factor are included in the correction factor.
 - 3) The symbol of "<" means "or less".
 - 4) The symbol of ">" means "or greater".
 - 5) A sample calculation(Peak) was made at 4.804 (GHz).
 $PA + Cf + Mr = 0 + 8.8 + 41 = 49.8$ (dBuV/m)
PA = Peak to Average Factor(P-A Factor)
Cf = Correction Factor
Mr = Meter Reading
 - 6) Measuring Instrument Setting :

<u>Detector function</u>	<u>Resolution Bandwidth</u>	<u>Video Bandwidth</u>
Average(AV)	1 MHz	-
Peak	1 MHz	1 MHz

2.11AC Power Line Conducted Emissions

Date : February 1, 2005
 Temp.: 22 °C Humi.: 32 %

Mode of EUT : TX Hopping OFF(Worst Case)

Frequency (MHz)	AMN Factor (dB)	Meter Reading (dBμV)				Limits (dBμV)		Emission Level (dBμV)		Margin (dB)		Comment
		V-A Q.P	AVE	V-B Q.P	AVE	Q.P	AVE	Q.P	AVE	Q.P	AVE	
0.15	0.1	28.5	-	27.7	-	66.0	56.0	28.6	-	37.4	-	
0.19	0.1	33.7	-	35.6	-	64.0	54.0	35.7	-	28.3	-	
0.30	0.1	22.0	-	22.0	-	60.2	50.2	22.1	-	38.1	-	
0.50	0.1	15.3	-	15.3	-	56.0	46.0	15.4	-	40.6	-	
1.00	0.1	13.5	-	14.4	-	56.0	46.0	14.5	-	41.5	-	
2.29	0.1	16.7	-	16.7	-	56.0	46.0	16.8	-	39.2	-	
3.82	0.1	18.5	-	18.5	-	56.0	46.0	18.6	-	37.4	-	
8.27	0.1	43.6	-	43.7	-	60.0	50.0	43.8	-	16.2	-	
10.47	0.2	38.2	-	38.2	-	60.0	50.0	38.4	-	21.6	-	
12.43	0.2	36.7	-	37.0	-	60.0	50.0	37.2	-	22.8	-	
14.01	0.3	36.7	-	36.7	-	60.0	50.0	37.0	-	23.0	-	
21.40	0.4	19.0	-	19.0	-	60.0	50.0	19.4	-	40.6	-	
30.00	0.6	25.3	-	29.2	-	60.0	50.0	29.8	-	30.2	-	

- Notes: 1) Test Location : Anechoic Chamber
 2) The spectrum was checked from 0.15 MHz to 30 MHz
 3) AMN(Artificial Mains Network) factor includes the cable loss for 5 meter.
 4) The symbol of "<" means "or less".
 5) The symbol of ">" means "more than".
 6) The symbol of "-" means "Not applicable".
 7) V-A : One end & Ground V-B : The other end & Ground
 8) Q.P : Quasi-Peak Detector AVE : Average Detector
 9) A sample calculation was made at 0.15 MHz

$$\text{Amn} + \text{Mr} = 0.1 + 28.5 = 28.6 \text{ dB}\mu\text{V}$$

$$\text{Amn} : \text{AMN Factor} \quad \text{Mr} : \text{Meter Reading}$$

 10) Setting of measuring instrument :
 Detector Function : CISPR Quasi-Peak / Average
 IF Bandwidth : 9 kHz / 10 kHz (0.15 MHz - 30 MHz)

2.12 RF Exposure Compliance

Not Applicable

2.13 Spurious Emissions for Receiver (Radiation)

Date : February 1, 2005
 Temp.: 22 °C Humi.: 32 %

Test Port : Enclosure

Spurious Emissions in the frequency range from 30 MHz to 1000 MHz

Mode of EUT : RX Hopping OFF(Worst Case)

Frequency (MHz)	Antenna Factor (dB/m)	Meter Reading (dBμV)		Limits (dBμV/m)	Emission Level (dBμV/m)		Margin (dB)		Comment
		Horiz.	Ver.		Horiz.	Ver.	Horiz.	Ver.	
30.0	19.0	4.3	12.3	40.0	23.3	31.3	16.7	8.7	
50.0	12.1	19.8	25.2	40.0	31.9	37.3	8.1	2.7	
110.0	12.9	19.0	20.0	43.5	31.9	32.9	11.6	10.6	
195.1	18.4	15.8	18.3	43.5	34.2	36.7	9.3	6.8	
210.0	18.7	19.5	17.0	43.5	38.2	35.7	5.3	7.8	
250.0	19.3	16.8	19.5	46.0	36.1	38.8	9.9	7.2	
325.1	16.7	18.1	18.0	46.0	34.8	34.7	11.2	11.3	
375.0	18.2	19.9	13.4	46.0	38.1	31.6	7.9	14.4	
466.6	20.2	19.1	12.9	46.0	39.3	33.1	6.7	12.9	
620.0	22.8	18.1	19.9	46.0	40.9	42.7	5.1	3.3	
700.0	23.7	16.5	12.8	46.0	40.2	36.5	5.8	9.5	
901.9	25.8	11.0	8.8	46.0	36.8	34.6	9.2	11.4	

- Notes: 1) Test Location : Anechoic Chamber
 2) Test Distance : 3 m
 3) The spectrum was checked from 30 MHz to 1000 MHz.
 4) Antenna factor includes the cable loss for 33 meter.
 5) The symbol of "<" means "or less".
 6) The symbol of ">" means "more than".
 7) A sample calculation was made at 30.0 MHz
 $Af + Mr = 19.0 + 12.3 = 31.3 \text{ dB}\mu\text{V/m}$
 Af : Antenna Factor Mr : Meter Reading
 8) Setting of measuring instrument :
 Detector Function : CISPR Quasi-Peak
 IF Bandwidth : 120 kHz

Spurious Emissions in the frequency above 1000 MHz

Mode of EUT : RX (1ch: 2402 MHz)

Frequency (GHz)	P-A Factor (dB)	Correction Factor (dB)	Polarization	Meter Reading (dBuV)		Limits (dBuV/m)		Emission Levels (dBuV/m)		Margins (dB)	
				AV	Peak	AV	Peak	AV	Peak	AV	Peak
1.0200	0.0	-6.7	V	45.8	49.2	54.0	74.0	39.1	42.5	14.9	31.5
1.0668	0.0	-6.2	H	42.3	50.0	54.0	74.0	36.1	43.8	17.9	30.2
1.6000	0.0	-1.2	V	34.7	50.0	54.0	74.0	33.5	48.8	20.5	25.2
1.9200	0.0	-0.1	V	43.3	47.6	54.0	74.0	43.2	47.5	10.8	26.5
2.4005	0.0	2.2	V	38.6	45.3	54.0	74.0	40.8	47.5	13.2	26.5
4.8010	0.0	8.8	H/V	< 28.0	< 41.0	54.0	74.0	< 36.8	< 49.8	> 17.2	> 24.2
5.2800	0.0	9.6	V	35.6	42.9	54.0	74.0	45.2	52.5	8.8	21.5
7.2015	0.0	13.3	H/V	< 28.0	< 41.0	54.0	74.0	< 41.3	< 54.3	> 12.7	> 19.7
9.6020	0.0	16.5	H/V	< 28.0	< 41.0	54.0	74.0	< 44.5	< 57.5	> 9.5	> 16.5

Mode of EUT : RX (6ch: 2441 MHz)

Frequency (GHz)	P-A Factor (dB)	Correction Factor (dB)	Polarization	Meter Reading (dBuV)		Limits (dBuV/m)		Emission Levels (dBuV/m)		Margins (dB)	
				AV	Peak	AV	Peak	AV	Peak	AV	Peak
1.0200	0.0	-6.7	V	45.8	49.2	54.0	74.0	39.1	42.5	14.9	31.5
1.0668	0.0	-6.2	H	42.3	50.0	54.0	74.0	36.1	43.8	17.9	30.2
1.6000	0.0	-1.2	V	34.7	50.0	54.0	74.0	33.5	48.8	20.5	25.2
1.9200	0.0	-0.1	V	43.3	47.6	54.0	74.0	43.2	47.5	10.8	26.5
2.4395	0.0	2.3	V	40.2	44.7	54.0	74.0	42.5	47.0	11.5	27.0
4.8790	0.0	8.9	H/V	< 28.0	< 41.0	54.0	74.0	< 36.9	< 49.9	> 17.1	> 24.1
5.2800	0.0	9.6	V	35.6	42.9	54.0	74.0	45.2	52.5	8.8	21.5
7.3185	0.0	13.5	H/V	< 28.0	< 41.0	54.0	74.0	< 41.5	< 54.5	> 12.5	> 19.5
9.7580	0.0	16.6	H/V	< 28.0	< 41.0	54.0	74.0	< 44.6	< 57.6	> 9.4	> 16.4

Mode of EUT : RX (11ch: 2480 MHz)

Frequency (GHz)	P-A Factor (dB)	Correction Factor (dB)	Polarization	Meter Reading (dBuV)		Limits (dBuV/m)		Emission Levels (dBuV/m)		Margins (dB)	
				AV	Peak	AV	Peak	AV	Peak	AV	Peak
1.0200	0.0	-6.7	V	45.8	49.2	54.0	74.0	39.1	42.5	14.9	31.5
1.0668	0.0	-6.2	H	42.3	50.0	54.0	74.0	36.1	43.8	17.9	30.2
1.6000	0.0	-1.2	V	34.7	50.0	54.0	74.0	33.5	48.8	20.5	25.2
1.9200	0.0	-0.1	V	43.3	47.6	54.0	74.0	43.2	47.5	10.8	26.5
2.4785	0.0	2.3	V	38.3	43.6	54.0	74.0	40.6	45.9	13.4	28.1
4.9570	0.0	9.0	H/V	< 28.0	< 41.0	54.0	74.0	< 37.0	< 50.0	> 17.0	> 24.0
5.2800	0.0	9.6	V	35.6	42.9	54.0	74.0	45.2	52.5	8.8	21.5
7.4355	0.0	13.7	H/V	< 28.0	< 41.0	54.0	74.0	< 41.7	< 54.7	> 12.3	> 19.3
9.9140	0.0	16.7	H/V	< 28.0	< 41.0	54.0	74.0	< 44.7	< 57.7	> 9.3	> 16.3

- Notes : 1) The spectrum was checked from 1.0 GHz to 26.5 GHz.
 2) The cable loss, amp. gain and antenna factor are included in the correction factor.
 3) The symbol of "<" means "or less".
 4) The symbol of ">" means "or greater".
 5) A sample calculation(Peak) was made at 1.02 (GHz).
 $PA + Cf + Mr = 0 + -6.7 + 49.2 = 42.5 \text{ (dBuV/m)}$
 PA = Peak to Average Factor(P-A Factor)
 Cf = Correction Factor
 Mr = Meter Reading
 6) Measuring Instrument Setting :

Detector function	Resolution Bandwidth	Video Bandwidth
Average(AV)	1 MHz	-
Peak	1 MHz	1 MHz

2.14AC Power Line Conducted Emissions for Receiver

Date : February 1, 2005
 Temp.: 22 °C Humi.: 32 %

Mode of EUT : RX Hopping OFF(Worst Case)

Frequency (MHz)	AMN	Meter Reading (dBμV)				Limits		Emission Level		Margin		Comment
	Factor	V-A		V-B		(dBμV)		(dBμV)		(dB)		
	(dB)	Q.P	AVE	Q.P	AVE	Q.P	AVE	Q.P	AVE	Q.P	AVE	
0.15	0.1	28.5	-	27.7	-	66.0	56.0	28.6	-	37.4	-	
0.19	0.1	33.7	-	35.6	-	64.0	54.0	35.7	-	28.3	-	
0.30	0.1	22.0	-	22.0	-	60.2	50.2	22.1	-	38.1	-	
0.50	0.1	15.3	-	15.3	-	56.0	46.0	15.4	-	40.6	-	
1.00	0.1	13.5	-	14.4	-	56.0	46.0	14.5	-	41.5	-	
2.29	0.1	16.7	-	16.7	-	56.0	46.0	16.8	-	39.2	-	
3.82	0.1	18.5	-	18.5	-	56.0	46.0	18.6	-	37.4	-	
8.27	0.1	43.6	-	43.7	-	60.0	50.0	43.8	-	16.2	-	
10.47	0.2	38.2	-	38.2	-	60.0	50.0	38.4	-	21.6	-	
12.43	0.2	36.7	-	37.0	-	60.0	50.0	37.2	-	22.8	-	
14.01	0.3	36.7	-	36.7	-	60.0	50.0	37.0	-	23.0	-	
21.40	0.4	19.0	-	19.0	-	60.0	50.0	19.4	-	40.6	-	
30.00	0.6	25.3	-	29.2	-	60.0	50.0	29.8	-	30.2	-	

- Notes: 1) Test Location : Anechoic Chamber
 2) The spectrum was checked from 0.15 MHz to 30 MHz
 3) AMN(Artificial Mains Network) factor includes the cable loss for 5 meter.
 4) The symbol of "<" means "or less".
 5) The symbol of ">" means "more than".
 6) The symbol of "-" means "Not applicable".
 7) V-A : One end & Ground V-B : The other end & Ground
 8) Q.P : Quasi-Peak Detector AVE : Average Detector
 9) A sample calculation was made at 0.15 MHz

$$\text{Amn} + \text{Mr} = 0.1 + 28.5 = 28.6 \text{ dB}\mu\text{V}$$

$$\text{Amn} : \text{AMN Factor} \quad \text{Mr} : \text{Meter Reading}$$

 10) Setting of measuring instrument :
 Detector Function : CISPR Quasi-Peak / Average
 IF Bandwidth : 9 kHz / 10 kHz (0.15 MHz - 30 MHz)



JQA File No.
Model No.
Standard

:441-41217
:F616
:CFR 47 FCC Rules Part 15

FCC ID:BJI-F616

IC:1004C-F616

Issue Date :February 4, 2005

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Appendix

Test Instruments List

COPY

January 30, 2005

Test Receivers

No.	Type	Model	Manufacturer	Serial	Last Cal.	Interval
TR01	Test Receiver	ESH2	Rohde & Schwarz	880370/016	May 2004	1 Year
TR02	Test Receiver	ESH3	Rohde & Schwarz	881460/030	May 2004	1 Year
TR03	Test Receiver	ESHS10	Rohde & Schwarz	835871/004	May 2004	1 Year
TR04	Test Receiver	ESV	Rohde & Schwarz	872148/039	May 2004	1 Year
TR05	Test Receiver	ESVS10	Rohde & Schwarz	826148/002	May 2004	1 Year
TR06	Test Receiver	ESI7	Rohde & Schwarz	100059	Nov 2004	1 Year
TR07	Test Receiver	ESI26	Rohde & Schwarz	100043	Aug 2004	1 Year

Spectrum Analyzers

No.	Type	Model	Manufacturer	Serial	Last Cal.	Interval
SA01	Spectrum Analyzer	8560E	Hewlett Packard	3240A00189	Oct. 2004	1 Year
SA02	Spectrum Analyzer	8566B	Hewlett Packard	2140A01091	Oct. 2004	1 Year
SA03	RF Pre-selector	85685A	Hewlett Packard	2648A00522	Oct. 2004	1 Year
SA04	Spectrum Analyzer	8566B	Hewlett Packard	2747A05855	Apr. 2004	1 Year
SA05	RF Pre-selector	85685A	Hewlett Packard	2901A00933	Apr. 2004	1 Year
SA06	Spectrum Analyzer	R3132	ADVANTEST	120500072	Sep. 2004	1 Year
SA07	Spectrum Analyzer	R3182	ADVANTEST	120600581	Mar. 2004	1 Year

Antennas

No.	Type	Model	Manufacturer	Serial	Last Cal.	Interval
AN01	Loop Antenna	HFH2-Z2	Rohde & Schwarz	881058/61	May. 2004	1 Year
AN02	Dipole Antenna	KBA-511	Kyoritsu	0-170-1	Nov. 2004	1 Year
AN03	Dipole Antenna	KBA-511A	Kyoritsu	0-201-13	Nov. 2004	1 Year
AN04	Dipole Antenna	KBA-611	Kyoritsu	0-147-14	Nov. 2004	1 Year
AN05	Dipole Antenna	KBA-611	Kyoritsu	0-210-5	Nov. 2004	1 Year
AN06	Biconical Antenna	BBA9106	Schwarzbeck	VHA91031516	May 2004	1 Year
AN07	Biconical Antenna	BBA9106	Schwarzbeck	-	Nov. 2004	1 Year
AN08	Log-peri. Antenna	UHALP9108	Schwarzbeck	0278	May 2004	1 Year
AN09	Log-peri. Antenna	UHALP9107	Schwarzbeck	-	Nov. 2004	1 Year
AN10	Log-peri. Antenna	HL025	Rohde & Schwarz	340182/015	Jan. 2005	1 Year
AN11	Horn Antenna	3115	EMC Test Systems	6442	Jan. 2005	1 Year
AN12	Horn Antenna	3116	EMC Test Systems	2547	May 2003	2 Year

Networks

No.	Type	Model	Manufacturer	Serial	Last Cal.	Interval
NE01	LISN	KNW-407	Kyoritsu	8-833-5	Nov. 2004	1 Year
NE02	LISN	KNW-407	Kyoritsu	8-757-1	Jun. 2004	1 Year
NE03	LISN	KNW-407	Kyoritsu	8-1130-6	Apr. 2004	1 Year
NE04	LISN	KNW-242C	Kyoritsu	8-837-13	Apr. 2004	1 Year
NE05	Absorbing Clamp	MDS21	Luthi	03293	Aug. 2004	1 Year

Cables

No.	Type	Model	Manufacturer	Serial	Last Cal.	Interval
CA01	RF Cable	20D/5D-2W	Fujikura	-	May 2004	1 Year
CA02	RF Cable	5D-2W	Fujikura	-	Feb. 2004	1 Year
CA03	RF Cable	3D-2W	Fujikura	-	May 2004	1 Year
CA04	RF Cable	3D-2W	Fujikura	-	Apr. 2004	1 Year
CA05	RF Cable	3D-2W	Fujikura	-	Apr. 2004	1 Year
CA06	RF Cable	RG213/U	Rohde & Schwarz	-	Apr. 2004	1 Year
CA07	RF Cable(10m)	S 04272B	Suhner	-	May 2004	1 Year
CA08	RF Cable(2m 18GHz)	SUCOFLEX 104	Suhner	-	May 2004	1 Year
CA09	RF Cable(1m 18GHz)	SUCOFLEX 104	Suhner	-	May 2004	1 Year
CA10	RF Cable(1m N)	S 04272B	Suhner	-	May 2004	1 Year
CA11	RF Cable(1m 26GHz)	SUCOFLEX 104	Suhner	182811/4	Dec. 2004	1 Year
CA12	RF Cable(4m 26GHz)	SUCOFLEX 104	Suhner	190630	Dec. 2004	1 Year
CA13	RF Cable(10m)	F130-S1S1-394	MEGA PHASE	10510	Dec. 2004	1 Year
CA14	RF Cable(7m)	3D-2W	Fujikura	-	Apr. 2004	1 Year
CA15	RF Cable(7m)	RG223/U	Suhner	-	May 2004	1 Year

Amplifiers

No.	Type	Model	Manufacturer	Serial	Last Cal.	Interval
AM01	AF Amplifier	P-500L	Accuphase	BOY806	Feb. 2004	1 Year
AM02	RF Amplifier	8447D	Hewlett Packard	1937A02168	May 2004	1 Year
AM03	RF Amplifier	8447D	Hewlett Packard	2944A07289	May 2004	1 Year
AM05	RF Amplifier	DBP-0102N533	DBS Microwave	012	Jun. 2004	1 Year
AM06	RF Amplifier	WJ-6882-814	Watkins-Johnson	0414	Jun. 2004	1 Year
AM07	RF Amplifier	WJ-5315-556	Watkins-Johnson	106	Jun. 2004	1 Year
AM08	RF Amplifier	WJ-5320-307	Watkins-Johnson	645	Jun. 2004	1 Year
AM09	RF Amplifier	JS4-00102600 -28-5A	MITEQ	669167	Apr. 2004	1 Year

Signal Generators

No.	Type	Model	Manufacturer	Serial	Last Cal.	Interval
SG01	Function Generator	3325B	Hewlett Packard	2847A03284	Jul. 2004	1 Year
SG02	Function Generator	VP-7422A	Matsushita Communication	050351E122	Jul. 2004	1 Year
SG03	Signal Generator	8664A	Hewlett Packard	3035A00140	Jun. 2004	1 Year
SG04	Signal Generator	8664A	Hewlett Packard	3438A00756	Jun. 2004	1 Year
SG05	Signal Generator	6061A	Gigatronics	5130593	Mar. 2004	1 Year

Auxiliary Equipment

No.	Type	Model	Manufacturer	Serial	Last Cal.	Interval
AU01	Termination(50)	BNC-P-1.5	TDC	-	Mar. 2004	1 Year
AU02	Termination(50)	-	Suhner	-	Jan. 2005	1 Year
AU03	Power Meter	436A	Hewlett Packard	1725A01930	Apr. 2004	1 Year
AU04	Power Sensor	8482A	Hewlett Packard	1551A01013	Apr. 2004	1 Year
AU05	Power Sensor	8485A	Hewlett Packard	2942A08969	Apr. 2004	1 Year
AU06	FM Linear Detector	MS61A	Anritsu	M77486	Oct. 2004	1 Year
AU07	Level Meter	ML422C	Anritsu	M87571	Jun. 2004	1 Year
AU08	Measuring Amplifier	2636	B & K	1614851	May 2004	1 Year
AU09	Microphone	4134	B & K	1269477	May 2004	1 Year
AU10	Preamplifier	2639	B & K	1268763	May 2004	1 Year
AU11	Pistonphone	4220	B & K	1165008	Mar. 2004	1 Year
AU12	Artificial Mouth	4227	B & K	1274869	N/A	N/A
AU13	Frequency Counter	53131A	Hewlett Packard	3546A11807	May 2004	1 Year
AU14	Oven	-	Ohnishi	-	May 2004	1 Year
AU15	DC Power Supply	6628A	Hewlett Packard	3224A00284	Jun. 2004	1 Year
AU16	Band Reject Filter	BRM12294	Micro-tronics	003	Jan. 2004	1 Year
AU17	High Pass Filter	F-100-4000-5-R	RLC Electronics	0149	Feb. 2004	1 Year
AU18	Attenuator	43KC-10	Anritsu	-	Feb. 2004	1 Year
AU19	Attenuator	43KC-20	Anritsu	-	Feb. 2004	1 Year
AU20	Attenuator	355D	Hewlett Packard	219-10782	Apr. 2004	1 Year
AU21	FFT Analyzer	R9211C	Advantest	02020253	Jun. 2004	1 Year
AU22	Noise Meter	MN-446	Meguro	53030478	Apr. 2004	1 Year
AU23	Digitizing Oscilloscope	54502A	Hewlett Packard	2934A05573	May 2004	1 Year
AU24	RF Detector	75KC50	Anritsu	305002	Jul. 2004	1 Year