



JAPAN QUALITY ASSURANCE ORGANIZATION

21-25, KINUTA 1-CHOME, SETAGAYA-KU, TOKYO 157-8573 JAPAN

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JQA APPLICATION NO.: 400-10722

Issue Date : March 6, 2002

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EMI TEST REPORT

JQA APPLICATION NO. : 400-10722

Model No. : LQ300A00

Type of Equipment : Insertion Type Density Meter

Regulations Applied : CFR 47 FCC Rules and Regulations Part 15

FCC ID : M8D62372311

Applicant : Toshiba Corporation Social Infrastructure Systems Company

Address : 1, Toshiba-cho, Fuchu-shi,
Tokyo 183-8511, Japan

Manufacture : Toshiba Corporation Social Infrastructure Systems Company

Address : 1, Toshiba-cho, Fuchu-shi,
Tokyo 183-8511, Japan

Received date of EUT : February 4, 2002

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 Communication Research Laboratory (CRL) 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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1 DOCUMENTATION

1.1 TEST REGULATION

FCC Rules and Regulations Part 15 Subpart A and C (June 23, 1989) Intentional Radiators

Test procedure :

AC power line conducted emission, radiated emission, frequency stability and occupied bandwidth tests were performed according to the procedures in ANSI C63.4-1992.

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 : June 04, 2002

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, 2002)

1.2.2 Description of the Equipment Under Test (EUT) :

- | | |
|--------------------------------------|---|
| 1) Type of Equipment | : Insertion Type Density Meter |
| 2) Product Type | : Prototype |
| 3) Category | : Low Power Transceiver, Rx Verified |
| 4) EUT Authorization | : Certification |
| 5) FCC ID | : M8D62372311 |
| 6) Trade Name | : LQ300A00 |
| 7) Model No. | : LQ300A00 |
| 8) Operating Frequency Range | : 1825 MHz - 1975 MHz |
| 9) Highest Frequency Used in the EUT | : 1975 MHz |
| 10) Serial No. | : - |
| 11) Date of Manufacture | : - |
| 12) Power Rating | : 120 VAC, 60 Hz |
| 13) EUT Grounding | : Grounded at the plug end of the power line cord |

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 the AC Power Line Conducted Emission

☒ - was performed in the following test site.

☐ - was not applicable.

Test location :

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

☒ - Shielded Enclosure

☐ - Anechoic Chamber No. 2 (portable Type)

Used test instruments :

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
<input type="checkbox"/> - Test Receiver	ESH-2	Rohde & Schwarz	880370/016	June 2001	1 Year
<input type="checkbox"/> - Test Receiver	ESH-3	Rohde & Schwarz	881460/030	May 2001	1 Year
<input type="checkbox"/> - Test Receiver	ESHS10	Rohde & Schwarz	835871/004	Aug. 2001	1 Year
<input checked="" type="checkbox"/> - Test Receiver	ESI26	Rohde & Schwarz	100043	Aug. 2001	1 Year
<input type="checkbox"/> - LISN(for Peripheral)	KNW-407	Kyoritsu Electrical	8-833-6	Apr. 2001	1 Year
<input checked="" type="checkbox"/> - LISN(for EUT)	KNW-407	Kyoritsu Electrical	8-855-2	Apr. 2001	1 Year
<input type="checkbox"/> - LISN	KNW-407	Kyoritsu Electrical	8-757-1	Apr. 2001	1 Year
<input checked="" type="checkbox"/> - RF Cable	3D-2W	Fujikura	155-21-006E0	Apr. 2001	1 Year
<input type="checkbox"/> - RF Cable	3D-2W	Fujikura	155-21-007E0	Apr. 2001	1 Year
<input type="checkbox"/> - 50ohm Termination	-	SUHNER	154-06-501E0	Jan. 2002	1 Year
<input type="checkbox"/> - 50ohm Termination	-	SUHNER	154-06-502E0	Jan. 2002	1 Year

1.3.2 The measurement of the Radiated Emission(9 kHz - 30 MHz)

x - was performed in the following test site.

___ - was not applicable.

Test location :

Safety & EMC Center EMC Engineering Dept. Testing Div.

21-25, Kinuta 1-chome, Setagaya-ku, Tokyo 157-8573, Japan

___ - Anechoic Chamber No. 2 (3 meters)

x - Anechoic Chamber No. 3 (3 meters)

Validation of Site Attenuation :

1) Last Confirmed Date : N/A

2) Interval : N/A

Used test instruments :

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
___ - Test Receiver	ESH-2	Rohde & Schwarz	880370/016	June 2001	1 Year
___ - Test Receiver	ESH-3	Rohde & Schwarz	881460/030	May 2001	1 Year
___ - Test Receiver	ESHS10	Rohde & Schwarz	835871/004	Aug 2001	1 Year
<u>x</u> - Test Receiver	ESI26	Rohde & Schwarz	100043	Aug. 2001	1 Year
<u>x</u> - Antenna	HFH2-Z2	Rohde & Schwarz	881058/62	Nov 2001	1 Year
<u>x</u> - RF Cable	RG-213/U	F & G	155-21-010E0	Apr. 2001	1 Year

1.3.3 The measurement of the Radiated Emission(30 MHz - 1000 MHz)

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

Test location :

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

- ☐ - Anechoic Chamber No. 2 (3 meters)
☒ - Anechoic Chamber No. 3 (3 meters)

Validation of Site Attenuation :

- 1) Last Confirmed Date :March, 2001
 2) Interval :1 year

Used test instruments :

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
<input type="checkbox"/> - Spectrum Analyzer	8560E	Hewlett Packard	3240A00189	Nov. 2001	1 Year
<input type="checkbox"/> - Spectrum Analyzer	8566B	Hewlett Packard	2140A01091	Apr. 2001	1 Year
<input type="checkbox"/> - RF Pre-selector	85685A	Hewlett Packard	2648A00522	Apr. 2001	1 Year
<input type="checkbox"/> - Spectrum Analyzer	8566B	Hewlett Packard	2747A05855	June 2001	1 Year
<input type="checkbox"/> - RF Pre-selector	85685A	Hewlett Packard	2091A00933	June 2001	1 Year
<input type="checkbox"/> - Test Receiver	ESV	Rohde & Schwarz	872148/039	June 2001	1 Year
<input type="checkbox"/> - Test Receiver	ESVS10	Rohde & Schwarz	826148/002	May 2001	1 Year
<input checked="" type="checkbox"/> - Test Receiver	ESVS10	Rohde & Schwarz	832699/001	May 2001	1 Year
<input type="checkbox"/> - Antenna	KBA-511	Kyoritsu Electrical	0-170-1	Nov. 2001	1 Year
<input type="checkbox"/> - Antenna	KBA-511A	Kyoritsu Electrical	0-201-13	Nov. 2001	1 Year
<input type="checkbox"/> - Antenna	KBA-611	Kyoritsu Electrical	0-147-14	Nov. 2001	1 Year
<input type="checkbox"/> - Antenna	KBA-611	Kyoritsu Electrical	0-210-5	Nov. 2001	1 Year
<input type="checkbox"/> - Biconical Antenna	BBA9106	Schwarzbeck	VHA91031150	Nov. 2001	1 Year
<input checked="" type="checkbox"/> - Biconical Antenna	BBA9106	Schwarzbeck	11905078E0	Nov. 2001	1 Year
<input type="checkbox"/> - Log-Periodic Antenna	UHALP9107	Schwarzbeck	11905079E0	Nov. 2001	1 Year
<input checked="" type="checkbox"/> - Log-Periodic Antenna	UHALP9107	Schwarzbeck	11905110	Nov. 2001	1 Year
<input type="checkbox"/> - RF Cable	5D-2W	Fujikura	155-21-001E0	Feb. 2002	1 Year
<input checked="" type="checkbox"/> - RF Cable	5D-2W	Fujikura	155-21-002E0	Feb. 2002	1 Year

1.3.4 The measurement of the Radiated Emission(Above 1000 MHz) x - was performed in the following test site. - was not applicable.**Test location :**

Safety & EMC Center EMC Engineering Dept. Testing Div.

21-25, Kinuta 1-chome, Setagaya-ku, Tokyo 157-8573, Japan

 - No. 2 site (3 meters) x - No. 3 site (3 meters)**Validation of Site Attenuation :**

1) Last Confirmed Date : N/A

2) Interval : N/A

Used test instruments :

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
<u> </u> - Spectrum Analyzer	8560E	Hewlett Packard	3240A00189	Nov. 2001	1 Year
<u> </u> - Spectrum Analyzer	8566B	Hewlett Packard	2140A01091	Apr. 2001	1 Year
<u> </u> - RF Pre-selector	85685A	Hewlett Packard	2648A00522	Apr. 2001	1 Year
<u> </u> - Spectrum Analyzer	8566B	Hewlett Packard	2747A05855	June 2001	1 Year
<u> </u> - RF Pre-selector	85685A	Hewlett Packard	2091A00933	June 2001	1 Year
<u> x </u> Test Receiver	ES126	Rohde & Schwarz	100043	Aug. 2001	1 Year
<u> x </u> - Log-Periodic Antenna	HL 025	Rohde & Schwarz	340182/015	Nov. 2001	1 Year
<u> x </u> - Horn Antenna	3116	EMC Test Systems	2547	May 2001	1 Year
<u> </u> - RF Amplifier	DBP-0102N5334272B	DBS Microwave Inc.	012	Mar. 2001	1 Year
<u> </u> - RF Amplifier	WJ-6882-814	Watkins-Johnson	0414	June 2001	1 Year
<u> </u> - RF Amplifier	WJ-5315-556	Watkins-Johnson	106	June 2001	1 Year
<u> </u> - RF Amplifier	WJ-5320-307	Watkins-Johnson	645	June 2001	1 Year
<u> x </u> - RF Amplifier	JS4-00102600-28-5A	MITEQ	669167	Oct. 2001	1 Year
<u> </u> - RF Cable(10m)	S 04272B	Suhner	155-21-011E0	May 2001	1 Year
<u> </u> - RF Cable(2m)	SUCOFLEX 104	Suhner	155-21-012E0	May 2001	1 Year
<u> </u> - RF Cable(1m)	SUCOFLEX 104	Suhner	155-21-013E0	May 2001	1 Year
<u> </u> - RF Cable(1m)	S 04272B	Suhner	155-21-015E0	June 2001	1 Year
<u> x </u> - RF Cable(4m)	SUCOFLEX 104	Suhner	190630	Dec. 2001	1 Year
<u> x </u> - RF Cable(1m)	SUCOFLEX 104	Suhner	182811/4	Dec. 2001	1 Year

1.3.5 The measurement of the Frequency Stability

☐ - was performed.

☒ - was not applicable.

Used test instruments :

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
<input type="checkbox"/> - Frequency Counter	53131A	Hewlett Packard	3546A11807	May 2001	1 Year
<input type="checkbox"/> - Oven	-	Ohnishi Co. Ltd.	-	May 2001	1 Year
<input type="checkbox"/> - DC Power Supply	6628A	Hewlett Packard	3224A00284	June 2001	1 Year

1.3.6 The measurement of the Occupied Bandwidth

☒ - was performed.

☐ - was not applicable.

Used test instruments :

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
<input type="checkbox"/> - Spectrum Analyzer	8560E	Hewlett Packard	3240A00189	Nov. 2001	1 Year
<input type="checkbox"/> - Spectrum Analyzer	8566B	Hewlett Packard	2140A01091	Apr. 2001	1 Year
<input type="checkbox"/> - Spectrum Analyzer	8566B	Hewlett Packard	2747A05855	June 2001	1 Year
<input checked="" type="checkbox"/> - Test Receiver	ESI26	Rohde & Schwarz	100043	Aug. 2001	1 Year
<input type="checkbox"/> - Function Generator	3325A	Hewlett Packard	2512A21776	May 2001	1 Year
<input type="checkbox"/> - FM Linear Detector	MS61A	Anritsu Corp.	M77486	Sep. 2001	1 Year
<input type="checkbox"/> - Level Meter	ML422C	Anritsu Corp.	M87571	June 2001	1 Year
<input type="checkbox"/> - Measuring Amplifier	2636	B & K	1614851	June 2001	1 Year
<input type="checkbox"/> - AF Amplifier	P-500L	Accuphase	BOY806	June 2001	1 Year
<input type="checkbox"/> - Microphone	4134	B & K	1269477	May 2001	1 Year
<input type="checkbox"/> - Preamplifier	2639	B & K	1268763	May 2001	1 Year
<input type="checkbox"/> - Pistonphone	4220	B & K	1165008	Apr. 2001	1 Year
<input type="checkbox"/> - Artificial Mouth	4227	B & K	1274869	N/A	N/A

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

AC Power Line Conducted Emission [§15.207] x - Applicable - NOT Applicable

The requirements are x - PASSED - NOT PASSED

Remarks :

Radiated Emission [§15.31(e),§15.209] x - Applicable - NOT Applicable

The requirements are x - PASSED - NOT PASSED

Remarks:

Frequency Stability - Applicable x - NOT Applicable

The requirements are - PASSED - NOT PASSED

Remarks:

Occupied Bandwidth x - Applicable - NOT Applicable

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 A and C (June 23, 1989) 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 : February 14, 2002

End of testing : February 14, 2002

- JAPAN QUALITY ASSURANCE ORGANIZATION -
Approved by:

Signatories:
Issued by:



Masaaki Takahashi
Senior Manager
JQA EMC Engineering Dept.



Shigeru Osawa
Assistant Manager
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	Insetion Type Density Meter	Toshiba Corporation Social Infrastructure Systems Company	LQ300A00	M8D62372311	-

Type of Cable :

Symbol	Description	Identification (Manufacturer etc.)	Shielded YES / NO	Ferrite Core	Connector type Shielded YES / NO	Length (m)
1	AC Power Cable with 3-pinplug	-	NO	NO	NO	1.2
2-1	EUT "Density Out" / 250 ohms resistance	-	YES	NO	NO	1.0
2-2	EUT "Error In-maintenance Contact Signal Output" / Short circuit	-	YES	NO	NO	1.0
3	EUT "Digital Input" / Short circuit	-	YES	NO	NO	1.0
4-1	EUT "External Synchronized Input" / Short circuit	-	YES	NO	NO	1.0
4-2	EUT "ConductivityMeter Input" / No termination	-	YES	NO	NO	1.0

1.7.2 Operating condition

Power supply Voltage : 120VAC 60Hz

The tests have been carried out under the following condition.

- Transmitting (Operating Frequency: 1825 MHz, 1900 MHz and 1975 MHz)

1.7.3 Generating and Operating frequency of EUT

Transmitter : F1=1825 MHz - 1975 MHz[Note 1]
RF Unit : F2=1824.85 MHz -1974.85 MHz[Note 2], 30 MHz
Main Board : 460.8 kHz, 3.6864 MHz, 29.4912 MHz
Display Board : 220 kHz
Power Supply : 140 kHz, 165 kHz

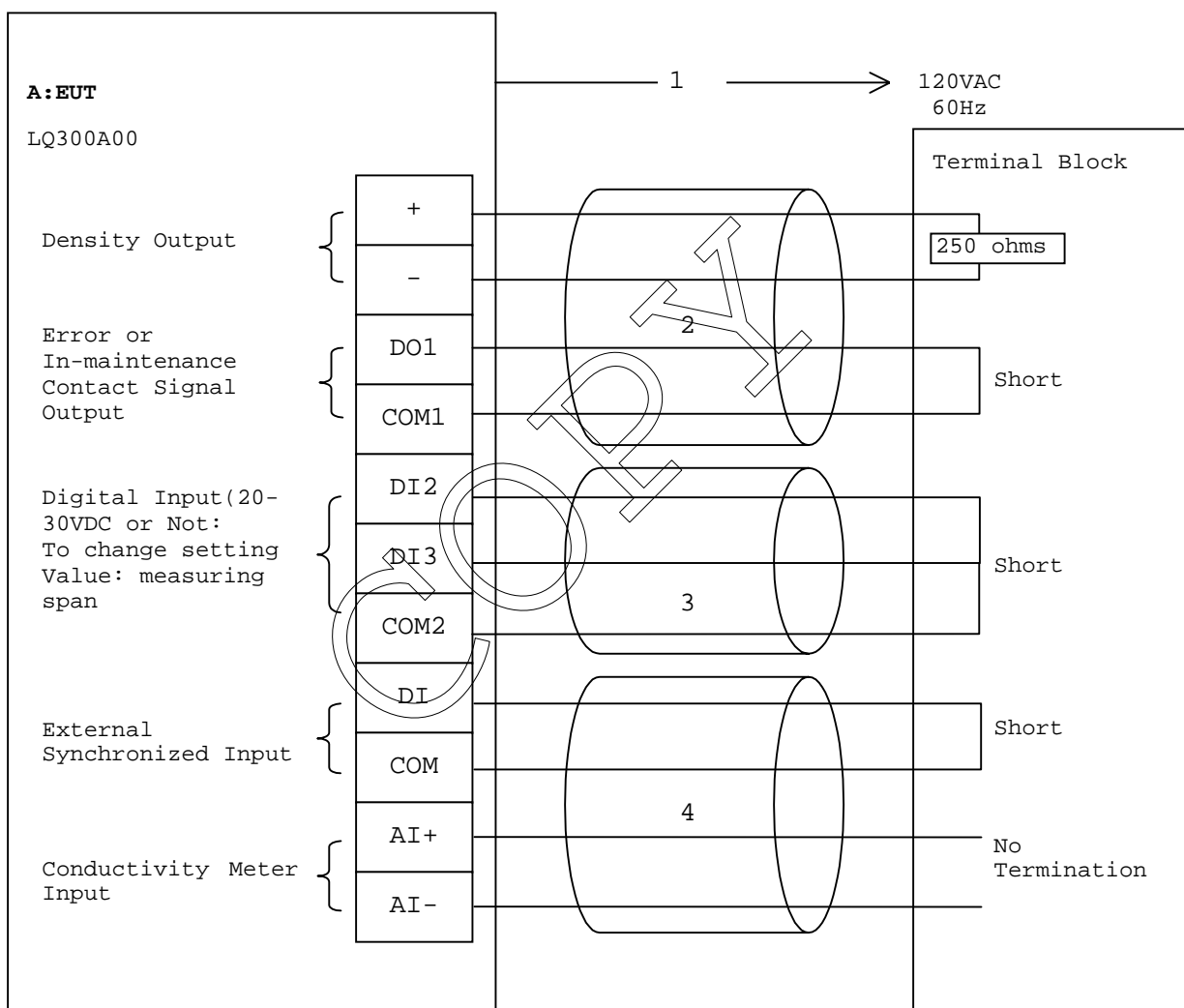
Note 1 : F1 is any of adjusted frequency between 1825 MHz to 1975 MHz.

Note 2 : F2 is any of adjusted frequency between 1824.85 MHz to 1974.85 MHz.

The following relational expression consists in F1 and F2.

$F2 = F1 - 0.15 \text{ MHz}$

1.8 EUT ARRANGEMENT (DRAWINGS)



1.9 PRELIMINARY TEST AND TEST-SETUP (DRAWINGS)

1.9.1 AC Power Line Conducted Emission (450 kHz - 30 MHz) :

According to description of ANSI C63.4-1992 sec.13.1.3.1, the AC power line preliminary conducted emissions measurements were carried out.

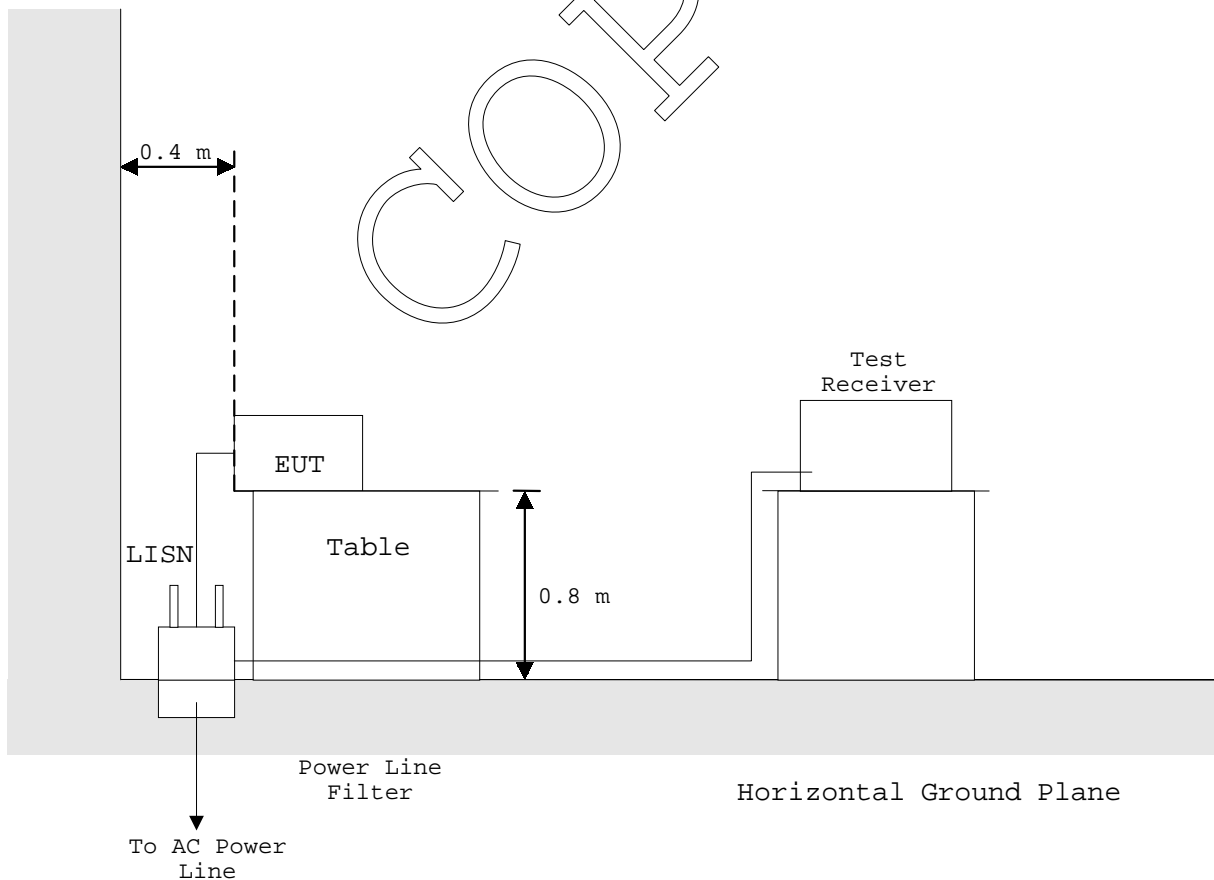
The preliminary conducted measurements were performed using the spectrum analyzer to observe the emission characteristics of the EUT.

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.

Shielded Enclosure

- Side View -

Vertical
Ground
Plane

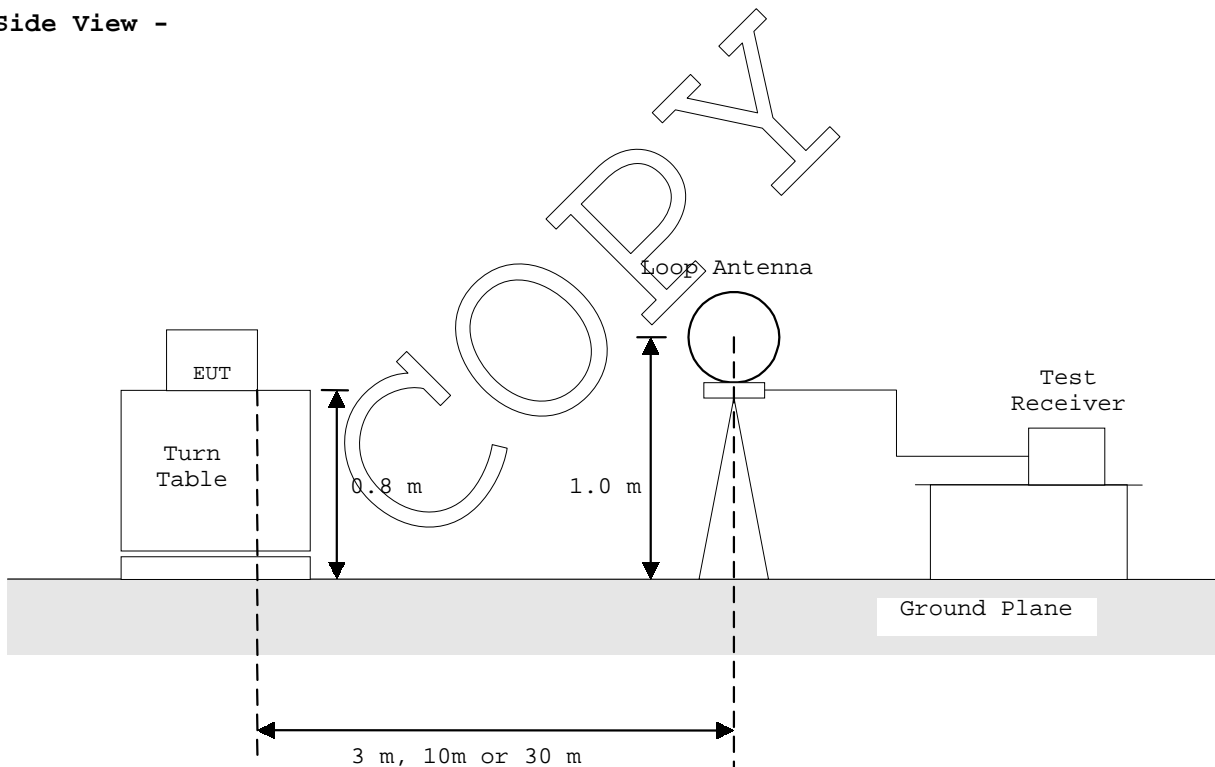


1.9.2 Radiated Emission (9 kHz - 30 MHz) :

According to description of ANSI C63.4-1992 sec.13.1.4.1, 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 -



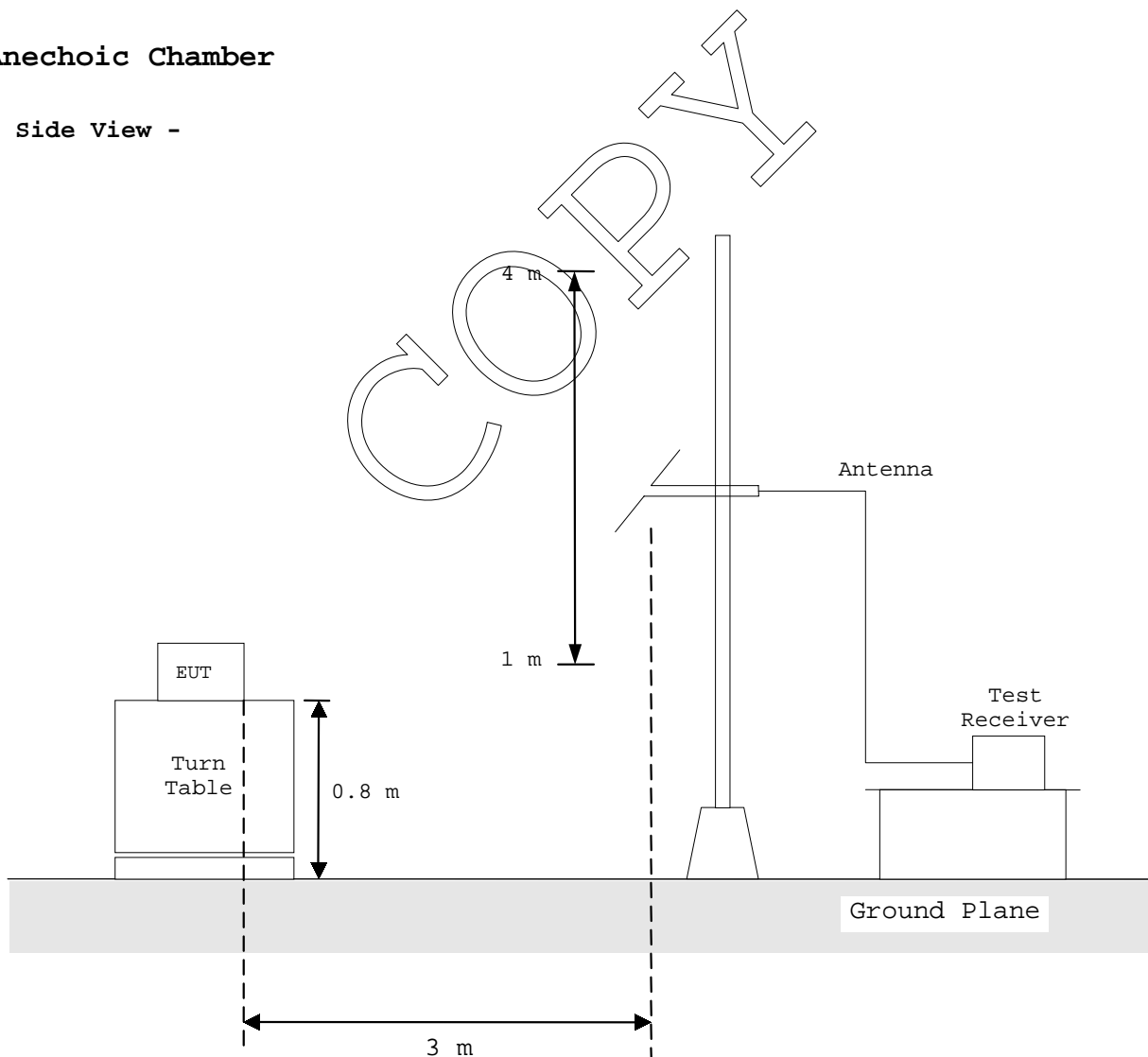
1.9.3 Radiated Emission (30 MHz - 1000 MHz) :

According to description of ANSI C63.4-1992 sec.13.1.4.1, 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.

Anechoic Chamber

- Side View -



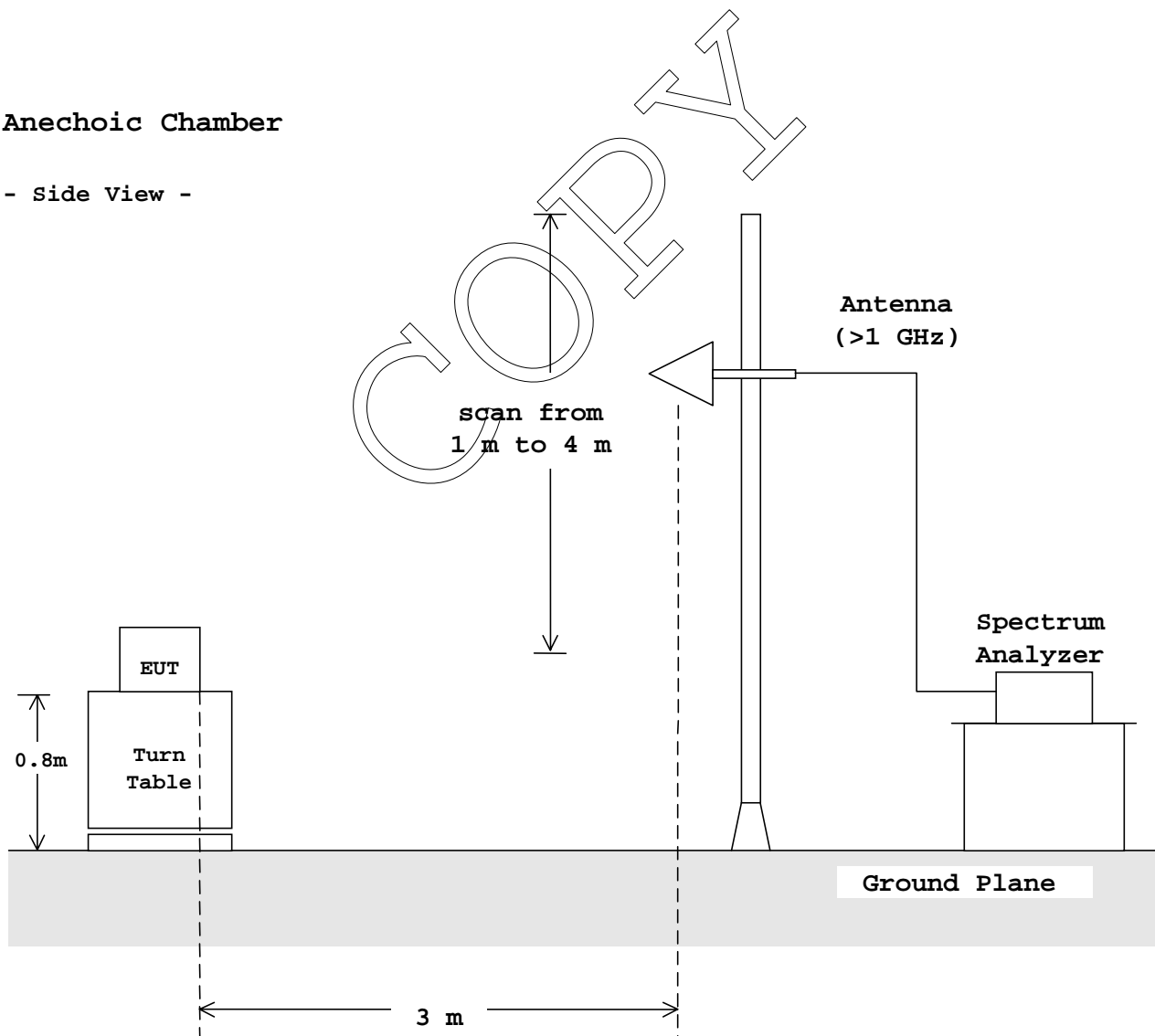
1.9.4 Radiated Emission (Above 1 GHz) :

According to description of ANSI C63.4-1992 sec.13.1.4.1, 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.

Anechoic Chamber

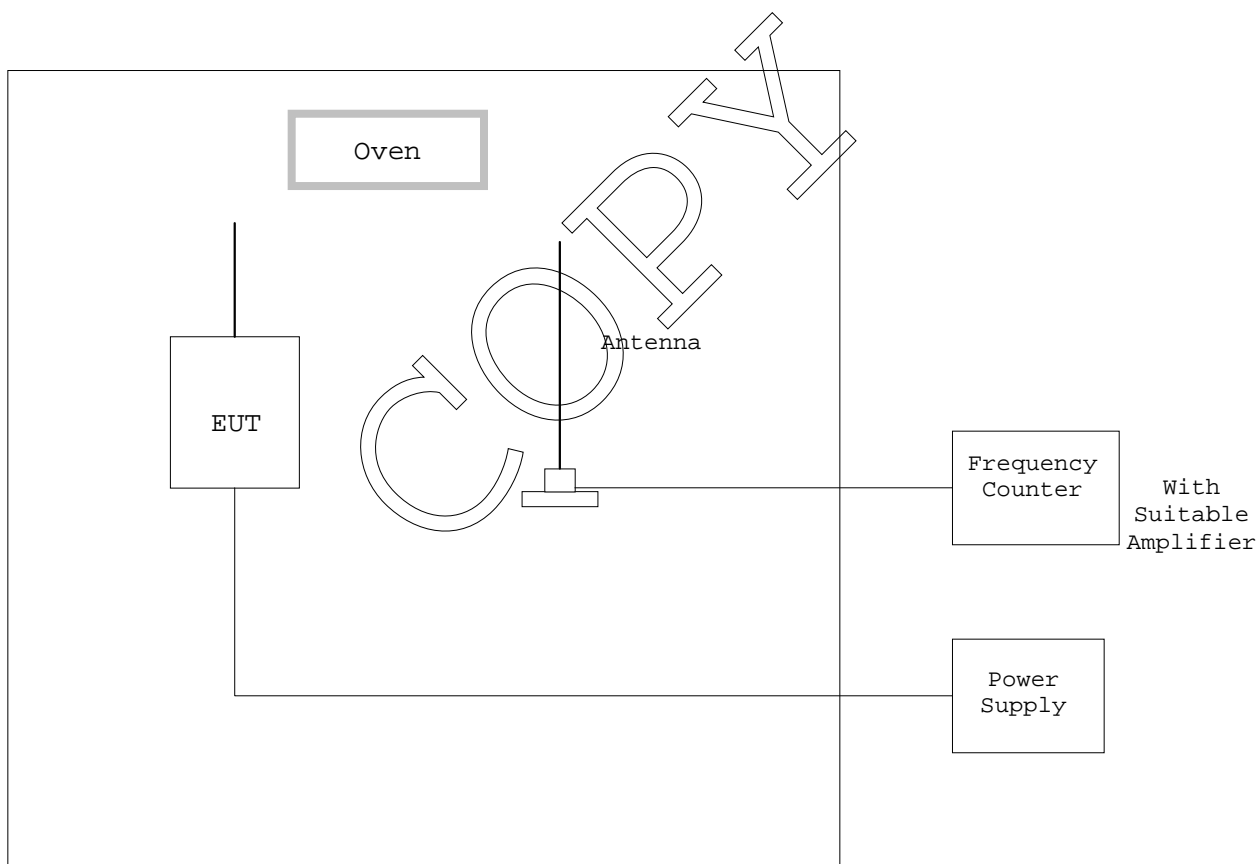
- Side View -



1.9.5 Frequency Stability :

According to description of ANSI C63.4-1992 sec.13.1.5 and sec.13.1.6, 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 $+50^{\circ}\text{C}$ 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 $+20^{\circ}\text{C}$.

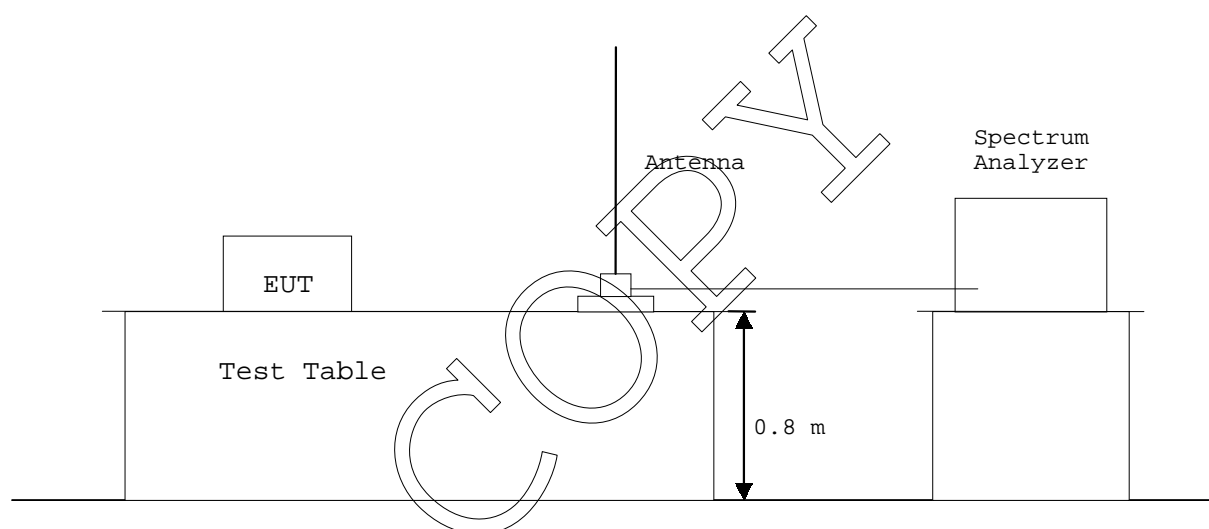
These measurements were carried out after allow sufficient time (approximately 1 hour) for the temperature of the chamber to stabilize.



1.9.6 Occupied Bandwidth :

According to description of ANSI C63.4-1992 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.

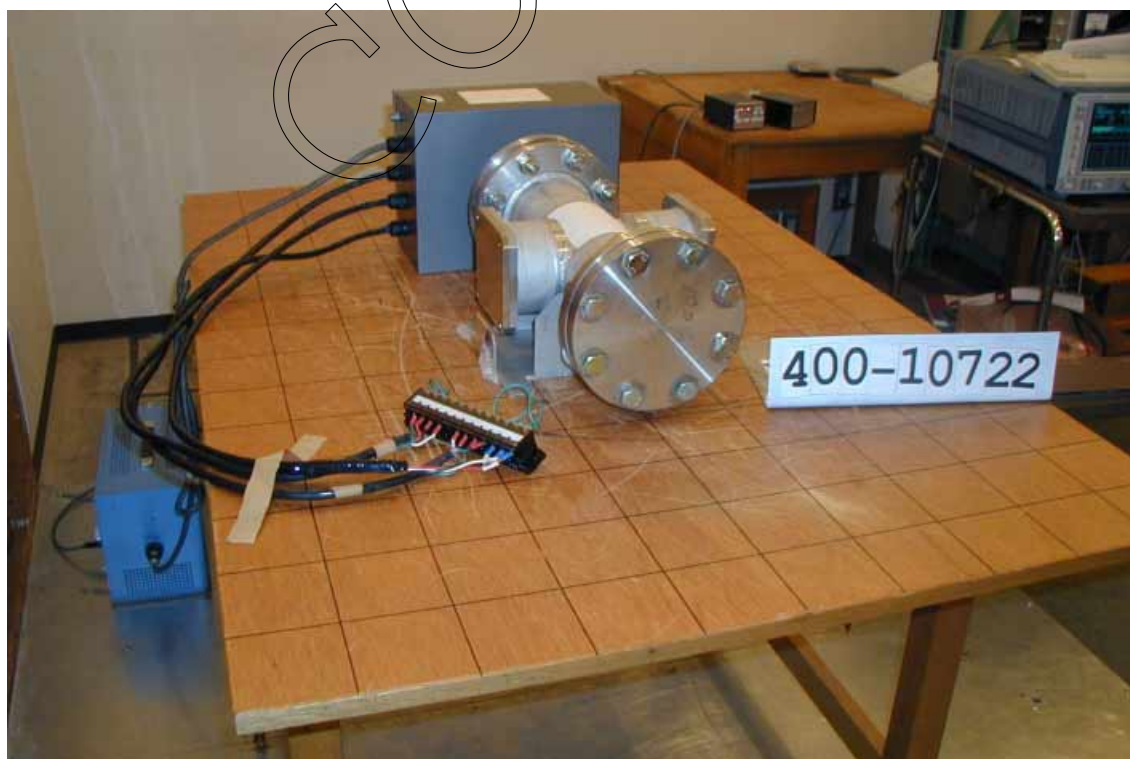
The resolution bandwidth of spectrum analyzer was set to the value specified in sec.13.1.7.



1.10 TEST ARRANGEMENT (PHOTOGRAPHS)

PHOTOGRAPHS OF EUT CONFIGURATION FOR AC POWER LINE CONDUCTED EMISSIONS MEASUREMENT

Photograph present configuration with maximum emission



PHOTOGRAPHS OF EUT CONFIGURATION FOR RADIATED EMISSIONS MEASUREMENT

Photograph present configuration with maximum emission



TEST DATA

2.1 AC Power Line Conducted Emission Measurement(0.45 MHz - 30 MHz)

Date February 14, 2002											
Temp. 21 °C Humi. 32 %											
Frequency (MHz)	LISN Factor (dB)	Meter Reading (dBuV)				Limits (dBuV)		Emission Level (dBuV)		Margins (dB)	
		V-A Q.P	AVE	V-B Q.P	AVE	Q.P	AVE	Q.P	AVE	Q.P	AVE
1.43	0.2	10.7	-	10.7	-	48.0	-	10.9	-	37.1	-
1.96	0.2	13.1	-	10.0	-	48.0	-	13.3	-	34.7	-
2.75	0.2	19.8	-	18.9	-	48.0	-	20.0	-	28.0	-
3.59	0.2	16.4	-	16.2	-	48.0	-	16.6	-	31.4	-
4.39	0.2	19.1	-	19.0	-	48.0	-	19.3	-	28.7	-
5.25	0.2	30.3	-	30.4	-	48.0	-	30.6	-	17.4	-
5.47	0.2	33.0	-	33.1	-	48.0	-	33.3	-	14.7	-
7.88	0.2	23.3	-	22.3	-	48.0	-	23.5	-	24.5	-
10.60	0.2	25.4	-	25.3	-	48.0	-	25.6	-	22.4	-
13.17	0.3	24.8	-	25.8	-	48.0	-	26.1	-	21.9	-
13.74	0.3	27.4	-	28.0	-	48.0	-	28.3	-	19.7	-
15.27	0.3	22.2	-	20.3	-	48.0	-	22.5	-	25.5	-
16.03	0.3	20.7	-	20.3	-	48.0	-	21.0	-	27.0	-
18.43	0.4	24.3	-	24.9	-	48.0	-	25.3	-	22.7	-
21.07	0.4	24.9	-	25.4	-	48.0	-	25.8	-	22.2	-
23.70	0.5	21.9	-	22.1	-	48.0	-	22.6	-	25.4	-
26.33	0.5	23.3	-	23.8	-	48.0	-	24.3	-	23.7	-
28.96	0.6	25.6	-	26.4	-	48.0	-	27.0	-	21.0	-
30.00	0.6	34.6	-	35.0	-	48.0	-	35.6	-	12.4	-

- Notes : 1) The spectrum was checked from 0.45 MHz to 30 MHz.
2) The cable loss is included in the LISN factor.
3) The symbol of "<" means "or less".
4) The symbol of ">" means "or greater".
5) The symbol of "-" means "Not applicable".
6) V-A : One end & Ground V-B : The other end & Ground
7) Q.P : Quasi-peak AVE : Average
8) A sample calculation was made at 1.43 (MHz).

$$L_f + M_r = 0.2 + 10.7 = 10.9(\text{dBuV})$$

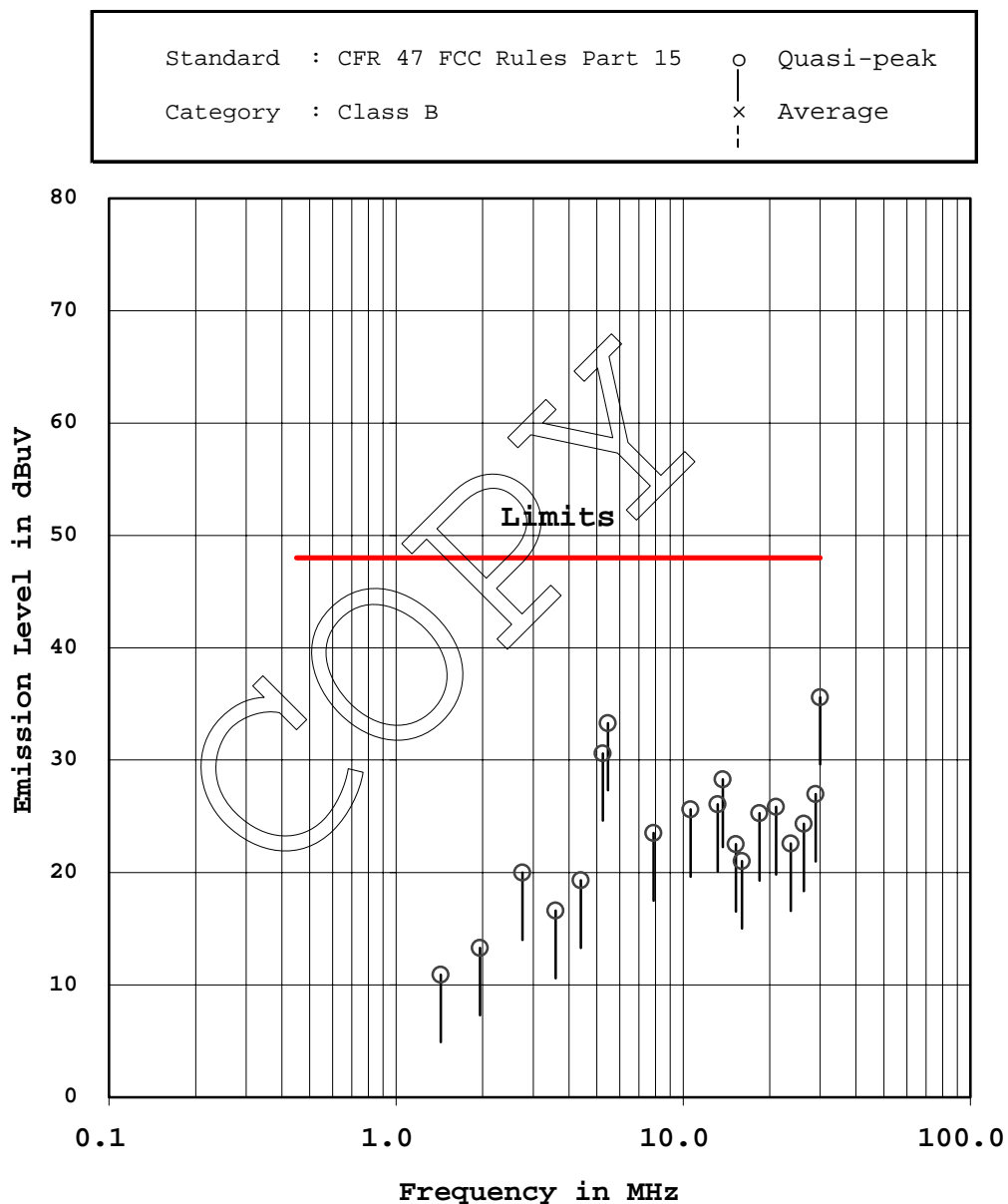
$$L_f = \text{LISN Factor}$$

$$M_r = \text{Meter Reading}$$

Tested by : Shigeru Osawa
Shigeru Osawa
Testing Engineer

AC POWER LINE CONDUCTED EMISSION MEASUREMENT

Model No. : LQ300A00



2.2 Radiated Emissions Measurement

Date : February 14, 2002

Temp.: 25 °C Humi.: 31 %

Operating Frequency : 1825 MHz

Distance of Measurement : 3.0 meters

Variation of Input Power[§15.31(e)]: 1825 MHz

Percentage of Rated Supply	Input Voltage (Vac 60 Hz)	Emission Level (dBµV/m)	Limits(QP/AV) (dBµV/m)
85 %	102	38.5	54.0
100 %	120	38.5	54.0
115 %	138	38.5	54.0

Frequency (MHz)	P-A Factor (dB)	Antenna Factor (dB)	Polarization	Meter Reading (dBµV)			Limits (dBµV/m)		Emission Levels (dBµV/m)		Margins (dB)	
				QP	AV	Peak	QP/AV	Peak	QP/AV	Peak	QP/AV	Peak
34.2	0.0	15.1	V	6.1	-	-	40.0	-	21.2	-	18.8	-
55.3	0.0	9.6	H	16.6	-	-	40.0	-	26.2	-	13.8	-
68.6	0.0	6.5	H	22.1	-	-	40.0	-	28.6	-	11.4	-
132.7	0.0	14.7	H	12.2	-	-	43.5	-	26.9	-	16.6	-
154.8	0.0	16.1	H	16.3	-	-	43.5	-	32.4	-	11.1	-
184.3	0.0	17.3	H	13.3	-	-	43.5	-	30.6	-	12.9	-
294.9	0.0	21.4	H	18.1	-	-	46.0	-	39.5	-	6.5	-
302.3	0.0	18.2	H	25.2	-	-	46.0	-	43.4	-	2.6	-
346.5	0.0	18.2	H	25.5	-	-	46.0	-	43.7	-	2.3	-

Notes :

- 1) The spectrum was checked from 9 kHz to 1000 MHz.
- 2) The cable loss is included in the antenna factor.
- 3) The symbol of "<" means "or less".
- 4) The symbol of ">" means "or greater".
- 5) A sample calculation(QP/AV) was made at 34.24 (MHz).
 $PA + Af + Mr = 0 + 15.1 + 6.1 = 21.2$ (dBµV/m)
PA = Peak to Average Factor(P-A Factor)
Af = Antenna Factor
Mr = Meter Reading

6) Measuring Instrument Setting :

Detector function	Resolution Bandwidth	Video Bandwidth
Quasi-peak(QP)	120 kHz	-
Average(AV)	1 MHz	10 Hz
Peak	1 MHz	1 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
1.1249	0.0	-5.9	V	32.6	40.5	54.0	74.0	26.7	34.6	27.3	39.4
1.8250	0.0	-0.9	H	39.4	44.6	54.0	74.0	38.5	43.7	15.5	30.3

- Notes :
- 1) The spectrum was checked from 1.0 GHz to tenth harmonics.
 - 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(AV) was made at 1.1249 (GHz).

$$PA + Cf + Mr = 0 + -5.9 + 40.5 = 34.6 \text{ (dBuV/m)}$$

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	-

Tested by :

Shigeru Osawa

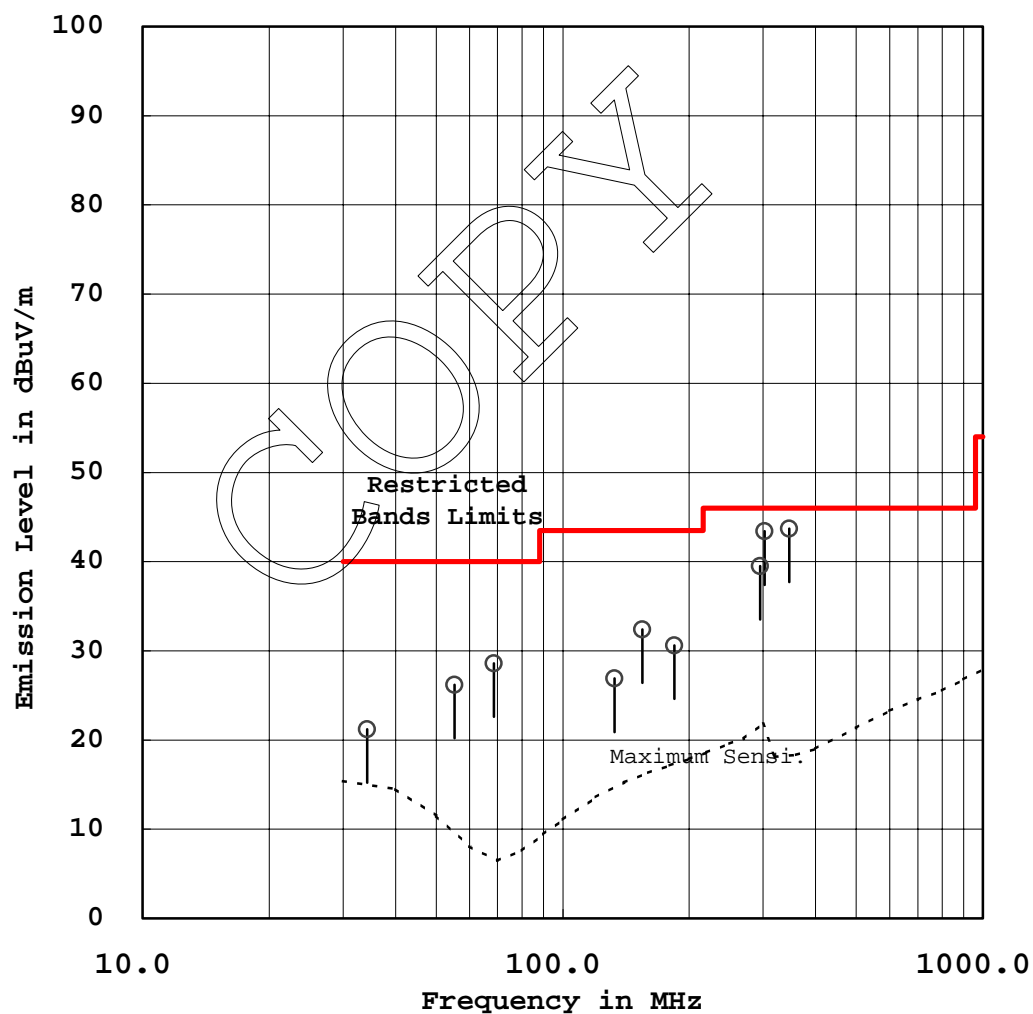
Shigeru Osawa

Testing Engineer

RADIATED EMISSION MEASUREMENT

Model No. : LQ300A00

Standard : CFR 47 FCC Rules Part 15 QP/AV
Operating Frequency(MHz) : 1825



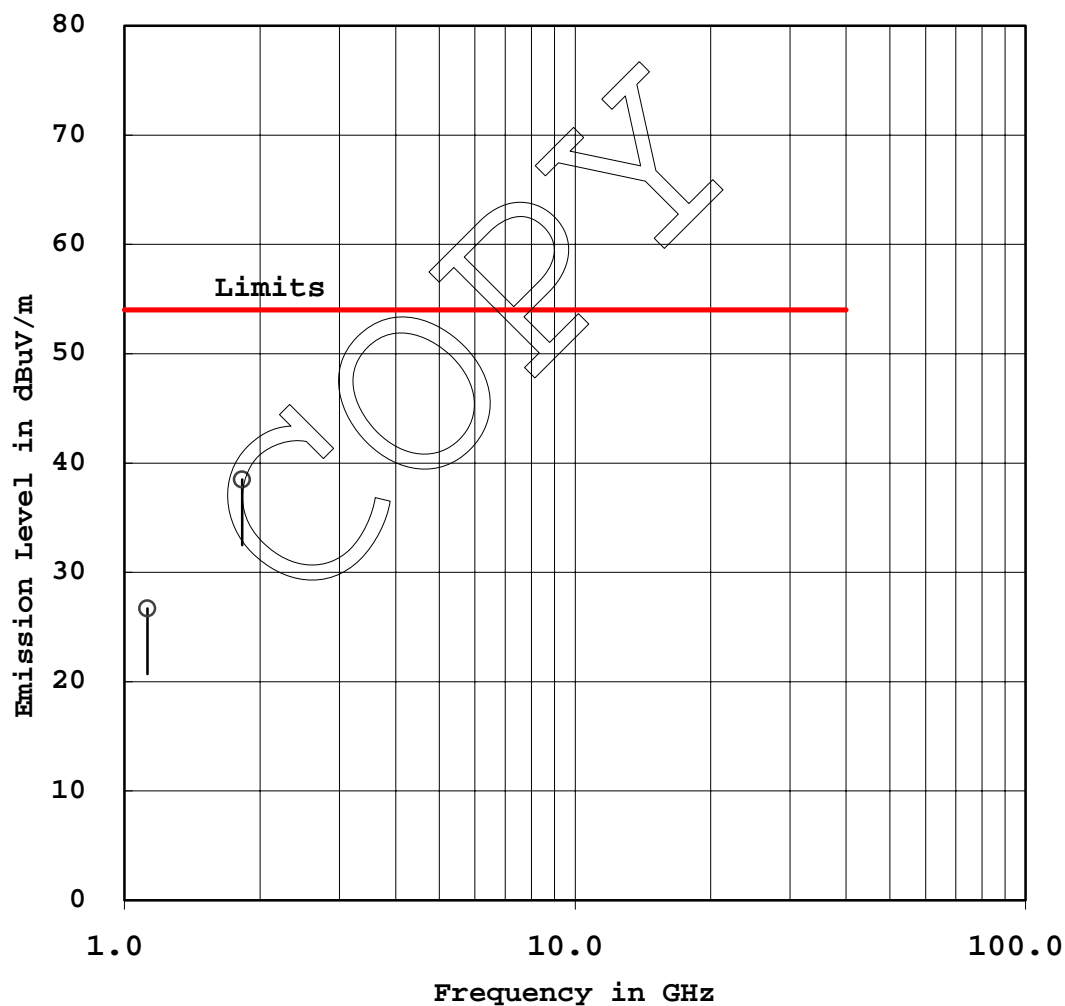
RADIATED EMISSION MEASUREMENT

Model No. : LQ300A00

Standard : CFR 47 FCC Rules Part 15

AV

Operating Frequency(MHz) : 1825



Date : February 14, 2002

Temp.: 25 °C Humi.: 31 %

Operating Frequency : 1900 MHz

Distance of Measurement : 3.0 meters

Variation of Input Power[§15.31(e)]: 1900 MHz

Percentage of Rated Supply	Input Voltage (Vac 60 Hz)	Emission Level (dBµV/m)	Limits(QP/AV) (dBµV/m)
85 %	102	38.5	54.0
100 %	120	38.5	54.0
115 %	138	38.5	54.0

Frequency (MHz)	P-A Factor (dB)	Antenna Factor (dB)	Polarization	Meter Reading (dBµV)			Limits (dBµV/m)		Emission Levels (dBµV/m)		Margins (dB)	
				QP	AV	Peak	QP/AV	Peak	QP/AV	Peak	QP/AV	Peak
34.2	0.0	15.1	V	6.1	-	-	40.0	-	21.2	-	18.8	-
55.3	0.0	9.6	H	16.6	-	-	40.0	-	26.2	-	13.8	-
68.6	0.0	6.5	H	22.1	-	-	40.0	-	28.6	-	11.4	-
132.7	0.0	14.7	H	12.2	-	-	43.5	-	26.9	-	16.6	-
154.8	0.0	16.1	H	16.3	-	-	43.5	-	32.4	-	11.1	-
184.3	0.0	17.3	H	13.3	-	-	43.5	-	30.6	-	12.9	-
294.9	0.0	21.4	H	18.1	-	-	46.0	-	39.5	-	6.5	-
302.3	0.0	18.2	H	25.2	-	-	46.0	-	43.4	-	2.6	-
346.5	0.0	18.2	H	25.5	-	-	46.0	-	43.7	-	2.3	-

Notes :

- 1) The spectrum was checked from 9 kHz to 1000 MHz.
- 2) The cable loss is included in the antenna factor.
- 3) The symbol of "<" means "or less".
- 4) The symbol of ">" means "or greater".
- 5) A sample calculation(QP/AV) was made at 34.24 (MHz).
 $PA + Af + Mr = 0 + 15.1 + 6.1 = 21.2$ (dBµV/m)
PA = Peak to Average Factor(P-A Factor)
Af = Antenna Factor
Mr = Meter Reading

6) Measuring Instrument Setting :

Detector function	Resolution Bandwidth	Video Bandwidth
Quasi-peak(QP)	120 kHz	-
Average(AV)	1 MHz	10 Hz
Peak	1 MHz	1 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
1.1249	0.0	-5.9	V	32.6	40.5	54.0	74.0	26.7	34.6	27.3	39.4
1.9000	0.0	-0.7	H	39.2	44.2	54.0	74.0	38.5	43.5	15.5	30.5

- Notes :
- 1) The spectrum was checked from 1.0 GHz to tenth harmonics.
 - 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(AV) was made at 1.1249 (GHz).

$$PA + Cf + Mr = 0 + -5.9 + 40.5 = 34.6 \text{ (dBuV/m)}$$

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

-

Tested by :

Shigeru Osawa

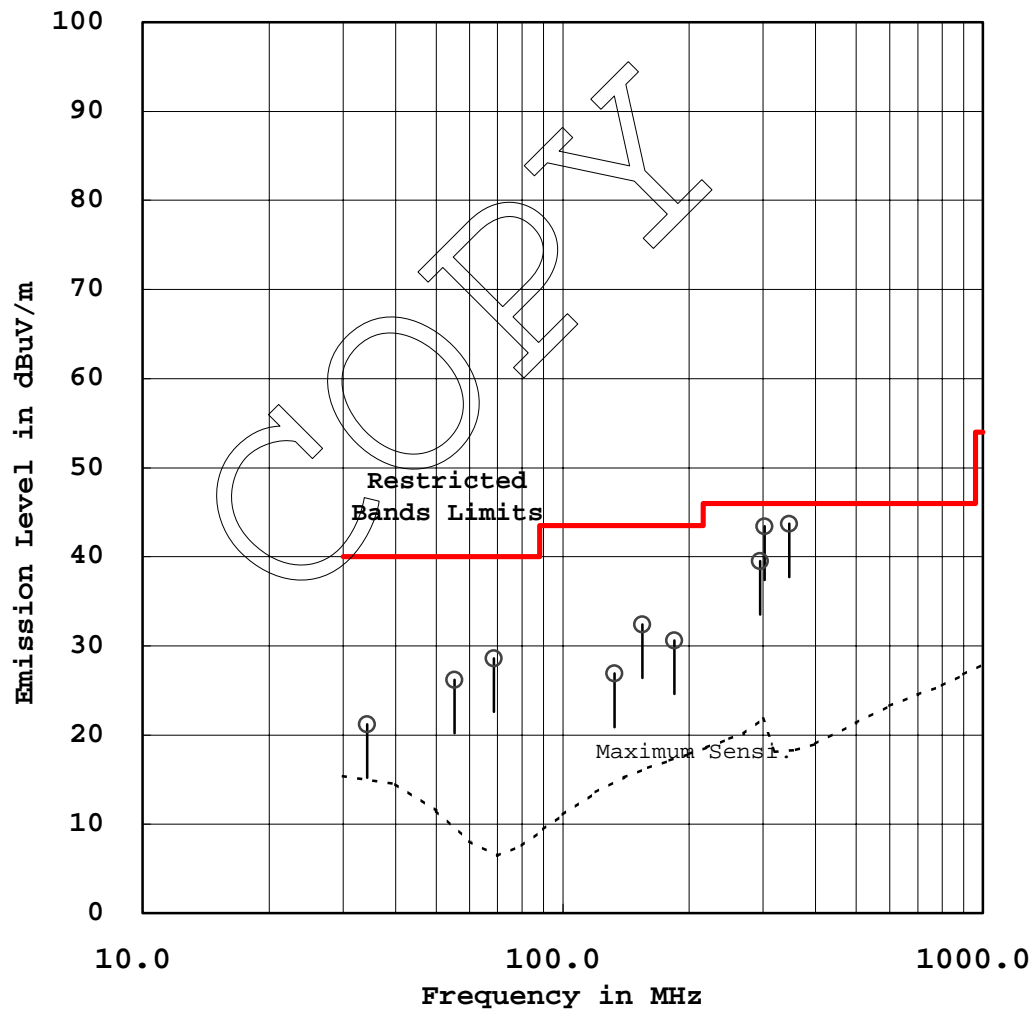
Shigeru Osawa

Testing Engineer

RADIATED EMISSION MEASUREMENT

Model No. : LQ300A00

Standard : CFR 47 FCC Rules Part 15 QP/AV
Operating Frequency(MHz) : 1900



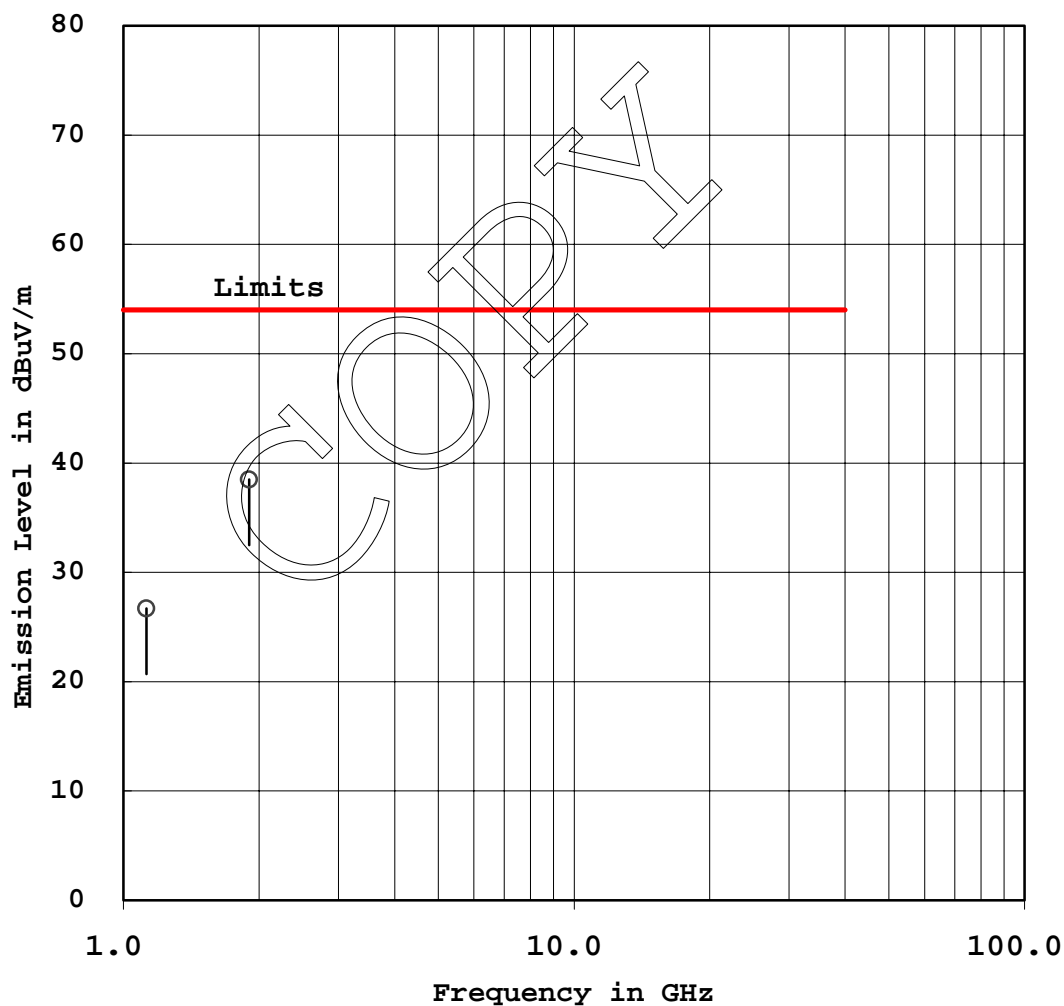
RADIATED EMISSION MEASUREMENT

Model No. : LQ300A00

Standard : CFR 47 FCC Rules Part 15

AV

Operating Frequency(MHz) : 1900



Date : February 14, 2002

Temp.: 25 °C Humi.: 31 %

Operating Frequency : 1975 MHz

Distance of Measurement : 3.0 meters

Variation of Input Power[§15.31(e)]: 1975 MHz

Percentage of Rated Supply	Input Voltage (Vac 60 Hz)	Emission Level (dBuV/m)	Limits(QP/AV) (dBuV/m)
85 %	102	31.4	54.0
100 %	120	31.4	54.0
115 %	138	31.4	54.0

Frequency (MHz)	P-A Factor (dB)	Antenna Factor (dB)	Polarization	Meter Reading (dBuV)			Limits (dBuV/m)		Emission Levels (dBuV/m)		Margins (dB)	
				QP	AV	Peak	QP/AV	Peak	QP/AV	Peak	QP/AV	Peak
34.2	0.0	15.1	V	6.1	-	-	40.0	-	21.2	-	18.8	-
55.3	0.0	9.6	H	16.6	-	-	40.0	-	26.2	-	13.8	-
68.6	0.0	6.5	H	22.1	-	-	40.0	-	28.6	-	11.4	-
132.7	0.0	14.7	H	12.2	-	-	43.5	-	26.9	-	16.6	-
154.8	0.0	16.1	H	16.3	-	-	43.5	-	32.4	-	11.1	-
184.3	0.0	17.3	H	13.3	-	-	43.5	-	30.6	-	12.9	-
294.9	0.0	21.4	H	18.1	-	-	46.0	-	39.5	-	6.5	-
302.3	0.0	18.2	H	25.2	-	-	46.0	-	43.4	-	2.6	-
346.5	0.0	18.2	H	25.5	-	-	46.0	-	43.7	-	2.3	-

Notes :

- 1) The spectrum was checked from 9 kHz to 1000 MHz.
- 2) The cable loss is included in the antenna factor.
- 3) The symbol of "<" means "or less".
- 4) The symbol of ">" means "or greater".
- 5) A sample calculation(QP/AV) was made at 34.24 (MHz).
 $PA + Af + Mr = 0 + 15.1 + 6.1 = 21.2$ (dBuV/m)
PA = Peak to Average Factor(P-A Factor)
Af = Antenna Factor
Mr = Meter Reading

6) Measuring Instrument Setting :

Detector function	Resolution Bandwidth	Video Bandwidth
Quasi-peak(QP)	120 kHz	-
Average(AV)	1 MHz	10 Hz
Peak	1 MHz	1 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
1.1249	0.0	-5.9	V	32.6	40.5	54.0	74.0	26.7	34.6	27.3	39.4
1.9750	0.0	-0.2	H	31.6	40.8	54.0	74.0	31.4	40.6	22.6	33.4

- Notes :
- 1) The spectrum was checked from 1.0 GHz to tenth harmonics.
 - 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(AV) was made at 1.1249 (GHz).

$$PA + Cf + Mr = 0 + -5.9 + 40.5 = 34.6 \text{ (dBuV/m)}$$

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	-	-

Tested by :

Shigeru Osawa

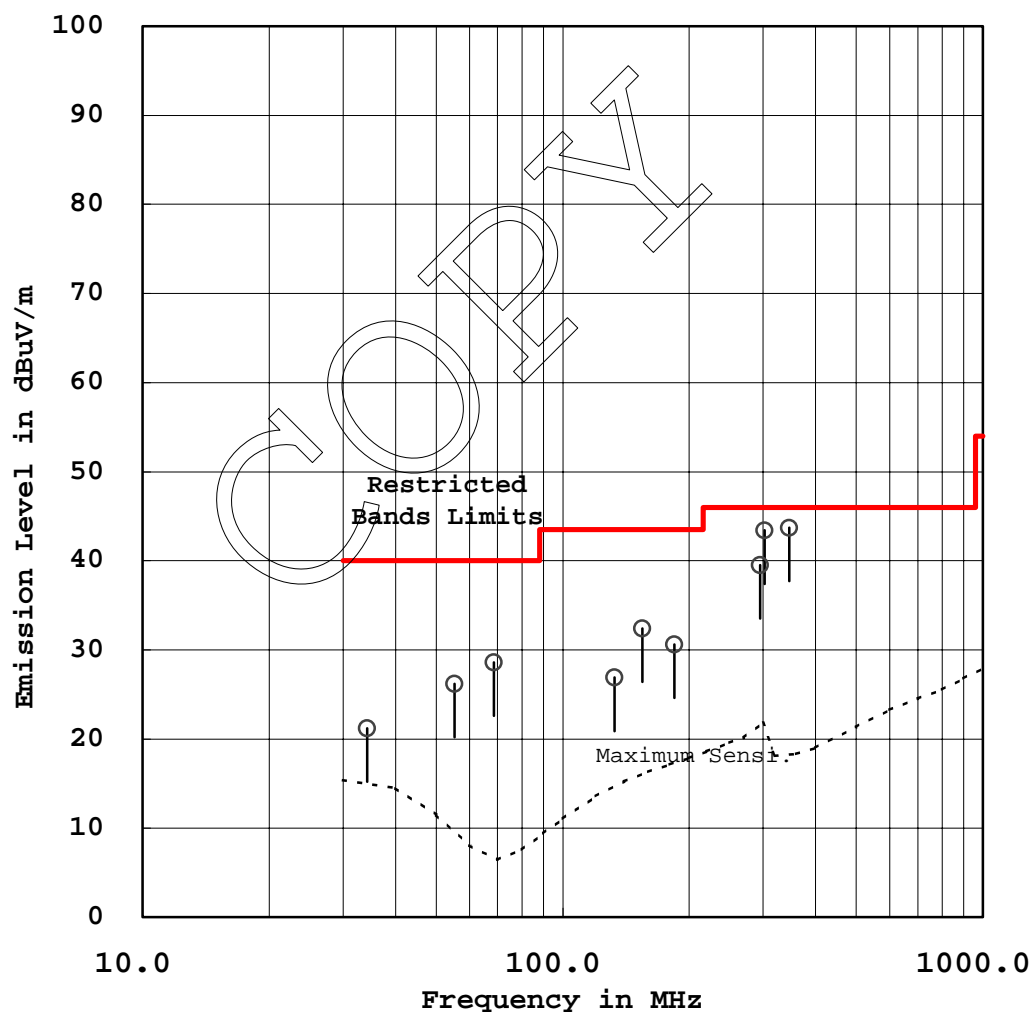
Shigeru Osawa

Testing Engineer

RADIATED EMISSION MEASUREMENT

Model No. : LQ300A00

Standard : CFR 47 FCC Rules Part 15 QP/AV
Operating Frequency(MHz) : 1975



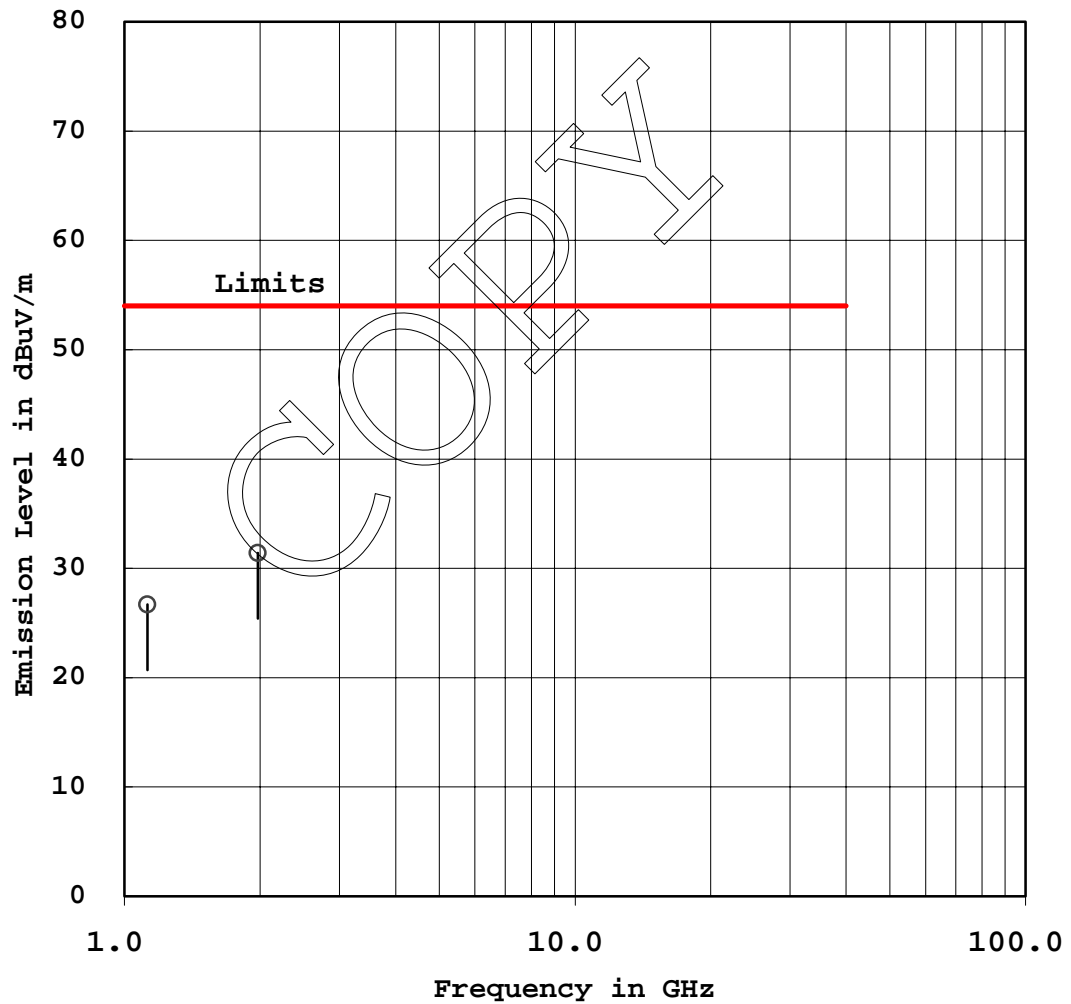
RADIATED EMISSION MEASUREMENT

Model No. : LQ300A00

Standard : CFR 47 FCC Rules Part 15

AV

Operating Frequency(MHz) : 1975





JQA Application No. :400-10722

Model No.

:LQ300A00

Standard

:CFR 47 FCC Rules Part 15

FCC ID :M8D62372311

Issue Date :March 6, 2002

Page 36 of 42

2.4 Occupied Bandwidth Measurement

Date : February 14, 2002

Temp.: 25 °C Humi.: 31 %

Measurements Results :

Specified Limits : Not applicable

Refer to the attached graphs.

Tested by :

Shigeru Osawa

Shigeru Osawa

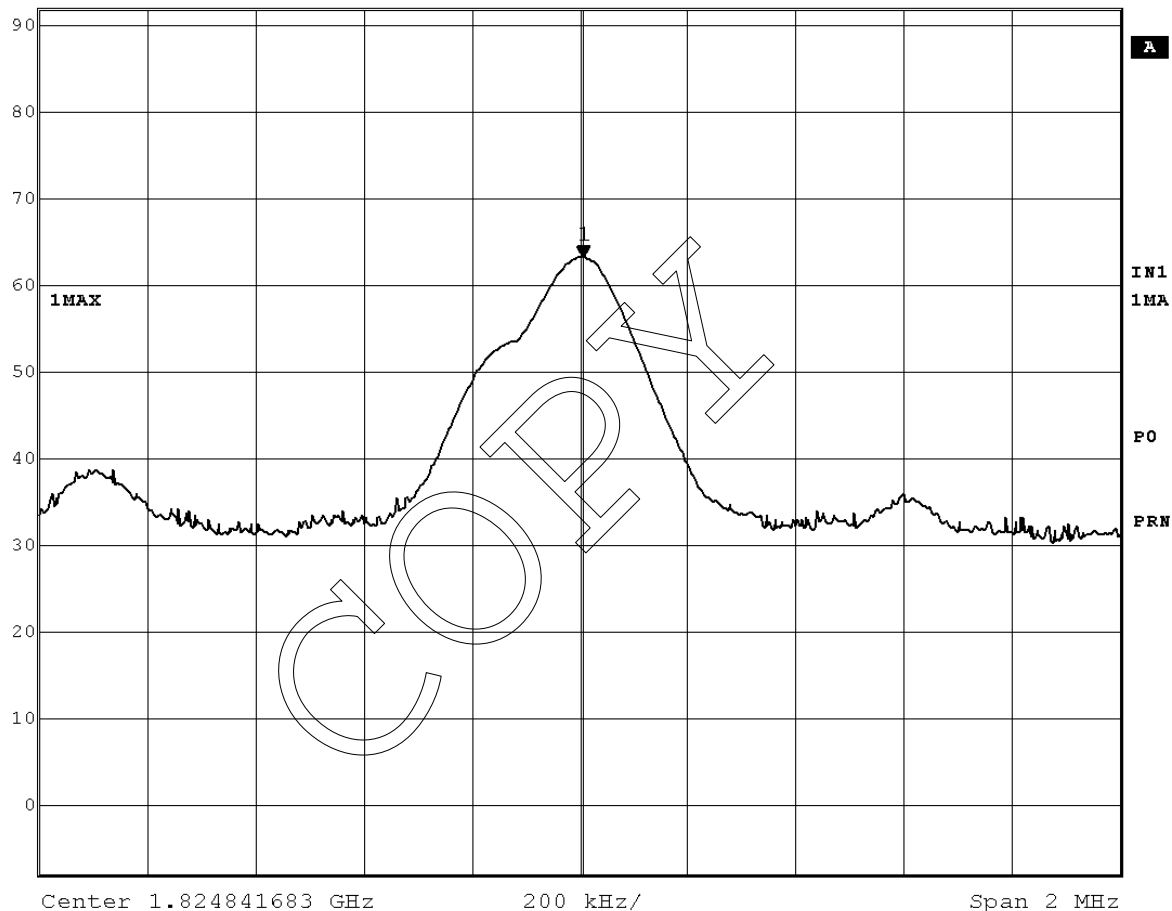
Testing Engineer

COPY

Operating Frequency : 1825 MHz



Marker 1 [T1]	RBW	100 kHz	RF Att	0 dB
Ref Lvl	63.13 dBμV	VBW	100 kHz	
92 dBμV	1.82484770 GHz	SWT	5 ms	Unit dBμV

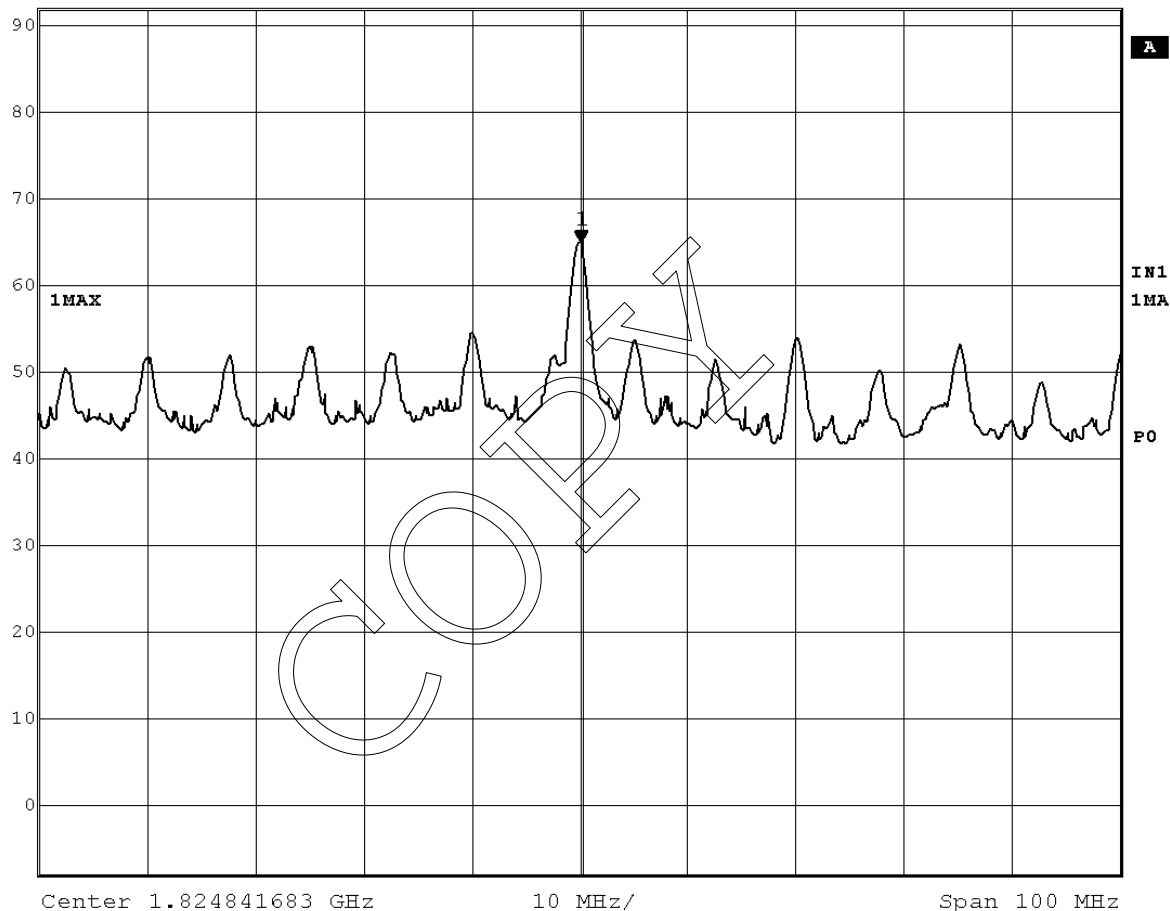


Date: 14.FEB.2002 10:49:18

Operating Frequency : 1825 MHz




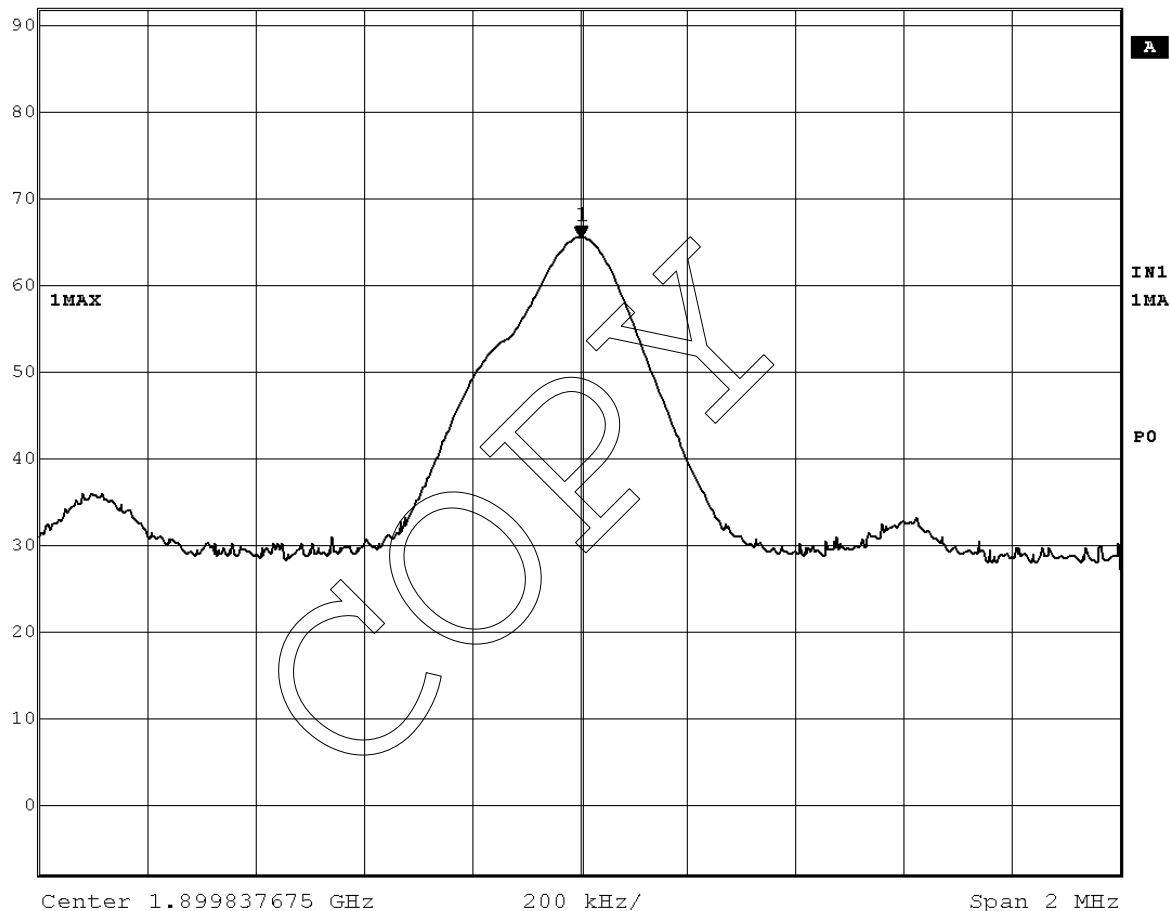
Marker 1 [T1]	RBW	1 MHz	RF Att	0 dB
Ref Lvl	64.84 dBμV	VBW	1 MHz	
92 dBμV	1.82494188 GHz	SWT	5 ms	Unit dBμV



Date: 14.FEB.2002 10:55:49

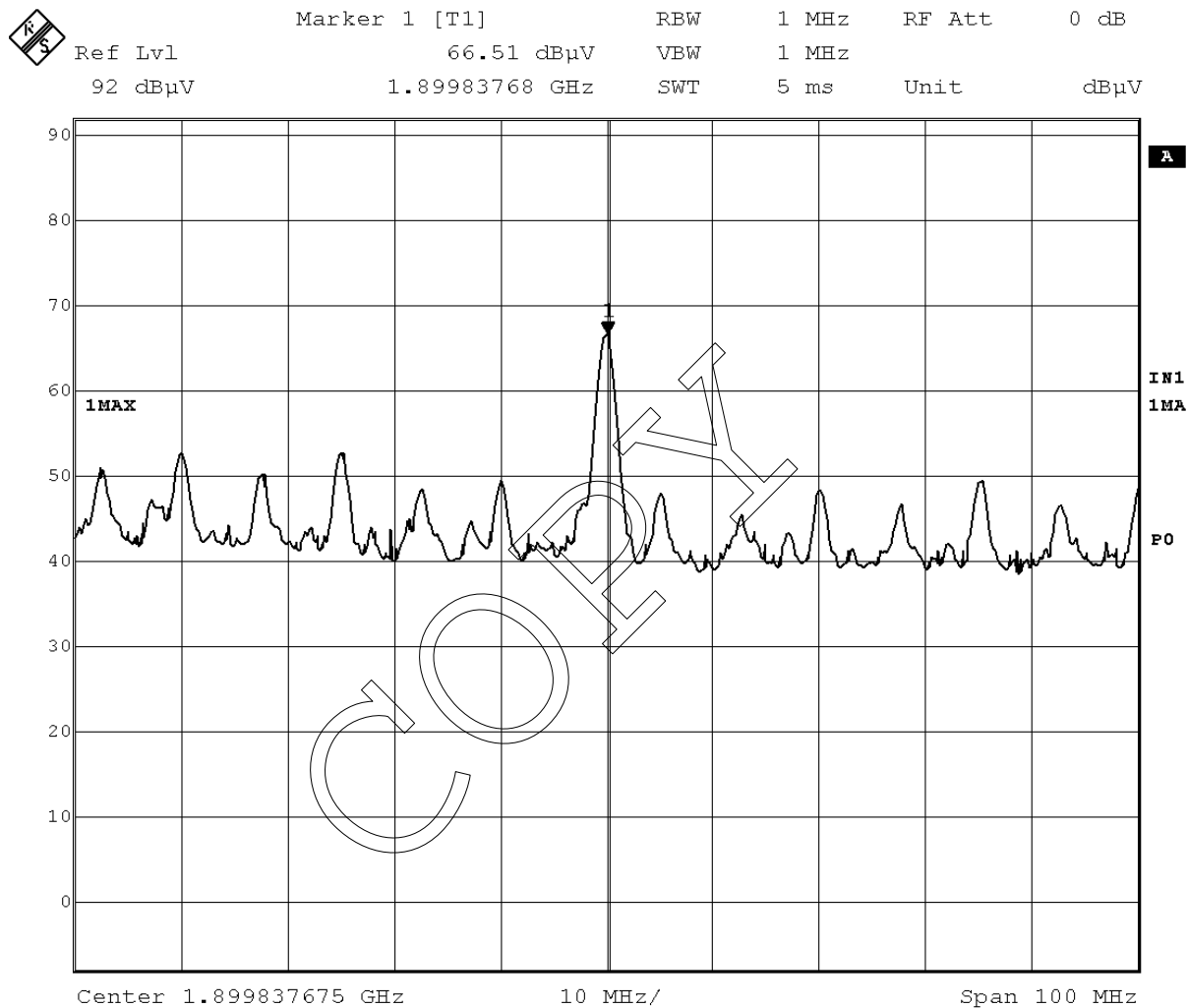
Operating Frequency : 1900 MHz

	Marker 1 [T1]	RBW	100 kHz	RF Att	0 dB
	Ref Lvl	65.37 dBμV	VBW	100 kHz	
	92 dBμV	1.89983768 GHz	SWT	5 ms	Unit dBμV




Date: 14.FEB.2002 14:09:52

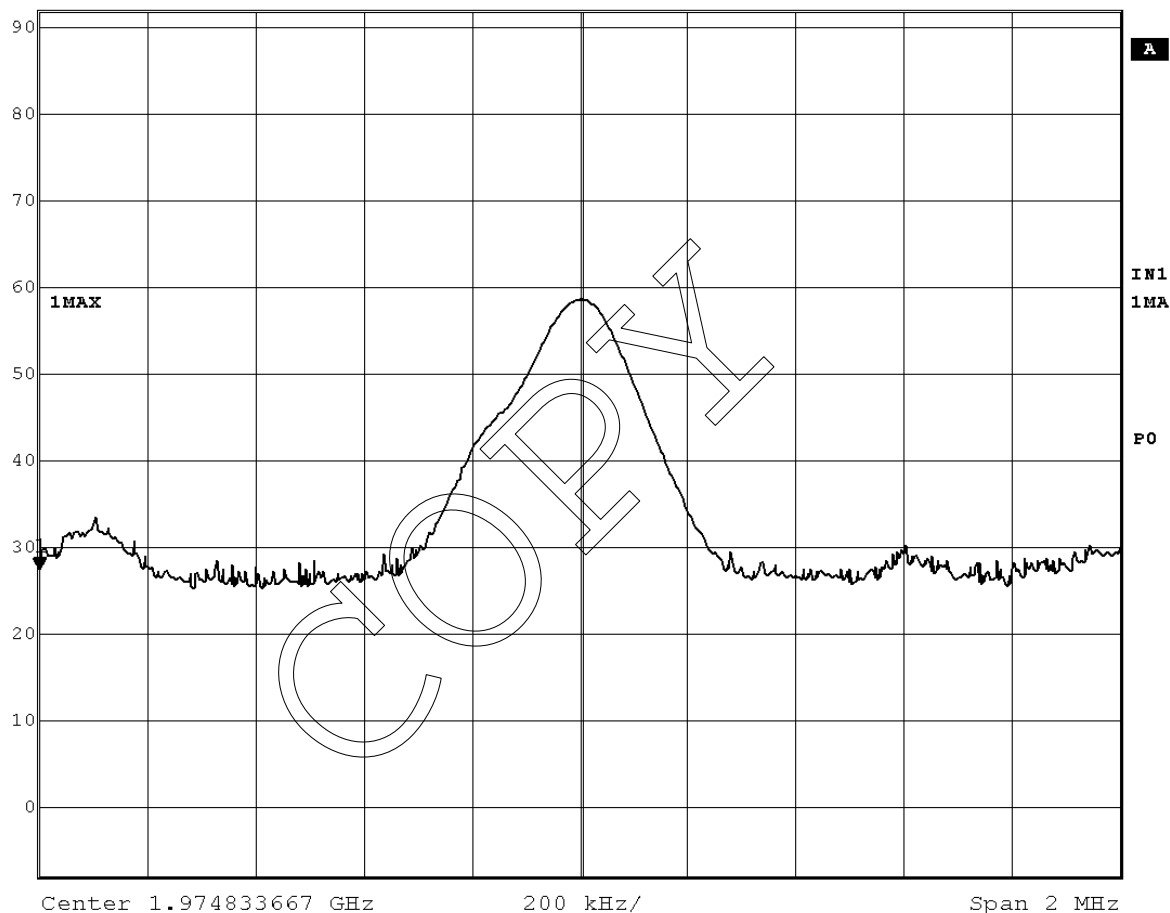
Operating Frequency : 1900 MHz



Date: 14.FEB.2002 14:10:48

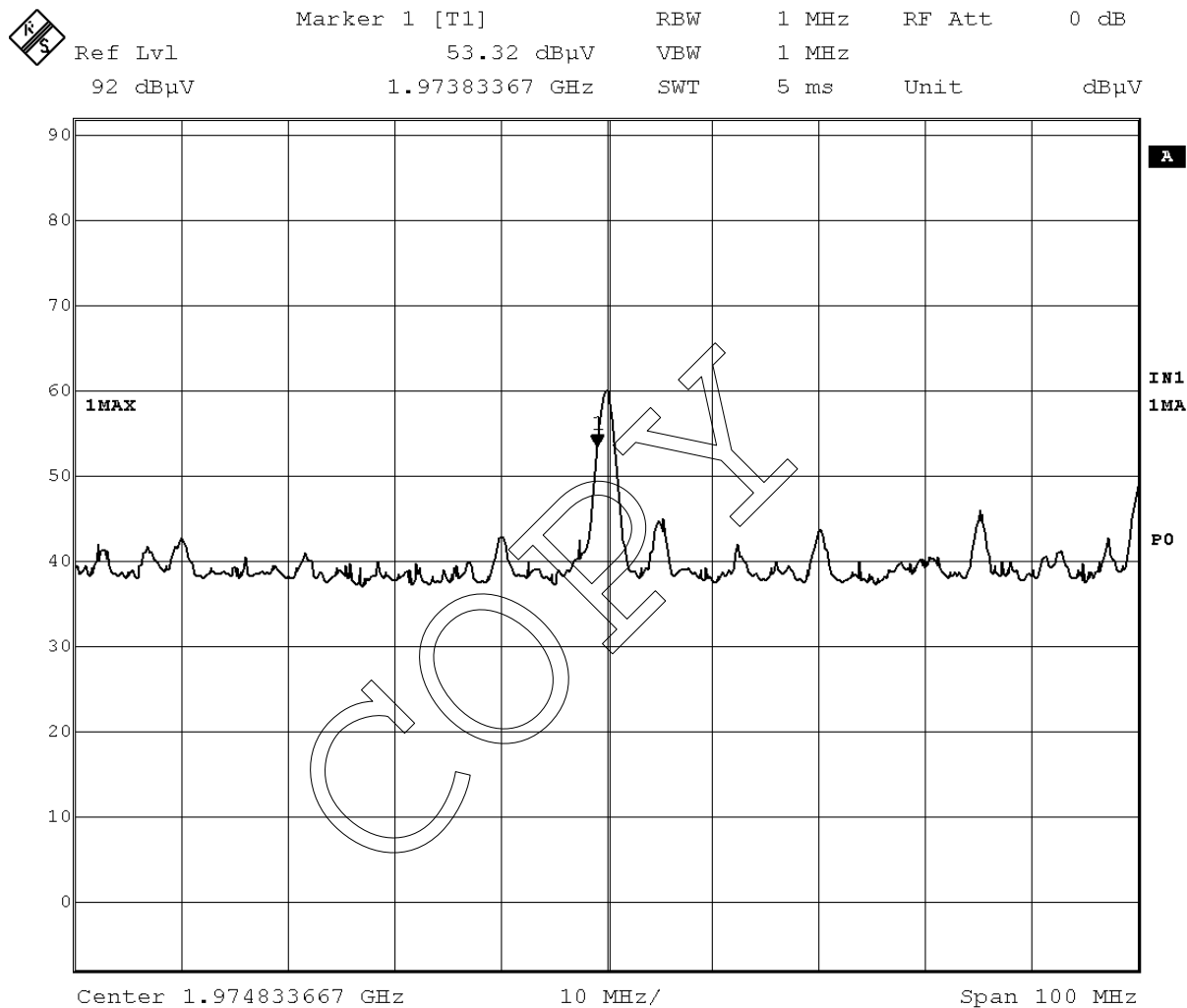
Operating Frequency : 1975 MHz

 Marker 1 [T1] RBW 100 kHz RF Att 0 dB
 Ref Lvl 27.28 dBμV VBW 100 kHz
 92 dBμV 1.97383367 GHz SWT 5 ms Unit dBμV



Date: 14.FEB.2002 14:14:39

Operating Frequency : 1975 MHz



Date: 14.FEB.2002 14:15:42