EXHIBIT D

TOKIN

EMC TEST REPORT

for

Hitachi Maxell, Ltd.

6139-1, Ohnogo, Mitsukaido-shi, Ibaraki 300-2595, Japan

Equipment Under Test:	Smart Card Reader/Writer model name : M-360M
Category:	FCC Part 15 Sub.part B Class B Digital Device
Tokin Report No.:	TAQ004421
Date of Issue:	May 8, 2000

H. Shida 9/5/00

Hiro Shida
Manager, Tsukuba Testing Lab.
Tokin EMC Engineering Co., Ltd.

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Contents

1 DESCRIPTION OF DEVICE

A) Kind of Equipment :	Smart Card Reader/Writer
B) FCC ID :	None
C) Model Name :	M-360M
D) Serial No. :	None
E) Type of Sample Tested :	Pre-production
F) High Frequency Used :	3.55MHz (IC Card) 7.1MHz (Micro Computer IC Card)
G) Rating Power Supply :	DC4.75 ~ 5.25V, 150mA
H) Tested Power Supply :	1phase AC120V, 60Hz
I) Date of Manufacture :	April 2000
J) Manufacturer :	Hitachi Maxell, Ltd. 6139-1, Ohnogo, Mitsukaido-shi, Ibaraki 300-2595, Japan
K) Description of Operating :	· Read/Write mode (3.55MHz) · Read/Write mode (7.1MHz)
L) Date of Sample Received :	April 25, 2000
M) Test Engineer :	Koji Takizawa

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Hiroko Nakamura

Koji Takizawa, Engineer

2 TEST FACILITY

The semi anechoic chamber and conducted measurement facility are used for these testing, where are located following address. This chamber was fully described in a report dated Dec.24,1999, that was submitted to the FCC. And we had accepted in a letter dated Feb.7,2000 (31040/SIT). This laboratory is accredited by NVLAP for NVLAP Lab. Code : 200221-0.

Tokin EMC Engineering Co., Ltd.
Tsukuba Testing Laboratory, Semi Anechoic Chamber and CE Measuring Room

Address ; 28-1, Kitahara-aza, Hanashimashinden-ohaza, Tsukuba-city, Ibaragi 305-0875, Japan

3 SUMMARY OF RESULTS

3.1 Electromagnetic Emission

RFI Voltage Measurement ..... **PASS**

RFI Field Strength Measurement ..... **PASS**

Although the measured emissions indicate that the EUT complies with the required limits, some measurements are close to these limits. When the uncertainty of measurement is considered, there is some possibility that the EUT may not be compliant.

Test results are traceable to JQA, TELEC and NIST.

3.2 Modifications to The EUT : None

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Hiroko Nakamura

Koji Takizawa, Engineer

4 TESTED SYSTEM DETAILS

4.1 Peripherals and Others :

Description	Model Name	Serial No.	Manufacturer	FCC ID
Personal Computer	GP6-366C	637495	Gateway	DoC
Monitor	500-069EV	15025E025543	Gateway	BEJCS592
Printer	K10158	None	Canon	DoC
Adapter for Printer	K30088	28246	Canon	DoC
Keyboard	Enhanced II keyboard	2441146CH170	COMPAQ	CNT8AV343A
Mouse	M-SAS51	LZB92302302	LOGITECH	JNZ211167

4.2 Type of Used Cables :

Description	Length	Type of shield	Model name	Manufacturer
Power cable for PC	2.0m	Non-shielded	None	None
Power cable for Monitor	2.5m	Non-shielded	None	None
Monitor cable	1.8m	Shielded	None	None
Mouse cable	1.8m	Shielded	None	None
Keyboard cable	1.8m	Shielded	None	None
Serial cable	2.0m	Shielded	None	None
Parallel cable	1.8m	Shielded	None	None
AC power cable for Printer	1.5m	Non-shielded	None	None
DC power cable for Printer	1.0m	Non-shielded	None	None

5 TECHINICAL COUNTERMEASURE: None

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Hiroko Nakamura

Koji Takizawa, Engineer

6 TEST RESULTS

6.1 RFI Voltage Measurement

6.1.1 Measurement Instrumentation Used

(*model/serial no./manufacturer/Tokin control no./last calibration/next calibration*)

Field strength meter ..... (KNM-2402/4N-170-4/Kyoritsu/RE015/31 Aug.'99/Aug.'00)

L.I.S.N. ..... (KNW-407/8-655-9/Kyoritsu/LI002/23 Aug.'99/Aug.'00)

Spectrum analyzer ..... (R3131/81781189/Advantest/SP042/23 Mar.'00/Mar.'01)

Coaxial cable..... (RG-55U/---/---/DK074/01 Mar.'00/Feb.'01)

CE measuring room ..... (Tsukuba No.1-CE/---/Tokin/SA018/---/---)

6.1.2 Measurement Procedure

The power line conducted interference measurements were performed according to ANSI C63.4-1992 in a shielded enclosure with peripherals placed on a table, 0.8m high over a metal floor. It was located more than required distance away from the shielded enclosure wall. Deviations from the standard was none.
The EUT was plugged into the LISN and the frequency range of interest scanned.
Reported are maximized emission levels.

6.1.3 Measurement Uncertainty

Measurement uncertainty of RFI Voltage Measurement test was estimated at ±0.6dB(k=2).

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Hiroko Nakamura

Koji Takizawa, Engineer

6.1.4 Test Data

Table 6.1-1 RFI Voltage Measurement Results

Operating mode: Read/Write mode (3.55MHz) Date of measurement: April 26, 2000
Test procedure: ANSI C63.4-1992 Temperature: 21 degree C
Humidity: 49 %

	Frequency (MHz)	Level (dBμV)	Total Factor(dB)	Result (dBμV)	Result (μV)	Limit (μV)	Margin (dB)
L1-E	0.494	27.0	0.0	27.0	22.39	250	21.0
	0.592	25.0	0.0	25.0	17.78	250	23.0
	3.657	32.0	0.2	32.2	40.74	250	15.8
	8.900	30.0	0.3	30.3	32.73	250	17.7
	11.470	34.0	0.3	34.3	51.88	250	13.7
	25.910	27.0	0.7	27.7	24.27	250	20.3
N-E	0.494	34.0	0.1	34.1	50.70	250	13.9
	0.592	32.0	0.1	32.1	40.27	250	15.9
	3.657	22.0	0.3	22.3	13.03	250	25.7
	8.900	29.0	0.4	29.4	29.51	250	18.6
	11.470	28.0	0.4	28.4	26.30	250	19.6
	25.910	28.0	0.9	28.9	27.86	250	19.1

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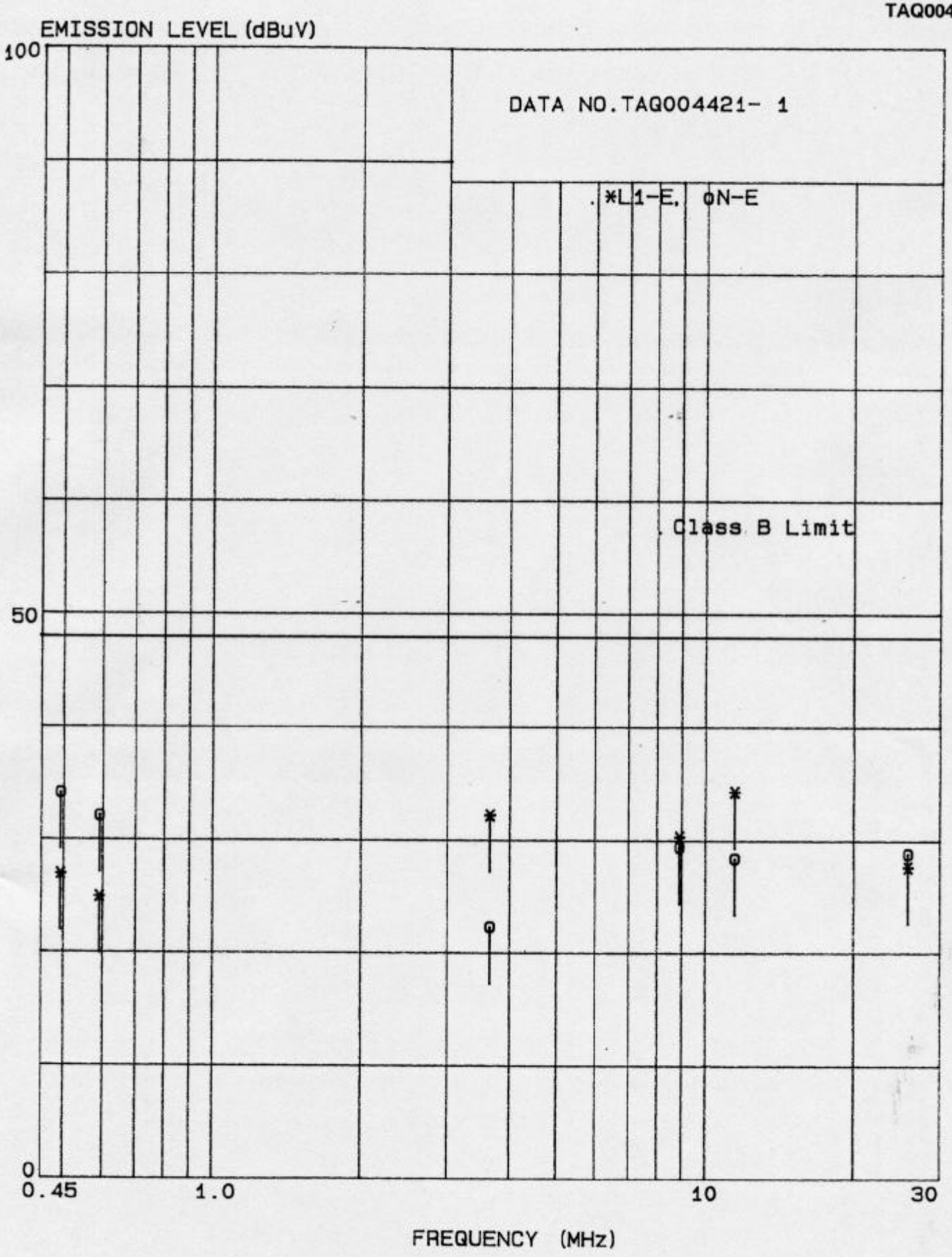

Figure 6.1-1 RFI Voltage Measurement Results

Table 6.1-2 RFI Voltage Measurement Results

Operating mode: Read/Write mode (7.1MHz)
Test procedure: ANSI C63.4-1992

Date of measurement: April 26, 2000
Temperature: 21 degree C
Humidity: 49 %

	Frequency (MHz)	Level (dBμV)	Total Factor(dB)	Result (dBμV)	Result (μV)	Limit (μV)	Margin (dB)
L1-E	0.494	26.0	0.0	26.0	19.95	250	22.0
	0.592	26.0	0.0	26.0	19.95	250	22.0
	3.657	32.5	0.2	32.7	43.15	250	15.3
	8.900	34.0	0.3	34.3	51.88	250	13.7
	11.470	36.0	0.3	36.3	65.31	250	11.7
	21.690	36.0	0.5	36.5	66.83	250	11.5
N-E	0.494	34.0	0.1	34.1	50.70	250	13.9
	0.592	32.5	0.1	32.6	42.66	250	15.4
	3.657	22.0	0.3	22.3	13.03	250	25.7
	8.900	33.0	0.4	33.4	46.77	250	14.6
	11.470	32.0	0.4	32.4	41.69	250	15.6
	21.690	36.0	0.8	36.8	69.18	250	11.2

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Koji Takizawa, Engineer

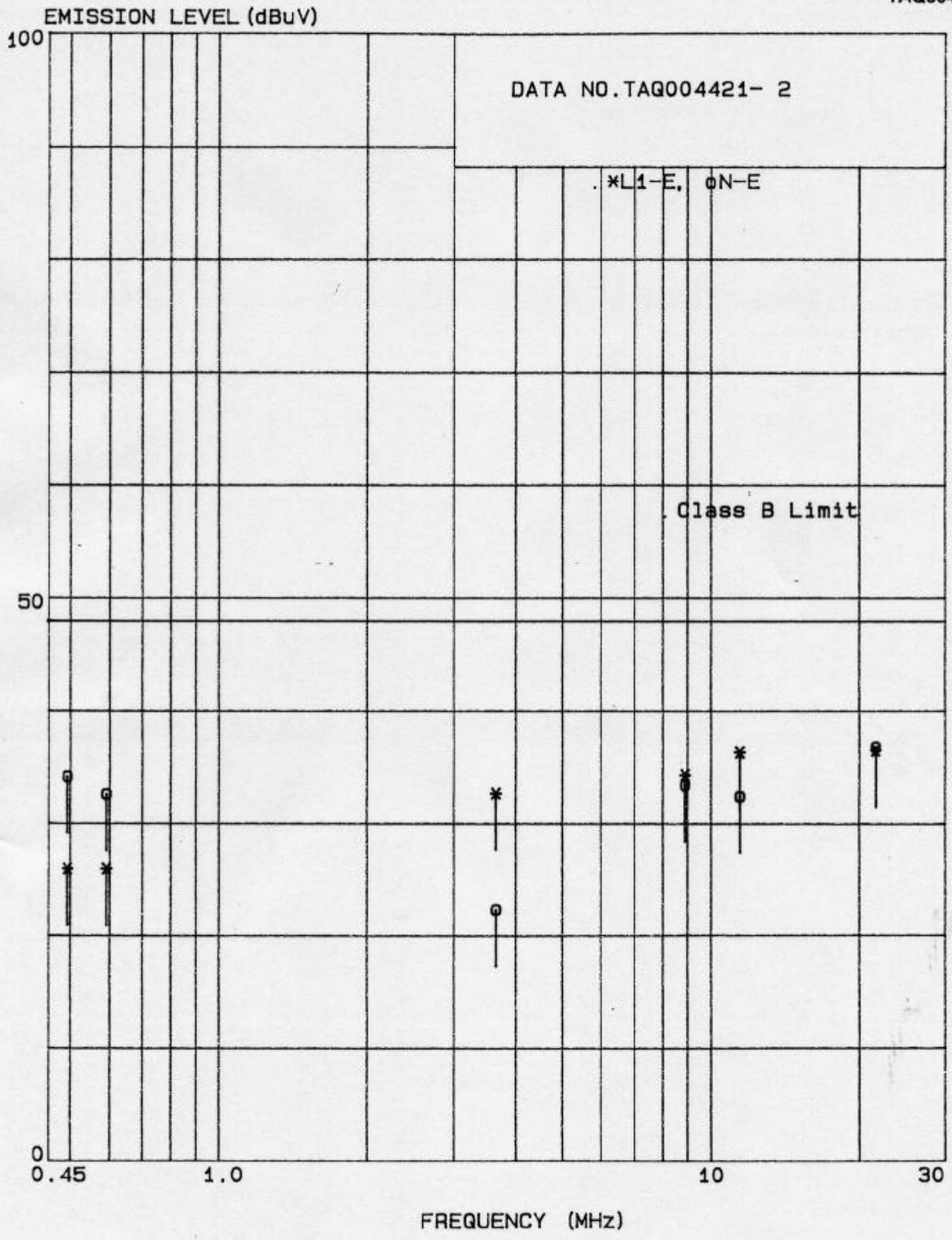

Figure 6.1-2 RFI Voltage Measurement Results

6.2 RFI Field Strength Measurement

6.2.1 Measurement Instrumentation Used

(*model/serial no./manufacturer/Tokin control no./last calibration/next calibration*)

Field strength meter ..... (FCVU1534/1534118/Schwarzbeck/RE040/16 Nov.'99/Nov.'00)

Bi-Log antenna..... (CBL6111/1154/Chase/TB018/16 Nov.'99/Nov.'00)

Pre-amplifier ..... (8447D/2727A05358/Hewlett Packard/AM00A/12 Oct.'99/Oct.'00)

Spectrum analyzer ..... (8566B/2139A01073/Hewlett Packard/SP00A/16 Aug.'99/Aug.'00)

Quasi-Peak adapter ..... (85650A/2430A00566/Hewlett Packard/SP022/16 Aug.'99/Aug.'00)

Preselector ..... (85685A/2645A00366/Hewlett Packard/SP023/16 Aug.'99/Aug.'00)

Coaxial cable..... (---/CLA/---/DK092/17 Nov.'99/Nov.'00)

Semi anechoic chamber ..... (Tsukuba AC/---/Tokin/SA012/03 Dec.'99/Dec.'00)

6.2.2 Measurement Procedure

Final test was performed according to ANSI C63.4-1992 at the semi anechoic chamber. Deviations from the standard was none.
The EUT was placed in a 0.8m high table along with the peripherals. The turn table was separated from the antenna distance 3meters. Cables were placed in a position to produce maximum emissions as determined by experimentation, and operation mode was selected for maximum.
The frequencies and amplitudes of maximum emission were measured at varying azimuths, antenna heights and antenna polarities. Reported are maximized emission levels.

6.2.3 Measurement Uncertainty

Measurement uncertainty of RFI Field Strength Measurement test was estimated at ±2.8dB(k=2).

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Hiroko Nakamura

Koji Takizawa, Engineer

6.2.4 Test Data

Table 6.2-1 RFI Field Strength Measurement Results

Operating mode: Read/Write mode (3.55MHz) Date of measurement: April 25, 2000
Test procedure: ANSI C63.4-1992 Temperature: 19 degree C
Humidity: 47 %

Frequency	Level		Ant.	Cable	Amp.	Result		Result		3 Meter	Margin	
	Ver.	Hor.	Factor	Loss	Gain	Ver.	Hor.	Ver.	Hor.	Limit	Ver.	Hor.
(MHz)	(dBμV)		(dB/m)	(dB)	(dB)	(dBμV/m)		(μV/m)		(μV/m)	(dB)	
47.00	49.0	-	10.7	1.8	27.6	33.9	-	49.55	-	100	6.1	-
54.25	53.0	-	6.8	1.8	27.6	34.0	-	50.12	-	100	5.9	-
232.42	-	45.0	9.2	4.7	27.0	-	31.9	-	39.36	200	-	14.1
298.92	-	42.0	13.8	5.4	26.9	-	34.3	-	51.88	200	-	11.7
398.31	37.0	-	16.4	6.5	27.5	32.4	-	41.69	-	200	13.6	-
398.42	-	41.0	16.4	6.5	27.5	-	36.4	-	66.07	200	-	9.6
405.58	-	43.0	16.7	6.6	27.6	-	38.7	-	86.10	200	-	7.3
497.99	39.0	-	17.6	7.4	28.1	35.9	-	62.37	-	200	10.1	-
596.69	41.0	-	20.0	8.1	28.4	40.7	-	108.39	-	200	5.3	-
597.82	-	40.0	20.0	8.1	28.4	-	39.7	-	96.61	200	-	6.3
663.65	-	41.0	20.7	8.5	28.4	-	41.8	-	123.03	200	-	4.2
663.69	41.0	-	20.7	8.5	28.4	41.8	-	123.03	-	200	4.2	-

Class B limit

Radiated Emission – 3 meter distance

Frequency (MHz)	dBμV/m	μV/m
30 - 88	40.0	100
88 - 216	43.5	150
216 - 960	46.0	200
> 960	54.0	500

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Koji Takizawa, Engineer

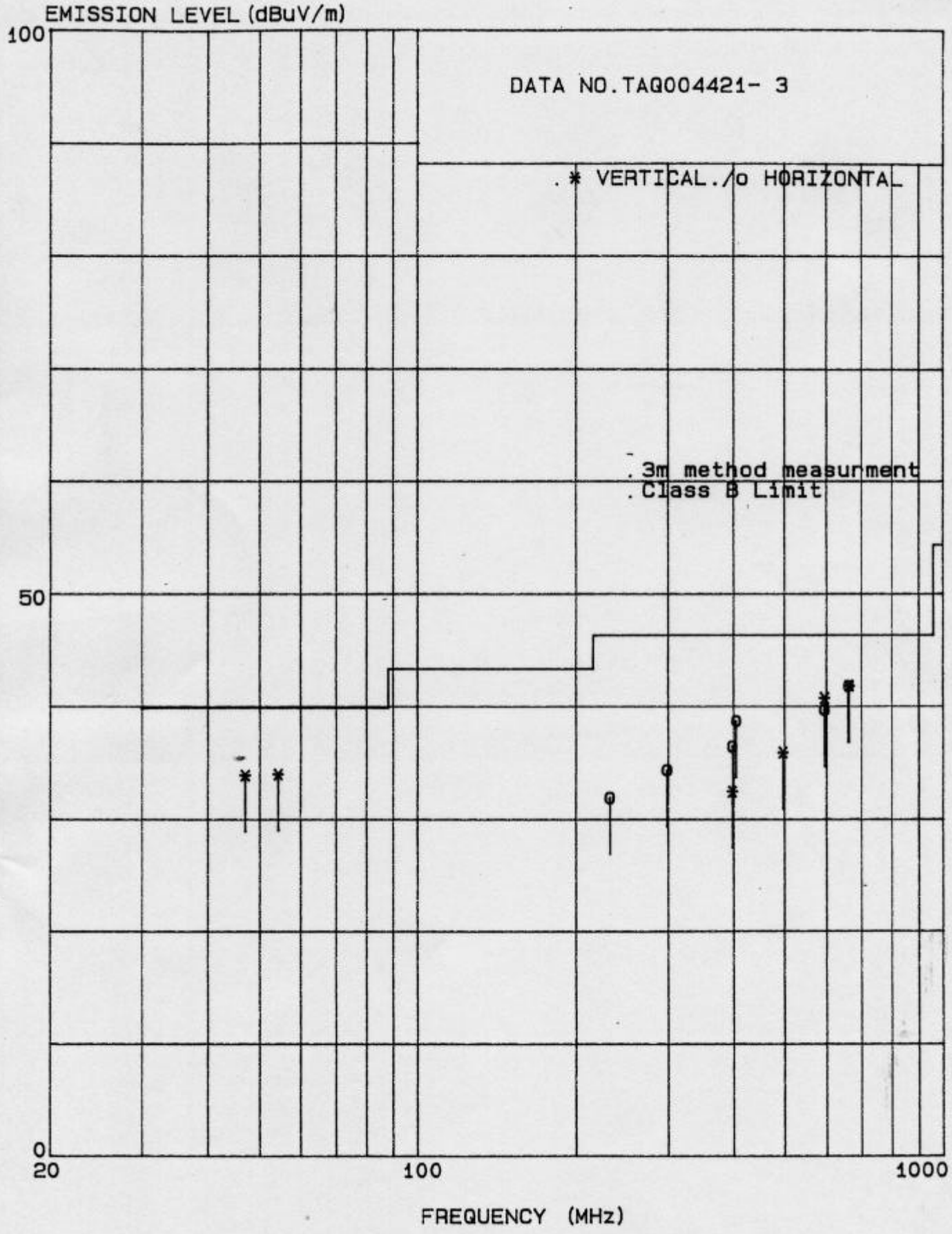

Figure 6.2-1 RFI Field Strength Measurement Results

Table 6.2-2 RFI Field Strength Measurement Results

Operating mode: Read/Write mode (7.1MHz) Date of measurement: April 25, 2000
Test procedure: ANSI C63.4-1992 Temperature: 19 degree C
Humidity: 47 %

Frequency	Level		Ant.	Cable	Amp.	Result		Result		3 Meter	Margin	
	Ver.	Hor.	Factor	Loss	Gain	Ver.	Hor.	Ver.	Hor.	Limit	Ver.	Hor.
(MHz)	(dBμV)		(dB/m)	(dB)	(dB)	(dBμV/m)		(μV/m)		(μV/m)	(dB)	
50.61	54.0	44.0	8.6	1.8	27.5	36.9	26.9	69.98	22.13	100	3.1	13.1
54.23	53.0	-	6.8	1.8	27.6	34.0	-	50.12	-	100	6.0	-
56.88	54.0	-	5.7	2.0	27.6	34.1	-	50.70	-	100	5.9	-
130.13	46.0	44.0	11.7	3.2	27.5	33.4	31.4	46.77	37.15	150	10.1	12.1
231.35	-	47.0	9.1	4.7	27.0	-	33.8	-	48.98	200	-	12.2
274.74	-	43.0	13.2	5.2	26.9	-	34.5	-	53.09	200	-	11.5
398.20	-	44.0	16.4	6.5	27.5	-	39.4	-	93.33	200	-	6.6
474.08	-	44.0	17.2	7.2	28.1	-	40.3	-	103.51	200	-	5.7
596.69	42.0	-	20.0	8.1	28.4	41.7	-	121.62	-	200	4.3	-
663.66	41.0	-	20.7	8.5	28.4	41.8	-	123.03	-	200	4.2	-

Class B limit

Radiated Emission – 3 meter distance

Frequency (MHz)	dBμV/m	μV/m
30 - 88	40.0	100
88 - 216	43.5	150
216 - 960	46.0	200
> 960	54.0	500

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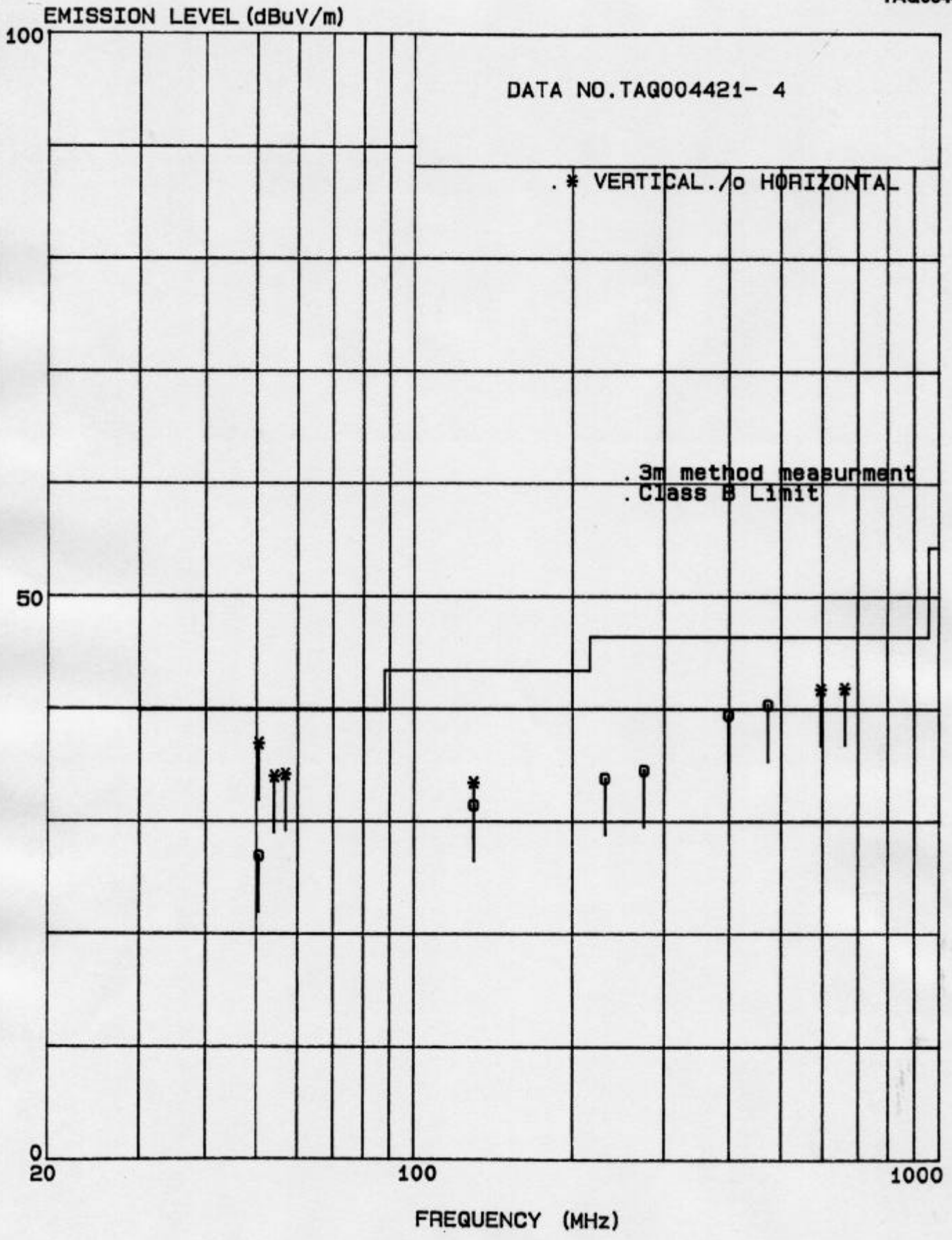

Figure 6.2-2 RFI Field Strength Measurement Results

6.3 Minimum Margin

Table 6.3-1 Minimum Margin

Conducted emission

Read/Write (7.1M/8) operation mode 21.69 MHz, 11.2 dB

Radiated emission

Read/Write (7.1M/8) operation mode 50.61 MHz, 3.1 dB

6.4 Sample Calculation

Table 6.4-1 Sample Calculation

The maximum radiating emission can be obtained at the frequency of 50.61 MHz, Vertical polarization on Read/Write (7.1M/8) operation mode.

Each value at frequency is as follows;

R :	Field strength meter reading	=	54.0	(dBμV)
A :	Antenna factor	=	8.6	(dB/m)
C :	Cable loss	=	1.8	(dB)
G :	Amplifier gain	=	27.5	(dB)

Then radiated emission E(dBμV/m) is ;

$$E = R + A + C - G$$

Therefore, the maximum radiated emission is ;

36.9 (dBμV/m)

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Koji Takizawa, Engineer

7 MEASUREMENT PHOTOS

Photo 7.1 Setup with the Maximized RFI Voltage Emission Level

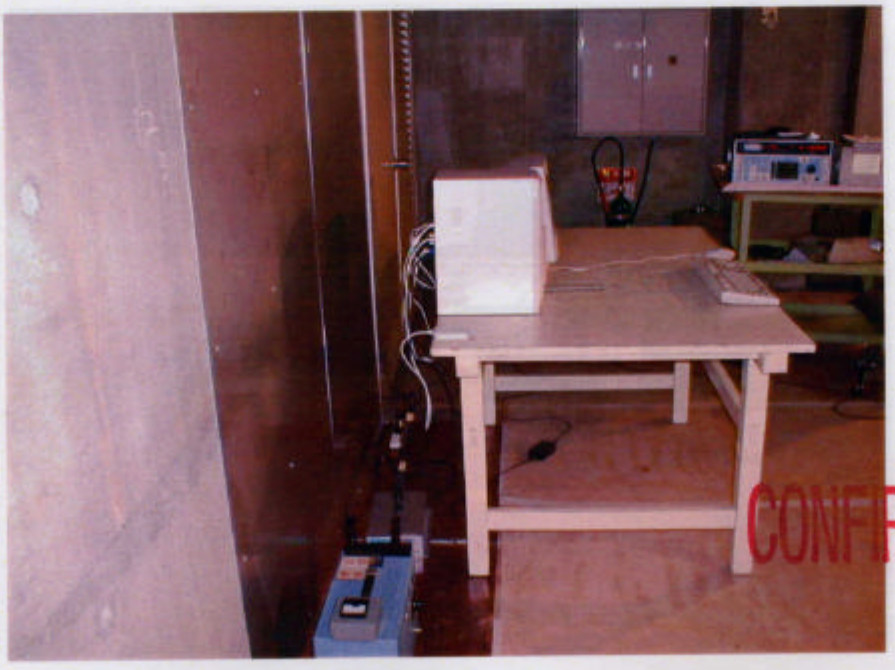

Photo 7.2 Setup with the Maximized RFI Field Strength Emission Level