

Tokin EMC Engineering Co., Ltd.
28-1 Kitahara-aza Hanashimashinden-ohaza
Tsukuba-city Ibaragi 305-0875 Japan
Tel +81-298-37-2400 Fax +81-298-37-2401

EMC TEST REPORT

for

WACOM Co., Ltd.

2-510-1, Toyonodai, Otone-machi,
Kitasaitama-gun, Saitama 349-1148, JAPAN

Equipment Under Test: Digitizer
model name : GD-0405-U
Category: FCC Part 15 Sub.part C Class B Digital Device
Token Report No.: T6G9940813
Date of Issue: April 14, 1999


Hiro Shida
15/4/99
Manager, Tsukuba Testing Lab.
Tokin EMC Engineering Co., Ltd.

-- ATTENTION --

The test results in this report relate only to the following EUTs, and this report shall not be reproduced except in full, without the written approval of the laboratory.

NVLAQ®

Contents

	<i>Page</i>
1 DESCRIPTION OF DEVICE	1
2 TEST FACILITY	2
3 SUMMARY OF RESULTS	
3.1 Electromagnetic Emission	2
3.2 Modification to The EUT.....	2
4 TESTED SYSTEM DETAILS	
4.1 Peripherals and Others	3
4.2 Type of Used Cables	3
5 TECHNICAL COUNTERMEASURE.....	3
6 TEST RESULTS	
6.1 RFI Voltage Measurement	
6.1.1 Measurement Instrumentation Used	4
6.1.2 Measurement Procedure.....	4
6.1.3 Measurement Uncertainty	4
6.1.4 Test Data	5 ~ 6
6.2 RFI Field Strength Measurement	
6.2.1 Measurement Instrumentation Used	7
6.2.2 Measurement Procedure.....	8
6.2.3 Measurement Uncertainty	8
6.2.4 Test Data	9 ~ 12
6.3 Minimum Margin.....	13
6.4 Sample Calculation	13
7 MEASUREMENT PHOTOS	
Photo 7.1 Setup with the Maximized RFI Voltage Emission Level	14
Photo 7.2 Setup with the Maximized RFI Field Strength Emission Level	15

1 DESCRIPTION OF DEVICE

A) Kind of Equipment : Digitizer

B) Model Name : GD-0405-U

C) Serial No. : 9CJP00001

D) Type of Sample Tested : Pre-production

E) High Frequency Used : 18.432MHz, 6MHz (CPU clock)
384.0kHz, 460.8kHz (Operating frequency)

F) Rating Power Supply : DC+5V, 0.5A

G) Tested Power Supply : DC+5V, 0.5A from PC
(PC power supply : 1phase AC120V, 50Hz)

H) Date of Manufacture : March 1999

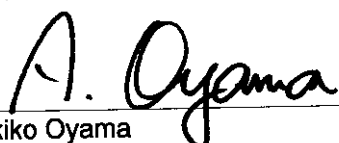
I) Manufacturer : WACOM Co., Ltd.
2-510-1, Toyonodai, Otone-machi, Kitasaitama-gun,
Saitama 349-1148, JAPAN

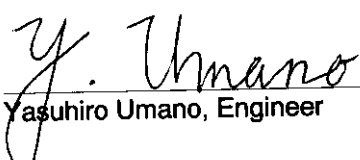
J) Description of Operating : DISPLAY : ALL H DISPLAY
USB Communication

K) Date of Sample Received : April 05, 1999

L) Test Engineer : Yasuhiro Umano

Report processed by


Akiko Oyama
14/Apr./1999


Yasuhiro Umano, Engineer

2 TEST FACILITY

The open field test site and conducted measurement facility are used for this measurement, where is located following address. This facility was fully described in a report dated Jan.31, 19994, that was submitted to the FCC. And we had accepted in a letter dated Apr.8, 1994 (31040/SIT). This laboratory is accredited by NVLAP for NVLAP Lab. Code : 200221-0.

Tokin EMC Engineering Co., Ltd.
Tsukuba Testing Laboratory, Open Field Test Site No.6 and Shielded Room No.1

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

3 SUMMARY OF RESULTS

3.1 Electromagnetic Emission

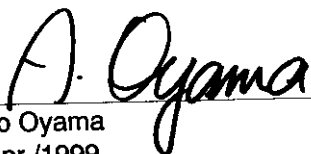
RFI Voltage Measurement **PASS**

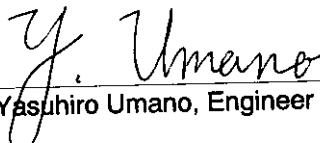
RFI Field Strength Measurement **PASS**

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, MKK and NIST.

3.2 Modifications to The EUT : This EUT had taken countermeasures.

Report processed by


Akiko Oyama
14/Apr./1999


Yasuhiro Umano, Engineer

4 TESTED SYSTEM DETAILS

4.1 Peripherals and Others :

Description	Model Name	Serial No.	Manufacturer	FCC ID
PC	DP2000 5166MMXJPN	7725BK	Compaq	DoC
Display	9060S	56475129 S-US	Nanao	GCJ9060
Mouse	M-S34	None	Compaq	DZL211029
Printer	J250	4300911101326	Star Micronics America	B6Z8MFJ250
Modem	T1200-SD2	S87309509	Omnitel	D786JC T1200-SD2
Keyboard	None	B07020A39EY2Y5	Compaq	AQ6-72BC15
CCD camera	LPC-U20	None	LG	DoC

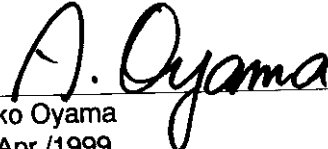
4.2 Type of Used Cables :

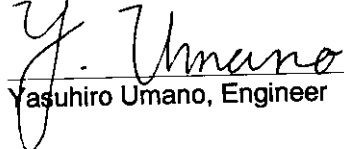
Description	Length	Type of shield	Model name	Manufacturer
Display AC cable	2.2m	Non-shielded	None	Nanao
Display I/F cable	1.8m	Shielded	V20	Nanao
PC AC cable	2.0m	Shielded	None	Compaq
Printer cable	1.8m	Shielded	None	None
Modem I/F cable	1.5m	Shielded	C232N-J3115	Elecom
Modular cable	1.0m x2	Non-shielded	None	None
USB cable	1.5m	Non-shielded	None	LG

5 TECHINICAL COUNTERMEASURE

Parts number	Description	Circuit sign	Quantity	Maker
BLM11A601S	Coil	F 1,2,3,4,5,6,7,201,202, 203,204,205,206	13	Murata manufacturing co., ltd.
PLP3216S551SL2	Coil	F 101	1	Murata manufacturing co., ltd.
HF70 BB5.2x10x3	Ferrite core		1	TDK co., ltd.
CU7636R	Copper tape		1	Sony chemicals corporation

Report processed by


 Akiko Oyama
 14/Apr./1999


 Yasuhiro Umamo, Engineer

6 TEST RESULTS

6.1 RFI Voltage Measurement

6.1.1 Measurement Instrumentation Used

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

Field strength meter (FCKL1528/134/Schwarzbeck/RE041/02 Dec.'98/Oct.'99)

L.I.S.N. (KNW-407/8-515-20/Kyoirtsu/LI010/31 Aug.'98/Aug.'99)

Spectrum analyzer (R3261A/01720142/Advantest/SP012/21 Oct.'98/Oct.'99)

Coaxial cable..... (---/---/---/DK124/02 Mar.'99/Mar.'00)

Shielded Room..... (Tsukuba No.1/---/Token/SA016/---/---)

6.1.2 Measurement Procedure

The power line conducted interference measurements were performed according to ANSI C63.4-1992 in a shielded enclosure No.1 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.

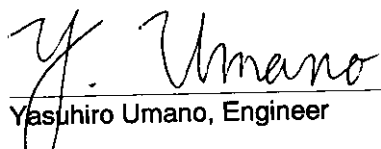
The EUT was plugged into the LISN and the frequency range of interest scanned.
Reported are maximized emission levels.

6.1.3 Measurement Uncertainty

Measurement uncertainty of RFI Voltage Measurement test was estimated at $\pm 1.8\text{dB}(k=2)$.

Report processed by


Akiko Oyama
14/Apr./1999


Yasuhiro Umano, Engineer

6.1.4 Test Data

Table 6.1-1 RFI Voltage Measurement Results

Operating mode: DISPLAY : ALL H DISPLAY
 USB Communication

Date of measurement: April 05, 1999

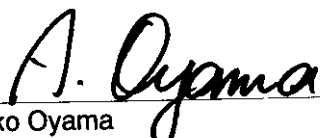
Temperature: 17 degree C

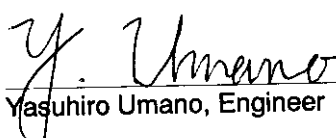
Test procedure: ANSI C63.4-1992

Humidity: 70 %

	Frequency (MHz)	Level (dBμV)	Total Factor(dB)	Result (dBμV)	Result (μV)	Limit (μV)	Margin (dB)
L1-E	0.865	16.0	0.2	16.2	6.46	250	31.8
	0.959	21.0	0.2	21.2	11.48	250	26.8
	1.010	23.0	0.2	23.2	14.45	250	24.8
	10.156	27.5	0.3	27.8	24.55	250	20.2
	12.873	20.0	0.4	20.4	10.47	250	27.6
	13.641	21.5	0.4	21.9	12.45	250	26.1
N-E	0.865	17.0	0.2	17.2	7.24	250	30.8
	0.959	22.0	0.2	22.2	12.88	250	25.8
	1.010	25.0	0.2	25.2	18.20	250	22.8
	10.156	26.5	0.3	26.8	21.88	250	21.2
	12.873	22.0	0.4	22.4	13.18	250	25.6
	13.641	23.0	0.4	23.4	14.79	250	24.6

Report processed by


 Akiko Oyama
 14/Apr./1999


 Yasuhiro Umano, Engineer

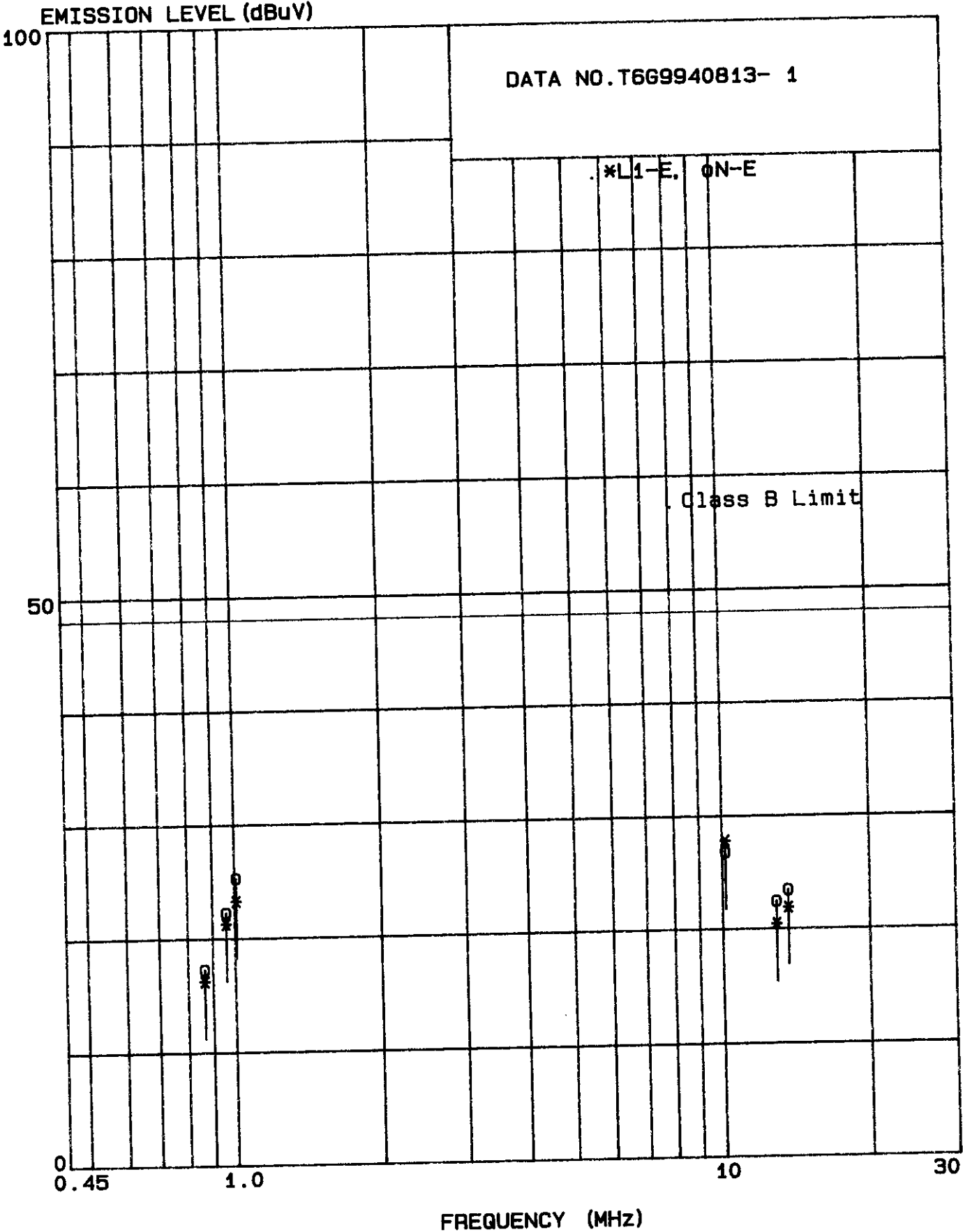


Figure 6.1-1 RFI Voltage Measurement Results

6.2 RFI Field Strength Measurement

6.2.1 Measurement Instrumentation Used

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

< 0.009MHz ~ 30MHz >

Loop antenna..... (HFH2-Z2/893503-014/Rohde&Schwarz/AN009/06 May '98/May '99)
Spectrum analyzer (TR4135/67800030/Advantest/SP014/29 Sep.'98/Sep.'99)
Coaxial cable..... (---/---/---/DK125/02 Mar.'99/Mar.'00)
Shielded Room..... (Tsukuba No.1/---/Tokin/SA016/---/---)

< 30MHz ~ 1000MHz >

Field strength meter (KNM-5002/4N-171-4/Kyoritsu/RE006/28 Sep.'98/Sep.'99)
Frequency converter (KCV-6002/4-248-1/Kyoritsu/RC006/28 Sep.'98/Sep.'99)
Biconical antenna (BBA9106/TB006/Schwarzbeck/TB006/10 Sep.'98/Sep.'99)
Logperiodic antenna..... (UHALP9108-A/0115/Schwarzbeck/TL021/07 Jul.'98/Jul.'99)
Pre-amplifier (8447D/2443A03690/Hewlett Packard/AM005/09 Sep.'98/Sep.'99)
Spectrum analyzer (R3261A/81720103/Advantest/SP006/12 Nov.'98/Nov.'99)
Coaxial cable..... (---/CL6/---/DK090/31 Jul.'98/Jul.'99)
Open field test site (Tsukuba No.6/---/Tokin/SA006/17 Nov.'98/Nov.'99)

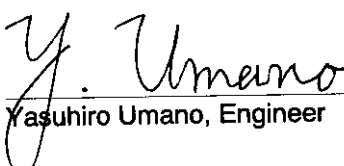
< Over 1000MHz >

Double ridged guide

horn antenna..... (3115/90053420/EMCO/AN003/03 Feb.'99/Feb.'00)
Pre-amplifier (8449B/3008A00681/Hewlett Packard/rental/24 Nov.'98/Nov.'99)
Coaxial cable..... (SUCOFLEX 104 2m/49402-4/SUCOFLEX/DK001/24 Nov.'98/Nov.'99)
Coaxial cable..... (SUCOFLEX 104/51100-4/SUCOFLEX/DK002/24 Nov.'98/Nov.'99)
Coaxial cable..... (SUCOFLEX 104 15m/51507-4/SUCOFLEX/DK003/24 Nov.'98/Nov.'99)
Coaxial cable..... (MW3.0D-FF-2500/910215-8/Hitachi/DK006/24 Nov.'98/Nov.'99)
Coaxial cable..... (MW3.0D-FF-2500/910215-10/Hitachi/DK007/24 Nov.'98/Nov.'99)
Open field test site (Tsukuba No.6/---/Tokin/SA006/17 Nov.'98/Nov.'99)

Report processed by


Akiko Oyama
14/Apr./1999


Yasuhiro Umamo, Engineer

6.2.2 Measurement Procedure

Final test was performed according to ANSI C63.4-1992 at the open field test site No.6. 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 $\pm 3.4\text{dB}(k=2)$.

Report processed by


Akiko Oyama
14/Apr./1999


Yasuhiro Umano, Engineer

6.2.4 Test Data

Table 6.2-1 RFI Field Strength Measurement Results (0.009MHz ~ 30MHz)

Operating mode: DISPLAY : ALL H DISPLAY						Date of measurement: April 05, 1999						
USB Communication						Temperature: 17 degree C						
Test procedure: ANSI C63.4-1992						Humidity: 70 %						
Frequency (MHz)	Level		Ant. Factor	Cable Loss	Amp. Gain	Result		Result		3 Meter Limit	Margin	
	Ver.	Hor.				Ver.	Hor.	Ver.	Hor.		Ver.	Hor.
	(dBμV)		(dB/m)	(dB)	(dB)	(dBμV/m)		(μV/m)		(μV/m)	(dB)	

Test results were under the required limit with 20dB margin or more.

Class B limit

Radiated Emission - 3 meter distance

Frequency (MHz)	dBμV/m	μV/m
0.009 ~ 0.490	88.5 ~ 53.8	2400/F(kHz) +40
0.490 ~ 1.705	53.8 ~ 43.0	24000/F(kHz) +20
1.705 ~ 30	29.5	30

Report processed by


 Akiko Oyama
 14/Apr./1999


 Yasuhiro Umano, Engineer

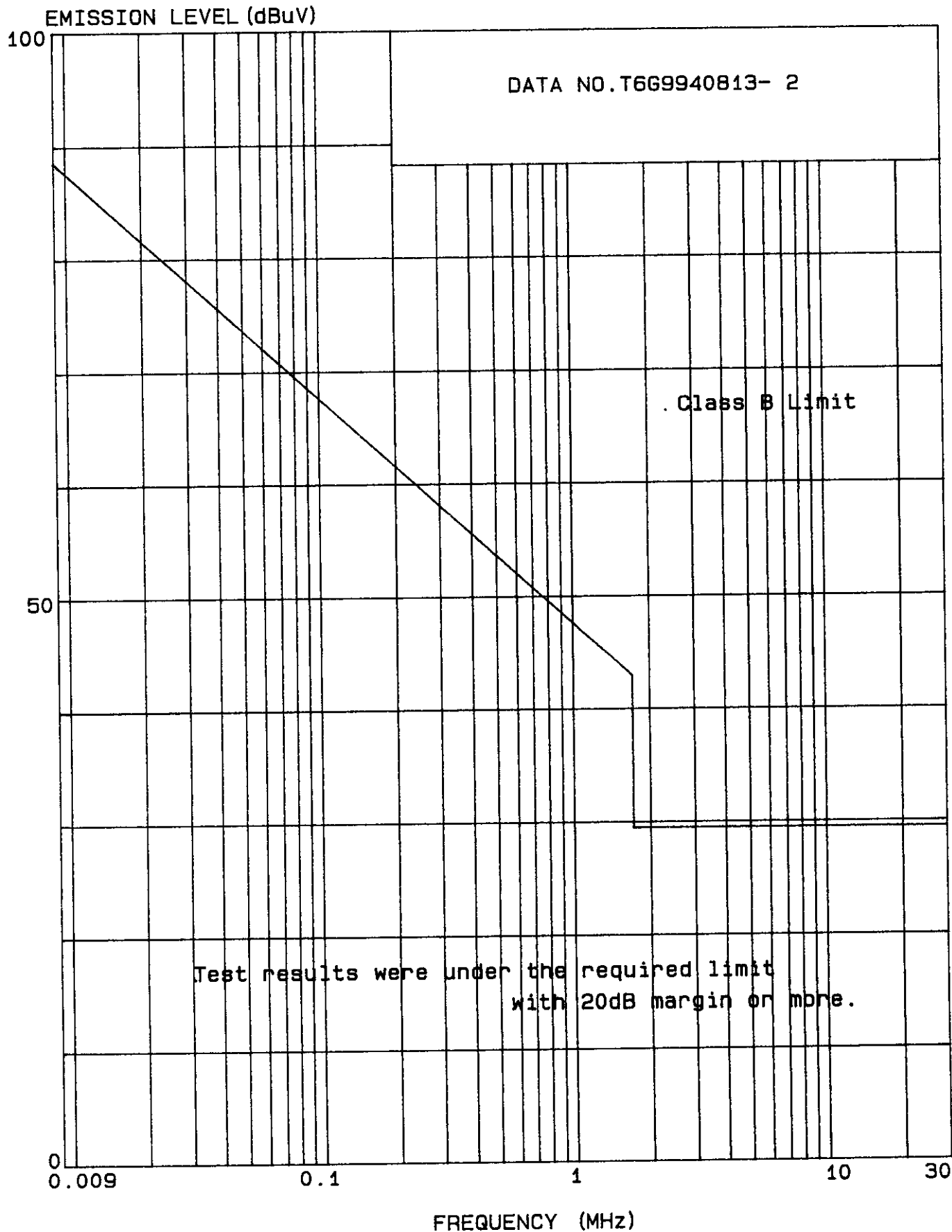


Figure 6.2-1 RFI Field Strength Measurement Results

Table 6.2-1 RFI Field Strength Measurement Results (Over 30MHz)

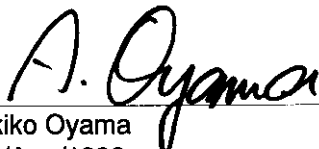
Operating mode: DISPLAY : ALL H DISPLAY						Date of measurement: April 05, 1999					
USB Communication						Temperature: 19 degree C					
Test procedure: ANSI C63.4-1992						Humidity: 72 %					
Frequency (MHz)	Level Ver. Hor. (dBμV)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp. Gain (dB)	Result Ver. Hor. (dBμV/m)		Result Ver. Hor. (μV/m)		3 Meter Limit (μV/m)	Margin Ver. Hor. (dB)	
68.90	- 43.0	5.8	3.2	27.7	-	24.3	-	16.41	100	-	15.7
75.17	42.5 45.0	6.2	3.4	27.7	24.4	26.9	16.60	22.13	100	15.6	13.1
125.36	35.5 -	14.7	4.5	27.5	27.2	-	22.91	-	150	16.3	-
125.40	- 32.0	14.7	4.5	27.5	-	23.7	-	15.31	150	-	19.8
136.43	42.0 38.0	15.1	4.8	27.5	34.4	30.4	52.48	33.11	150	9.1	13.1
160.40	34.0 -	14.7	5.2	27.3	26.6	-	21.38	-	150	16.9	-
224.92	- 32.0	16.9	6.1	27.0	-	28.0	-	25.12	200	-	18.0
346.59	- 41.0	14.1	7.4	27.0	-	35.5	-	59.57	200	-	10.5
347.49	37.0 -	14.1	7.4	27.0	31.5	-	37.58	-	200	14.5	-
386.27	- 33.5	15.1	7.8	27.2	-	29.2	-	28.84	200	-	16.8
467.09	31.5 -	16.9	8.5	27.9	29.0	-	28.18	-	200	17.0	-
486.16	32.5 -	17.2	8.9	28.0	30.6	-	33.88	-	200	15.4	-
665.58	36.0 33.0	20.1	10.9	28.5	38.5	35.5	84.14	59.57	200	7.5	10.5
768.14	29.0 -	20.8	11.6	28.4	33.0	-	44.67	-	200	13.0	-
998.41	28.0 27.5	22.8	13.7	27.3	37.2	36.7	72.44	68.39	500	16.8	17.8
1131.00	38.0 37.0	25.6	6.9	34.3	36.2	35.2	64.57	57.54	500	17.8	18.8

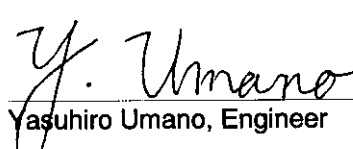
Class B limit

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

Report processed by


 Akiko Oyama
 14/Apr./1999


 Yasuhiro Umamo, Engineer

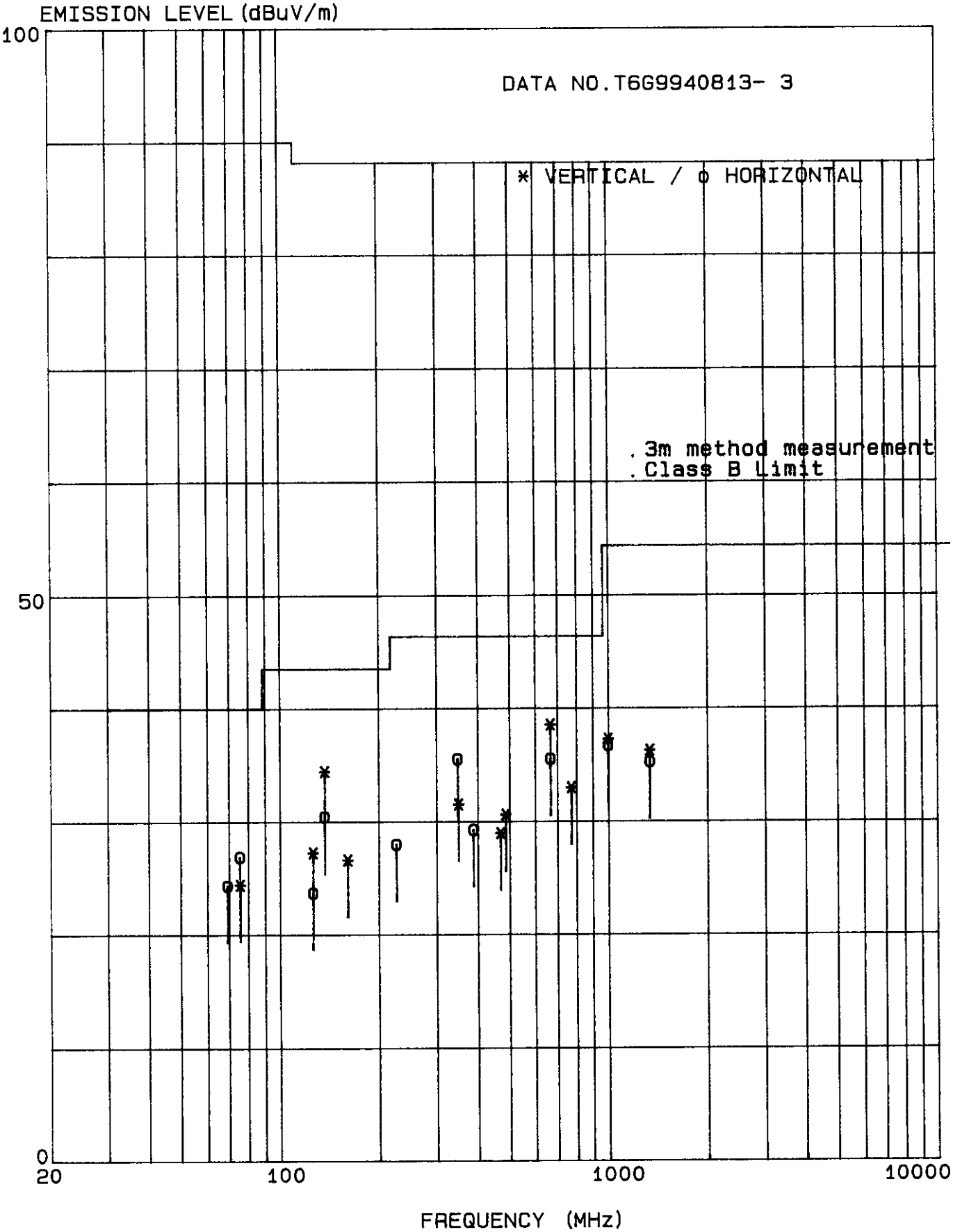


Figure 6.2-2 RFI Field Strength Measurement Results

6.3 Minimum Margin

Table 6.3-1 Minimum Margin

Conducted emission	
DISPLAY: ALL H DISPLAY	operation mode 10.156 MHz, 20.2 dB
USB Communication	
Radiated emission	
DISPLAY: ALL H DISPLAY	operation mode 665.58 MHz, 7.5 dB
USB Communication	

6.4 Sample Calculation

Table 6.4-1 Sample Calculation

The maximum radiating emission can be obtained at the frequency of 665.58 MHz,
 Vertical polarization on DISPLAY: ALL H DISPLAY operation mode.
 Each value at frequency is as follows; USB Communication

R :	Field strength meter reading	=	36.0	(dBμV)
A :	Antenna factor	=	20.1	(dB/m)
C :	Cable loss	=	10.9	(dB)
G :	Amplifier gain	=	28.5	(dB)

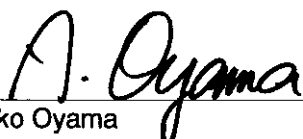
Then radiated emission E(dBμV/m) is ;

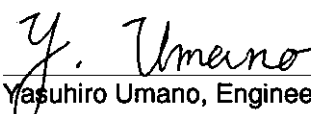
$$E = R + A + C - G$$

Therefore, the maximum radiated emission is ;

$$38.5 \text{ (dBμV/m)}$$

Report processed by


 Akiko Oyama
 14/Apr./1999


 Yasuhiro Umamo, Engineer

Tokin EMC Engineering Co., Ltd.
28-1 Kitahara-aza Hanashimashinden-ohaza
Tsukuba-city Ibaragi 305-0875 Japan
Tel +81-298-37-2400 Fax +81-298-37-2401

EMC TEST REPORT

for

WACOM Co., Ltd.

2-510-1, Toyonodai, Otone-machi,
Kitasaitama-gun, Saitama 349-1148, JAPAN

Equipment Under Test: Digitizer
model name : GD-0405-U
Category: FCC Part 15 Sub.part B Class B Digital Device
Token Report No.: T6G9940811
Date of Issue: April 14, 1999


Hiro Shida
15/4/99
Manager, Tsukuba Testing Lab.
Tokin EMC Engineering Co., Ltd.

-- ATTENTION --

The test results in this report relate only to the following EUTs, and this report shall not be reproduced except in full, without the written approval of the laboratory.

NVLAQ®

Contents

	Page
1 DESCRIPTION OF DEVICE	1
2 TEST FACILITY	2
3 SUMMARY OF RESULTS	
3.1 Electromagnetic Emission	2
3.2 Modification to The EUT.....	2
4 TESTED SYSTEM DETAILS	
4.1 Peripherals and Others	3
4.2 Type of Used Cables	3
5 TECHNICAL COUNTERMEASURE	3
6 TEST RESULTS	
6.1 RFI Voltage Measurement	
6.1.1 Measurement Instrumentation Used	4
6.1.2 Measurement Procedure.....	4
6.1.3 Measurement Uncertainty	4
6.1.4 Test Data	5 ~ 6
6.2 RFI Field Strength Measurement	
6.2.1 Measurement Instrumentation Used	7
6.2.2 Measurement Procedure.....	7
6.2.3 Measurement Uncertainty	7
6.2.4 Test Data	8 ~ 9
6.3 Minimum Margin.....	10
6.4 Sample Calculation	10
7 MEASUREMENT PHOTOS	
Photo 7.1 Setup with the Maximized RFI Voltage Emission Level	11
Photo 7.2 Setup with the Maximized RFI Field Strength Emission Level	12

1 DESCRIPTION OF DEVICE

A) Kind of Equipment : Digitizer

B) Model Name : GD-0405-U

C) Serial No. : 9CJP00001

D) Type of Sample Tested : Pre-production

E) High Frequency Used : 18.432MHz, 6MHz (CPU clock)
384.0kHz, 460.8kHz (Operating frequency)

F) Rating Power Supply : DC+5V, 0.5A

G) Tested Power Supply : DC+5V, 0.5A from PC
(PC power supply : 1phase AC120V, 50Hz)

H) Date of Manufacture : March 1999

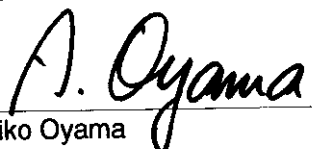
I) Manufacturer : WACOM Co., Ltd.
2-510-1, Toyonodai, Otone-machi, Kitasaitama-gun,
Saitama 349-1148, JAPAN

J) Description of Operating : DISPLAY : ALL H DISPLAY
USB Communication

K) Date of Sample Received : April 05, 1999

L) Test Engineer : Yasuhiro Umano

Report processed by


Akiko Oyama
14/Apr./1999


Yasuhiro Umano, Engineer

2 TEST FACILITY

The open field test site and conducted measurement facility are used for this measurement, where is located following address. This facility was fully described in a report dated Jan.31, 19994, that was submitted to the FCC. And we had accepted in a letter dated Apr.8, 1994 (31040/SIT). This laboratory is accredited by NVLAP for NVLAP Lab. Code : 200221-0.

Tokin EMC Engineering Co., Ltd.
Tsukuba Testing Laboratory, Open Field Test Site No.6 and Shielded Room No.1

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

3 SUMMARY OF RESULTS

3.1 Electromagnetic Emission

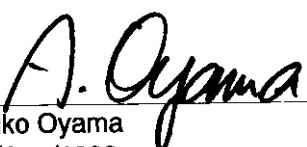
RFI Voltage Measurement **PASS**

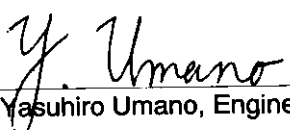
RFI Field Strength Measurement **PASS**

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, MKK and NIST.

3.2 Modifications to The EUT : This EUT had taken countermeasures.

Report processed by


Akiko Oyama
14/Apr./1999


Yasuhiro Umano, Engineer

4 TESTED SYSTEM DETAILS

4.1 Peripherals and Others :

Description	Model Name	Serial No.	Manufacturer	FCC ID
PC	DP2000 5166MMXJPN	7725BK	Compaq	DoC
Display	9060S	56475129 S-US	Nanao	GCI9060
Mouse	M-S34	None	Compaq	DZL211029
Printer	J250	4300911101326	Star Micronics America	B6Z8MFJ250
Modem	T1200-SD2	S87309509	Omnitel	D786JC T1200-SD2
Keyboard	None	B07020A39EY2Y5	Compaq	AQ6-72BC15
CCD camera	LPC-U20	None	LG	DoC

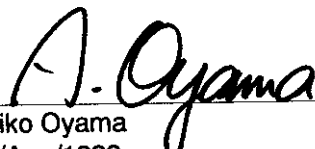
4.2 Type of Used Cables :

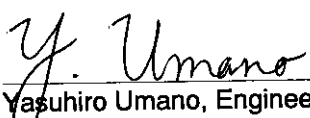
Description	Length	Type of shield	Model name	Manufacturer
Display AC cable	2.2m	Non-shielded	None	Nanao
Display I/F cable	1.8m	Shielded	V20	Nanao
PC AC cable	2.0m	Shielded	None	Compaq
Printer cable	1.8m	Shielded	None	None
Modem I/F cable	1.5m	Shielded	C232N-J3115	Elecom
Modular cable	1.0m x2	Non-shielded	None	None
USB cable	1.5m	Non-shielded	None	LG

5 TECHINICAL COUNTERMEASURE

Parts number	Description	Circuit sign	Quantity	Maker
BLM11A601S	Coil	F 1,2,3,4,5,6,7,201,202, 203,204,205,206	13	Murata manufacturing co., ltd.
PLP3216S551SL2	Coil	F 101	1	Murata manufacturing co., ltd.
HF70 BB5.2x10x3	Ferrite core		1	TDK co., ltd.
CU7636R	Copper tape		1	Sony chemicals corporation

Report processed by


 Akiko Oyama
 14/Apr./1999


 Yasuhiro Umano, 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 (FCKL1528/134/Schwarzbeck/RE041/02 Dec.'98/Oct.'99)

L.I.S.N. (KNW-407/8-515-20/Kyoirtsu/LI010/31 Aug.'98/Aug.'99)

Spectrum analyzer (R3261A/01720142/Advantest/SP012/21 Oct.'98/Oct.'99)

Coaxial cable..... (---/---/---/DK124/02 Mar.'99/Mar.'00)

Shielded Room..... (Tsukuba No.1/---/Tokin/SA016/---/---)

6.1.2 Measurement Procedure

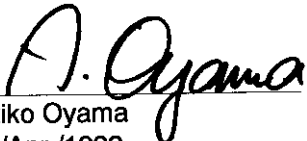
The power line conducted interference measurements were performed according to ANSI C63.4-1992 in a shielded enclosure No.1 with peripherals placed on a table, 0.8m high over a metal floor. It was located more than required distance away from the shielded enclosure wall. Deviations from the standard was none.

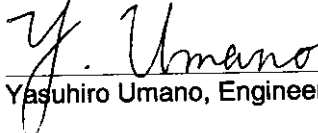
The EUT was plugged into the LISN and the frequency range of interest scanned.
Reported are maximized emission levels.

6.1.3 Measurement Uncertainty

Measurement uncertainty of RFI Voltage Measurement test was estimated at $\pm 1.8\text{dB}(k=2)$.

Report processed by


Akiko Oyama
14/Apr./1999


Yasuhiro Umano, Engineer

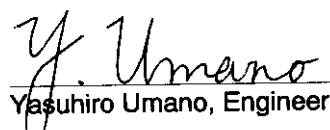
6.1.4 Test Data

Table 6.1-1 RFI Voltage Measurement Results

Operating mode: DISPLAY : ALL H DISPLAY				Date of measurement: April 05, 1999			
USB Communication				Temperature: 17 degree C			
Test procedure: ANSI C63.4-1992				Humidity: 70 %			
	Frequency (MHz)	Level (dBμV)	Total Factor(dB)	Result (dBμV)	Result (μV)	Limit (μV)	Margin (dB)
L1-E	0.865	16.0	0.2	16.2	6.46	250	31.8
	0.959	21.0	0.2	21.2	11.48	250	26.8
	1.010	23.0	0.2	23.2	14.45	250	24.8
	10.156	27.5	0.3	27.8	24.55	250	20.2
	12.873	20.0	0.4	20.4	10.47	250	27.6
	13.641	21.5	0.4	21.9	12.45	250	26.1
N-E	0.865	17.0	0.2	17.2	7.24	250	30.8
	0.959	22.0	0.2	22.2	12.88	250	25.8
	1.010	25.0	0.2	25.2	18.20	250	22.8
	10.156	26.5	0.3	26.8	21.88	250	21.2
	12.873	22.0	0.4	22.4	13.18	250	25.6
	13.641	23.0	0.4	23.4	14.79	250	24.6

Report processed by


 Akiko Oyama
 14/Apr./1999


 Yasuhiro Umano, Engineer

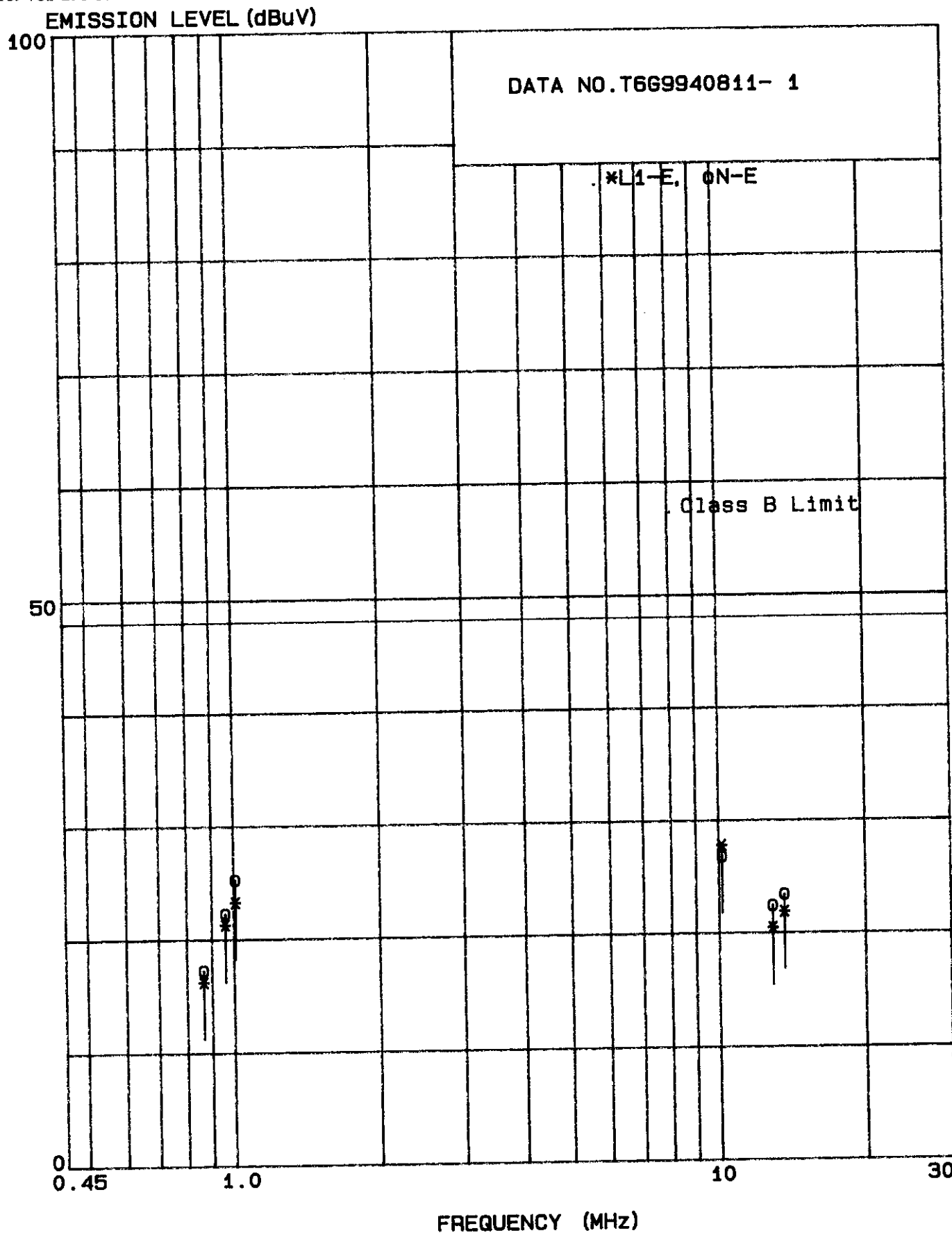


Figure 6.1-1 RFI Voltage Measurement Results

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 (KNM-5002/4N-171-4/Kyoritsu/RE006/28 Sep.'98/Sep.'99)
Frequency converter (KCV-6002/4-248-1/Kyoritsu/RC006/28 Sep.'98/Sep.'99)
Biconical antenna (BBA9106/TB006/Schwarzbeck/TB006/10 Sep.'98/Sep.'99)
Logperiodic antenna..... (UHALP9108-A/0115/Schwarzbeck/TL021/07 Jul.'98/Jul.'99)
Pre-amplifier (8447D/2443A03690/Hewlett Packard/AM005/09 Sep.'98/Sep.'99)
Spectrum analyzer (R3261A/81720103/Advantest/SP006/12 Nov.'98/Nov.'99)
Coaxial cable..... (---/CL6/---/DK090/31 Jul.'98/Jul.'99)
Open field test site (Tsukuba No.6/---/Tokin/SA006/17 Nov.'98/Nov.'99)

6.2.2 Measurement Procedure

Final test was performed according to ANSI C63.4-1992 at the open field test site No.6. Deviations from the standard was none.

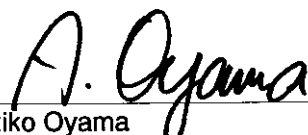
The EUT was placed in a 0.8m high table along with the peripherals. The turn table was separated from the antenna distance 3meters. Cables were placed in a position to produce maximum emissions as determined by experimentation, and operation mode was selected for maximum.

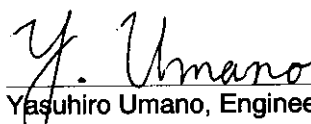
The frequencies and amplitudes of maximum emission were measured at varying azimuths, antenna heights and antenna polarities. Reported are maximized emission levels.

6.2.3 Measurement Uncertainty

Measurement uncertainty of RFI Field Strength Measurement test was estimated at $\pm 3.4\text{dB}(k=2)$.

Report processed by


Akiko Oyama
14/Apr./1999


Yasuhiro Umano, Engineer

6.2.4 Test Data

Table 6.2-1 RFI Field Strength Measurement Results

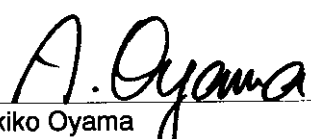
Operating mode: DISPLAY : ALL H DISPLAY						Date of measurement: April 05, 1999						
USB Communication						Temperature: 19 degree C						
Test procedure: ANSI C63.4-1992						Humidity: 72 %						
Frequency (MHz)	Level		Ant. Factor (dB/m)	Cable Loss (dB)	Amp. Gain (dB)	Result		Result		3 Meter Limit (μV/m)	Margin	
	Ver.	Hor.				Ver.	Hor.	Ver.	Hor.		Ver.	Hor.
	(dBμV)					(dBμV/m)		(μV/m)			(dB)	
68.90	-	43.0	5.8	3.2	27.7	-	24.3	-	16.41	100	-	15.7
75.17	42.5	45.0	6.2	3.4	27.7	24.4	26.9	16.60	22.13	100	15.6	13.1
125.36	35.5	-	14.7	4.5	27.5	27.2	-	22.91	-	150	16.3	-
125.40	-	32.0	14.7	4.5	27.5	-	23.7	-	15.31	150	-	19.8
136.43	42.0	38.0	15.1	4.8	27.5	34.4	30.4	52.48	33.11	150	9.1	13.1
160.40	34.0	-	14.7	5.2	27.3	26.6	-	21.38	-	150	16.9	-
224.92	-	32.0	16.9	6.1	27.0	-	28.0	-	25.12	200	-	18.0
346.59	-	41.0	14.1	7.4	27.0	-	35.5	-	59.57	200	-	10.5
347.49	37.0	-	14.1	7.4	27.0	31.5	-	37.58	-	200	14.5	-
386.27	-	33.5	15.1	7.8	27.2	-	29.2	-	28.84	200	-	16.8
467.09	31.5	-	16.9	8.5	27.9	29.0	-	28.18	-	200	17.0	-
486.16	32.5	-	17.2	8.9	28.0	30.6	-	33.88	-	200	15.4	-
665.58	36.0	33.0	20.1	10.9	28.5	38.5	35.5	84.14	59.57	200	7.5	10.5
768.14	29.0	-	20.8	11.6	28.4	33.0	-	44.67	-	200	13.0	-
998.41	28.0	27.5	22.8	13.7	27.3	37.2	36.7	72.44	68.39	500	16.8	17.8

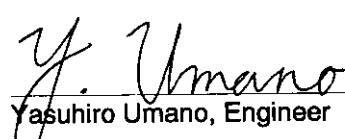
Class B limit

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

Report processed by


 Akiko Oyama
 14/Apr./1999


 Yasuhiro Umano, Engineer

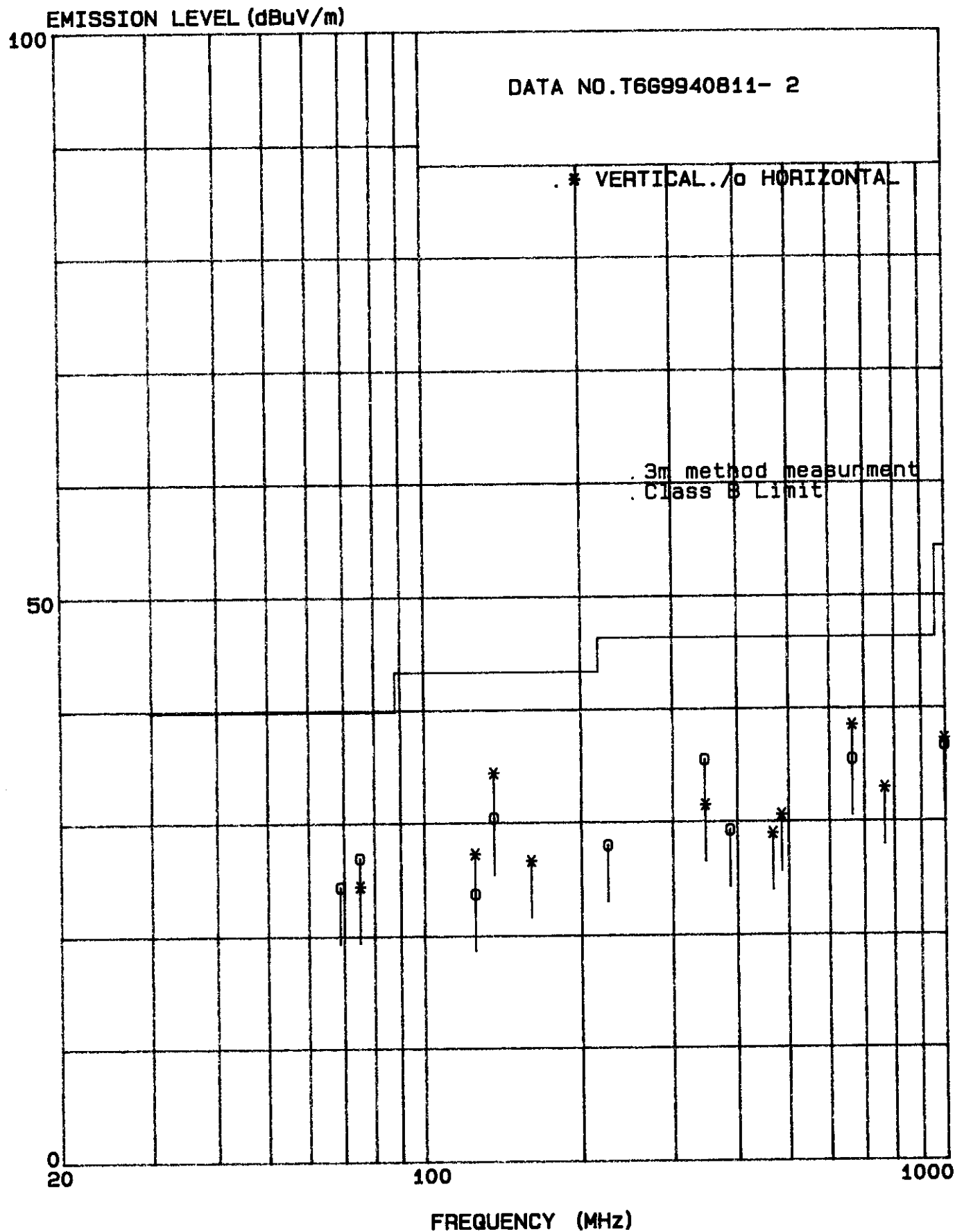


Figure 6.2-1 RFI Field Strength Measurement Results

6.3 Minimum Margin

Table 6.3-1 Minimum Margin

Conducted emission DISPLAY: ALL H DISPLAY	operation mode	10.156 MHz,	20.2 dB
USB Communication Radiated emission DISPLAY: ALL H DISPLAY	operation mode	665.58 MHz,	7.5 dB
USB Communication			

6.4 Sample Calculation

Table 6.4-1 Sample Calculation

The maximum radiating emission can be obtained at the frequency of 665.58 MHz,
 Vertical polarization on DISPLAY: ALL H DISPLAY operation mode.

Each value at frequency is as follows; USB Communication

R :	Field strength meter reading	=	36.0 (dBμV)
A :	Antenna factor	=	20.1 (dB/m)
C :	Cable loss	=	10.9 (dB)
G :	Amplifier gain	=	28.5 (dB)

Then radiated emission E(dBμV/m) is ;

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

Therefore, the maximum radiated emission is ;

38.5 (dBμV/m)

Report processed by

A. Oyama
 Akiko Oyama
 14/Apr./1999

Y. Umano
 Yasuhiro Umano, Engineer