

**Test Report
Application for Certification
On Behalf Of
BRITEK ELECTRONICS CO., LTD.**

VGA CARD

**Model No.: Titan 4000L
FCC ID:ILL160**

**Prepared for:
BRITEK ELECTRONICS CO., LTD.
8F-2, No. 146, Sung Chiang Road,
Taipeim Taiwan, R.O.C.**



**Report By : Global EMC Standard Tech. Corp.
No.3 Pau-Tou-Tsuo Valley, Chia-Pau
Tsuen, Lin Kou Hsiang, Taipei Country,
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Fax : (02) 2603-5325**

Test results given in this report only relate to the specimen(s) tested, calibrated or measured.
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This report must not be use to claim product endorsement by NVLAP or any agency of the U.S. Government.

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G7k98-F022

1. Test Report Certification

Applicant : BRITEK ELECTRONICS CO., LTD.**Manufacturer : BRITEK ELECTRONICS CO., LTD.****EUT Description : VGA CARD**

(A) FCC ID : ILL160

(B) Model No. : Titan 4000L

(C) Serial No. : 998014289

(D) Tested Power Supply: 110V/60Hz

MEASUREMENT PROCEDURE USED :☐ CFR 47, Part 15 Radio Frequency Device Subpart B Unintentional Radiators Class **B** :1996☒ CISPR 22 Limits and methods of measurement of radio disturbance characteristics of information technology equipment: 1993☒ ANSI C63.4 Methods of Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9kHz to 40GHz. :1992

THE MEASUREMENT SHOWN IN THE ATTACHMENT WERE MADE IN ACCORDANCE WITH THE PROCEDURES INDICATED, AND THE MAXIMUM ENERGY EMITTED BY THE EQUIPMENT WAS FOUND TO BE WITHIN THE FCC LIMITS APPLICABLE.



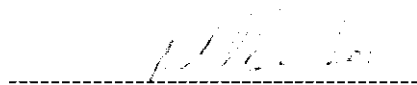
Sample Received Date : Oct. 14, 1998

Final Test Date : Nov. 05, 1998

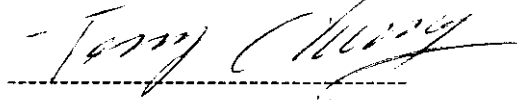
Documented by : Winnie Chiu

Test Engineer :

Approve & Authorized Signer :



MILLER LEE



TERRY CHUNG

This test data shown below is traceable to National or international standard such as NIST/USA, etc.
The laboratory's NVLAP accreditation in no way constitutes or implies product certification, approval, or endorsement by NVLAP or the United States government.

2. General Information

2.1 Production Description

Description : VGA CARD
 Model Number : Titan 4000L
 Serial Number : 998014289
 Applicant : BRITEK ELECTRONICS CO., LTD.
 Address : 8F-2, No. 146, Sung Chiang Road, Taipei Taiwan, R.O.C.
 Manufacturer : BRITEK ELECTRONICS CO., LTD.
 Address : 8F-2, No. 146, Sung Chiang Road, Taipei Taiwan, R.O.C.
 FCC ID : ILL160
 Power Cord : Non-shielded, Detachable, 1.8m

2.2 Results:

The EUT(s) **met** the EN55022/CISPR 22 Class B requirements.

The Worst Emission data was found as following,

	Worst Emission Frequency (MHz)	Emission Level	Limit	Height of Antenna, Angel of Turntable
Conduction Mode 2	0.34468	44.0 dBuV Line2 QP	59.1dBuV	N/A
Radiation Mode 1	133.550	26.91[dB(uV/m)], Vertical	30.0 [dB(uV/m)]	1M, 45°

Mode Differences:

Mode 1: CPU Pentium II 400MHz, Resolution 1600x1200, H-Sync: 106KHz, V-Sync: 85Hz.

Mode 2: CPU Pentium II 400MHz, Resolution 1280x1024, H-Sync: 90KHz, V-Sync: 85Hz.

Mode 3: CPU Pentium II 400MHz, Resolution 1024x768, H-Sync: 68.5KHz, V-Sync: 85Hz.

Mode 4: CPU Pentium II 400MHz, Resolution 800x600, H-Sync: 53.5KHz, V-Sync: 85Hz.

Mode 5: CPU Pentium II 400MHz, Resolution 640x480, H-Sync: 31.5KHz, V-Sync: 60Hz.

Note:

1. The EUT is a AGP bus VGA CARD, use S3 Trio 3D chipset, Which can run to maximum resolution 1600x1200, H-Sync 106KHz, V-Sync 85Hz NI, each different resolution mode has been investigated to find the maximum emission situation, The data shown in this test report reflects the worst-case data shown in this test report reflects the worst-case data for each operation mode.

2.3 Tested System Details

The FCC IDs/Types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards, which have grants) are:

☒ Host Personal Computer

P.C. Chassis : Chenbro Micom Co., Ltd. *FCC : DoC*
Model Number : A6721
Mother Board : P2B-F by AsusTek
CPU : Pentium II 400MHz, Clock:100MHz
Floppy Disk Driver _{3.5"} : Manufacture: Panasonic, M/N:JU-257A606P
FCC DoC Applied.
Hard Disk # 1 : Manufacture: WESTERN DIGITAL
M/N:WDAC21200-00H
FCC DoC Applied.
CD-ROM : Manufacture: ASUS, M/N:CD-S340
FCC Doc Applied.
Disk Ctrl Card : On Board
I/O Card : On Board
VGA Card (EUT) : Manufacture: BRITEK Electronics Co., Ltd.
M/N: Titan 4000L
Switching Power Supply :Manufacture: Seventeam
M/N:ST-251HR, S/N:998014289
Power Cord : Non-Shielded , Detachable, 1.8m

☒ Monitor M01-006

Model Number : D2846
Manufacturer :HP
Data Cable : Shielded, Undetachable, 1.5m
Power Cord : Shielded, Detachable, 1.5m

☒ Keyboard K01-032

Model Number : KB-5923
Serial Number : 8060032216
FCC ID : E8HKB-5923
Manufacturer : TATUNG
BCIQ ID : 3862A177
Data Cable : Sheiled, Undetachable, 2.0 m

☒ Printer P01-011

Model Number : C2642A(DJ-400)
Serial Number : MY7951C4J5
FCC ID : B94C2642X
Manufacturer : HP
Data Cable : Shielded, Detachable, 1.8m
Adaptor & Power Cord : AC 110V, 60Hz To DC 30V
: Non-Shielded, Detachable, 1.9m

☒ Modem M03-004

Model Number : 1414
Serial Number : 960018047
FCC ID : IFAXDM1414
Manufacturer : ACEEX
Adaptor & Power Cord : Non-Shielded, Detachable, 1.5m
Data Cable : Shielded, Detachable, 1.2m

☒ Modem M03-010

Model Number : 1414
Serial Number : 960018043
FCC ID : IFAXDM1414
Manufacturer : ACEEX
Adaptor & Power Cord : Non-Shielded, Detachable, 1.5m
Data Cable : Shielded, Detachable, 1.2m

☒ Mouse(PS2) M02-027

Model Number : MUS3P
Serial Number : N/A
FCC ID : JKGMUS3P01
Manufacturer : Tremon Enterprises Co., Ltd.
Data Cable : Shielded, Undetachable, 1.5m

☒ Mouse(USB) M02-034

Model Number : M-UA34
Serial Number : LTC70500272
FCC ID : DZL211087
Manufacturer : LOGITECH
Data Cable : Shielded, Undetachable, 1.5m

☒ Scanner (USB) S02-001
 Model Number : S-UA1
 Serial Number : LTC74803633
 FCC ID : DZL211089
 Manufacturer : Logitech
 Power with Data cable : Shielded, Undetachable, 1.5m with DC 5V

2.4 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4-1992.

Radiated testing was performed at an antenna to EUT distance of 10 meters.

2.5 Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	23-26
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

FCC Site Description : Aug. 10, 1995 /Aug. 25, 1998 File on
 Federal Communication Commission
 FCC Engineering Laboratory
 7435 Oakland Mills Road
 Columbia, MD 21046
 Reference 31040/SIT1300F2

NVLAP Lab Code : 200085-0
 United States Department of commerce
 National Institute of Standards and Technology
 National Voluntary Laboratory Accreditation Program

Name of firm : Global EMC Standard Tech. Corp.

Site location : No. 3 Pau-Tou Valley, Chia-Pau Tsuen, Lin Kou
 Hsiang, Taipei County, Taiwan, R.O.C.

3. Conducted Emission test

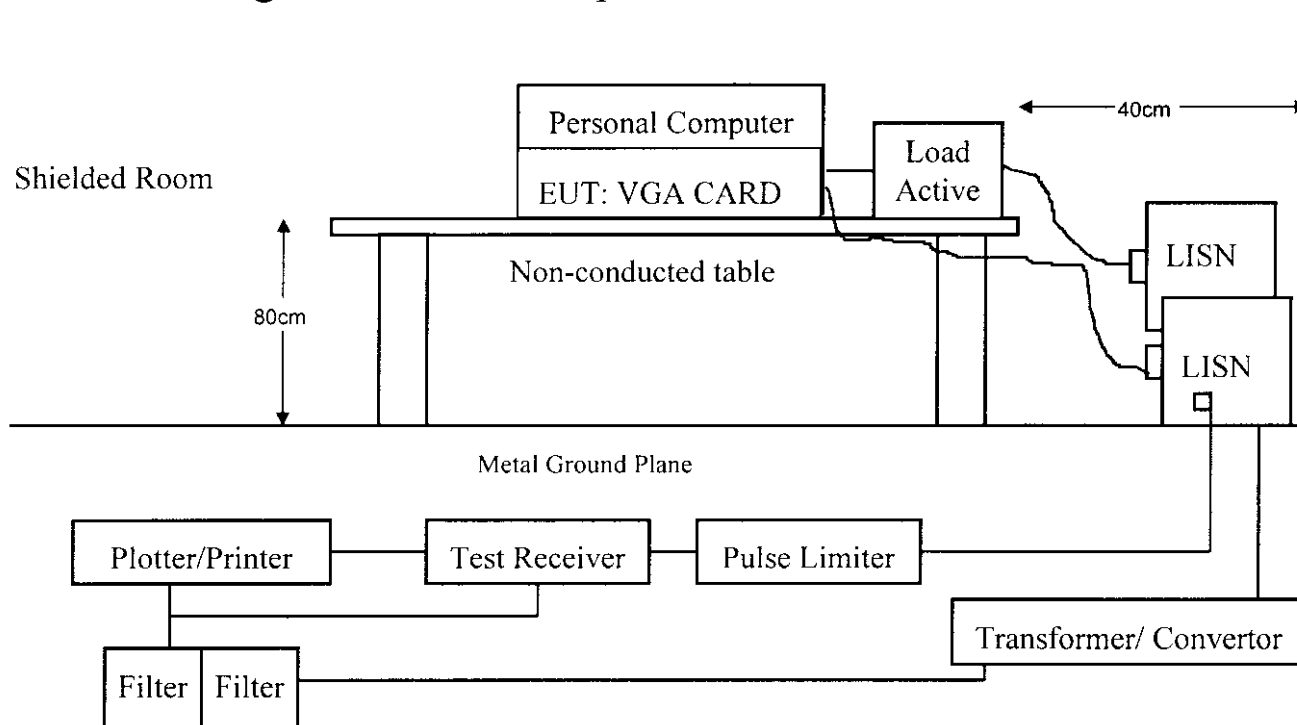
3.1 Test Equipments

The following test equipments are used during the conducted power line tests:

Instrument	Manufacturer	Type /Serial No.	Last Calibration	Location	C.E.
Test Receiver	Rohde & Schwarz	ESHS 30 / 8281091010	Dec. 24, 1997	Shield Room #1	✓
L.I.S.N.	Kyoritsu	KNW-407	Oct.03,1998	Shield Room #1	✓
L.I.S.N.	Solar	8012-50-R24 / 90038	Jun. 02, 1998	Shield Room #1	
L.I.S.N.	EMCO	3825/2 / 91111-1902	Aug.10,1998	Shield Room #1	
L.I.S.N.	Rohde & Schwarz	ESH3-Z5 / 840567/002	Jun. 02, 1998	Shield Room #1	✓
L.I.S.N.	Schwarzbeck	NNLK 8121	Apr. 10, 1998	Shield Room #1	
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	Jan. 11, 1998	Shield Room #1	✓

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

3.2 Block Diagram of Test Setup



Note: This is a representative setup diagram for Table-top EUT.

For Floor-standing EUT, the table will be removed with all others setup condition remain the same.

3.3 Conducted Emission Limit

3.3.1 FCC Limits

Frequency	Maximum RF Line Voltage			
	Class A		Class B	
MHz	uV	dBuV	uV	dBuV
0.45 - 1.705	1000	60.0	250	48.0
1.705 - 30	3000	69.5	250	48.0

Remarks : 1. RF Line Voltage (dBuV) = $20 \log$ RF Line Voltage (uV)

2. In the Above Table, the tighter limit applies at the band edges.

3.3.2 CISPR Limits

Frequency	Maximum RF Line Voltage dB(uV)			
	Class A		Class B	
MHz	QUASI-PEAK	AVERAGE	QUASI-PEAK	AVERAGE
0.15 - 0.50	79	66	66-56	56-46
0.50-5.0	73	60	56	46
5.0 - 30	73	60	60	50

Remarks : In the Above Table, the tighter limit applies at the band edges.

3.4 EUT Configuration on Measurement

The equipments which is listed 3.2 are installed on Conducted Power Line Test to meet the Commission requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

The device under test, installed in a representative system as described in section 3.2, was placed on a non-conductive table whose total height equaled 80 cm. Powered from one LISN which signal output to receiver, and the other peripherals was powered from another LISN which signal output was terminated by 50Ω.

3.5 EUT Exercise Software

The EUT exercise program used during conducted testing was designed to exercise the EUT in a manner similar to a typical use. The exercise sequence is listed as below:

- 3.5.1 Setup the EUT and simulators as shown on 3.2
- 3.5.2 Turn on the power of all equipments.
- 3.5.3 Boot the PC from Hard Disk and setup the video to appropriated resolution .
- 3.5.4 PC sent "H" Pattern to Monitor.
- 3.5.5 PC sent "H" Pattern to Printer Port.
- 3.5.6 PC sent "H" Pattern to Modem Port.
- 3.5.7 CD-ROM play audio disk to speaker repeatedly.
- 3.5.8 Repeat the above procedure 3.5.4 to 3.5.7

3.6 Conducted Emission Data

The measurement range of conducted emission which is from **0.15 MHz to 30 MHz** was investigated. All readings are quasi-peak and average values with a resolution Bandwidth of 9 KHz. The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range for all the test modes. Then the worst modes were reported the following data pages. The final measurement equal to Receiver reading plus Correction factor if available. When LISN insertion loss bigger than 0.5dB then the receiver will add correction factor to reading level automatically.

The total uncertainty for this test is as follows:

- Uncertainty in the field strength measured: $< \pm 2.0 \text{ dB}$

The uncertainty is calculated in accordance with NAMAS document NIS 81, and is given as 2 standard deviations.

CONDUCTED EMISSION DATA

Date of Test	:	Oct. 27, 1998	Temperature	:	25.5 °C
EUT	:	VGA CARD	Humidity	:	63 %
Test Mode	:	Mode 1	Display Pattern	:	H Pattern

FREQUENCY MHz	READING LEVEL dBuV				LIMIT	
	LINE1 QP	LINE1 AV	LINE2 QP	LINE2 AV	QP	AV
0.20510	42.6	*	43.0	*	63.4	53.4
**0.34538	43.7	*	43.8	*	59.0	49.0
0.48503	27.9	*	28.3	*	56.2	46.2
11.12518	35.1	*	32.2	*	60.0	50.0
18.92503	34.7	*	31.2	*	60.0	50.0
22.70026	36.9	*	37.0	*	60.0	50.0

Remarks : 1. All readings are Quasi-peak.

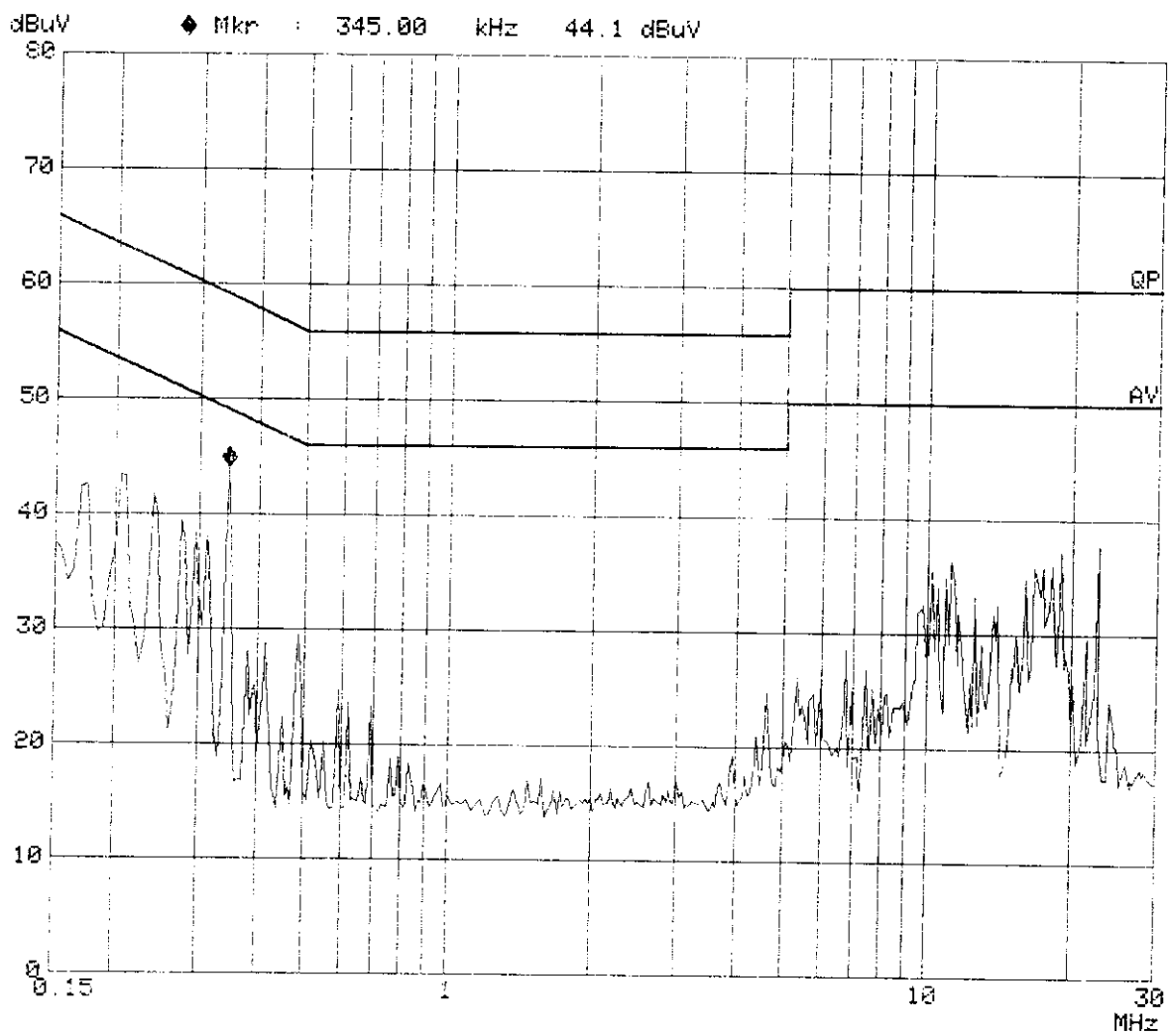
2. “ * ” means that the quasi-peak reading level is lower then the average limits, it is not necessary to measure the average level.
3. “ ** ” means that this data is the worse case emission level.
4. Final measurement = (Receiver reading) + (Correction factor if available)

Attached 2 individual pages of peak scan curve data sheets.

ROHDE & SCHWARZ ESHS 30

CesTek, PowerLine Conducted Emission

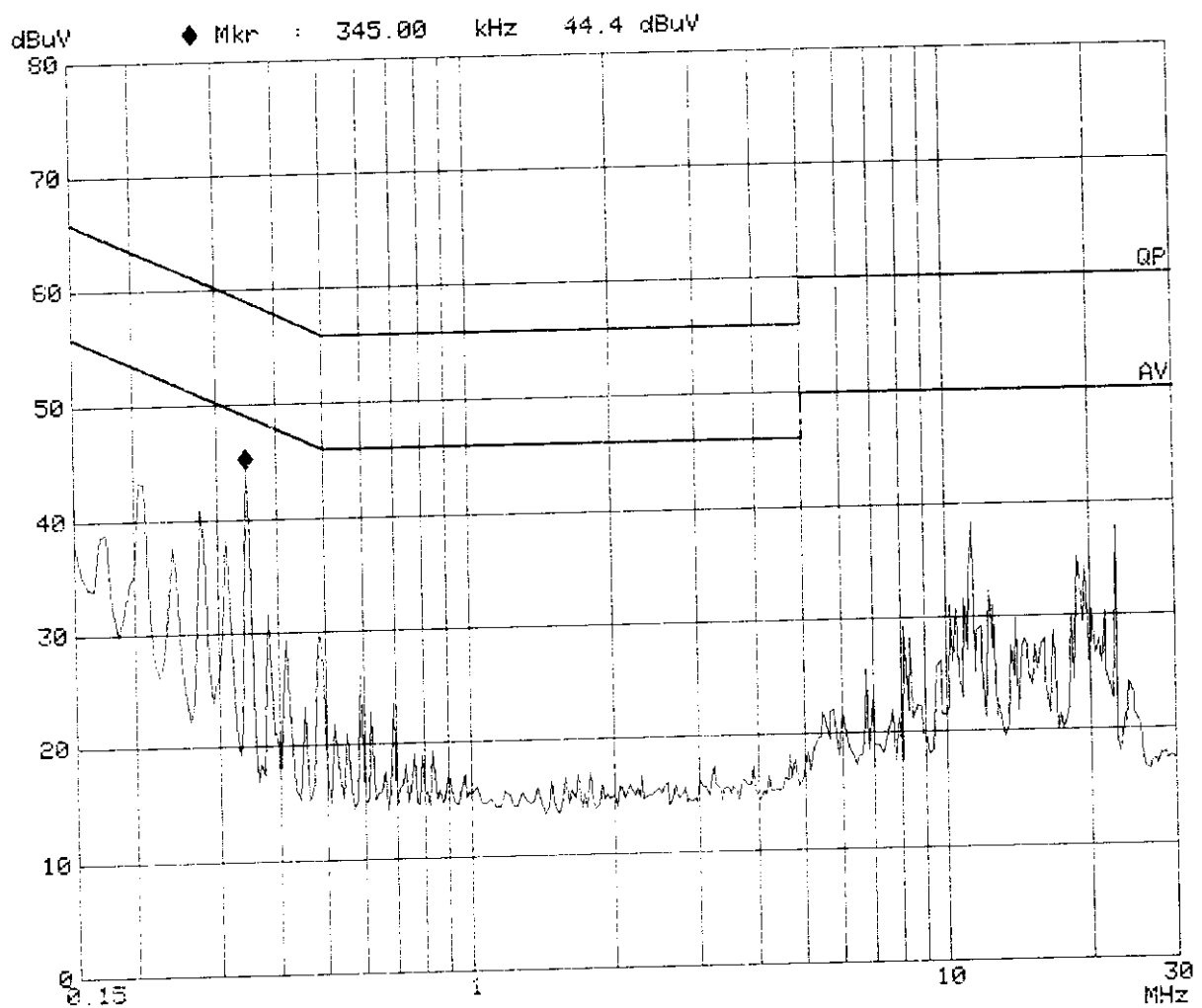
EUT: VGA CARD
Manuf: BRITEK
Op Cond: FULL SYSTEM
Operator: MILLER
Test Spec: CISPR_22 CLASS B
Comment: Line 1
M/N: Titan 4000L MODE:1
Date: 27. Oct 98 01:32



ROHDE & SCHWARZ ESHS 30

GesTek, PowerLine Conducted Emission

EUT: VGA CARD
Manuf: BRITEK
Op Cond: FULL SYSTEM
Operator: MILLER
Test Spec: CISPR 22 CLASS B
Comment: Line 2
M/N: Titan 400CL MODE:1
Date: 27. Oct 98 01:42



CONDUCTED EMISSION DATA

Date of Test	:	Oct. 27, 1998	Temperature	:	25.5 °C
EUT	:	VGA CARD	Humidity	:	63 %
Test Mode	:	Mode 2	Display Pattern	:	H Pattern

FREQUENCY MHz	READING LEVEL dBuV				LIMIT	
	LINE1 QP	LINE1 AV	LINE2 QP	LINE2 AV	QP	AV
0.20416	41.4	*	42.8	*	63.4	53.4
**0.34468	43.7	*	44.0	*	59.1	49.1
0.48516	27.9	*	28.6	*	56.2	46.2
8.12466	31.4	*	29.7	*	60.0	50.0
18.92510	40.5	*	41.0	*	60.0	50.0
22.70004	40.2	*	40.0	*	60.0	50.0

Remarks : 1. All readings are Quasi-peak.

2. “ * ” means that the quasi-peak reading level is lower then the average limits, it is not necessary to measure the average level.

3. “ ** ” means that this data is the worse case emission level.

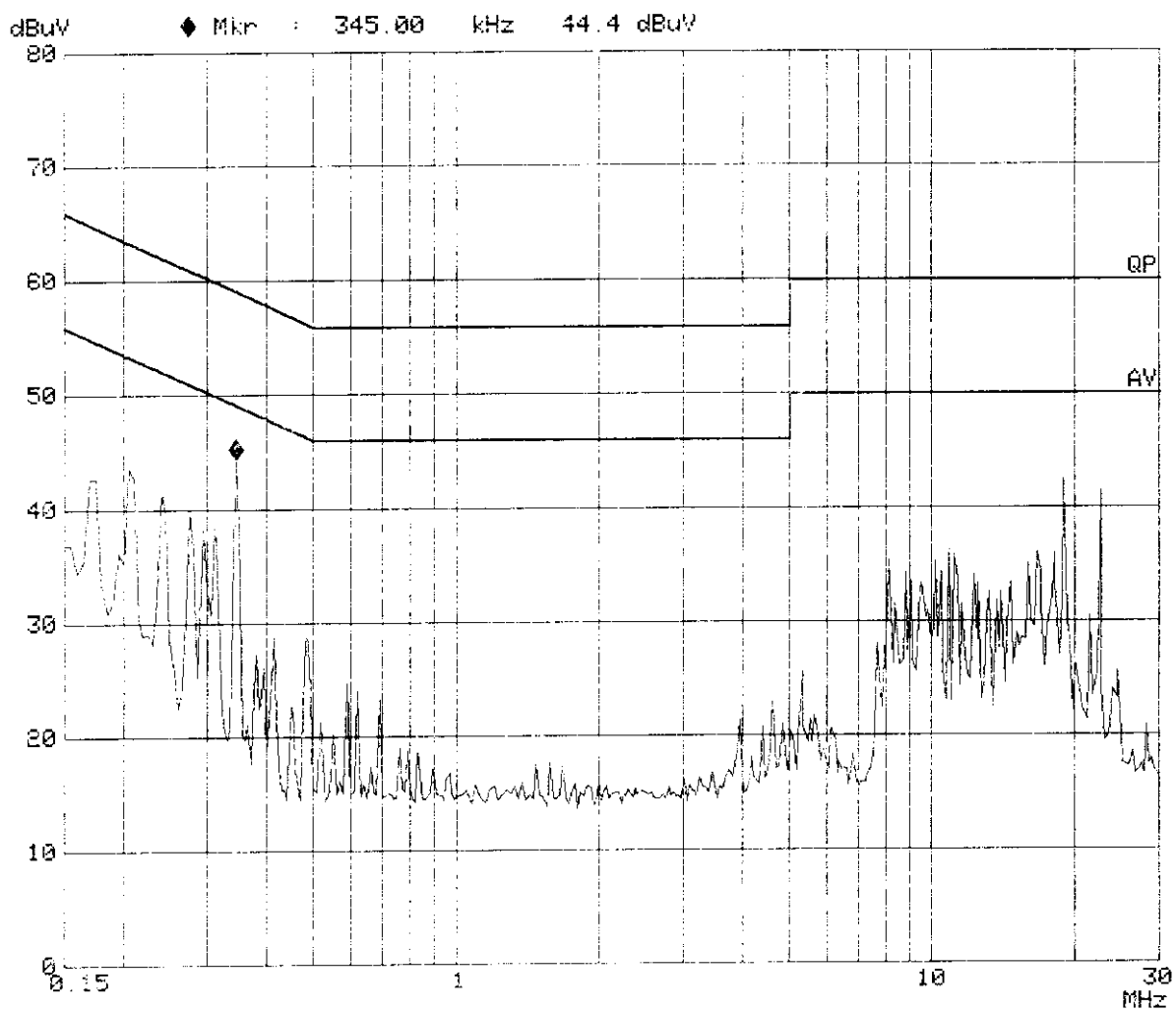
4. Final measurement = (Receiver reading) + (Correction factor if available)

Attached 2 individual pages of peak scan curve data sheets.

ROHDE & SCHWARZ ESHS 30

GesTek, PowerLine Conducted Emission

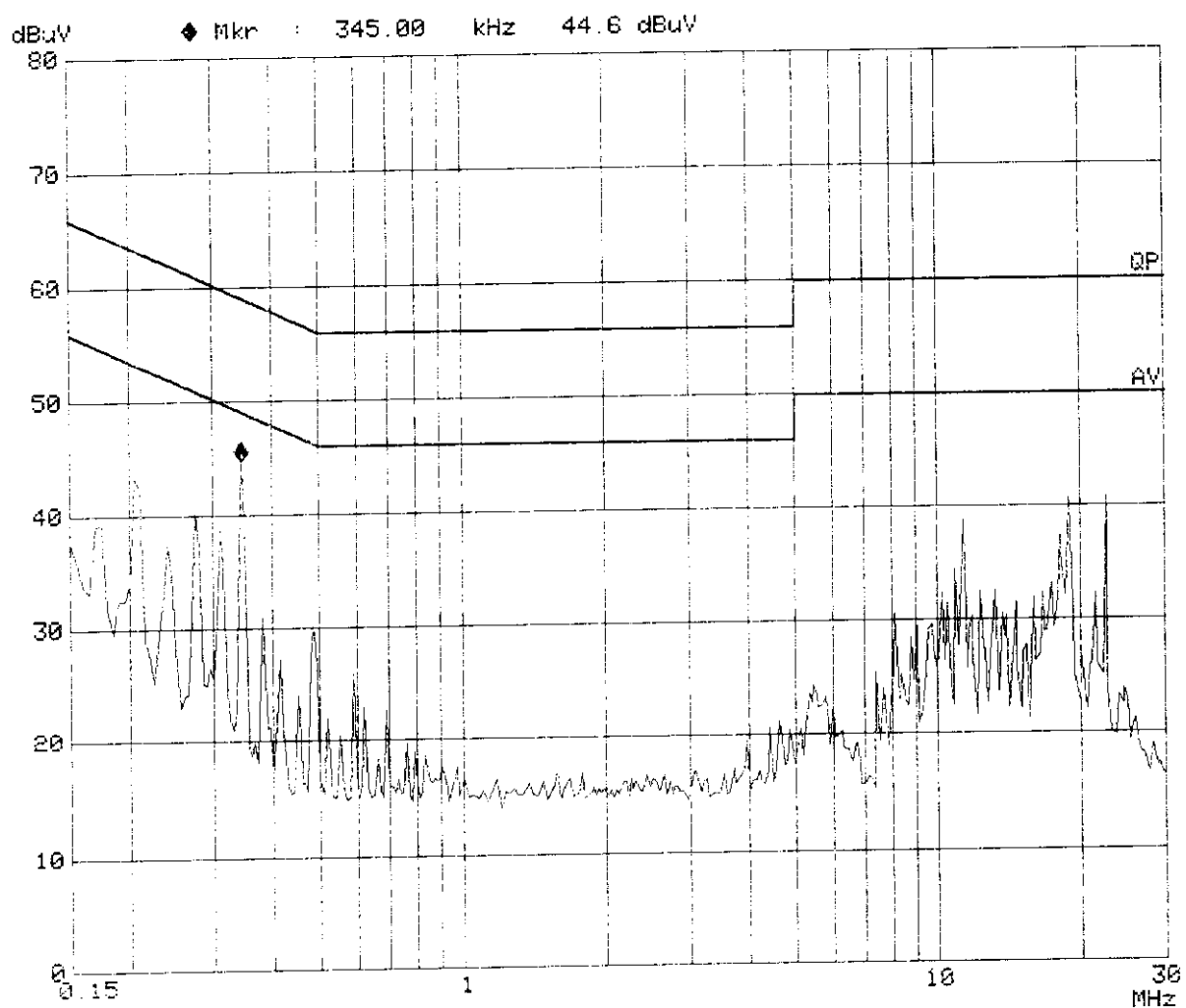
EUT: VGA CARD
Manuf: BRITEK
Op Cond: FULL SYSTEM
Operator: MILLER
Test Spec: CISPR_22 CLASS B
Comment: Line 1
M/N: Titan 4000L MODE:2
Date: 27. Oct 98 01:23



ROHDE & SCHWARZ ESHS 30

GesTek, PowerLine Conducted Emission

EUT: VGA CARD
Manuf: BRITEK
Op Cond: FULL SYSTEM
Operator: MILLER
Test Spec: CISPR 22 CLASS B
Comment: Line 2
M/N: Titan 4000L MODE:2
Date: 27. Oct 98 01:28



CONDUCTED EMISSION DATA

Date of Test	:	Oct. 27, 1998	Temperature	:	25.2 °C
EUT	:	VGA CARD	Humidity	:	63 %
Test Mode	:	Mode 3	Display Pattern	:	H Pattern

FREQUENCY MHz	READING LEVEL dBuV				LIMIT	
	LINE1 QP	LINE1 AV	LINE2 QP	LINE2 AV	QP	AV
0.20658	43.4	*	43.3	*	63.3	53.3
**0.34525	43.6	*	43.8	*	59.0	49.0
0.48523	27.7	*	28.4	*	56.2	46.2
10.19807	32.6	*	29.5	*	60.0	50.0
16.69967	34.6	*	31.5	*	60.0	50.0
22.70038	34.5	*	34.3	*	60.0	50.0

Remarks : 1. All readings are Quasi-peak.

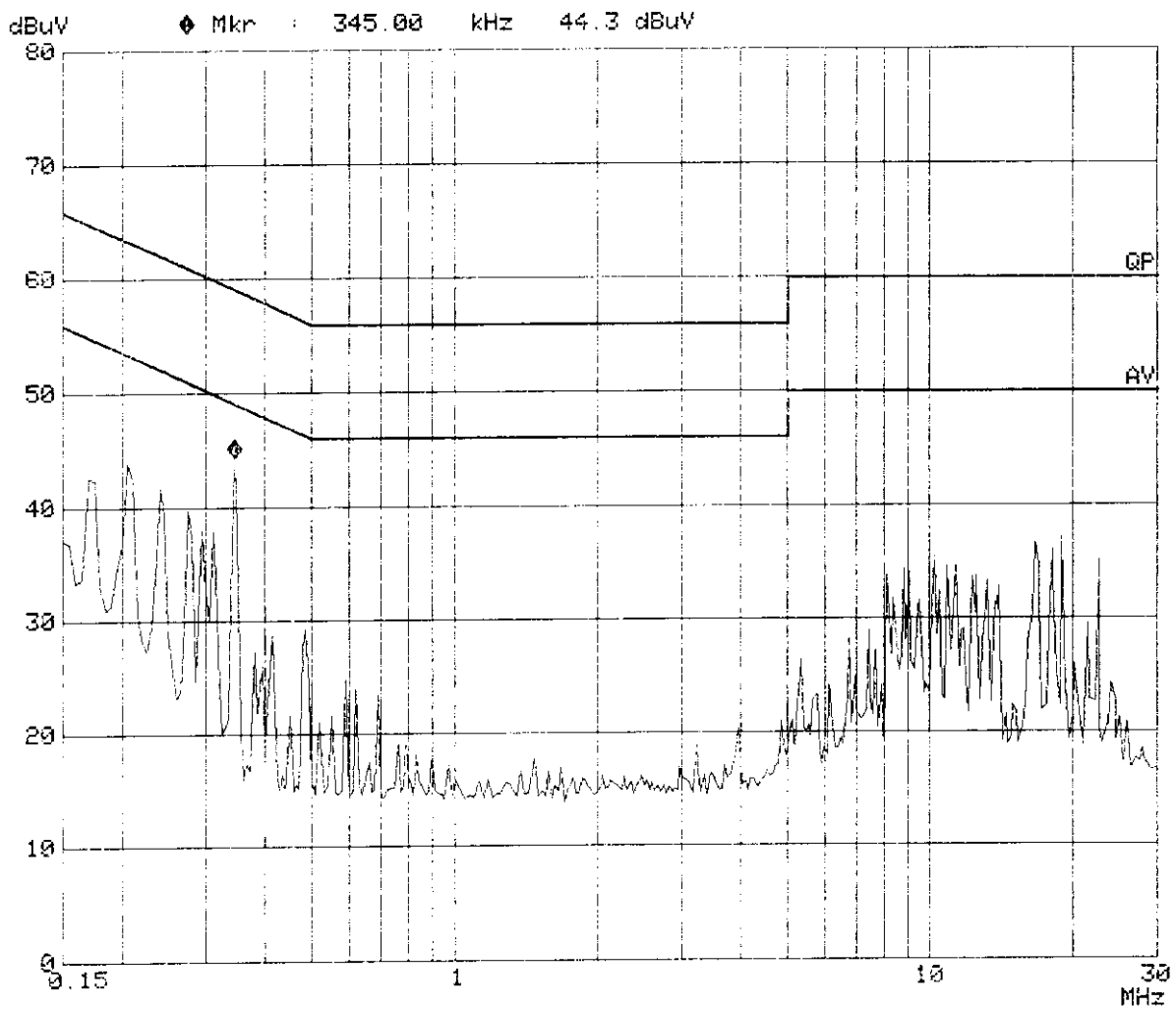
2. " * " means that the quasi-peak reading level is lower then the average limits, it is not necessary to measure the average level.
3. " ** " means that this data is the worse case emission level.
4. Final measurement = (Receiver reading) + (Correction factor if available)

Attached 2 individual pages of peak scan curve data sheets.

ROHDE & SCHWARZ ESHS 30

GesTek, PowerLine Conducted Emission

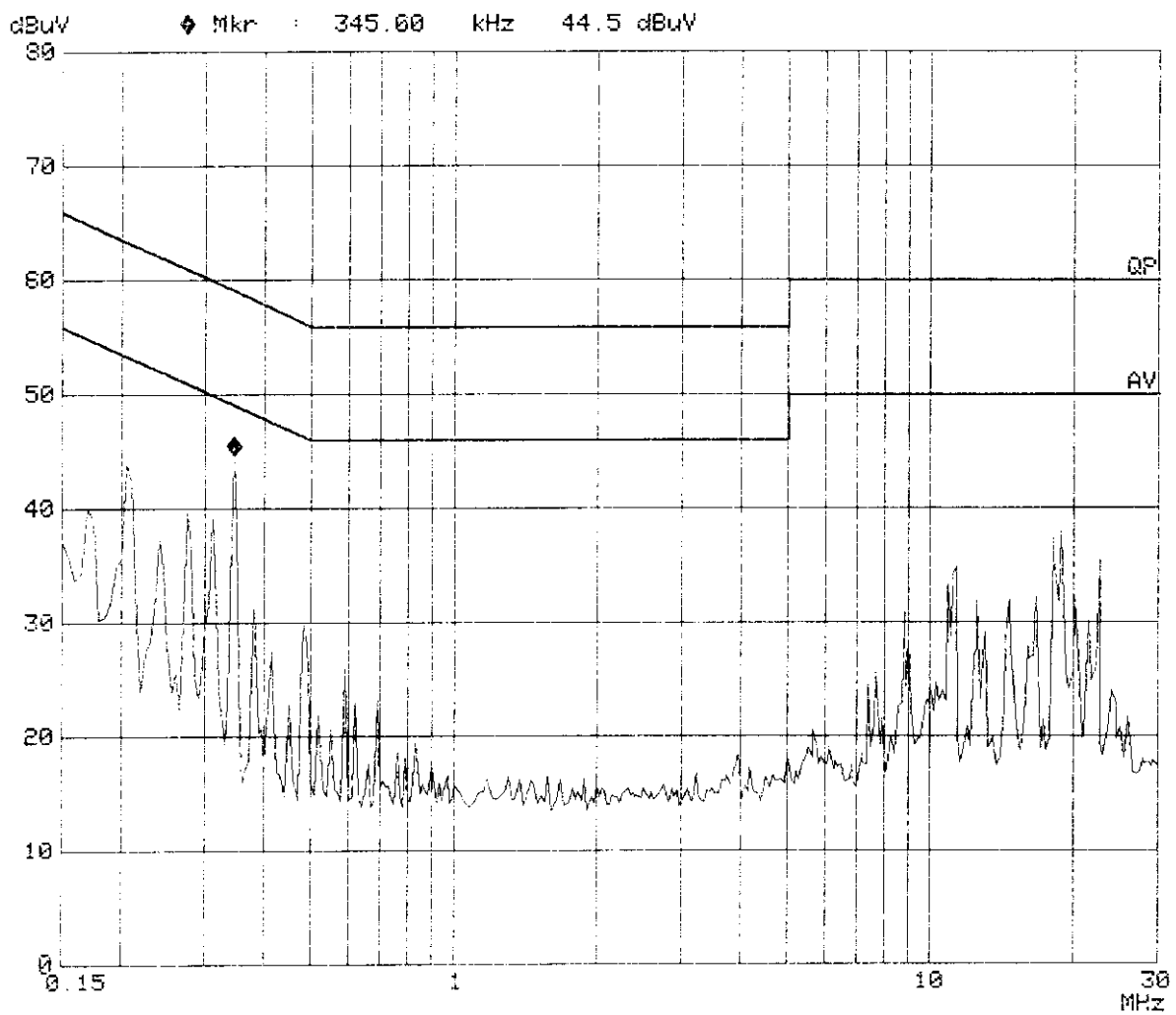
EUT: VGA CARD
Manuf: BRITEK
Op Cond: FULL SYSTEM
Operator: MILLER
Test Spec: CISPR_22 CLASS B
Comment: Line 1
M/N: Titan 4000L MODE:3
Date: 27. Oct 98 01:13



ROHDE & SCHWARZ ESHS 30

GesTek, PowerLine Conducted Emission

EUT: VGA CARD
Manuf: BRITEK
Op Cond: FULL SYSTEM
Operator: MILLER
Test Spec: CISPR_22 CLASS B
Comment: Line 2
M/N: Titan 4000L MODE:3
Date: 27. Oct 98 01:19



CONDUCTED EMISSION DATA

Date of Test	:	Oct. 27, 1998	Temperature	:	25.2 °C
EUT	:	VGA CARD	Humidity	:	63 %
Test Mode	:	Mode 4	Display Pattern	:	H Pattern

FREQUENCY MHz	READING LEVEL dBuV				LIMIT	
	LINE1 QP	LINE1 AV	LINE2 QP	LINE2 AV	QP	AV
0.20484	42.5	*	42.4	*	63.4	53.4
**0.34504	43.8	*	43.6	*	59.0	49.0
0.48543	27.5	*	28.8	*	56.2	46.2
10.20066	31.5	*	29.3	*	60.0	50.0
18.91861	44.6	*	42.2	*	60.0	50.0
22.69973	37.8	*	39.3	*	60.0	50.0

Remarks : 1. All readings are Quasi-peak.

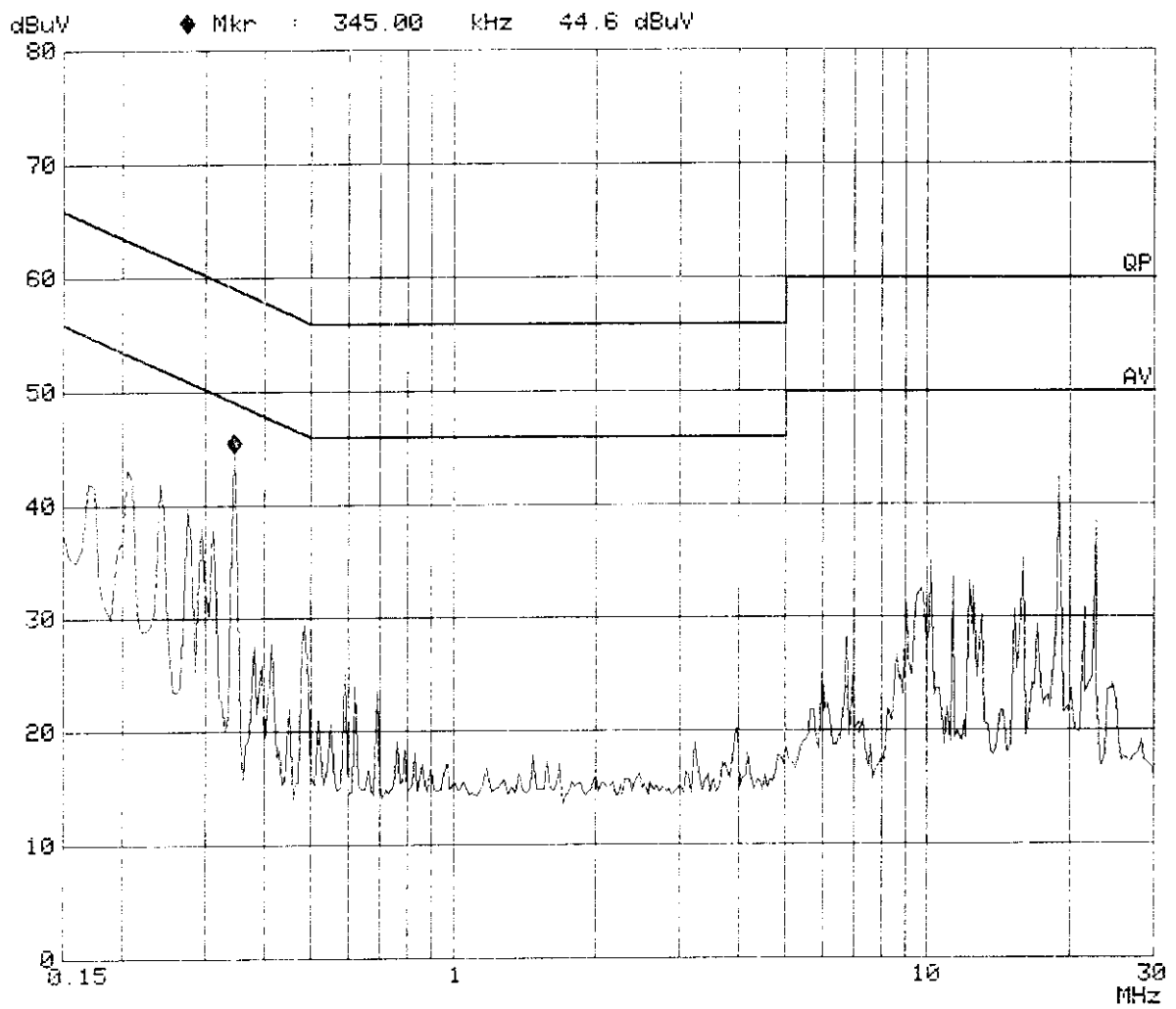
2. “ * ” means that the quasi-peak reading level is lower then the average limits, it is not necessary to measure the average level.
3. “ ** ” means that this data is the worse case emission level.
4. Final measurement = (Receiver reading) + (Correction factor if available)

Attached 2 individual pages of peak scan curve data sheets.

ROHDE & SCHWARZ ESHS 30

GesTek, PowerLine Conducted Emission

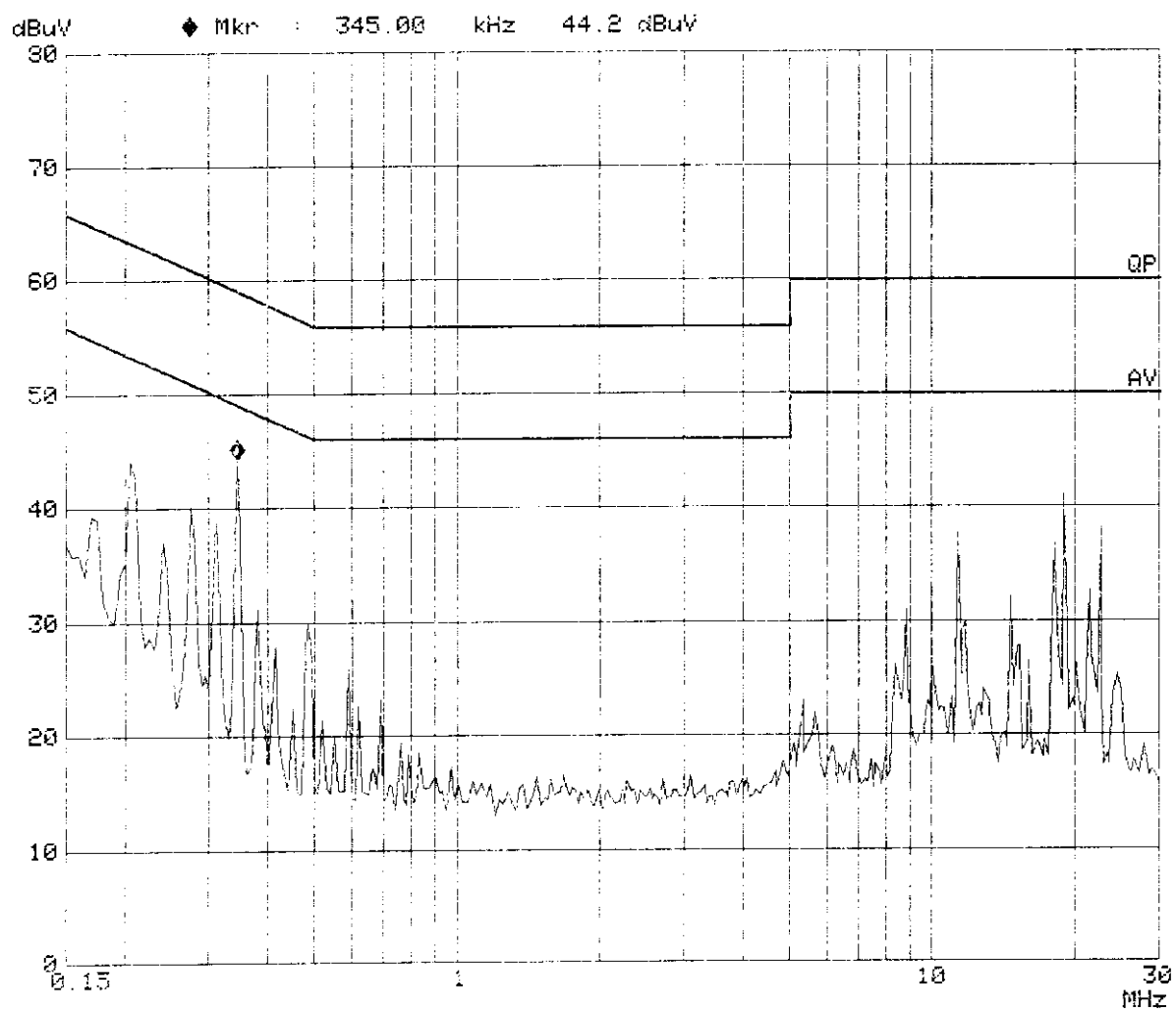
EUT: VGA CARD
Manuf: BRITEK
Op Cond: FULL SYSTEM
Operator: MILLER
Test Spec: CISPR_22 CLASS B
Comment: Line 1
M/N: Titan 4000L MODE:4
Date: 27. Oct 98 01:04



ROHDE & SCHWARZ ESHS 30

GesTek, PowerLine Conducted Emission

EUT: VGA CARD
Manuf: BRITEK
Op Cond: FULL SYSTEM
Operator: MILLER
Test Spec: CISPR_22 CLASS B
Comment: Line 2
M/N: Titan 4000L MODE:4
Date: 27. Oct 98 01:09



CONDUCTED EMISSION DATA

Date of Test	:	Oct. 27, 1998	Temperature	:	25.1 °C
EUT	:	VGA CARD	Humidity	:	62 %
Test Mode	:	Mode 5	Display Pattern	:	H Pattern

FREQUENCY MHz	READING LEVEL dBuV				LIMIT	
	LINE1 QP	LINE1 AV	LINE2 QP	LINE2 AV	QP	AV
0.20640	43.5	*	43.3	*	63.6	53.6
**0.34620	43.4	*	43.7	*	59.0	49.0
0.48487	28.1	*	28.3	*	56.2	46.2
11.34979	32.3	*	34.4	*	60.0	50.0
18.92457	42.4	*	42.3	*	60.0	50.0
22.70452	40.6	*	40.6	*	60.0	50.0

Remarks : 1. All readings are Quasi-peak.

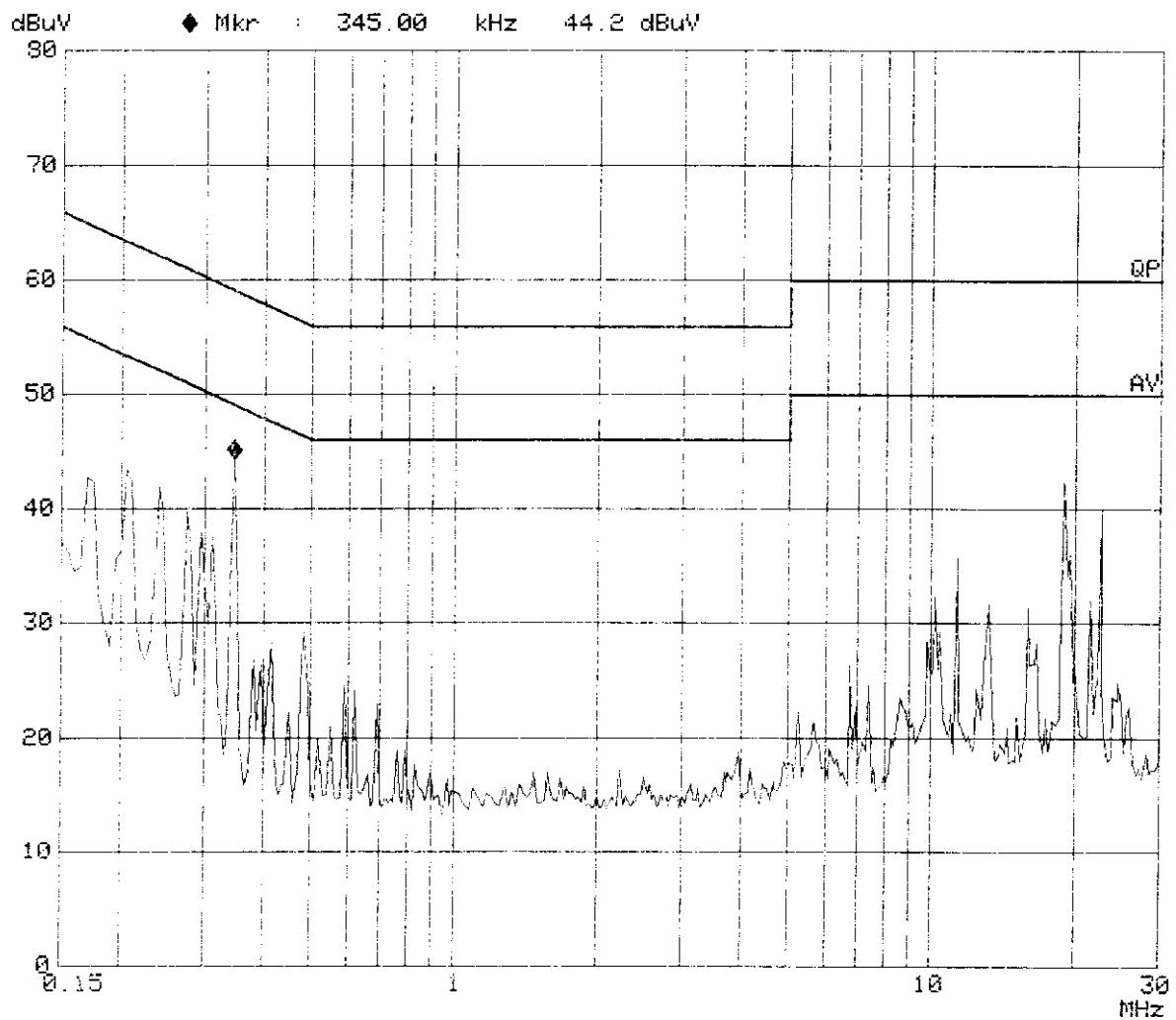
2. “ * ” means that the quasi-peak reading level is lower then the average limits, it is not necessary to measure the average level.
3. “ ** ” means that this data is the worse case emission level.
4. Final measurement = (Recciver reading) + (Correction factor if available)

Attached 2 individual pages of peak scan curve data sheets.

ROHDE & SCHWARZ ESHS 30

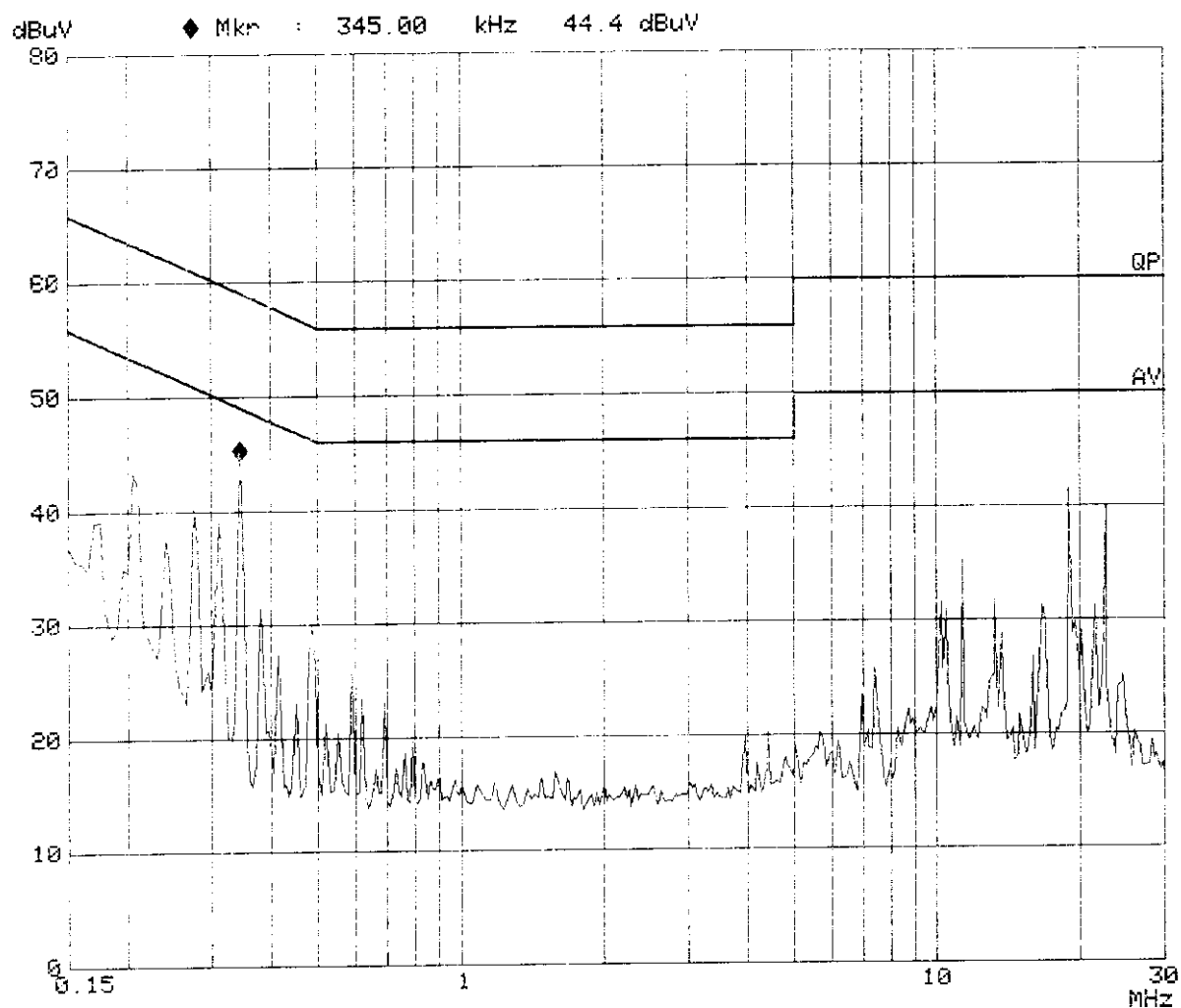
GesTek, PowerLine Conducted Emission

EUT: VGA CARD
Manuf: BRITEK
Op Cond: FULL SYSTEM
Operator: MILLER
Test Spec: CISPR_22 CLASS B
Comment: Line 1
M/N: Titan 4000L MODE:5
Date: 27. Oct 98 00:56



GesTek, PowerLine Conducted Emission

EUT: VGA CARD
 Manuf: BRITEK
 Op Cond: FULL SYSTEM
 Operator: MILLER
 Test Spec: CISPR_22 CLASS B
 Comment: Line 2
 M/N: Titan 4000L MODE:5
 Date: 27. Oct 98 01:00



GTR 90 F022

4. Radiation Emission Test

4.1 Test Equipment

The following test equipments are used during the radiated emission tests:

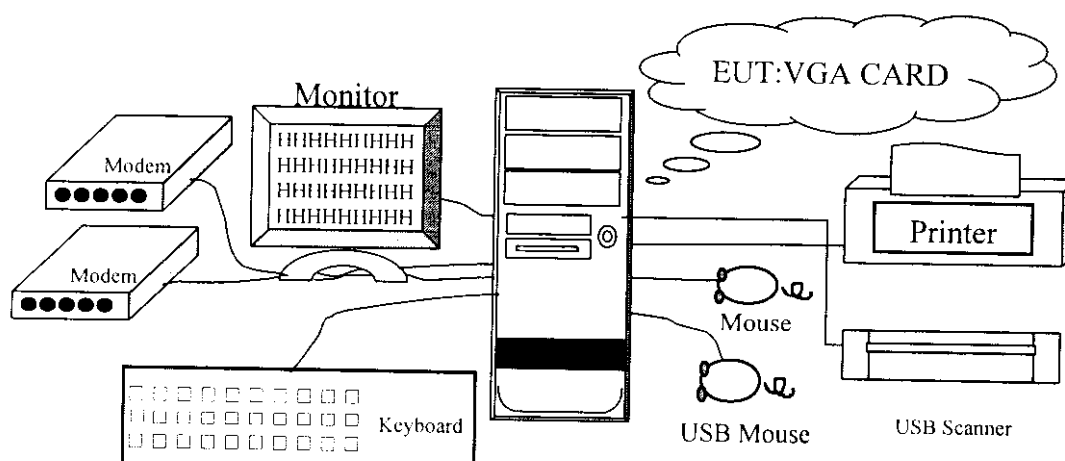
Radiated test was performed on : ☐ Site #1 ☒ Site #2

Instrument	Manufacturer	Type /Serial No.	Last Calibration	Site #1	Site #2
Test Receiver	Rohde & Schwarz	ESVS 30/829007/014	Nov. 15,1997	✓	
Spectrum Analyzer	Anristu	MA2601B/MT16442	Jun. 15,1998	✓	
Pre-Amplifier	HP	7447F/3113A04998	Nov. 16,1997	✓	
Test Receiver	Rohde & Schwarz	ESVS 10/8421122/001	Dec. 26,1997		✓
Spectrum Analyzer	HP	8568B/4315B05847	Jan. 05,1998		✓
Pre Amplifier	HP	8447D/3113A04487	Jan. 05,1998		✓
Antenna 30Mhz-2Ghz	Chase	CBL 6112/2039	May. 16,1998	✓	
Bilog Antenna	Chase	CBL6111/1380	May. 16,1998		✓
Dipole Antenna	Schwarzbeck	VIIAP/719,UHAP/736	May.19,1998		

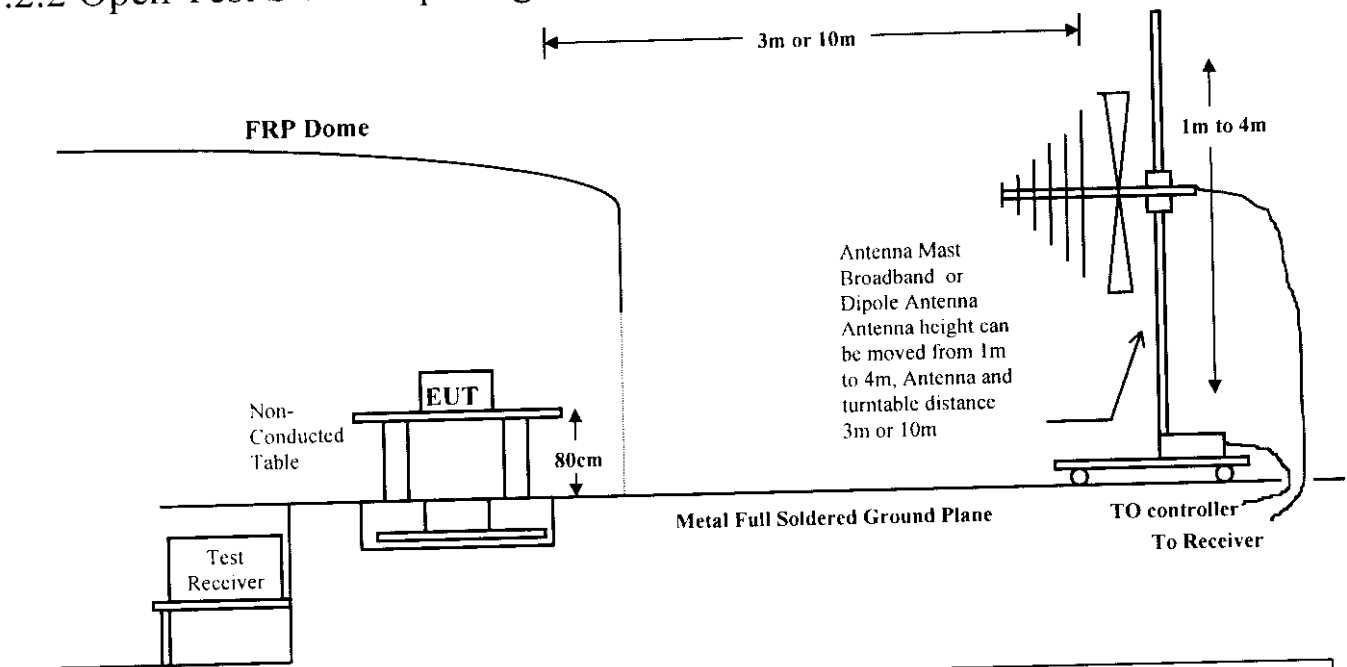
Note: All equipment upon which need to calibrated are with calibration period of 1 year.

4.2 Test Setup

4.2.1 Block Diagram of Connections between EUT and simulators



4.2.2 Open Test Site Setup Diagram



Note: This is a representative setup diagram for Table-top EUT.
For Floor-standing EUT, the table will be removed with all others setup condition remain the

4.3 Radiated Emission Limit

4.3.1 FCC Class B Limits at 3m

Frequency MHz	Distance Meter	Field Strength	
		$\mu\text{V/M}$	$\text{dB}\mu\text{V/M}$
30 - 88	3	100	40.0
88 - 216	3	150	43.5
216 - 960	3	200	46.0
960 - 2000	3	500	54.0

4.3.2 CISPR Class B Limits at 10m

Frequency MHz	Distance Meter	Field Strength
		$\text{dB}(\mu\text{V/M})$
30 - 230	10	30
230 - 1000	10	37

- Remark :
1. The tighter limit shall apply at the edge between two frequency bands.
 2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.4 EUT Configuration

The equipments which is listed 4.2.1 are installed on Radiated Emission Test to meet the Commission requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

The device under test, installed in a representative system as described in section 4.2.2, was placed on a non-conductive table whose total height equaled 80 cm. This table can be rotated 360 degree. The measurement antenna was mounted to a non-conductive mast capable of moving the antenna vertically. Antenna height was varied from 1 meter to 4 meters and the system under test was rotated from 0 degree through 360 degrees relative to the antenna position and polarization (Horizontal and Vertical). Also the I/O cable position was investigated to find the maximum emission condition.

4.5 Operating Condition of EUT

Same as Conducted Power Line Test which is listed in 3.5.

4.6 Radiated Emission Data

The measurement range of radiated emission which is from **30 MHz to 1 GHz** was investigated. The initial step in collecting radiated data is a spectrum analyzer peak scan of the measurement range for all the test modes. Then the worst modes were reported the following data pages .

The total uncertainty for this test is as follows:

- Uncertainty in the field strength measured (3m antenna distance): $< \pm 4.0$ dB
- Uncertainty in the field strength measured (10m antenna distance): $< \pm 4.0$ dB

The uncertainty is calculated in accordance with NAMAS document NIS 81, and is given as 2 standard deviations.

Radiated Emission Data

Date of Test :10-26,1998 Mon Temperature :27 deg/C
 EUT :VGA CARD (Mode 1) Humidity :67 %RH
 Working Cond.:M/N:TITAN 4000L Display Pattern:H Pattern

Frequency	Cable	Antenna	Reading Level	Emission Level	Limit
	Loss	Factor	Horizontal	Horizontal	
[MHz]	[dB]	[dB/m]	[dB(uV)]	[dB(uV/m)]	[dB(uV/m)]
74.214	1.28	6.63	7.50	15.41	30.00
108.468	1.44	11.77	2.00	15.21	30.00
128.875	1.62	12.27	1.30	15.19	30.00
186.147	2.05	9.64	6.41	18.09	30.00
*192.002	2.12	9.87	8.65	20.64	30.00
288.001	2.79	13.28	9.15	25.23	37.00

- Remarks:1. All Readings are Quasi-Peak and average values.
 2.“ * ”, means this data is worse case emission level.
 3.Emission Level = Reading Level + Antenna Factor + Cable loss
 4.Deviations from the specifications: None.

Radiated Emission Data

Date of Test :10-26,1998 Mon Temperature :27 deg/C
 EUT :VGA CARD (Mode 1) Humidity :67 %RH
 Working Cond.:M/N:TITAN 4000L Display Pattern:H Pattern

Frequency	Cable	Antenna	Reading Level	Emission Level	Limit
	Loss	Factor	Vertical	Vertical	
[MHz]	[dB]	[dB/m]	[dB(uV)]	[dB(uV/m)]	[dB(uV/m)]
116.650	1.48	12.56	9.61	23.65	30.00
*133.550	1.69	11.95	13.27	26.91	30.00
160.348	2.10	9.90	5.34	17.34	30.00
183.254	2.02	9.48	14.42	25.92	30.00
192.029	2.12	9.87	6.29	18.28	30.00
206.158	2.23	10.47	2.51	15.22	30.00
288.001	2.79	13.28	7.44	23.52	37.00

- Remarks:1. All Readings are Quasi-Peak and average values.
 2.“ * ”, means this data is worse case emission level.
 3.Emission Level = Reading Level + Antenna Factor + Cable loss
 4.Deviations from the specifications: None.

Radiated Emission Data

Date of Test :10-26,1998 Mon Temperature :27 deg/C
 EUT :VGA CARD (Mode 2) Humidity :67 %RH
 Working Cond.:M/N:TITAN 4000L Display Pattern:H Pattern

Frequency	Cable	Antenna	Reading Level	Emission Level	Limit
	Loss	Factor	Horizontal	Horizontal	
[MHz]	[dB]	[dB/m]	[dB(uV)]	[dB(uV/m)]	[dB(uV/m)]
74.212	1.28	6.63	8.89	16.80	30.00
111.238	1.45	12.09	4.23	17.77	30.00
186.147	2.05	9.64	5.18	16.86	30.00
*192.003	2.12	9.87	7.98	19.97	30.00
240.002	2.44	12.01	4.80	19.25	37.00
288.002	2.79	13.28	8.55	24.63	37.00
300.746	2.91	13.60	3.71	20.22	37.00
332.003	3.09	14.17	1.23	18.49	37.00

- Remarks:1. All Readings are Quasi-Peak and average values.
 2.“ * ”, means this data is worse case emission level.
 3.Emission Level = Reading Level + Antenna Factor + Cable loss
 4.Deviations from the specifications: None.

Radiated Emission Data

Date of Test :10-26,1998 Mon Temperature :27 deg/C
 EUT :VGA CARD (Mode 2) Humidity :70 %RH
 Working Cond.:M/N:TITAN 4000L Display Pattern:H Pattern

Frequency	Cable	Antenna	Reading Level	Emission Level	Limit
	Loss	Factor	Vertical	Vertical	
[MHz]	[dB]	[dB/m]	[dB(uV)]	[dB(uV/m)]	[dB(uV/m)]
68.504	1.20	6.14	9.14	16.48	30.00
*110.019	1.45	11.93	7.43	20.81	30.00
192.026	2.12	9.87	6.73	18.72	30.00
204.029	2.22	10.38	3.05	15.65	30.00
288.000	2.79	13.28	6.43	22.51	37.00
300.113	2.90	13.60	5.65	22.15	37.00

- Remarks:1. All Readings are Quasi-Peak and average values.
 2.“ * ”, means this data is worse case emission level.
 3.Emission Level = Reading Level + Antenna Factor + Cable loss
 4.Deviations from the specifications: None.

Radiated Emission Data

Date of Test :10-26,1998 Mon Temperature :27 deg/C
 EUT :VGA CARD (Mode 3) Humidity :67 %RH
 Working Cond.:M/N:TITAN 4000L Display Pattern:H Pattern

Frequency	Cable	Antenna	Reading Level	Emission Level	Limits
	Loss	Factor	Horizontal	Horizontal	
[MHz]	[dB]	[dB/m]	[dB(uV)]	[dB(uV/m)]	[dB(uV/m)]
*111.242	1.45	12.09	5.42	18.96	30.00
133.650	1.69	11.95	2.22	15.86	30.00
192.036	2.12	9.87	0.88	12.87	30.00
200.373	2.20	10.20	4.20	16.60	30.00
240.005	2.44	12.01	4.64	19.09	37.00
288.000	2.79	13.28	7.96	24.04	37.00
336.047	3.12	14.24	0.95	18.30	37.00

- Remarks:1. All Readings are Quasi-Peak and average values.
 2.“ * ”, means this data is worse case emission level.
 3.Emission Level = Reading Level + Antenna Factor + Cable loss
 4.Deviations from the specifications: None.

Radiated Emission Data

Date of Test :10-26,1998 Mon Temperature :27 deg/C
 EUT :VGA CARD (Mode 3) Humidity :67 %RH
 Working Cond.:M/N:TITAN 4000L Display Pattern:H Pattern

Frequency	Cable	Antenna	Reading Level	Emission Level	Limit
	Loss	Factor	Vertical	Vertical	
[MHz]	[dB]	[dB/m]	[dB(uV)]	[dB(uV/m)]	[dB(uV/m)]
*110.019	1.45	11.93	4.92	18.30	30.00
152.652	1.99	10.47	0.02	12.48	30.00
186.148	2.05	9.64	5.91	17.59	30.00
192.021	2.12	9.87	5.04	17.03	30.00
200.478	2.20	10.20	3.07	15.47	30.00
240.034	2.44	12.01	7.43	21.88	37.00
288.003	2.79	13.28	6.67	22.75	37.00

- Remarks:1. All Readings are Quasi-Peak and average values.
 2.“ * ”, means this data is worse case emission level.
 3.Emission Level = Reading Level + Antenna Factor + Cable loss
 4.Deviations from the specifications: None.

Radiated Emission Data

Date of Test :10-26,1998 Mon Temperature :27 deg/C
 EUT :VGA CARD (Mode 4) Humidity :67 %RH
 Working Cond.:M/N:TITAN 4000L Display Pattern:H Pattern

Frequency	Cable	Antenna	Reading Level	Emission Level	Limit
	Loss	Factor	Horizontal	Horizontal	
[MHz]	[dB]	[dB/m]	[dB(uV)]	[dB(uV/m)]	[dB(uV/m)]
133.695	1.69	11.95	7.15	20.79	30.00
167.058	2.07	9.75	7.13	18.95	30.00
*192.007	2.12	9.87	12.32	24.31	30.00
193.256	2.13	9.95	6.57	18.65	30.00
200.483	2.20	10.20	9.24	21.64	30.00
240.012	2.44	12.01	7.80	22.25	37.00
288.005	2.79	13.28	8.69	24.77	37.00
300.725	2.91	13.60	6.70	23.21	37.00
334.115	3.10	14.20	5.97	23.28	37.00

- Remarks:1. All Readings are Quasi-Peak and average values.
 2.“ * ”, means this data is worse case emission level.
 3.Emission Level = Reading Level + Antenna Factor + Cable loss
 4.Deviations from the specifications: None.

Radiated Emission Data

Date of Test :10-26,1998 Mon Temperature :27 deg/C
 EUT :VGA CARD (Mode 4) Humidity :67 %RH
 Working Cond.:M/N:TITAN 4000L Display Pattern:H Pattern

Frequency	Cable	Antenna	Reading Level	Emission Level	Limits
	Loss	Factor	Vertical	Vertical	
[MHz]	[dB]	[dB/m]	[dB(uV)]	[dB(uV/m)]	[dB(uV/m)]
*133.604	1.69	11.95	6.20	19.84	30.00
192.010	2.12	9.87	6.58	18.57	30.00
200.550	2.20	10.20	7.19	19.59	30.00
240.007	2.44	12.01	6.44	20.89	37.00
288.003	2.79	13.28	7.23	23.31	37.00
332.004	3.09	14.17	7.68	24.94	37.00

- Remarks:1. All Readings are Quasi-Peak and average values.
 2.“ * ”, means this data is worse case emission level.
 3.Emission Level = Reading Level + Antenna Factor + Cable loss
 4.Deviations from the specifications: None.

Radiated Emission Data

Date of Test :10-26,1998 Mon Temperature :27 deg/C
 EUT :VGA CARD (Mode 5) Humidity :67 %RH
 Working Cond.:M/N:TITAN 4000L Display Pattern:H Pattern

Frequency	Cable	Antenna	Reading Level	Emission Level	Limit
	Loss	Factor	Horizontal	Horizontal	
[MHz]	[dB]	[dB/m]	[dB(uV)]	[dB(uV/m)]	[dB(uV/m)]
133.695	1.69	11.95	7.29	20.93	30.00
167.173	2.07	9.75	3.05	14.87	30.00
*192.015	2.12	9.87	9.52	21.51	30.00
200.518	2.20	10.20	8.05	20.45	30.00
208.261	2.25	10.56	5.41	18.22	30.00
288.003	2.79	13.28	9.01	25.09	37.00
300.775	2.91	13.60	7.56	24.07	37.00

- Remarks:1. All Readings are Quasi-Peak and average values.
 2.“ * ”, means this data is worse case emission level.
 3.Emission Level = Reading Level + Antenna Factor + Cable loss
 4.Deviations from the specifications: None.

Radiated Emission Data

Date of Test :10-26,1998 Mon Temperature :27 deg/C
 EUT :VGA CARD (Mode 5) Humidity :67 %RH
 Working Cond.:M/N:TITAN 4000L Display Pattern:H Pattern

Frequency	Cable	Antenna	Reading Level	Emission Level	Limit
	Loss	Factor	Vertical	Vertical	
[MHz]	[dB]	[dB/m]	[dB(uV)]	[dB(uV/m)]	[dB(uV/m)]
133.650	1.69	11.95	9.86	23.50	30.00
167.061	2.07	9.75	10.60	22.42	30.00
*186.147	2.05	9.64	12.06	23.74	30.00
192.030	2.12	9.87	9.58	21.57	30.00
200.481	2.20	10.20	8.80	21.20	30.00
288.003	2.79	13.28	10.48	26.56	37.00
300.726	2.91	13.60	9.28	25.79	37.00
334.119	3.10	14.20	7.42	24.73	37.00

- Remarks:1. All Readings are Quasi-Peak and average values.
 2.“ * ”, means this data is worse case emission level.
 3.Emission Level = Reading Level + Antenna Factor + Cable loss
 4.Deviations from the specifications: None.

6. EMI Reduction Method During Compliance Testing

No modification was made during testing.