

National Panasonic

Kyushu Matsushita Electric Co., Ltd.

1-62, 4-chome, Minoshima, Hakata-ku, Fukuoka 812-8531 Japan Phone: Fukuoka(092)431-2111

Telex: 723579'KMEFUK J' Cable Address: "KMEFUKUOKA" FUKUOKA

REPORT OF MEASUREMENT

1. Manufacturer : Kyushu Matsushita Electric Co., Ltd.
1-62, 4-chome, Minoshima, Hakata-ku, Fukuoka, 812-8531, Japan
2. Description Device : Cordless Terminal [PC (Personal Computer) Unit]
Tx: 5.755 ~ 5.845GHz, Rx: 904.00 ~ 926.04MHz
 - a) Type of EUT : Desk-top Type
 - b) Category : Intentional Radiator and Receiver
 - c) FCC Identifier : ACJ96NKX-MC1PC
 - d) Trade Name : Panasonic
 - e) Model Number : KX-MC1PC
 - f) Serial Number : ES1001
 - g) Date of Manufacture : August 1999
 - h) Power Source : AC 120V, 60Hz
(AC Adaptor, Output rating DC 12V, 1A)
3. Date of Measurement : August 18, 19 & 20, 1999
4. Regulation Applied : FCC Rules and Regulations Part 15, Subpart C
Intentional Radiator (§ 15.249)
5. Measurement Procedure : ANSI C63.4 - 1992
6. Place of Measurement : IPS Corporation, Nagano
1878-1 Harumiya Ono Tatsuno-machi, Kamiina-gun, Nagano-ken, 399-0601,
Japan
7. Measurement Results : The results obtained from the measuring of the above-mentioned device are
as shown in attached sheets.
8. Summary of Results : Test sample complies with FCC Rules and Regulations Part 15 Subpart C
Intentional Radiators

Signature : _____

T. Yamashita
Tetsuo Yamashita, Manager of
Engineering Section of 4th Division of
Kyushu Matsushita Electric Co., Ltd.

Date: August 31, 1999

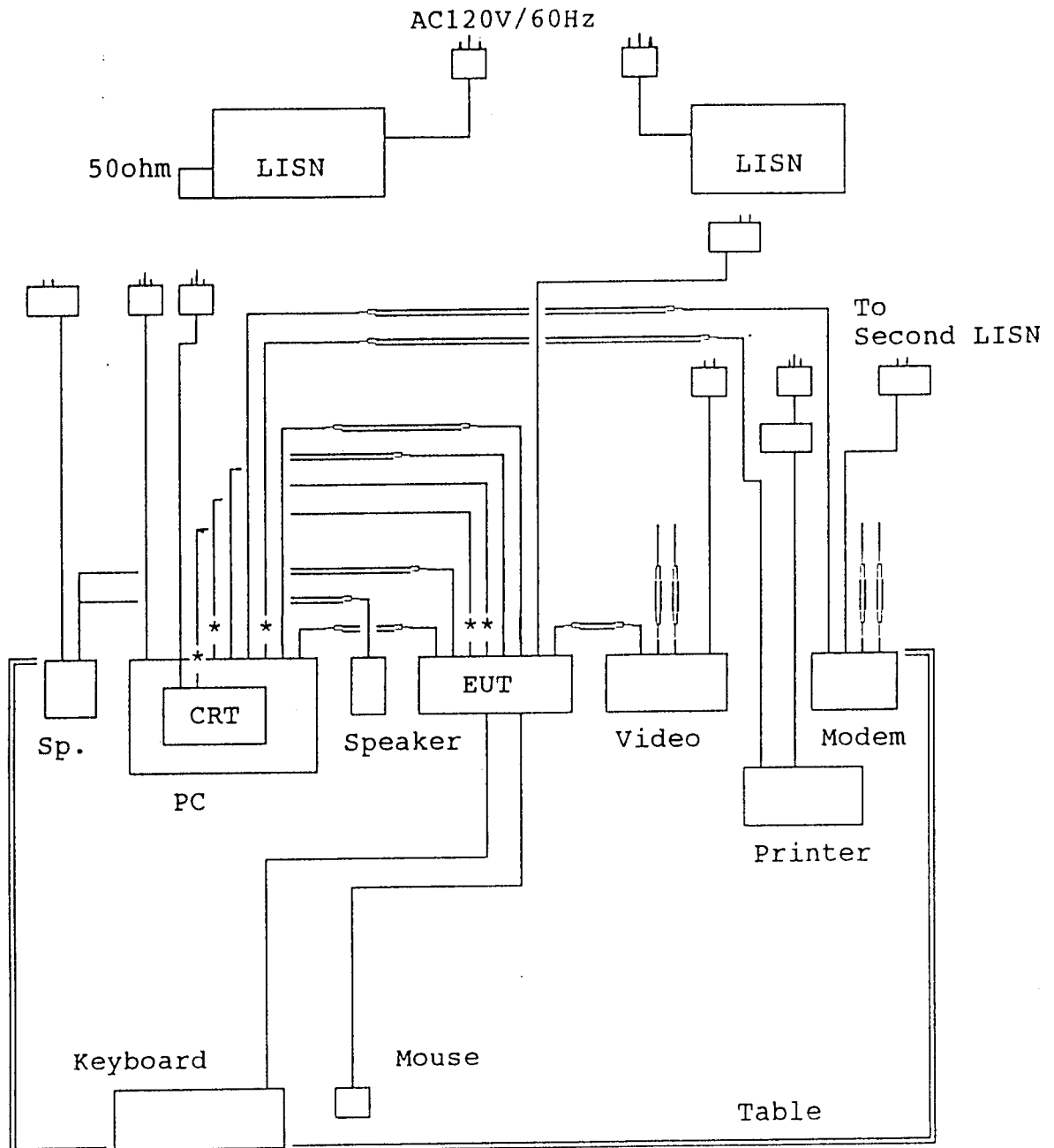
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Test Facility

The Test Facility has been certified to Quality System for EMC Testing Service by TUV CERT. Proof has been furnished that the requirements according to DIN EN ISO 9002 / JIS Z 9902 are fulfilled. (Certificate Registration No. 09 100 6813)

Conducted Interference Voltage test was performed on a shielded room and Radiated interference Field Strength test was performed on a 10 meter open filed test site located at IPS Corp. 4593, Hosohora Ono Tatsuno-machi, Kamiina-gun, Nagano-ken, 399-0601, Japan. The spectrum investigation of radiated emission in the range of 30 MHz to 10 GHz (peak detector function) was performed on a 3 m semi-anechoic chamber located at IPS Corp. 1878-1, Harumiya Ono Tatsuno-machi, Kamiina-gun, Nagano-ken, 399-0601, Japan. This Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP) by United States Department of Commerce, National Institute of Standard and Technology (NIST) for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO / IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI / ASQC Q92-1987) as suppliers of calibration or test results. Accreditation awarded for specific services, listed on the Scope of Accreditation for: ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS FCC. (NVLAP LAB CODE: 200012-0). And this Laboratory has been fully described in a report November 28, 1998 submitted to Federal Communications Commission Authorization and Evaluation Division, and accepted in a letter dated December 11, 1998 (Registration Number 90676).

This Laboratory is accredited by Japan Accreditation Board for Conformity Assessment for satisfactory compliance with JAB RL100 and RL152-1997 of JAB Regulations. These criteria encompass the requirements of ISO / IEC Guide 25 and the relevant requirements of JIS Z 9325 as suppliers of calibration or test results. Accreditation awarded for specific services, listed on the Scope of Accreditation for : ELECTROMAGNETIC COMPATIBILITY TESTING (JAB Accreditation No.: RTL00010).



* Ferrite Bead

List of Test Equipment(s)

No.	Manufacturer	Products	Model No.	Serial No.	Remarks
1	Panasonic	MicroCast	KX-MC1PC	ES1001	EUT
2	Salom Electric	AC Adaptor	SADC-1165	N/A	AC120V, 60Hz
3	Panasonic	Hi-Fi Stereo	PV-8451	J8SC27157	FCC ID: ACJ927098AH
4	Compaq	Personal Computer	DESKPRO XE 4100	7450HK30120	FCC ID: CNT75MCX1
5	Panasonic	CRT	C-1795E	KH3430406	FCC ID: ACJ928KMX-F1701
6	Chicony Electronics	Keyboard	KB-9320	TIM5200558	FCC ID: E8HKB-5323
7	Logitech	Mouse	13H6690	23-G432148	FCC ID: DZL210429
8	Key systems Cord	Hi-Fi Speaker	SP-306G	J812031243	2 pcs
9	Hewlett Packard	Printer	C4608A	SG76A1D0VG	FCC ID: B94C2164X
10	Hewlett Packard	ACAdaptor	C2178A	280597	DC30V, 0.4A
11	Epson	Modem	C202A	010802	FCC ID: BKM552C202A
12	Epson	AC Adaptor	H00AAJ	N/A	DC6V, 0.6A

List of Cable(s)

Equip ment	Terminal	Cable	Length	Equip ment	Terminal	Remarks
1	Video Audio (L/R)	Audio Cable	1.4m	3	Video Out Audio Out	Contains of 3 cables
1	Keyboard	PS/2 Cable	1.4m	3	Keyboard	
1	Mouse	PS/2 Cable	1.4m	4	Mouse	
1	15D-Sub	D-Sub Cable	1.4m	4	Joystick	
1	Video	Video Cable	1.4m	4	Video	Cores at both Ends
1	Video	Video Cable	1.4m	5	Video	Cores at both Ends
2		DC Cable	1.8m	1	DC IN	
3	AC IN	AC 2P	1.5m			AC120V, 60Hz
3	Video IN Audio (L/R)	Audio Cable	1.9m		Open	
3	Ant		1.0m		Open	
4	AC IN	AC 3P	2.1m			AC120V, 60Hz
4		Modular Cable	2.1m		Open	
5	AC IN	AC 3P	1.4m			AC120V, 60Hz
6		Keyboard cable	1.5m	1	Keyboard	
7		Mouse Cable	1.8m	1	Mouse	
8		AC 2P	1.6m			AC120V, 60Hz
8		Speaker Cable	1.7m	1		
8		Speaker Cable	2.1m	8		
9	Parallel	Parallel Cable	3.0m	4	Parallel	
10		DC Cable	1.8m	9	DC IN	DC30V, 0.4A
11	DTE	Serial Cable	2.0m	4	Serial	
11	Line Phone	Modular Cable	2.1m		Open	2 pcs
12		DC Cable	1.9m	11	DC IN	DC6V, 0.6A

RADIATED EMISSION

The test setup was made according to ANSI STD C63.4-1992 clause 8 on a 3 meter anechoic chamber, which allows a 3 m distance measurement. The EUT shall be located on the non-conductive wooden table top and they are all aligned and flush with rear of this table top. The height of this table was 0.8 m and 1.5 m wide x 1.0 m deep size. Spacing between the each equipment maintain 10 cm. Connection of the EUT to the artificial mains network is required and artificial mains network is located under the turn table. The artificial mains network is 50 ohm terminated. The mains flexible cords were dropped to the floor and is routed over to receptacle. Interconnecting cables of table top equipment were shortened to appropriate length on the table. The measurement has been conducted with both horizontal and vertical antenna polarization. The turntable has been fully rotated. The highest radiation of the equipment has been recorded. By varying the configuration of the test sample and the cable routing it was attempted to maximize the radiated emission. For further description of the configuration refer to the pictures of this report.

Distance between equipment and antenna : 3 m
 Height of antenna : 1 m to 4 m

RADIATED EMISSION (9 kHz to 30 MHz)

The test setup for the frequency range 9 kHz to 30 MHz was on a 3 meter anechoic chamber, which allows a 3 m distance measurement. The EUT and peripherals shall be located on the non-conductive wooden table top and they are all aligned and flush with rear of this table top. The height of this table was 0.8 m and 1.5 m wide x 1.0 m deep size. Spacing between the each equipment maintain 10 cm. The mains flexible cords were dropped to the floor and is routed over to receptacle. Interconnecting cables of table top equipment that hang closer than 0.4 m to the ground plane shall be folded back and forth forming a bungle 30 to 40 cm long, hanging approximately in the middle between ground plane and table. The measurement has been conducted with both horizontal and vertical antenna polarization. The turntable has been fully rotated. The highest radiation of the equipment has been recorded. By varying the configuration of the test sample and the cable routing it was attempted to maximize the radiated emission.

Distance between equipment and antenna : 3 m (9 kHz to 1 GHz)
 * due to Only for the spectrum investigation

Height of antenna : 1 m (9 kHz to 30 MHz)

Number of Channels Tested:

Frequency Band	Number of Channels	Channel Location
Less than 1MHz	1	Middle
1 - 10MHz	2	Top, Bottom
More than 10MHz	3	Top, Middle, Bottom

List of the Instrumentation

1. Radiation(30MHz - 1GHz)

- 1) Equipment : Test Receiver (For the final measurement)
Model No. : HP8546A
S/N : 3807A00432
Manufacture : Hewlett Packard
Frequency Range : 9 kHz to 6.9 GHz
System Bandwidth: 10 kHz
Detector : Quasi-Peak
Last Calibrate : 1998/12/09
Next Calibrate : 1999/12/09
- 2) Equipment : Bilog Antenna (For the spectrum analysis)
Model No. : CBL6140A
S/N : 1124
Manufacture : Chase
Frequency Range : 30 MHz to 1000 MHz
Last Calibrate : 1999/02/01
Next Calibrate : 2000/02/01
- 3) Equipment : Tunable Dipole Antenna
(For the final measurement)
Model No. : VHA9103
S/N : 91031513
Manufacture : Schwarzbeck
Frequency Range : 30 MHz to 300 MHz
Last Calibrate : 1998/10/08
Next Calibrate : 1999/10/08
- 4) Equipment : Tunable Dipole Antenna
(For the final measurement)
Model No. : UHA9105
S/N : 91052108
Manufacture : Schwarzbeck
Frequency Range : 300 MHz to 1000 MHz
Last Calibrate : 1998/10/08
Next Calibrate : 1999/10/08
- 5) Equipment : Attenuator (Connected to the Antenna)
Model No. : MP721A
S/N : M47971
Manufacture : Anritsu
Frequency Range : 30 MHz to 1000 MHz
Calibrated with the Cable system
- 6) Equipment : Step Attenuator (For the Pre-Amp. Saturation)
Model No. : HP8494B
S/N : 3308A37637
Manufacture : Hewlett Packard
Frequency Range : 30 MHz to 1000 MHz
Calibrated with the Cable system

- 7) Equipment : Pre Amplifier
Model No. : HP8347A
S/N : 3307A01779
Manufacture : Hewlett Packard
Frequency Range: 30 MHz to 3000 MHz
Calibrated with the Cable system
- 8) Equipment : Cable System
Consists of : Attenuator, Pre-Amplifier, Switch Unit and cable
Manufacture : IPS Corporation
Frequency Range: 30 MHz to 1000 MHz
Last Calibrate : 1999/02/01
Next Calibrate : 2000/02/01
- 9) Equipment : LISN for EUT & Peripherals
Model No. : A
S/N : 003 / 004
Manufacture : IPS
Frequency Range: 0.15 MHz to 30 MHz
RF Load : 50 ohm 50 micro henry, 50 ohm terminated
Located under the turn table. Non calibration equipment.

2. Radiation(1GHz - 40GHz)

- 1) Equipment : Test Receiver (For the final measurement)
Model No. : 2784
S/N : B020190
Manufacture : Textronix
Frequency Range: 9 kHz to 40 GHz
System Bandwidth: 10 kHz
Detector : Quasi-Peak
Last Calibrate : 1999/03/12
Next Calibrate : 2000/03/31
- 2) Equipment : Guide Antenna (For the spectrum analysis)
Model No. : 3115
S/N : 9512-4647
Manufacture : EMCO
Frequency Range: 1GHz to 18GHz
Last Calibrate : 1998/08/19
Next Calibrate : 1999/08/31
- 3) Equipment : Guide Antenna (For the spectrum analysis)
Model No. : 3116
S/N : 9512-2277
Manufacture : EMCO
Frequency Range: 18GHz to 40GHz
Last Calibrate : 1998/08/19
Next Calibrate : 1999/08/31
- 4) Equipment : Pre Amplifier
Model No. : HP83051A
S/N : 3332A00357
Manufacture : Hewlett Packard
Frequency Range: 45 MHz to 50 GHz
Calibrated with the Cable System
- 5) Equipment : 4 m Junflon Cable System (For 1 GHz to 40 GHz)
Consists of : Pre-Amplifier and Cable.
Manufacture : IPS Corporation
Frequency Range: 1 GHz to 40 GHz
Last Calibrated : 1998/11/21
Next Calibrated: 1999/11/21

3. Magnetic Field Emission(9kHz - 30MHz)

- 1) Equipment : Test Receiver (For the final measurement)
Model No. : HP8546A
S/N : 3807A00432
Manufacture : Hewlett Packard
Frequency Range: 9 kHz to 6.9 GHz
System Bandwidth: 10 kHz
Detector : Quasi-Peak
Last Calibrate : 1998/12/09
Next Calibrate : 1999/12/09

- 2) Equipment : LoopAntenna (For the spectrum analysis)
Model No. : HLA6120
S/N : 1131
Manufacture : Chase
Frequency Range: 10 KHz to 30 MHz
Last Calibrate : 1999/06/11
Next Calibrate : 2000/06/11

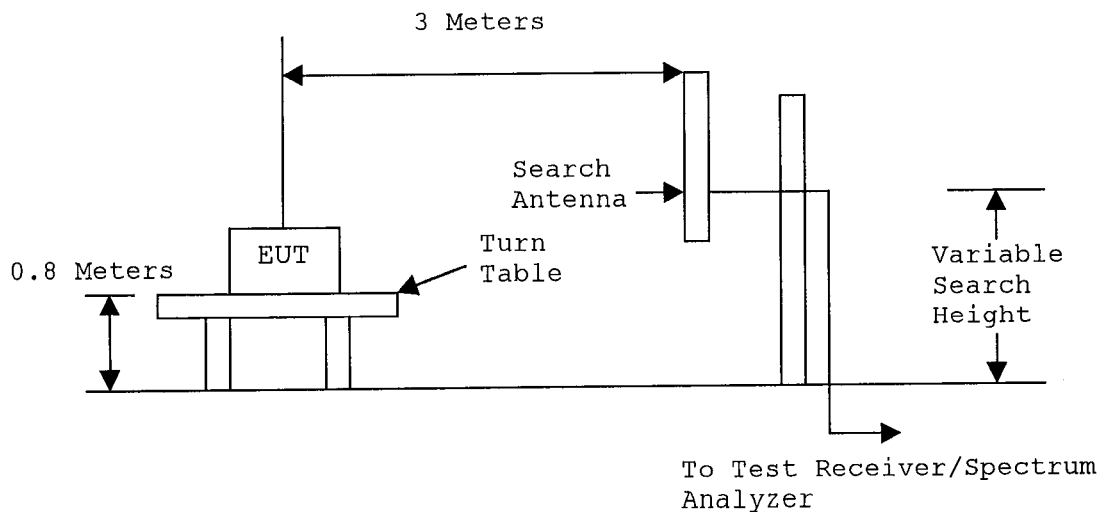
- 3) Equipment : Cable System
Consists of : Attenuator, Pre-Amplifier, Switch Unit and cable
Manufacture : IPS Corporation
Frequency Range: 30 MHz to 1000 MHz
Last Calibrate : 1999/02/01
Next Calibrate : 2000/02/01

- 4) Equipment : LISN for EUT & Peripherals
Model No. : A
S/N : 003 / 004
Manufacture : IPS
Frequency Range: 0.15 MHz to 30 MHz
RF Load : 50 ohm 50 micro henry
: 50 ohm terminated

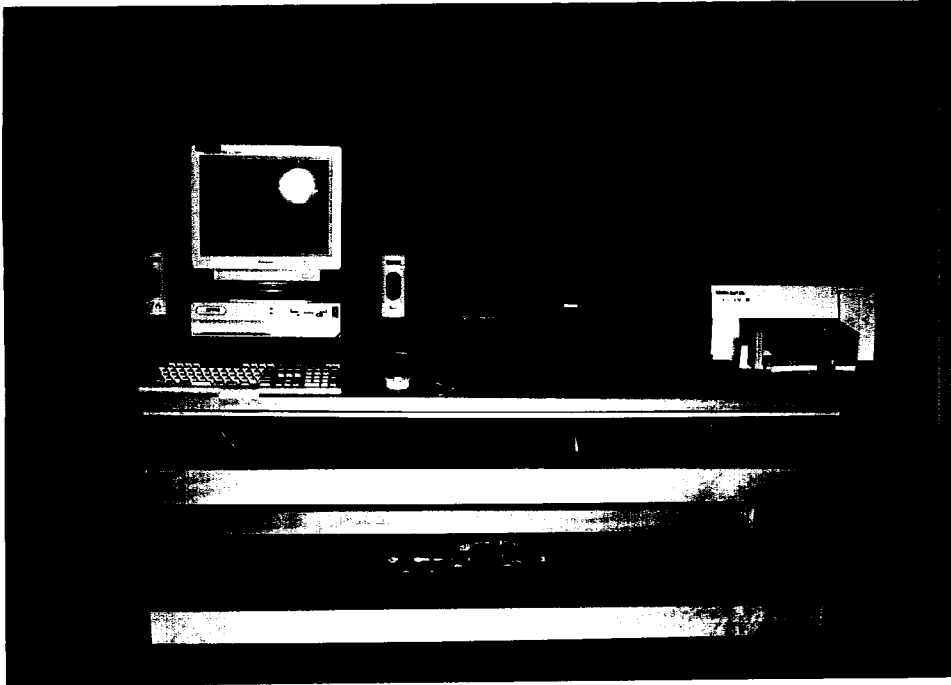
Located under the turn table.
Non calibration equipment.

BLOCK DIAGRAM

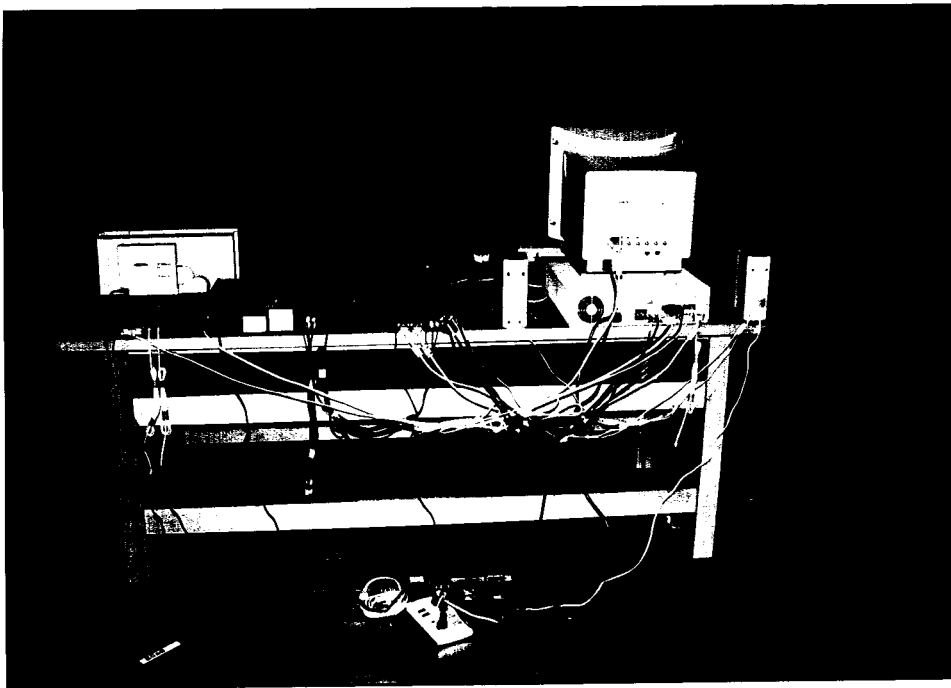
TEST SITE FOR RADIATED EMISSIONS



Configuration Photograph(s)
[30MHz to 1000MHz]



Front View

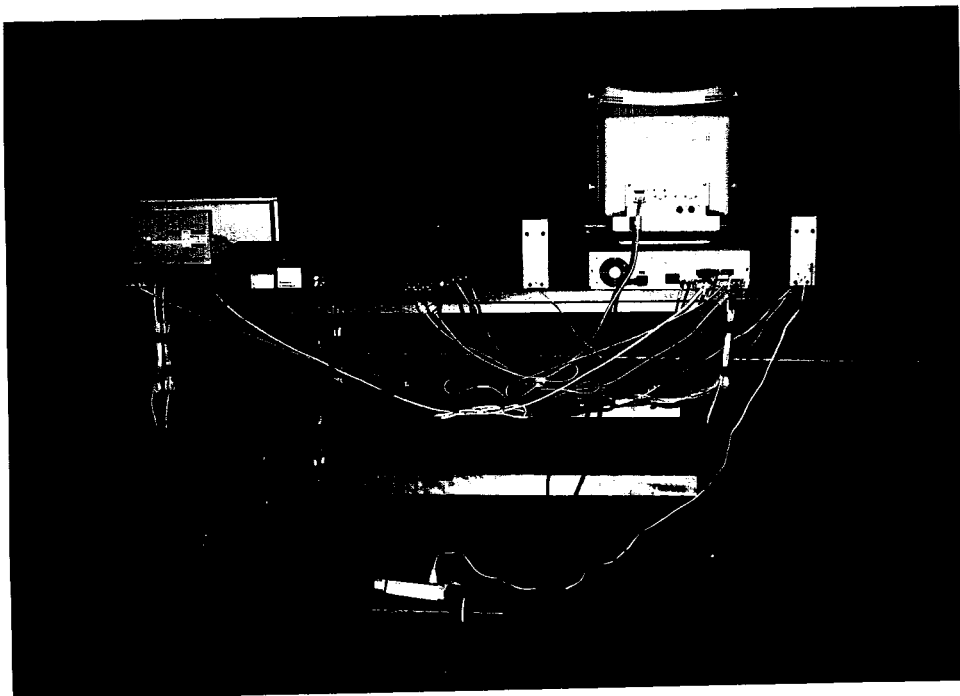


Rear View

Configuration Photograph(s)
[1GHz to 40GHz]



Front View



Rear View

Configuration Photograph(s)
[9KHz to 30MHz]



Front View



Rear View

*****<I P S Corporation>*****
<<< RADIATED EMISSION >>>

20 August, 1999 21:22
Page 1

Model : KX-MC1PC
Serial No. : ES1001
Standard : FCC Part15C.249(a)
Condition File : C210Gtk
Condition :
Remarks : EUT NAME : MicroCast
: PC Mode , ch=1 , f=5.755GHz
: FILE No. : 010
AC Power : 120 V 60 Hz
Temperature : 25 deg.
Humidity : 57 %
Operator : T.YAMAGUCHI



----- Spectrum Selection -----

- Horizontal Polarization -

No.	Frequency [MHz]	Reading [dBuV]	c.f. [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]
1	5757.774	74.0	15.3	89.3	94.0	4.7

- Vertical Polarization -

No.	Frequency [MHz]	Reading [dBuV]	c.f. [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]
2	5756.725	74.3	15.3	89.6	94.0	4.4

< I P S Corporation >
I P S EMC SITE

<<< RADIATED EMISSION >>>

Date/Time : 20 August, 1999 21:20

Model : KX-MC1PC
Serial No. : ES1001
Remarks : EUT NAME : MicroCast
PC Mode , ch=1 , f=5.755GHz
FILE No. : 010

Standard : FCC Part15C.249(a)
Operator : T. YAMAGUCHI



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RBW : 1000kHz

VBW : 3kHz

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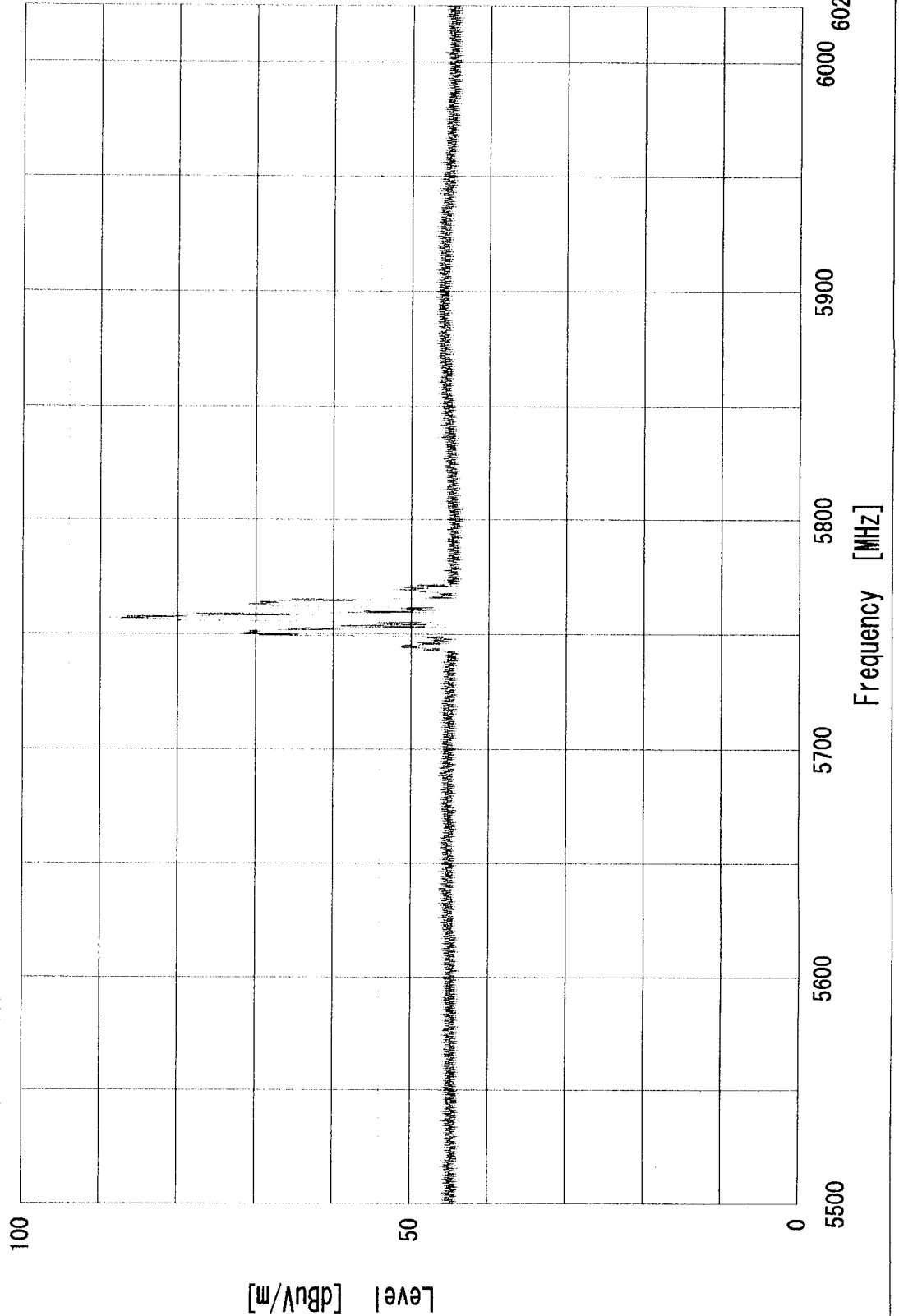
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Horizontal

Total (Hor)



Date/Time : 20 August, 1999 21:20

<<< RADIATED EMISSION >>>

< I P S Corporation >

I P S EMC SITE

Model : KX-MC1PC

Serial No. : ES1001

Remarks : EUT NAME : MicroCast

PC Mode , ch=1 , f=5.755GHz

FILE No. : 010

Standard : FCC Part15C.249(a)

Operator : T. YAMAGUCHI



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RBW : 1000kHz

VBW : 3kHz

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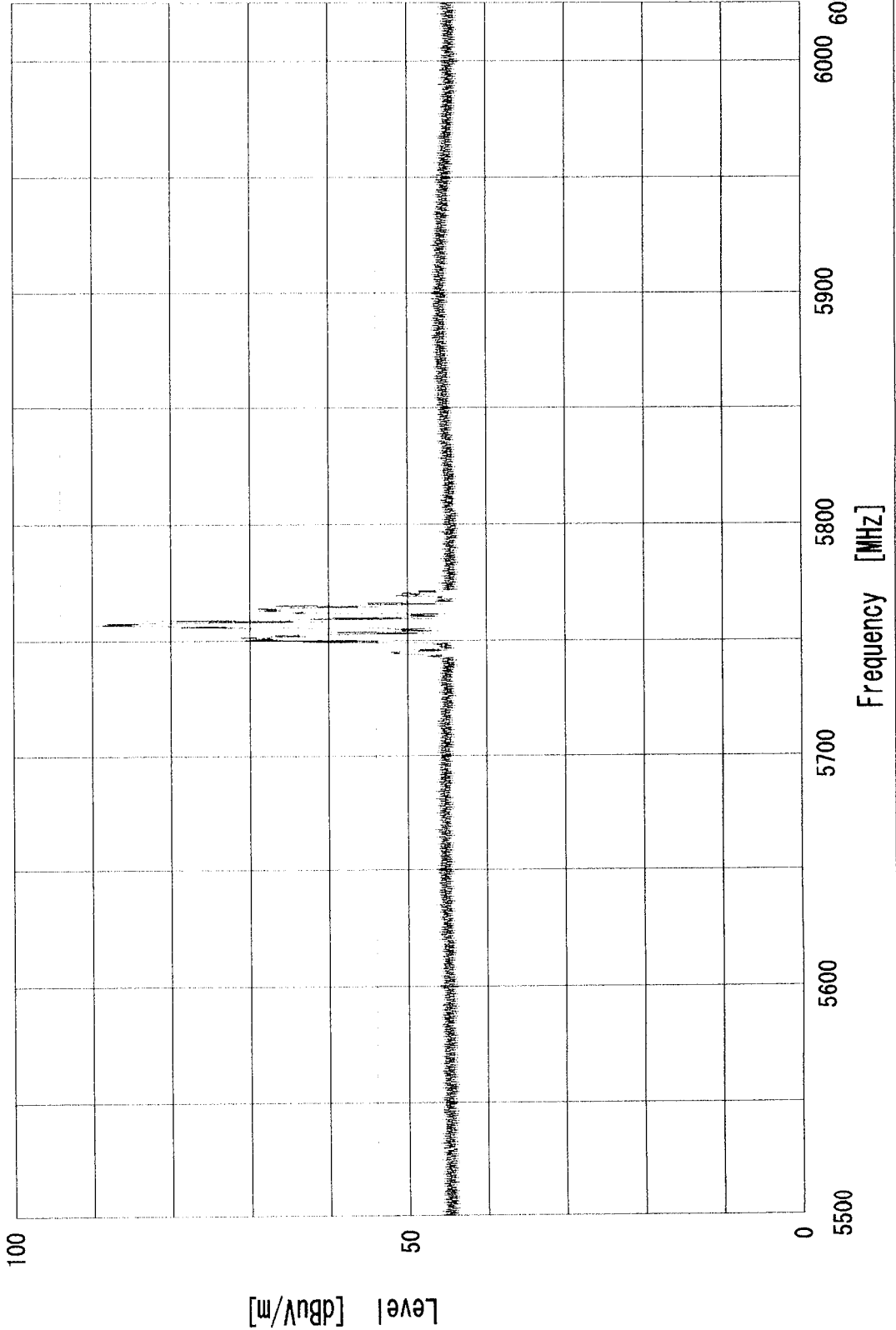
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Vertical

Total (Ver)



Level [dBuV/m]

Frequency [MHz]

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<<< RADIATED EMISSION >>>

19 August, 1999 15:35
Page 1

Model : KX-MC1PC
Serial No. : ES1001
Standard : FCC Part15C.249(a)
Condition File : C210Gtk
Condition :
Remarks : EUT NAME : MicroCast
: PC Mode , ch=2 , f=5.785GHz
: FILE No. : 011
AC Power : 120 V 60 Hz
Temperature : 25 deg.
Humidity : 57 %
Operator : T.YAMAGUCHI



----- Spectrum Selection -----

- Horizontal Polarization -

No.	Frequency [MHz]	Reading [dBuV]	c.f. [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]
1	5787.175	72.9	15.2	88.1	94.0	5.9

- Vertical Polarization -

No.	Frequency [MHz]	Reading [dBuV]	c.f. [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]
2	5787.175	73.3	15.2	88.5	94.0	5.5

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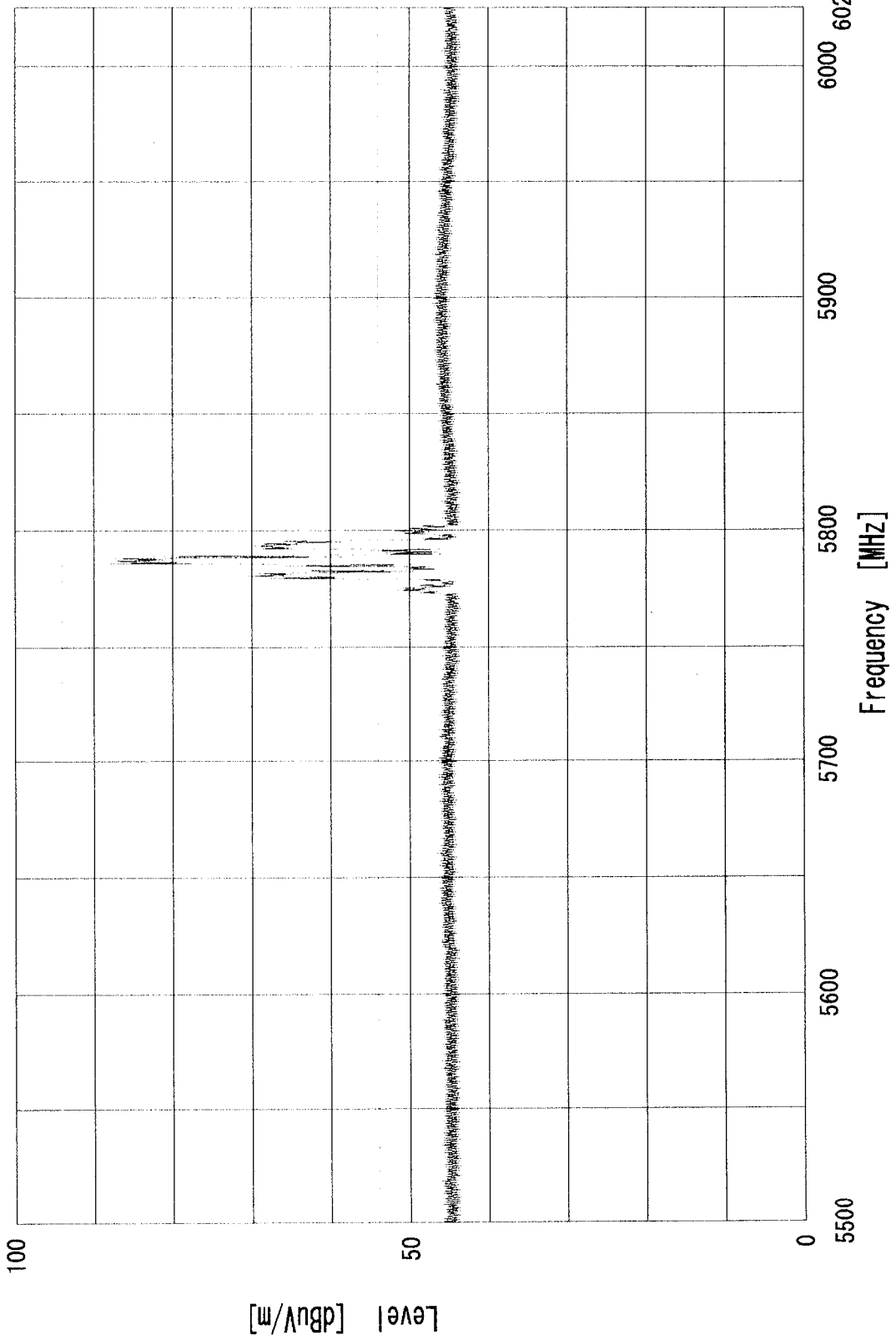
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Model : KX-MC1PC
Serial No. : ES1001
Remarks : EUT NAME : MicroCast
PC Mode , ch=2 , f=5.785GHz
FILE No. : 011

Standard : FCC Part15C.249(a)
Operator : T. YAMAGUCHI



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VBW : 3kHz
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Total (Hor)

Date/Time : 19 August, 1999 15:29

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Mode : KX-MC1PC
Serial No. : ES1001
Remarks : EUT NAME : MicroCast
PC Mode , ch=2 , f=5.785GHz
FILE No. : 011

Standard : FCC Part15C.249(a)
Operator : T. YAMAGUCHI



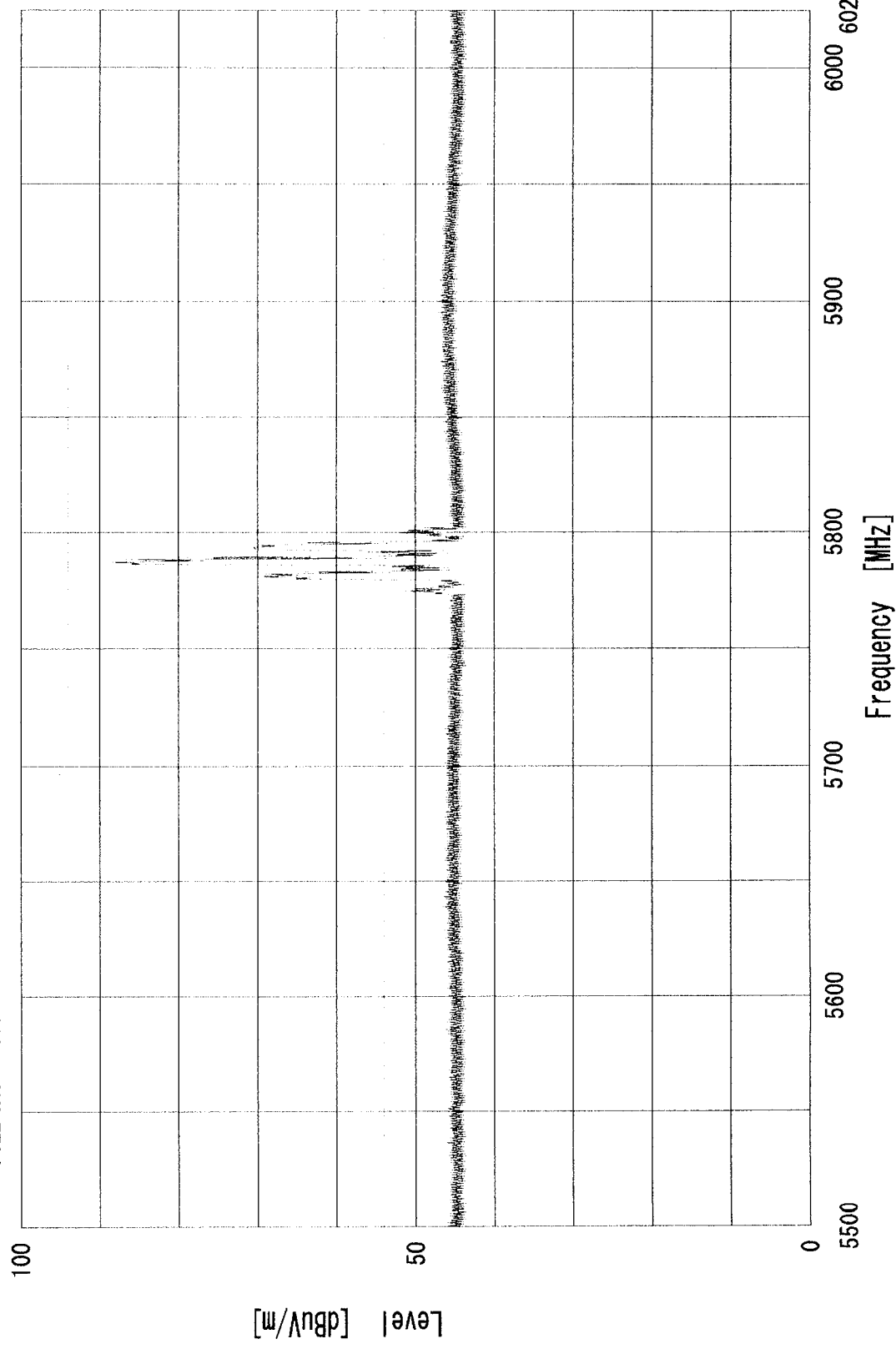
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VBW : 3kHz

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Total (Ver)



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<<< RADIATED EMISSION >>>

19 August, 1999 13:43
Page 1

Model : KX-MC1PC
Serial No. : ES1001
Standard : FCC Part15C.249(a)
Condition File : C210Gtk
Condition :
Remarks : EUT NAME : MicroCast
: PC Mode , ch=4 , f=5.845GHz
: FILE No. : 007
AC Power : 120 V 60 Hz
Temperature : 26 deg.
Humidity : 58 %
Operator : T.YAMAGUCHI



----- Spectrum Selection -----

- Horizontal Polarization -

No.	Frequency [MHz]	Reading [dBuV]	c.f. [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]
1	5847.024	75.0	15.6	90.6	94.0	3.4

- Vertical Polarization -

No.	Frequency [MHz]	Reading [dBuV]	c.f. [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]
2	5847.024	75.0	15.6	90.6	94.0	3.4

Date/Time : 19 August, 1999 13:35

<<< RADIATED EMISSION >>>

< I P S Corporation >
I P S EMC SITE

Model : KX-MC1PC
Serial No. : ES1001
Remarks : EUT NAME : MicroCast
PC Mode , ch=4 , f=5.845GHz
FILE No. : 007

Standard : FCC Part15C.249(a)
Operator : T. YAMAGUCHI



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RBW : 1000kHz

VBW : 3kHz

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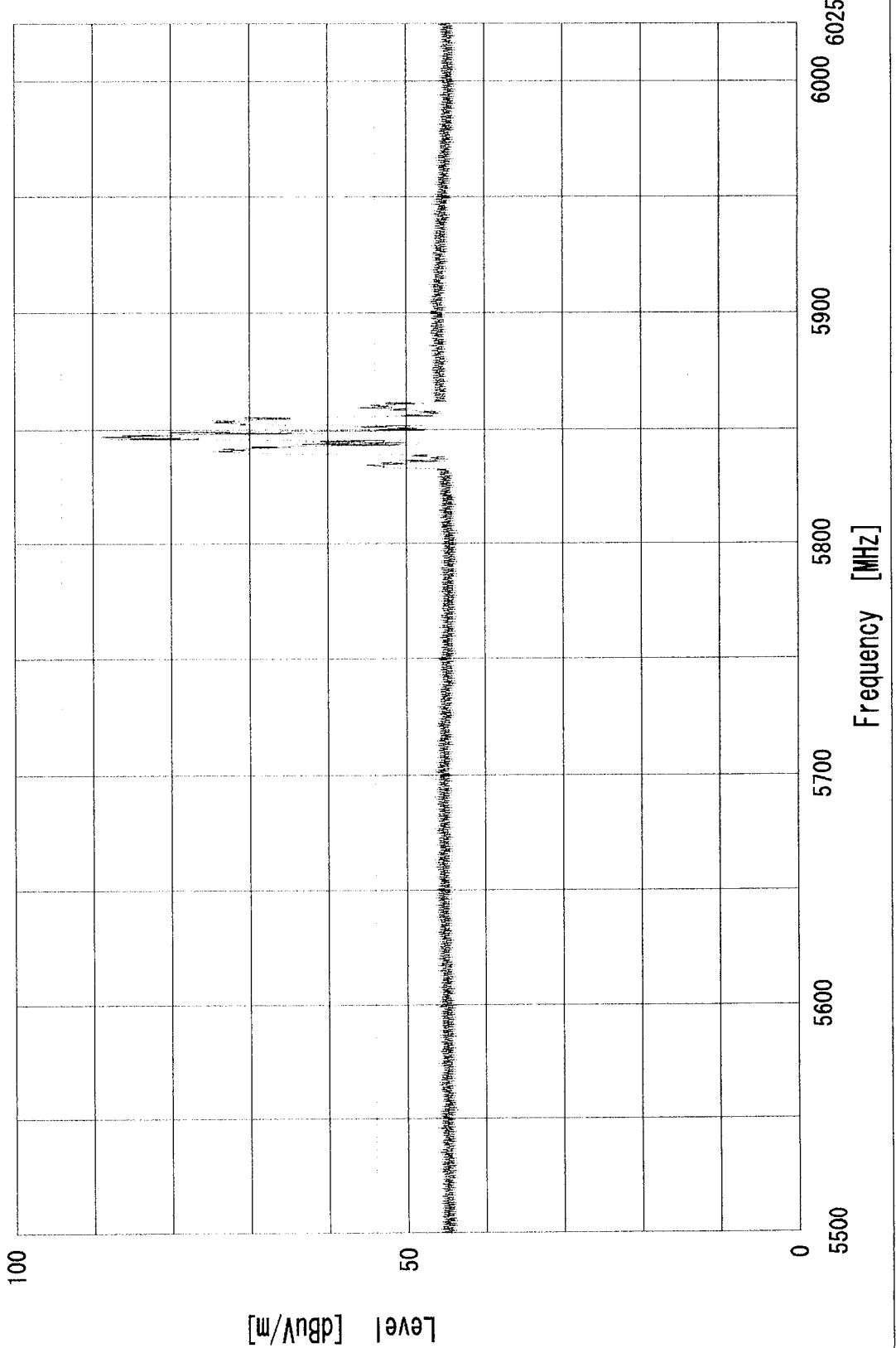
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Range : 10

Horizontal

Total (Hor)



Date/Time : 19 August, 1999 13:35

<<< RADIATED EMISSION >>>

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I P S EMC SITE

Model : KX-MC1PC
Serial No. : ES1001
Remarks : EUT NAME : MicroCast
PC Mode , ch=4 , f=5.845GHz
FILE No. : 007

Standard : FCC Part15C.249(a)
Operator : T. YAMAGUCHI



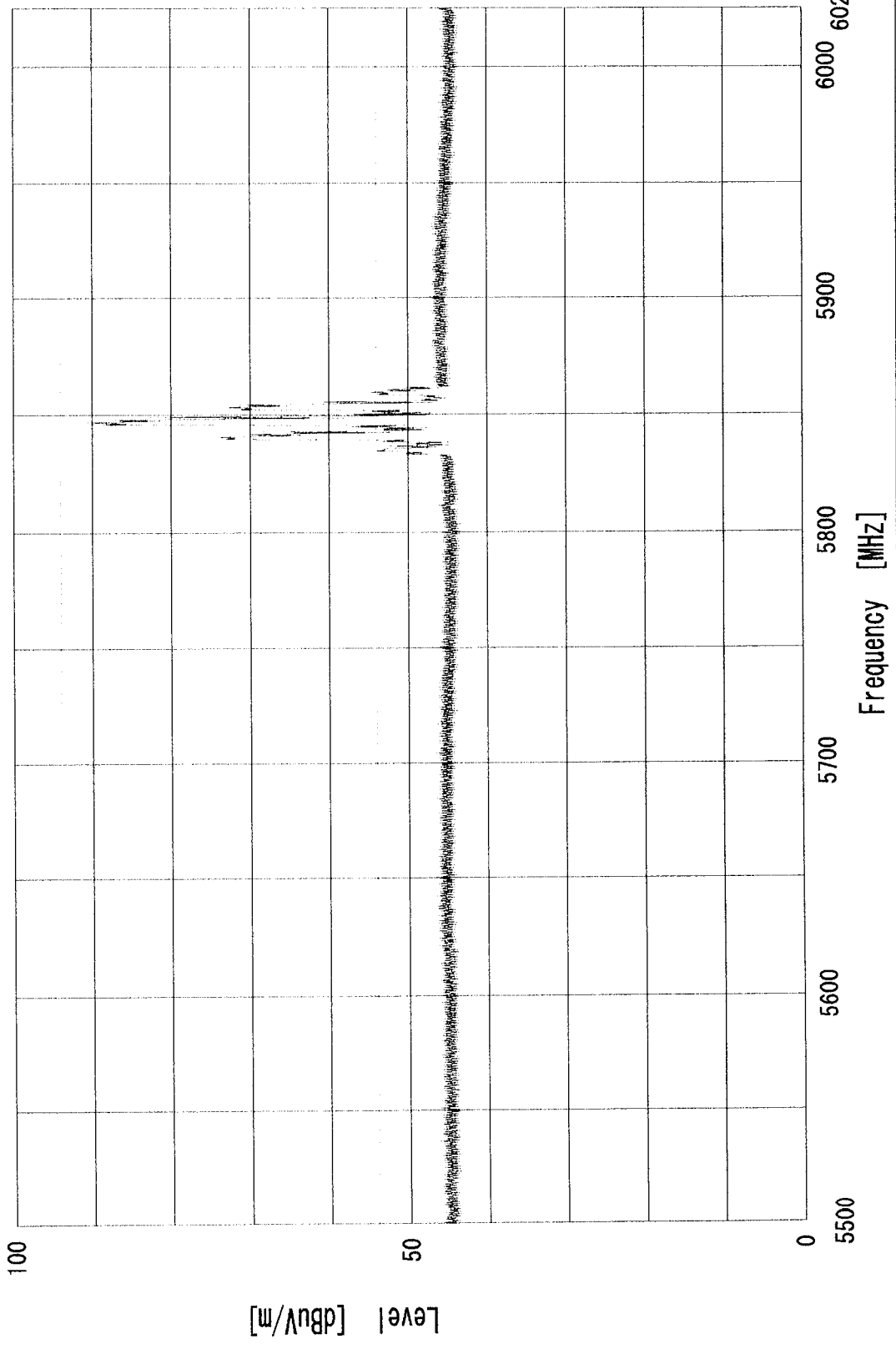
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VBW : 3kHz

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Vertical

Total (Ver)



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<<< RADIATED EMISSION >>>

19 August, 1999 14:42
Page 1

Model : KX-MC1PC
Serial No. : ES1001
Standard : FCC Part15C.249(a)
Condition File : C210Gtk
Condition :
Remarks : EUT NAME : MicroCast
: Theater Mode , ch=1 , f=5.755GHz
: FILE No. : 009
AC Power : 120 V 60 Hz
Temperature : 25 deg.
Humidity : 57 %
Operator : T.YAMAGUCHI



----- Spectrum Selection -----

- Horizontal Polarization -

No.	Frequency [MHz]	Reading [dBuV]	c.f. [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]
1	5757.774	74.6	15.3	89.9	94.0	4.1

- Vertical Polarization -

No.	Frequency [MHz]	Reading [dBuV]	c.f. [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]
2	5757.774	74.2	15.3	89.5	94.0	4.5

Date/Time : 19 August, 1999 14:36

<<< RADIATED EMISSION >>>

< I P S Corporation >
I P S EMC SITE

Model : KX-MC1PC
Serial No. : ES1001
Remarks : EUT NAME : MicroCast
Theater Mode , ch=1 , f=5.755GHz
FILE No. : 009

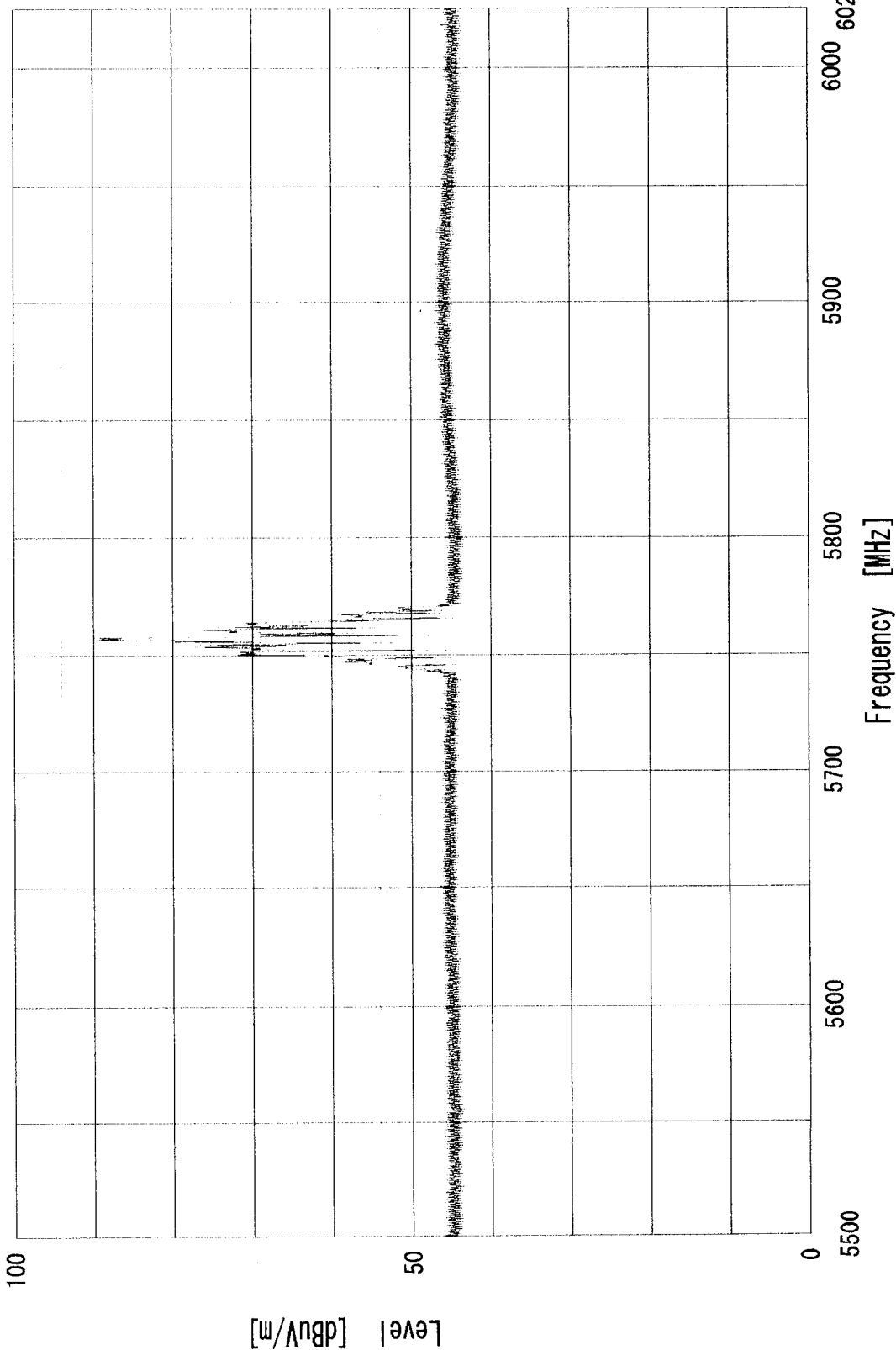
Standard : FCC Part15C.249(a)
Operator : T. YAMAGUCHI



<peak>
RBW : 1000kHz
VBW : 3kHz
<Limit Line>

Limit:
FCC_15C

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Range : 10
Horizontal
Total (Hor)



Date/Time : 19 August, 1999 14:36

<<< RADIATED EMISSION >>>

< I P S Corporation >
I P S EMC SITE

Model : KX-MC1PC
Serial No. : ES1001
Remarks : EUT NAME : MicroCast
Theater Mode , ch=1 , f=5.755GHz
FILE No. : 009

Standard : FCC Part15C.249(a)
Operator : T. YAMAGUCHI



< peak >

RBW : 1000kHz

VBW : 3kHz

< Limit Line >

Limit:

FCC_15C

< Data >

Range : 10

Vertical

Total (Ver)

