

DATA OF CONDUCTION TEST

A-PEX INTERNATIONAL CO., LTD.
No.2 SEMI ANECHOIC CHAMBER
Report No. : 221E0025-H0

Applicant : SONY Corporation
Kind of Equipment : Digital Video Camera Recorder
Model No. : DCR-IP220
Serial No. : 95
Power : AC120V/60Hz
Mode : Tx(2402MHz)
Remarks :
Date : 6/10/2002
Phase : Single Phase
Temperature : 26 °C
Humidity : 48 %
Regulation : FCC 15. 207 (0.15-30MHz)


Engineer : Hiroka Umeyama

No.	FREQ. [MHz]	READING(N)		READING(L1)		LISN FACTOR [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
		QP [dBuV]	AV	QP [dBuV]	AV				QP [dBuV]	AV	QP [dBuV]	AV	QP [dB]	AV
1.	0.1500	39.5	-	39.3	-	0.0	0.1	0.0	39.6	-	66.0	56.0	26.4	-
2.	0.2597	40.6	-	40.4	-	0.0	0.1	0.0	40.7	-	61.4	51.4	20.7	-
3.	0.3896	36.7	-	36.7	-	0.0	0.1	0.0	36.8	-	58.1	48.1	21.3	-
4.	0.6499	30.6	-	30.6	-	0.1	0.1	0.0	30.8	-	56.0	46.0	25.2	-
5.	1.8182	31.2	-	30.4	-	0.1	0.3	0.0	31.6	-	56.0	46.0	24.4	-
6.	1.9479	30.8	-	29.8	-	0.1	0.3	0.0	31.2	-	56.0	46.0	24.8	-
7.	4.8052	33.5	-	32.3	-	0.2	0.5	0.0	34.2	-	56.0	46.0	21.8	-
8.	7.0120	36.6	-	36.6	-	0.3	0.6	0.0	37.5	-	60.0	50.0	22.5	-
9.	11.2986	39.8	-	40.7	-	0.4	0.9	0.0	42.0	-	60.0	50.0	18.0	-

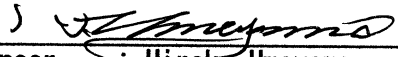
CALCULATION: READING + LISN FACTOR + CABLE LOSS + ATTEN.

Except for the above table : adequate margin data below the limits.

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Report No. : 221E0025-H0

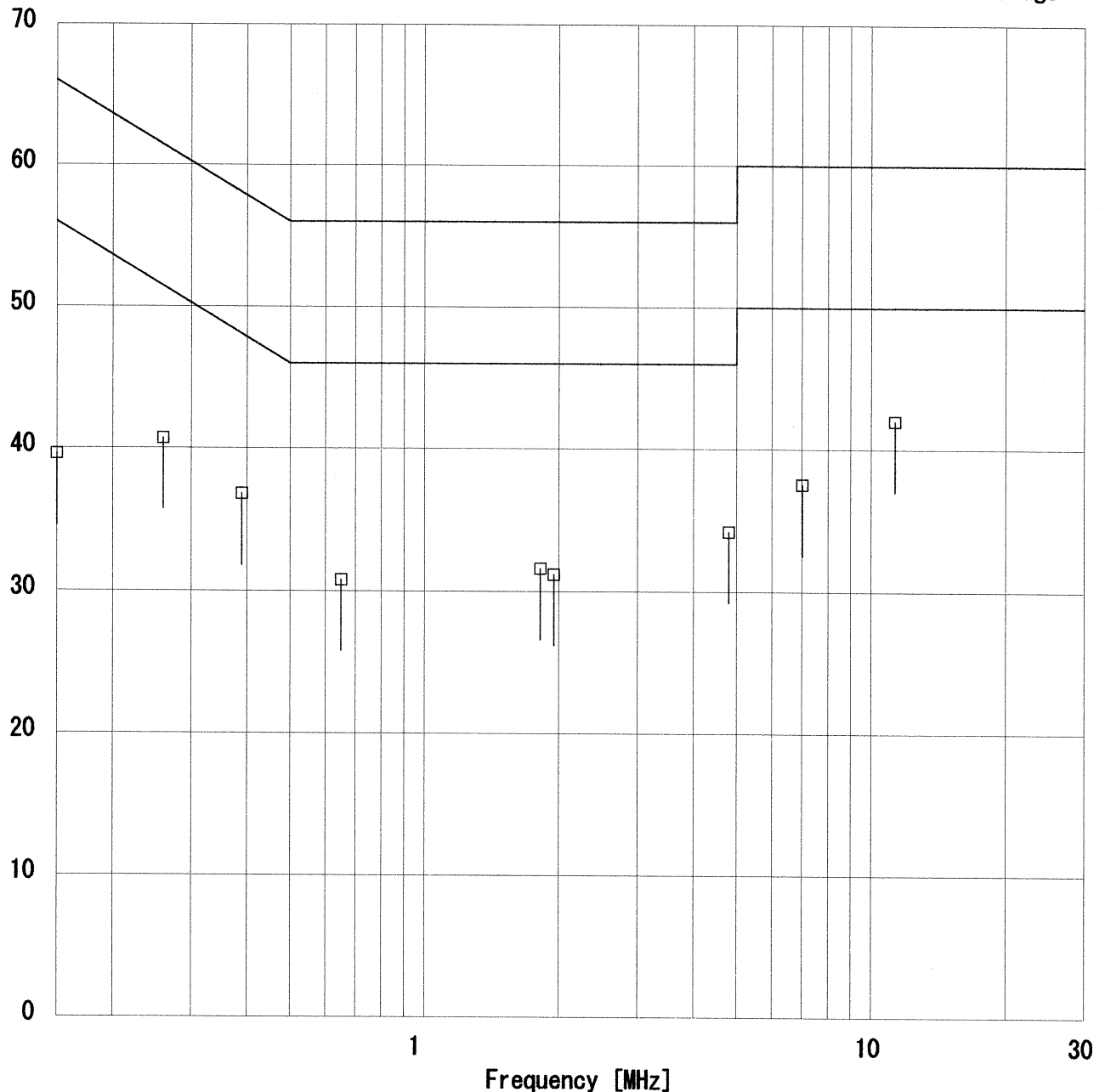
Applicant : SONY Corporation
Kind of Equipment : Digital Video Camera Recorder
Model No. : DCR-IP220
Serial No. : 95
Power : AC120V/60Hz
Mode : Tx (2402MHz)
Remarks :
Date : 6/10/2002
Phase : Single Phase
Temperature : 26 °C
Humidity : 48 %
Regulation : FCC 15.207 (0.15-30MHz)

Engineer :  : Hiroka Umeyama

Emission Level [dB μ V]

□ Quasi-Peak

× Average



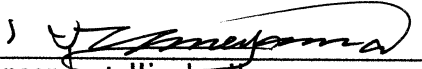
DATA OF CONDUCTION TEST CHART

A-PEX INTERNATIONAL CO., LTD.

No.2 SEMI ANECHOIC CHAMBER

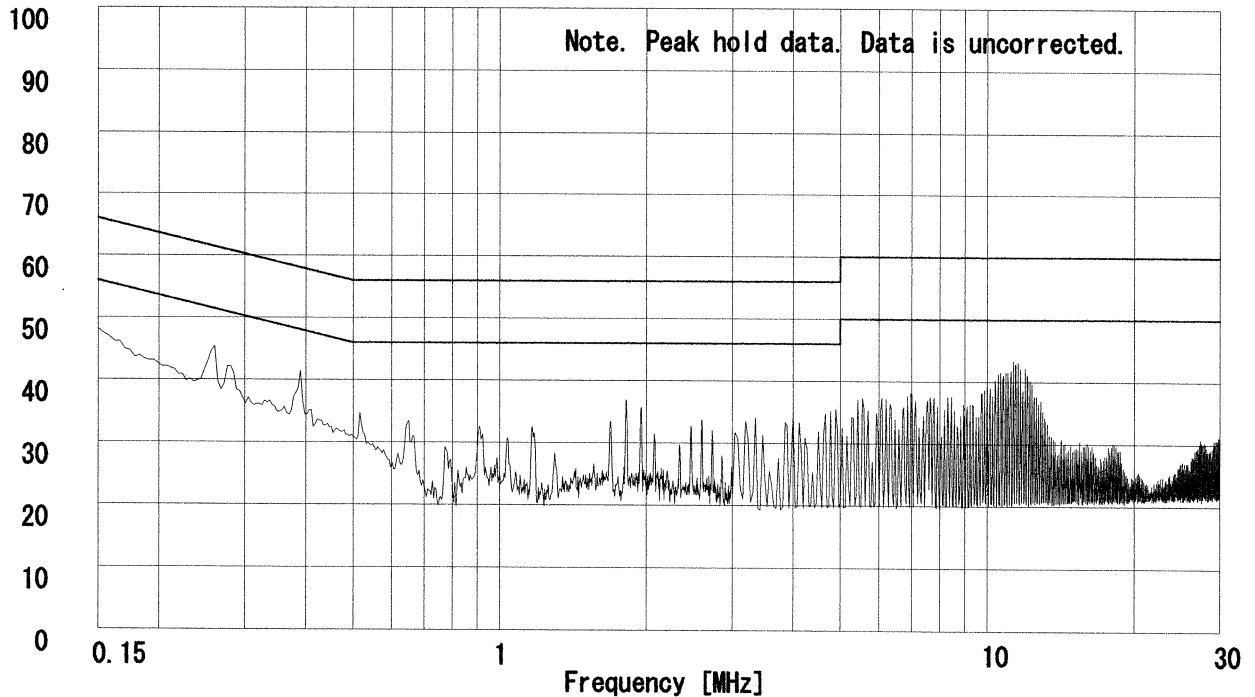
Report No. : 221E0025-H0

Applicant : SONY Corporation
Kind of Equipment : Digital Video Camera Recorder
Model No. : DCR-IP220
Serial No. : 95
Power : AC120V/60Hz
Mode : Tx(2402MHz)
Remarks :
Date : 6/10/2002
Phase : Single Phase
Temperature : 26 °C
Humidity : 48 %
Regulation 1 : FCC 15.207 (0.15-30MHz)
Regulation 2 : None

Engineer : 
Hiroka Umeyama

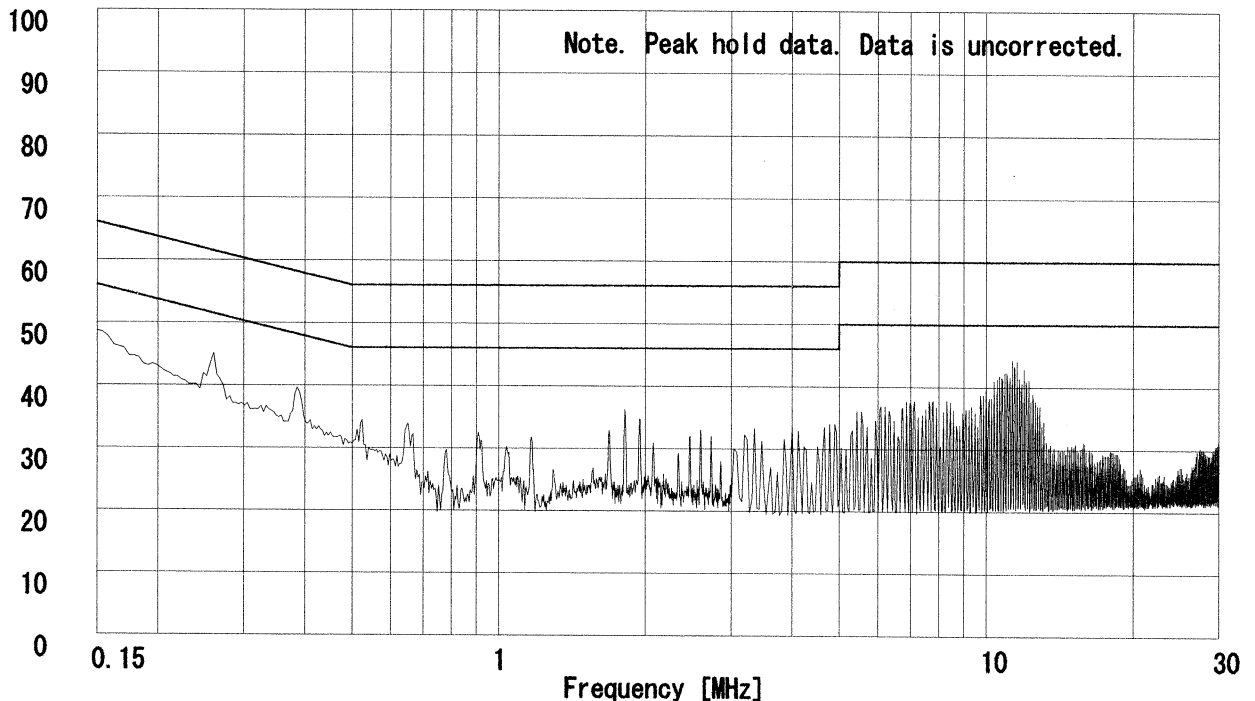
Emission Level [dB μ V]

PHASE:N



Emission Level [dB μ V]

PHASE:L1

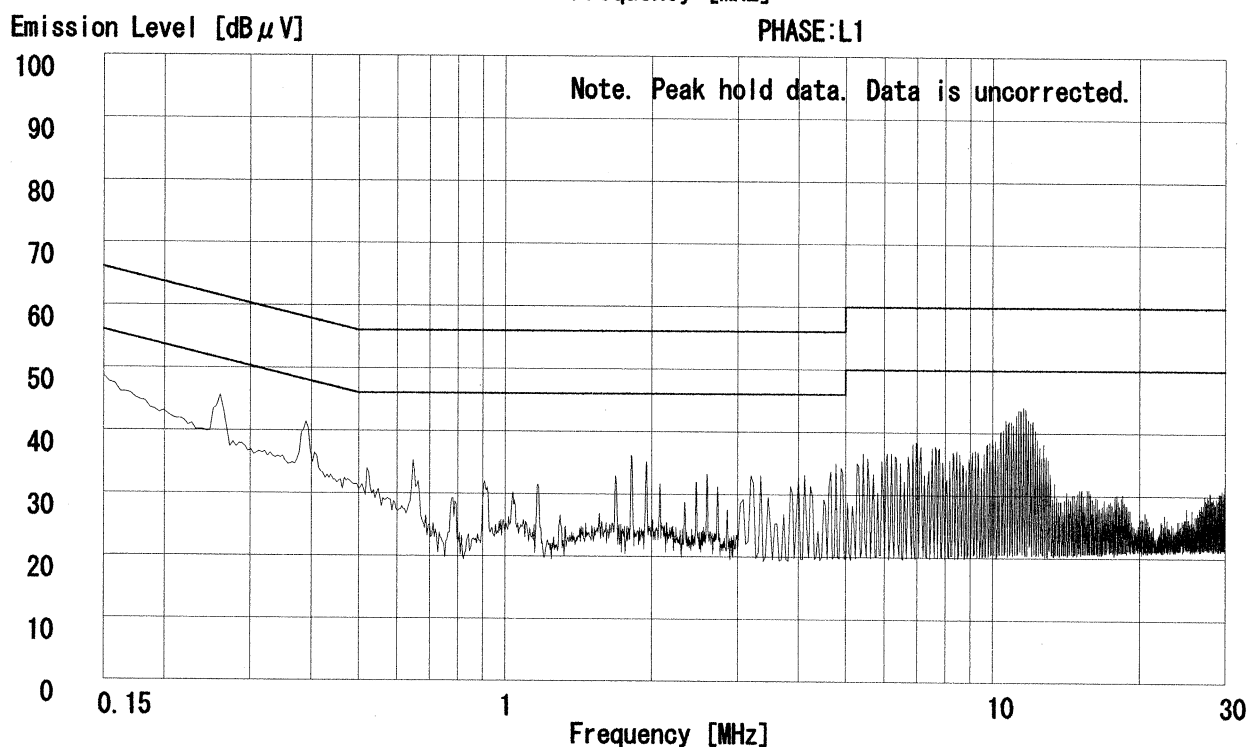
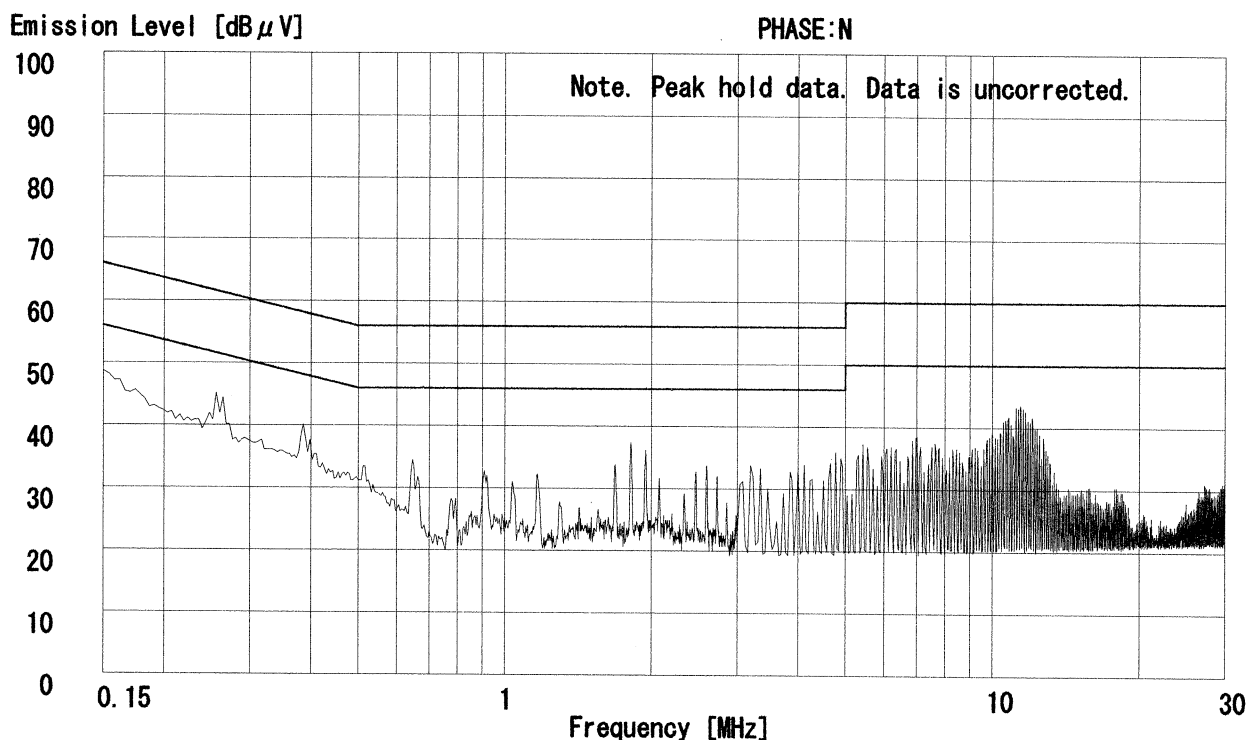


DATA OF CONDUCTION TEST CHART

A-PEX INTERNATIONAL CO., LTD.
No.2 SEMI ANECHOIC CHAMBER
Report No. : 22IE0025-H0

Applicant : SONY Corporation
Kind of Equipment : Digital Video Camera Recorder
Model No. : DCR-IP220
Serial No. : 95
Power : AC120V/60Hz
Mode : Tx (2441MHz)
Remarks :
Date : 6/10/2002
Phase : Single Phase
Temperature : 26 °C
Humidity : 48 %
Regulation 1 : FCC 15.207 (0.15-30MHz)
Regulation 2 : None


Engineer : Hiroka Umeyama

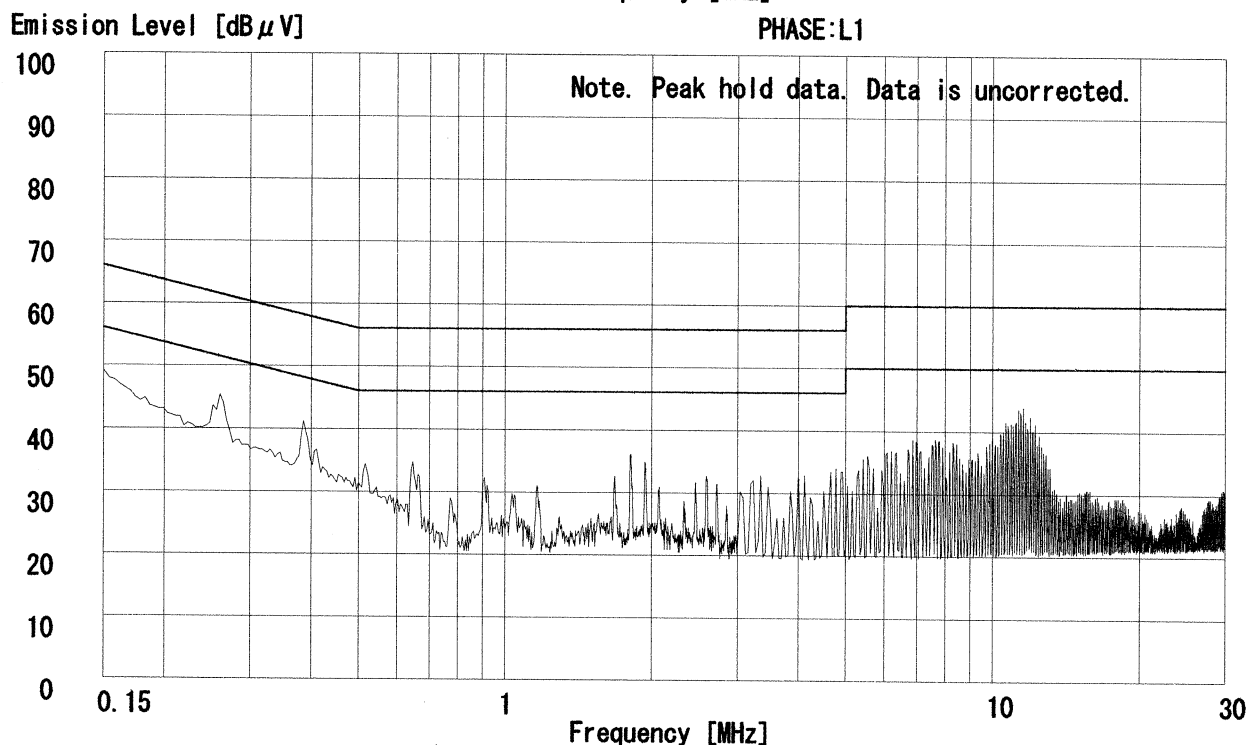
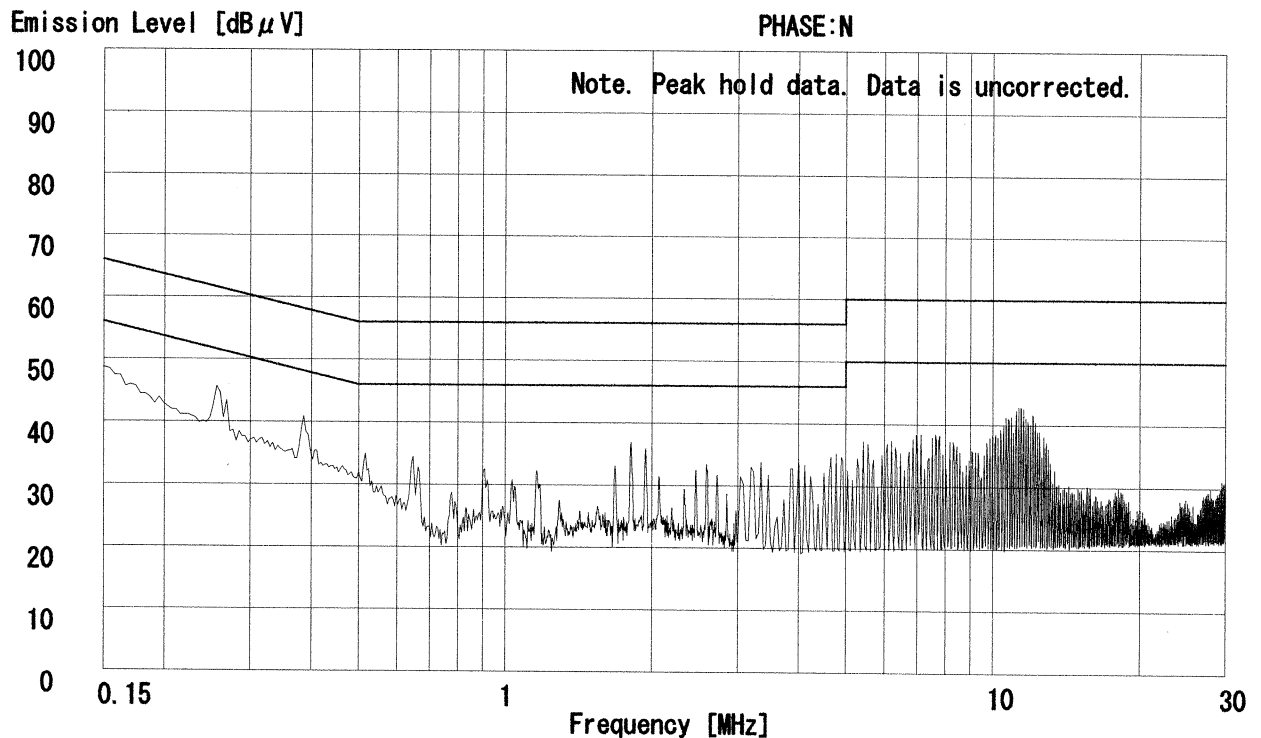


DATA OF CONDUCTION TEST CHART

A-PEX INTERNATIONAL CO., LTD.
No.2 SEMI ANECHOIC CHAMBER
Report No. : 22IE0025-H0

Applicant : SONY Corporation
Kind of Equipment : Digital Video Camera Recorder
Model No. : DCR-IP220
Serial No. : 95
Power : AC120V/60Hz
Mode : Tx (2480MHz)
Remarks :
Date : 6/10/2002
Phase : Single Phase
Temperature : 26 °C
Humidity : 48 %
Regulation 1 : FCC 15.207 (0.15-30MHz)
Regulation 2 : None

S. Umeyama
Engineer : Hiroka Umeyama



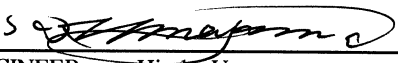
DATA OF CARRIER FREQUENCY SEPARATION

A-PEX INTERNATIONAL CO., LTD.

EMC HEAD OFFICE DIVISON No.3 MEASUREMENT ROOM

COMPANY : SONY Corporation
 EQUIPMENT : Digital Video Camera Recorder
 MODEL : DCR-IP220
 S/N : 96
 FCC ID : AK8DCRIP220
 POWER : AC120V/60Hz
 MODE : Tx (Hopping on)

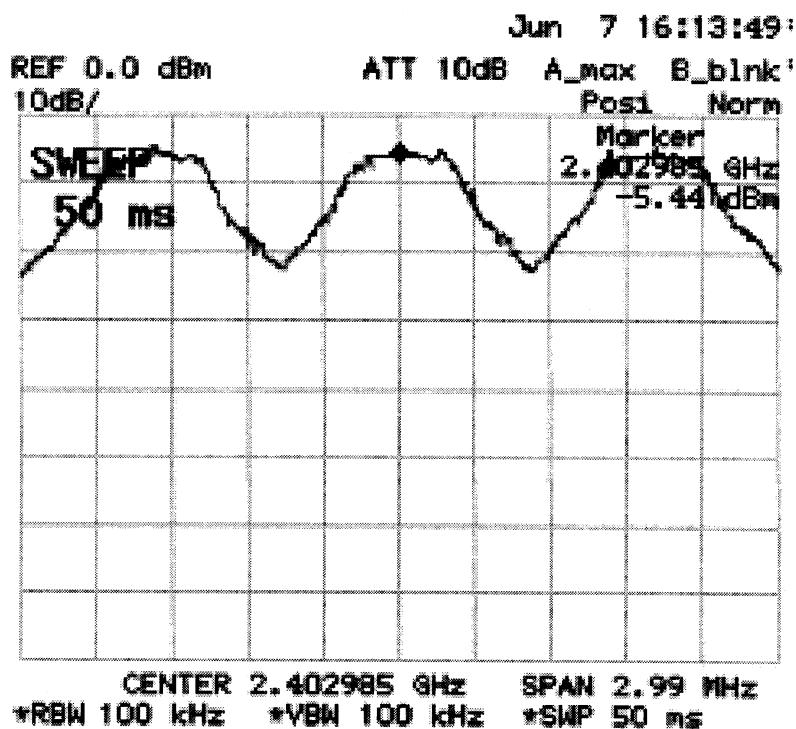
REPORT NO : 22IE0025-HO
 REGULATION : Fcc Part15 Subpart C 15.247(a)(1)
 TEST DISTANCE : -
 DATE : 2002/6/7
 Temperature : 24°C
 Humidity : 62%


 ENGINEER : Hiroka Umeyama

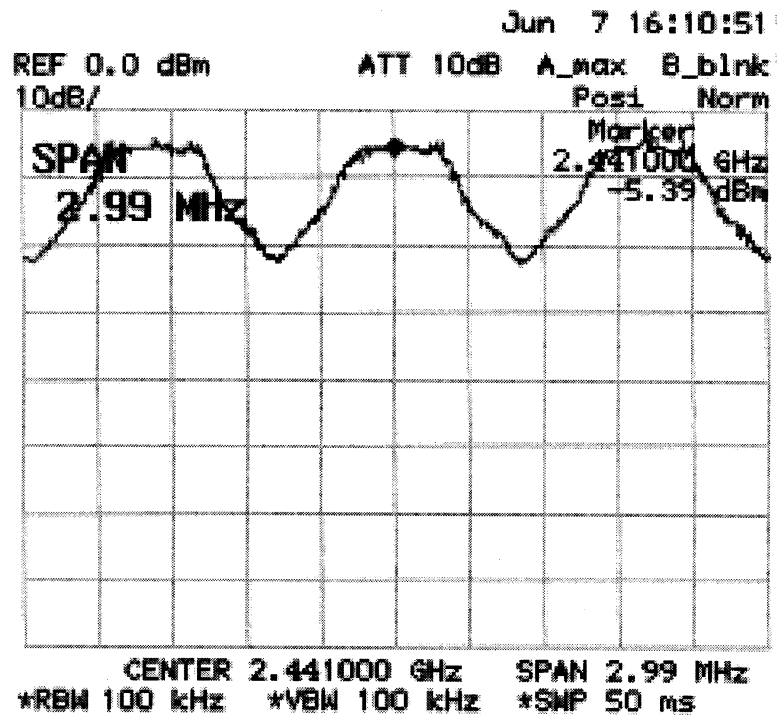
PK DETECT(S/A :span 3MHz, RBW 100kHz, VBW 100kHz, sweep time AUTO)

CH	FREQ	Channel separation	Limit
	[MHz]	[MHz]	
Low	2402.0	1.000	>20dB Bandwidth and 25[kHz]
Mid	2441.0	1.000	>20dB Bandwidth and 25[kHz]
High	2480.0	1.000	>20dB Bandwidth and 25[kHz]

Carrier Frequency Separation :Tx(Hopping on)2402MHz



Carrier Frequency Separation :Tx(Hopping on)2480MHz



DATA OF 20dB BANDWIDTH (CONDUCTED)

A-PEX INTERNATIONAL CO., LTD.

EMC HEAD OFFICE DIVISON No.3 MEASUREMENT ROOM

COMPANY : SONY Corporation
 EQUIPMENT : Digital Video Camera Recorder
 MODEL : DCR-IP220
 S/N : 96
 FCC ID : AK8DCRIP220
 POWER : AC120V/60Hz
 MODE : Tx (Hopping off)

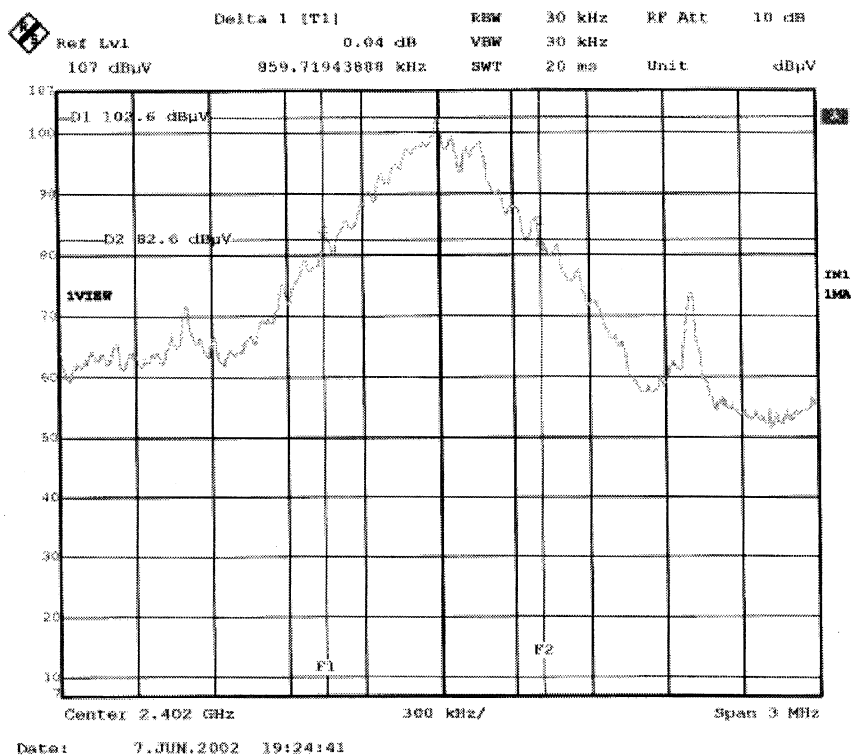
REPORT NO : 22IE0025-HO
 REGULATION : Fcc Part15 Subpart C 15.247(a)(1)(ii)
 TEST DISTANCE : -
 DATE : 2002/6/7
 Temperature : 24℃
 Humidity : 62%

> 
 ENGINEER : Hiroka Umeyama

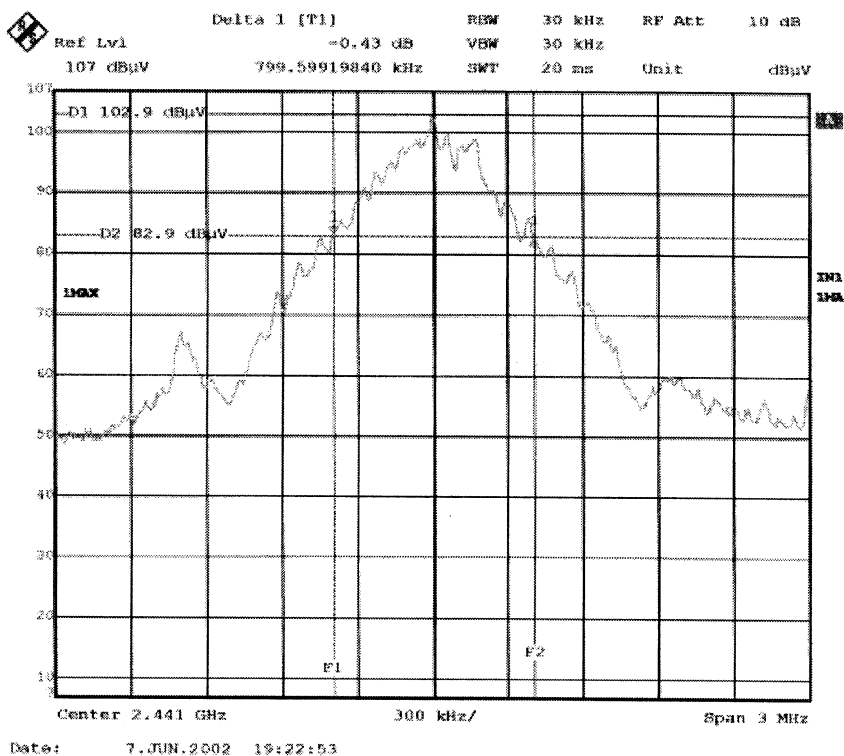
PK DETECT(S/A: span 3MHz, RBW 30kHz, VBW 30kHz, sweep time AUTO)

CH	FREQ	20dB Bandwidth	Limit
	[MHz]	[MHz]	[MHz]
Low	2402.0	0.860	1.0
Mid	2441.0	0.800	1.0
High	2480.0	0.800	1.0

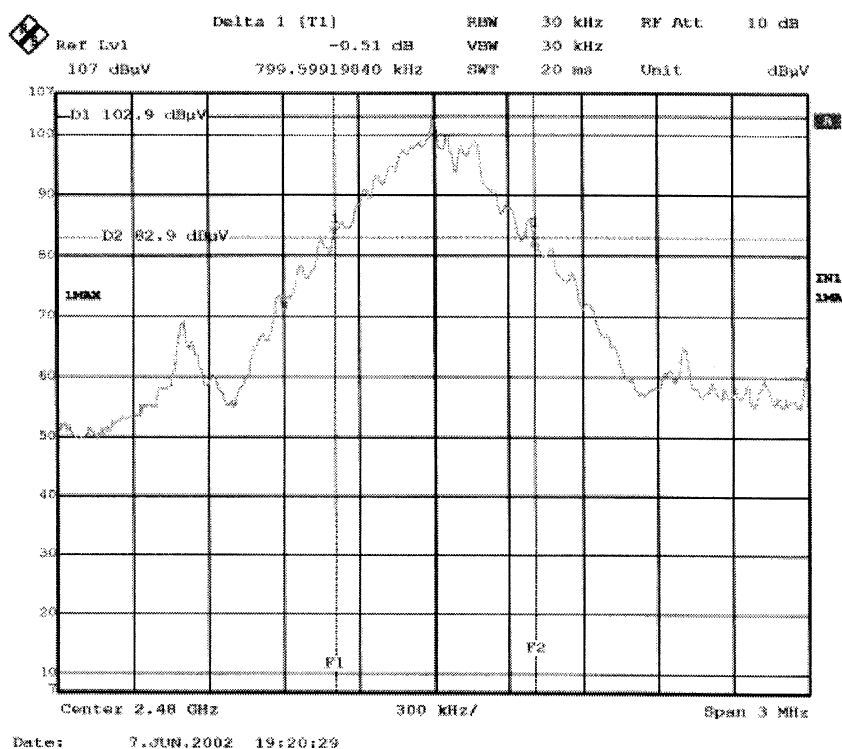
20dB Band Width :Tx(Hopping on)2402MHz



20dB Band Width :Tx(Hopping on)2441MHz



20dB Band Width :Tx(Hopping on)2480MHz



DATA OF NUMBER OF HOPPING FREQUENCY

A-PEX INTERNATIONAL CO., LTD.

EMC HEAD OFFICE DIVISON No.3 MEASUREMENT ROOM

COMPANY : SONY Corporation

EQUIPMENT : Digital Video Camera Recorder

MODEL : DCR-IP220

S/N : 96

FCC ID : AK8DCRIP220

POWER : AC120V/60Hz

MODE : Tx (Hopping on) / Inquiry

REPORT NO : 22IE0025-HO

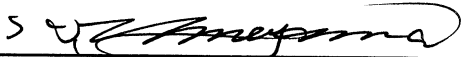
REGULATION : Fcc Part15 Subpart C 15.247(a)(1)(ii)

TEST DISTANCE : -

DATE : 2002/6/7

Temperature : 24°C

Humidity : 62%

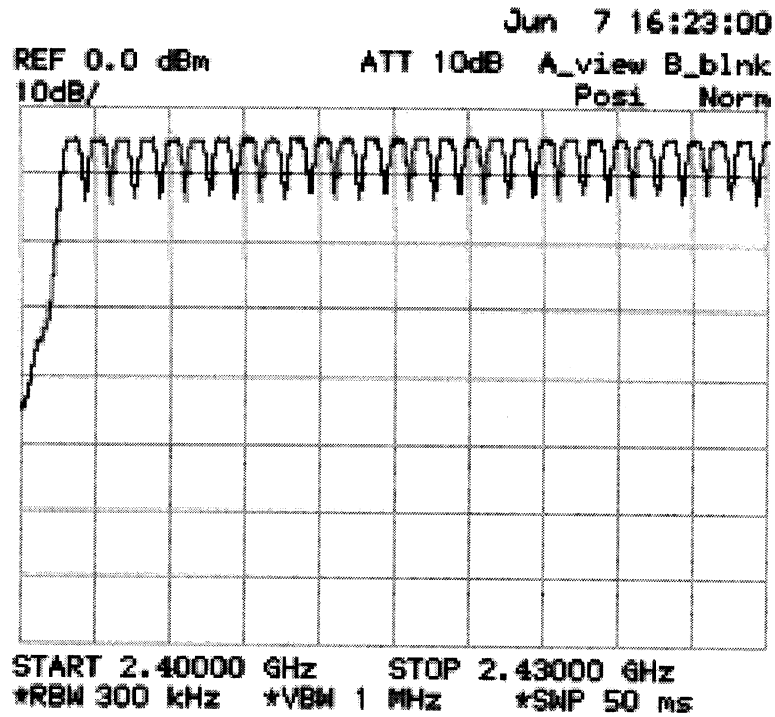

 ENGINEER : Hiroka Umeyama
PK DETECT(S/A : RBW 300kHz, VBW 1MHz, sweep time AUTO)

Mode	Number of channel	Limit
	[time]	[time]
Tx(Hoppng on)	79.0	≥ 75

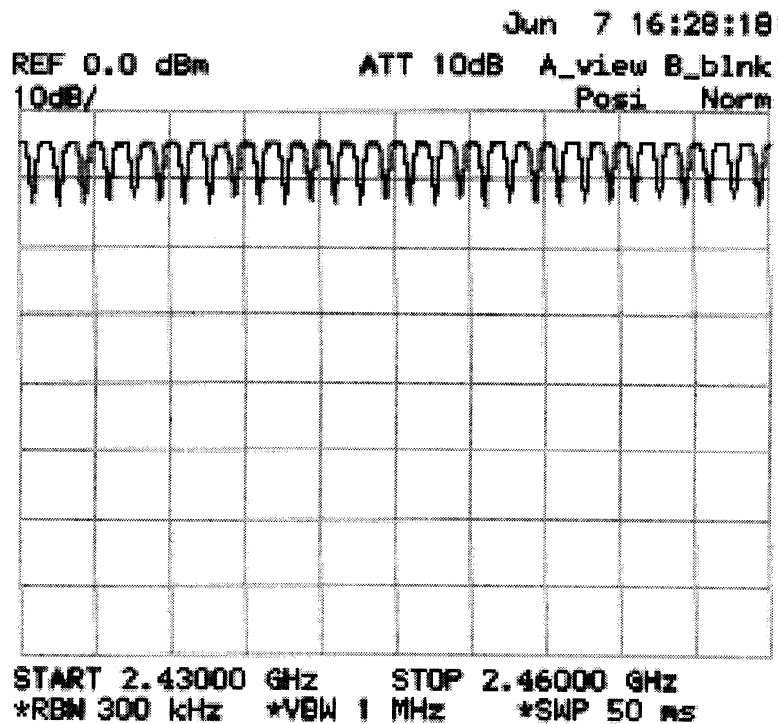
PK DETECT(S/A : RBW 300kHz, VBW 1MHz, sweep time AUTO)

Mode	Number of channel	Limit
	[time]	[time]
Inquiry	32.0	-

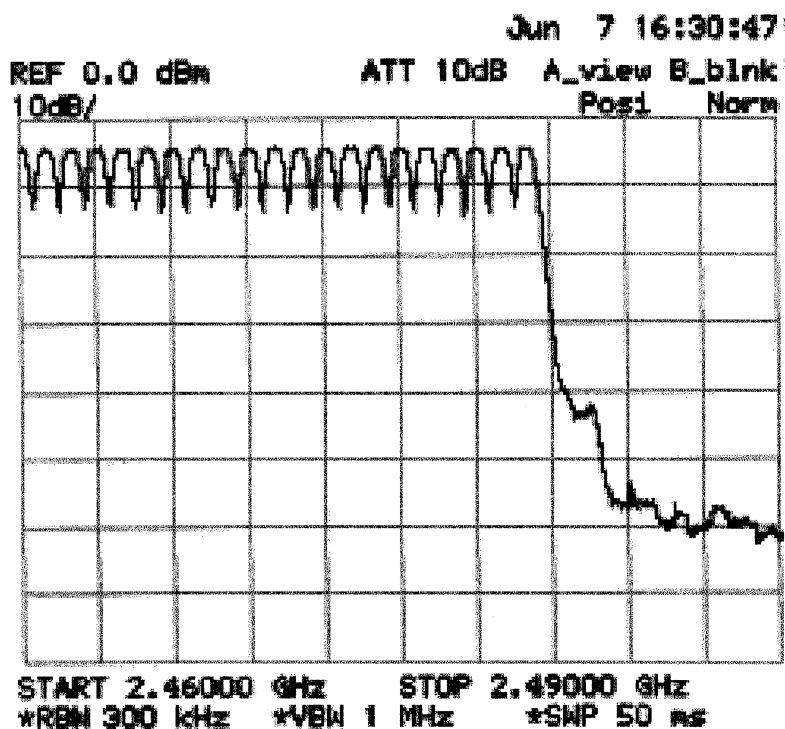
Number of Hopping Frequency :Tx(Hopping on)2400-2430MHz



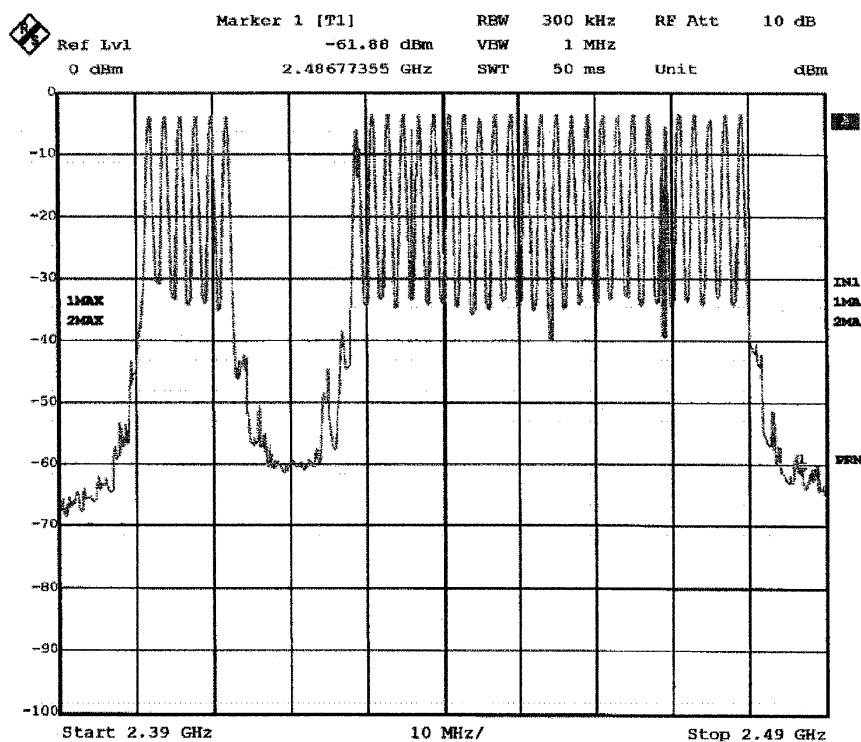
Number of Hopping Frequency :Tx(Hopping on)2430-2460MHz



Number of Hopping Frequency :Tx(Hopping on)2460-2490MHz



Number of Hopping Frequency :Inquiry



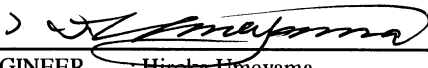
DATA OF DWELL TIME

A-PEX INTERNATIONAL CO., LTD.

EMC HEAD OFFICE DIVISION No.3 MEASUREMENT ROOM

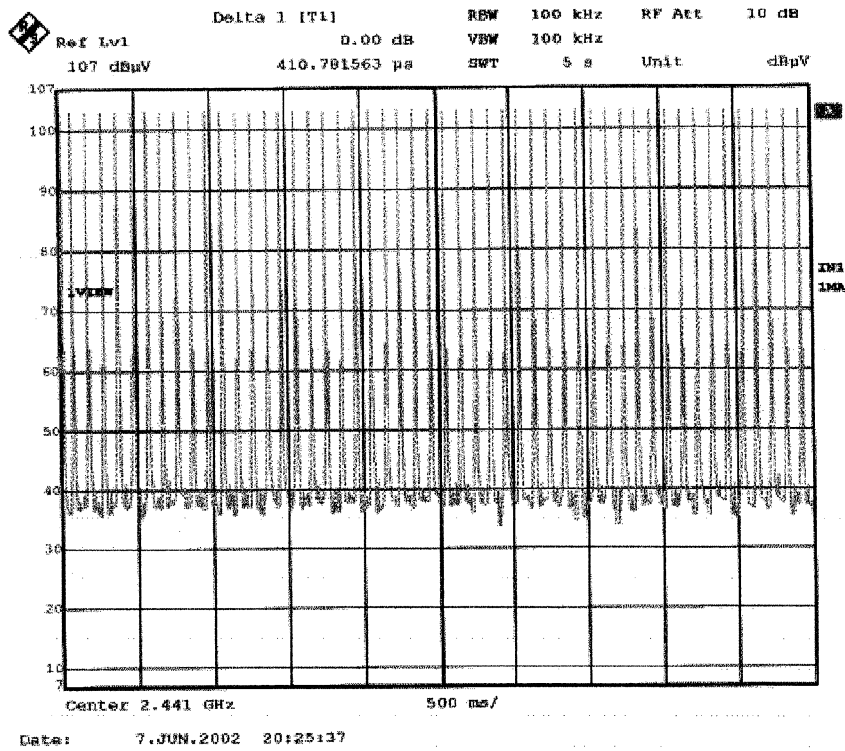
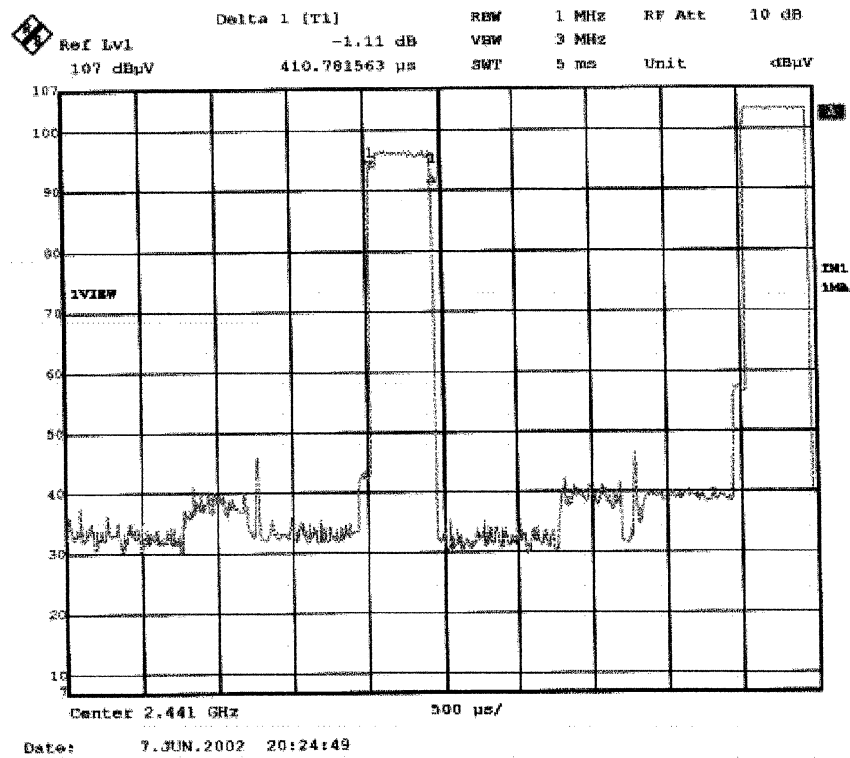
COMPANY : SONY Corporation
 EQUIPMENT : Digital Video Camera Recorder
 MODEL : DCR-IP220
 S/N : 96
 FCC ID : AK8DCRIP220
 POWER : AC120V/60Hz
 MODE : Tx (Hopping off) / Inquiry / Loopback

REPORT NO : 22IE0025-HO
 REGULATION : Fcc Part15 Subpart C 15.247(a)(1)(ii)
 TEST DISTANCE : -
 DATE : 2002/6/7,12
 Temperature : 24°C, 22°C
 Humidity : 62%, 60%

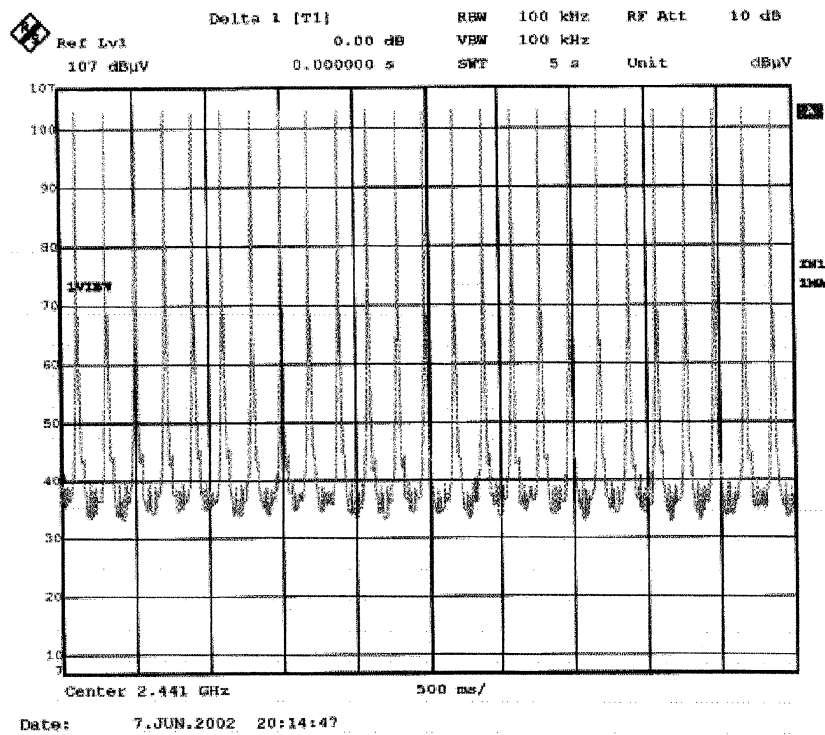

 ENGINEER : Hiroka Umeyama

PK DETECT(S/A :span ZERO, RBW 1MHz, VBW 3MHz, sweep time 1ms-10ms)

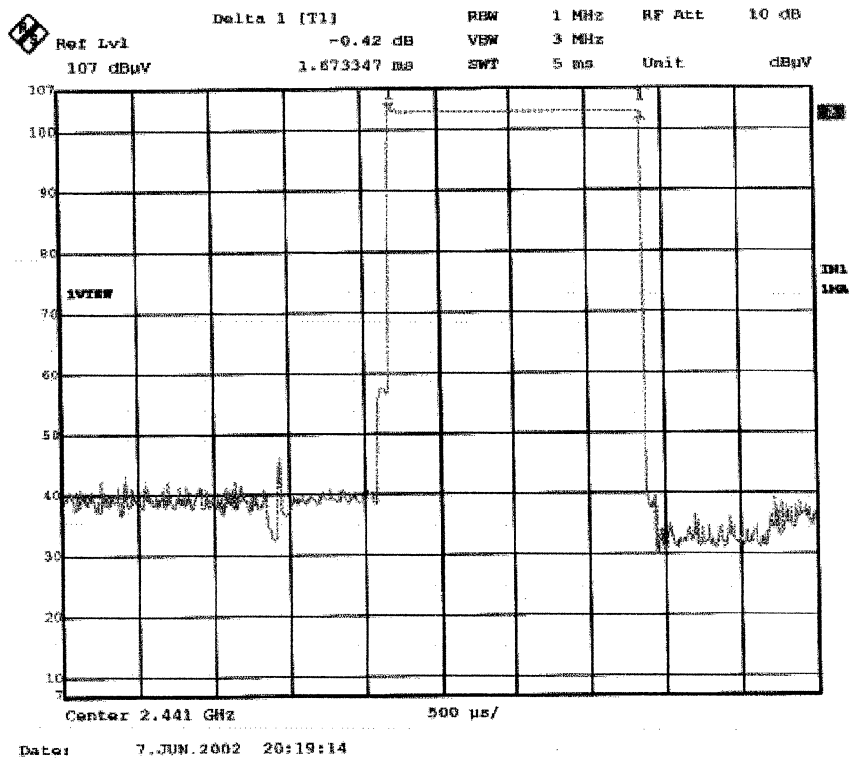
Mode	Number of transmission in a 30 second period	Length of transmission time [msec]	Result [msec]	Limit [msec]
DH1	50 times / 5sec. x 6 = 300 times	0.411	124	400
DH3	25 times / 5sec. x 6 = 150 times	1.673	251	400
DH5	17 times / 5 sec. x 6 = 102 times	2.866	293	400
Loopback	18 + 24 + 13 + 10 + 13 + 16 = 94 times	1.523	144	400
Inquiry	10 times / 100msec. x 1.283 = 129 times	0.142	19	400

Dwell time :Tx(Hopping on)DH1(1)Dwell time :Tx(Hopping on)DH1(2)

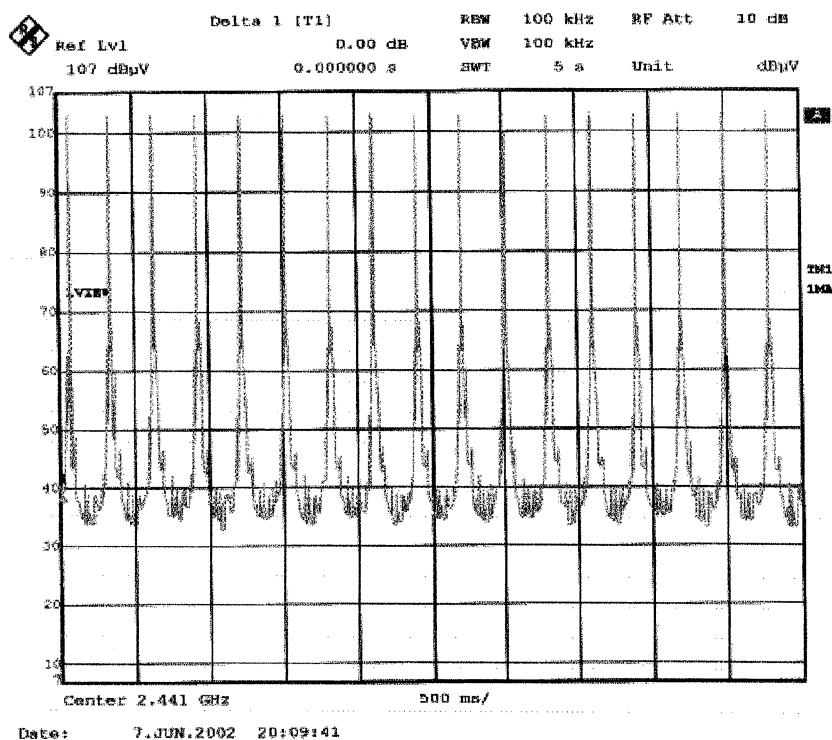
Dwell time :Tx(Hopping on)DH3(1)



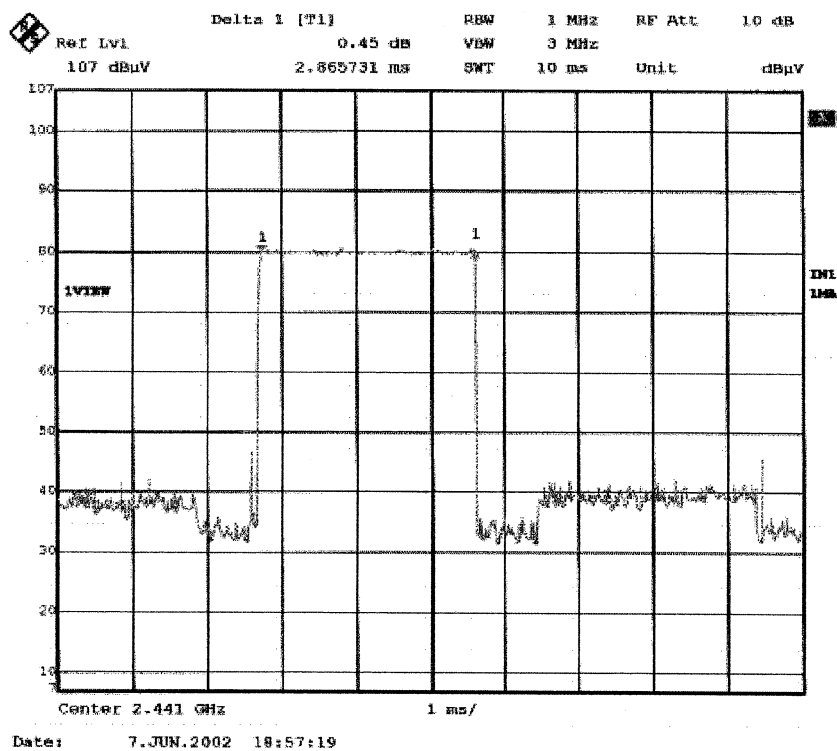
Dwell time :Tx(Hopping on)DH3(2)

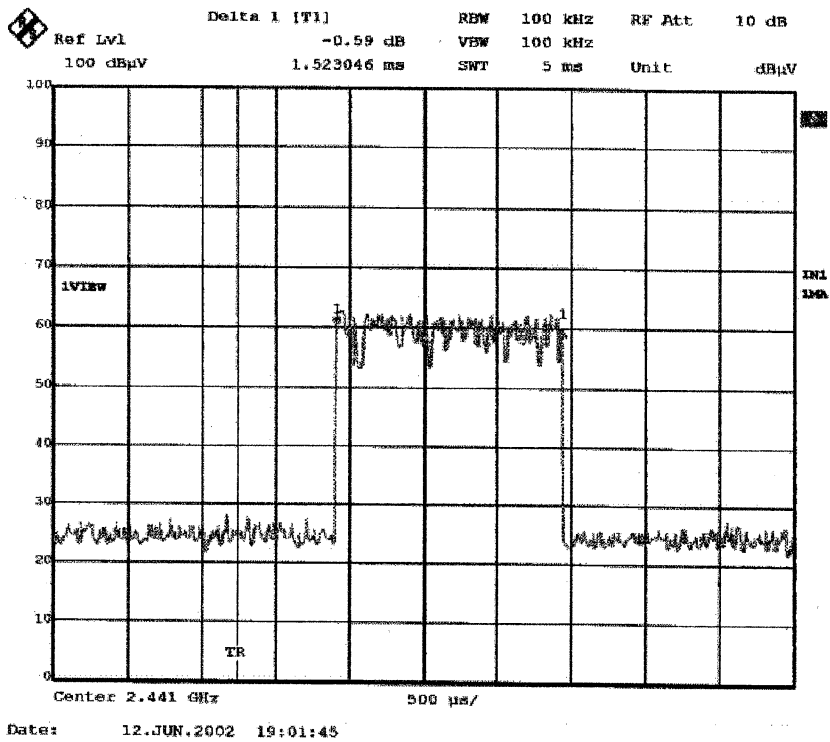
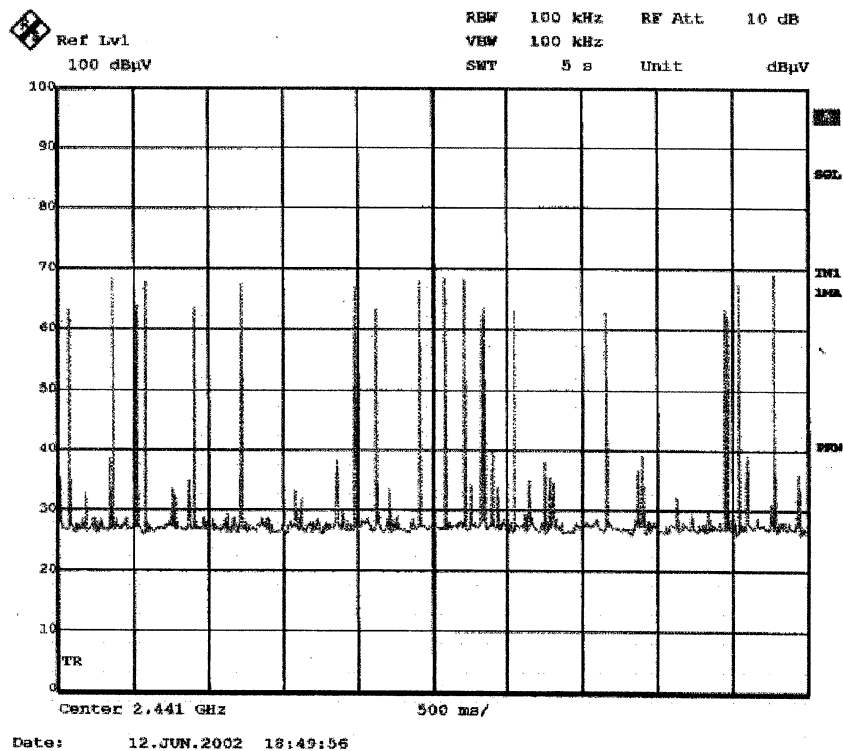


Dwell time :Tx(Hopping on)DH5(1)

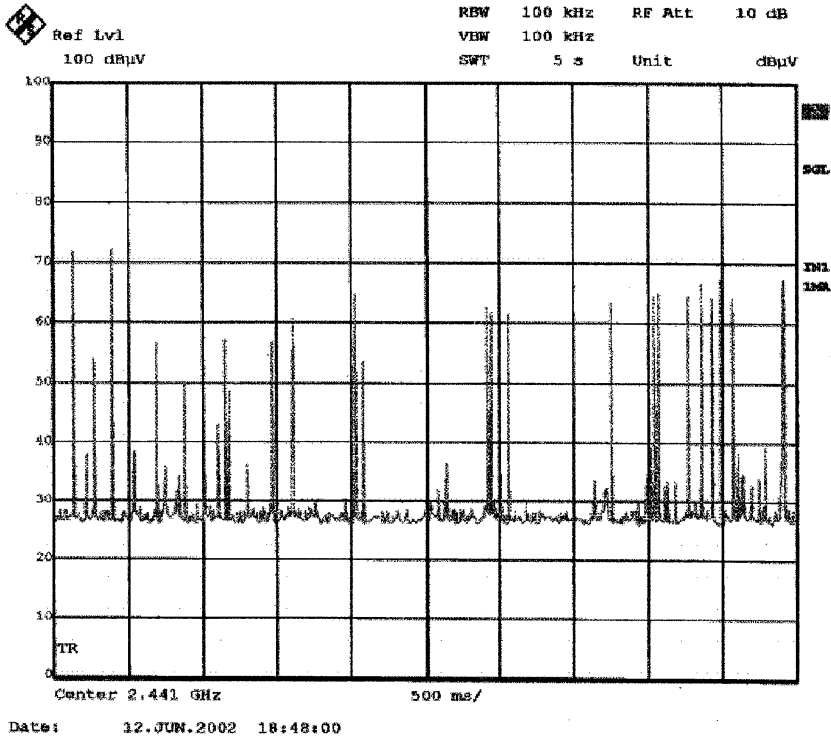


Dwell time :Tx(Hopping on)DH5(2)

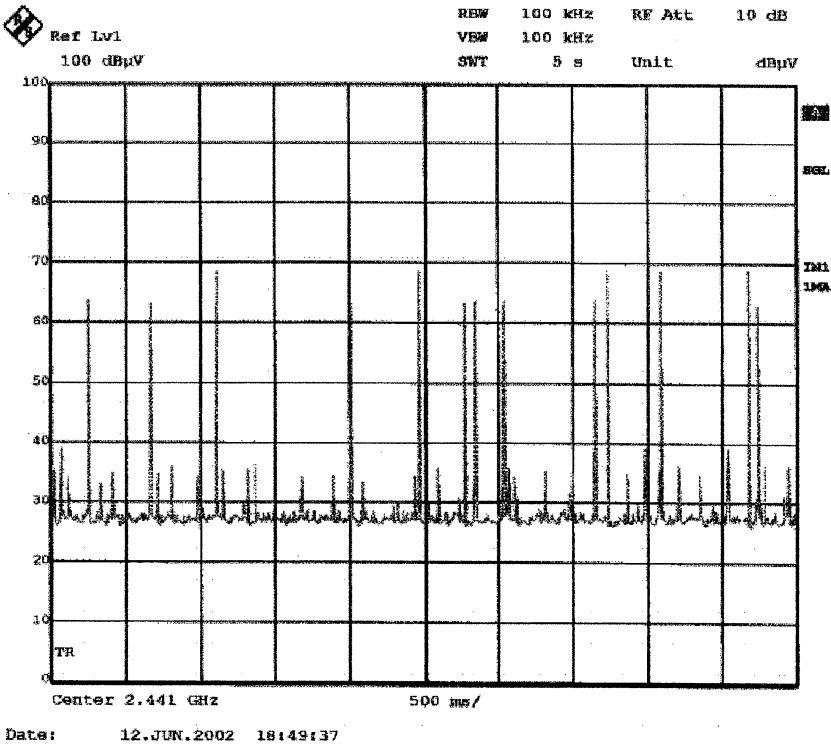


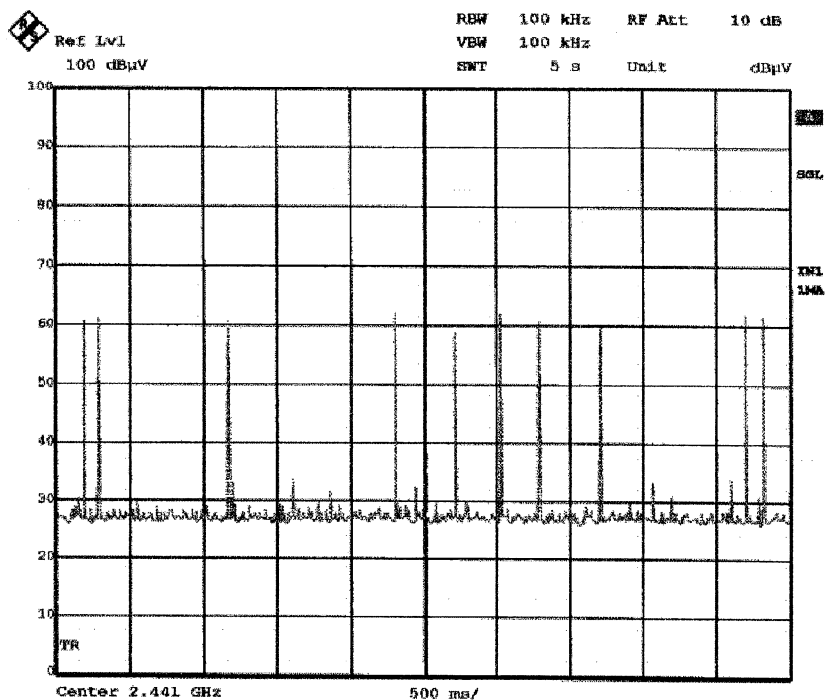
Dwell time :Loopback DH3(1)Dwell time :Loopback DH3(2)

Dwell time :Loopback DH3(3)

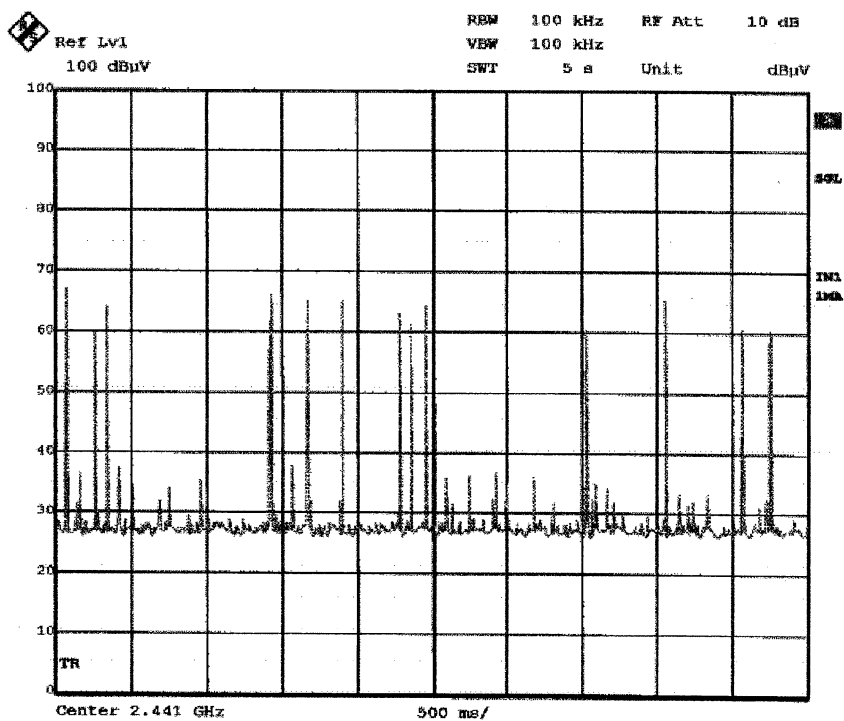


Dwell time :Loopback DH3(4)

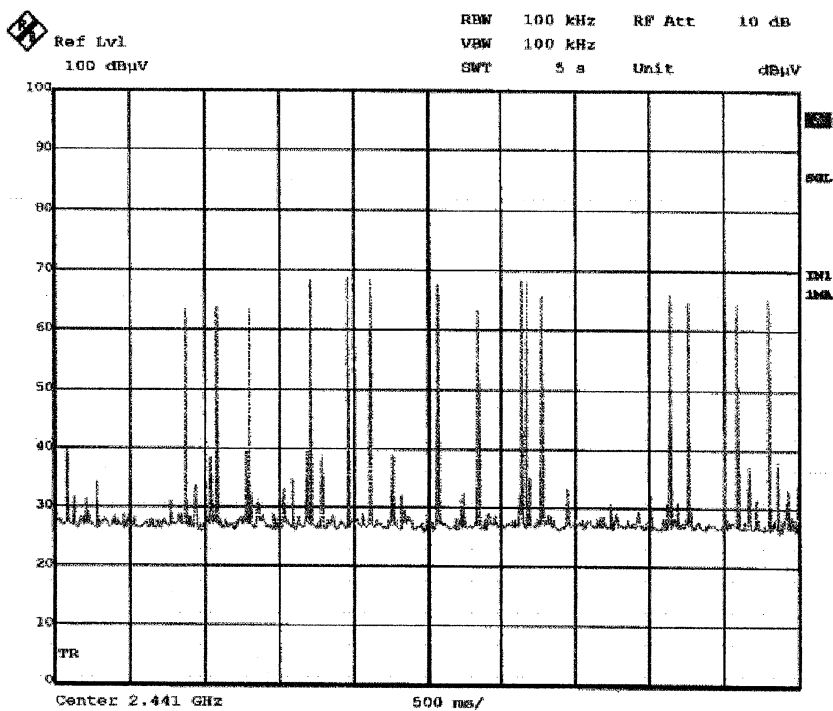


Dwell time :Loopback DH3(5)

Date: 12.JUN.2002 18:47:34

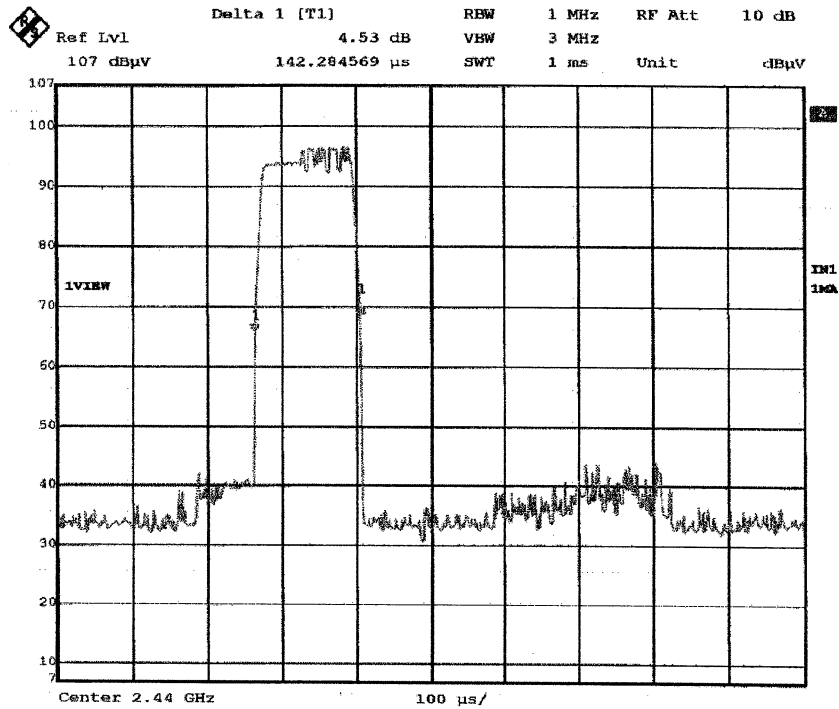
Dwell time :Loopback DH3(6)

Date: 12.JUN.2002 18:45:27

Dwell time : Loopback DH3(7)

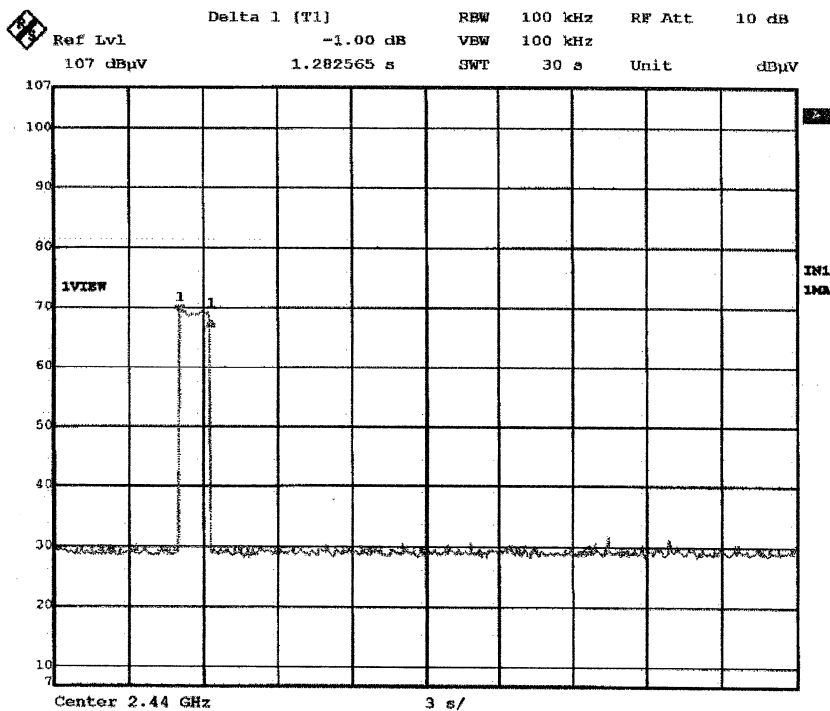
Date: 12.JUN.2002 18:55:09

Dwell time :Inquiry (1)

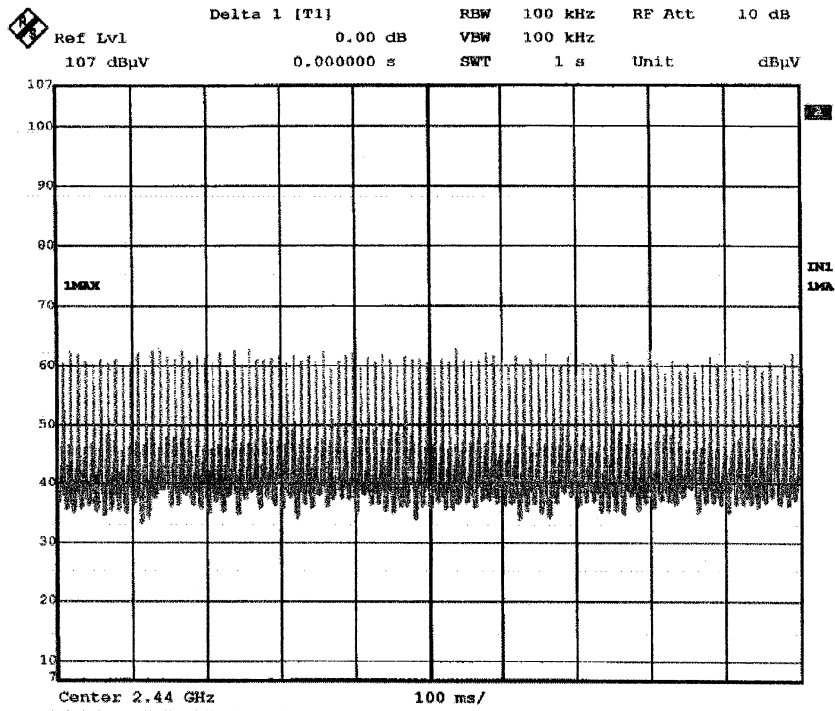


Date: 12.JUN.2002 15:04:20

Dwell time :Inquiry (2)



Date: 12.JUN.2002 15:37:56

Dwell time :Inquiry (3)

Date: 12.JUN.2002 15:41:12

DATA OF PEAK OUTPUT POWER(CONDUCTED)

A-PEX INTERNATIONAL CO., LTD.
EMC HEAD OFFICE DIVISION No.3 MEASUREMENT ROOM

COMPANY : SONY Corporation
EQUIPMENT : Digital Video Camera Recorder
MODEL : DCR-IP220
S/N : 96
FCC ID : AK8DCRIP220
POWER : AC120V/60Hz
MODE : Tx (Hopping on) / Inquiry

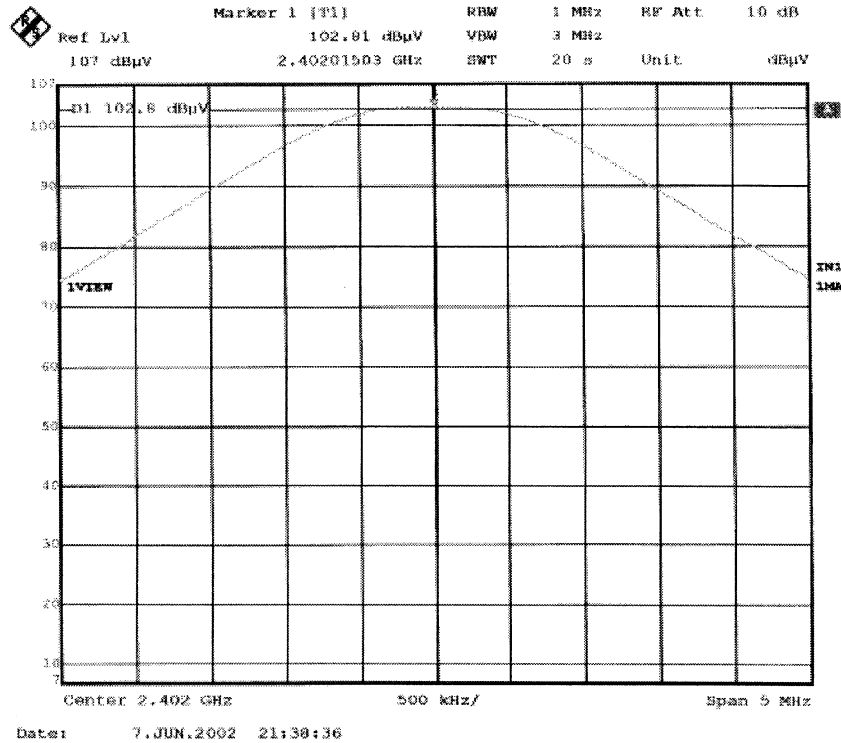
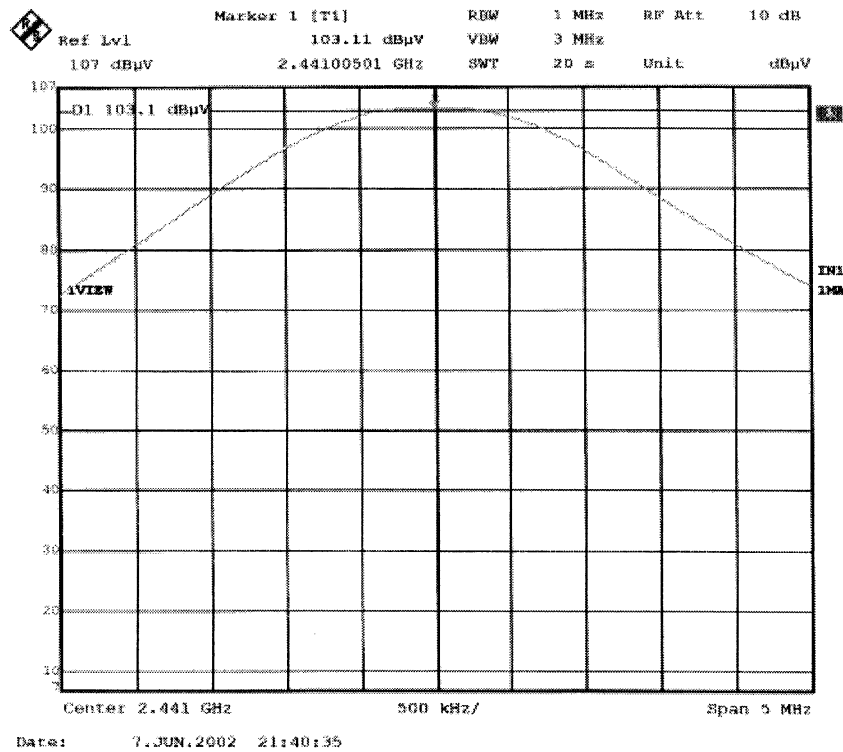
REPORT NO : 22IE0025-HO
REGULATION : Fcc Part15 Subpart C 15.247(b)(1)
TEST DISTANCE : -
DATE : 2002/6/7
Temperature : 24°C
Humidity : 62%

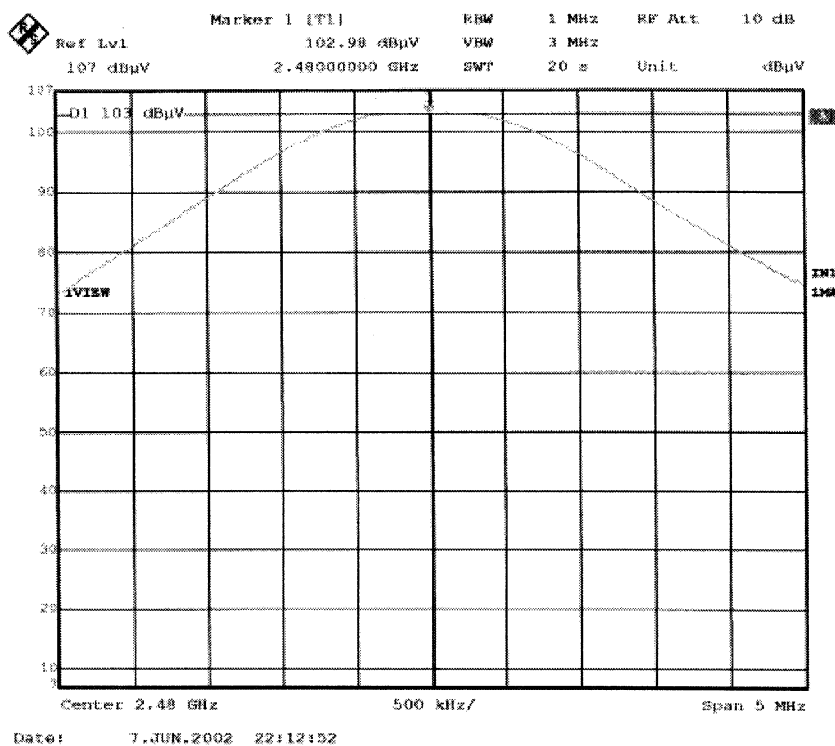

ENGINEER : Hiroka Umeyama

CH	FREQ [MHz]	T/R Reading [dBuV]	Cable Loss [dB]	Result [dBuV]	Result [dBm]	Limit (1W) [dBm]
Low	2402.0	103.0	1.7	104.7	-2.34	30.0
Mid	2441.0	103.1	1.8	104.9	-2.11	30.0
High	2480.0	103.0	1.8	104.8	-2.20	30.0

Sample Calculation :

Result = T/R Reading + Cable Loss

Peak Output Power(Conducted):Tx(2402MHz)**Peak Output Power(Conducted):Tx(2441MHz)**

Peak Output Power(Conducted):Tx(2480MHz)

PEAK OUTPUT POWER (RADIATED)

A-PEX INTERNATIONAL CO., LTD.

EMC HEAD OFFICE DIVISON No.1 SEMI ANECHOIC CHAMBER

COMPANY : SONY Corporation
 EQUIPMENT : Digital Video Camera Recorder
 MODEL : DCR-IP220
 S/N : 95
 FCC ID : AK8DCRIP220
 POWER : AC120V/60Hz
 MODE : Tx (2402/2441/2480MHz)

REPORT NO : 22IE0025-HO
 REGULATION : Fcc Part15 Subpart C 15.247(c)
 TEST DISTANCE : 3m
 DATE : 2002/6/10
 Temperature : 23°C
 Humidity : 61%


 ENGINEER : Hiroka Uneyama

CH	FREQ	T/R READING		All Factor	E1		E		Limit 1W	Result		Result	
		HOR	VER		HOR	VER	HOR	VER		HOR	VER	HOR	VER
		[dBuV]			[dB]		[dBuV/m]			[V/m]		[mW]	
	[MHz]												
Low	2402.0	93.3	92.3	-4.0	89.3	88.3	0.0292	0.0260	1000.0	0.24	0.19	-6.2	-7.2
Mid	2441.0	90.9	94.5	-3.9	87.0	90.6	0.0224	0.0339	1000.0	0.14	0.32	-8.5	-4.9
High	2480.0	90.7	94.3	-3.6	87.1	90.7	0.0226	0.0343	1000.0	0.15	0.33	-8.4	-4.8

Sample Calculation :

All Factor = ANT Factor + Cable Loss

Low (2402MHz): ANT Factor (27.7dB) - Amp Gain(36.7dB) + Cable Loss(5.0dB)

Mid (2441MHz): ANT Factor (27.8dB) - Amp Gain(36.7dB) + Cable Loss(5.0dB)

High (2480MHz): ANT Factor (27.9dB) - Amp Gain(36.7dB) + Cable Loss(5.2dB)

Result[W] = $(E \cdot d)^2 / (30 \cdot G)$

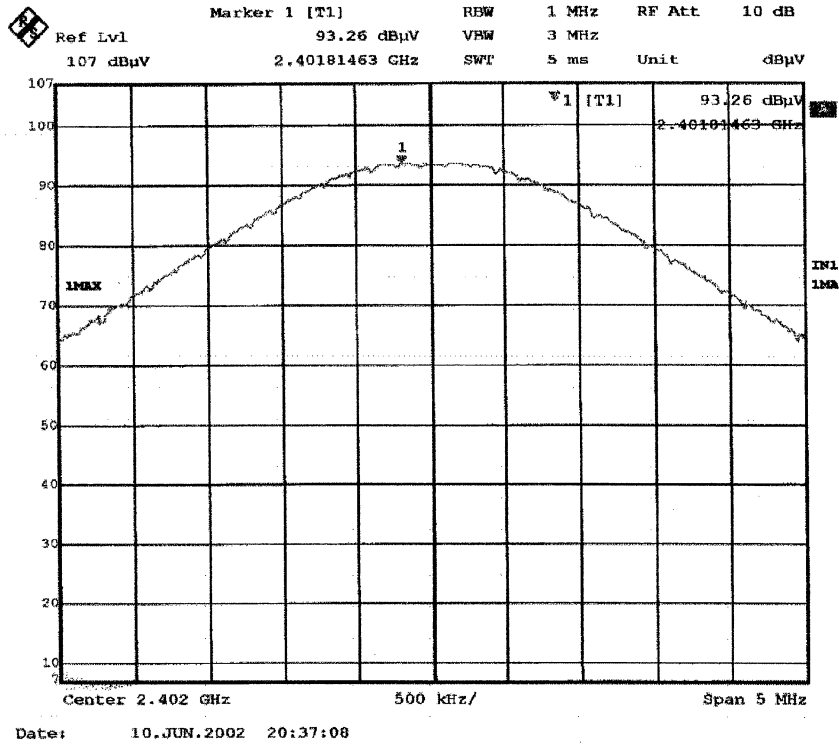
E1[dBuV/m] : T/R Reading + All Factor

E : Converted to V/m

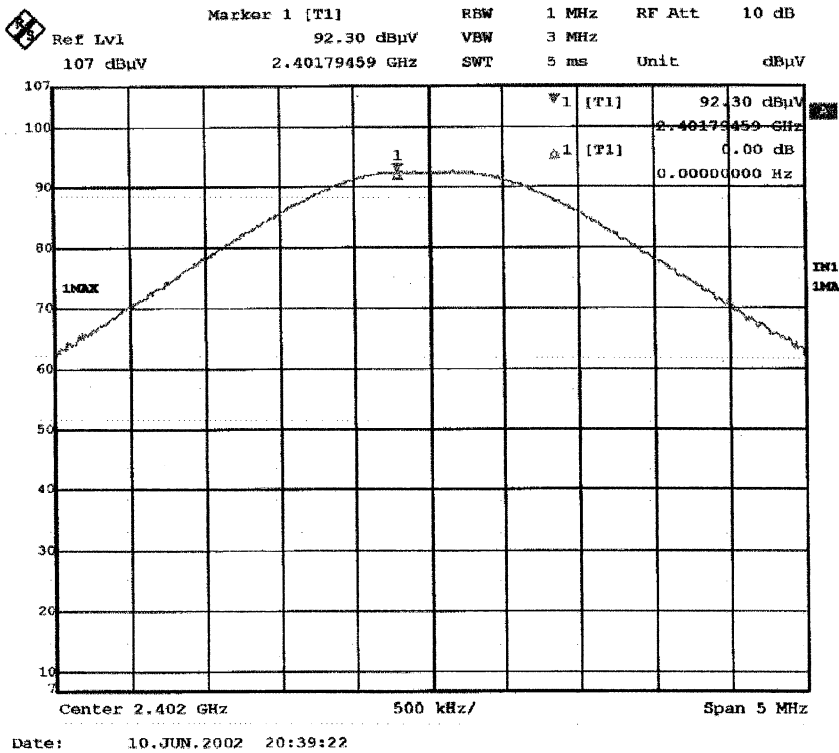
d : Test distance(3.0m)

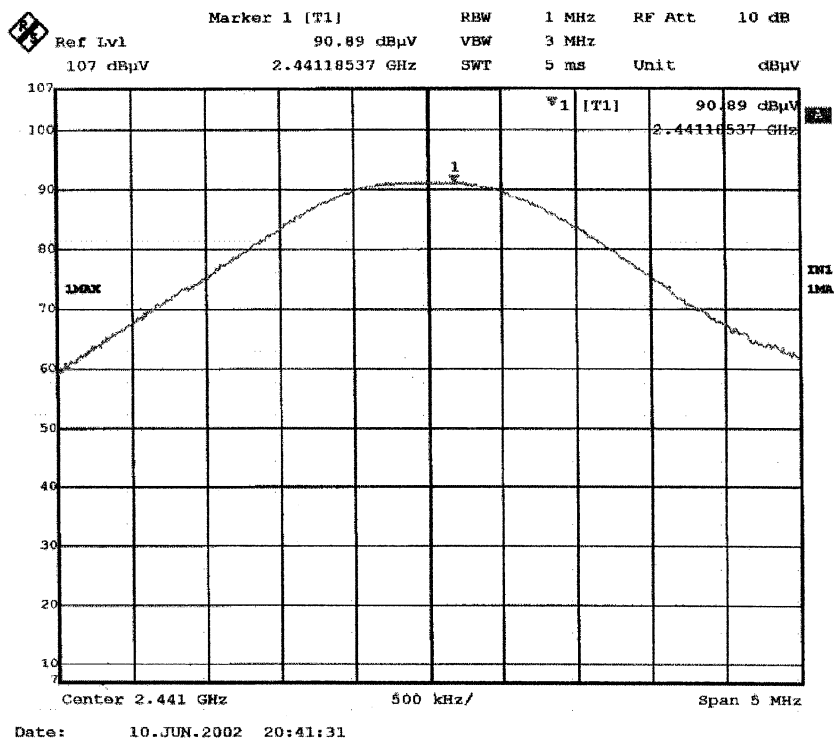
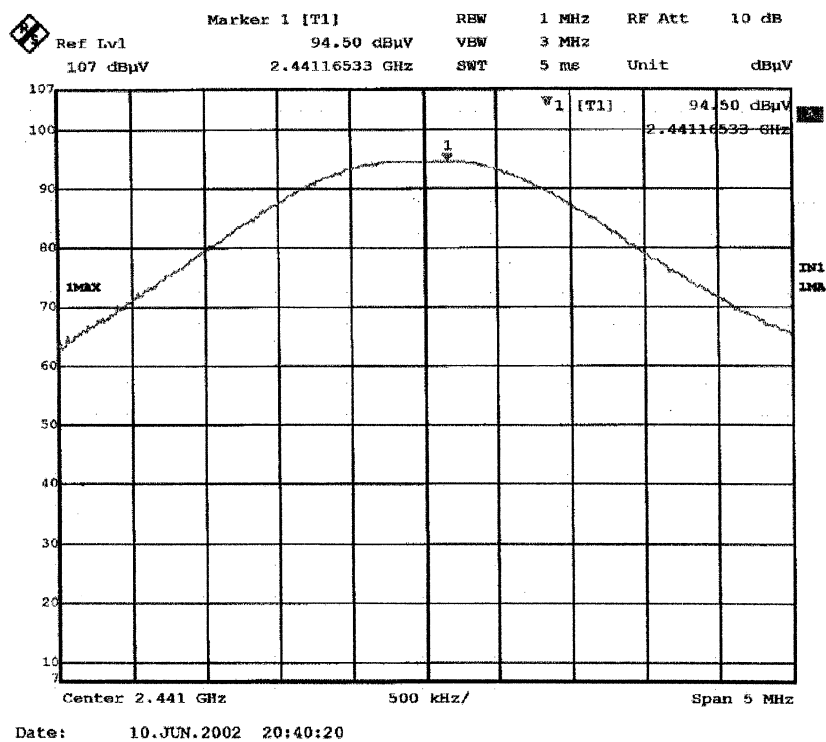
G : Numeric Antenna Gain (1.06)

Peak Output Power(Radiated):Tx(2402MHz)HOR

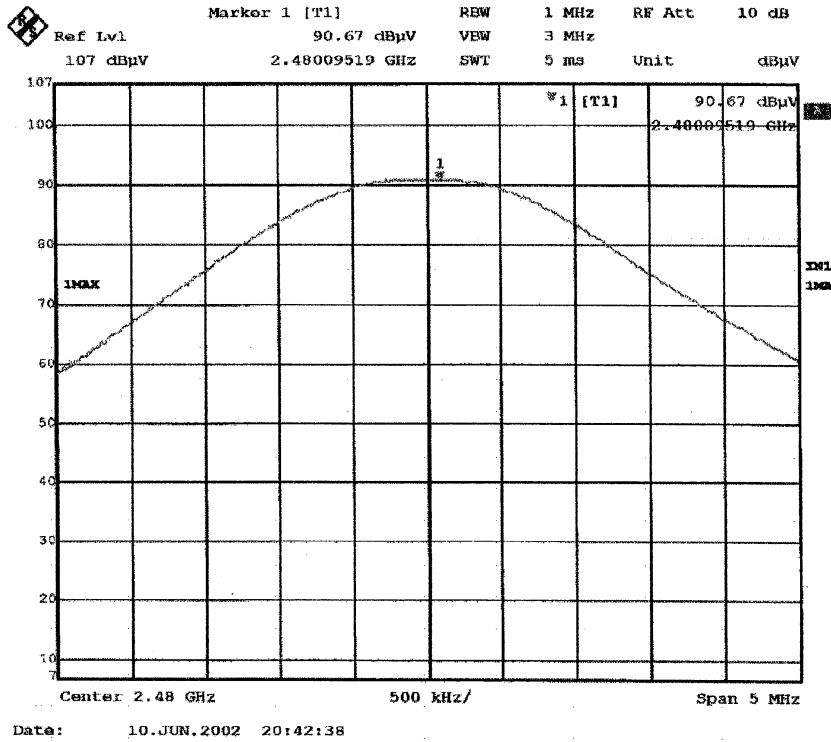


Peak Output Power(Radiated):Tx(2402MHz)VER

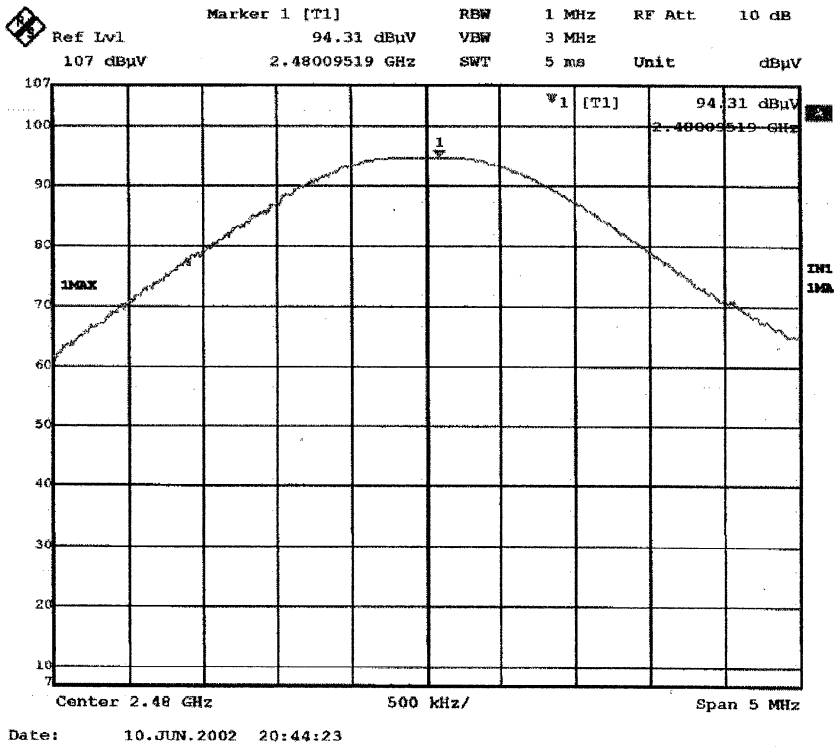


Peak Output Power(Radiated):Tx(2441MHz)HOR**Peak Output Power(Radiated):Tx(2441MHz)VER**

Peak Output Power(Radiated):Tx(2480MHz)HOR



Peak Output Power(Radiated):Tx(2480MHz)VER



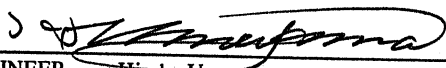
DATA OF BAND EDGE

A-PEX INTERNATIONAL CO., LTD.

EMC HEAD OFFICE DIVISON No.3 MEASUREMENT ROOM

COMPANY : SONY Corporation
 EQUIPMENT : Digital Video Camera Recorder
 MODEL : DCR-IP220
 S/N : 96
 FCC ID : AK8DCRIP220
 POWER : AC120V/60Hz
 MODE : Tx (Hopping on) ,Tx (Hopping off 2402/2480MHz)

REPORT NO : 22IE0025-HO
 REGULATION : Fcc Part15 Subpart C 15.247(c)
 TEST DISTANCE : -
 DATE : 2002/6/7
 Temperature : 24°C
 Humidity : 62%

ENGINEER :  Hiroka Umeyama

PK DETECT(S/A :Span 20/10MHz, RBW 200/100kHz/1MHz, VBW 200/100kHz/1MHz, sweep time AUTO)

[Hopping on] Conducted

Frequency [MHz]	Reading [dBuV]	Cable Loss [dB]	E [dBuV]	P [mW]	Difference of level [dB]	Field Strength [dBuV/m]	Limit
2390.0	38.7	1.7	40.4	0.000000219	-	28.9	<54[dBuV/m]
2400.0	63.2	1.7	64.9	-	39.8 *	-	>20[dB]
2483.5	45.2	1.8	47.0	0.000001000	-	35.5	<54[dBuV/m]

* Reference : Reading (102.9[dBuV]) + Cable Loss (1.8[dB]) = E (104.7[dBuV]) at 2480MHz.

[Hopping off Tx (2402/2480MHz)] Conducted

Frequency [MHz]	Reading [dBuV]	Cable Loss [dB]	E [dBuV]	P [mW]	Difference of level [dB]	Field Strength [dBuV/m]	Limit
2390.0	45.7	1.7	47.4	0.000001096	-	35.9	<54[dBuV/m]
2400.0	70.6	1.7	72.3	-	32.3*	-	>20[dB]
2483.5	47.0	1.8	48.8	0.000001514	-	37.3	<54[dBuV/m]

* Reference : Reading (102.8[dBuV]) + Cable Loss (1.8[dB]) = E (104.6[dBuV]) at 2480MHz.

Sample Calculation:

Field Strength = $(\sqrt{30 * P * 0.001 * G}) / d$

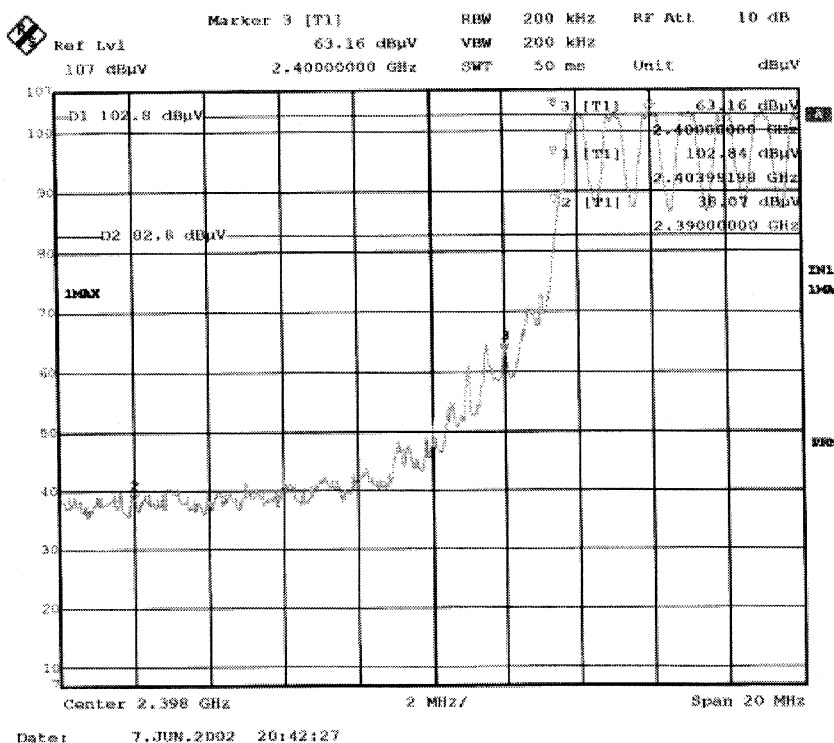
E : Reading + Cable Loss

P : Converted to mW

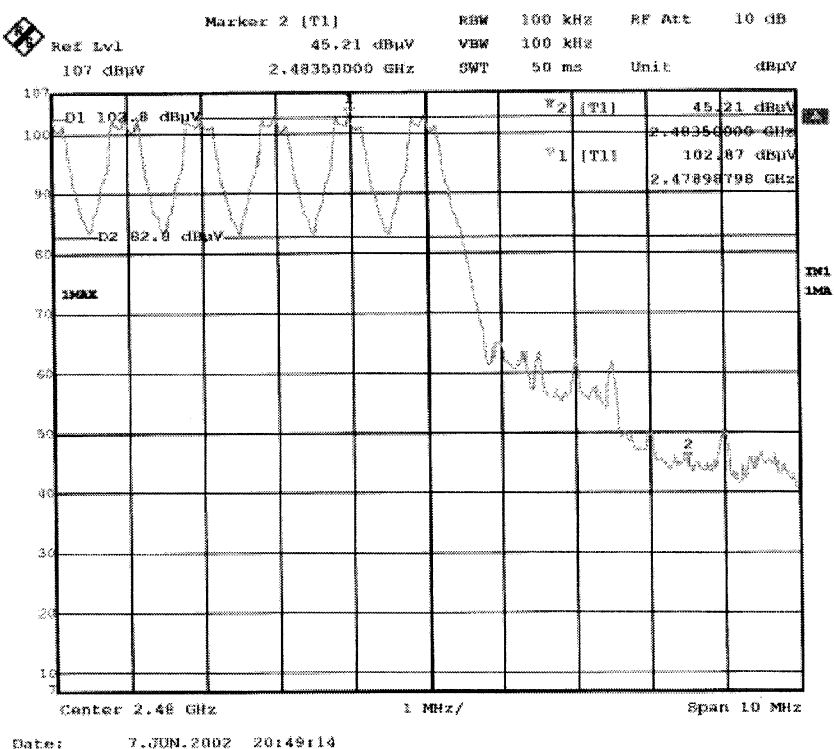
d : Test distance(3.0m)

G : Numeric Antenna Gain (1.06)

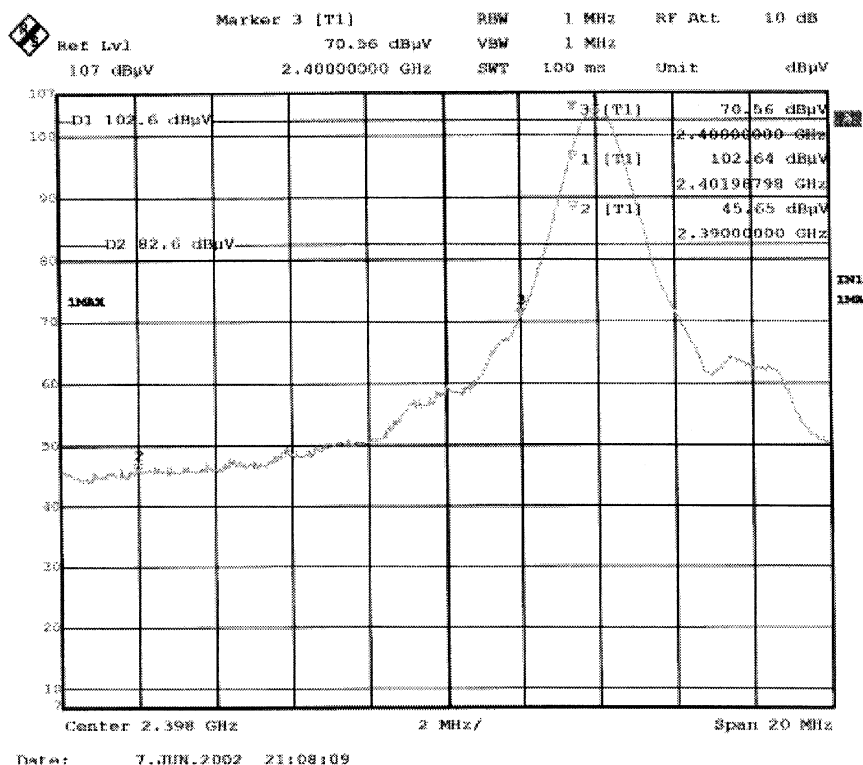
Band Edge :Tx(Hopping on)2402MHz



Band Edge :Tx(Hopping on)2480MHz



Band Edge :Tx(Hopping off)2402MHz



Band Edge :Tx(Hopping off)2480MHz

