



## EMI TEST REPORT

Test Report No. : 25IE0112-HO-1

Applicant : Panasonic Communications Co., Ltd.  
Type of Equipment : Color LCD Portable Unit  
Model No. : KX-THA12  
FCC ID : ACJ96NKX-THA12  
Test standard : FCC Part 15 Subpart C  
Section 15.207, Section 15.247 : 2005  
Test Result : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Apex Co., Ltd.
2. The results in this report apply only to the sample tested.
3. This equipment is in compliance with the above regulation. We hereby certify that the data contain a true representation of the EMC profile.
4. The test results in this report are traceable to the national or international standards.

Date of test:

May 16 to 19, 2005

Tested by:

Mitsuru Fujimura  
EMC Service

Keiichi Aoki  
EMC Service

Approved by :

Hironobu Shimoji  
Group Leader of  
EMC Service

UL Apex Co., Ltd.

Head Office EMC Lab.

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## **SECTION 1: Client information**

Company Name : Panasonic Communications Co., Ltd.  
Brand Name : Panasonic  
Address : 1-62, 4-chome, Minoshima, Hakata-ku, Fukuoka, 812-8531 Japan  
Telephone Number : +81-92-477-1405  
Facsimile Number : +81-92-477-1487  
Contact Person : Kunihiko Nawata

## **SECTION 2: Equipment under test (E.U.T.)**

### **2.1 Identification of E.U.T.**

Type of Equipment : Color LCD Portable Unit  
Model No. : KX-THA12  
Serial No. : 0080F0801243  
351280f08000  
Rating : DC3.6V (Battery)  
Country of Manufacture : Japan  
Receipt Date of Sample : May 15, 2005  
Condition of EUT : Engineering prototype  
(Not for Sale: This sample is equivalent to mass-produced items.)

### **2.2 Product Description**

Model No: KX-THA11 (referred to as the EUT in this report) is the 2.4GHz FHSS Cordless Telephone (Portable Unit).

<b>Clock frequencies in the system</b>	13.000MHz (standard clock) 117.000MHz (RFIC internal clock)
<b>Feature of EUT</b>	2.4GHz FHSS Cordless Telephone

<b>Equipment Type</b>	Transceiver
<b>Frequency of Operation</b>	2402MHz – 2480MHz
<b>Type of Modulation</b>	FHSS
<b>Antenna Type</b>	Whip (Main Antenna) and Whip (Sub Antenna)
<b>Antenna Gain</b>	2.14 dBi (Main Antenna), 2.14 dBi (Sub Antenna)
<b>Mode of Operation</b>	Duplex
<b>ITU code</b>	F1D
<b>Power Supply (Inner)</b>	DC2.5V

### **FCC 15.31 (e)**

This EUT provides stable voltage(DC3.6V) from Host, and it is constantly converted into and provided with DC2.5V for the Operational voltage within RF Module. Therefore, this EUT complies with the requirement.

### **FCC Part 15.203 Antenna requirement**

It is impossible for end users to replace the antenna, because the antenna is fixed inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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## **SECTION 3: Test specification, procedures & results**

### **3.1 Test Specification**

Test Specification : FCC Part15 Subpart C : 2005  
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators  
Section 15.207 Conducted limits : 2005  
Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz : 2005

### **3.2 Procedures and results**

[FHSS]

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin*0)	Results
1	Conducted emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements	Section 15.207	-	N/A	N/A*1)	N/A
2	Carrier Frequency Separation	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247(a)(1)	Conducted	N/A	*See data.	Complied
3	20dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247(a)(1)	Conducted	N/A		Complied
4	Number of Hopping Frequency	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247(a)(1)(iii)	Conducted	N/A		Complied
5	Dwell time	ANSI C63.4:2003 13.Measurement of intentional radiators	Section15.247(a)(1)(iii)	Conducted	N/A		Complied
6	Maximum Peak Output Power	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247(b)(1)	Conducted	N/A		Complied
7	Band Edge Compliance	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247(d)	Conducted	N/A		Complied
8	Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247(d)	Conducted/ Radiated	N/A		Model 9.9dB 4959.7MHz Vertical, PK Mode 2 9.5dB 7319.9MHz Horizontal, PK

Note: UL Apex's EMI Work Procedures No.QPM05 and QPM15.

\*0) The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

\*1) The test is not applicable since this EUT does not have AC mains.

#### **Uncertainty:**

##### Conducted Emission

The measurement uncertainty (with a 95% confidence level) for this test is  $\pm 1.3$ dB.

##### Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is  $\pm 4.5$ dB(3m)/  $\pm 4.7$ dB(10m).

The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is  $\pm 5.2$ dB(3m)/  $\pm 3.8$ dB(10m).

The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is  $\pm 6.6$ dB.

##### Other test except Conducted Emission and Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test is  $\pm 3.0$ dB.

\*These tests were also referred to FCC Public Notice DA 00-705 "Guidance on Measurement for Frequency Hopping Spread Spectrum Systems".

\*These tests were performed without any deviations from test procedure except for additions or exclusions.

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### 3.3 Addition to standards

No addition, deviation, nor exclusion has been made from standards.

### 3.4 Test Location

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	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	IC4247	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	846015	IC4247-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.4 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-

\* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1 and No.2 semi-anechoic and No.3 shielded room.

### 3.5 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

## **SECTION 4: Operation of E.U.T. during testing**

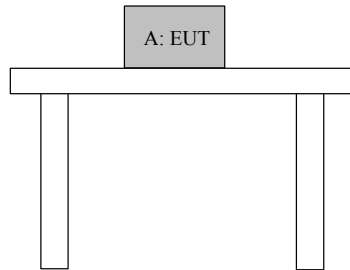
### **4.1 Operating Modes**

The mode is used : [Mode1]  
Transmitting mode(Packet size DH1, DH5)  
Low Channel :2402MHz  
Mid Channel :2441MHz  
High Channel :2480MHz  
Inquiry  
\*Remarks: AFH OFF mode: 79ch, AFH ON mode 20ch

[Mode2]  
Transmitting mode(Packet size DH1, DH5)  
Low Channel :2402MHz  
Mid Channel :2440MHz  
High Channel :2480MHz  
\*Remarks: AFH OFF mode: 40ch, AFH ON mode 20ch

\*The test level was checked with both main and sub antenna. The test was made with main antenna which had higher noise level.

### **4.2 Configuration and peripherals**



### **Description of EUT and Support equipment**

No.	Item	Model number	Serial number	Manufacturer	FCC ID
A	Color LCD Portable Unit	KX-THA12	0080F0801243 *1) 351280f08000 *2)	Panasonic	ACJ96NKX-THA12

\*1) Used for Antenna port conducted tests

\*2) Used for Radiated emission tests

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**SECTION 5: Spurious Emission**

[Conducted]

**Test Procedure**

The Out of Band Emission was measured with a spectrum analyzer connected to the antenna port.

**Test data** : APPENDIX 3

**Test result** : Pass

[Radiated]

**Test Procedure**

EUT was placed on a platform of nominal size, 0.5m by 1.0m, raised 80cm above the conducting ground plane. The Radiated Electric Field Strength intensity has been measured in a Semi Anechoic Chamber with a ground plane and at a distance of 3m(Below 10GHz) and 1m(Upper 10GHz).

The height of the measuring varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer (in linear mode).

The test was made with the detector (RBW/VBW) in the following table.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

**\*Delta Marker Method (Measurement for Band-edge)**

STEP 1) Perform an in-band field strength measurement of the fundamental emission using the RBW table below.

STEP 2) Choose a spectrum analyzer span that encompasses both the peak of the fundamental emission and the band-edge emission under investigation. Set the analyzer RBW to 1% of the total span, and measure the amplitude delta between the peak of the fundamental and the peak of the band-edge emission.

STEP 3) Subtract the delta measured in STEP 2) from the field strengths measured in STEP 1). The result is the field strength of band-edge.

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

**Test data** : APPENDIX 3

**Test result** : Pass

**20dBc was applied to the frequency over the limit of FCC 15.209 and outside the restricted band of 15.205.**

Frequency	Below 1GHz		Above 1GHz
Instrument used	Test Receiver	Spectrum Analyzer	Spectrum Analyzer
Detector	QP: BW 120kHz	20dBc :	PK: RBW:1MHz/VBW: 1MHz
IF Bandwidth		RBW: 100kHz	AV: RBW:1MHz/VBW:10Hz
		VBW: 300kHz	20dBc : RBW:100kHz/VBW:300kHz

-The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

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## **SECTION 6: Bandwidth**

### **Test Procedure**

The bandwidth was measured with a spectrum analyzer connected to the antenna port.

**Test data** : APPENDIX 3  
**Test result** : Pass

## **SECTION 7: Maximum Peak Output Power**

### **Test Procedure**

The Maximum Peak Output Power was measured with a power meter connected to the antenna port.

**Test data** : APPENDIX 3  
**Test result** : Pass

## **SECTION 8: Carrier Frequency Separation**

### **Test Procedure**

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna port.

**Test data** : APPENDIX 3  
**Test result** : Pass

## **SECTION 9: Number of Hopping Frequency**

### **Test Procedure**

The Number of Hopping Frequency was measured with a spectrum analyzer connected to the antenna port.

**Test data** : APPENDIX 3  
**Test result** : Pass

## **SECTION 10: Dwell time**

### **Test Procedure**

The Dwell time was measured with a spectrum analyzer connected to the antenna port.

**Test data** : APPENDIX 3  
**Test result** : Pass

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**APPENDIX 1: Photographs of test setup**

**Spurious Emission (Radiated)**

**Front**



**Rear**



**Worst Case Position (X-axis:Horizontal / Y-axis:Vertical)**

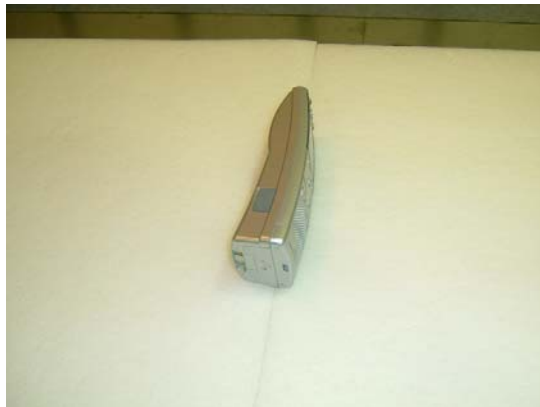
**X-axis**



**Y-axis**



**Z-axis**



## APPENDIX 2: Test instruments

### EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE	2005/04/11 * 12
MRENT-14	Spectrum Analyzer	Advantest	R3273	RE	2005/02/21 * 12
MCC-04	Microwave Cable 1G-50GHz	Storm	421-011 ( 90-1394-079 )	RE	2005/01/05 * 12
MCC-19	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX 104	RE	2005/02/03 * 12
MAT-23	Attenuator(10dB)(above1GHz)	Orient Microwave	BX10-0476-00	RE	2005/03/16 * 12
MHF-02	High Pass Filter	Tokimec	TF323DCA	RE	2004/09/18 * 12
MPA-01	Pre Amplifier	Agilent	8449B	RE	2005/02/05 * 12
MHA-06	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2005/01/10 * 12
MHA-02	Horn Antenna	EMCO	3160-09	RE	2005/01/10 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	RE	2005/02/02 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	RE	2005/02/24 * 12
MPA-06	Pre Amplifier	Hewlett Packard	8447D	RE	2004/08/29 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	2004/10/14 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2004/10/14 * 12
MCC-06	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX 104	AT	2005/02/03 * 12
MAT-21	Attenuator(20dB)(above1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-120	AT/RE	2005/01/11 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	AT	2004/06/12 * 12
MST-03	Power Meter	Agilent	E4416A	AT	2005/03/16 * 12
MPSE-04	Power sensor	Agilent	E9327A	AT	2005/03/29 * 12

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

#### Test Item:

**RE: Radiated emission,**

**AT: Antenna terminal conducted measurement**

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**APPENDIX 3: Data of EMI test**  
**[Mode1]**

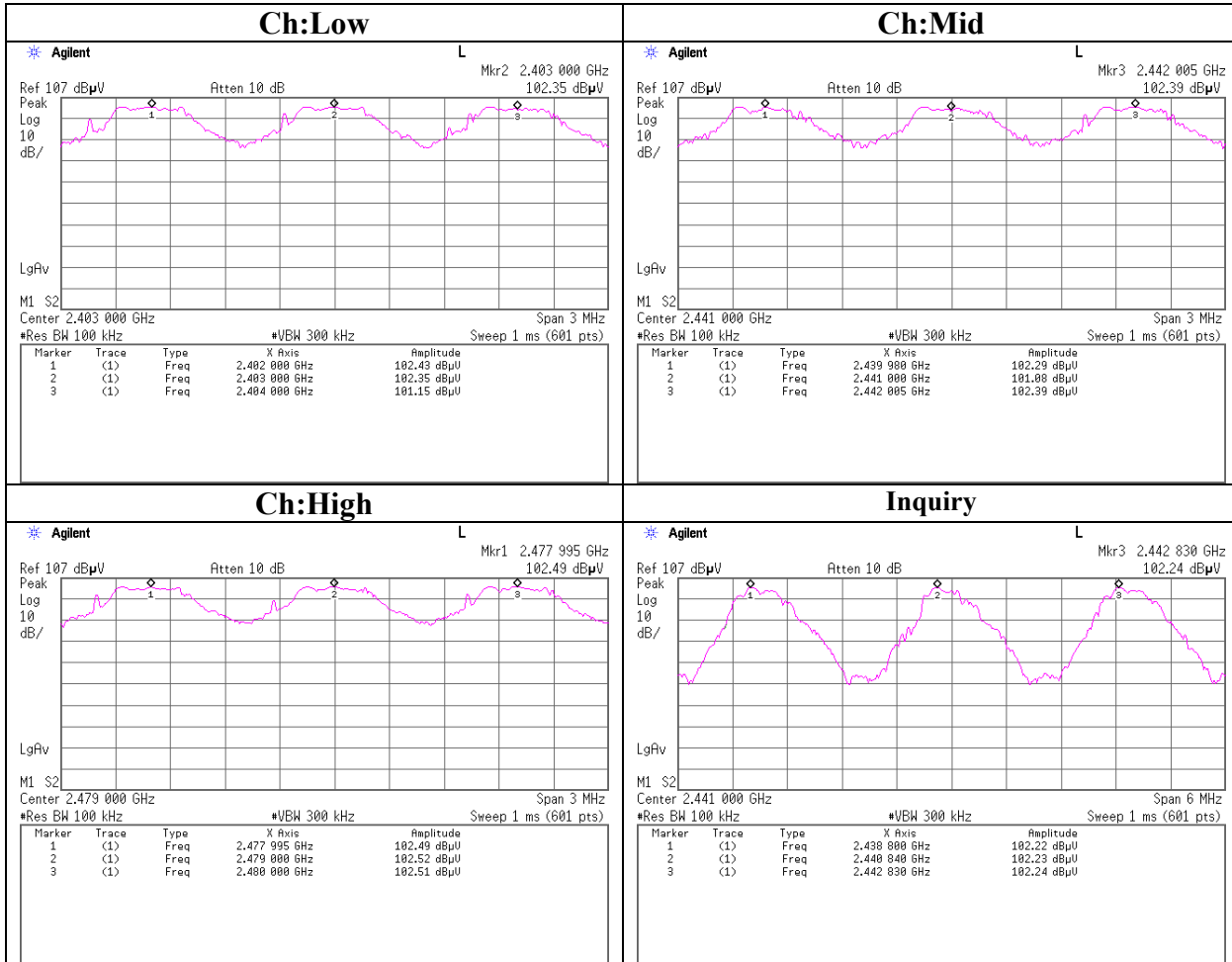
**Carrier Frequency Separation(Mode1)**

UL Apex Co., Ltd.  
Head Office EMC Lab. No.3 Measurement Room

COMPANY	: Panasonic Communications Co.,Ltd.	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	: Color LCD Portable Unit	TEST DISTANCE	: -
MODEL	: KX-THA12	DATE	: 05/19/2005
S/N	: 0080F0801243	TEMPERATURE	: 25deg.C
POWER	: DC3.6V	HUMIDITY	: 45%
MODE	: Tx(Hopping on)/Inquiry	ENGINEER	: Mitsuru Fujimura

Ch	Freq. [MHz]	Channel separation [MHz]	Limit
Low	2402.0	1.000	>two-thirds of 20dB Bandwidth or 25[kHz]
Mid	2441.0	1.005	>two-thirds of 20dB Bandwidth or 25[kHz]
High	2480.0	1.000	>two-thirds of 20dB Bandwidth or 25[kHz]
Inquiry	2441.0	1.990	>two-thirds of 20dB Bandwidth or 25[kHz]

**Carrier Frequency Separation(Mode1)**



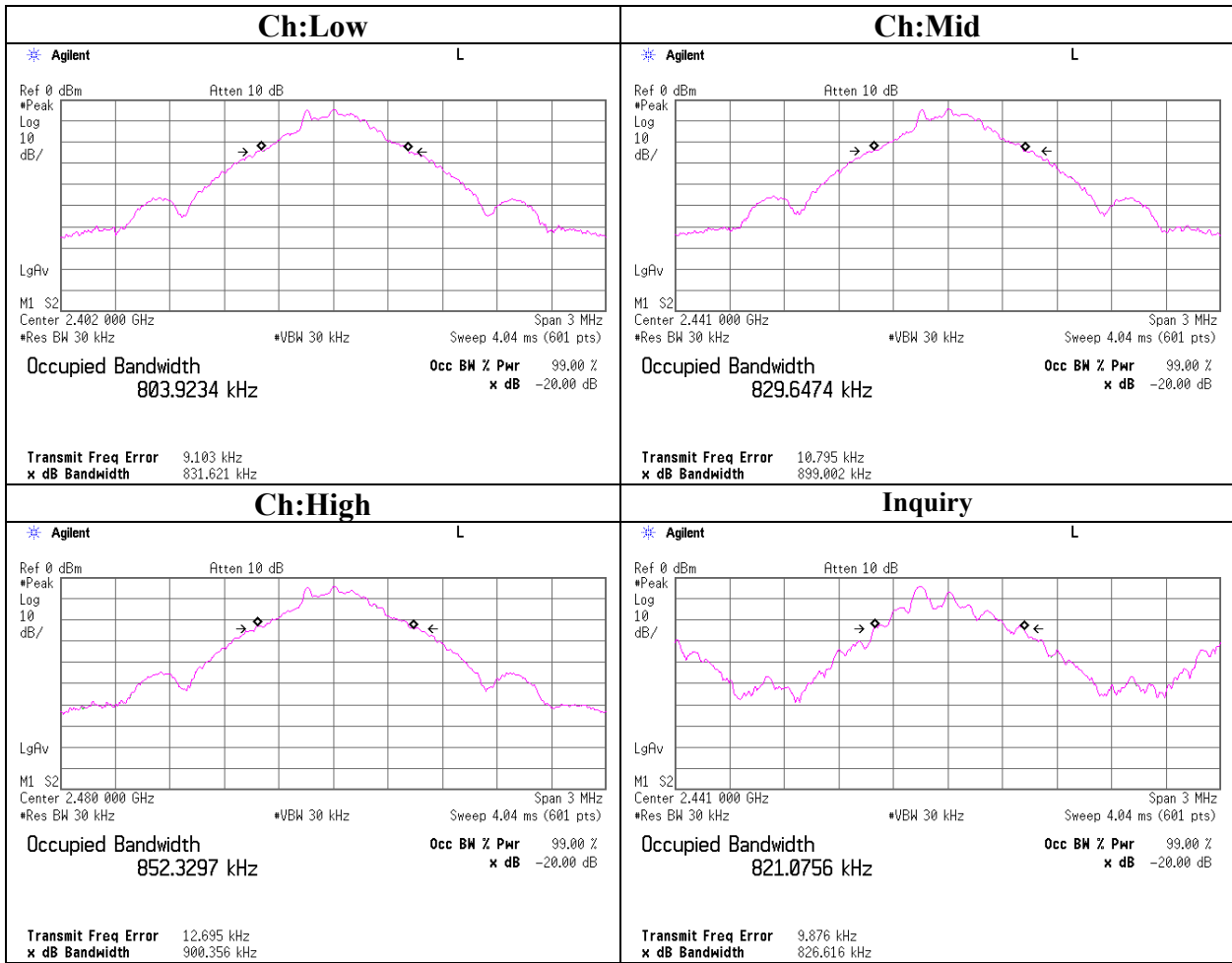
### 20dB Bandwidth(Mode1)

UL Apex Co., Ltd.  
Head Office EMC Lab. No.3 Measurement Room

COMPANY : Panasonic Communications Co.,Ltd.      REGULATION : Fcc Part15 Subpart C 15.247(a)(1)  
EQUIPMENT : Color LCD Portable Unit      TEST DISTANCE : -  
MODEL : KX-THA12      DATE : 05/19/2005  
S/ N : 0080F0801243      TEMPERATURE : 25deg.C  
POWER : DC3.6V      HUMIDITY : 45%  
MODE : Tx (Hopping off) /Inquiry      ENGINEER : Mitsuru Fujimura

Ch	Freq. [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
Low	2402.0	0.832	-
Mid	2441.0	0.899	-
High	2480.0	0.900	-
Inquiry	2441.0	0.827	-

**20dB Bandwidth(Mode1)**



### Number of Hopping Frequency(Model)

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COMPANY	: Panasonic Communications Co.,Ltd.	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)(iii)
EQUIPMENT	: Color LCD Portable Unit	TEST DISTANCE	: -
MODEL	: KX-THA12	DATE	: 05/19/2005
S/ N	: 0080F0801243	TEMPERATURE	: 25deg.C
POWER	: DC3.6V	HUMIDITY	: 45%
MODE	: Tx (Hopping on) /Inquiry	ENGINEER	: Mitsuru Fujimura

#### Mode 1, AFH off

Mode	Number of channel [time]	Limit [time]
Tx(Hopping on)	79	$\geq 15$

#### Mode 1, AFH off

Mode	Number of channel [time]	Limit [time]
Inquiry	32	$\geq 15$

#### Mode 1, AFH on

Mode	Number of channel [time]	Limit [time]
Tx(Hopping on)	20	$\geq 15$

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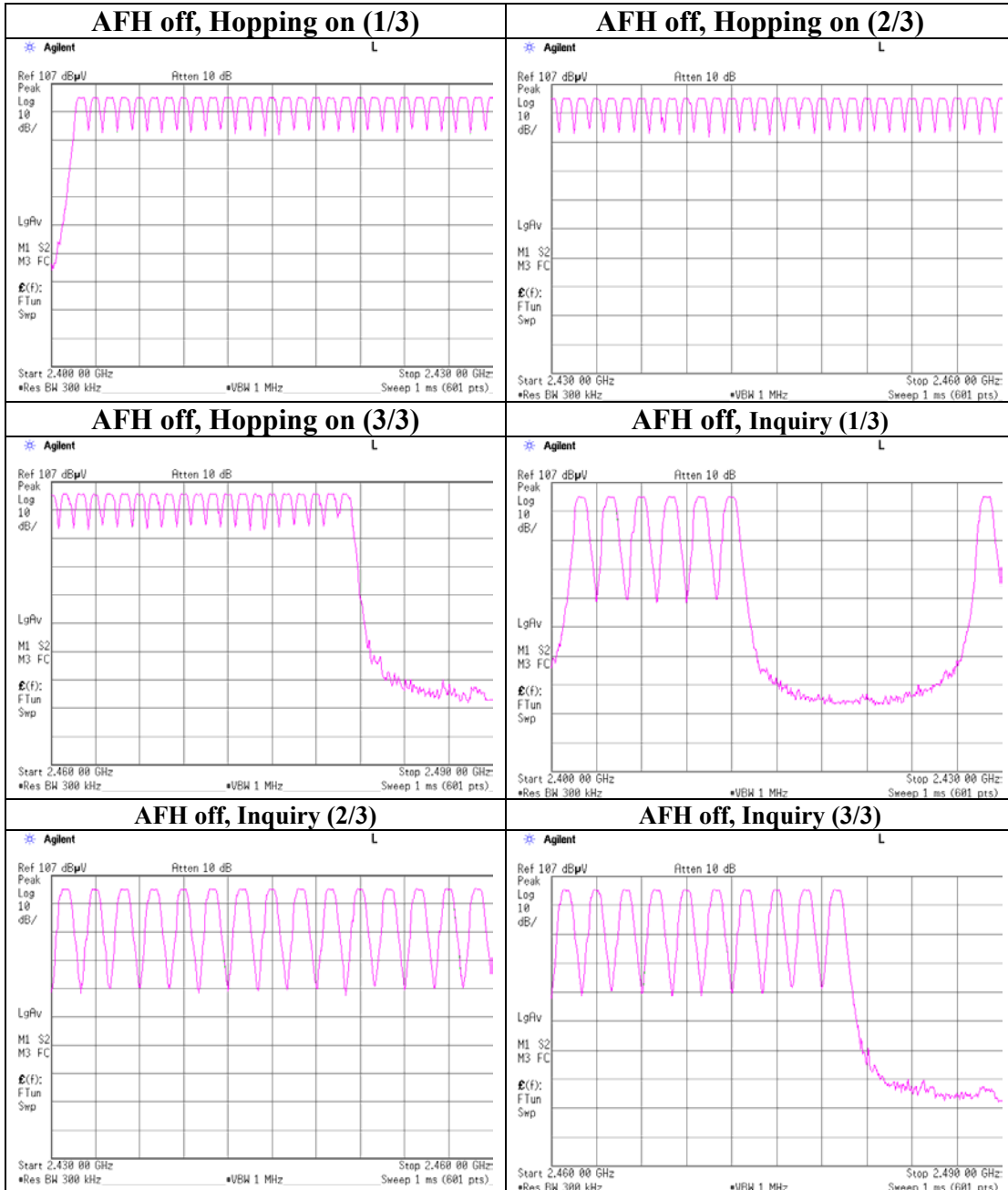
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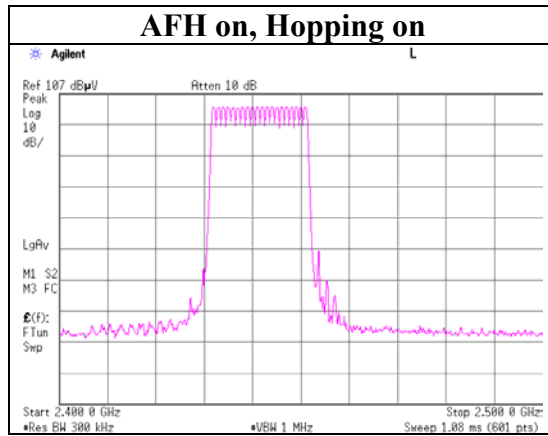
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**Number of Hopping Frequency(Model)**



**Number of Hopping Frequency(Model)**



**Dwell Time(Mode1)**

UL Apex Co., Ltd.  
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COMPANY : Panasonic Communications Co.,Ltd.      REGULATION : Fcc Part15 Subpart C 15.247(a)(1)(iii)  
EQUIPMENT : Color LCD Portable Unit      TEST DISTANCE : -  
MODEL : KX-THA12      DATE : 05/19/2005  
S/ N : 0080F0801243      TEMPERATURE : 25deg.C  
POWER : DC3.6V      HUMIDITY : 45%  
MODE : Tx (Hopping on) /Inquiry      ENGINEER : Mitsuru Fujimura

**Mode1,AFH off**

Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8(32 Hopping x 0.4)second period	Length of transmission time [msec]	Result [msec]	Limit [msec]
DH1	51 times /5sec. x 31.6 = 322.32 times	0.590	190	400
DH5	13 times / 5 sec. x 31.6 = 82.16 times	3.417	281	400
Inquiry	10 times / 0.1sec. x 12.8 = 1280 times	0.237	303	400

**Mode1, AFH on**

Mode	Number of transmission in a 8(20 Hopping x 0.4) second period	Length of transmission time [msec]	Result [msec]	Limit [msec]
DH1	38 times /1sec. x 8 = 304.0 times	0.583	177	400
DH5	59 times / 5sec. x 8 = 94.4 times	3.467	327	400

Dwell Factor calculation for Spurious emissions :  $= 20 \times \log ( ( 3.467 \text{ [ms]} \times ( 59 / ( 5 \text{ [s]} / 0.100 \text{ [s]} ) ) ) / 100 \text{ [ms]} ) = -27.8 \text{ dB}$

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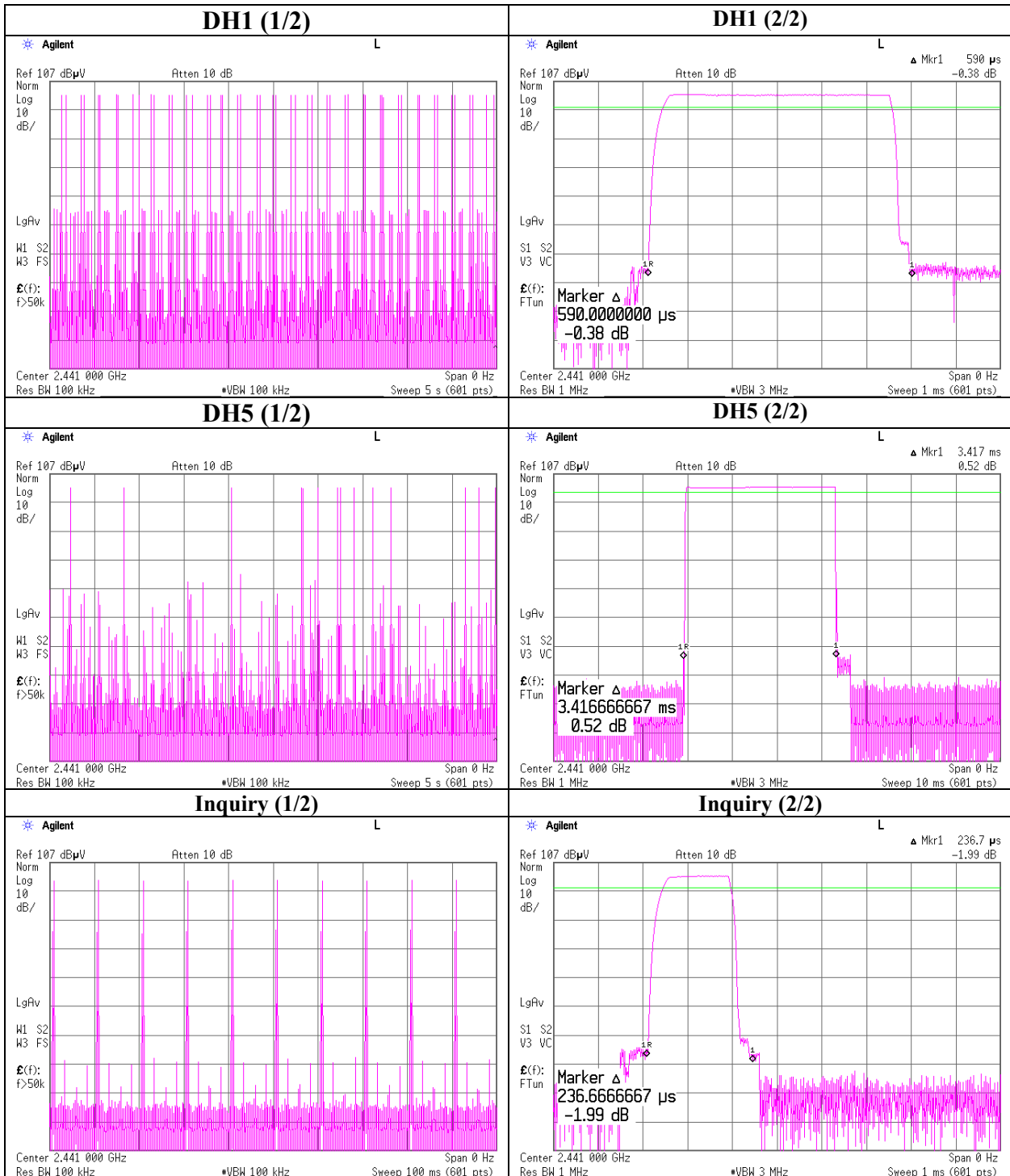
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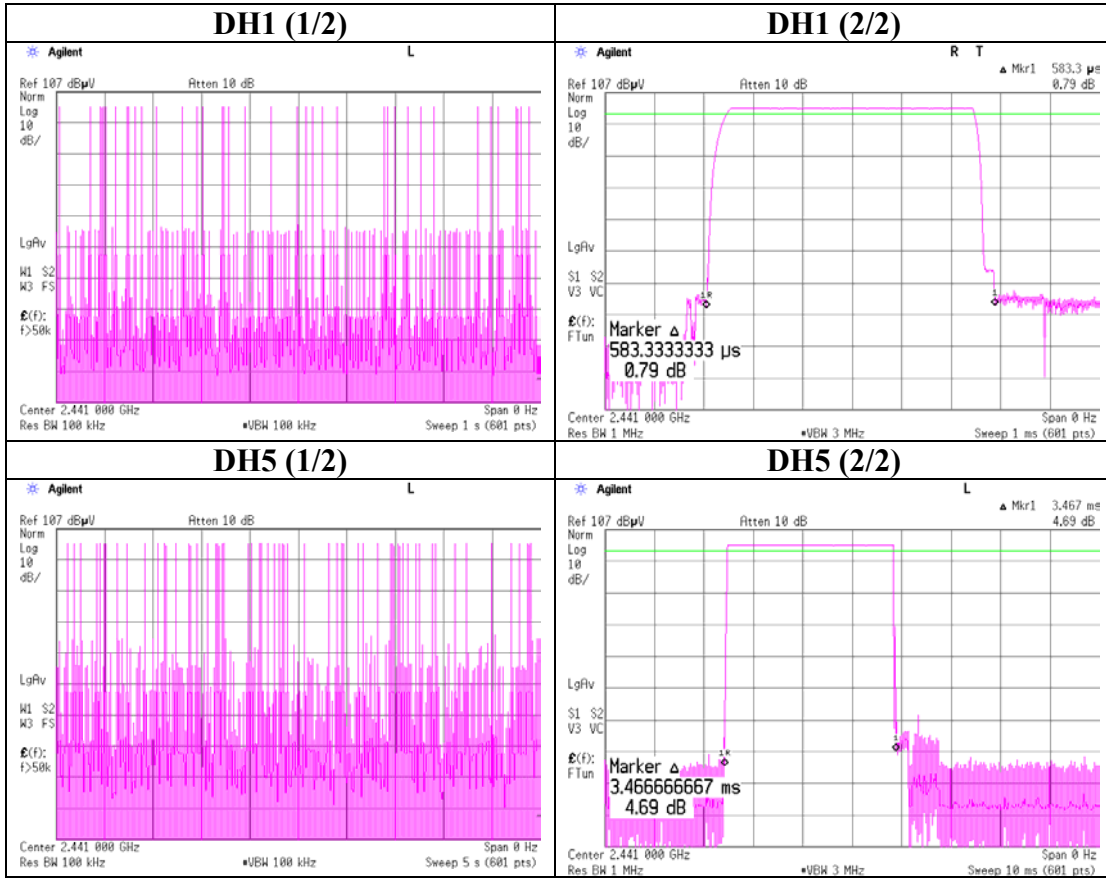
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**Dwell Time(Model)**  
**AFH off**



**Dwell Time(Model)**  
**AFH on**



### Maximum Peak Output Power(Mode1)

UL Apex Co., Ltd.  
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COMPANY : Panasonic Communications Co.,Ltd.      REGULATION : Fcc Part15 Subpart C 15.247(b)(1)  
EQUIPMENT : Color LCD Portable Unit      TEST DISTANCE : -  
MODEL : KX-THA12      DATE : 05/19/2005  
S/N : 0080F0801243      TEMPERATURE : 25deg.C  
POWER : DC3.6V      HUMIDITY : 45%  
MODE : Tx(Hopping off)/Inquiry      ENGINEER : Mitsuru Fujimura

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
Low	2402.0	-3.70	0.00	20.00	16.30	20.96	4.66
Mid	2441.0	-3.47	0.00	20.00	16.53	20.96	4.43
High	2480.0	-3.31	0.00	20.00	16.69	20.96	4.27
Inquiry	2441.0	-3.46	0.00	20.00	16.54	20.96	4.42

Sample Calculation:

Result = Reading + Cable Loss (supplied by customer)+ Attenuator

\* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.

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## Maximum Peak Output Power(Mode1)

UL Apex Co., Ltd.  
Head Office EMC Lab. No.3 Measurement Room

COMPANY	: Panasonic Communications Co.,Ltd.	REGULATION	: Fcc Part15 Subpart C 15.247(b)(1)
EQUIPMENT	: Color LCD Portable Unit	TEST DISTANCE	: -
MODEL	: KX-THA12	DATE	: 05/19/2005
S/N	: 351280f08000	TEMPERATURE	: 25deg.C
POWER	: DC3.6V	HUMIDITY	: 45%
MODE	: Tx(Hopping off)/Inquiry	ENGINEER	: Mitsuru Fujimura

### Out power measurement method

The Output power has been measured in a Semi Anechoic Chamber with a ground plane and at a distance of 3m. The highest of the measuring varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the output power. The measurements were performed for both vertical and horizontal antenna polarization with the Spectrum Analyzer.

### Spectrum Analyzer setting

Mode1: Resolution bandwidth set to 1MHz and Video bandwidth to 3MHz.  
Mode2 : Resolution bandwidth set to 3MHz and Video bandwidth to 10MHz.

### Calculation of result

E-field [dB $\mu$ V/m]= Reading (S/A) + Factor (Measurement equipment)

E-field [dB $\mu$ V/m] was converted into E[V/m]

EIRP[dBm] = 10log[((E\*d)<sup>2</sup>/30G)\*10<sup>3</sup>] ; d= 3[m], G =1

[Mode1 ]			
Ch	Freq.	E-field	EIRP
	[MHz]	[dB $\mu$ V/m]	[dBm]
Low	2402	111.3	16.1
Mid	2441	112.2	17.0
High	2480	112.5	17.3

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MF060b(01.06.05)

### Radiated Spurious Emission(Model1)

\* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

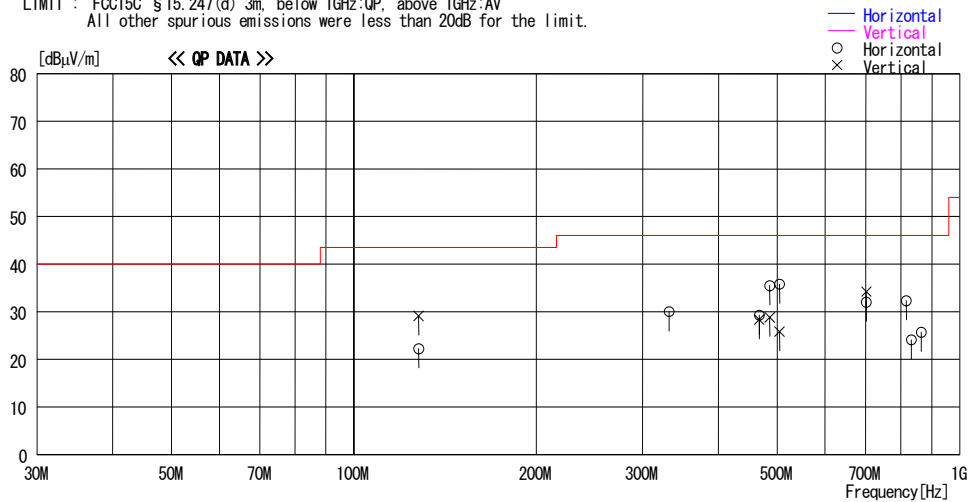
### DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber

Applicant : Panasonic Communications Co.,Ltd. Report No. : 25IE0112-HO  
Kind of EUT : Color LCD Portable Unit Power : AC120V/60Hz (AC Adaptor)  
Model No. : KX-THA12 Temp./Humi. : 27deg.C / 30%  
Serial No. : 351280F08000 Operator : Keiichi Aoki

Mode / Remarks : Mode1 Tx2441MHz /Main Antenna /EUT-Axis:Hor X-axis, Ver Y-axis (Max-axis)

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV  
All other spurious emissions were less than 20dB for the limit.



No.	FREQ [MHz]	READING QP [dBµV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBµV/m]	LIMIT [dBµV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
— Horizontal —										
1	128.009	34.8	13.7	1.1	27.4	22.2	43.5	21.3	138	81
2	331.638	38.8	16.0	2.2	27.0	30.0	46.0	16.0	100	274
3	467.097	35.8	18.8	2.7	28.0	29.3	46.0	16.7	100	279
4	485.999	41.9	18.9	2.8	28.1	35.5	46.0	10.5	194	99
5	504.515	42.2	18.9	2.9	28.2	35.8	46.0	10.2	181	76
6	701.996	36.0	20.5	3.6	28.1	32.0	46.0	14.0	211	312
7	816.993	34.2	22.0	4.0	27.9	32.3	46.0	13.7	100	291
8	832.758	26.0	22.0	4.0	27.9	24.1	46.0	21.9	100	87
9	864.956	27.5	21.9	4.1	27.8	25.7	46.0	20.3	100	138
— Vertical —										
10	128.009	41.7	13.7	1.1	27.4	29.1	43.5	14.4	100	317
11	467.097	34.8	18.8	2.7	28.0	28.3	46.0	17.7	100	180
12	485.999	35.2	18.9	2.8	28.1	28.8	46.0	17.2	192	189
13	504.515	32.2	18.9	2.9	28.2	25.8	46.0	20.2	100	78

CHART: WITH FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN  
CALCULATION : READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - AMP. GAIN Page:

\*There was no difference in levels at low/mid/high channels between 30MHz and 1GHz, and thus test was conducted at Tx 2441MHz only.

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## Radiated Spurious Emission (Mode1)

UL Apex Co., Ltd.  
Head Office EMC Lab. No.2 Semi Anechoic Chamber

Company : Panasonic Communications Co.,Ltd.	REPORT NO : 25IE0107-HO
Equipment : Color LCD Portable Unit	REGULATION : Fcc Part15 Subpart C 15.247(d)
Model : KX-THA12	TEST DISTANCE : 3/1m
Sample No. : 3512 800 8000	DATE : 05/18/2005
Power : DC 3.6 V	TEMPERATURE : 24deg.C
Mode : Model, Tx 2402MHz	HUMIDITY : 50%
Remarks : Hor X-axis / Ver Y-axis	ENGINEER : Keiichi Aoki

**PK DETECT** (RBW: 1MHz, VBW: 1MHz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter or ATT [dB]	Dwell Factor [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER						HOR	VER		HOR	VER
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>													
1	2390.0	44.5	44.6	30.5	36.4	3.7	10.7	0.0	53.0	53.1	74.0	21.0	20.9
3	4804.1	50.4	49.9	35.1	36.0	5.3	1.0	0.0	55.8	55.3	74.0	18.2	18.7
4	7206.1	47.2	46.8	37.7	36.1	6.6	0.4	0.0	55.8	55.4	74.0	18.2	18.6
5	9608.0	42.8	42.7	37.0	36.4	7.9	0.1	0.0	51.4	51.3	74.0	22.6	22.7
<b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b>													
6	12010.0	41.7	42.9	41.6	36.1	9.5	0.0	0.0	47.2	48.4	74.0	26.8	25.6
7	14412.0	41.6	41.2	41.7	34.6	9.7	0.0	0.0	48.9	48.5	74.0	25.1	25.5
8	16814.0	43.9	44.2	45.1	35.1	10.6	0.0	0.0	55.0	55.3	74.0	19.0	18.7
9	19216.0	43.1	43.7	40.1	34.1	12.0	0.0	0.0	51.6	52.2	74.0	22.4	21.8
10	21618.0	44.9	45.4	39.8	34.8	12.0	0.0	0.0	52.4	52.9	74.0	21.6	21.1
11	24020.0	45.2	44.9	40.4	35.5	13.9	0.0	0.0	54.5	54.2	74.0	19.5	19.8

**AV DETECT** (RBW: 1MHz, VBW: 10Hz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter or ATT [dB]	Dwell Factor [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER						HOR	VER		HOR	VER
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>													
1	2390.0	31.8	32.0	30.5	36.4	3.7	10.7	-27.8	12.5	12.7	54.0	41.5	41.3
3	4804.1	43.1	40.6	35.1	36.0	5.3	1.0	-27.8	20.7	18.2	54.0	33.3	35.8
4	7206.1	39.1	38.7	37.7	36.1	6.6	0.4	-27.8	19.9	19.5	54.0	34.1	34.5
5	9608.0	30.0	30.1	37.0	36.4	7.9	0.1	-27.8	10.8	10.9	54.0	43.2	43.1
<b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b>													
6	12010.0	29.3	29.9	41.6	36.1	9.5	0.0	-27.8	7.0	7.6	54.0	47.0	46.4
7	14412.0	28.7	28.7	41.7	34.6	9.7	0.0	-27.8	8.2	8.2	54.0	45.8	45.8
8	16814.0	31.4	31.5	45.1	35.1	10.6	0.0	-27.8	14.7	14.8	54.0	39.3	39.2
9	19216.0	30.8	30.8	40.1	34.1	12.0	0.0	-27.8	11.5	11.5	54.0	42.5	42.5
10	21618.0	32.1	32.0	39.8	34.8	12.0	0.0	-27.8	11.8	11.7	54.0	42.2	42.3
11	24020.0	32.4	32.4	40.4	35.5	13.9	0.0	-27.8	13.9	13.9	54.0	40.1	40.1

**20dBc(Fundamental 2402MHz)** (RBW: 100kHz, VBW: 300kHz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATT LOSS [dB]	Dwell Factor [dB]	RESULT		Limit 20dBc [dBuV/m]	MARGIN	
		HOR	VER						HOR	VER		HOR	VER
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>													
0	2402.0	103.9	105.6	30.5	36.4	3.7	10.7	0.0	112.4	114.1	-	-	-
2	2400.0	47.8	49.0	30.5	36.4	3.7	10.7	0.0	56.3	57.5	Funda-20dB	36.1	36.6

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB

\*Except for the above table : All other spurious emissions were less than 20dB for the limit.

\*In the frequency over the fifth harmonic, the noise from the EUT was not seen. The data above is its base noise.

\*The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

\*Hi-Pass Fiter was not used for factor 0.0dB of the above table.

\*Dwell Factor calculation for Spurious emissions : = 20 x log ( ( 3.467 [ms] x ( 59 / ( 5[s] / 0.100 [s] ) ) ) / 100 [ms] ) = -27.8 dB

## Radiated Spurious Emission (Mode1)

UL Apex Co., Ltd.  
Head Office EMC Lab. No.2 Semi Anechoic Chamber

Company : Panasonic Communications Co.,Ltd.	REPORT NO : 25IE0107-HO
Equipment : Color LCD Portable Unit	REGULATION : Fcc Part15 Subpart C 15.247(d)
Model : KX-THA12	TEST DISTANCE : 3/1m
Sample No. : 3512 80f0 8000	DATE : 05/16/2005
Power : DC 3.6 V	TEMPERATURE : 26deg.C
Mode : Mode1, Tx 2441MHz	HUMIDITY : 30%
Remarks : Hor X-axis / Ver Y-axis	ENGINEER : Keiichi Aoki

**PK DETECT** (RBW: 1MHz, VBW: 1MHz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter or ATT [dB]	Dwell Factor [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER						HOR	VER		HOR	VER
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>													
1	4881.9	53.4	53.3	35.6	36.0	5.3	1.0	0.0	59.3	59.2	74.0	14.7	14.8
2	7323.5	51.8	51.2	37.9	36.0	6.6	0.5	0.0	60.8	60.2	74.0	13.2	13.8
3	9763.8	45.5	47.8	36.8	36.4	8.1	0.2	0.0	54.2	56.5	74.0	19.8	17.5
<b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b>													
4	12205.0	41.2	43.4	41.6	36.0	9.5	0.0	0.0	46.8	49.0	74.0	27.2	25.0
5	14646.0	42.1	41.7	42.2	35.2	9.8	0.0	0.0	49.4	49.0	74.0	24.6	25.0
6	17087.0	43.6	43.9	45.2	34.9	10.8	0.0	0.0	55.2	55.5	74.0	18.8	18.5
7	19528.0	43.5	43.6	40.3	34.3	12.1	0.0	0.0	52.1	52.2	74.0	21.9	21.8
8	21969.0	44.3	44.4	39.8	34.2	12.0	0.0	0.0	52.4	52.5	74.0	21.6	21.5
9	24410.0	43.9	43.2	40.4	35.8	14.0	0.0	0.0	53.0	52.3	74.0	21.0	21.7

**AV DETECT** (RBW: 1MHz, VBW: 10Hz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter or ATT [dB]	Dwell Factor [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER						HOR	VER		HOR	VER
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>													
1	4881.9	46.9	46.8	35.6	36.0	5.3	1.0	-27.8	25.0	24.9	54.0	29.0	29.1
2	7323.5	42.1	41.4	37.9	36.0	6.6	0.5	-27.8	23.3	22.6	54.0	30.7	31.4
3	9763.8	34.2	37.3	36.8	36.4	8.1	0.2	-27.8	15.1	18.2	54.0	38.9	35.8
<b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b>													
4	12205.0	29.0	29.9	41.6	36.0	9.5	0.0	-27.8	6.8	7.7	54.0	47.2	46.3
5	14646.0	29.2	28.9	42.2	35.2	9.8	0.0	-27.8	8.7	8.4	54.0	45.3	45.6
6	17087.0	31.7	31.8	45.2	34.9	10.8	0.0	-27.8	15.5	15.6	54.0	38.5	38.4
7	19528.0	31.2	31.3	40.3	34.3	12.1	0.0	-27.8	12.0	12.1	54.0	42.0	41.9
8	21969.0	32.2	32.2	39.8	34.2	12.0	0.0	-27.8	12.5	12.5	54.0	41.5	41.5
9	24410.0	30.9	31.0	40.4	35.8	14.0	0.0	-27.8	12.2	12.3	54.0	41.8	41.7

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB

\*Except for the above table : All other spurious emissions were less than 20dB for the limit.

\*In the frequency over the fifth harmonic, the noise from the EUT was not seen. The data above is its base noise.

\*The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

\*Hi-Pass Fiter was not used for factor 0.0dB of the above table.

\*Dwell Factor calculation for Spurious emissions : = 20 x log ( ( 3.467 [ms] x ( 59 / ( 5[s] / 0.100 [s] ) ) ) / 100 [ms] ) = -27.8 dB

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MF060b(01.06.05)

## Radiated Spurious Emission (Mode1)

UL Apex Co., Ltd.  
Head Office EMC Lab. No.2 Semi Anechoic Chamber

Company : Panasonic Communications Co.,Ltd.	REPORT NO : 25IE0107-HO
Equipment : Color LCD Portable Unit	REGULATION : Fcc Part15 Subpart C 15.247(d)
Model : KX-THA12	TEST DISTANCE : 3/1m
Sample No. : 3512 80f0 8000	DATE : 05/16/2005
Power : DC 3.6 V	TEMPERATURE : 26deg.C
Mode : Mode1, Tx 2480MHz	HUMIDITY : 30%
Remarks : Hor X-axis / Ver Y-axis	ENGINEER : Keiichi Aoki

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter or ATT [dB]	Dwell Factor [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER						HOR	VER		HOR	VER
<b>PK DETECT (RBW: 1MHz, VBW: 1MHz)</b>													
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss													
1	2106.0	51.3	51.5	30.3	36.4	3.4	10.7	0.0	59.3	59.5	74.0	14.7	14.5
3	4959.7	55.4	57.5	36.1	35.9	5.3	1.1	0.0	62.0	64.1	74.0	12.0	9.9
4	7439.5	54.0	51.9	38.1	35.9	6.7	0.7	0.0	63.6	61.5	74.0	10.4	12.5
5	9919.4	48.0	49.7	36.7	36.5	8.1	0.3	0.0	56.6	58.3	74.0	17.4	15.7
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac													
6	12400.0	45.1	42.2	41.7	35.9	9.5	0.0	0.0	50.9	48.0	74.0	23.1	26.0
7	14880.0	41.8	41.8	42.7	36.0	9.9	0.0	0.0	48.9	48.9	74.0	25.1	25.1
8	17360.0	43.7	43.7	44.7	35.1	11.0	0.0	0.0	54.8	54.8	74.0	19.2	19.2
9	19840.0	43.5	43.8	40.4	34.8	12.3	0.0	0.0	51.9	52.2	74.0	22.1	21.8
10	22320.0	44.4	44.7	39.8	34.1	12.3	0.0	0.0	52.9	53.2	74.0	21.1	20.8
11	24800.0	44.6	43.3	40.7	35.1	14.0	0.0	0.0	54.7	53.4	74.0	19.3	20.6

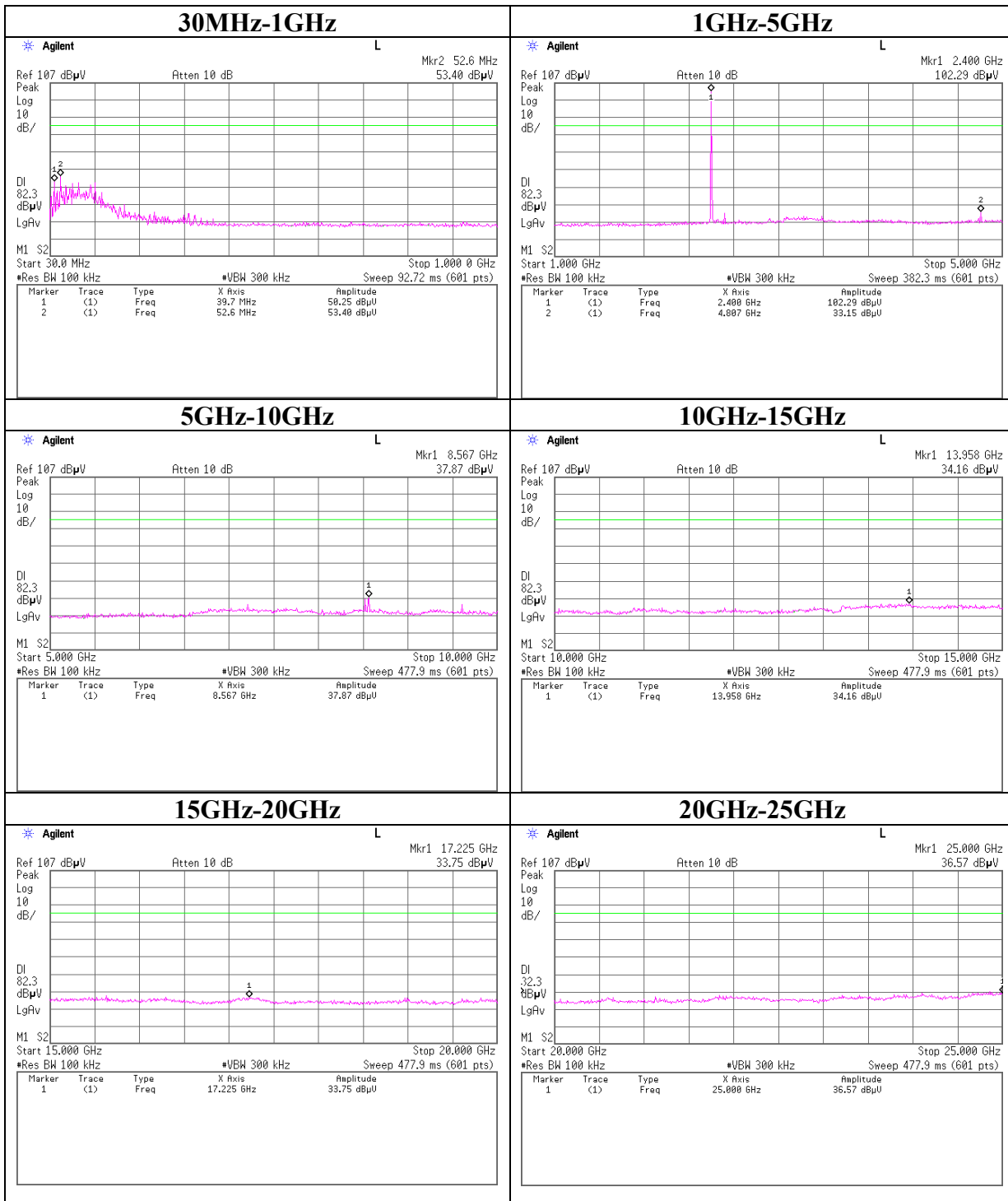
No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter or ATT [dB]	Dwell Factor [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER						HOR	VER		HOR	VER
<b>AV DETECT (RBW: 1MHz, VBW: 10Hz)</b>													
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss													
1	2106.0	47.1	47.7	30.3	36.4	3.4	10.7	-27.8	27.3	27.9	54.0	26.7	26.1
3	4959.7	48.1	50.8	36.1	35.9	5.3	1.1	-27.8	26.9	29.6	54.0	27.1	24.4
4	7439.5	44.3	41.9	38.1	35.9	6.7	0.7	-27.8	26.1	23.7	54.0	27.9	30.3
5	9919.4	36.6	38.6	36.7	36.5	8.1	0.3	-27.8	17.4	19.4	54.0	36.6	34.6
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac													
6	12400.0	33.6	30.1	41.7	35.9	9.5	0.0	-27.8	11.6	8.1	54.0	42.4	45.9
7	14880.0	29.1	29.5	42.7	36.0	9.9	0.0	-27.8	8.4	8.8	54.0	45.6	45.2
8	17360.0	31.3	31.6	44.7	35.1	11.0	0.0	-27.8	14.6	14.9	54.0	39.4	39.1
9	19840.0	31.3	31.4	40.4	34.8	12.3	0.0	-27.8	11.9	12.0	54.0	42.1	42.0
10	22320.0	32.1	32.2	39.8	34.1	12.3	0.0	-27.8	12.8	12.9	54.0	41.2	41.1
11	24800.0	30.9	31.0	40.7	35.1	14.0	0.0	-27.8	13.2	13.3	54.0	40.8	40.7

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATT LOSS [dB]	Dwell Factor [dB]	RESULT		Limit [dBuV/m]	MARGIN	
		HOR	VER						HOR	VER		HOR	VER
<b>Marker-Delta Method (RBW:100kHz)</b>													
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss													
<b>PK DETECT</b>													
2	2483.5	40.9	41.9	30.5	36.4	3.7	10.7	0.0	49.4	50.4	74.0	24.6	23.6
<b>AV DETECT</b>													
2	2483.5	28.2	27.5	30.5	36.4	3.7	10.7	0.0	36.7	36.0	54.0	17.3	18.0

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB  
\*Except for the above table : All other spurious emissions were less than 20dB for the limit.  
\*In the frequency over the fifth harmonic, the noise from the EUT was not seen. The data above is its base noise.  
\*The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.  
\*Hi-Pass Fiter was not used for factor 0.0dB of the above table.  
\*Dwell Factor calculation for Spurious emissions : = 20 x log ( ( 3.467 [ms] x ( 59 / ( 5[s] / 0.100 [s] ) ) ) / 100 [ms] ) = -27.8 dB

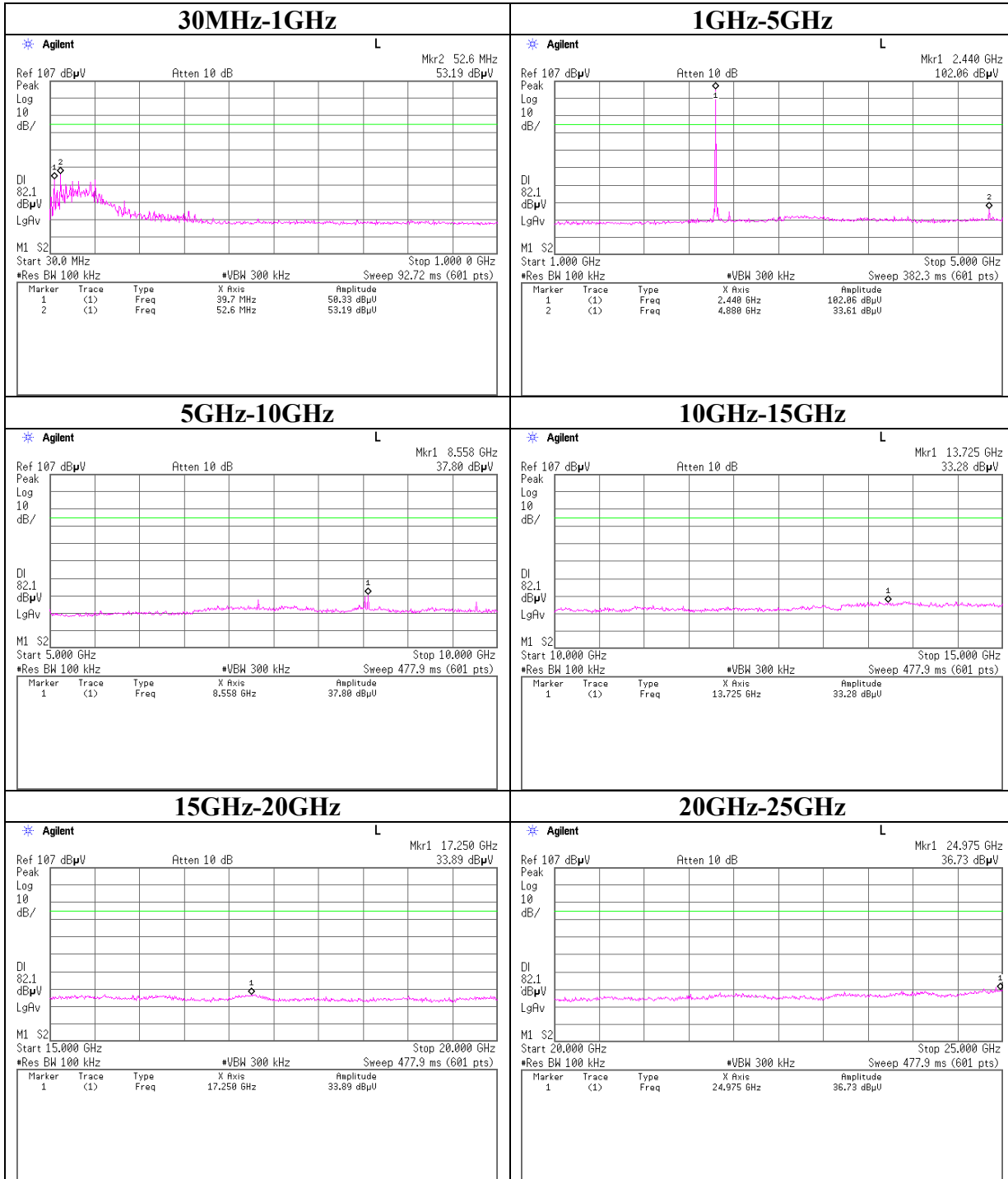
### Conducted Spurious Emission (Mode1)

Ch:Low

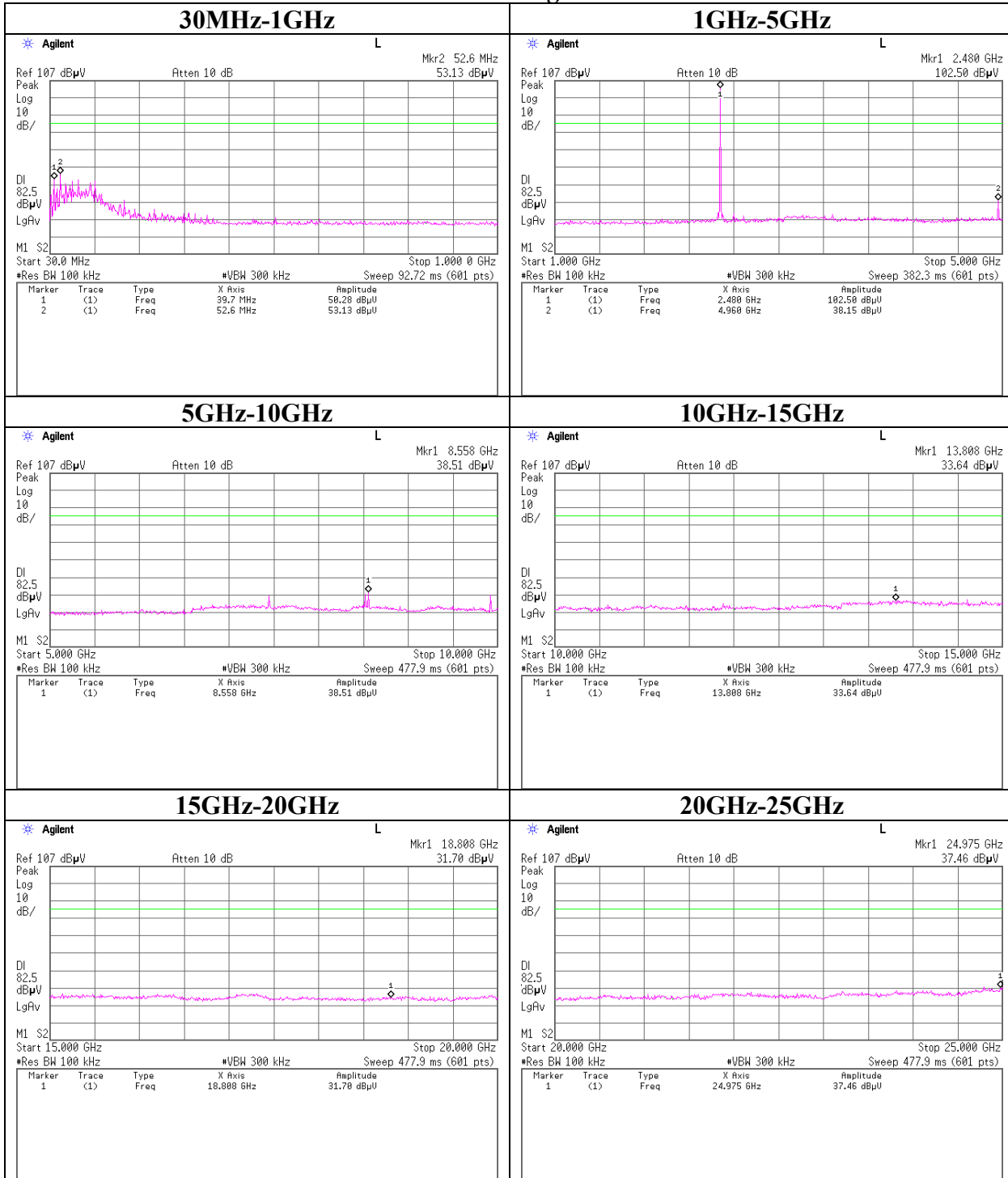


### Conducted Spurious Emission (Mode1)

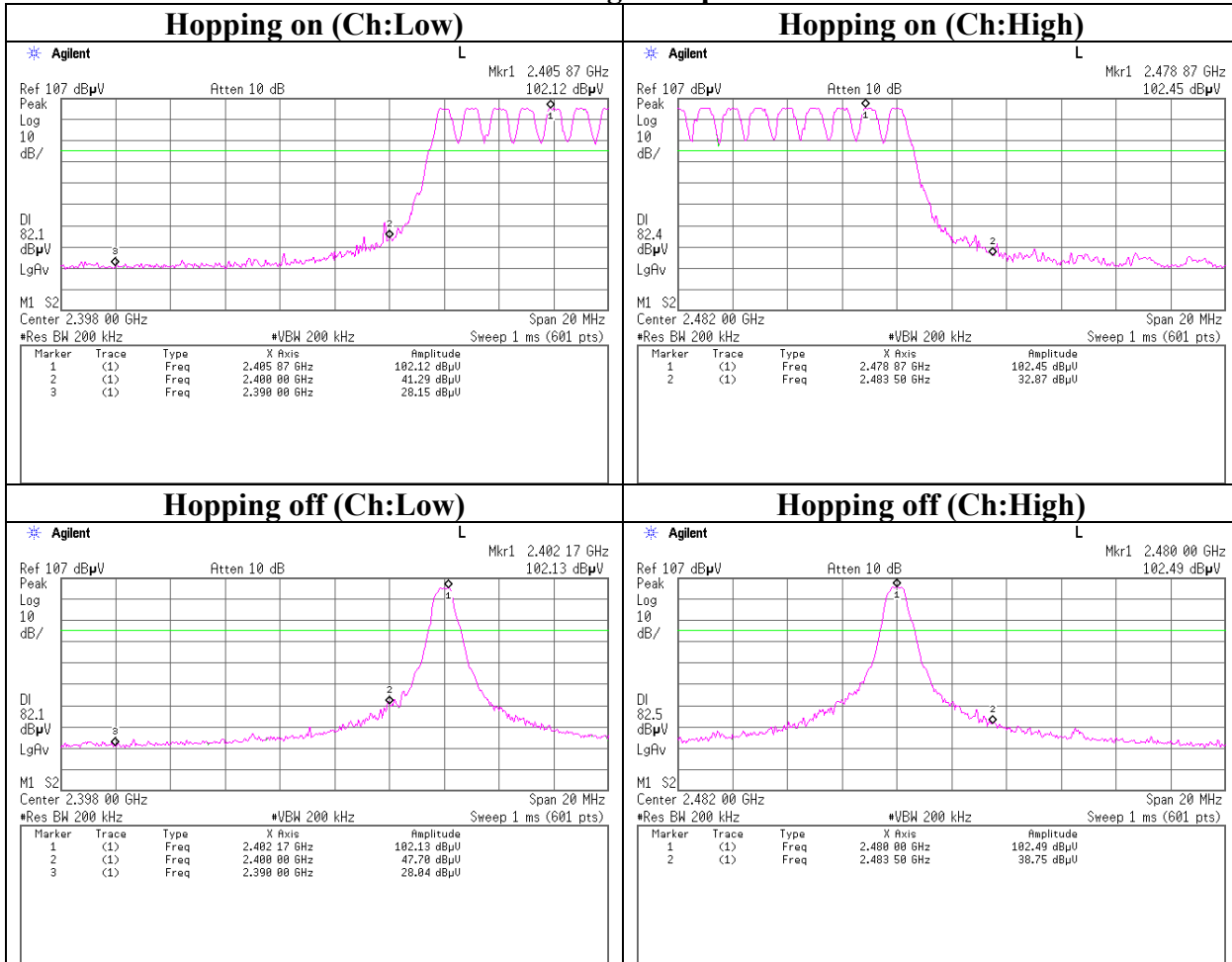
Ch:Mid



**Conducted Spurious Emission (Mode1)**  
**Ch:High**



**Conducted Spurious Emission (Mode1)**  
**Band Edge compliance**



**[Mode2]**

**Carrier Frequency Separation(Mode2)**

UL Apex Co., Ltd.  
Head Office EMC Lab. No.3 Measurement Room

COMPANY : Panasonic Communications Co.,Ltd.      REGULATION : Fcc Part15 Subpart C 15.247(a)(1)  
EQUIPMENT : Color LCD Portable Unit      TEST DISTANCE : -  
MODEL : KX-THA12      DATE : 05/19/2005  
S/ N : 0080F0801243      TEMPERATURE : 25deg.C  
POWER : DC3.6V      HUMIDITY : 45%  
MODE : Tx(Hopping on)      ENGINEER : Mitsuru Fujimura

Ch	Freq. [MHz]	Channel separation [MHz]	Limit
Low	2402.0	2.000	>two-thirds of 20dB Bandwidth or 25[kHz]
Mid	2440.0	1.980	>two-thirds of 20dB Bandwidth or 25[kHz]
High	2480.0	2.010	>two-thirds of 20dB Bandwidth or 25[kHz]

### Carrier Frequency Separation(Mode2)



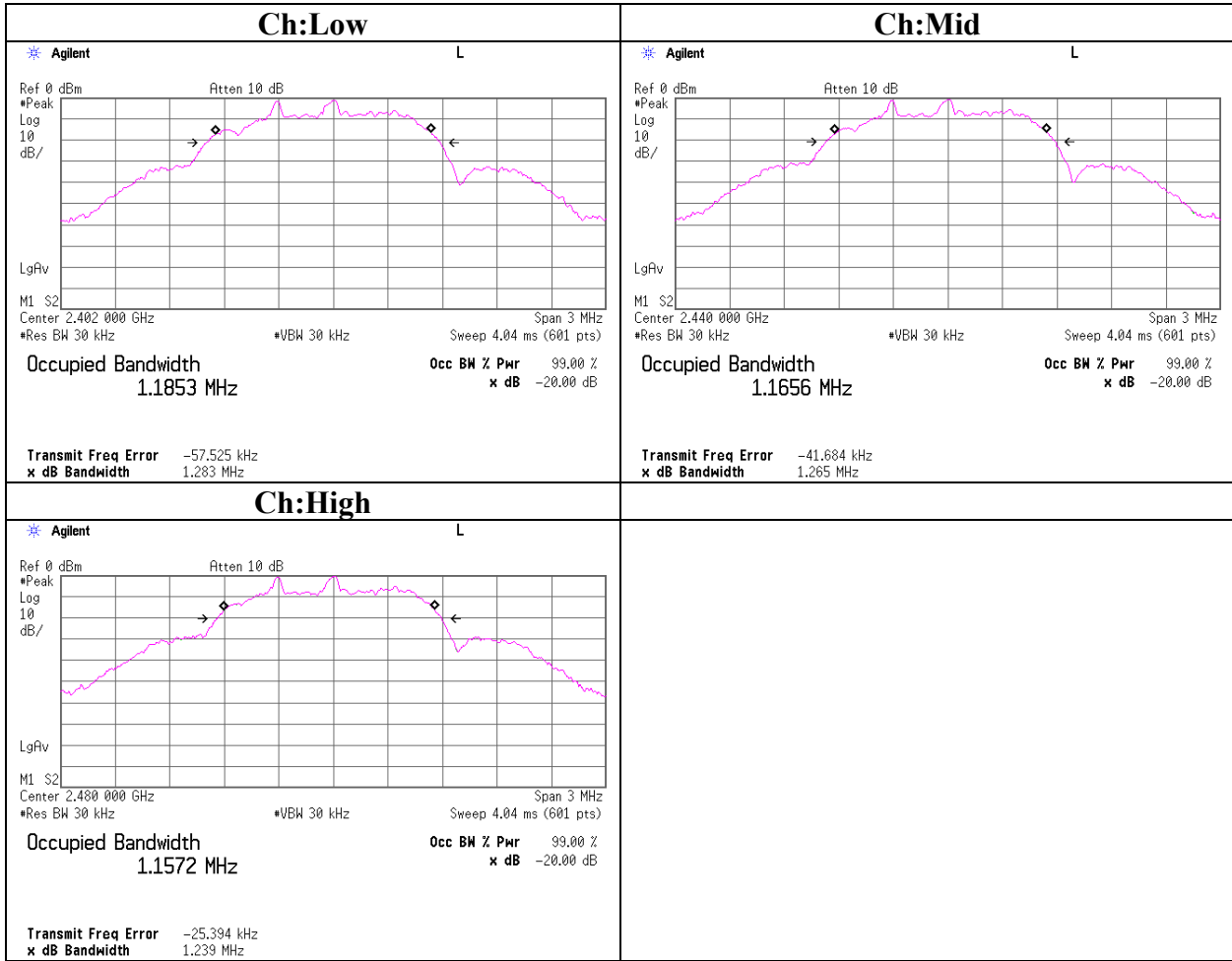
## 20dB Bandwidth(Mode2)

UL Apex Co., Ltd.  
Head Office EMC Lab. No.3 Measurement Room

COMPANY	: Panasonic Communications Co.,Ltd.	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	: Color LCD Portable Unit	TEST DISTANCE	: -
MODEL	: KX-THA12	DATE	: 05/19/2005
S/ N	: 0080F0801243	TEMPERATURE	: 25deg.C
POWER	: DC3.6V	HUMIDITY	: 45%
MODE	: Tx (Hopping off)	ENGINEER	: Mitsuru Fujimura

Ch	Freq. [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
Low	2402.0	1.283	-
Mid	2440.0	1.265	-
High	2480.0	1.239	-

**20dB Bandwidth(Mode2)**



## Number of Hopping Frequency(Mode2)

UL Apex Co., Ltd.  
Head Office EMC Lab. No.3 Measurement Room

COMPANY : Panasonic Communications Co.,Ltd. REGULATION : Fcc Part15 Subpart C 15.247(a)(1)(iii)  
EQUIPMENT : Color LCD Portable Unit TEST DISTANCE : -  
MODEL : KX-THA12 DATE : 05/19/2005  
S/ N : 0080F0801243 TEMPERATURE : 25deg.C  
POWER : DC3.6V HUMIDITY : 45%  
MODE : Tx (Hopping on) ENGINEER : Mitsuru Fujimura

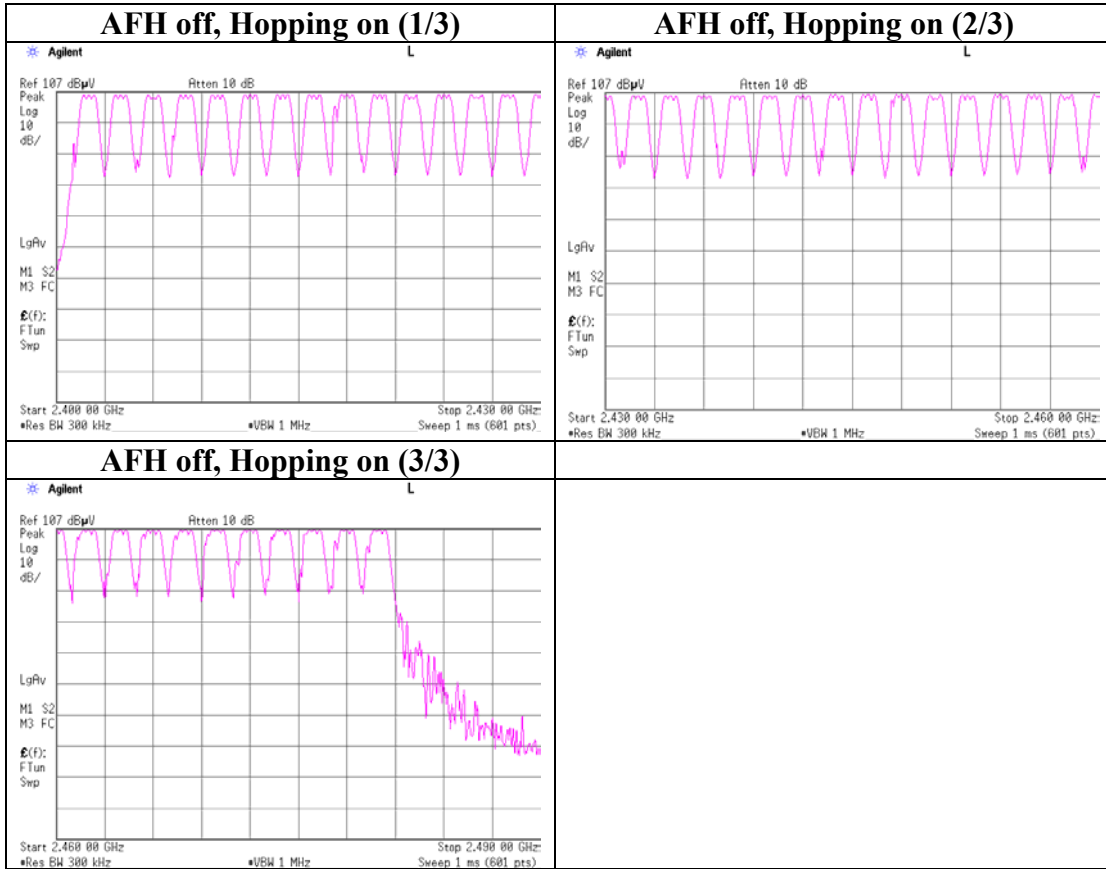
### Mode 2, AFH off

Mode	Number of channel [time]	Limit [time]
Tx(Hopping on)	40	$\geq 15$

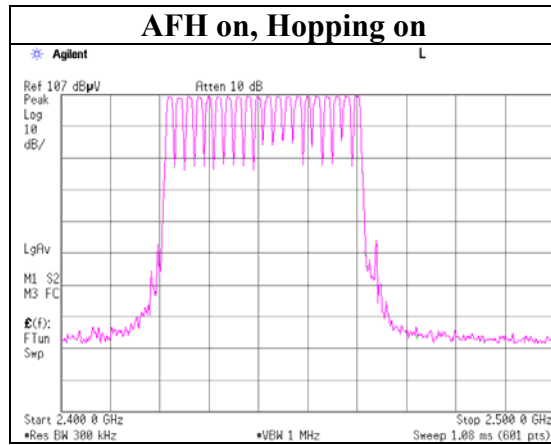
### Mode 2, AFH on

Mode	Number of channel [time]	Limit [time]
Tx(Hopping on)	20	$\geq 15$

**Number of Hopping Frequency(Mode2)**



**Number of Hopping Frequency(Mode2)**



**Dwell time(Mode2)**

UL Apex Co., Ltd.  
Head Office EMC Lab. No.3 Measurement Room

COMPANY : Panasonic Communications Co.,Ltd.      REGULATION : Fcc Part15 Subpart C 15.247(a)(1)(iii)  
EQUIPMENT : Color LCD Portable Unit      TEST DISTANCE : -  
MODEL : KX-THA12      DATE : 05/19/2005  
S/ N : 0080F0801243      TEMPERATURE : 25deg.C  
POWER : DC3.6V      HUMIDITY : 45%  
MODE : Tx (Hopping on)      ENGINEER : Mitsuru Fujimura

**Mode2, AFH off**

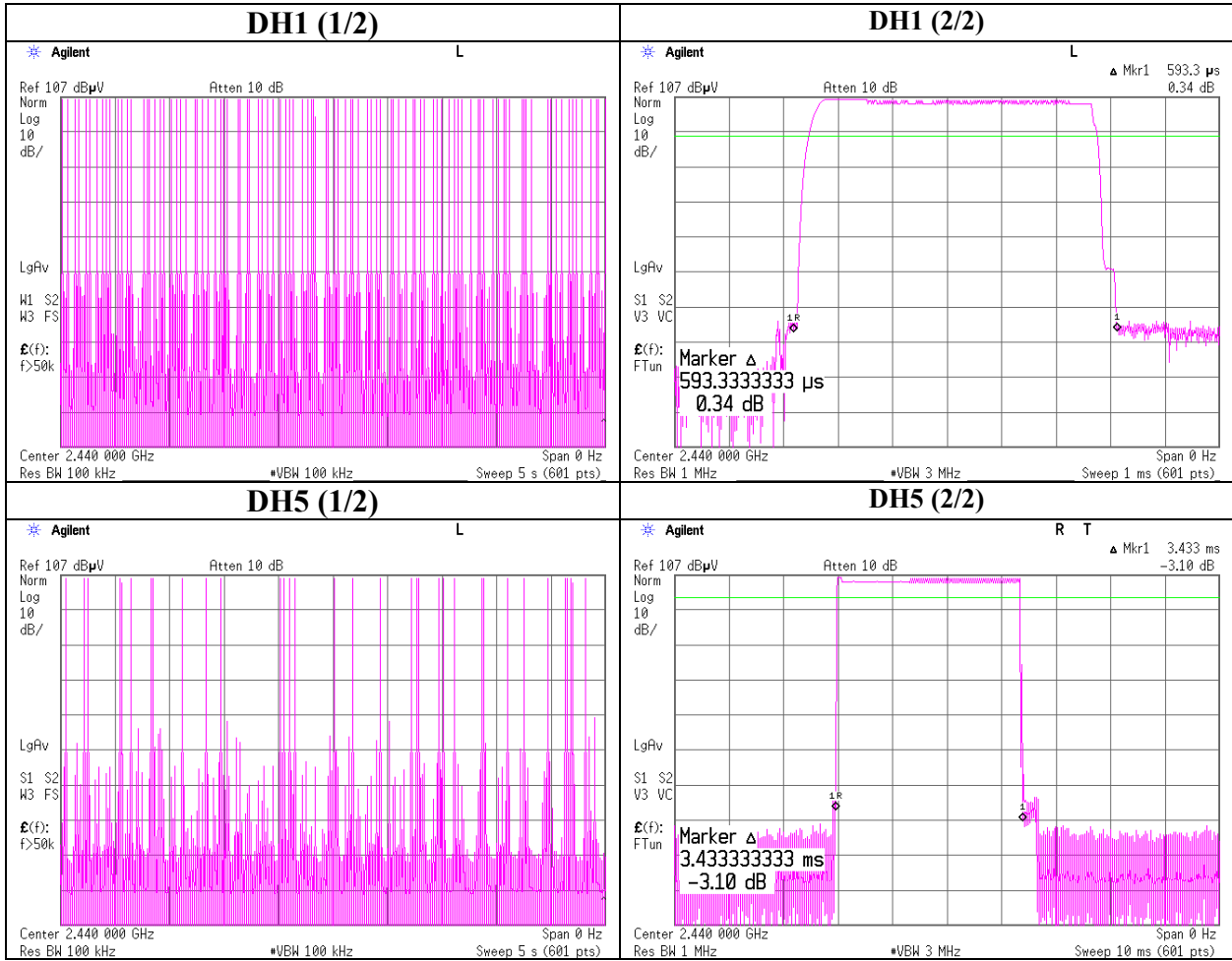
Mode	Number of transmission in a 16(40 Hopping x 0.4)	Length of transmission time [msec]	Result [msec]	Limit [msec]
DH1	101 times /5sec. x 16 = 323.2 times	0.593	192	400
DH5	34 times /5 sec. x 16 = 108.8 times	3.433	374	400

**Mode2, AFH on**

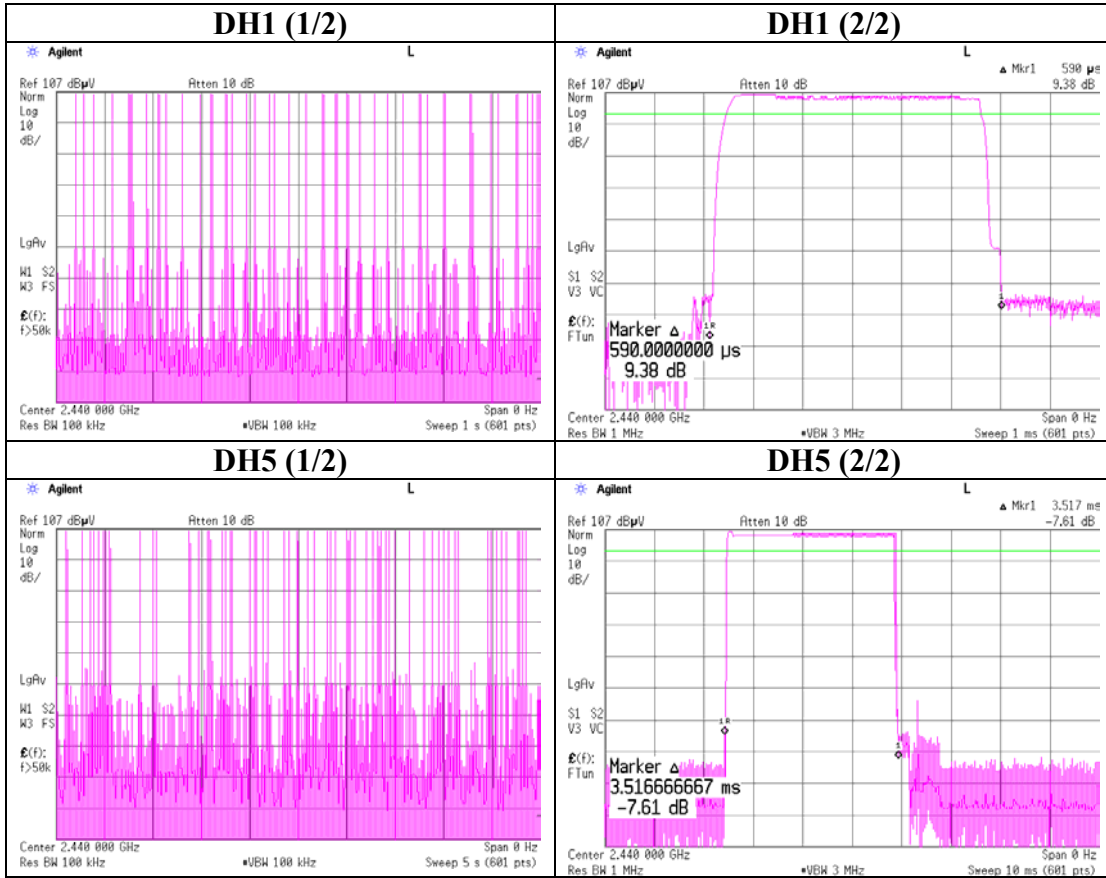
Mode	Number of transmission in a 8(20 Hopping x 0.4) second period	Length of transmission time [msec]	Result [msec]	Limit [msec]
DH1	48 times /1sec. x 8 = 384.0 times	0.590	227	400
DH5	66 times / 5sec. x 8 = 105.6 times	3.517	371	400

Dwell Factor calculation for Spurious emissions :  $= 20 \times \log ( ( 3.517 \text{ [ms]} \times ( 66 / ( 5 \text{ [s]} / 0.100 \text{ [s]} ) ) ) / 100 \text{ [ms]} ) = -26.7 \text{ dB}$

**Dwell Time(Mode2)**  
**AFH off**



**Dwell Time(Mode2)**  
**AFH on**



## Maximum Peak Output Power(Mode2)

UL Apex Co., Ltd.  
Head Office EMC Lab. No.3 Measurement Room

COMPANY : Panasonic Communications Co.,Ltd.      REGULATION : Fcc Part15 Subpart C 15.247(b)(1)  
EQUIPMENT : Color LCD Portable Unit      TEST DISTANCE : -  
MODEL : KX-THA12      DATE : 05/19/2005  
S/ N : 0080F0801243      TEMPERATURE : 25deg.C  
POWER : DC3.6V      HUMIDITY : 45%  
MODE : Tx(Hopping off)      ENGINEER : Mitsuru Fujimura

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
Low	2402.0	0.13	0.00	20.00	20.13	20.96	0.83
Mid	2440.0	0.52	0.00	20.00	20.52	20.96	0.44
High	2480.0	0.82	0.00	20.00	20.82	20.96	0.14

Sample Calculation:

Result = Reading + Cable Loss (supplied by customer)+ Attenuator

\* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.

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**UL Apex Co., Ltd.**

**Head Office EMC Lab.**

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MF060b(01.06.05)

## Maximum Peak Output Power(Mode2)

UL Apex Co., Ltd.  
 Head Office EMC Lab. No.3 Measurement Room

COMPANY : Panasonic Communications Co.,Ltd.	REGULATION : Fcc Part15 Subpart C 15.247(b)(1)
EQUIPMENT : Color LCD Portable Unit	TEST DISTANCE : -
MODEL : KX-THA12	DATE : 05/19/2005
S/ N : 351280f08000	TEMPERATURE : 25deg.C
POWER : DC3.6V	HUMIDITY : 45%
MODE : Tx(Hopping off)/Inquiry	ENGINEER : Mitsuru Fujimura

### Out power measurement method

The Output power has been measured in a Semi Anechoic Chamber with a ground plane and at a distance of 3m.  
 The highest of the measuring varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the output power.  
 The measurements were performed for both vertical and horizontal antenna polarization with the Spectrum Analyzer.

### Spectrum Analyzer setting

Model1: Resolution bandwidth set to 1MHz and Video bandwidth to 3MHz.  
 Mode2 : Resolution bandwidth set to 3MHz and Video bandwidth to 10MHz.

### Calculation of result

E-field [dBμV/m]= Reading (S/A) + Factor (Measurement equipment)  
 E-field [dBμV/m] was converted into E[V/m]  
 $EIRP[dBm] = 10\log[((E*d)^2/30G)*10^3]$  ; d= 3[m], G =1

[Mode2 ]			
Ch	Freq.	E-field	EIRP
	[MHz]	[dBμV/m]	[dBm]
Low	2402	115.0	19.8
Mid	2440	115.8	20.6
High	2480	116.2	21.0

### Radiated Spurious Emission(Mode2)

\* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

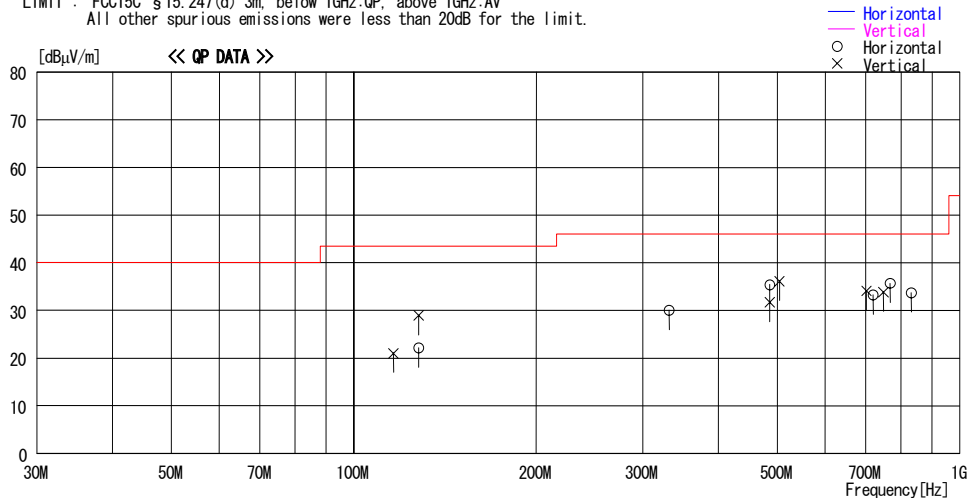
### DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber

Applicant : Panasonic Communications Co., Ltd. Report No. : 25IE0112-HO  
Kind of EUT : Color LCD Portable Unit Power : AC120V/60Hz (AC Adaptor)  
Model No. : KX-THA12 Temp./Humi. : 27deg. C / 30%  
Serial No. : 351280F08000 Operator : Mitsuru Fujimura

Mode / Remarks : Mode2 Tx2440MHz /Main Antenna /EUT-Axis:Hor X-axis, Ver Y-axis (Max-axis)

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV  
All other spurious emissions were less than 20dB for the limit.



No.	FREQ [MHz]	READING QP [dBµV]	ANT FACTOR [dB/m]	LOSS	GAIN	RESULT [dBµV/m]	LIMIT [dBµV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
— Horizontal —										
1	128.008	34.7	13.7	1.1	27.4	22.1	43.5	21.4	177	360
2	486.005	41.8	18.9	2.8	28.1	35.4	46.0	10.6	197	282
3	331.645	38.8	16.0	2.2	27.0	30.0	46.0	16.0	100	274
4	768.000	38.5	21.5	3.8	28.1	35.7	46.0	10.3	113	279
5	831.995	35.6	22.0	4.0	27.9	33.7	46.0	12.3	100	94
6	719.997	36.8	20.8	3.8	28.2	33.2	46.0	12.8	127	274
— Vertical —										
7	116.368	34.9	12.6	1.0	27.5	21.0	43.5	22.5	100	360
8	128.005	41.5	13.7	1.1	27.4	28.9	43.5	14.6	100	347
9	504.522	42.5	18.9	2.9	28.2	36.1	46.0	9.9	100	1
10	485.999	38.1	18.9	2.8	28.1	31.7	46.0	14.3	234	360
11	701.998	38.1	20.5	3.6	28.1	34.1	46.0	11.9	173	179
12	748.882	36.8	21.2	3.8	28.0	33.8	46.0	12.2	160	360

CHART: WITH FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN  
CALCULATION : READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - AMP. GAIN Page:

\*There was no difference in levels at low/mid/high channels between 30MHz and 1GHz, and thus test was conducted at Tx 2440MHz only.

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MF060b(01.06.05)

## Radiated Spurious Emission (Mode2)

UL Apex Co., Ltd.  
Head Office EMC Lab. No.2 Semi Anechoic Chamber

Company : Panasonic Communications Co.,Ltd.  
Equipment : Color LCD Portable Unit  
Model : KX-THA12  
Sample No. : 3512 80f0 8000  
Power : DC 3.6 V  
Mode : Mode2, Tx 2402MHz  
Remarks : Hor X-axis / Ver Y-axis  
**PK DETECT** (RBW: 1MHz, VBW: 1MHz)

REPORT NO : 25IE0112-HO  
REGULATION : Fcc Part15 Subpart C 15.247(d)  
TEST DISTANCE : 3/1m  
DATE : 05/18/2005  
TEMPERATURE : 24deg.C  
HUMIDITY : 50%  
ENGINEER : Mitsuru Fujimura

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter or ATT [dB]	Dwell Factor [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER						HOR	VER		HOR	VER
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>													
1	2390.0	47.2	46.3	30.5	36.4	3.7	10.7	0.0	55.7	54.8	74.0	18.3	19.2
3	4804.0	52.6	52.4	35.1	36.0	5.3	1.0	0.0	58.0	57.8	74.0	16.0	16.2
4	7206.0	50.9	49.2	37.7	36.1	6.6	0.4	0.0	59.5	57.8	74.0	14.5	16.2
5	9606.9	44.9	45.4	37.0	36.4	7.9	0.1	0.0	53.5	54.0	74.0	20.5	20.0
<b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b>													
6	12010.0	41.9	43.9	41.6	36.1	9.5	0.0	0.0	47.4	49.4	74.0	26.6	24.6
7	14412.0	41.1	41.3	41.7	34.6	9.7	0.0	0.0	48.4	48.6	74.0	25.6	25.4
8	16814.0	43.8	44.1	45.1	35.1	10.6	0.0	0.0	54.9	55.2	74.0	19.1	18.8
9	19216.0	43.1	44.1	40.1	34.1	12.0	0.0	0.0	51.6	52.6	74.0	22.4	21.4
10	21618.0	45.0	44.9	39.8	34.8	12.0	0.0	0.0	52.5	52.4	74.0	21.5	21.6
11	24020.0	44.9	44.7	40.4	35.5	13.9	0.0	0.0	54.2	54.0	74.0	19.8	20.0

**AV DETECT** (RBW: 1MHz, VBW: 10Hz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter or ATT [dB]	Dwell Factor [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER						HOR	VER		HOR	VER
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>													
1	2390.0	35.2	32.6	30.5	36.4	3.7	10.7	-26.7	17.0	14.4	54.0	37.0	39.7
3	4804.0	41.0	42.1	35.1	36.0	5.3	1.0	-26.7	19.7	20.8	54.0	34.3	33.2
4	7206.0	39.5	38.2	37.7	36.1	6.6	0.4	-26.7	21.4	20.1	54.0	32.6	33.9
5	9606.9	32.8	33.3	37.0	36.4	7.9	0.1	-26.7	14.7	15.2	54.0	39.3	38.8
<b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b>													
6	12010.0	29.4	29.5	41.6	36.1	9.5	0.0	-26.7	8.2	8.3	54.0	45.8	45.7
7	14412.0	28.7	28.6	41.7	34.6	9.7	0.0	-26.7	9.3	9.2	54.0	44.7	44.8
8	16814.0	31.5	31.4	45.1	35.1	10.6	0.0	-26.7	15.9	15.8	54.0	38.1	38.2
9	19216.0	30.8	30.7	40.1	34.1	12.0	0.0	-26.7	12.6	12.5	54.0	41.4	41.5
10	21618.0	32.0	31.9	39.8	34.8	12.0	0.0	-26.7	12.8	12.7	54.0	41.2	41.3
11	24020.0	32.4	32.4	40.4	35.5	13.9	0.0	-26.7	15.0	15.0	54.0	39.0	39.0

\* Reference data

**20dBc(Fundamental 2402MHz)** (RBW: 100kHz, VBW: 300kHz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATT LOSS [dB]	Dwell Factor [dB]	RESULT		Limit 20dBc [dBuV/m]	MARGIN	
		HOR	VER						HOR	VER		HOR	VER
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>													
0	2402.0	107.1	109.4	30.5	36.4	3.7	10.7	0.0	115.6	117.9	-	-	-
2	2400.0	54.8	57.6	30.5	36.4	3.7	10.7	0.0	63.3	66.1	Funda-20dB	32.2	31.8

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB

\*Except for the above table : All other spurious emissions were less than 20dB for the limit.

\*In the frequency over the fifth harmonic, the noise from the EUT was not seen. The data above is its base noise.

\*The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

\*Hi-Pass Fiter was not used for factor 0.0dB of the above table.

Dwell Factor calculation for Spurious emissions : = 20 x log ( ( 3.517 [ms] x ( 66 / ( 5[s] / 0.100 [s] ) ) ) / 100 [ms] ) = -26.7 dB

## Radiated Spurious Emission (Mode2)

UL Apex Co., Ltd.  
Head Office EMC Lab. No.2 Semi Anechoic Chamber

Company : Panasonic Communications Co.,Ltd.	REPORT NO : 25IE0112-HO
Equipment : Color LCD Portable Unit	REGULATION : Fcc Part15 Subpart C 15.247(d)
Model : KX-THA12	TEST DISTANCE : 3/1m
Sample No. : 3512 80f0 8000	DATE : 05/18/2005
Power : DC 3.6 V	TEMPERATURE : 24deg.C
Mode : Mode2, Tx 2440MHz	HUMIDITY : 50%
Remarks : Hor X-axis / Ver Y-axis	ENGINEER : Mitsuru Fujimura

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter or ATT [dB]	Dwell Factor [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER						HOR	VER		HOR	VER
<b>PK DETECT (RBW: 1MHz, VBW: 1MHz)</b>													
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>													
1	2106.0	51.0	51.6	30.3	36.4	3.4	10.7	0.0	59.0	59.6	74.0	15.0	14.4
2	4880.1	56.4	54.0	35.6	36.0	5.3	1.0	0.0	62.3	59.9	74.0	11.7	14.1
3	7319.9	55.5	55.0	37.9	36.0	6.6	0.5	0.0	64.5	64.0	74.0	9.5	10.0
4	9759.9	53.1	48.2	36.8	36.4	8.1	0.2	0.0	61.8	56.9	74.0	12.2	17.1
<b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b>													
5	12200.0	43.8	44.2	41.6	36.0	9.5	0.0	0.0	49.4	49.8	74.0	24.6	24.2
6	14640.0	41.7	41.9	42.2	35.1	9.8	0.0	0.0	49.1	49.3	74.0	24.9	24.7
7	17080.0	43.6	44.5	45.2	34.9	10.8	0.0	0.0	55.2	56.1	74.0	18.8	17.9
8	19520.0	42.6	44.3	40.3	34.3	12.1	0.0	0.0	51.2	52.9	74.0	22.8	21.1
9	21960.0	44.5	44.7	40.2	34.9	12.9	0.0	0.0	53.2	53.4	74.0	20.8	20.6
10	24400.0	43.0	44.0	40.4	35.8	14.0	0.0	0.0	52.1	53.1	74.0	21.9	20.9

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter or ATT [dB]	Dwell Factor [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER						HOR	VER		HOR	VER
<b>AV DETECT (RBW: 1MHz, VBW: 10Hz)</b>													
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>													
1	2106.0	46.2	47.4	30.3	36.4	3.4	10.7	-26.7	27.5	28.7	54.0	26.5	25.3
2	4880.1	41.3	39.4	35.6	36.0	5.3	1.0	-26.7	20.5	18.6	54.0	33.5	35.4
3	7319.9	44.1	43.6	37.9	36.0	6.6	0.5	-26.7	26.4	25.9	54.0	27.6	28.1
4	9759.9	39.0	35.8	36.8	36.4	8.1	0.2	-26.7	21.0	17.8	54.0	33.0	36.2
<b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b>													
5	12200.0	30.0	30.2	41.6	36.0	9.5	0.0	-26.7	8.9	9.1	54.0	45.1	44.9
6	14640.0	29.6	28.9	42.2	35.1	9.8	0.0	-26.7	10.3	9.6	54.0	43.7	44.4
7	17080.0	31.6	31.8	45.2	34.9	10.8	0.0	-26.7	16.5	16.7	54.0	37.5	37.3
8	19520.0	31.3	31.3	40.3	34.3	12.1	0.0	-26.7	13.2	13.2	54.0	40.8	40.8
9	21960.0	32.2	32.2	40.2	34.9	12.9	0.0	-26.7	14.2	14.2	54.0	39.8	39.8
10	24400.0	30.9	31.0	40.4	35.8	14.0	0.0	-26.7	13.3	13.4	54.0	40.7	40.6

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATT LOSS [dB]	Dwell Factor [dB]	RESULT		Limit 20dBc [dBuV/m]	MARGIN	
		HOR	VER						HOR	VER		HOR	VER
<b>20dBc(Fundamental 2402MHz) (RBW: 100kHz, VBW: 300kHz)</b>													
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>													
0	2440.0	106.9	109.8	30.5	36.4	3.6	10.7	0.0	115.3	118.2	-	-	-
1	2106.0	47.7	48.9	30.3	36.4	3.4	10.7	0.0	55.7	56.9	Funda-20dB	39.6	41.3

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB  
\*Except for the above table : All other spurious emissions were less than 20dB for the limit.  
\*In the frequency over the fifth harmonic, the noise from the EUT was not seen. The data above is its base noise.  
\*The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.  
\*Hi-Pass Fiter was not used for factor 0.0dB of the above table.  
Dwell Factor calculation for Spurious emissions : = 20 x log ( ( 3.517 [ms] x ( 66 / ( 5[s] / 0.100 [s] ) ) ) / 100 [ms] ) = -26.7 dB

### Radiated Spurious Emission (Mode2)

<p>Company : Panasonic Communications Co.,Ltd.  Equipment : Color LCD Portable Unit  Model : KX-THA12  Sample No. : 3512 80f0 8000  Power : DC 3.6 V  Mode : Mode2, Tx 2480MHz  Remarks : Hor X-axis / Ver Y-axis  <b>PK DETECT</b> (RBW: 1MHz, VBW: 1MHz)</p>	<p style="text-align: center;">UL Apex Co., Ltd.  Head Office EMC Lab. No.2 Semi Anechoic Chamber</p> <p>REPORT NO : 25IE0112-HO  REGULATION : Fcc Part15 Subpart C 15.247(d)  TEST DISTANCE : 3/1m  DATE : 05/18/2005  TEMPERATURE : 24deg.C  HUMIDITY : 50%  ENGINEER : Mitsuru Fujimura</p>
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No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter or ATT [dB]	Dwell Factor [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER						HOR	VER		HOR	VER
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>													
2	2368.9	61.9	61.0	30.4	36.4	3.7	10.7	0.0	70.3	69.4	74.0	3.7	4.6
5	4960.0	57.9	56.4	36.1	35.9	5.3	1.1	0.0	64.5	63.0	74.0	9.5	11.0
6	7440.1	54.2	54.7	38.1	35.9	6.7	0.7	0.0	63.8	64.3	74.0	10.2	9.7
7	9919.2	52.3	51.1	36.7	36.5	8.1	0.3	0.0	60.9	59.7	74.0	13.1	14.3
<b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b>													
8	12400.0	42.9	43.5	41.7	35.9	9.5	0.0	0.0	48.7	49.3	74.0	25.3	24.7
9	14880.0	41.9	41.5	42.7	36.0	9.9	0.0	0.0	49.0	48.6	74.0	25.0	25.4
10	17360.0	43.9	44.7	44.7	35.1	11.0	0.0	0.0	55.0	55.8	74.0	19.0	18.2
11	19840.0	44.1	44.3	40.4	34.8	12.3	0.0	0.0	52.5	52.7	74.0	21.5	21.3
12	22320.0	43.6	44.3	39.8	34.1	12.3	0.0	0.0	52.1	52.8	74.0	21.9	21.2
13	24800.0	42.8	43.7	40.7	35.1	14.0	0.0	0.0	52.9	53.8	74.0	21.1	20.2

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter or ATT [dB]	Dwell Factor [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER						HOR	VER		HOR	VER
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>													
2	2368.9	52.0	51.4	30.4	36.4	3.7	10.7	-26.7	33.7	33.1	54.0	20.3	20.9
5	4960.0	48.1	47.0	36.1	35.9	5.3	1.1	-26.7	28.0	26.9	54.0	26.0	27.1
6	7440.1	43.9	44.1	38.1	35.9	6.7	0.7	-26.7	26.8	27.0	54.0	27.2	27.0
7	9919.2	39.4	38.3	36.7	36.5	8.1	0.3	-26.7	21.3	20.2	54.0	32.7	33.8
<b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b>													
8	12400.0	29.5	30.2	41.7	35.9	9.5	0.0	-26.7	8.6	9.3	54.0	45.4	44.7
9	14880.0	28.9	29.0	42.7	36.0	9.9	0.0	-26.7	9.3	9.4	54.0	44.7	44.6
10	17360.0	31.4	31.5	44.7	35.1	11.0	0.0	-26.7	15.8	15.9	54.0	38.2	38.1
11	19840.0	31.5	31.3	40.4	34.8	12.3	0.0	-26.7	13.2	13.0	54.0	40.8	41.0
12	22320.0	32.2	32.2	39.8	34.1	12.3	0.0	-26.7	14.0	14.0	54.0	40.0	40.0
13	24800.0	31.1	31.0	40.7	35.1	14.0	0.0	-26.7	14.5	14.4	54.0	39.5	39.6

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATT LOSS [dB]	Dwell Factor [dB]	RESULT		Limit 20dBc [dBuV/m]	MARGIN	
		HOR	VER						HOR	VER		HOR	VER
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>													
0	2480.0	109.3	109.7	30.5	36.4	3.7	10.7	0.0	117.8	118.2	-	-	-
1	2106.0	49.1	49.8	30.3	36.4	3.4	10.7	0.0	57.1	57.8	Funda-20dB	40.7	40.4
4	2594.7	65.7	66.3	30.8	36.4	3.7	10.7	0.0	74.5	75.1	Funda-20dB	23.3	23.1

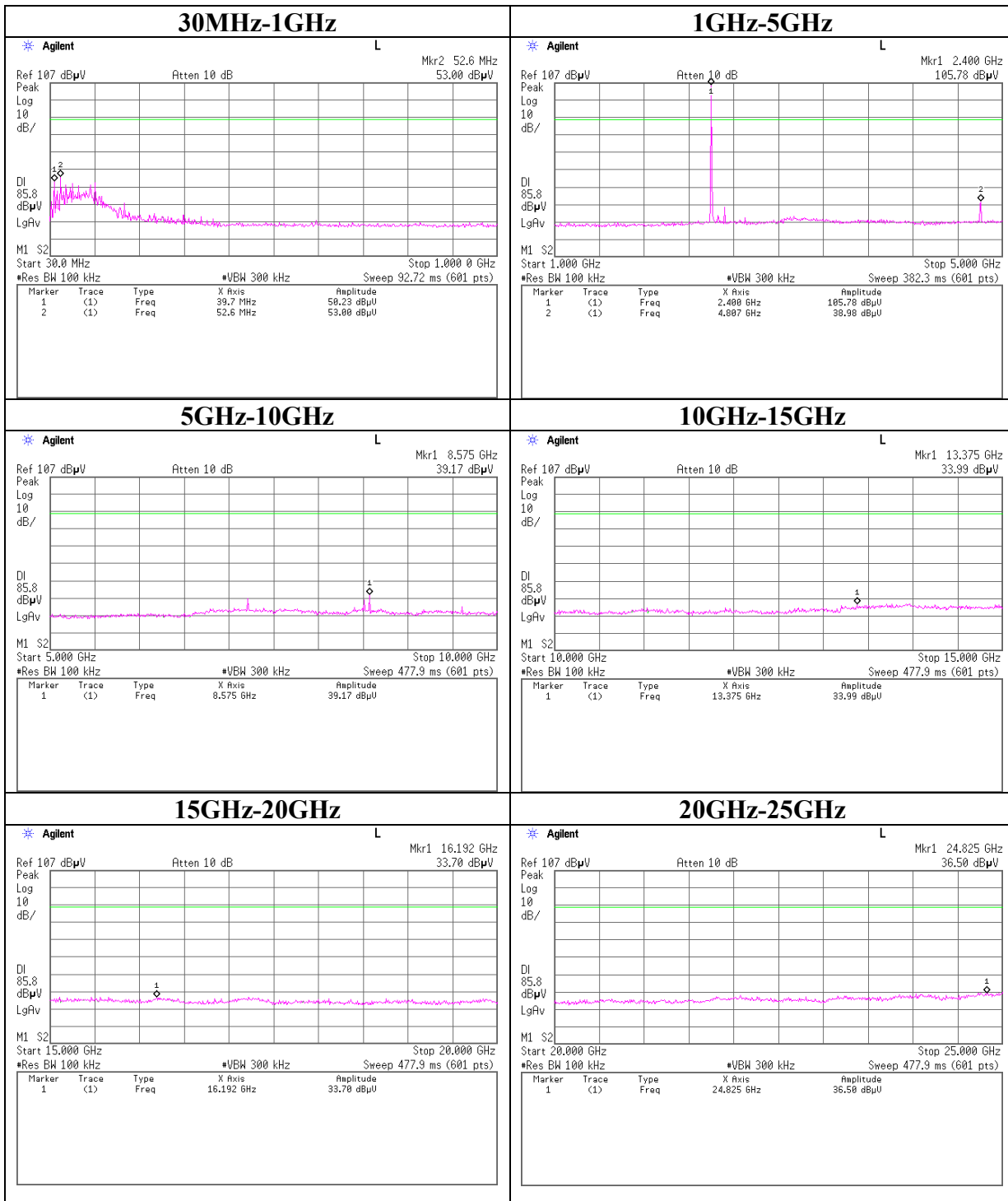
No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATT LOSS [dB]	Dwell Factor [dB]	RESULT		Limit [dBuV/m]	MARGIN	
		HOR	VER						HOR	VER		HOR	VER
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>													
3	2483.5	46.3	47.5	30.5	36.4	3.7	10.7	0.0	54.8	56.0	74.0	19.3	18.0

**AV DETECT**

3	2483.5	40.7	40.0	30.5	36.4	3.7	10.7	0.0	49.2	48.5	54.0	4.8	5.5
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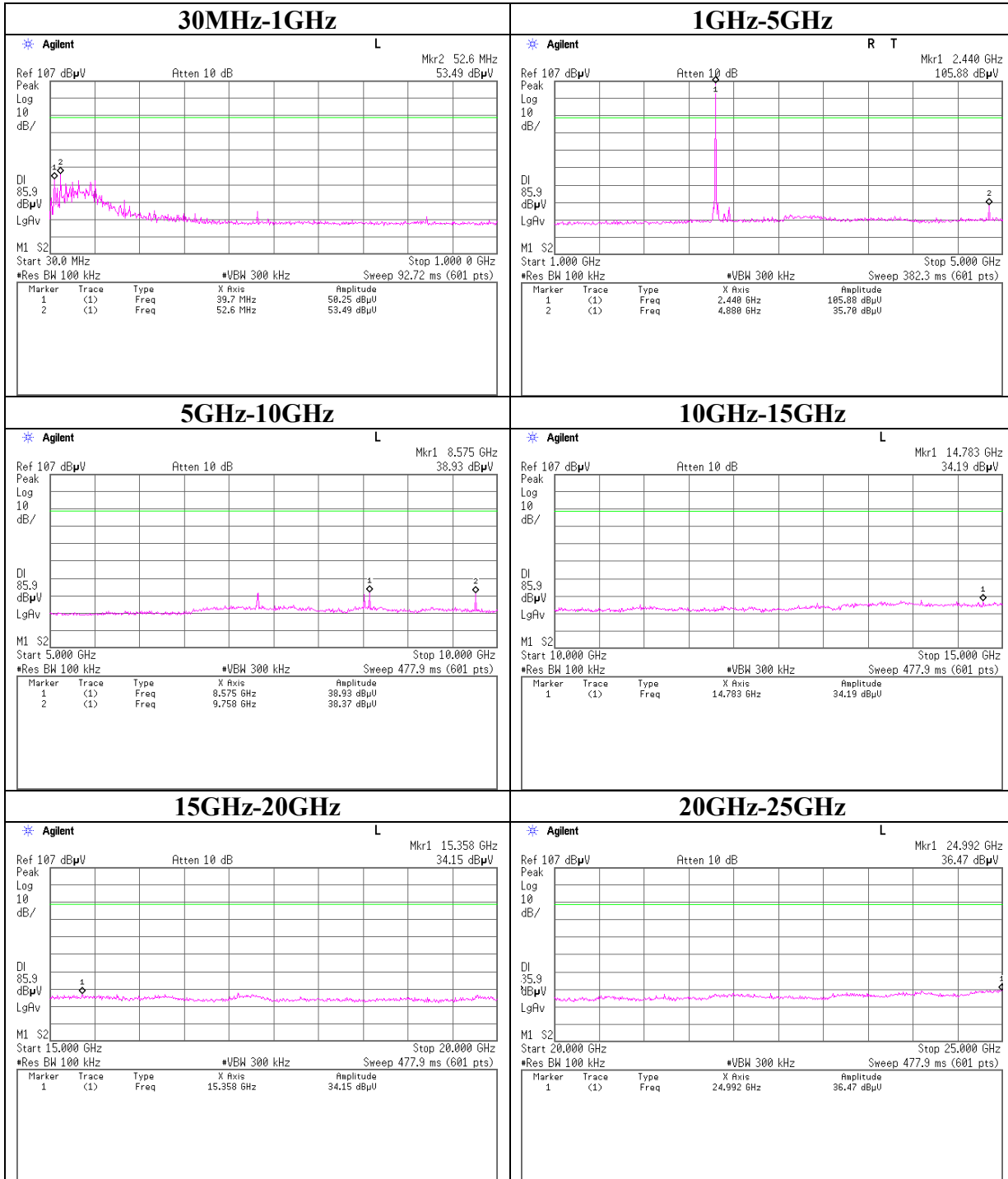
Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB  
\*Except for the above table : All other spurious emissions were less than 20dB for the limit.  
\*In the frequency over the fifth harmonic, the noise from the EUT was not seen. The data above is its base noise.  
\*The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.  
\*Hi-Pass Filter was not used for factor 0.0dB of the above table.  
Dwell Factor calculation for Spurious emissions : = 20 x log ( ( 3.517 [ms] x ( 66 / ( 5[s] / 0.100 [s] ) ) ) / 100 [ms] ) = -26.7 dB

**Conducted Spurious Emission (Mode2)**  
**Ch:Low**

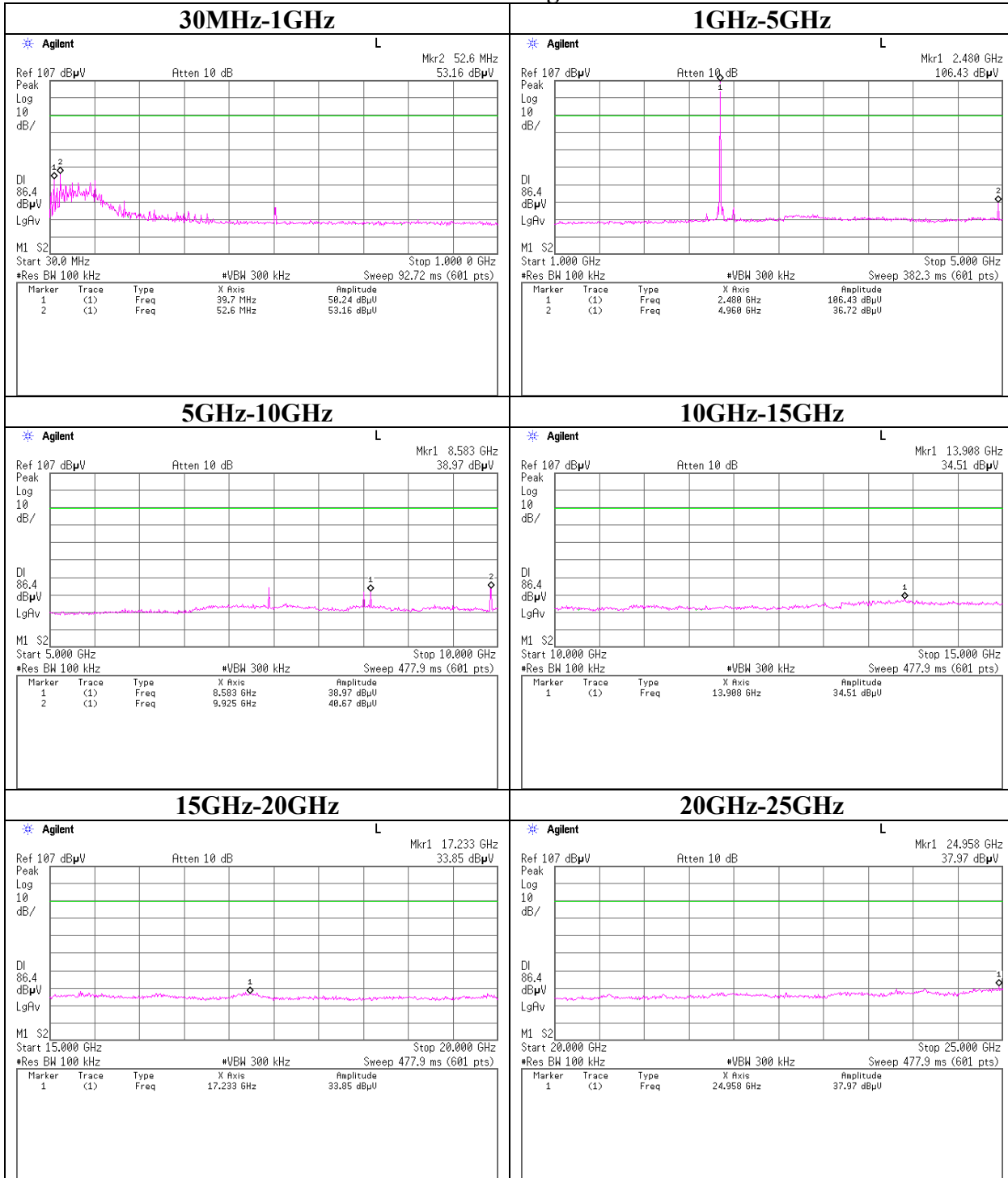


## Conducted Spurious Emission (Mode2)

Ch:Mid



**Conducted Spurious Emission (Mode2)**  
**Ch:High**



## Conducted Spurious Emission (Mode2)

### Band Edge compliance

