



EMI TEST REPORT

Test Report No. : 24FE0196-HO-1

Applicant : Fujitsu Ten Limited
Type of Equipment : Display
Model No. : 134000-296
134000-288
Test standard : FCC Part 15 Subpart C : 2003
Section 15.207, Section 15.247
FCC ID : BAB134000-296

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 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.
5. This test report does not constitute an endorsement by NIST/NVLAP or U.S. Government.

Date of test:

March 04 and 05, 2004

Tested by:

Hiroka Umeyama
EMC Service

Approved by :

Hironobu Shimoji
Group Leader of
EMC Service

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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MF060b(10.04.03)

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SECTION 1: Client information

Company Name : Fujitsu Ten Limited
Address : 2-28 Gosho-Dori 1-chome, Hyogo-ku, Kobe 652-8510 Japan
Telephone Number : +81-78-682-2159
Facsimile Number : +81-78-671-7160
Contact Person : Naoto Nishimura

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

2.1 Identification of E.U.T.

Type of Equipment : Display
Model No. : 134000-296
Serial No. : 0047-A(for Radiated Spurious Emissions)
0046-A(except for Radiated Spurious Emissions)
Rating : DC13.2V/3A and below
Country of Manufacture : JAPAN
Receipt Date of Sample : March 4, 2004
Condition of EUT : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)

2.2 Product Description

Fujitsu Ten Limited, Model No: 134000-296 and 134000-288 (referred to as the EUT in this report) are the Display.
EUT is installed in the vehicles on the production line. EUT is the display with Bluetooth module and can be communicated with other Bluetooth devices such as a cellular phone.

Difference between M/N:134000-296 and M/N:134000-288

M/N	Figure(Inner/Outer)	Bluetooth Module	Software
134000-296	No difference	No difference	Difference (See Note)
134000-288	No difference	No difference	Difference (See Note)

Note: The difference in the kinds of vehicles. The difference in software doesn't affect EMC tests.

Other Clock Frequencies : 8.3076MHz, 12.55MHz (Microprocessor)/19.17MHz (Echo canceller)
50kHz, 196.1kHz, 6.29MHz (other communication clocks)
86.5kHz (D-D converter)/55kHz (Inverter)
150Hz (Back light duty)/15.734kHz (Synchronous separation)
500kHz, 8kHz, 115.2kHz (Bluetooth)
27MHz, 18.432kHz (Drawing dot clock)
Equipment Type : Transceiver
Emission designation : F1D
Frequency of operation : 2402-2480MHz
Type of modulation : FSK, FHSS
Bandwidth & Channel spacing : 79MHz & 1MHz
Transmit power or power range : 2.5mW and below
Antenna Type : Chip Multilayer Antenna
Antenna Gain : -3.0dBi
Antenna Connector Type : 2DA923G0520D-210
Operating voltage (inner) : DC+3- +3.5V
Operating Temperature : -30 deg. C. - +85 deg. C.

FCC 15.31 (e)

This EUT provides stable voltage(DC3-3.5V) constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

Since the EUT uses a transmitting antenna that is an integral part of the equipment, it is impossible for end users to replace the antenna. 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 : 2003

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

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	Conducted emission	ANSI C63.4:2001	Section 15.207	-	N/A	N/A*1)	Complied
2	Carrier Frequency Separation	ANSI C63.4:2001	Section15.247(a)(1)	Conducted	N/A	-	Complied
3	20dB Bandwidth	ANSI C63.4:2001	Section15.247(a)(1)	Conducted	N/A	-	Complied
4	Number of Hopping Frequency	ANSI C63.4:2001	Section15.247(a)(1)(iii)	Conducted	N/A	-	Complied
5	Dwell time	ANSI C63.4:2001	Section15.247(a)(1)(iii)	Conducted	N/A	-	Complied
6	Maximum Peak Output Power	ANSI C63.4:2001	Section15.247(b)(1)	Conducted	N/A	-	Complied
7	Band Edge Compliance	ANSI C63.4:2001	Section15.247(c)	Conducted	N/A	-	Complied
8	Spurious Emission	ANSI C63.4:2001	Section15.247(c)	Conducted/ Radiated	N/A	6.1dB 22320.0MHz Vertical	Complied

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

*1) The test is not applicable since the EUT does not have AC Mains.

*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.

3.3 Confirmation

UL Apex Co., Ltd. hereby confirms that E.U.T., in the configuration tested, complies with the specifications FCC Part 15 Subpart C : 2003 Section 15.207 and 15.247.

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3.4 Uncertainty

Spurious Emission (Radiated)

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

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

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

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

Other test except Conducted Emission and Spurious Emission (Radiated)

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

The data listed in this test report has enough margin.

3.5 Test Location

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No.1 semi anechoic chamber has been fully described in a report submitted to FCC office, and listed on February 01, 2002. (Registration number: No.1:313583 Industry Canada: No.1: IC4247)

No.2 semi anechoic chamber has been fully described in a report submitted to FCC office, and listed on June 05, 2002. (Registration number: No.2:846015 Industry Canada: No.2: IC4247-2)

*NVLAP Lab. code: 200572-0

Test room	Width x Depth x Height (m)	Size of reference ground plane(m)	Other rooms
No.1 semi-anechoic chamber	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	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 shielded room	3.1 x 5.0 x 2.7m	N/A	-

3.6 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

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

4.1 Operating Modes

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to typical use.

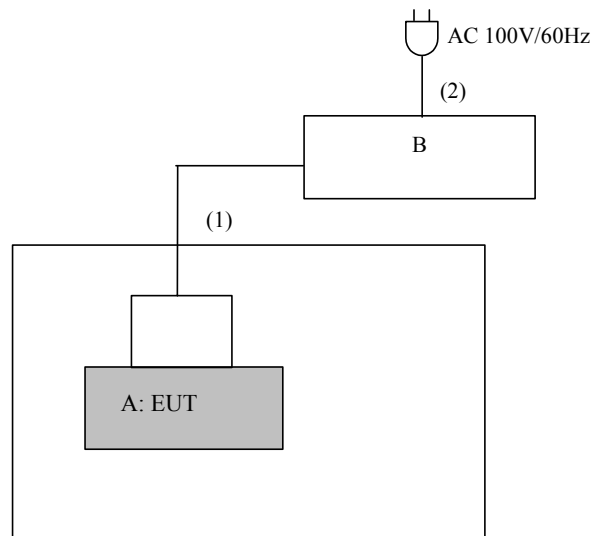
The sequence is used : Transmitting mode(Bluetooth)
Low Channel :2402MHz
Mid Channel :2441MHz
High channel :2480MHz
Inquiry

Internal drawing screen mode

*The standard operation state which displays the picture of an internal memory.

Justification: The system was configured in typical fashion (as a customer would normally use it) for testing.

4.2 Configuration and peripherals



*Cabling was taken into consideration and test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID	Remark
A	Display	134000-296	0047-A(for Radiated Spurious Emissions) 0046-A(except for Radiated Spurious Emissions)	Fujitsu Ten Limited	BAB134000-296	EUT
B	DC Power supply	PMC35-2A	13090501	KIKUSUI	-	-

List of cables used

No.	Name	Length (m)	Shield	Backshell Material
(1)	DC power cable	1.5	N	Polyvinyl chloride
(2)	AC power cable	2.0	N	Polyvinyl chloride

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SECTION 5: Carrier Frequency Separation, Section 15.247(a)(1)

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 6: 20dB Bandwidth, Section 15.247(a)(1)

Test Procedure

The 20dB bandwidth was measured with a spectrum analyzer connected to the antenna port.

Test data	: APPENDIX 3
Test result	: Pass

SECTION 7: Number of Hopping Frequency, Section 15.247(a)(1)(iii)

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 8: Dwell time, Section 15.247(a)(1)(iii)

Test Procedure

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

Test data	: APPENDIX 3
Test result	: Pass

SECTION 9: Maximum Peak Output Power, Section 15.247(b)(1)

Test Procedure

The Maximum Peak Output Power was measured with a spectrum analyzer connected to the antenna port.

Test data	: APPENDIX 3
Test result	: Pass

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SECTION 10: Band Edge Compliance, Section 15.247(c)

Test Procedure

The Band Edge Compliance was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3
Test result : Pass

SECTION 11: Spurious Emission, Section 15.247(c)

[Conducted]

Test Procedure

The Spurious Emission (Conducted) 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, 1m by 1.5m, raised 80cm above the conducting ground plane.

Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.

The measuring antenna height was varied between 1 to 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.

The result was also satisfied the general limits specified in section 15.209(a).

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

Test data : APPENDIX 3
Test result : Pass

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APPENDIX 1: Photographs of test setup

Spurious Emission (Radiated)

Front



Rear



Tested EUT Position

**Worst Case:
Angle A (Normal installation)**



Angle B



Angle C



APPENDIX 2: Test instruments

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-01	Anechoic Chamber	TDK	Semi Anechoic Chamber 10m	8	2003/12/27 * 12
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	8	2003/11/12 * 12
MCC-23	Microwave Cable	Storm	-	8	2003/04/30 * 12
MCC-05	Microwave Cable	Storm	421-011	8	2004/01/06 * 12
MPA-01	Pre Amplifier	Agilent	8449B	8	2004/02/06 * 12
MHA-05	Horn Antenna	Schwarzbeck	BBHA9120D	8	2004/01/10 * 12
MHA-01	Horn Antenna	EMCO	3160-09	8	2004/01/10 * 12
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	8	2003/04/11 * 12
MRENT-08	Spectrum Analyzer	Advantest	R3272	8	2004/03/04
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	8	2003/04/28 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	8	2003/04/28 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	8	2003/12/16 * 12
MPA-02	Pre Amplifier	Agilent	87405A	8	2003/04/17 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	8	2004/02/03 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	8	2004/02/24 * 12
MRENT-09	Spectrum Analyzer	Advantest	R3273	1-7	2004/02/18 * 12

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

Test Item:

- 1: Carrier Frequency Separation
- 2: 20dB Bandwidth
- 3: Number of Hopping Frequency
- 4: Dwell time
- 5: Maximum Peak Output Power
- 6: Band Edge Compliance
- 7: Spurious Emission (Conducted)
- 8: Spurious Emission (Radiated)

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APPENDIX 3: Data of EMI test

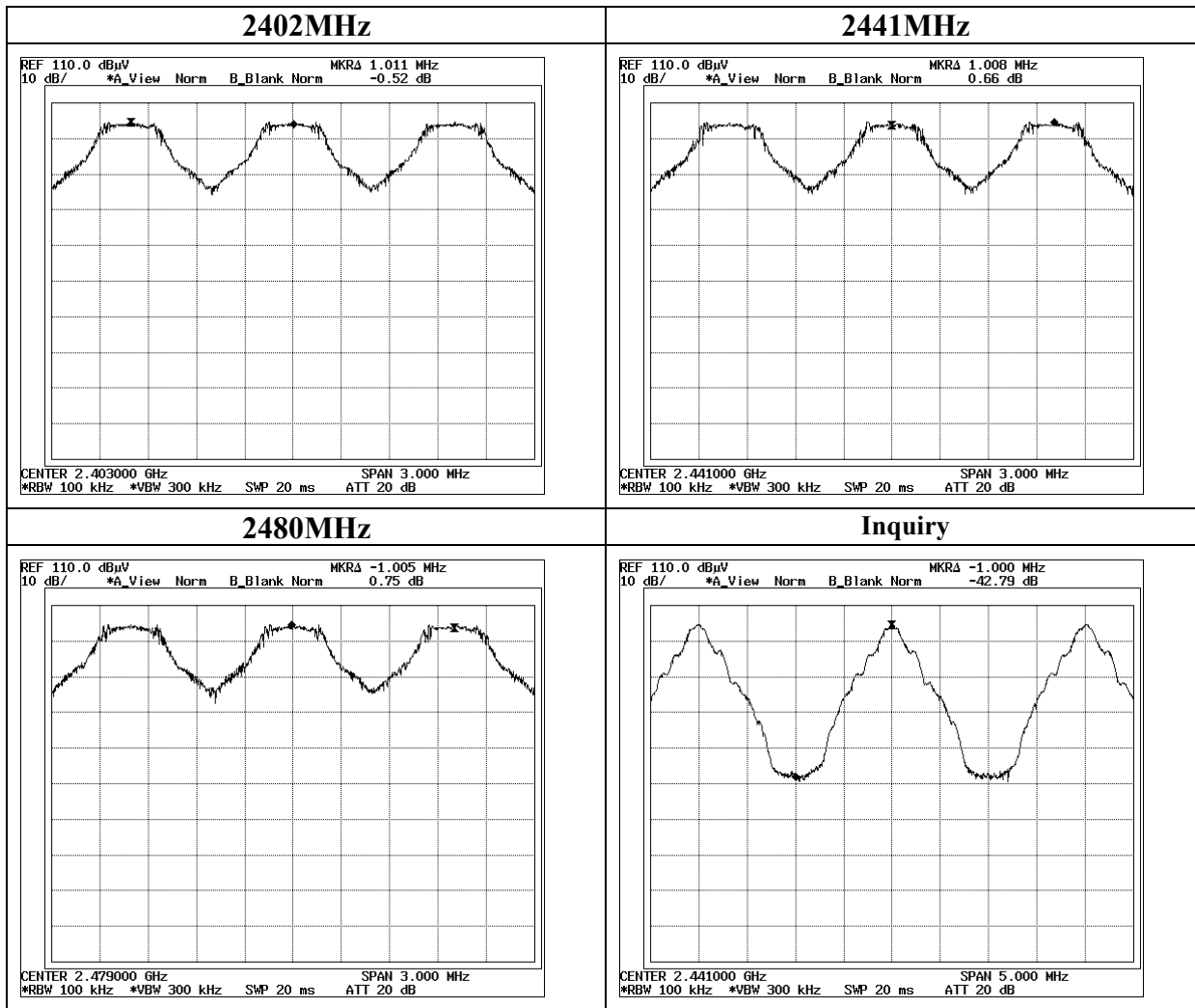
Carrier Frequency Separation

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

COMPANY	: Fujitsu Ten Limited	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	: Display	TEST DISTANCE	: -
MODEL	: 134000-296/288	DATE	: 03/05/2004
S/ N	: 0046-A	TEMPERATURE	: 24deg.C
POWER	: 12VDC	HUMIDITY	: 25%
MODE	: Tx(Hopping on)/Inquiry	ENGINEER	: Hiroka Umeyama

CH	FREQ [MHz]	Channel separation [MHz]	Limit
Low	2402.0	1.011	>20dB Bandwidth and 25[kHz]
Mid	2441.0	1.008	>20dB Bandwidth and 25[kHz]
High	2480.0	1.005	>20dB Bandwidth and 25[kHz]
Inquiry	2441.0	1.000 x 2	>20dB Bandwidth and 25[kHz]

Carrier Frequency Separation



20dB Bandwidth

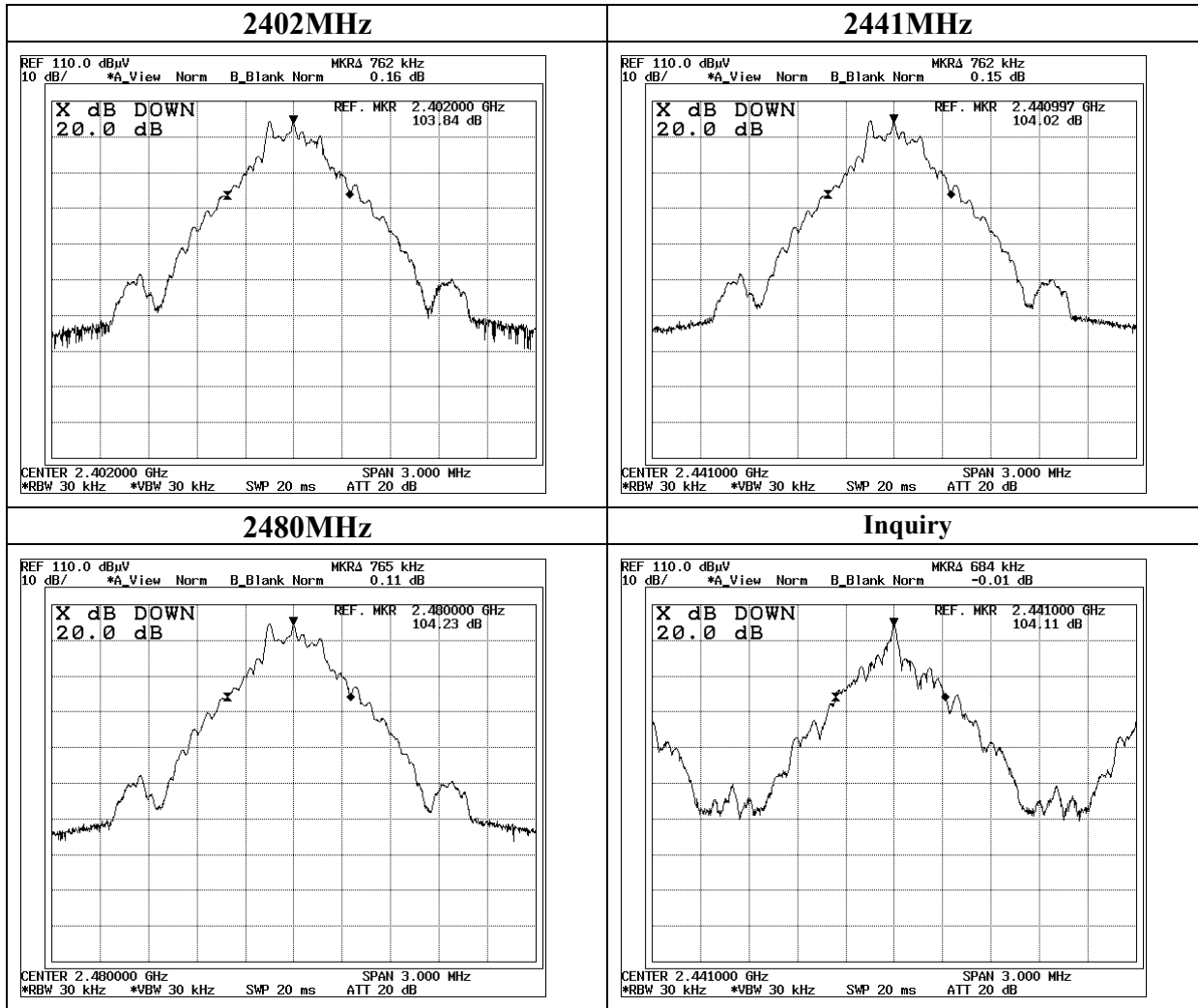
UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

COMPANY	: Fujitsu Ten Limited	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	: Display	TEST DISTANCE	: -
MODEL	: 134000-296/288	DATE	: 03/05/2004
S/ N	: 0046-A	TEMPERATURE	: 24deg.C
POWER	: 12VDC	HUMIDITY	: 25%
MODE	: Tx (Hopping off) /Inquiry	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	0.762	1.0
Mid	2441.0	0.762	1.0
High	2480.0	0.765	1.0
Inquiry	2441.0	0.684	1.0

20dB Bandwidth



Number of Hopping Frequency

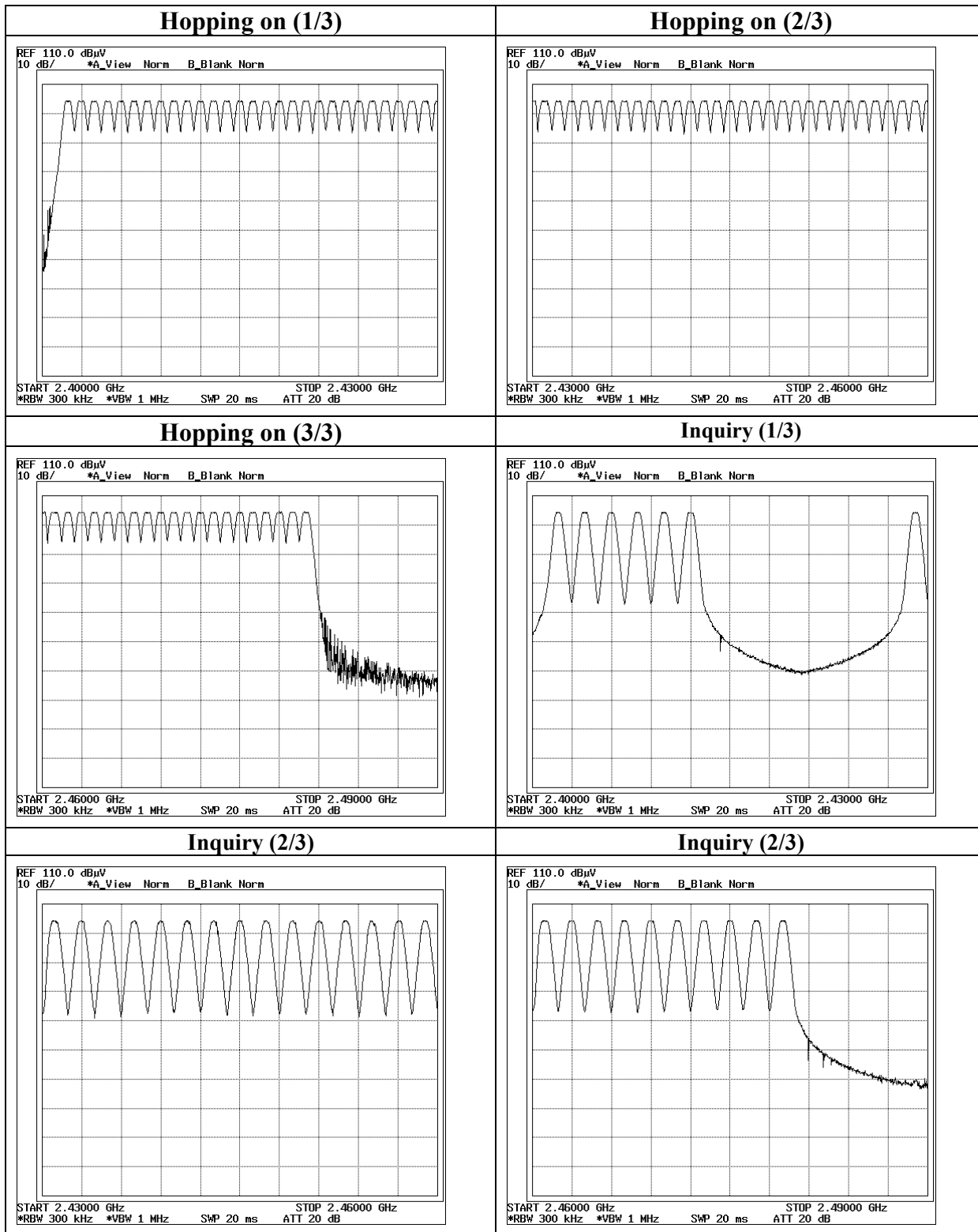
UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

COMPANY	: Fujitsu Ten Limited	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)(iii)
EQUIPMENT	: Display	TEST DISTANCE	: -
MODEL	: 134000-296/288	DATE	: 03/05/2004
S/N	: 0046-A	TEMPERATURE	: 24deg.C
POWER	: 12VDC	HUMIDITY	: 25%
MODE	: Tx (Hopping on) /Inquiry	ENGINEER	: Hiroka Umeyama

Mode	Number of channel	Limit
	[time]	[time]
Tx(Hoppng on)	79	≥ 15

Mode	Number of channel	Limit
	[time]	[time]
Inquiry	32	≥ 15

Number of Hopping Frequency



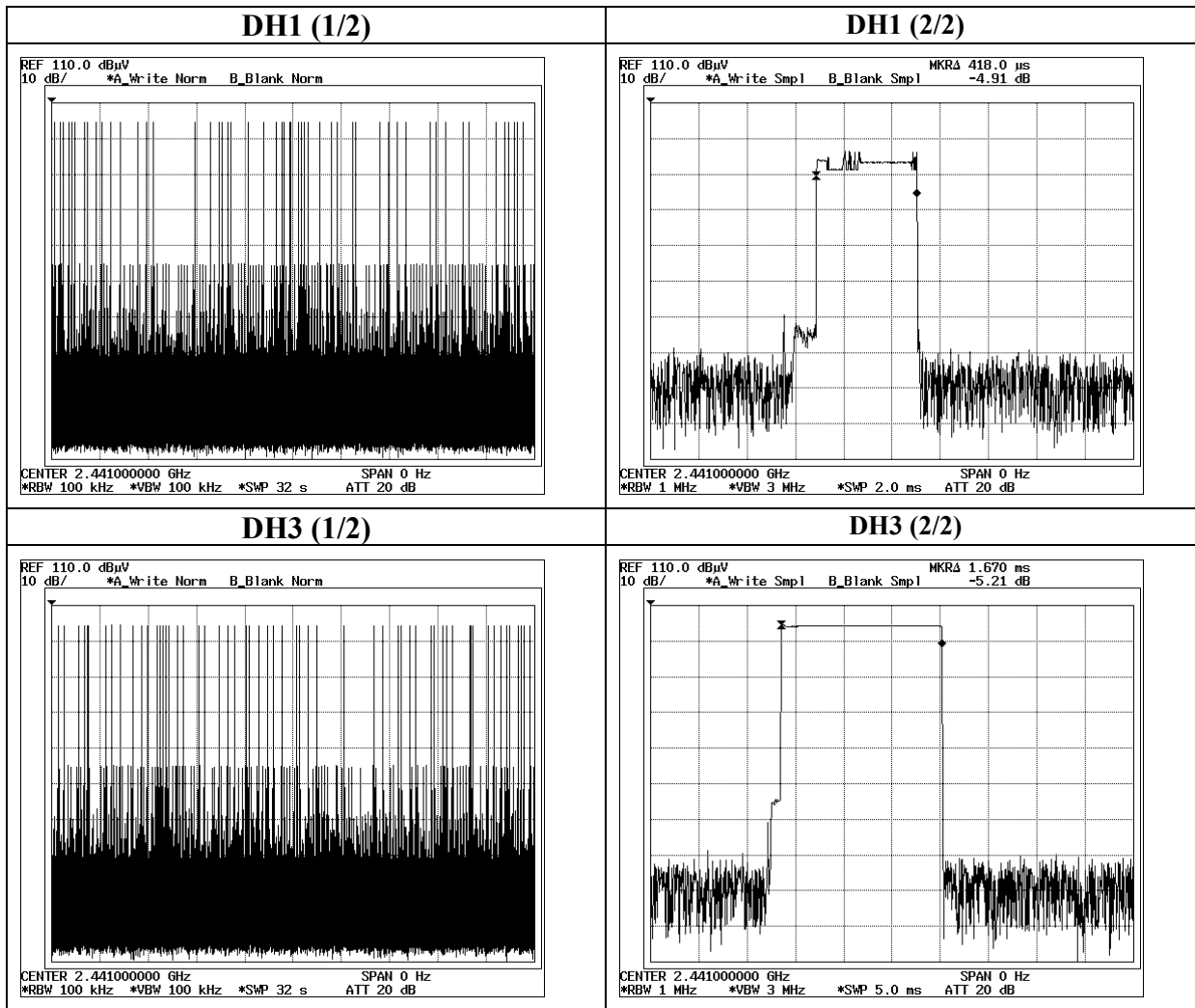
Dwell time

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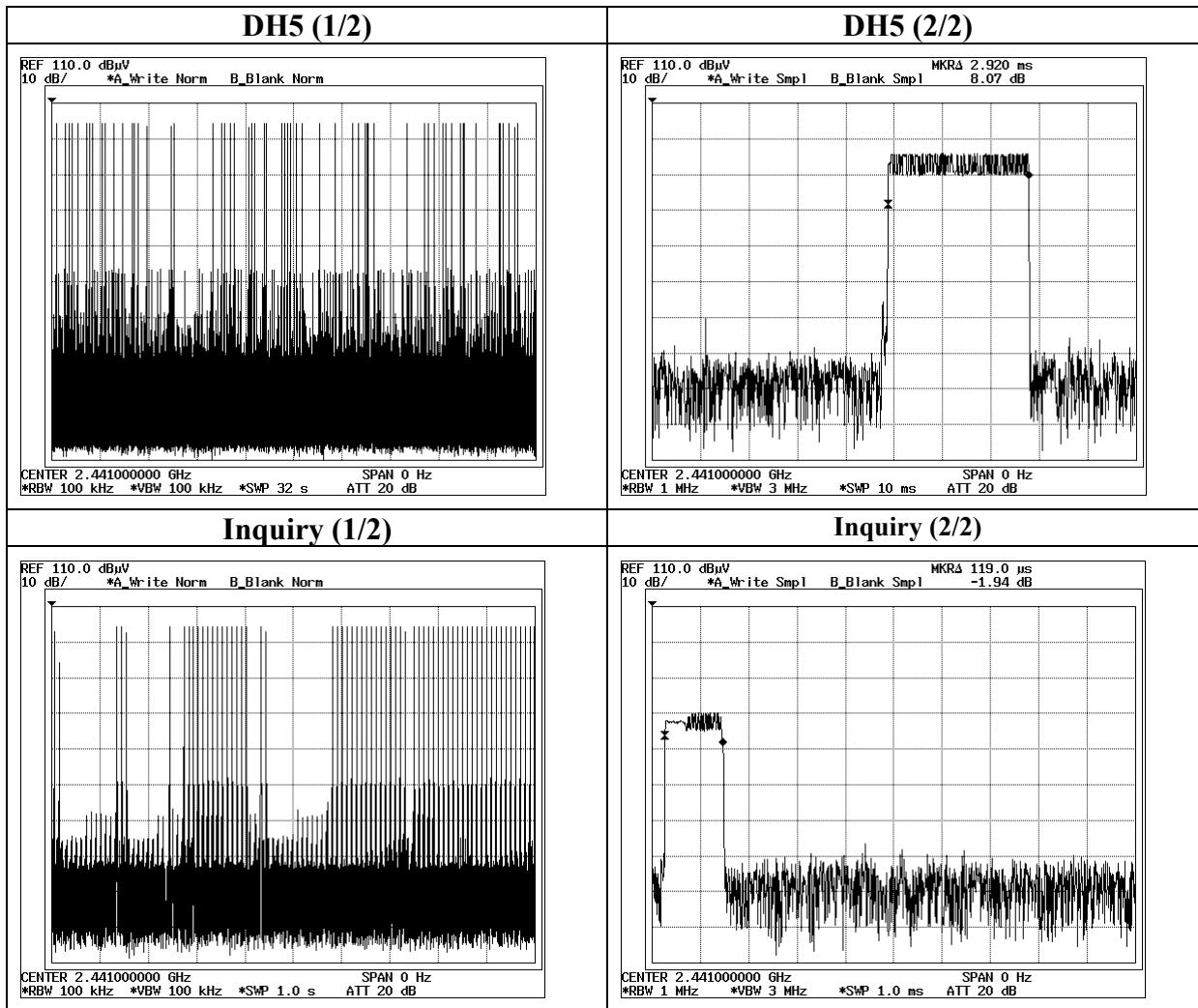
COMPANY	: Fujitsu Ten Limited	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)(iii)
EQUIPMENT	: Display	TEST DISTANCE	: -
MODEL	: 134000-296/288	DATE	: 03/05/2004
S/ N	: 0046-A	TEMPERATURE	: 24deg.C
POWER	: 12VDC	HUMIDITY	: 25%
MODE	: Tx (Hopping off) /Inquiry	ENGINEER	: Hiroka Umeyama

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	52	0.418	22	400
DH3	57	1.670	96	400
DH5	59	2.920	173	400
Inquiry	64 times / 1sec. x 12.8 = 820 times	0.119	98	400

Dwell time



Dwell time



Maximum Peak Output Power

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COMPANY	: Fujitsu Ten Limited	REGULATION	: FCC Part15 Subpart C 15.247(b)(1)
EQUIPMENT	: Display	TEST DISTANCE	: -
MODEL	: 134000-296/288	DATE	: 03/05/2004
S/N	: 0046-A	TEMPERATURE	: 24deg.C
POWER	: 12VDC	HUMIDITY	: 25%
MODE	: Tx (Hopping off) /Inquiry	ENGINEER	: Hiroka Umeyama

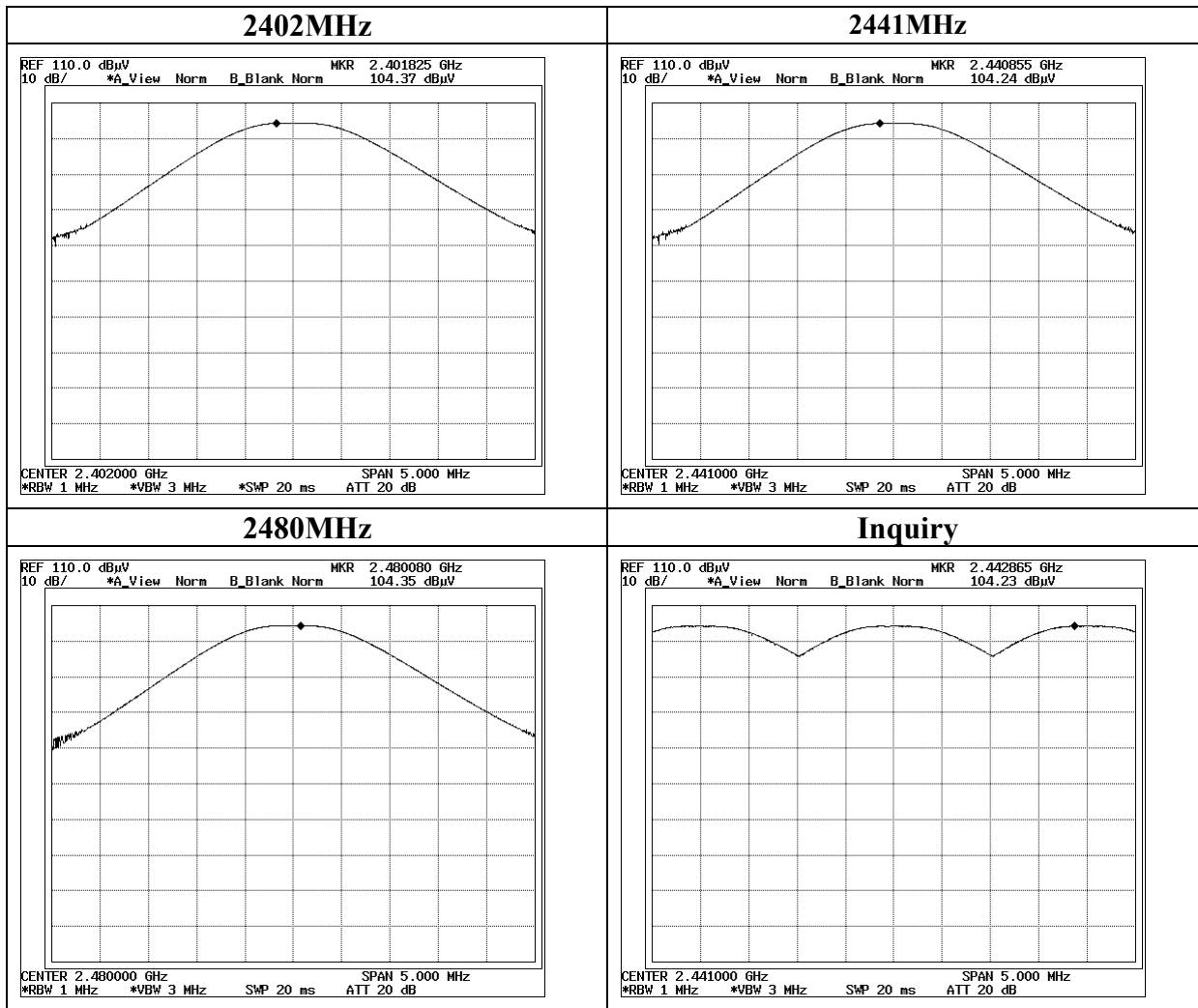
CH	FREQ [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Result [dBm]	Limit [dBm]
Low	2402.0	-2.6	0.0	-2.6	30.0
Mid	2441.0	-2.7	0.0	-2.7	30.0
High	2480.0	-2.6	0.0	-2.6	30.0
Inquiry	2441.0	-2.7	0.0	-2.7	21.0

Sample Calculation:

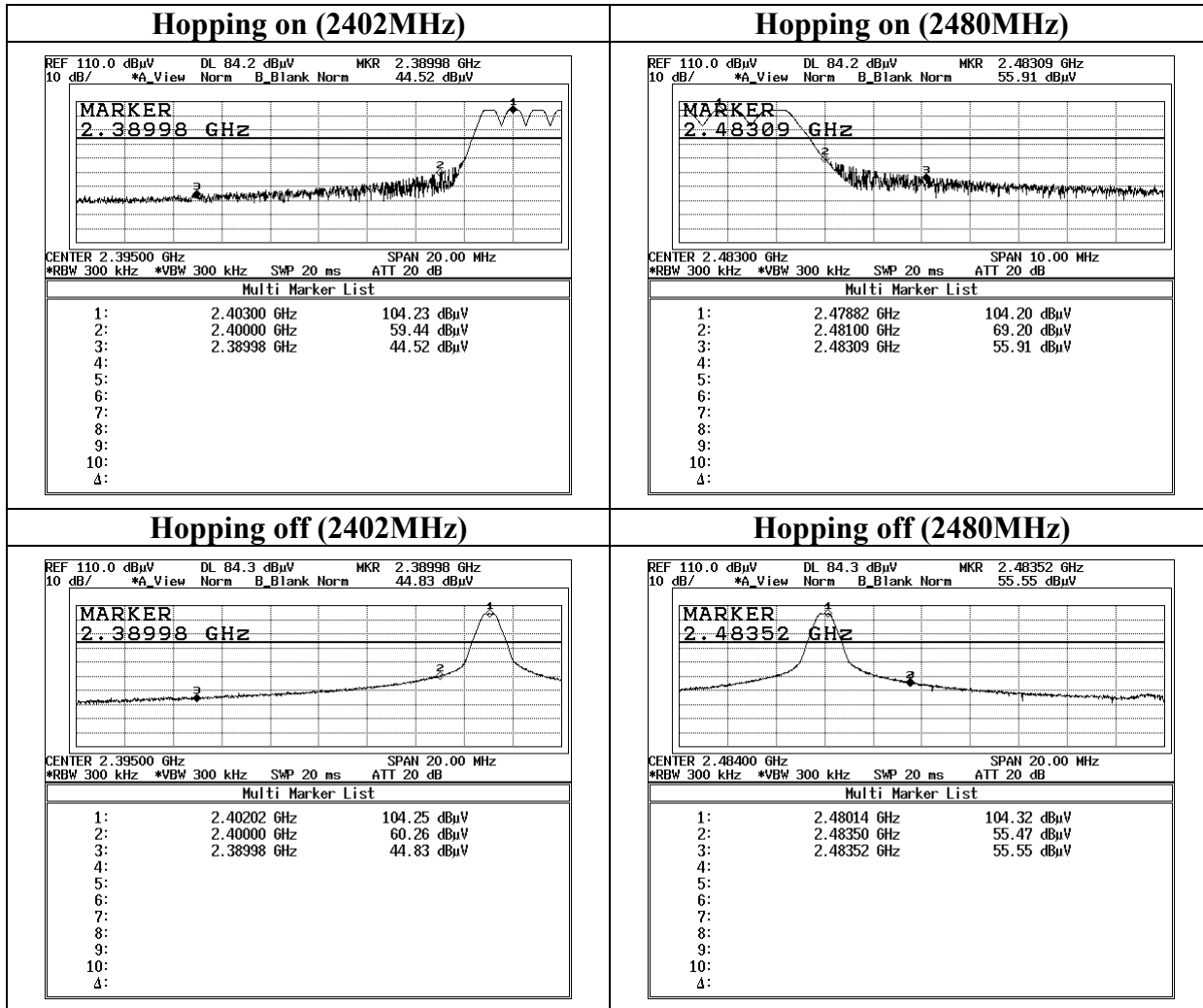
Result = S/A Reading + Cable Loss

*Cable attached to the circuit board was used.

Maximum Peak Output Power



Band Edge compliance



Spurious Emission(Radiated)
2402MHz

DATA OF RADIATED EMISSION TEST

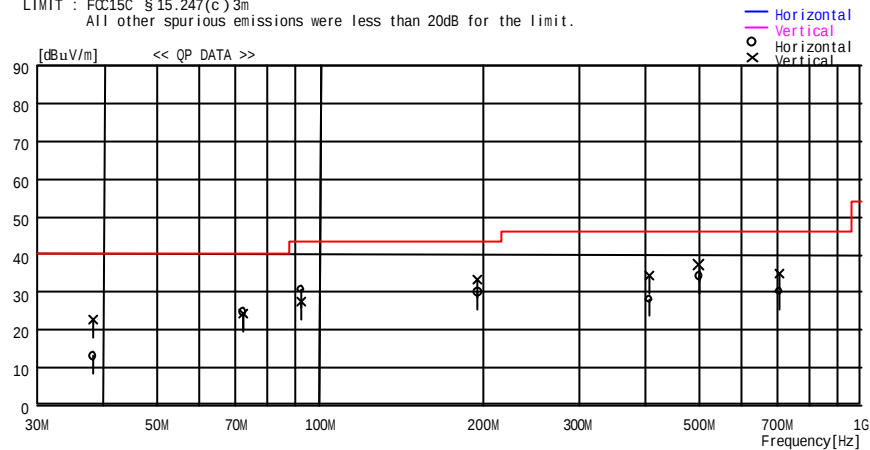
UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/03/05 10:33:09

Applicant : Fujitsu Ten Limited
Kind of EUT : Display
Model No. : 134000-296/288
Serial No. : 0047-A

Report No. : 24FE0196-HO
Power : DC12V
Temp /Humi% : 21 / 33%
Operator : Hiroka Umeyama

Mode / Remarks : Tx:2402MHz MAX-Angle

LIMIT : FCC15C §15.247(c)3m
All other spurious emissions were less than 20dB for the limit.



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	38.200	14.8	15.4	6.6	23.7	13.1	40.0	26.9	200	0
2	72.080	35.8	4.9	6.9	23.0	24.6	40.0	15.4	260	0
3	92.159	40.0	7.0	7.2	23.5	30.7	43.5	12.8	200	260
4	195.450	29.4	16.2	7.8	23.3	30.1	43.5	13.4	254	0
5	405.500	25.0	17.3	8.9	23.1	28.1	46.0	17.9	104	255
6	499.910	29.7	18.2	9.3	23.0	34.2	46.0	11.8	100	128
7	704.100	22.6	20.7	10.2	23.3	30.2	46.0	15.8	190	115
----- Vertical -----										
8	38.200	24.4	15.4	6.6	23.7	22.7	40.0	17.3	100	0
9	72.080	35.4	4.9	6.9	23.0	24.2	40.0	15.8	100	0
10	92.159	36.9	7.0	7.2	23.5	27.6	43.5	15.9	100	113
11	195.450	32.7	16.2	7.8	23.3	33.4	43.5	10.1	100	0
12	405.500	31.4	17.3	8.9	23.1	34.5	46.0	11.5	110	0
13	499.910	32.8	18.2	9.3	23.0	37.3	46.0	8.7	100	11
14	704.100	27.5	20.7	10.2	23.3	35.1	46.0	10.9	100	118

CHART:WITHOUT FACTOR ANT TYPE : -30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP.GAIN Page:

Spurious Emission(Radiated)
2441MHz

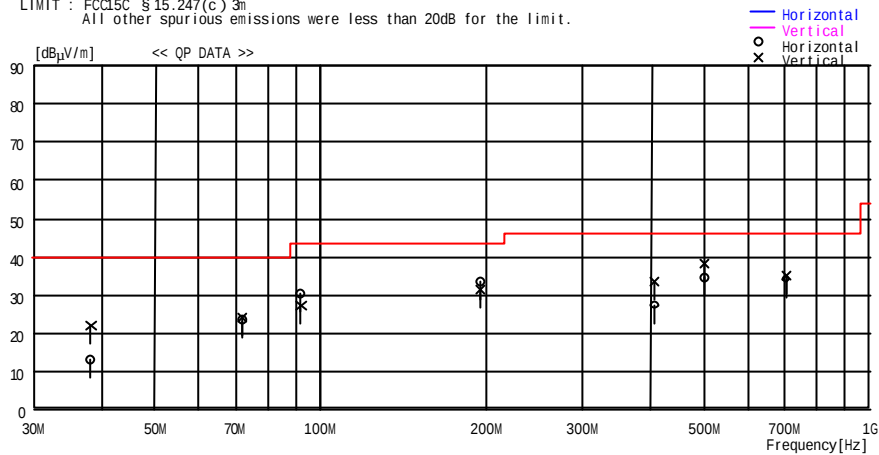
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/03/05 10:33:09

Applicant : Fujitsu Ten Limited
Kind of EUT : Display
Model No. : 134000-296/288
Serial No. : 0047-A
Report No. : 24FE0196-HO
Power : DC12V
Temp /Humi% : 21 / 33%
Operator : Hiroka Umeyama

Mode / Remarks : Tx:2441Hz MAX-Angle

LIMIT : FCC15C §15.247(c) 3m
All other spurious emissions were less than 20dB for the limit.



No.	FREQ [MHz]	READING QP [dB μ V]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dB μ V/m]	LIMIT [dB μ V/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	38.200	14.7	15.4	6.6	23.7	13.0	40.0	27.0	200	0
2	72.080	34.5	4.9	6.9	23.0	23.3	40.0	16.7	260	0
3	92.159	39.6	7.0	7.2	23.5	30.3	43.5	13.2	200	260
4	195.450	32.7	16.2	7.8	23.3	33.4	43.5	10.1	154	0
5	405.500	24.2	17.3	8.9	23.1	27.3	46.0	18.7	104	255
6	499.910	29.9	18.2	9.3	23.0	34.4	46.0	11.6	100	128
7	704.100	26.4	20.7	10.2	23.3	34.0	46.0	12.0	190	115
----- Vertical -----										
8	38.200	23.8	15.4	6.6	23.7	22.1	40.0	17.9	100	0
9	72.080	35.2	4.9	6.9	23.0	24.0	40.0	16.0	100	0
10	92.159	36.6	7.0	7.2	23.5	27.3	43.5	16.2	100	113
11	195.450	30.7	16.2	7.8	23.3	31.4	43.5	12.1	100	0
12	405.500	30.5	17.3	8.9	23.1	33.6	46.0	12.4	110	0
13	499.910	33.6	18.2	9.3	23.0	38.1	46.0	7.9	100	11
14	704.100	27.4	20.7	10.2	23.3	35.0	46.0	11.0	100	118

CHART:WITHOUT FACTOR ANT TYPE : -30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP.GAIN
Page:

Spurious Emission(Radiated)
2480MHz

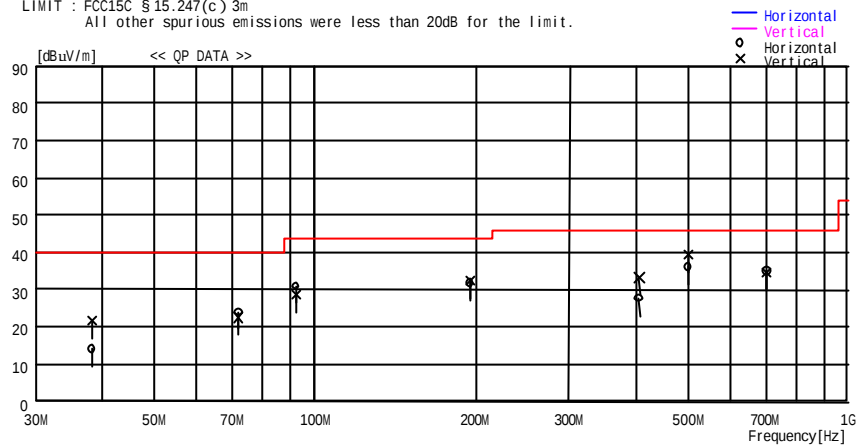
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/03/05 10:33:09

Applicant : Fujitsu Ten Limited
Kind of EUT : Display
Model No. : 134000-296/288
Serial No. : 0047-A
Report No. : 24FE0196-HO
Power : DC12V
Temp /Humi% : 21 / 33%
Operator : Hiroka Uneyama

Mode / Remarks : Tx:2480Hz MAX-Angle

LIMIT : FCC15C §15.247(c) 3m
All other spurious emissions were less than 20dB for the limit.



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	38.200	15.6	15.4	6.6	23.7	13.9	40.0	26.1	200	0
2	72.080	35.1	4.9	6.9	23.0	23.9	40.0	16.1	260	0
3	92.159	40.3	7.0	7.2	23.5	31.0	43.5	12.5	200	260
4	195.450	31.0	16.2	7.8	23.3	31.7	43.5	11.8	154	0
5	405.500	24.5	17.3	8.9	23.1	27.6	46.0	18.4	104	255
6	499.910	31.6	18.2	9.3	23.0	36.1	46.0	9.9	100	128
7	704.100	27.4	20.7	10.2	23.3	35.0	46.0	11.0	190	115
----- Vertical -----										
8	38.200	23.1	15.4	6.6	23.7	21.4	40.0	18.6	100	0
9	72.080	33.6	4.9	6.9	23.0	22.4	40.0	17.6	100	0
10	92.159	37.8	7.0	7.2	23.5	28.5	43.5	15.0	100	113
11	195.450	31.7	16.2	7.8	23.3	32.4	43.5	11.1	100	0
12	405.500	30.1	17.3	8.9	23.1	33.2	46.0	12.8	110	0
13	499.910	34.9	18.2	9.3	23.0	39.4	46.0	6.6	100	11
14	704.100	26.9	20.7	10.2	23.3	34.5	46.0	11.5	100	118

CHART:WITHOUT FACTOR ANT TYPE : -30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP.GAIN
Page:

Test report No. : 24FE0196-HO-1
Page : 27 of 33
Issued date : March 15, 2004
Revised date : April 1, 2004
ECC ID : BAB134000-296

Spurious Emission (Radiated) 2402MHz

UL Apex Co., Ltd.
Head Office EMC Lab. No.1 Semi Anechoic Chamber

COMPANY : Fujitsu Ten Limited
EQUIPMENT : Display
MODEL : 134000-296/288
S/ N : 0047-A
POWER : 12VDC
MODE : Tx (2402MHz)
ANGLE : Hor: A(MAX) , Ver: A(MAX)

REGULATION : FCC Part 15 Subpart C 15.247(c)
TEST DISTANCE : 3 and 1m
DATE : 03/04/2004
TEMPERATURE : 21deg.C
HUMIDITY : 33%
ENGINEER : Hiroka Umeyama

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

No.	FREQ [MHz]	S/A READING		ANT FACTOR [dBm]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. OR FILTER [dB]	RESULT		LIMIT PK [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
Test distance 3meters RESULT=READING + ANT FACTOR - AMP GAIN + CABLE LOSS + ATTEN. OR FILTER												
1	1070.0	56.8	62.1	22.6	37.1	3.7	0.0	46.0	51.3	74.0	28.0	22.7
2	2390.0	44.0	45.2	30.7	36.3	5.6	0.0	44.0	45.2	74.0	30.0	28.8
3	4804.0	45.6	44.6	35.1	36.1	7.9	0.0	52.5	51.5	74.0	21.5	22.5
4	7206.0	43.7	43.2	37.6	35.6	9.9	0.0	55.6	55.1	74.0	18.4	18.9
5	9608.0	43.5	43.7	37.1	36.3	11.4	0.0	55.7	55.9	74.0	18.3	18.1
Test distance 1meters RESULT=READING - AMP GAIN + CABLE LOSS + ATTEN OR FILTER - Dfac												
6	12010.0	44.1	44.2	40.5	35.7	13.1	0.0	52.5	52.6	74.0	21.5	21.4
7	14412.0	42.7	43.1	41.9	34.6	14.1	0.0	54.6	55.0	74.0	19.4	19.0
8	16814.0	43.4	43.2	46.1	35.6	15.9	0.0	60.3	60.1	74.0	13.7	13.9
9	19216.0	43.2	42.3	42.1	35.1	17.2	0.0	57.9	57.0	74.0	16.1	17.0
10	21618.0	44.3	43.1	40.8	35.4	18.8	0.0	59.0	57.8	74.0	15.0	16.2
11	24020.0	43.4	43.7	41.0	35.8	20.0	0.0	59.1	59.4	74.0	14.9	14.6

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

No.	FREQ [MHz]	S/A READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. OR FILTER [dB]	RESULT		LIMIT AV [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV/m]						[dBuV/m]			[dB]	[dB]
Test distance 3meters RESULT=READING + ANT FACTOR -AMP GAIN + CABLE LOSS + ATTEN. OR FILTER.												
1	1070.0	36.5	41.9	22.6	37.1	3.7	0.0	25.7	31.1	54.0	28.3	22.9
2	2390.0	30.9	31.0	30.7	36.3	5.6	0.0	30.9	31.0	54.0	23.1	23.0
3	4804.0	34.9	32.5	35.1	36.1	7.9	0.0	41.8	39.4	54.0	12.2	14.6
4	7206.0	30.2	30.3	37.6	35.6	9.9	0.0	42.1	42.2	54.0	11.9	11.8
5	9608.0	30.4	30.3	37.1	36.3	11.4	0.0	42.6	42.5	54.0	11.4	11.5
Test distance 1meters RESULT=READING - AMP GAIN + CABLE LOSS + ATTEN OR FILTER - Dfac												
6	12010.0	30.7	30.8	40.5	35.7	13.1	0.0	39.1	39.2	54.0	14.9	14.8
7	14412.0	29.8	29.8	41.9	34.6	14.1	0.0	41.7	41.7	54.0	12.3	12.3
8	16814.0	29.8	29.8	46.1	35.6	15.9	0.0	46.7	46.7	54.0	7.3	7.3
9	19216.0	29.6	29.6	42.1	35.1	17.2	0.0	44.3	44.3	54.0	9.7	9.7
10	21618.0	30.7	30.5	40.8	35.4	18.8	0.0	45.4	45.2	54.0	8.6	8.8
11	24020.0	30.4	30.4	41.0	35.8	20.0	0.0	46.1	46.1	54.0	7.9	7.9

Test Distance 1.0m : Distance Factor(Dfac) = $20\log(3/1.0)$ =

9.5 dB

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

*2: ATTN : 1 to 3.5GHz, FILTER : 3.5 to 26GHz

ATTEN. or FILTER was not used for factor 0.0dB of the above table.

*3: Result is calculated to two places of decimals. Therefore, there may be 0.1 difference for the result.

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MF060b(10.04.03)

Test report No. : 24FE0196-HO-1
Page : 28 of 33
Issued date : March 15, 2004
Revised date : April 1, 2004
ECC ID : BAB134000-296

Spurious Emission (Radiated)2441MHz

UL Apex Co., Ltd.
Head Office EMC Lab. No.1 Semi Anechoic Chamber

COMPANY : Fujitsu Ten Limited
EQUIPMENT : Display
MODEL : 134000-296/288
S/ N : 0047-A
POWER : 12VDC
MODE : Tx (2441MHz)
ANGLE : Hor: A(MAX) , Ver: A(MAX)

REGULATION : FCC Part 15 Subpart C 15.247(c)
TEST DISTANCE : 3 and 1m
DATE : 03/04/2004
TEMPERATURE : 21deg.C
HUMIDITY : 33%
ENGINEER : Hiroka Umeyama

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

No.	FREQ [MHz]	S/A READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. OR FILTER [dB]	RESULT		LIMIT PK [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV/m]	[dBuV/m]					[dB]	[dB]		[dB]	[dB]
Test distance 3meters RESULT=READING + ANT FACTOR -AMP GAIN + CABLE LOSS + ATTEN. OR FILTER.												
1	1563.8	49.0	49.9	25.0	36.5	4.4	0.0	41.9	42.8	74.0	32.1	31.2
2	4882.0	47.1	46.9	35.5	36.1	8.0	0.0	54.5	54.3	74.0	19.5	19.7
3	7323.0	43.1	44.0	37.9	35.7	10.1	0.0	55.4	56.3	74.0	18.6	17.7
4	9764.0	42.9	43.7	37.0	36.3	11.5	0.0	55.1	55.9	74.0	18.9	18.1
Test distance 1meters RESULT=READING - AMP GAIN + CABLE LOSS + ATTEN OR FILTER - Dfac												
5	12205.0	43.4	43.1	41.4	35.6	13.2	0.0	52.9	52.6	74.0	21.1	21.4
6	14646.0	43.0	42.5	42.6	34.8	14.0	0.0	55.3	54.8	74.0	18.7	19.2
7	17087.0	43.0	42.4	46.5	35.4	16.0	0.0	60.6	60.0	74.0	13.4	14.0
8	19528.0	42.0	41.9	41.2	35.0	17.5	0.0	56.2	56.1	74.0	17.8	17.9
9	21969.0	44.8	44.8	41.1	35.0	19.0	0.0	60.4	60.4	74.0	13.6	13.6
10	24410.0	43.8	44.0	41.2	36.6	20.2	0.0	59.1	59.3	74.0	14.9	14.7

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

No.	FREQ [MHz]	S/A READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. OR FILTER [dB]	RESULT		LIMIT A V [dBuV/m]	MARGIN		
		HOR	VER					HOR	VER		HOR	VER	
		[dBuV/m]						[dB]			[dB]		
Test distance 3meters RESULT=READING + ANT FACTOR -AMP GAIN + CABLE LOSS + ATTEN. OR FILTER.													
1	1563.8	38.0	40.5	25.0	36.5	4.4	0.0	30.9	33.4	54.0	23.1	20.6	
2	4882.0	37.6	37.6	35.5	36.1	8.0	0.0	45.0	45.0	54.0	9.0	9.0	
3	7323.0	30.7	30.5	37.9	35.7	10.1	0.0	43.0	42.8	54.0	11.0	11.2	
4	9764.0	30.3	30.3	37.0	36.3	11.5	0.0	42.5	42.5	54.0	11.5	11.5	
Test distance 1meters RESULT=READING - AMP GAIN + CABLE LOSS + ATTEN OR FILTER - Dfac													
5	12205.0	30.3	30.4	41.4	35.6	13.2	0.0	39.8	39.9	54.0	14.2	14.1	
6	14646.0	29.7	29.8	42.6	34.8	14.0	0.0	42.0	42.1	54.0	12.0	11.9	
7	17087.0	29.8	29.8	46.5	35.4	16.0	0.0	47.4	47.4	54.0	6.6	6.6	
8	19528.0	29.3	29.3	41.2	35.0	17.5	0.0	43.5	43.5	54.0	10.5	10.5	
9	21969.0	32.0	32.0	41.1	35.0	19.0	0.0	47.6	47.6	54.0	6.4	6.4	
10	24410.0	30.5	30.6	41.2	36.6	20.2	0.0	45.8	45.9	54.0	8.2	8.1	

Test Distance 1.0m : Distance Factor(Dfac) = $20\log(3/1.0) =$

9.5 dB

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

*2: ATTEN : 1 to 3.5GHz, FILTER : 3.5 to 26GHz

ATTEN. or FILTER was not used for factor 0.0dB of the above table.

*3: Result is calculated to two places of decimals. Therefore, there may be 0.1 difference for the result.

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MF060b(10.04.03)

Spurious Emission (Radiated) 2480MHz

UL Apex Co., Ltd.
Head Office EMC Lab. No.1 Semi Anechoic Chamber

COMPANY : Fujitsu Ten Limited
EQUIPMENT : Display
MODEL : 134000-296/288
S/ N : 0047-A
POWER : 12VDC
MODE : Tx (2480MHz)
ANGLE : Hor: A(MAX) , Ver: A(MAX)

REGULATION : FCC Part 15 Subpart C 15.247(c)
TEST DISTANCE : 3 and 1m
DATE : 03/04/2004
TEMPERATURE : 21deg.C
HUMIDITY : 33%
ENGINEER : Hiroka Umeyama

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

No.	FREQ [MHz]	S/A READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. OR FILTER [dB]	RESULT		LIMIT PK [dBuV/m]	MARGIN	
		HOR [dBuV/m]	VER					HOR [dBuV/m]	VER		HOR [dB]	VER [dB]
Test distance 3meters RESULT=READING + ANT FACTOR -AMP GAIN + CABLE LOSS + ATTEN. OR FILTER.												
1	1368.7	48.9	51.2	23.7	36.7	4.1	0.0	40.0	42.3	74.0	34.0	31.7
2	2483.5	55.2	54.3	30.8	36.2	5.7	0.0	55.5	54.6	74.0	18.5	19.4
3	4960.0	46.8	45.8	35.8	36.1	8.1	0.0	54.6	53.6	74.0	19.4	20.4
4	7440.0	44.4	43.9	38.2	35.7	10.2	0.0	57.1	56.6	74.0	16.9	17.4
5	9920.0	43.5	43.4	37.0	36.3	11.5	0.0	55.7	55.6	74.0	18.3	18.4
Test distance 1meters RESULT=READING - AMP GAIN + CABLE LOSS + ATTEN OR FILTER - Dfac												
6	12400.0	43.7	43.6	42.3	35.5	13.2	0.0	54.2	54.1	74.0	19.8	19.9
7	14880.0	42.8	42.0	43.0	35.0	14.5	0.0	55.8	55.0	74.0	18.2	19.0
8	17360.0	41.4	41.5	45.4	35.2	16.2	0.0	58.3	58.4	74.0	15.7	15.6
9	19840.0	42.8	42.7	41.2	35.7	17.7	0.0	56.5	56.4	74.0	17.5	17.6
10	22320.0	44.9	44.3	41.4	35.1	19.2	0.0	60.9	60.3	74.0	13.1	13.7
11	24800.0	43.5	43.4	41.2	36.7	20.5	0.0	59.0	58.9	74.0	15.0	15.1

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

No.	FREQ	S/A READING		ANT FACTOR	AMP GAIN	CABLE LOSS	ATTEN. OR FILTER	RESULT		LIMIT AV	MARGIN	
	[MHz]	HOR	VER					HOR	VER		HOR	VER
		[dBuV/m]						[dB/m]	[dB]			[dBuV/m]
Test distance 3meters RESULT=READING + ANT FACTOR -AMP GAIN + CABLE LOSS + ATTEN. OR FILTER.												
1	1368.7	36.2	38.2	23.7	36.7	4.1	0.0	27.3	29.3	54.0	26.7	24.7
2	2483.5	32.1	31.9	30.8	36.2	5.7	0.0	32.4	32.2	54.0	21.6	21.8
3	4960.0	37.6	33.8	35.8	36.1	8.1	0.0	45.4	41.6	54.0	8.6	12.4
4	7440.0	30.6	30.7	38.2	35.7	10.2	0.0	43.3	43.4	54.0	10.7	10.6
5	9920.0	30.5	30.5	37.0	36.3	11.5	0.0	42.7	42.7	54.0	11.3	11.3
Test distance 1meters RESULT=READING - AMP GAIN + CABLE LOSS + ATTEN OR FILTER - Dfac												
6	12400.0	30.9	30.9	42.3	35.5	13.2	0.0	41.4	41.4	54.0	12.6	12.6
7	14880.0	30.1	30.1	43.0	35.0	14.5	0.0	43.1	43.1	54.0	10.9	10.9
8	17360.0	29.7	29.3	45.4	35.2	16.2	0.0	46.6	46.2	54.0	7.4	7.8
9	19840.0	29.5	29.4	41.2	35.7	17.7	0.0	43.2	43.1	54.0	10.8	10.9
10	22320.0	31.8	31.9	41.4	35.1	19.2	0.0	47.8	47.9	54.0	6.2	6.1
11	24800.0	30.7	30.7	41.2	36.7	20.5	0.0	46.2	46.2	54.0	7.8	7.8

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

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

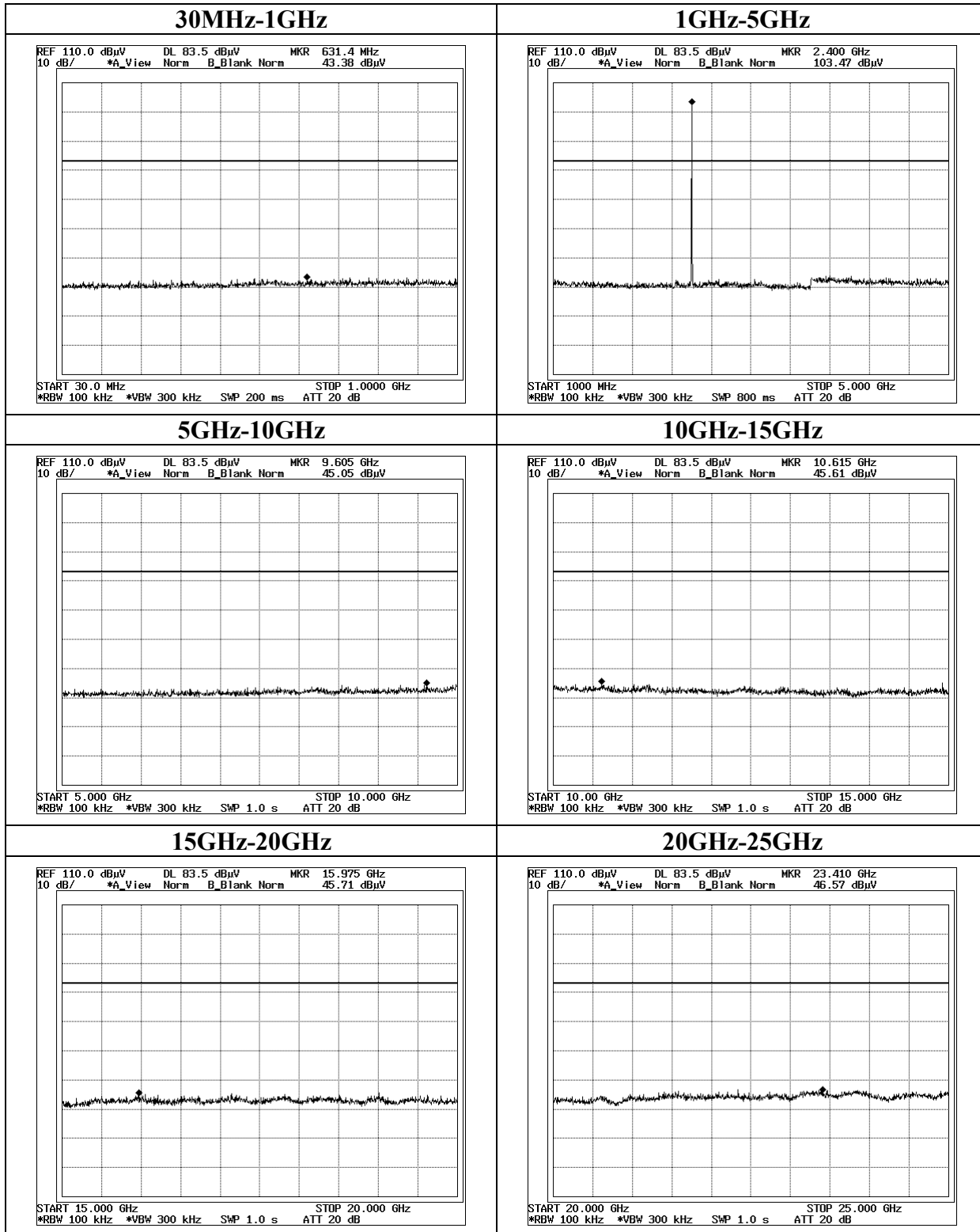
*2: ATTN : 1 to 3.5GHz, FILTER : 3.5 to 26GHz

ATTEN. or FILTER was not used for factor 0.0dB of the above table.

*3: Result is calculated to two places of decimals. Therefore, there may be 0.1 difference for the result.

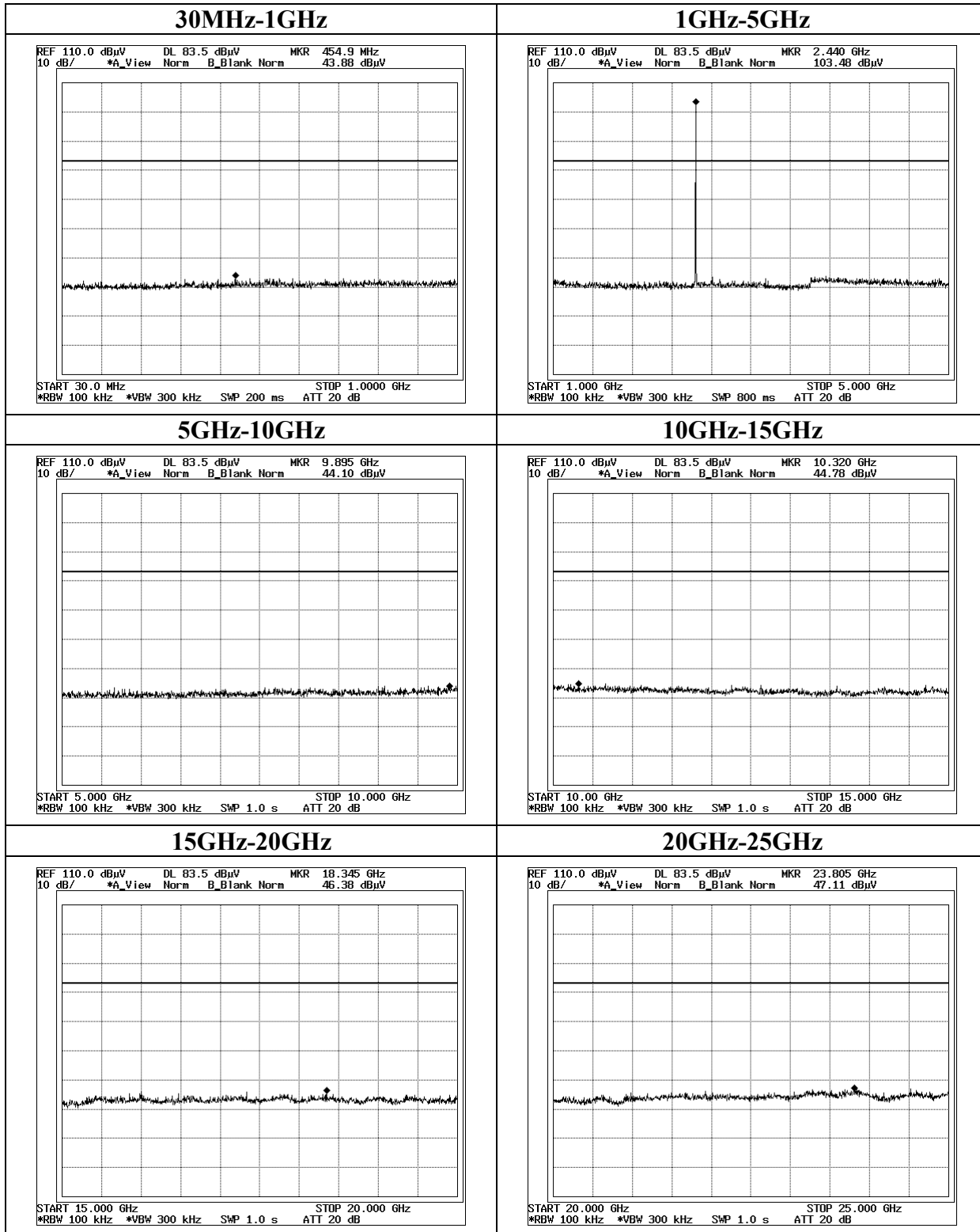
Spurious Emission (Conducted)

2402MHz



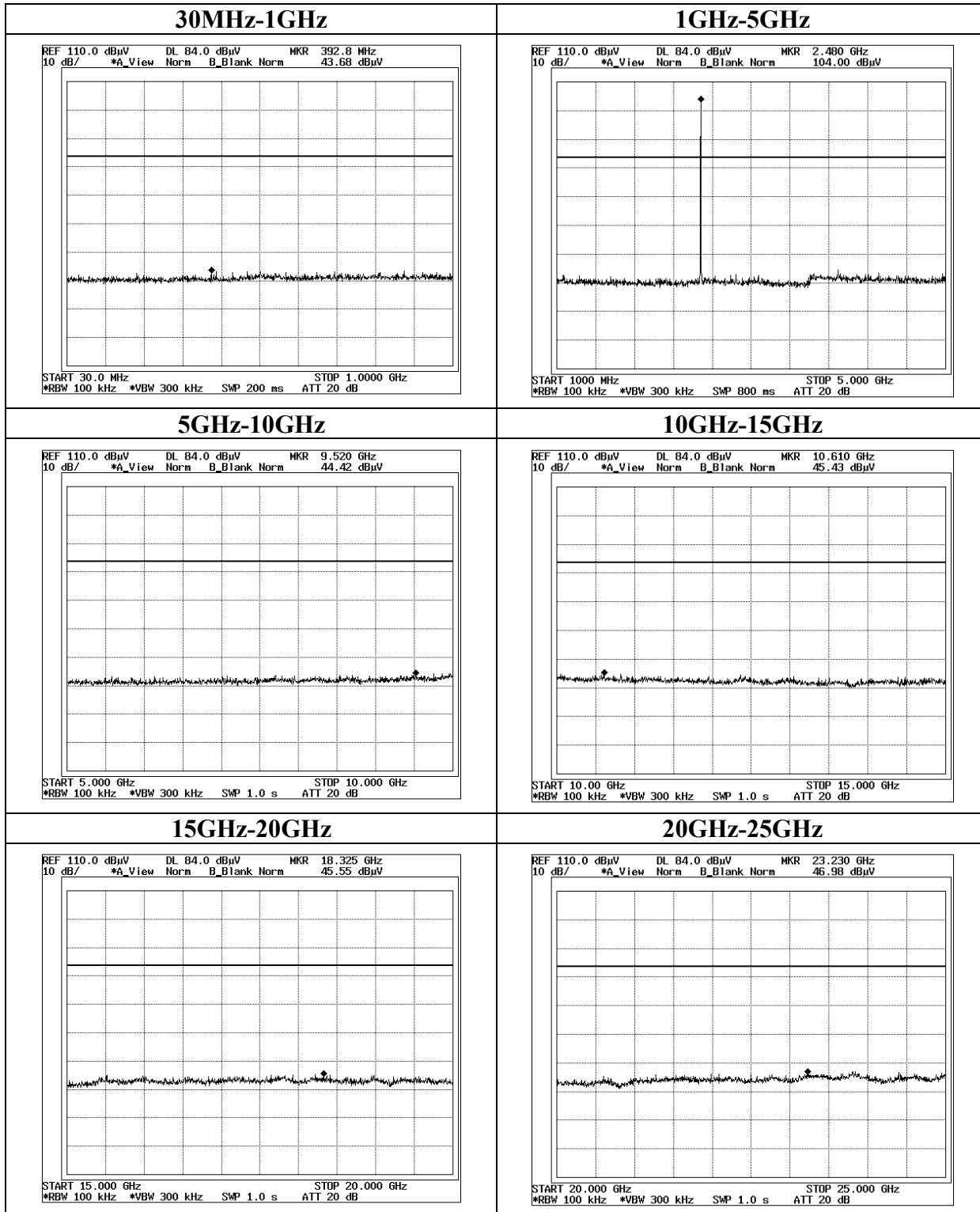
Spurious Emission (Conducted)

2441MHz



Spurious Emission (Conducted)

2480MHz



99%Occupied Bandwidth

