



EMI TEST REPORT

Test Report No. : 24FE0196-HO-2

Applicant : Fujitsu Ten Limited
Type of Equipment : Display
Model No. : 134000-290
Test standard : FCC Part 15 Subpart C : 2003
Section 15.207, Section 15.247
FCC ID : BAB134000-290
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 16 and 17, 2004

Tested by:

Hiroka Umeyama
EMC Service

Kenichi Adachi
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)

CONTENTS	PAGE
SECTION 1: Client information	3
SECTION 2: Equipment under test (E.U.T.).....	3
SECTION 3: Test specification, procedures & results.....	4
SECTION 4: Operation of E.U.T. during testing	6
SECTION 5: Carrier Frequency Separation, Section 15.247(a)(1)	7
SECTION 6: 20dB Bandwidth, Section 15.247(a)(1)	7
SECTION 7: Number of Hopping Frequency, Section 15.247(a)(1)(iii).....	7
SECTION 8: Dwell time, Section 15.247(a)(1)(iii).....	7
SECTION 9: Maximum Peak Output Power, Section 15.247(b)(1)	7
SECTION 10: Band Edge Compliance, Section 15.247(c).....	8
SECTION 11: Spurious Emission, Section 15.247(c)	8
APPENDIX 1: Photographs of test setup	9
Spurious Emission (Radiated)	9
Tested EUT position	10
APPENDIX 2: Test instruments	11
APPENDIX 3: Data of EMI test.....	12
Carrier Frequency Separation	12
20dB Bandwidth	14
Number of Hopping Frequency	16
Dwell time.....	18
Maximum Peak Output Power.....	21
Band Edge compliance	23
Spurious Emission(Radiated)	24
Spurious Emission (Conducted)	30

SECTION 1: Client information

Company Name : Fujitsu Ten Limited
Address : 2-28 Goshō-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. : 134000-290
Serial No. : 4(for Radiated Spurious Emissions)
7(except for Radiated Spurious Emissions)
Rating : DC13.2V/3A and below
Country of Manufacture : JAPAN
Receipt Date of Sample : March 10, 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: 134000-290 (referred to as the EUT in this report) is 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.

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 : -3.5dBi
Antenna Connector Type : 2DA923G0520D-215
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

It is impossible for end users to replace the antenna, because the antenna is mounted 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 : 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	5.7dB 22320.0MHz Horizontal	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.

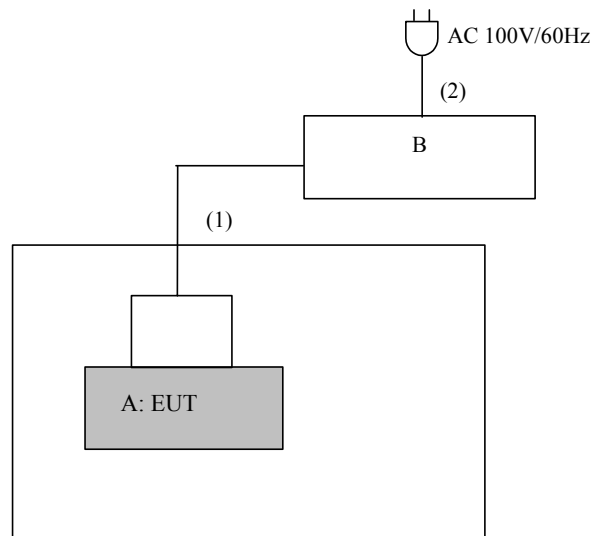
The sequence is used : Transmitting mode(Bluetooth)
Low Channel :2402MHz
Mid Channel :2441MHz
High channel :2480MHz
Inquiry

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	134000-290	4(for Radiated Spurious Emissions) 7(except for Radiated Spurious Emissions)	Fujitsu Ten Limited	BAB134000-290	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

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

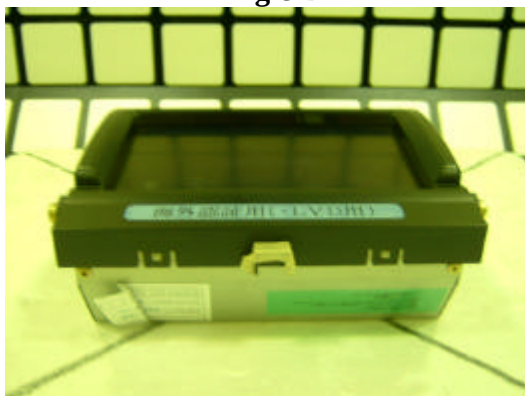


Tested EUT position

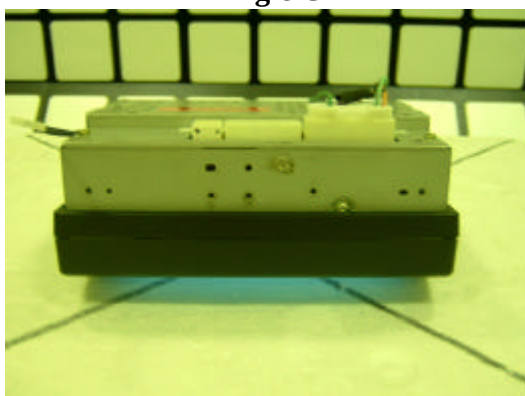
**Worst Case:
Angle A (Normal installation)**



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 * 12
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

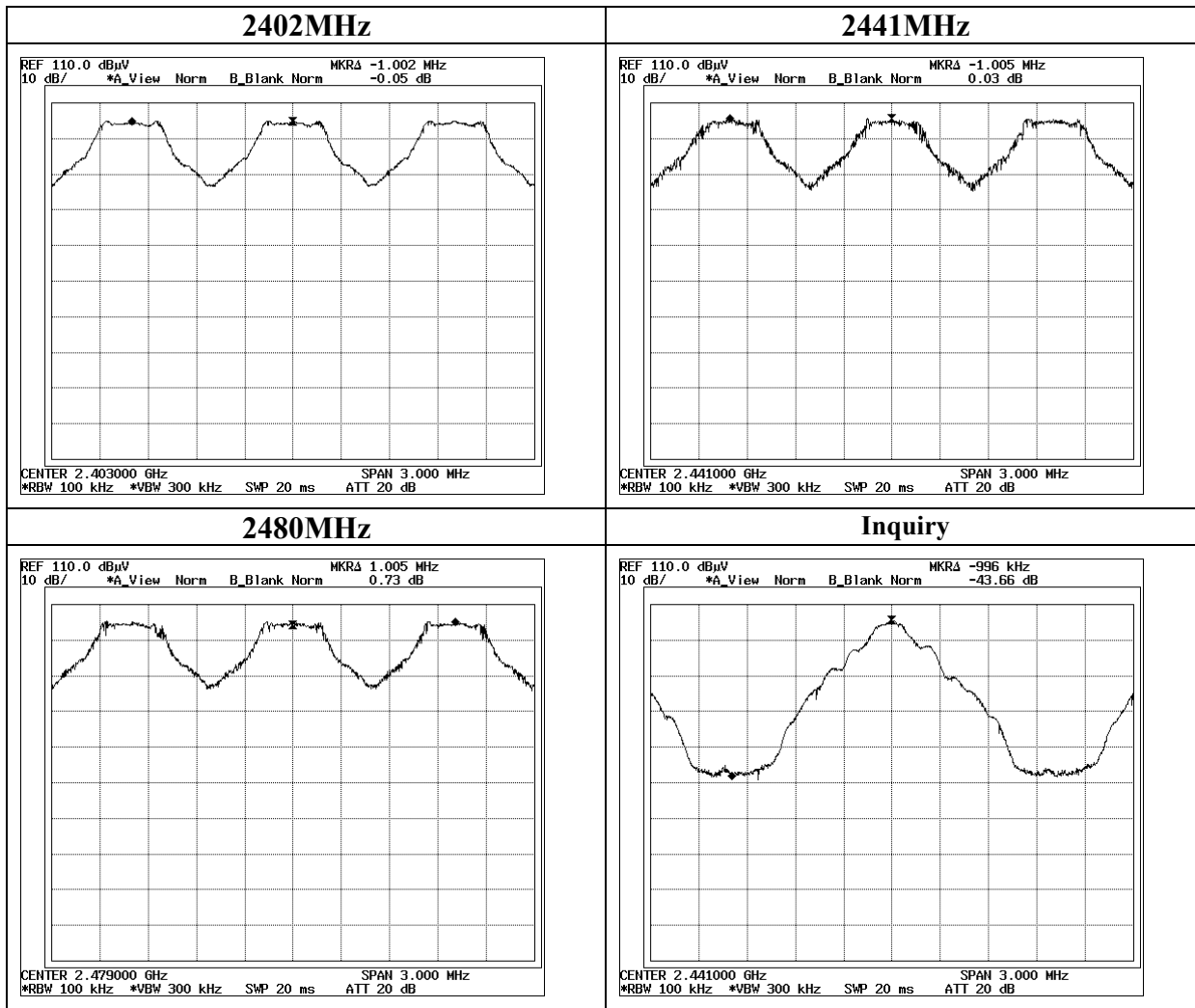
Carrier Frequency Separation

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	: 134000-290	DATE	: 03/16/2004
S/ N	: 7	TEMPERATURE	: 25deg.C
POWER	: 12VDC	HUMIDITY	: 30%
MODE	: Tx(Hopping on)/Inquiry	ENGINEER	: Hiroka Umeyama

CH	FREQ	Channel separation	Limit
	[MHz]	[MHz]	
Low	2402.0	1.002	>20dB Bandwidth and 25[kHz]
Mid	2441.0	1.005	>20dB Bandwidth and 25[kHz]
High	2480.0	1.005	>20dB Bandwidth and 25[kHz]
Inquiry	2441.0	0.996 x 2	>20dB Bandwidth and 25[kHz]

Carrier Frequency Separation



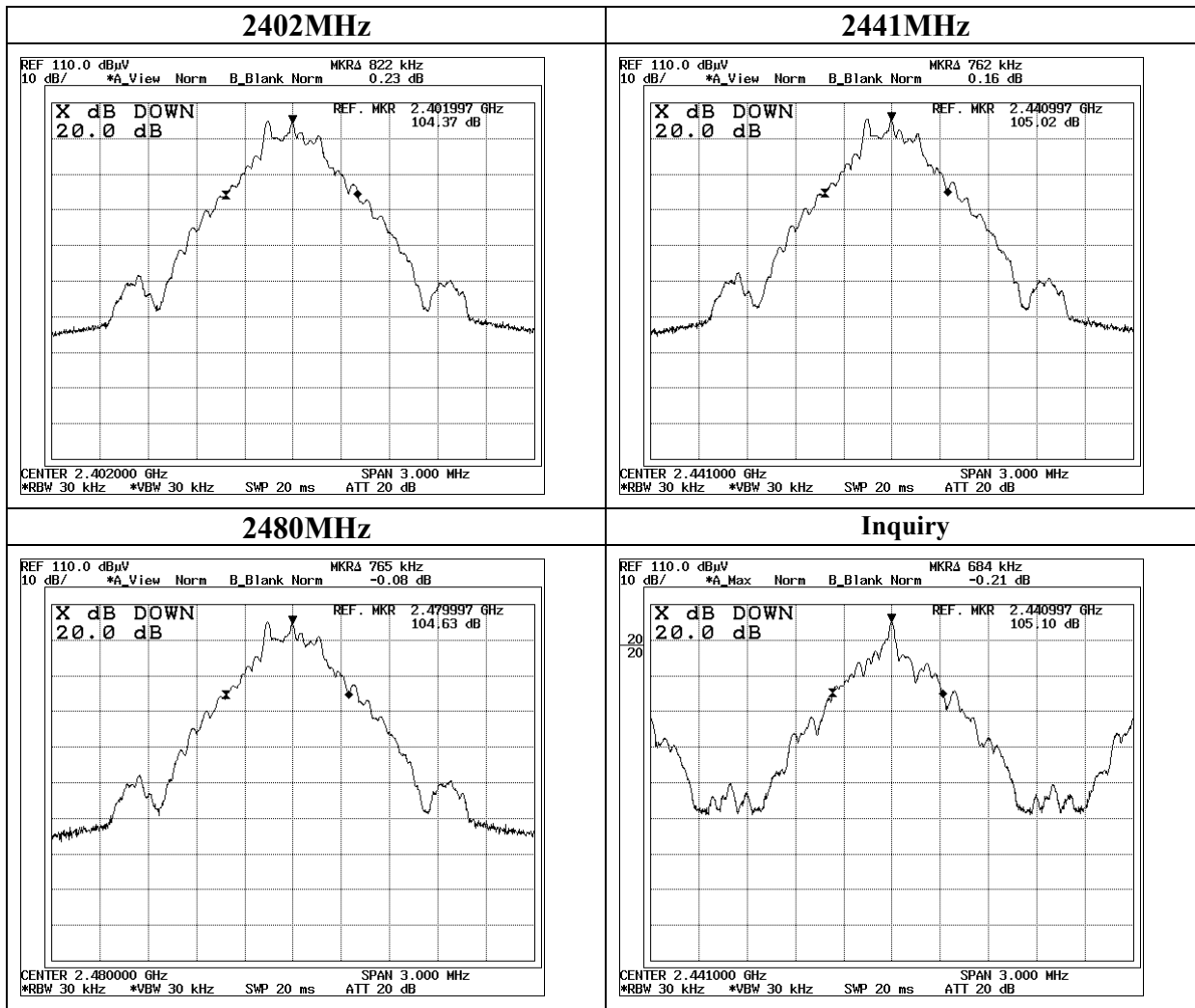
20dB Bandwidth

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	: 134000-290	DATE	: 03/16/2004
S/ N	: 7	TEMPERATURE	: 25deg.C
POWER	: 12VDC	HUMIDITY	: 30%
MODE	: Tx (Hopping off) /Inquiry	ENGINEER	: Hiroka Umeyama

CH	FREQ	20dB Bandwidth	Limit
	[MHz]	[MHz]	[MHz]
Low	2402.0	0.822	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

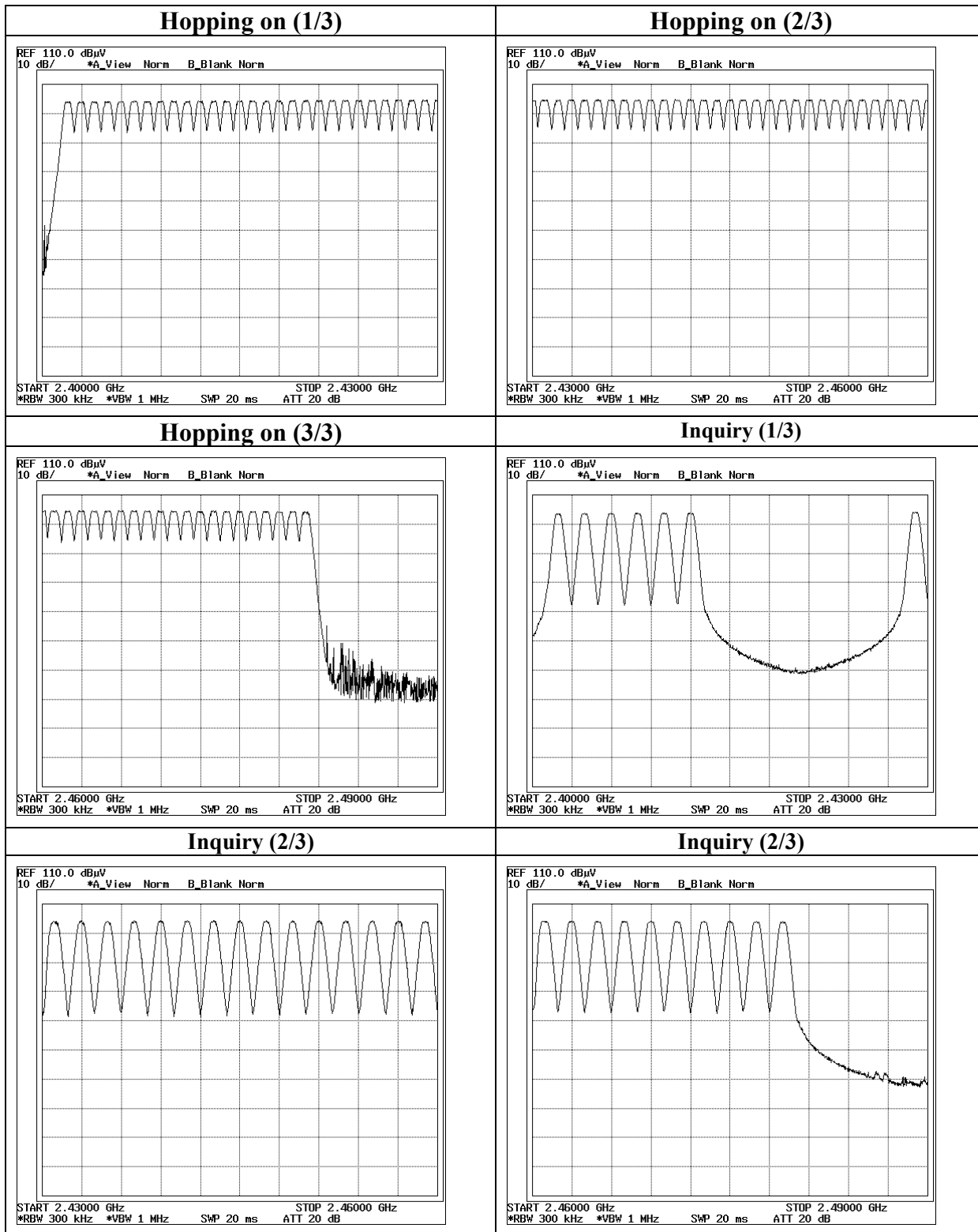
UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

COMPANY	: Fujitsu Ten Limited	REGULATION	: FCC Part15 Subpart C 15.247(a)(1)(iii)
EQUIPMENT	: Display	TEST DISTANCE	: -
MODEL	: 134000-290	DATE	: 03/16/2004
S/ N	: 7	TEMPERATURE	: 25deg.C
POWER	: 12VDC	HUMIDITY	: 30%
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



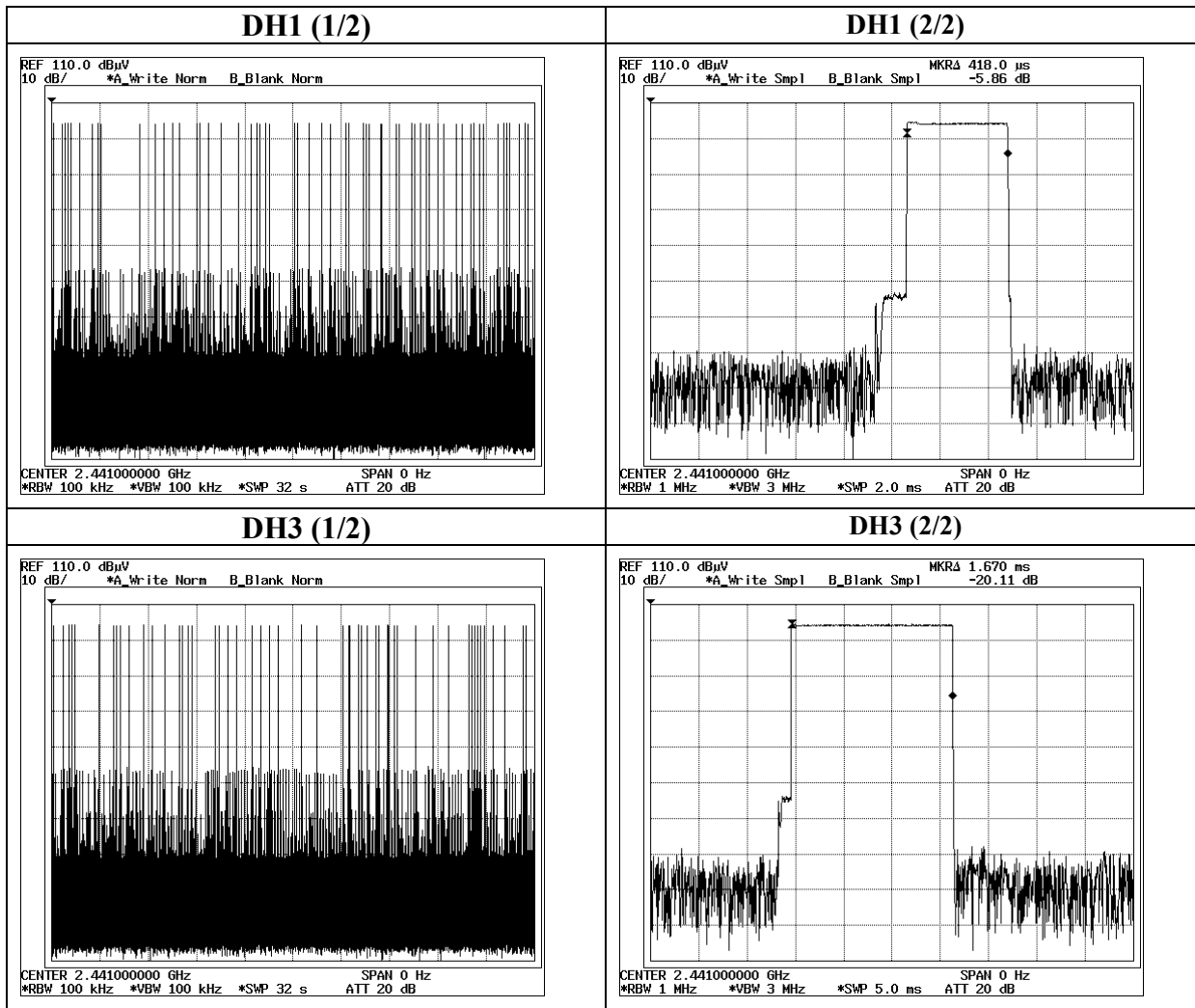
Dwell time

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

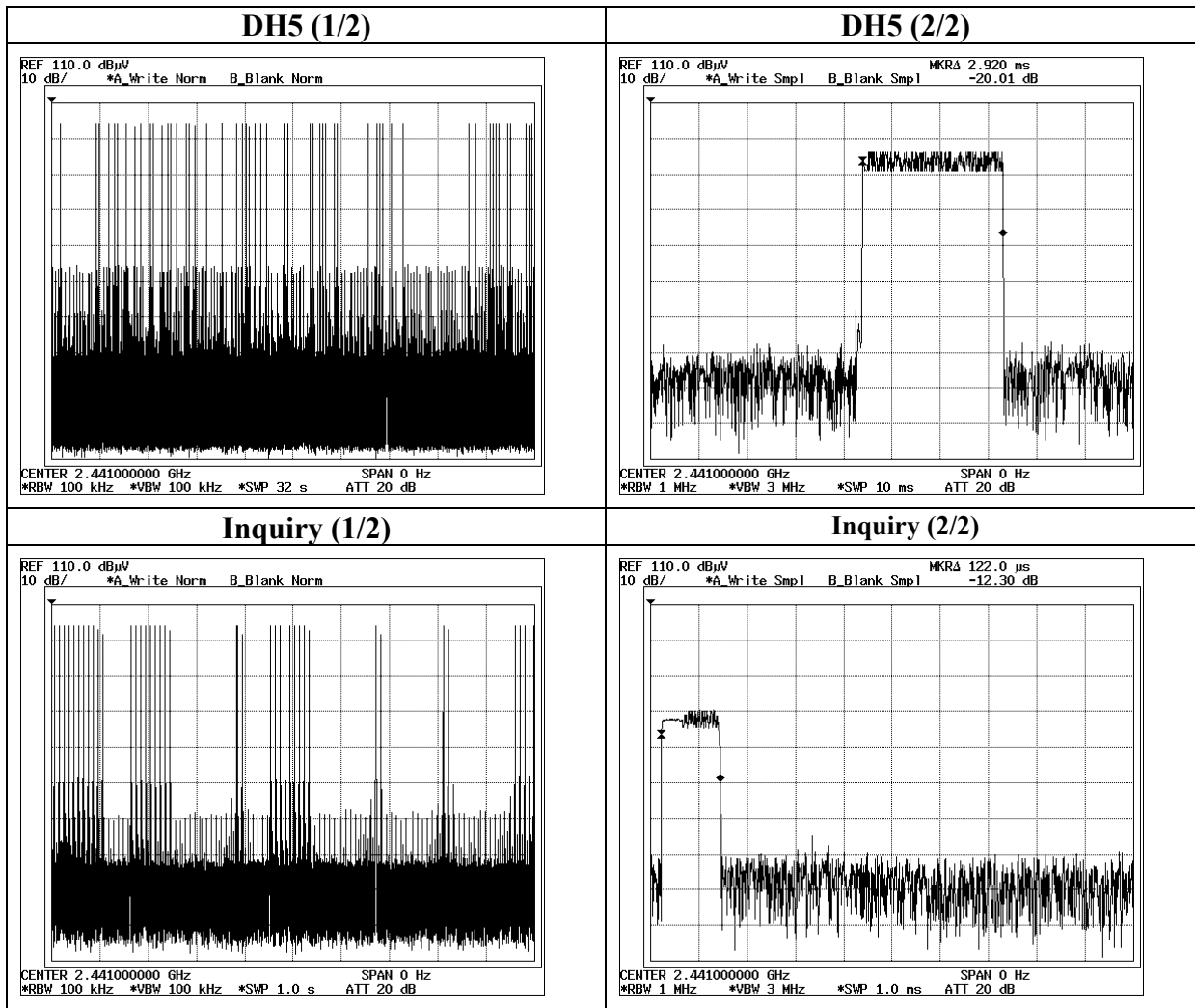
COMPANY	: Fujitsu Ten Limited	REGULATION	: FCC Part15 Subpart C 15.247(a)(1)(iii)
EQUIPMENT	: Display	TEST DISTANCE	: -
MODEL	: 134000-290	DATE	: 03/16/2004
S/N	: 7	TEMPERATURE	: 25deg.C
POWER	: 12VDC	HUMIDITY	: 30%
MODE	: Tx (Hopping on) /Inquiry	ENGINEER	: Hiroka Umeyama

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	58	0.418	25	400
DH3	51	1.670	86	400
DH5	53	2.920	155	400
Inquiry	41 times / 1sec. x 12.8 = 525 times	0.122	65	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	: 134000-290	DATE	: 03/16/2004
S/N	: 7	TEMPERATURE	: 25deg.C
POWER	: 12VDC	HUMIDITY	: 30%
MODE	: Tx (Hopping off) /Inquiry	ENGINEER	: Hiroka Umeyama

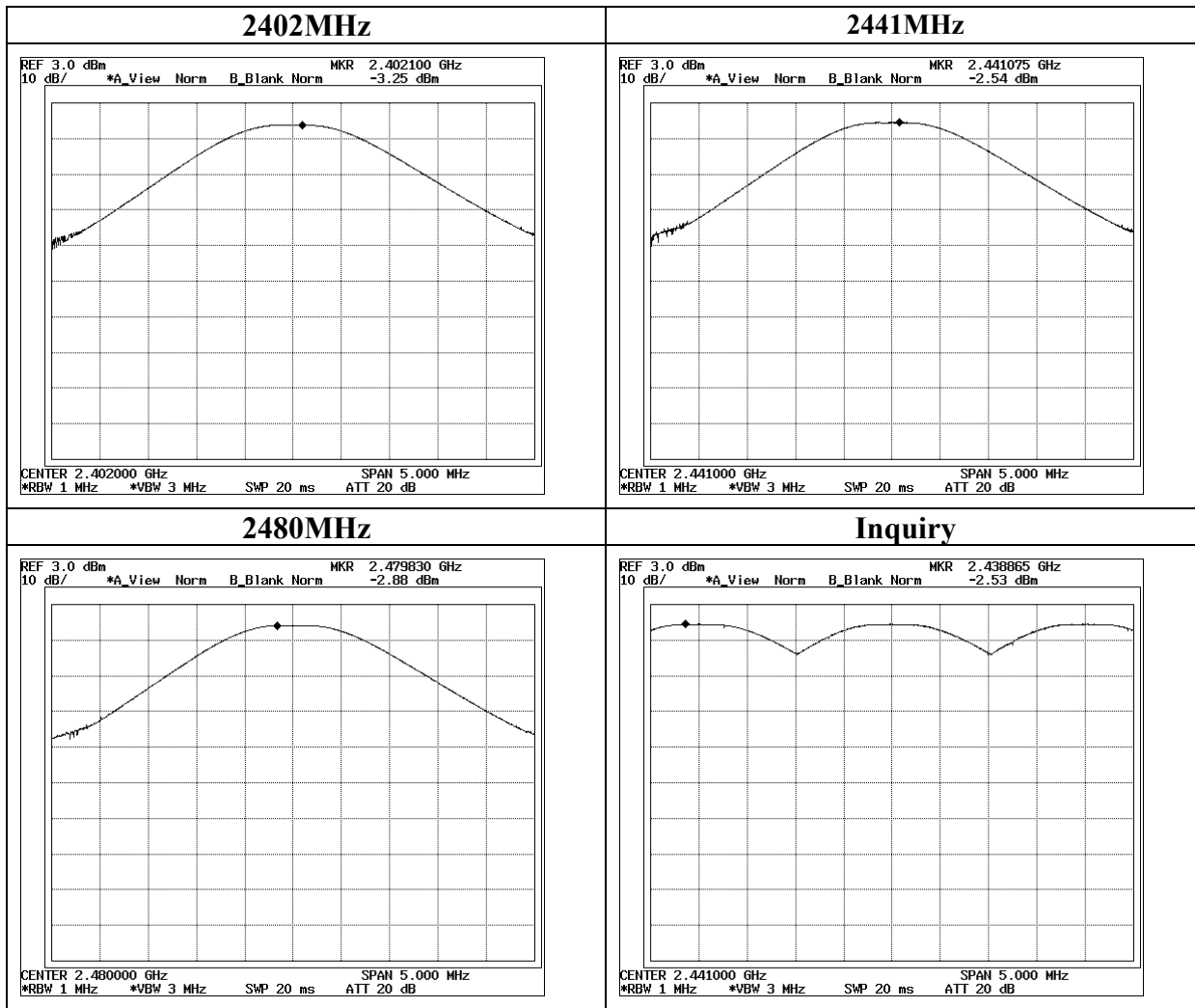
CH	FREQ [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Result [dBm]	Limit [dBm]
Low	2402.0	-3.2	0.0	-3.2	30.0
Mid	2441.0	-2.5	0.0	-2.5	30.0
High	2480.0	-2.8	0.0	-2.8	30.0
Inquiry	2441.0	-2.5	0.0	-2.5	21.0

Sample Calculation:

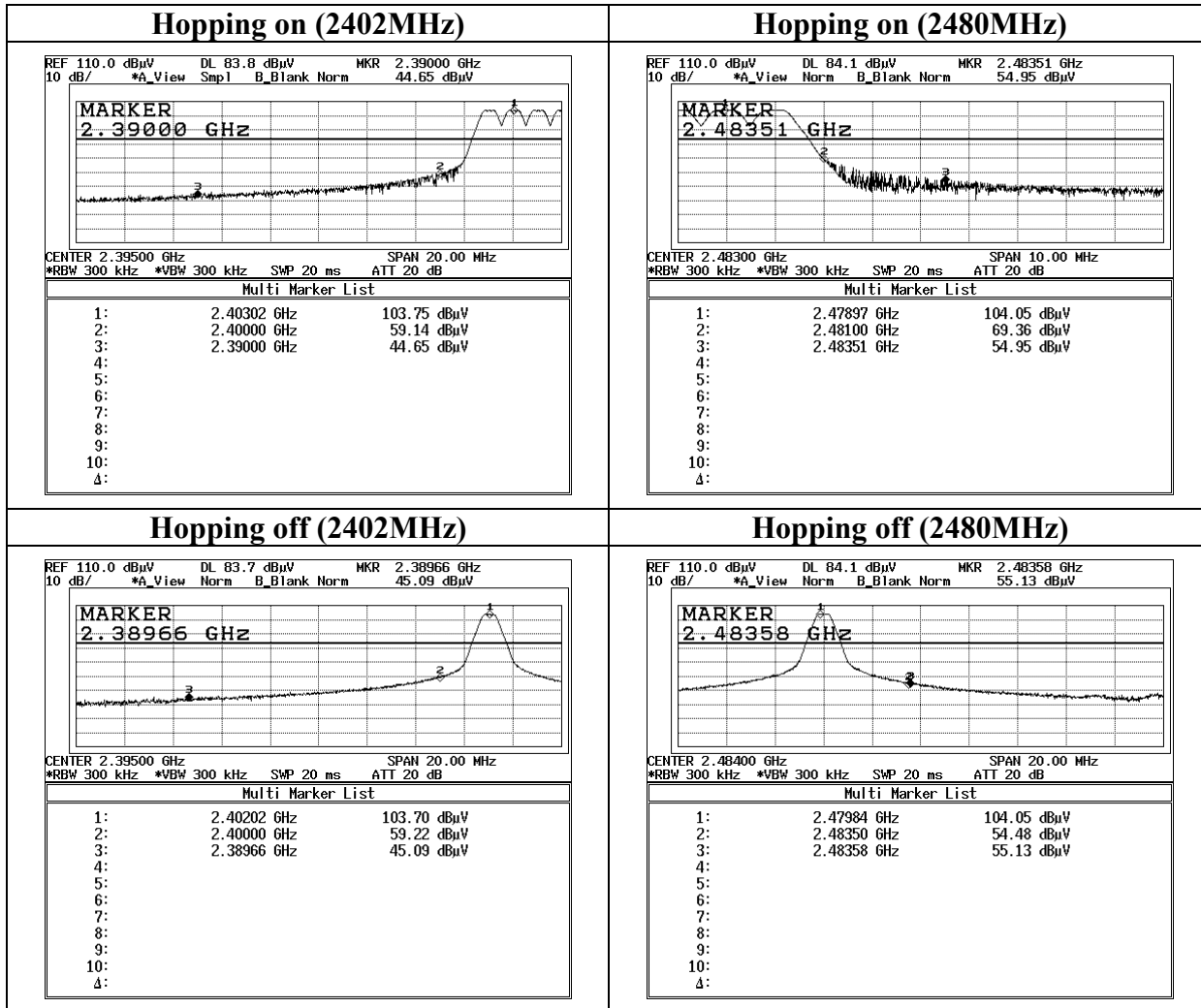
Result = S/A Reading + Cable Loss

*Cable attached to the circuit board was used.

Maximum Peak Output Power



Band Edge compliance



Spurious Emission(Radiated)
2402MHz

DATA OF RADIATED EMISSION TEST

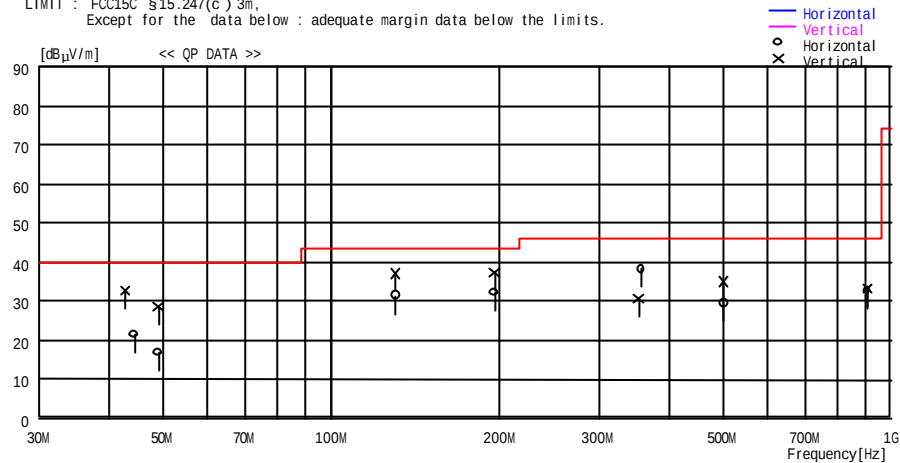
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/03/17 10:41:13

Applicant : Fujitsu Ten Limited
Kind of EUT : Display
Model No. : 134000-290
Serial No. : 4

Report No. : 24FE0196-HO
Power : DC 12V
Temp /Humi% : 22 / 49%
Operator : Kenichi Adachi

Mode / Remarks : Tx 2402MHz MAX-Angle

LIMIT : FCC15C §15.247(c) 3m,
Except for the data below : adequate margin data below the limits.



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	44.598	25.7	13.0	6.6	23.7	21.6	40.0	18.4	260	252
2	49.168	22.7	11.3	6.7	23.7	17.0	40.0	23.0	250	136
3	130.302	33.6	13.7	7.4	23.3	31.4	43.5	12.1	179	261
4	195.453	31.6	16.2	7.8	23.3	32.3	43.5	11.2	229	128
5	356.705	36.6	16.0	8.6	23.1	38.1	46.0	7.9	100	148
6	502.321	24.9	18.2	9.3	23.0	29.4	46.0	16.6	100	311
7	904.458	23.7	21.3	10.9	23.0	32.9	46.0	13.1	100	291
----- Vertical -----										
8	42.955	36.1	13.6	6.6	23.7	32.6	40.0	7.4	100	0
9	49.125	34.4	11.3	6.7	23.7	28.7	40.0	11.3	100	-1
10	130.299	39.3	13.7	7.4	23.3	37.1	43.5	6.4	100	130
11	195.453	36.5	16.2	7.8	23.3	37.2	43.5	6.3	100	-1
12	353.917	29.2	16.0	8.5	23.0	30.7	46.0	15.3	100	137
13	502.300	30.5	18.2	9.3	23.0	35.0	46.0	11.0	100	296
14	905.510	24.0	21.3	10.9	23.0	33.2	46.0	12.8	100	290

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

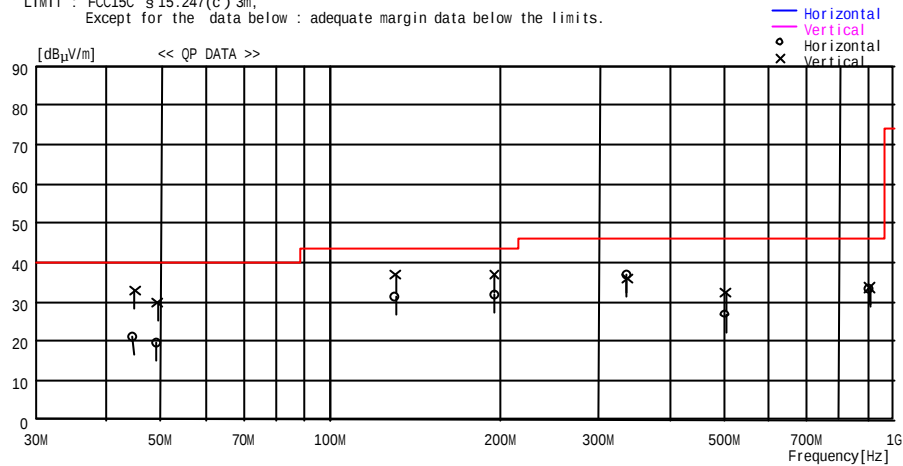
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/03/17 13:07:44

Applicant : Fujitsu Ten Limited
Kind of EUT : Display
Model No. : 134000-290
Serial No. : 4

Report No. : 24FE0196-HO
Power : DC 12V
Temp /Humi% : 22 / 49%
Operator : Kenichi Adachi

Mode / Remarks : Tx 2441MHz MAX-Angle

LIMIT : FCC15C §15.247(c) 3m,
Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING OP [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	44.577	24.9	13.1	6.6	23.7	20.9	40.0	19.1	218	254
2	49.138	25.3	11.3	6.7	23.7	19.6	40.0	20.4	281	255
3	130.302	33.4	13.7	7.4	23.3	31.2	43.5	12.3	319	256
4	195.452	31.0	16.2	7.8	23.3	31.7	43.5	11.8	159	115
5	336.066	36.1	15.4	8.4	23.1	36.8	46.0	9.2	239	150
6	502.301	22.2	18.2	9.3	23.0	26.7	46.0	19.3	100	283
7	904.811	24.0	21.3	10.9	23.0	33.2	46.0	12.8	100	294
----- Vertical -----										
8	44.877	37.1	12.9	6.6	23.7	32.9	40.0	7.1	100	360
9	49.180	35.4	11.3	6.7	23.7	29.7	40.0	10.3	100	360
10	130.301	39.1	13.7	7.4	23.3	36.9	43.5	6.6	100	133
11	195.452	36.2	16.2	7.8	23.3	36.9	43.5	6.6	100	360
12	336.070	35.3	15.4	8.4	23.1	36.0	46.0	10.0	100	325
13	502.300	27.9	18.2	9.3	23.0	32.4	46.0	13.6	100	292
14	905.503	24.5	21.3	10.9	23.0	33.7	46.0	12.3	100	292

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

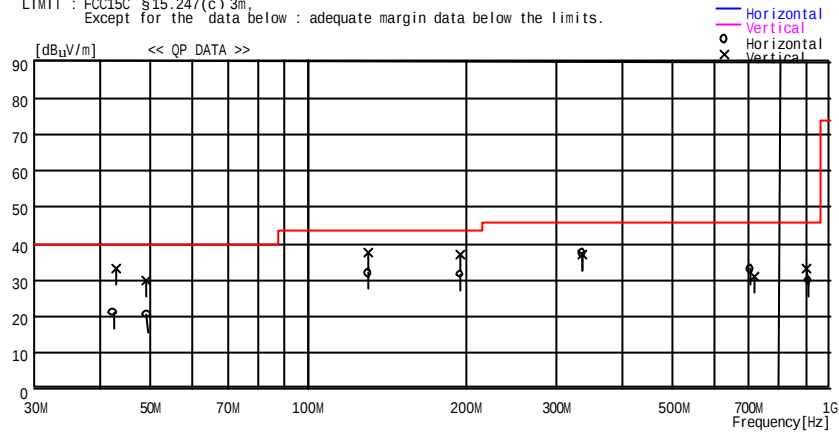
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/03/17 14:37:41

Applicant : Fujitsu Ten Limited
Kind of EUT : Display
Model No. : 134000-290
Serial No. : 4

Report No. : 24FE0196-HO
Power : DC 12V
Temp /Humi% : 22 / 49%
Operator : Kenichi Adachi

Mode / Remarks : Tx 2480MHz MAX-Angle

LIMIT : FCC15C §15.247(c) 3m
Except for the data below : adequate margin data below the limits.



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	42.368	24.4	13.8	6.6	23.7	21.1	40.0	18.9	307	248
2	49.146	26.1	11.3	6.7	23.7	20.4	40.0	19.6	386	265
3	130.301	34.1	13.7	7.4	23.3	31.9	43.5	11.6	156	260
4	195.453	31.0	16.2	7.8	23.3	31.7	43.5	11.8	166	116
5	336.067	36.5	15.4	8.4	23.1	37.2	46.0	8.8	100	157
6	703.905	25.4	20.7	10.2	23.3	33.0	46.0	13.0	100	153
7	904.910	20.8	21.3	10.9	23.0	30.0	46.0	16.0	100	306
----- Vertical -----										
8	43.022	36.7	13.6	6.6	23.7	33.2	40.0	6.8	100	-1
9	49.120	35.6	11.3	6.7	23.7	29.9	40.0	10.1	100	360
10	130.299	39.6	13.7	7.4	23.3	37.4	43.5	6.1	100	135
11	195.454	36.4	16.2	7.8	23.3	37.1	43.5	6.4	100	360
12	336.069	36.4	15.4	8.4	23.1	37.1	46.0	8.9	100	106
13	716.647	22.9	20.8	10.3	23.1	30.9	46.0	15.1	100	-1
14	904.110	23.9	21.3	10.9	23.0	33.1	46.0	12.9	100	288

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) 2402MHz

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

COMPANY : Fujitsu Ten Limited
EQUIPMENT : Display
MODEL : 134000-290
S/ N : 4
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 : 03/16/2004
TEMPERATURE : 22deg.C
HUMIDITY : 37%
ENGINEER : Kenichi Adachi

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	1201.0	45.9	45.8	23.1	36.9	3.9	0.0	36.0	35.9	74.0	38.0	38.1
2	2385.5	44.6	44.8	30.7	36.3	5.6	0.0	44.6	44.8	74.0	29.4	29.2
3	4804.0	45.7	45.1	35.1	36.1	7.9	0.0	52.6	52.0	74.0	21.4	22.0
4	7206.0	43.8	43.8	37.6	35.6	9.9	0.0	55.7	55.7	74.0	18.3	18.3
5	9608.0	44.0	44.0	37.1	36.3	11.4	0.0	56.2	56.2	74.0	17.8	17.8
Test distance 1meters RESULT=READING - AMP GAIN + CABLE LOSS + ATTEN OR FILTER - Dfac												
6	12010.0	43.6	43.7	40.5	35.7	13.1	0.0	52.0	52.1	74.0	22.0	21.9
7	14412.0	44.6	43.1	41.9	34.6	14.1	0.0	56.5	55.0	74.0	17.5	19.0
8	16814.0	42.7	42.7	46.1	35.6	15.9	0.0	59.6	59.6	74.0	14.4	14.4
9	19216.0	42.8	42.8	42.1	35.1	17.2	0.0	57.5	57.5	74.0	16.5	16.5
10	21618.0	43.6	43.8	40.8	35.4	18.8	0.0	58.3	58.5	74.0	15.7	15.5
11	24020.0	43.6	43.9	41.0	35.8	20.0	0.0	59.3	59.6	74.0	14.7	14.4

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		LMIT AV [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV/m]	[dBuV/m]					[dBuV/m]	[dBuV/m]		[dB]	[dB]
Test distance 3meters RESULT=READING + ANT FACTOR -AMP GAIN + CABLE LOSS + ATTEN. OR FILTER												
1	1070.0	32.3	32.4	23.1	36.9	3.9	0.0	22.4	22.5	54.0	31.6	31.5
2	2385.5	31.3	31.4	30.7	36.3	5.6	0.0	31.3	31.4	54.0	22.7	22.6
3	4804.0	33.3	33.0	35.1	36.1	7.9	0.0	40.2	39.9	54.0	13.8	14.1
4	7206.0	30.6	30.3	37.6	35.6	9.9	0.0	42.5	42.2	54.0	11.5	11.8
5	9608.0	30.6	30.5	37.1	36.3	11.4	0.0	42.8	42.7	54.0	11.2	11.3
Test distance 1meters RESULT=READING - AMP GAIN + CABLE LOSS + ATTEN OR FILTER - Dfac												
6	12010.0	30.7	30.9	40.5	35.7	13.1	0.0	39.1	39.3	54.0	14.9	14.7
7	14412.0	32.4	30.0	41.9	34.6	14.1	0.0	44.3	41.9	54.0	9.7	12.1
8	16814.0	29.7	29.8	46.1	35.6	15.9	0.0	46.6	46.7	54.0	7.4	7.3
9	19216.0	29.9	29.8	42.1	35.1	17.2	0.0	44.6	44.5	54.0	9.4	9.5
10	21618.0	30.8	30.9	40.8	35.4	18.8	0.0	45.5	45.6	54.0	8.5	8.4
11	24020.0	30.8	30.7	41.0	35.8	20.0	0.0	46.5	46.4	54.0	7.5	7.6

Test Distance 1.0m : Distance Factor(Dfac) = 20log(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.

Test report No. : 24FE0196-HO-2
Page : 28 of 34
Issued date : March 22, 2004
Revised : April 1, 2004
ECC ID : BAB134000-290

Spurious Emission (Radiated)2441MHz

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

COMPANY : Fujitsu Ten Limited
EQUIPMENT : Display
MODEL : 134000-290
S/ N : 4
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 : 03/16/2004
TEMPERATURE : 22deg.C
HUMIDITY : 37%
ENGINEER : Kenichi Adachi

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]					[dBuV/m]	[dBuV/m]		[dB]	[dB]
Test distance 3meters RESULT=READING + ANT FACTOR -AMP GAIN + CABLE LOSS + ATTEN. OR FILTER.												
1	1220.7	45.2	44.8	23.1	36.9	3.9	0.0	35.3	34.9	74.0	38.7	39.1
2	4882.0	44.9	45.5	35.5	36.1	8.0	0.0	52.3	52.9	74.0	21.7	21.1
3	7323.0	45.2	44.9	37.9	35.7	10.1	0.0	57.5	57.2	74.0	16.5	16.8
4	9764.0	44.6	44.7	37.0	36.3	11.5	0.0	56.8	56.9	74.0	17.2	17.1
Test distance 1meters RESULT=READING - AMP GAIN + CABLE LOSS + ATTEN OR FILTER - Dfac												
5	12205.0	43.6	43.9	41.4	35.6	13.2	0.0	53.1	53.4	74.0	20.9	20.6
6	14646.0	43.9	43.8	42.6	34.8	14.0	0.0	56.2	56.1	74.0	17.8	17.9
7	17087.0	42.9	42.8	46.5	35.4	16.0	0.0	60.5	60.4	74.0	13.5	13.6
8	19528.0	43.2	43.1	41.2	35.0	17.5	0.0	57.4	57.3	74.0	16.6	16.7
9	21969.0	45.2	45.2	41.1	35.0	19.0	0.0	60.8	60.8	74.0	13.2	13.2
10	24410.0	43.3	43.6	41.2	36.6	20.2	0.0	58.6	58.9	74.0	15.4	15.1

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

No.	FREQ [MHz]	S/A READING		ANT FACTOR [dBuV/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]	[dBuV/m]					[dBuV/m]	[dBuV/m]		[dBuV/m]	[dBuV/m]	
Test distance 3meters RESULT=READING + ANT FACTOR -AMP GAIN + CABLE LOSS + ATTEN. OR FILTER.													
1	1220.7	31.6	31.6	23.1	36.9	3.9	0.0	21.7	21.7	54.0	32.3	32.3	
2	4882.0	33.9	33.4	35.5	36.1	8.0	0.0	41.3	40.8	54.0	12.7	13.2	
3	7323.0	31.7	31.6	37.9	35.7	10.1	0.0	44.0	43.9	54.0	10.0	10.1	
4	9764.0	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													
5	12205.0	30.7	30.8	41.4	35.6	13.2	0.0	40.2	40.3	54.0	13.8	13.7	
6	14646.0	30.5	30.4	42.6	34.8	14.0	0.0	42.8	42.7	54.0	11.2	11.3	
7	17087.0	29.4	29.3	46.5	35.4	16.0	0.0	47.0	46.9	54.0	7.0	7.1	
8	19528.0	29.7	29.8	41.2	35.0	17.5	0.0	43.9	44.0	54.0	10.1	10.0	
9	21969.0	32.2	32.2	41.1	35.0	19.0	0.0	47.8	47.8	54.0	6.2	6.2	
10	24410.0	30.6	30.6	41.2	36.6	20.2	0.0	45.9	45.9	54.0	8.1	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)

Test report No. : 24FE0196-HO-2
Page : 29 of 34
Issued date : March 22, 2004
Revised : April 1, 2004
ECC ID : BAB134000-290

Spurious Emission (Radiated) 2480MHz

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

COMPANY : Fujitsu Ten Limited
EQUIPMENT : Display
MODEL : 134000-290
S/ N : 4
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 : 03/16/2004
TEMPERATURE : 22deg.C
HUMIDITY : 37%
ENGINEER : Kenichi Adachi

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]						[dB]	[dB]				
Test distance 3meters RESULT=READING + ANT FACTOR -AMP GAIN + CABLE LOSS + ATTEN. OR FILTER													
1	1240.0	45.4	45.5	23.2	36.9	3.9	0.0	35.6	35.7	74.0	38.4	38.3	
2	2483.5	53.9	58.6	30.8	36.2	5.7	0.0	54.2	58.9	74.0	19.8	15.1	
3	4960.0	45.7	43.9	35.8	36.1	8.1	0.0	53.5	51.7	74.0	20.5	22.3	
4	7440.0	43.9	43.7	38.2	35.7	10.2	0.0	56.6	56.4	74.0	17.4	17.6	
5	9920.0	43.8	43.6	37.0	36.3	11.5	0.0	56.0	55.8	74.0	18.0	18.2	
Test distance 1meters RESULT=READING - AMP GAIN + CABLE LOSS + ATTEN OR FILTER - Dfac													
6	12400.0	43.6	43.6	42.3	35.5	13.2	0.0	54.1	54.1	74.0	19.9	19.9	
7	14880.0	43.2	43.4	43.0	35.0	14.5	0.0	56.2	56.4	74.0	17.8	17.6	
8	17360.0	42.9	43.0	45.4	35.2	16.2	0.0	59.8	59.9	74.0	14.2	14.1	
9	19840.0	42.9	42.8	41.2	35.7	17.7	0.0	56.6	56.5	74.0	17.4	17.5	
10	22320.0	45.3	45.2	41.4	35.1	19.2	0.0	61.3	61.2	74.0	12.7	12.8	
11	24800.0	44.6	44.5	41.2	36.7	20.5	0.0	60.1	60.0	74.0	13.9	14.0	

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
Test distance 3meters RESULT=READING + ANT FACTOR -AMP GAIN + CABLE LOSS + ATTEN. OR FILTER												
1	1368.7	32.4	32.3	23.2	36.9	3.9	0.0	22.6	22.5	54.0	31.4	31.5
2	2483.5	31.8	33.0	30.8	36.2	5.7	0.0	32.1	33.3	54.0	21.9	20.7
3	4960.0	35.0	30.6	35.8	36.1	8.1	0.0	42.8	38.4	54.0	11.2	15.6
4	7440.0	30.8	30.8	38.2	35.7	10.2	0.0	43.5	43.5	54.0	10.5	10.5
5	9920.0	30.7	30.7	37.0	36.3	11.5	0.0	42.9	42.9	54.0	11.1	11.1
Test distance 1meters RESULT=READING - AMP GAIN + CABLE LOSS + ATTEN OR FILTER - Dfac												
6	12400.0	30.9	31.0	42.3	35.5	13.2	0.0	41.4	41.5	54.0	12.6	12.5
7	14880.0	30.4	30.4	43.0	35.0	14.5	0.0	43.4	43.4	54.0	10.6	10.6
8	17360.0	29.7	29.7	45.4	35.2	16.2	0.0	46.6	46.6	54.0	7.4	7.4
9	19840.0	29.6	29.5	41.2	35.7	17.7	0.0	43.3	43.2	54.0	10.7	10.8
10	22320.0	32.3	32.2	41.4	35.1	19.2	0.0	48.3	48.2	54.0	5.7	5.8
11	24800.0	31.4	31.5	41.2	36.7	20.5	0.0	46.9	47.0	54.0	7.1	7.0

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.

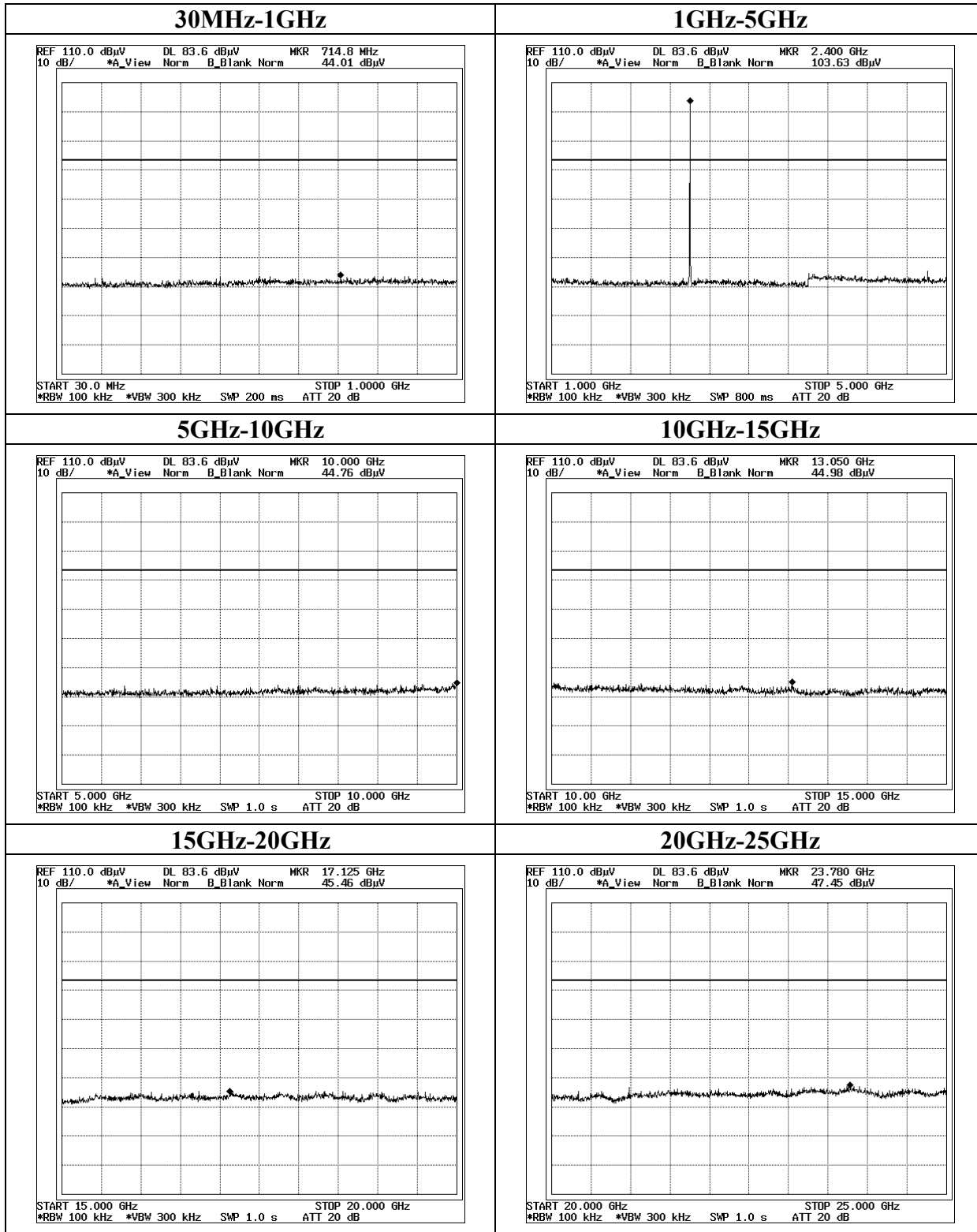
*3: Result is calculated to two places of decimals. Therefore, there may be 0.1 difference for the result.

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MF060b(10.04.03)

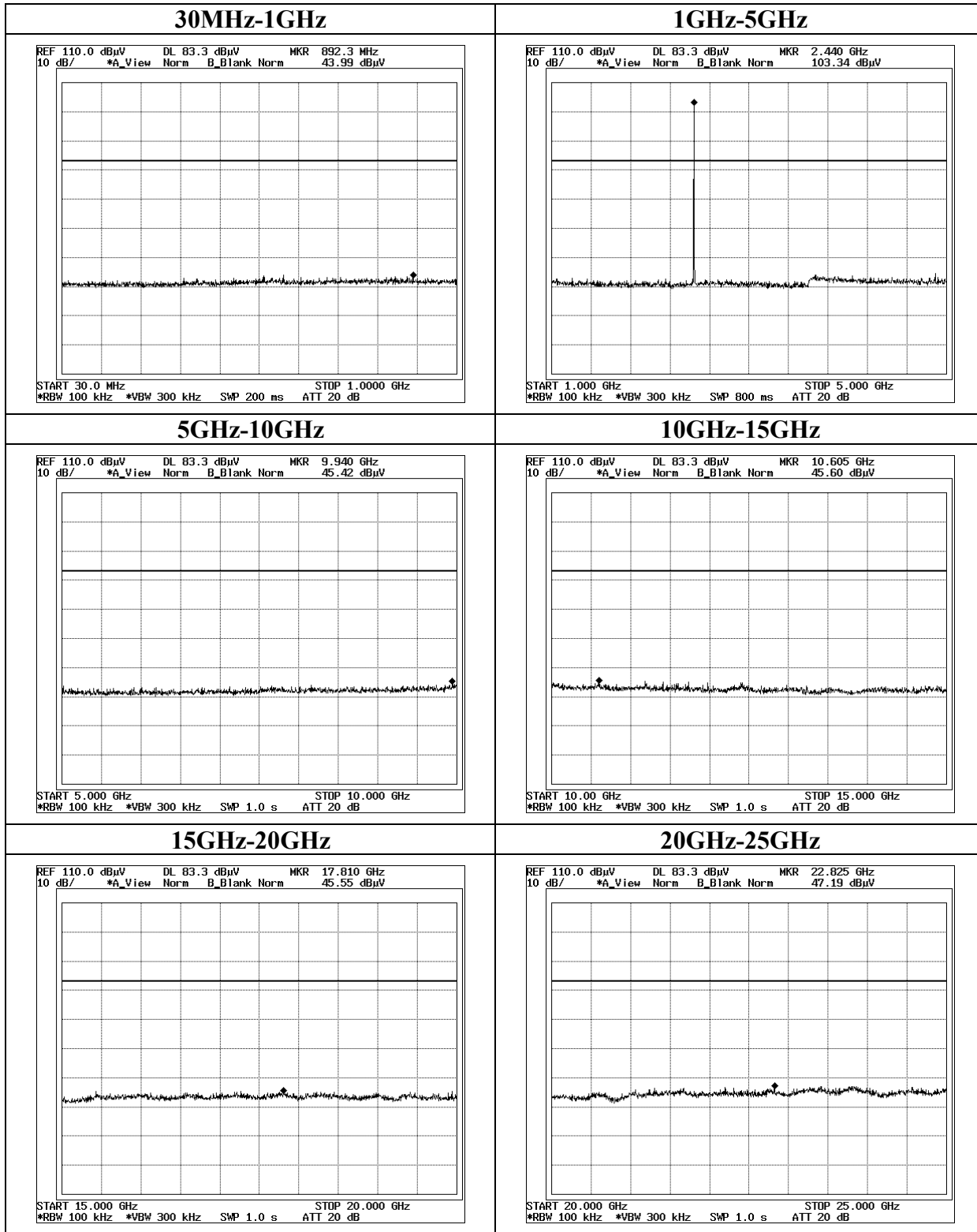
Spurious Emission (Conducted)

2402MHz



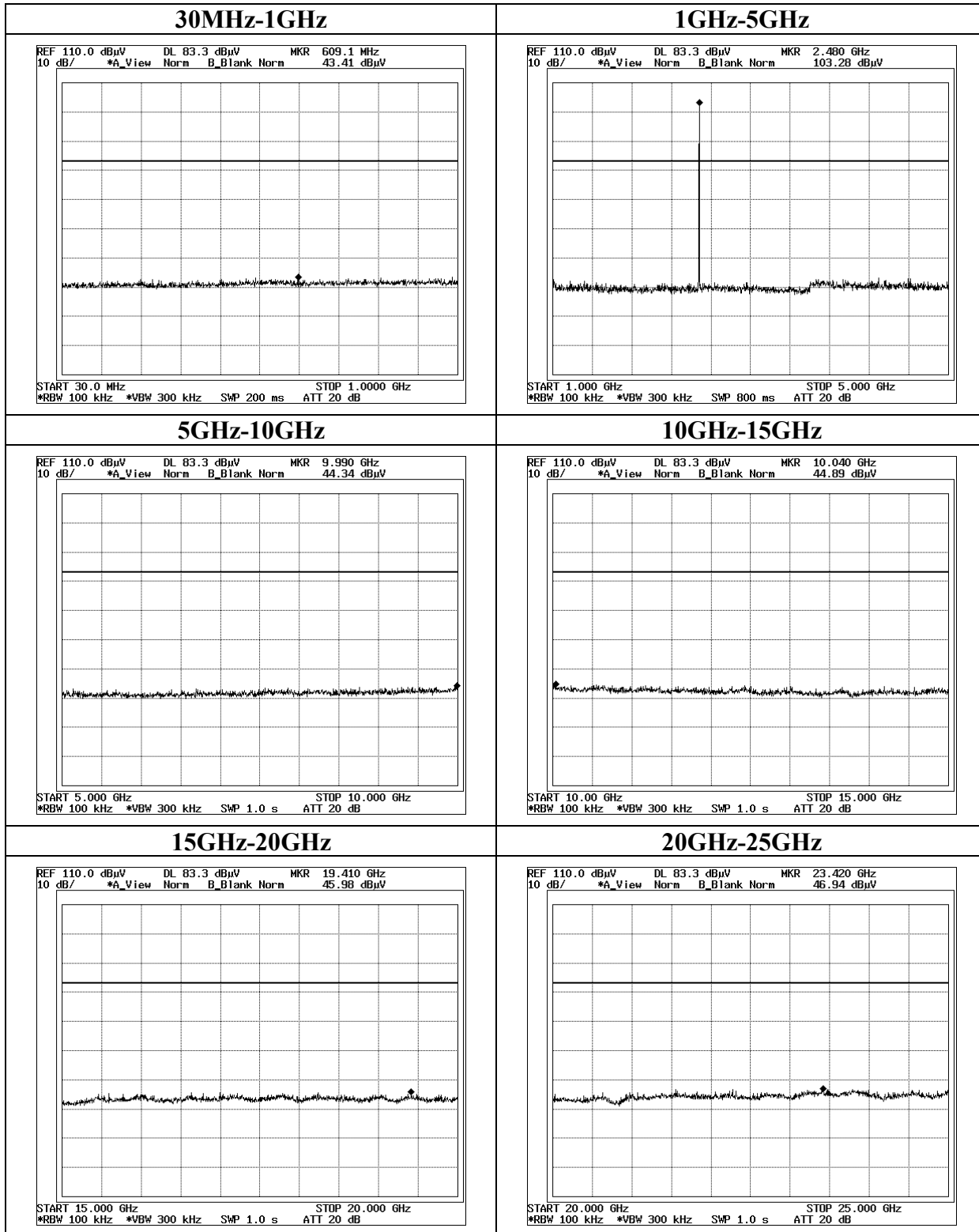
Spurious Emission (Conducted)

2441MHz



Spurious Emission (Conducted)

2480MHz



99%Occupied Bandwidth

