



EMI TEST REPORT

Test Report No.: 26IE0294-HO-B-2

Applicant : THine Electronics, inc.
Type of Equipment : THG4649 demonstration set
Model No. : FMT-MB02 rev3
Test standard : FCC Part 15 Subpart C
Section 15.239: 2006
FCC ID : USTFMTMB02R3
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.
4. The test results in this report are traceable to the national or international standards.

Date of test: June 6, 2006 to January 23, 2007

Tested by:

T. Shimada

Takumi Shimada
EMC Services

S. Watanabe

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Approved by :

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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: 200kHz Band Width and 20 dB Bandwidth.....	7
SECTION 6: Emissions from the Intentional radiator and Spurious Emissions	8
APPENDIX 1: Photographs of test setup	9
Spurious Emissions	9
Worst Case Position (Horizontal: Z-axis / Vertical:Y-axis)	10
APPENDIX 2: Test instruments	11
APPENDIX 3: Data of EMI test.....	13
200kHz Bandwidth	13
20dB Bandwidth	14
Emissions from the Intentional radiators	16
Spurious Emissions	19
Spurious Emissions (Band Edge).....	22

SECTION 1: Client information

Company Name	:	THine Electronics, inc.
Address	:	3-3-6, Nihombashi-Honcho, Chuo-ku, Tokyo, 103-0023, Japan
Telephone Number	:	+81-3-3270-1137
Facsimile Number	:	+81-3-3270-1773
Contact Person	:	Takeo Okamura

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

2.1 Identification of E.U.T.

Type of Equipment	:	THG4649 demonstration set
Model No.	:	FMT-MB02 rev3
Serial No.	:	170
Rating	:	DC3V
Country of Manufacture	:	Japan
Receipt Date of Sample	:	June 5, 2006
Condition of EUT	:	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No modification by the test lab.

2.2 Product Description

Model No: FMT-MB02 rev3 (referred to as the EUT in this report) is the THG4649 demonstration set.

Equipment Type	:	Transmitter
Frequency of operation	:	88.1-107.9MHz
Type of modulation	:	FM
Bandwidth & Channel spacing	:	200kHz
Antenna Type	:	Pattern Antenna
Operating voltage (inner)	:	DC3V (Battery)

* RS232C exists inside the chassis (on the printed circuit board) but does not be connected with it. Thus, RS232C cannot be used.

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part15 Subpart C : 2006
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits : 2006
Section 15.239 Operation in the band 88-108MHz: 2006

FCC 15.31 (e)

This EUT provides the stable voltage (DC3V) to the radio part constantly. Therefore, the EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

The antenna is not removable from EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Deviation	Worst margin *0)	Results
1	Conducted emission	FCC: ANSI C63.4:2003 7. AC powerline conducted emission measurements	Section 15.207	N/A *1)	N/A	N/A
2	200kHz Bandwidth	FCC Part 2 Section 2.1049	Section 15.239(a)	N/A	65.2kHz (107.9MHz Horizontal)	Complied
3	Emissions from the Intentional radiators	FCC Part 2 Section 2.1046	Section 15.239(b)	N/A	2.0dB (88.100MHz AV, Vertical)	Complied
4	Spurious Emissions	FCC Part 2 Section 2.1053	Section 15.239 (c)	N/A	7.1dB (88.200MHz, QP, Vertical)	Complied
5	20dB Bandwidth	ANSI C63.4:2003	Section 15.215(c)	N/A	N/A	Complied

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 the EUT is a battery-operated device.

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

3.3 Uncertainty

Radiated emission

The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is $\pm 4.59\text{dB}(3\text{m})/\pm 4.58\text{dB}(10\text{m})$.

The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is $\pm 4.62\text{dB}(3\text{m})/\pm 4.60\text{dB}(10\text{m})$.

The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is $\pm 5.27\text{dB}$.

The data listed in this test report has enough margin, more than the site margin.

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3.4 Test Location

UL Apex Co., Ltd. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
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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	IC4247A	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	655103	IC4247A-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	IC4247A-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	IC4247A-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	-
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 shielded room	-	-	6.0 x 6.0 x 3.9m	N/A	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	N/A	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	N/A	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 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, No.2, No.3 and No.4 semi-anechoic chambers and No.7 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

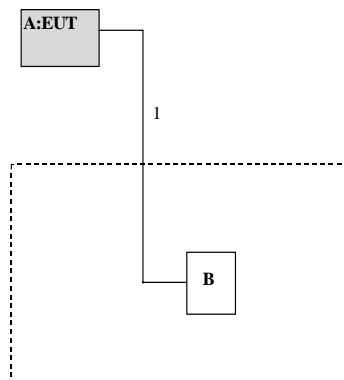
The EUT was operating in a manner similar to typical use during the tests.

The mode is used : Transmitting mode (88.1/98.0/107.9 MHz) with audio signal of a typical audio file from a typical device.

- * The test was performed with the maximum Audio input level.
 - * The EUT does not have user power control function.
 - * The test was performed with the same range as tuning range (88.1 – 107.9MHz)
 - * The output level was confirmed with and without modulation.
- As the result, there was no difference in the output level.

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

4.2 Configuration and peripherals



* [] : Located in the underground pit.

* Cabling and setup were 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	Remarks
A	THG4649 demonstration set	FMT-MB02 rev3	170	THine Electronics, inc.	EUT
B	Note PC	2647-LJ3	97-ALT8N 02/03	IBM	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Audio Cable	6.0	Unshielded	Unshielded	-

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SECTION 5: 200kHz Band Width and 20 dB Bandwidth

5.1 Operating environment

Test place	: No.2 semi anechoic chamber
Temperature	: 24 deg.C.
Humidity	: 31%

5.2 Test configuration

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 80cm above the conducting ground plane. The EUT was set on the center of the tabletop. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength. A drawing of the set up is shown in the photos of APPENDIX 1.

5.3 Test conditions

Test distance	: 3m
EUT position	: Table top
EUT operation mode	: See Clause 4.1

5.4 Test procedure

The 200kHz Bandwidth and 20dB Bandwidth was measured with a spectrum analyzer.

5.5 Results

Summary of the test results: Pass

Date: January 23, 2007

Tested by: Shinya Watanabe

SECTION 6: Emissions from the Intentional radiator and Spurious Emissions

6.1 Operating environment

Test place : No.4 semi anechoic chamber / No.3 semi anechoic chamber
Temperature : 25 deg.C. / 24 deg.C.
Humidity : 56% / 36%

6.2 Test configuration

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 80cm above the conducting ground plane. The EUT was set on the center of the tabletop.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.
A drawing of the set up is shown in the photos of APPENDIX 1.

6.3 Test conditions

Frequency range : 30MHz-1080MHz
Test distance : 3m / 1m
EUT position : Table top
EUT operation mode : See Clause 4.1

6.4 Test procedure

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 800MHz) and 1m(Above 800MHz).
The measuring antenna height 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.
The radiated emission measurements were made with the following detector function of the test receiver.

	Emissions from intentional radiator	Spurious Emissions (below 1GHz)	Spurious Emissions (above 1GHz)
Detector Type	Average/Peak	Quasi-Peak	Average/Peak
IF Bandwidth	120kHz	120kHz	PK: RBW:1MHz/VBW: 1MHz AV: RBW:1MHz/VBW:10Hz

6.5 Results

Summary of the test results: Pass

Date: June 6, 2006 / December 13, 2006

Tested by: Takumi Shimada / Shinya Watanabe