



KOREA TECHNOLOGY INSTITUTE CO., LTD.

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FCC VERIFICATION CERTIFICATE

FCC Registration Number	99058
Test Report No.	KTI14EF12001
Test Site	Korea Technology Institute Co. Ltd.
Manufacture	MultimediaLink Inc.
Date of Test	December 13, 2014
Contact Person	Jaehong Choi / CEO & President Tel : +82-31-462-0292 / Fax : +82-31-462-0293
Product Type	USB Touchscreen Monitor
Model	UM-760R
Series Model	UM-760, UM-760RF, UM-760C, UM-760CF, UM-780, UM-780R, UM-780RF, UM-780C, UM-780CF
FCC Rule Part(s)	Part 15, Subpart B
Classification	Class A

The device bearing the trade name and model specified above has been shown to comply with the applicable technical standard as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C.63.4-2003.

I attest to the accuracy of data and all measurement reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief.

I assume full responsibility for the completeness of these measurements and vouch for the qualification of all persons taking them.

Ph.D. Gyung Chan, Min/ President



Test Report

Test Report No.:	KT114EF12001
Registration No.:	99058
Applicant:	MultimediaLink Inc.
Applicant Address:	#821, DaehyeonTechnoWorld, 174, Ojeon-dong, Uiwang-si, Gyeonggi-do, 437-753, Korea
Product:	USB Touchscreen Monitor
Model No.	UM-760R
Series Model:	UM-760, UM-760RF, UM-760C, UM-760CF, UM-780, UM-780R, UM-780RF, UM-780C, UM-780CF
Date of receipt	December 11, 2014
Date of Issue:	December 17, 2014
Testing location:	Korea Technology Institute Co., Ltd. 51-19, Sanglim3-Ri, Docheok-Myeun, Gwangju-Shi, Gyeonggi-Do, Korea
Test Standards:	FCC/ANSI. C63.4: 2009
Rule Parts: FCC:	Part 15, Subpart B
Equipment Class:	Class A digital devices
Test Result:	The above-mentioned product has been tested with compliance.

Tested by: J.Y. Shin
/ Engineer

Signature, Date December 17, 2014

Approved by: S. H. Song
/Chief Engineer

Signature, Date December 17, 2014

Other Aspects:	
Abbreviations:	• OK, Pass=passed • Fail=failed • N/A=not applicable



- This test report is not permitted to copy partly without our permission.
- This test result is dependent on only equipment to be used.
- This test result is based on a single evaluation of one sample of the above mentioned.
- This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S Government.
- We certify this test report has been based on the measurement standards that is traceable to the national or international standards.



»» Contents ««

Contents	2
List of Tables	2
List of Figures	2
List of Photographs	2
1. General	3
2. Test Site	3
2.1 Location	3
2.2 List of Test and Measurement Instruments	4
2.3 Test Data	4
2.4 Test Environment	4
3. Description of the tested samples	5
3.1 Rating and Physical characteristics	5
3.2 Submitted documents	5
4. Measurement conditions	6
4.1 Modes of operation	6
4.2 List of peripherals	6
4.3 Uncertainty	6
4.4 Test Setup	7
5. Emission Test	8
5.1 Conducted Emissions	8
5.2 Radiated Emissions	12
6. Photographs of the Test Set-up	14~15
Annex1 Label	23
Annex2 Photographs of EUT	16~21

» List of Tables

Table 1	List of test and measurement equipment	4
Table 2	Test Data. Conducted Emissions	10~11
Table 3	Test Data. Radiated Emissions	13

» List of Figures

Figure 1	Spectral Diagram, LINE-PE	9
Figure 2	Spectral Diagram, Neutral-PE	9

» List of Photographs

Photograph 1	Setup for Radiated Emissions	14
Photograph 2	Setup for Conducted Emissions	15



1. General

This equipment has been shown to be capable of compliance with the applicable technical standards and was tested in accordance with the measurement procedures as indicated in this report.

We attest to the accuracy of data. Korea Technology Institute Co., Ltd. performed all measurements reported herein. And were made under Chief Engineer's supervisor.

We assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

2. Test Site

Korea Technology Institute Co., Ltd.

Location

51-19, Sanglim3-Ri, Docheok-Myeun, Gwangju-Shi, Gyeongki-Do, Korea

The Test Site is in compliance with ANSI C63.4/2009 for measurement of radio Interference.



List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

• Conducted Emissions

Kind of Equipment	Type	S/N	Calibrated until
Field Strength Meter	ESCI	100025	10.2015
LISN	AFJ LS16C	16011328326	11.2015
Conducted Cable	N/A	N/A	N/A

• Radiated Emissions

Kind of Equipment	Type	S/N	Calibrated until
Field Strength Meter	ESIB40	100093	05.2015
Biconic Logarithmic PeriodicAntenna	VULB9163	9163-281	11.2016
Open Site Cable	N/A	N/A	N/A
Antenna Mast	DETT-03	N/A	N/A
Antenna & Turntable controller	DETT-04	91X519	N/A

Test Date

Date of Application: December 11, 2014

Date of Test: December 13, 2014

Test Environment

Indoor: 24℃/36%/1012mbar

Outdoor: -6℃/40%/1012mbar



3. Description of the tested samples

The EUT is USB Touchscreen Monitor.

Rating and Physical Characteristics

Specification		TSP Model
Display	Screen Size	7.0" Wide
	Resolution	WSVGA(1,024*600)
	Display Colors	16.7M
	Brightness	250cd/m ²
	Contrast Ratio	700:1
	Response Time	10msec
Signal Input	Touch Input	Touch Screen Panel
	Video Input	USB2.0 High Speed
	Connector	USB Mini B type
Power	Power Input	USB Power (5V, 500mA)
	Power Consumption	2.0 ~ 5.0W
Feature	UI, Pivot	Pivot (Landscape, Portrait)
Dimension	Product Dimension (opened)	180(W) x 140(L) x 115(H)
	Product Dimension (folded)	180(W) x 140(L) x 25(H)
	Shipment Dimension	220(W) x 185(L) x 65(H)

PC System Requirements

PC H/W Requirements

- CPU: Intel Pentium/Celeron/AMD/K6/Athlon/Duron 1.2GHz or above
- RAM: 512MB or above
- USB: at least one or more USB 2.0 port
- 30MB HDD space above

Operating System

Windows 7 (64bit), Windows 7 (32bit), Windows Vista (64bit),
Windows Vista (32bit), Windows XP (SP2 32bit), Windows 2000 (SP4)
MAC OSX – Snow Leopard (32bit only), Leopard 10.5.6, Tiger 10.4.11

Submitted Documents

- User's Guide
- Block Diagram



4. Measurement Conditions

Testing Input Voltage: AC 110V

4.1 Modes of Operation

The EUT was in the following operation mode during all testing;

Prior to a measurement, the Instruments of education shall be operated until stabilization has been reached.

4.2 Additional Equipment

DEVICE TYPE	Manufacturer	M/N	S/N	FCC ID
NoteBook PC	SAMSUNG	NT300V5A-A25B	HP6Q91UC300329J	-

4.3 Uncertainty

1) Radiated disturbance

U_c (Combined standard Uncertainty) = $\pm 2.61\text{dB}$

Expanded uncertainty $U=KU_c$

$K = 2$

$\therefore U = \pm 5.22\text{dB}$

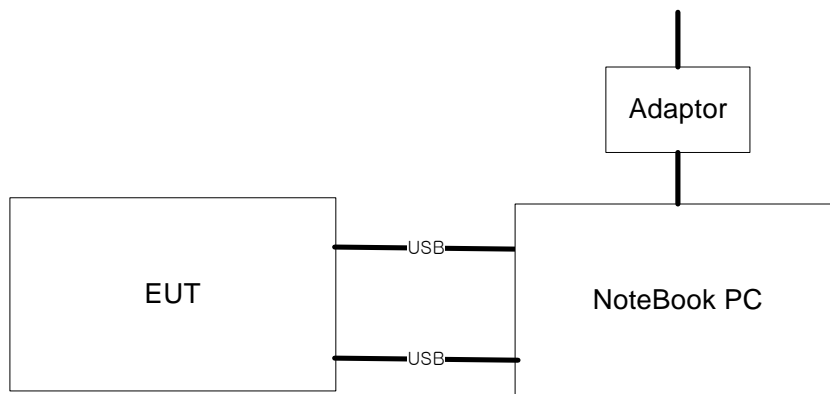
2) Conducted disturbance

$U_c = \pm 1.40\text{dB}$

$U = KU_c=2 \times U_c = \pm 2.80\text{dB}$



4.4 Test Setup



— SIGNAL

— POWER



5. EMISSION Test

5.1. Conducted Emissions

Result:

Pass

The line-conducted facility is located inside a 2.3M x 3.5M x 5.5M shielded closure.

The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 605-05. A 1m x 1.5m wooden table 80cm high is placed 80cm away from the conducting ground plane and 40cm away from the sidewall of the shielded room. Electro-Metroics Model EM-7823 (9kHz-30MHz) 50ohm/50 uH Line-Impedance Stabilization Networks (LISN) are bonded to the shielded room.

The EUT is powered from the Electro-Metroics LISN and the support equipment is powered from the Rohde & Schwarz LISN. Power to the LISN are filtered by a high-current high-insertion loss shield enclosures power line filters (100dB 14kHz-1GHz).

The purpose of the filter is to attenuate ambient signal interference and this filter is also bonded to the shielded enclosure.

All electrical cables are shielded by copper pipe with inner diameter of 1".

If the EUT is a DC-Powered device, power will be derived from the source power supply it normally will be powered from and this supply lines will be connected to the Rohde & Schwarz LISN.

All interconnecting cables more than 1 meter were shortened by non-inductive bundling (serpentine fashion) to a 1-meter length.

Sufficient time for the EUT, Support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer to determine the frequency producing the maximum EME from the EUT. The frequency producing the maximum level was reexamined using EMI field Intensity meter (ESIB40). The detector function was set to CISPR quasi-peak mode.

The bandwidth of the receiver was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was maximized by: switching power lines; varying the mode of operation or resolution; clock or data exchange speed; if applicable; whichever determined the worst-case emission.

Photographs of the worst-case emission can be seen in photograph of conducted test.

Each EME reported was calibrated using self-calibrating mode.



Figure 1: Spectral Diagram, LINE-PE

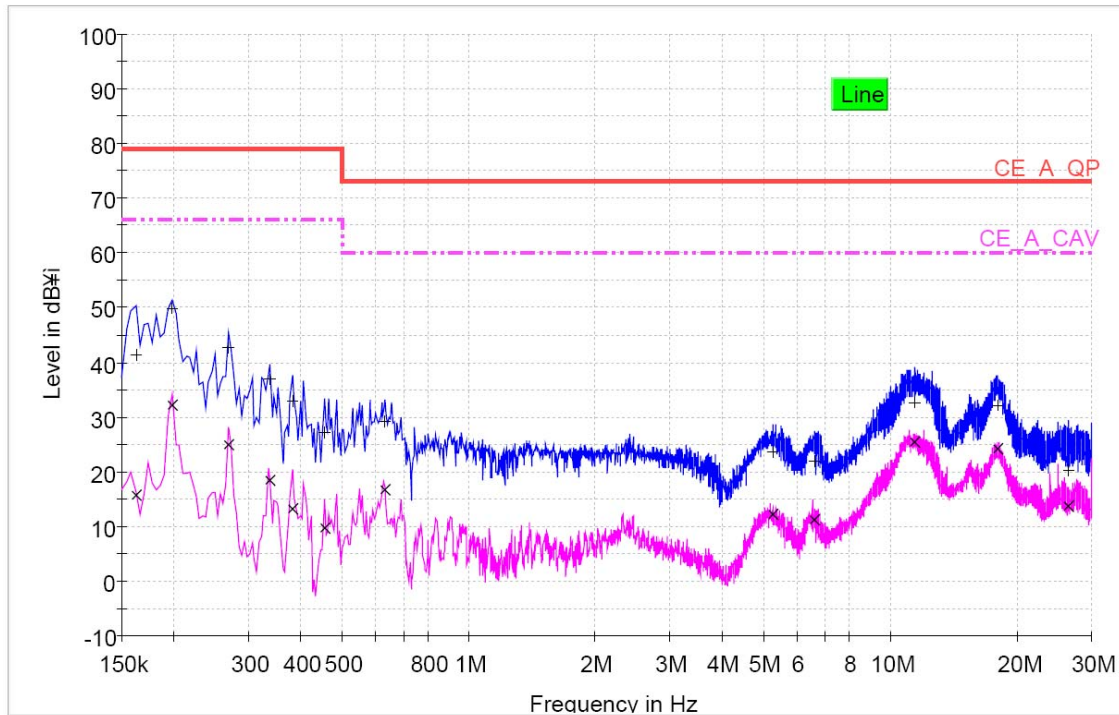


Figure 2: Spectral Diagram, NEUTRAL-PE

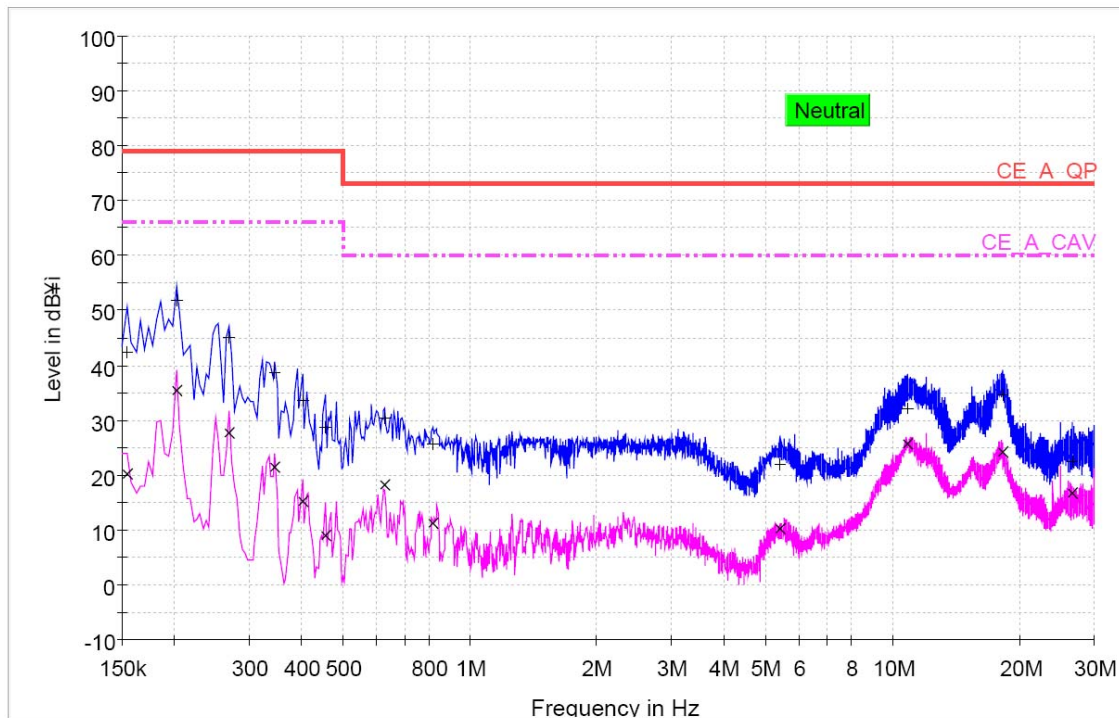




Table 2: Test Data, Conducted Emissions

<LINE>

QP

Frequency (MHz)	MaxPeak (dBμV)	QuasiPeak (dBμV)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBμV)	Comment
0.162000	---	41.4	15.6	1000.0	9.000	L1	10.0	37.6	79.0	
0.198000	---	49.9	32.2	1000.0	9.000	L1	10.0	29.1	79.0	
0.270000	---	42.7	24.8	1000.0	9.000	L1	10.0	36.3	79.0	
0.338000	---	36.9	18.4	1000.0	9.000	L1	10.0	42.1	79.0	
0.382000	---	32.9	13.2	1000.0	9.000	L1	10.0	46.1	79.0	
0.454000	---	27.2	9.7	1000.0	9.000	L1	10.0	51.8	79.0	
0.634000	---	29.3	16.6	1000.0	9.000	L1	10.0	43.7	73.0	
5.278000	---	23.6	12.3	1000.0	9.000	L1	10.2	49.4	73.0	
6.598000	---	21.9	11.2	1000.0	9.000	L1	10.2	51.1	73.0	
11.474000	---	32.7	25.5	1000.0	9.000	L1	10.4	40.3	73.0	
18.038000	---	32.2	24.1	1000.0	9.000	L1	10.6	40.8	73.0	
26.414000	---	20.1	13.6	1000.0	9.000	L1	10.7	52.9	73.0	

CAV

Frequency (MHz)	MaxPeak (dBμV)	QuasiPeak (dBμV)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin - CAV (dB)	Limit - CAV (dBμV)	Comment
0.162000	---	41.4	15.6	1000.0	9.000	L1	10.0	50.4	66.0	
0.198000	---	49.9	32.2	1000.0	9.000	L1	10.0	33.8	66.0	
0.270000	---	42.7	24.8	1000.0	9.000	L1	10.0	41.2	66.0	
0.338000	---	36.9	18.4	1000.0	9.000	L1	10.0	47.6	66.0	
0.382000	---	32.9	13.2	1000.0	9.000	L1	10.0	52.8	66.0	
0.454000	---	27.2	9.7	1000.0	9.000	L1	10.0	56.3	66.0	
0.634000	---	29.3	16.6	1000.0	9.000	L1	10.0	43.4	60.0	
5.278000	---	23.6	12.3	1000.0	9.000	L1	10.2	47.7	60.0	
6.598000	---	21.9	11.2	1000.0	9.000	L1	10.2	48.8	60.0	
11.474000	---	32.7	25.5	1000.0	9.000	L1	10.4	34.5	60.0	
18.038000	---	32.2	24.1	1000.0	9.000	L1	10.6	35.9	60.0	
26.414000	---	20.1	13.6	1000.0	9.000	L1	10.7	46.4	60.0	

NOTES:

1. All modes of operation were investigated
And the worst-case emissions are reported.
2. All other emissions are non-significant.
3. All readings are calibrated by self-mode in receiver.
4. Measurements using CISPR Quasi-peak mode.
5. L1 = LINE-PE, L2 = NEUTRAL-PE
6. C/F = Correction Factor(LISN factor + Cable loss)
7. The limit for Class A digital device is 79dBuV from 150KHz to 500KHz, 73dBuV Above 500KHz.

♣ **Margin Calculation**

(5) Margin = (4) Limit – (3) Actual

[(3) Actual = (1) Reading + (2) C/F]



Table 2: Test Data, Conducted Emissions

<NEUTRAL>

QP

Frequency (MHz)	MaxPeak (dBµV)	QuasiPeak (dBµV)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)	Comment
0.154000	---	42.4	20.1	1000.0	9.000	N	10.0	36.6	79.0	
0.202000	---	51.9	35.4	1000.0	9.000	N	10.0	27.1	79.0	
0.270000	---	45.1	27.6	1000.0	9.000	N	10.0	33.9	79.0	
0.346000	---	38.7	21.5	1000.0	9.000	N	10.0	40.3	79.0	
0.402000	---	33.6	15.2	1000.0	9.000	N	10.0	45.4	79.0	
0.454000	---	28.6	8.8	1000.0	9.000	N	10.0	50.4	79.0	
0.630000	---	30.3	18.2	1000.0	9.000	N	10.0	42.7	73.0	
0.818000	---	25.6	11.1	1000.0	9.000	N	10.1	47.4	73.0	
5.406000	---	21.9	10.1	1000.0	9.000	N	10.2	51.1	73.0	
10.886000	---	32.3	25.7	1000.0	9.000	N	10.6	40.7	73.0	
18.186000	---	34.7	24.2	1000.0	9.000	N	11.0	38.3	73.0	
26.778000	---	22.5	16.7	1000.0	9.000	N	11.3	50.5	73.0	

CAV

Frequency (MHz)	MaxPeak (dBµV)	QuasiPeak (dBµV)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin - CAV (dB)	Limit - CAV (dBµV)	Comment
0.154000	---	42.4	20.1	1000.0	9.000	N	10.0	45.9	66.0	
0.202000	---	51.9	35.4	1000.0	9.000	N	10.0	30.6	66.0	
0.270000	---	45.1	27.6	1000.0	9.000	N	10.0	38.4	66.0	
0.346000	---	38.7	21.5	1000.0	9.000	N	10.0	44.5	66.0	
0.402000	---	33.6	15.2	1000.0	9.000	N	10.0	50.8	66.0	
0.454000	---	28.6	8.8	1000.0	9.000	N	10.0	57.2	66.0	
0.630000	---	30.3	18.2	1000.0	9.000	N	10.0	41.8	60.0	
0.818000	---	25.6	11.1	1000.0	9.000	N	10.1	48.9	60.0	
5.406000	---	21.9	10.1	1000.0	9.000	N	10.2	49.9	60.0	
10.886000	---	32.3	25.7	1000.0	9.000	N	10.6	34.3	60.0	
18.186000	---	34.7	24.2	1000.0	9.000	N	11.0	35.8	60.0	
26.778000	---	22.5	16.7	1000.0	9.000	N	11.3	43.3	60.0	

NOTES:

1. All modes of operation were investigated
And the worst-case emissions are reported.
2. All other emissions are non-significant.
3. All readings are calibrated by self-mode in receiver.
4. Measurements using CISPR Quasi-peak mode.
5. L1 = LINE-PE, L2 = NEUTRAL-PE
6. C/F = Correction Factor(LISN factor + Cable loss)
7. The limit for Class A digital device is 79dBuV from 150KHz to 500KHz, 73dBuV Above 500KHz.

♣ **Margin Calculation**

(5) Margin = (4) Limit – (3) Actual

[(3) Actual = (1) Reading + (2) C/F]



5.2 Radiated Emissions

Result:

Pass

Preliminary measurements were made indoors at 1 meter using broadband antennas, broadband Amplifier, and spectrum analyzer to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and Investigated. The system configurations, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30MHz to 1GHz using Biconic Logarithmic Periodic Antenna. Above 1GHz, Double ridged horn Antenna was used.

Final measurements were made outdoors at 3-meter test range using Schwarzbeck antennas. The test equipment was placed on a wooden table situated on a 4x4 meter area adjacent to the measurement area. Turntable was to protect from weather in the dome that made with Polyethylene film. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined and investigated using EMI/Field Intensity Meter (ESIB40). The detector function was set to CISPR quasi-peak or peak mode as appropriate and the bandwidth of the receiver was set to 120kHz or 1 MHz depending on the frequency or type or signal.

The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8meter high non-metallic 1 x 1.5 meter table.

The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying the mode of operation or resolution; clock or data exchange speed, and/or support equipment, if applicable; and changing the polarity of the antenna and rotating the EUT in turns with three orthogonal axes for portable devices, whichever determined the worst-case emission.

Photographs of the worst-case emission can be seen in photograph of radiated emission test.

Each EME reported was calibrated using self-calibrating mode.



Table 3: Test Data, Radiated Emissions

Frequency (MHz)	(1) Reading (dB μ V)	Pol	Hei(m)	(2) AFCL (dB/m)	(3) Total (dB μ V/m)	(4) Limit (dB μ V/m)	(5) Margin (dB)
51.40	11.2	V	1.03	14.68	25.88	40.00	14.12
144.00	19.9	V	1.21	10.20	30.10	40.00	9.90
199.20	11.9	V	1.32	12.55	24.45	40.00	15.55
240.00	12.3	H	3.29	14.83	27.13	47.00	19.87
308.24	16.0	V	2.10	17.10	33.10	47.00	13.90
359.60	21.6	V	2.86	19.00	40.60	47.00	6.40

Notes:

- 1.All modes of operation were investigated.
And the worst-case emissions are reported.
- 2.All other emission is non-significant.
- 3.All readings are calibrated by self-mode in receiver.
- 4.Measurements using CISPR quasi-peak mode.
- 5.AFCL = Antenna factor and cable loss
- 6.H = Horizontal, V = Vertical Polarization
7. The limit for Class A digital device is 40dBuV from 30MHz to 230MHz,
47dBuV from 230MHz to 1000MHz at 10m.

♠ Margin Calculation

(5) Margin = (4) Limit – (3) Total

[(3) Total = (1) Reading + (2) AFCL]



6. Photograph of the Test Set-Up

Photograph 1 : Setup for radiated Emissions





Photograph 2 : Setup for Conducted Emissions





External photo (Front)





External photo (Rear)





Internal photo 1 – LCD Front



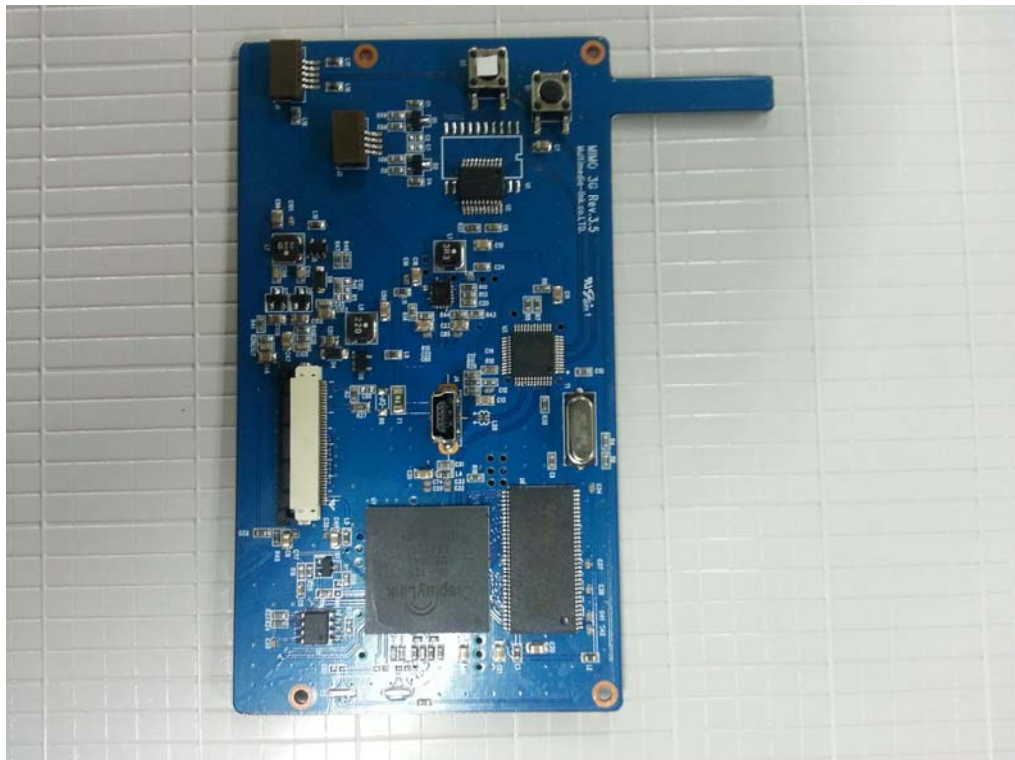


Internal photo 1 – Board 1 Rear



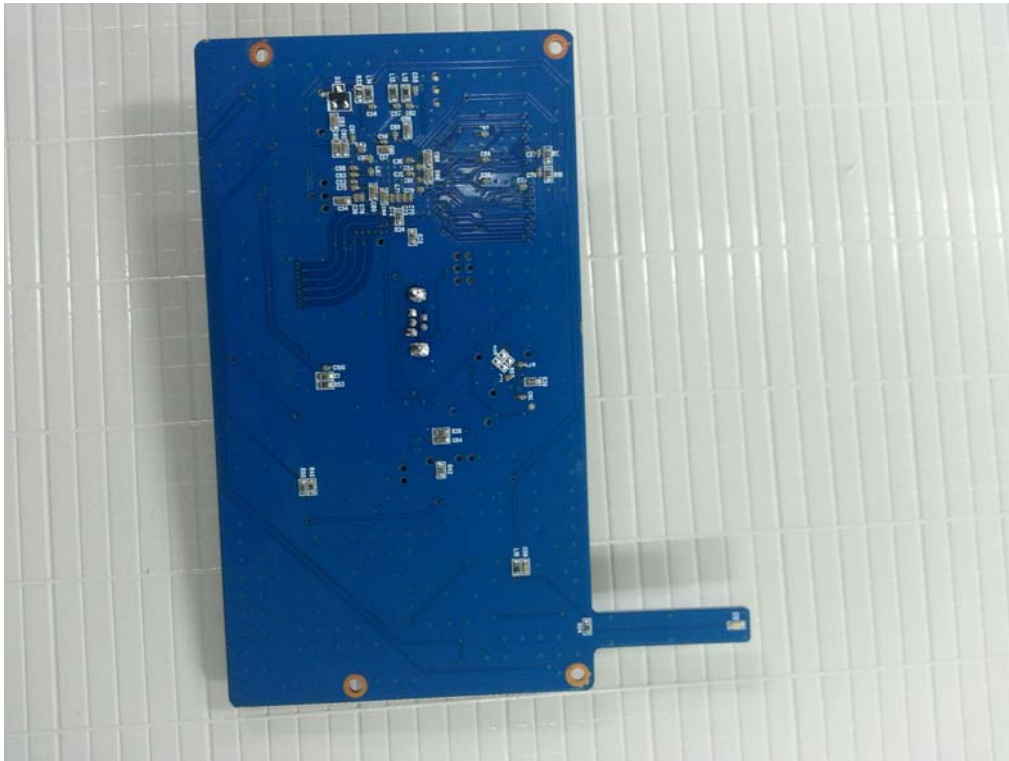


Internal photo 2 – Board 2 Front





Internal photo 2 – Board 2 Rear





Label location



**FCC Label
Location**



FCC ID Sample Label



Model Number : UM-760R

S/N:

MultimediaLink Inc.

Made in Korea