香 港 標 準 及 檢 定 中 心
Hong Kong Standards and Testing Centre

Date : 2005-05-09
No. : HM153892

TEST REPORT

Applicant: WIDE ASIA INDUSTRIAL LIMITED.
Block B, 8/F., Jing Ho Industrial Building,
78-84 Wang Lung Street, Tsuen Wan, N.T.,
HONG KONG.

Description of Samples:

Model name:	Tunestir
Model no.:	IPOD-FMTR
Brand name:	BTI
FCC ID:	S8GAWWINWA2005

Date Samples Received: 2005-04-15

Date Tested: 2005-04-27

Investigation Requested: FCC Part 15 Subpart C

Conclusions: The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

Remarks: For additional models details, see page 5.

K C Lee, EMC
for Chief Executive

香港新界大埔工業村大宏街 10 號
10 Dai Wang Street, Taipo Industrial Estate, N.T., Hong Kong
Tel: (852) 2666 1888 Fax: (852) 2664 4353 Homepage: www.hkstc.org E-mail: hkstc@hkstc.org

Date : 2005-05-09
No. : HM153892

TEST REPORT

CONTENT:

Date : 2005-05-09
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TEST REPORT

1.0 General Details

1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd.
EMC Laboratory
10 Dai Wang Street, Taipo Industrial Estate
New Territories, Hong Kong

Telephone: 852 2666 1888
Fax: 852 2664 4353

1.2 Applicant Details

Applicant

WIDE ASIA INDUSTRIAL LIMITED.
Block B, 8/F., Jing Ho Industrial Building,
78-84 Wang Lung Street, Tsuen Wan, N.T.,
HONG KONG.

HKSTC Code Number for Applicant **GLT001**

Manufacturer

WIDE ASIA INDUSTRIAL LIMITED.
Block B, 8/F., Jing Ho Industrial Building,
78-84 Wang Lung Street, Tsuen Wan, N.T.,
HONG KONG.

1.3 Equipment Under Test [EUT]

Description of Sample

Model Name:	Tunestir
Manufacturer:	WIDE ASIA INDUSTRIAL LIMITED.
Brand Name:	BTI
Additional Brand Name:	iAir
Model Number:	IPOD-FMTR
Additional Model Number:	iAiR01
Input Voltage:	The product draws power from the signal port of the console.

1.3.1 Description of EUT Operation

The Equipment Under Test (EUT) is a WIDE ASIA INDUSTRIAL LIMITED., Tunestir. The transmitter is a 6 button transmitter. The EUT continues to transmit while Button is being pressed. It is voice transmitter, Modulation by IC and type is frequency modulation.

1.4 Date of Order

2005-04-15

1.5 Submitted Sample(s):

1 Sample per model

1.6 Test Duration

2005-04-27

1.7 Country of Origin

China

1.8 Additional Information of EUT

	Submitted	Not Available
User Manual	☒	☐
Part List	☒	☐
Circuit Diagram	☒	☐
Printed Circuit Board [PCB] Layout	☒	☐
Block diagram	☒	☐
FCC ID Label	☒	☐

2.0 Technical Details

2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 and ANSI C63.4: 2003 for FCC Certification.

2.2 Test Standards and Results Summary Tables

EMISSION
Results Summary

Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Failed	N/A
Field Strength of Fundamental Emissions & Spurious Emissions	FCC 47CFR 15.239	ANSI C63.4:2003	N/A	☒	☐	☐
Radiated Emissions, 30MHz to 1GHz	FCC 47CFR 15.209	ANSI C63.4:2003	Class B	☒	☐	☐
Conducted Emissions on AC, 0.15MHz to 30MHz	FCC 47CFR 15.207	ANSI C63.4:2003	Class B	☐	☐	☒

Note: N/A - Not Applicable

3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions (30 – 1000MHz)

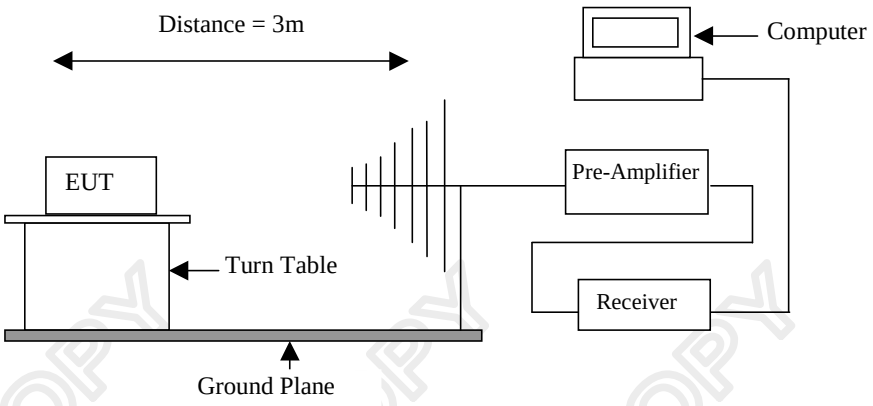
Test Requirement:	FCC 47CFR 15.239
Test Method:	ANSI C63.4:2003
Test Date:	2005-04-27
Mode of Operation:	Tx mode and connected to i-Pod, FM mode and connected to i-Pod, Music mode and connected to i-Pod,

Test Method:

The sample was placed 0.8m above the ground plane on the OATS *. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

*: OATS [Open Area Test Site] located at HKSTC with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

Test Setup:



Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.239]:

Frequency Range of Fundamental [MHz]	Peak Limits [μV/m]	Average Limits [μV/m]
88-108	2,500	250

Results of Tx mode and connected to i-Pod: PASS

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
88.50	28.5	9.5	38.0	79.4	2,500	Horizontal

Field Strength of Fundamental Emissions Average Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
88.50	28.3	9.5	37.8	77.6	250	Horizontal

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.
Calculated measurement uncertainty : 30MHz to 1GHz ±4.1dB

According to FCC 47CFR15.35, the limit on the radio frequency emissions as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

For effective averaging, the bandwidth of the video filter must be smaller than the resolution bandwidth. The higher the ratio of resolution bandwidth to video bandwidth, the greater the averaging will be. Below setting for HP8572A EMI Receiver.

Resolution Bandwidth : 3MHz
Video Bandwidth 1Hz

Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Frequency Range [MHz]	Limits [µV/m]
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results of Tx mode and connected to i-Pod: PASS

Radiated Emissions Quasi-Peak						
Frequency MHz	Measured Level @3m dBµV/m	Correction Factor dBµV/m	Field Strength dBµV/m	Field Strength µV/m	Limit @3m µV/m	E-Field Polarity
177.00	< 1.0	11.2	< 12.2	< 4.1	150	Vertical
265.50	< 1.0	14.0	< 15.0	< 5.6	150	Vertical
354.00	< 1.0	11.5	< 12.5	< 4.2	150	Vertical
442.50	< 1.0	15.9	< 16.9	< 7.0	200	Vertical
531.00	< 1.0	17.4	< 18.4	< 8.3	200	Vertical
619.50	< 1.0	17.2	< 18.2	< 8.1	200	Vertical
708.00	< 1.0	18.8	< 19.8	< 9.8	200	Vertical
796.50	< 1.0	19.7	< 20.7	< 10.8	200	Vertical
885.00	< 1.0	20.6	< 21.6	< 12.0	200	Vertical

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.
Calculated measurement uncertainty : 30MHz to 1GHz ±4.1dB

Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.239]:

Frequency Range of Fundamental [MHz]	Peak Limits [µV/m]	Average Limits [µV/m]
88-108	2,500	250

Results of Tx mode and connected to i-Pod: PASS

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dBµV/m	Correction Factor dBµV/m	Field Strength dBµV/m	Field Strength µV/m	Limit @3m µV/m	E-Field Polarity
98.30	26.7	10.3	37.0	70.8	2,500	Horizontal

Field Strength of Fundamental Emissions Average Value						
Frequency MHz	Measured Level @3m dBµV/m	Correction Factor dBµV/m	Field Strength dBµV/m	Field Strength µV/m	Limit @3m µV/m	E-Field Polarity
98.30	26.6	10.3	36.9	70.0	250	Horizontal

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.
Calculated measurement uncertainty : 30MHz to 1GHz ±4.1dB

According to FCC 47CFR15.35, the limit on the radio frequency emissions as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

For effective averaging, the bandwidth of the video filter must be smaller than the resolution bandwidth. The higher the ratio of resolution bandwidth to video bandwidth, the greater the averaging will be. Below setting for HP8572A EMI Receiver.

Resolution Bandwidth : 3MHz
Video Bandwidth 1Hz

Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Frequency Range [MHz]	Limits [µV/m]
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results of Tx mode and connected to i-Pod: PASS

Radiated Emissions Quasi-Peak						
Frequency MHz	Measured Level @3m dBµV/m	Correction Factor dBµV/m	Field Strength dBµV/m	Field Strength µV/m	Limit @3m µV/m	E-Field Polarity
196.60	< 1.0	11.6	< 12.6	< 4.3	150	Vertical
294.90	< 1.0	14.3	< 15.3	< 5.8	150	Vertical
393.20	< 1.0	11.5	< 12.5	< 4.2	150	Vertical
491.50	< 1.0	15.9	< 16.9	< 7.0	200	Vertical
589.80	< 1.0	17.4	< 18.4	< 8.3	200	Vertical
688.10	< 1.0	17.2	< 18.2	< 8.1	200	Vertical
786.40	< 1.0	18.8	< 19.8	< 9.8	200	Vertical
884.70	< 1.0	19.7	< 20.7	< 10.8	200	Vertical
983.00	< 1.0	20.6	< 21.6	< 12.0	200	Vertical

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.
Calculated measurement uncertainty : 30MHz to 1GHz ±4.1dB

Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.239]:

Frequency Range of Fundamental [MHz]	Peak Limits [µV/m]	Average Limits [µV/m]
88-108	2,500	250

Results of Tx mode and connected to i-Pod: PASS

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dBµV/m	Correction Factor dBµV/m	Field Strength dBµV/m	Field Strength µV/m	Limit @3m µV/m	E-Field Polarity
107.90	28.6	10.0	38.6	85.1	2,500	Horizontal

Field Strength of Fundamental Emissions Average Value						
Frequency MHz	Measured Level @3m dBµV/m	Correction Factor dBµV/m	Field Strength dBµV/m	Field Strength µV/m	Limit @3m µV/m	E-Field Polarity
107.90	28.5	10.0	38.5	84.1	250	Horizontal

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.
Calculated measurement uncertainty : 30MHz to 1GHz ±4.1dB

According to FCC 47CFR15.35, the limit on the radio frequency emissions as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

For effective averaging, the bandwidth of the video filter must be smaller than the resolution bandwidth. The higher the ratio of resolution bandwidth to video bandwidth, the greater the averaging will be. Below setting for HP8572A EMI Receiver.

Resolution Bandwidth : 3MHz
Video Bandwidth 1Hz

Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Frequency Range [MHz]	Limits [µV/m]
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results of Tx mode and connected to i-Pod: PASS

Radiated Emissions Quasi-Peak						
Frequency MHz	Measured Level @3m dBµV/m	Correction Factor dBµV/m	Field Strength dBµV/m	Field Strength µV/m	Limit @3m µV/m	E-Field Polarity
215.80	< 1.0	11.8	< 12.8	< 4.4	150	Vertical
323.70	< 1.0	14.8	< 15.8	< 6.2	150	Vertical
431.60	< 1.0	11.5	< 12.5	< 4.2	150	Vertical
539.50	< 1.0	15.9	< 16.9	< 7.0	200	Vertical
647.40	< 1.0	17.4	< 18.4	< 8.3	200	Vertical
755.30	< 1.0	17.2	< 18.2	< 8.1	200	Vertical
863.20	< 1.0	18.8	< 19.8	< 9.8	200	Vertical
971.10	< 1.0	19.7	< 20.7	< 10.8	200	Vertical
1079.00	< 1.0	20.6	< 21.6	< 12.0	200	Vertical

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.
Calculated measurement uncertainty : 30MHz to 1GHz ±4.1dB

Date : 2005-05-09
No. : HM153892

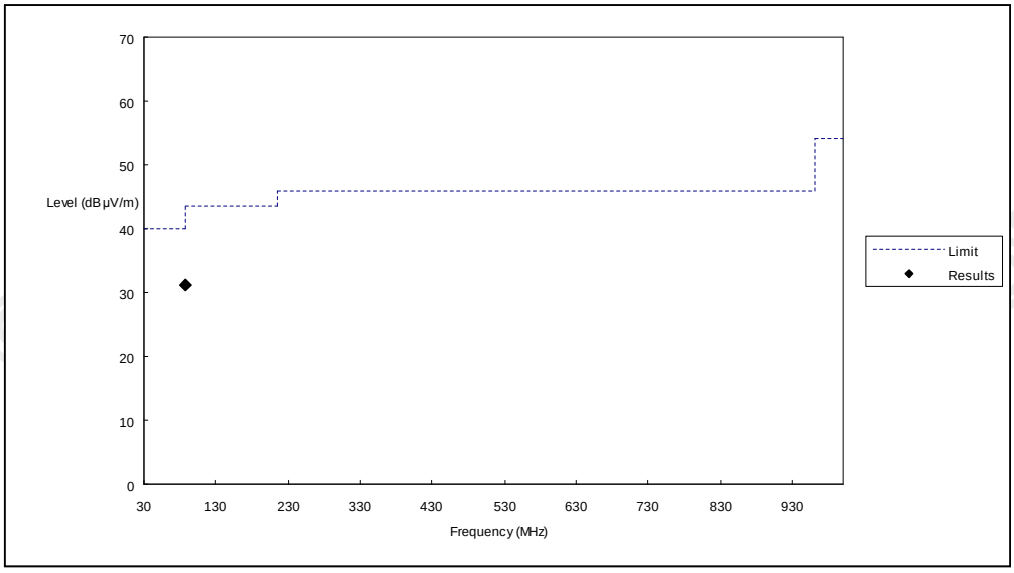
TEST REPORT

Limits for Radiated Emissions [FCC 47 CFR 15.109 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [µV/m]
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results of FM mode and connected to i-Pod: PASS



Radiated Emissions Quasi-Peak						
Turned Frequency MHz	Emission Frequency MHz	Measured Level @3m dBµV/m	Limit @3m dBµV/m	Measured Level @3m µV/m	Limit @3m µV/m	E-Field Polarity
88.1	88.1	31.2	43.5	36.3	150	Horizontal

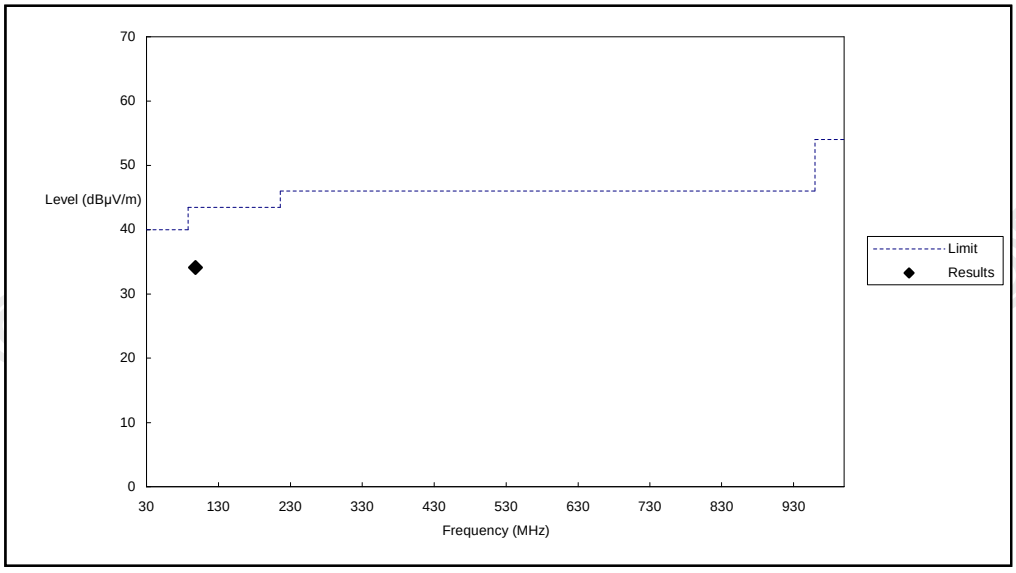
Remark:
Calculated measurement uncertainty : 30MHz to 1GHz ±4.1dB

Limits for Radiated Emissions [FCC 47 CFR 15.109 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [µV/m]
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results of FM mode and connected to i-Pod: PASS



Radiated Emissions Quasi-Peak						
Turned Frequency MHz	Emission Frequency MHz	Measured Level @3m dBµV/m	Limit @3m dBµV/m	Measured Level @3m µV/m	Limit @3m µV/m	E-Field Polarity
98.3	98.3	34.1	43.5	50.7	150	Horizontal

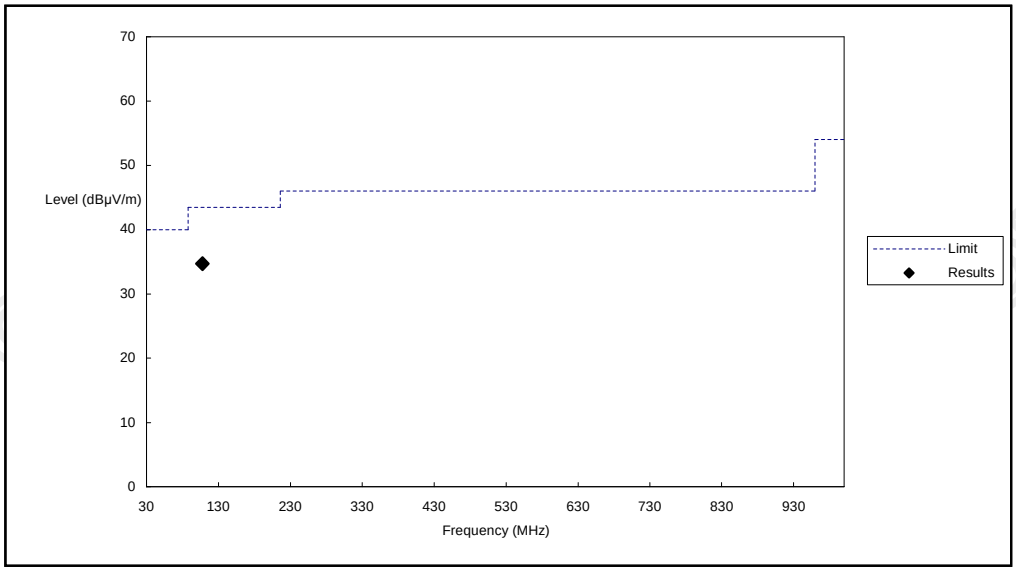
Remark:
Calculated measurement uncertainty : 30MHz to 1GHz ±4.1dB

Limits for Radiated Emissions [FCC 47 CFR 15.109 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [µV/m]
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results of FM mode and connected to i-Pod: PASS



Radiated Emissions Quasi-Peak						
Turned Frequency MHz	Emission Frequency MHz	Measured Level @3m dBµV/m	Limit @3m dBµV/m	Measured Level @3m µV/m	Limit @3m µV/m	E-Field Polarity
107.9	107.9	34.7	43.5	54.3	150	Horizontal

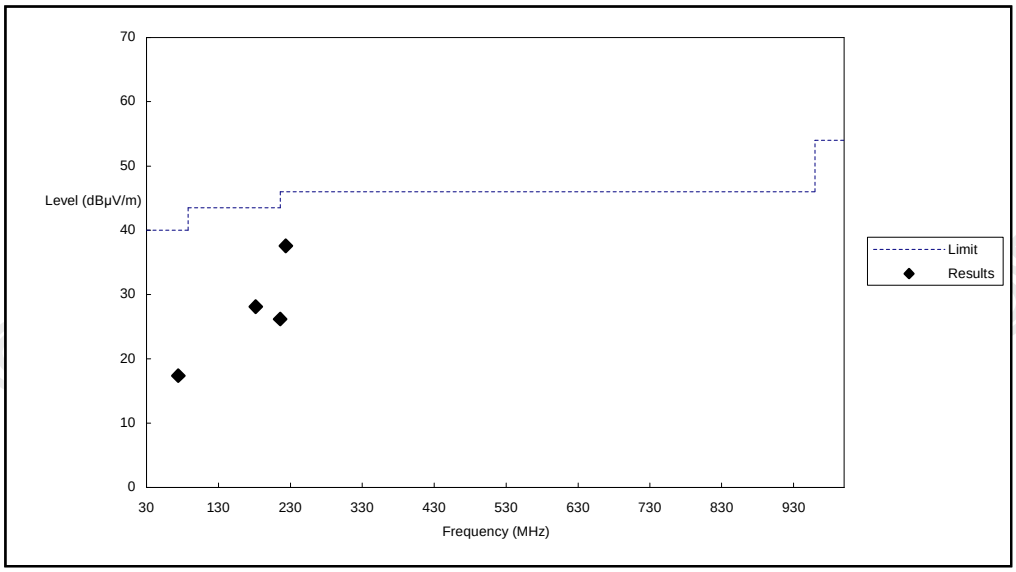
Remark:
Calculated measurement uncertainty : 30MHz to 1GHz ±4.1dB

Limits for Radiated Emissions [FCC 47 CFR 15.109 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results of Music mode and connected to i-Pod: PASS



Date : 2005-05-09
No. : HM153892

TEST REPORT

Results of Music mode and connected to i-Pod: PASS

Radiated Emissions Quasi-Peak					
Emission Frequency MHz	E-Field Polarity	Level @3m dBµV/m	Limit @3m dBµV/m	Level @3m @3m µV/m	Limit @3m µV/m
74.500	Horizontal	17.4	40.0	7.4	100
182.000	Horizontal	28.1	43.5	25.4	150
216.060	Horizontal	26.2	46.0	20.4	200
224.000	Horizontal	37.6	46.0	75.9	200

Remark:
Calculated measurement uncertainty : 30MHz to 1GHz ±4.1dB

3.1.2 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC 47CFR 15.207
Test Method:	ANSI C63.4:2003
Test Date:	N/A
Mode of Operation:	N/A

Results: N/A

The EUT is operated by a single source of internal battery power [located in the battery compartment], therefore power line conducted emission was deemed unnecessary.

3.2 20B Bandwidth of Fundamental Emission

Test Requirement:	FCC 47 CFR 15.227
Test Method:	ANSI C63.4:2003 (Section 13.1.7)
Test Date:	2005-04-27
Mode of Operation:	Tx mode

Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

Test Setup:

As Test Setup of clause 3.1.1 in this test report.

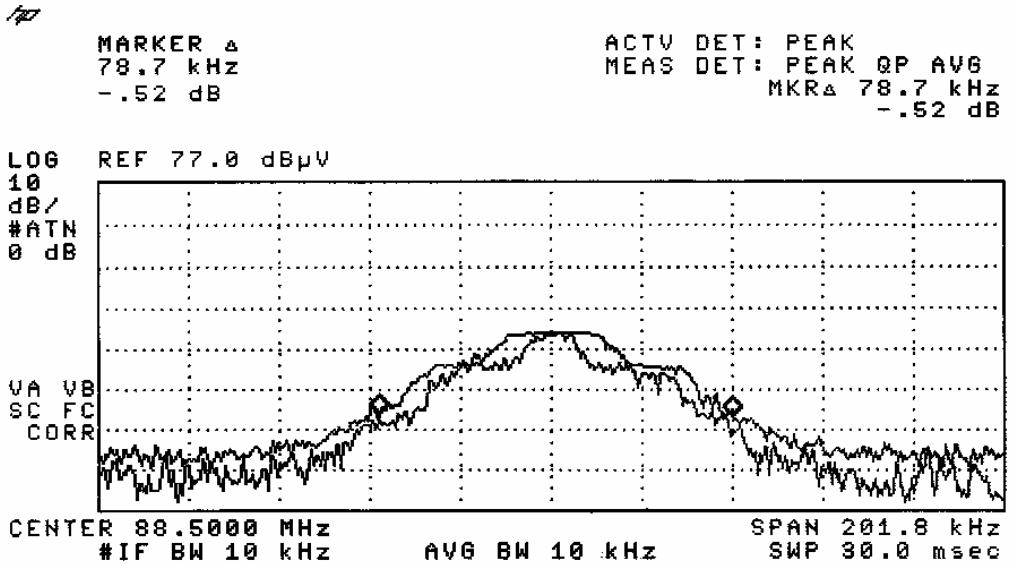
Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [kHz]	FCC Limits [kHz]
88.5	78.7	200

Results of Tx Mode: PASS

The following figure is the measured bandwidth of Fundamental Emission.

20dB Bandwidth of Fundamental Emission



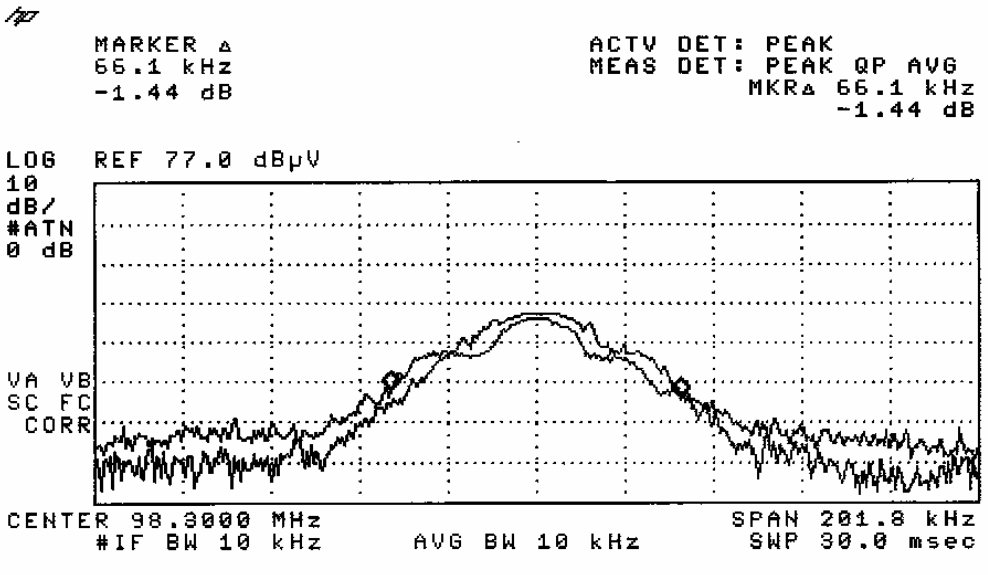
Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [kHz]	FCC Limits [kHz]
98.3	66.1	200

Results of Tx Mode: PASS

The following figure is the measured bandwidth of Fundamental Emission.

20dB Bandwidth of Fundamental Emission



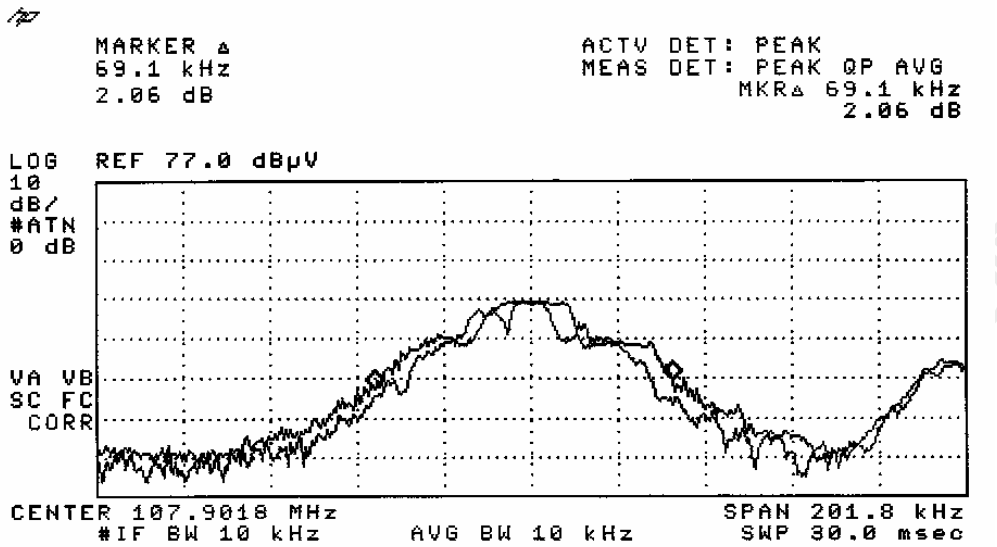
Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [kHz]	FCC Limits [kHz]
107.9	69.1	200

Results of Tx Mode: PASS

The following figure is the measured bandwidth of Fundamental Emission.

20dB Bandwidth of Fundamental Emission



Appendix A

List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL
EM007	SPECTRUM ANALYZER	HEWLETT PACKARD	HP85660B	3144A21192	15/06/04
EM008	SPECTRUM ANALYZER DISPLAY	HEWLETT PACKARD	HP85662A	3144A20514	15/06/04
EM009	QUASI PEAK ADAPTOR	HEWLETT PACKARD	HP85650A	3303A01702	15/06/04
EM010	RF PRESELECTOR	HEWLETT PACKARD	HP85685A	3221A01410	15/06/04
EM011	ATTENNUATOR/SWITCH	HEWLETT PACKARD	HP11713A	2508A10595	15/06/04
EM012	PRE-AMPLIFIER	HEWLETT PACKARD	HP8449B	3008A00262	15/06/04
EM013	CONTROLLER (COMPUTER), COLOR MONITOR, KEYBOARD & MOUSE FLOPPY DRIVE	HEWLETT PACKARD HEWLETT PACKARD HEWLETT PACKARD	HP9000 HP A1097C HP9133L	6226A60314 3151J39517 2623A02468	15/06/04
EM020	HORN ANTENNA	EMCO	3115	4032	30/07/03
EM022	LOOP ANTENNA	EMCO	6502	1189-2424	30/07/03
EM072	SIGNAL GENERATOR	HEWLETT PACKARD	8640B	1948A11892	N/A
EM083	HKSTC OPEN AREA TEST SITE	HKSTC	N/A	N/A	08/02/03
EM131	PORTABLE SPECTRUM ANALYSER	HEWLETT PACKARD	8595EM	3710A00155	13/01/04
EM145	EMI TEST RECEIVER	R & S	ESCS 30	830245/021	04/10/04
EM219	BICONILOG ANTENNA	EMCO	3142C	00029071	28/10/03
EM195	ANTENNA POSITIONING MAST	EMCO	2075	2368	N/A
EM196	MULTI-DEVICE CONTROLLER	EMCO	2090	1662	N/A

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL
EM078	VARIAC	SHANGHAI VOLTAGE	TDGC-3/0.5	N/A	CM
EM081	SMALL SCREENED ROOM	MIKO INST HK	N/A	N/A	17/10/03
EM119	LISN	R & S	ESH3-Z5	0831.5518.52	14/10/04
EM127	ISOLATION TRANSFORMER 220 TO 300	WING SUN	N/A	N/A	CM
EM142	PULES LIMITER	R & S	ESH3Z2	357.8810.52	04/08/04
EM181	EMI TEST RECEIVER	R & S	ESIB7	100072	06/01/04
EM154	SHIELDING ROOM	SIEMENA MATSUSHITA COMPONENTS	N/A	803-740-057-99A	17/10/03
EM197	LISN	EMCO	4825/2	1193	05/06/04

Remarks:-
CM Corrective Maintenance
N/A Not Applicable or Not Available
TBD To Be Determined

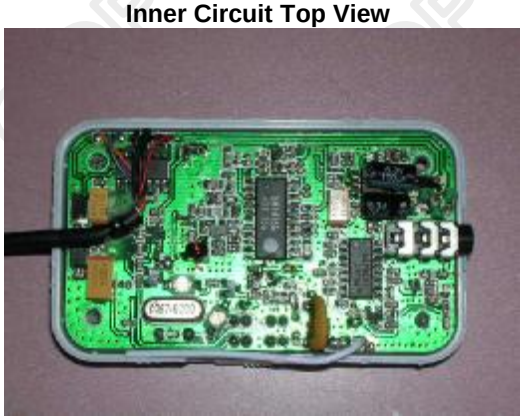
Appendix B

Photographs of EUT

Front View of the product

Rear View of the product

Inner Circuit Top View



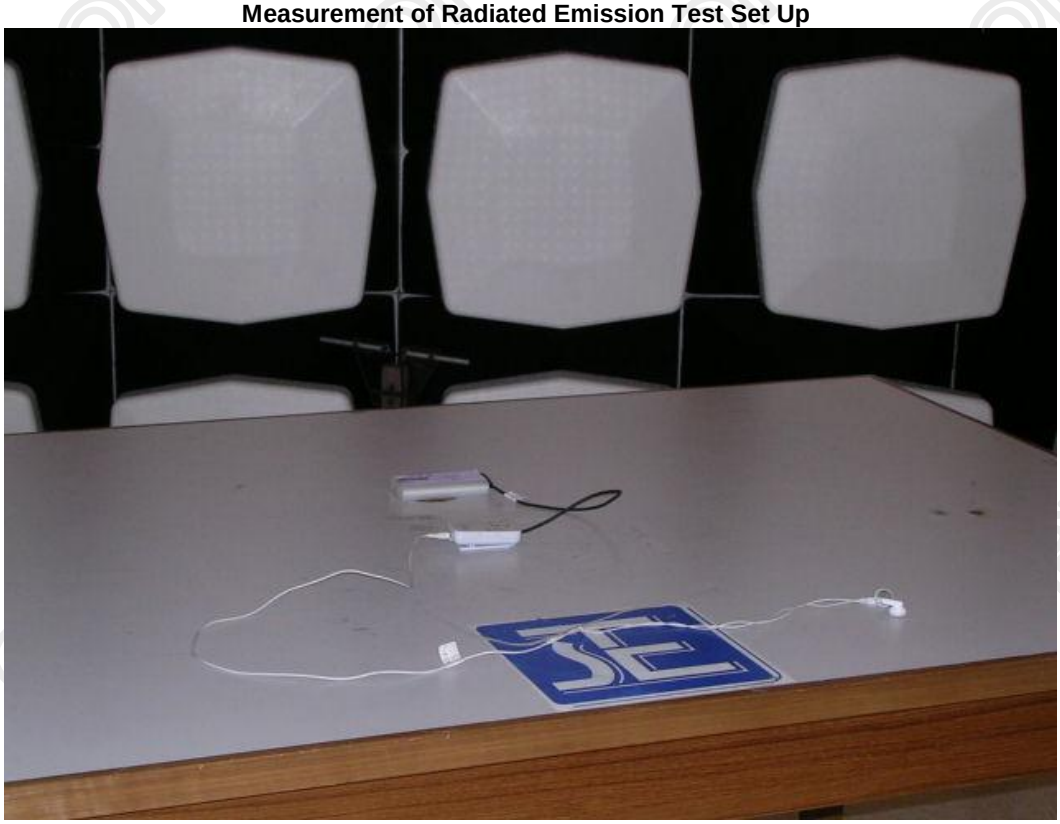
Inner Circuit Bottom View

Date : 2005-05-09
No. : HM153892

TEST REPORT

Photographs of EUT

Measurement of Radiated Emission Test Set Up



******* End of Test Report *******