

EMC Testing Laboratories, Inc.

RF Emissions Test Report To Determine Compliance With: FCC, Part 15C Rules and Regulations

Model number: .0703B

May 14, 2007

Manufacturer: Inventec Multimedia & Telecom (Tianjin) Co. Ltd.
No 51, the 9th Avenue, TEDA
Tianjin, China 300457

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Section 1

GENERAL INFORMATION

Manufacturer: Inventec Multimedia & Telecom (Tianjin) Co. Ltd.
No 51, the 9th Avenue, TEDA
Tianjin, China 300457

Manufacturer representative: **Ms. Cindy Bao**

Equipment covered by this report: Model no.0703B

Ratings: 433 MHz, 3 Vdc

Transmitting time: ≤ 5 seconds

Options covered by this report: None

Equipment serial no. Prototype

Test specifications: To determine Certification with
The FCC, Part 15C, Rules and
Regulations, Class B

Test report number: 07-223A

Test commenced: April 30, 2007

Test completed: May 14, 2007

Test engineer: **Edward Barnes**

Test Facility: The test facility used to perform these tests is on file
with the FCC under registration number 637500 and
located at:

EMC Testing Laboratories, Inc.
2035 Grassland Parkway
Suite 101
Alpharetta, GA 30004

Section 2

PRODUCT DESCRIPTION AND TEST SUMMARY

Test Summary:

Tests	Results
FCC, Part 15.205, Restricted Bands of Operation	Pass
FCC, Part 15.209, General Radiated emissions:	Pass
FCC, Part 15.231, Periodic Operation in the Bands, 40.66-40.70 MHz and above 70 MHz	Pass

The test results apply only to the products identified in this test report.

Product description:

The product covered by this report is a hand held Wireless Remote kit intended to be used with iPod NANO.

The enclosure is constructed of plastic with overall dimensions measuring 5.8 cm by 2.8 cm by 5.0 mm and contains the following components judged as critical.

Description

Remote control, printed wiring board
C cell Battery, Battery is rated 3V

Part no.

009-3044A
2025 or CR 2025, UL

Test operation:

For all measurements, the equipment was caused to function in a continuous mode of operation for maximum electrical activity as specified by the manufacturer. Specifically a button was caused to be pushed-in continuously.

Product Description and Test Summary cont...

Test configuration:

The equipment under test (EUT) was set-up and configured as specified by the manufacturer as follows:

1- The EUT was connected to the following support peripherals:

A- None

2- The EUT utilized the following cables and were connected as indicated below:

A- None

Modifications:

The following modifications were required to comply with the radiated emission limits:

1- None

Engineering Statement:

All measurement data of this test report was taken in accordance with the FCC, Part 15, Subpart C, Class B Rules and Regulations, ANSI C63.4-(03), by EMC Testing Laboratories, Inc. located in Alpharetta, Georgia. Although this data is taken under stringent laboratory conditions and to the best of our knowledge, represents accurate data, it must be recognized that emissions from or immunity to this type equipment may be greatly affected by the final installation of the equipment. Therefore, EMC Testing Laboratories, Inc., while supporting the accuracy of the data in this report, takes no responsibility for use of equipment based on these tests. The manufacturer of this equipment must take full responsibility for any field problems which may arise, and agrees that EMC Testing Laboratories, Inc., in performing its functions in accordance with its objectives and purposes, does not assume or undertake to discharge any responsibility of the manufacturer to any other party or parties.

Product Description and Test Summary cont...

Conclusion:

The product covered by this report has been tested and found to comply with the above-indicated standards.

Tested by: **Edward Barnes, RF Engineer**

Approved by: _____

Gene Bailey, Engineering Manager
EMC Testing Laboratories, Inc.

Section 3

STANDARD REFERENCE

The following primary standards were used for this test:

- 1- **ANSI C63.4-03:** Method of Measurements of Radio-Noise Emissions from Low- Voltage Electrical and Electronic Equipment in the 9 Khz to 40 Ghz.
- 2- **US Code of Federal Regulations (CFR) (03):** Title 47, Part 15, Radio Frequency Devices, Subpart B, Unintentional Radiators.

Note: Applicable amendments were applied to all standards.

Section 4

RADIATED EMISSIONS, TEST METHOD

INTRODUCTION:

The product(s) covered by this report were subjected to electromagnetic interference emissions measurements to determine compliance with the FCC, Part 15C requirements.

Radiated and conducted emissions were measured in accordance with the Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 KHz to 40 GHz, ANSI C63.4.

MEASUREMENT CALCULATIONS:

Radiated Emissions:

For radiated emissions measurements, the signal attenuation due to impedance losses in the antenna and signal cable were significant and was added to the spectrum analyzer reading to give corrected signal strength reading. If a preamplifier was used, the signal gain was subtracted from the signal strength reading. Radiated emissions data was specified as decibels above 1 microvolt per meter (dBμV/m) of radiated field strength.

$$\text{Radiated emissions (dB}\mu\text{V)} = \text{Analyzer reading (dB}\mu\text{V)} + \text{antenna factor (dB)} + \text{cable factor (dB)} - \text{Amplifier gain (dB)}$$

Conducted Emissions:

For conducted emissions, the signal attenuation due to impedance losses in the LISN and signal cables were negligible and assumed to be 0dB. The conducted emissions were directly equal to the spectrum analyzer reading. Conducted emissions data was specified as decibels above 1 microvolt (dBμV) of conducted line voltage.

$$\text{Conducted emissions (dB}\mu\text{V)} = \text{Analyzer reading (dB}\mu\text{V)}$$

Test Method cont...

RADIATED EMISSIONS MEASUREMENT:

Radiated emissions measurements were performed at an open field test site. The receiving antenna was positioned 3 meters from the equipment under test along the center axis of the test site. Measurements were made with broadband antennas and if necessary, detected emissions were verified with dipole antennas. The dipole antenna was manually tuned to the signal frequency by adjusting the length of the antenna elements. The radiated emissions were measured for both the horizontal and vertical signal planes by rotating the antennas. Additionally, the EUT was rotated by the turntable and the antenna height was raised and lowered 1 to 4 meters to locate the maximum emission strength at each frequency.

The radiated emissions were measured over the frequency span of 30 MHz to 1000 MHz. The following antennas were used to measure the radiated emissions within the specified frequency spans.

CONDUCTED EMISSIONS MEASUREMENT:

Conducted emissions measurements were performed on a ground plane that was electrically bonded to earth ground. The equipment under test was positioned 0.8 meter above the ground plane and 0.8 meter minimum from the LISN that was positioned on the ground plane. The LISN housings were electrically bonded to the ground plane. The conducted emissions for both the ungrounded supply conductor (L1) and the grounded conductor (L2) of the power supply cord were measured. The conducted emissions were measured over the frequency span of 0.15 to 30 MHz. The measurements were conducted in the quasi-peak and average detector modes.

INSTRUMENTATION:

Radiated and conducted signal strength measurements were taken with a spectrum analyzer. Radiated emissions were measured with broadband and tuned dipole antennas. Conducted emissions were measured with a 50 UH line impedance stabilization network (LISN).

Test Method cont...

DETECTOR FUNCTION:

Unless otherwise indicated in this report, all measurements were taken using a peak hold signal detector function. In this mode, the spectrum analyzer makes continuous scans across the frequency band and stores the highest emission value detected at each frequency for all scans. The peak hold integration will detect transient or low duty cycle emissions peak, which might be missed on single scan measurement. The emission value at each frequency was a true value.

SPECTRUM ANALYZER SETTING:

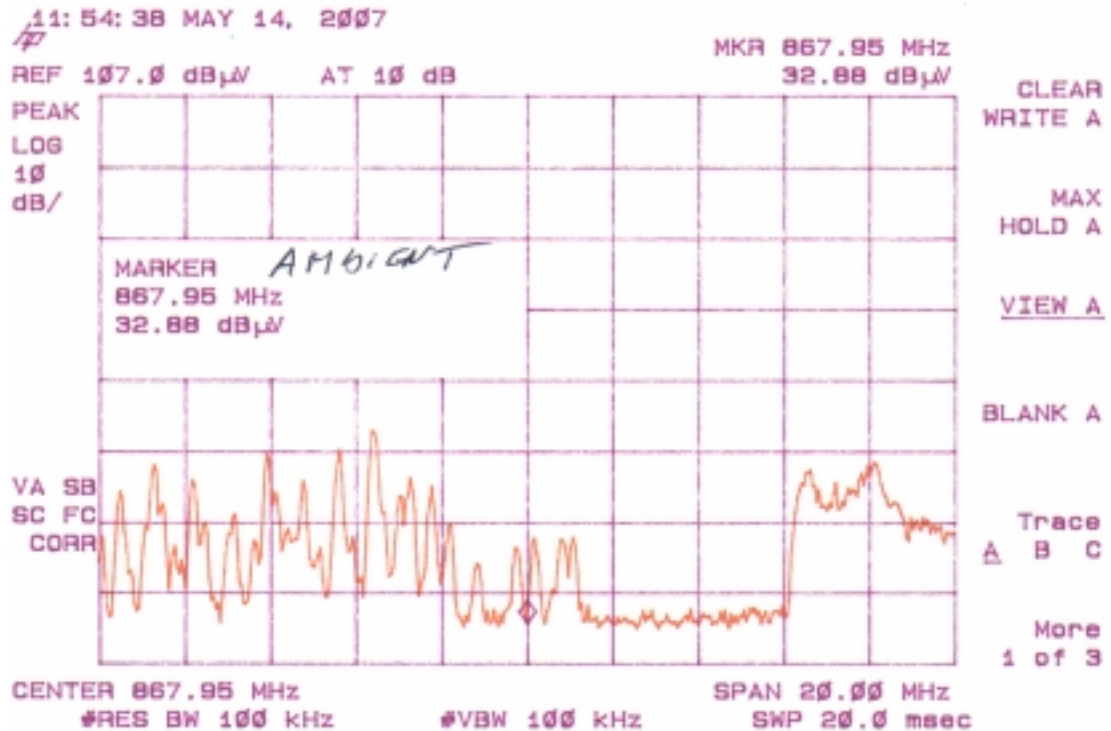
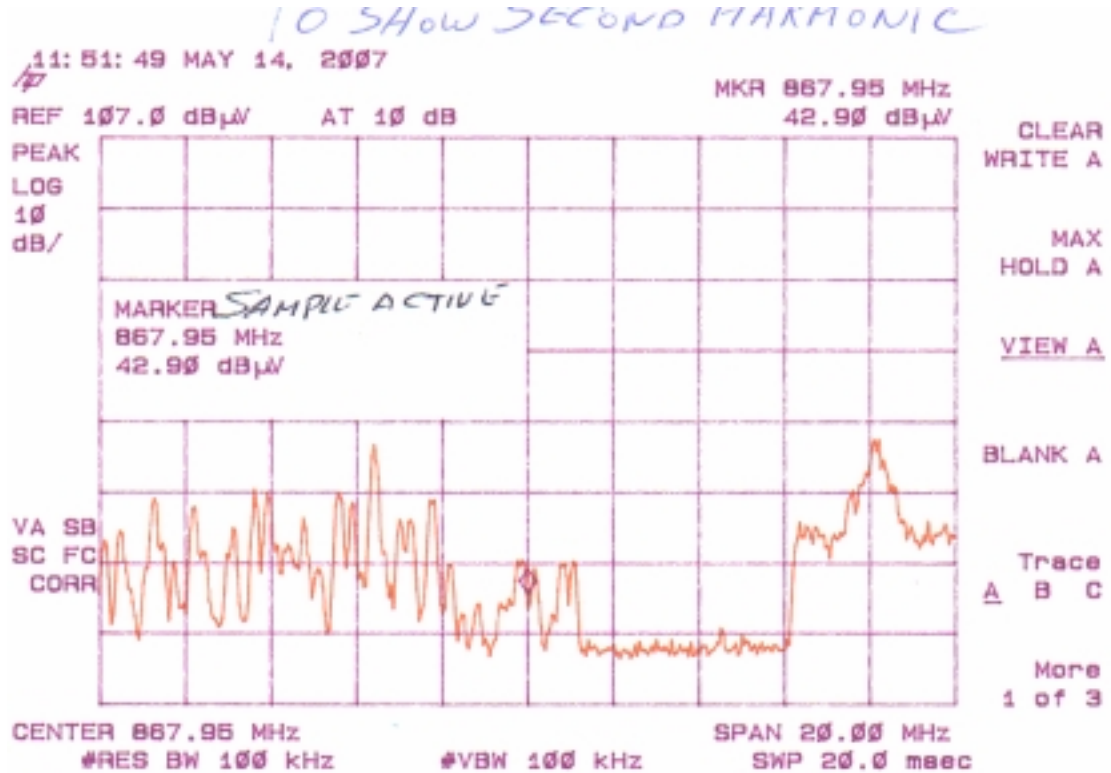
For all measurements, the spectrum analyzer was set for a 10 dB input attenuation, 10 dB/Division vertical scale and 90 or 100 dB μ V reference level. The resolution bandwidth was set at 9 KHz for the 0.15 - 30 MHz span and at 120 KHz for 30 - 1000 MHz span. The video bandwidth and sweep rate were automatically coupled by the analyzer.

Section 5

RADIATED EMISSIONS MEASUREMENTS

*Radiated Emissions Measurements cont...****RADIATED EMISSIONS MEASUREMENTS*****< 1.0 GHz****Model number:** Code Data**Test Date:****FCC, clause:** 15.209**Antenna distance:** 3 meters

Frequency, Mhz and Position	Measurement Reading, dBμV/m	Corrected Reading, dBμV/m	Duty Cycle 65 %, -3.74 dB	FCC Limit, dBμV/m	Minimum Margin, dBμV/m
433.85 X	65.3	62.1	58.4	80.8	-22.8
433.85 Y	65.9	62.7	59.0	80.8	-21.8
433.85 Z	70.3	67.1	63.4	80.8	-17.4
867.9 X	44.7	49.2	45.5	60.8	-15.3
867.9 Y	42.4	46.9	43.2	60.8	-17.6
867.9 Z	40.1	44.6	40.9	60.8	-19.9
433.85 X	78.9	75.7	72.0	80.8	-8.8
433.85 Y	76.7	73.5	69.8	80.8	-11.0
433.85 Z	73.2	70.0	66.3	80.8	-14.5
868.9 X	41.3	45.7	42.0	60.8	-18.8
868.9 Y	45.6	50.0	46.3	60.8	-14.5
868.9 Z	42.9	41.3	38.6	60.8	-22.2



*Radiated Emissions Measurements cont...****RADIATED EMISSIONS MEASUREMENTS*****> 1 GHz****Model number:** Code Data**Test Date:** April 4, 2007**FCC, clause:** 15.209**Antenna distance:** 3 meters

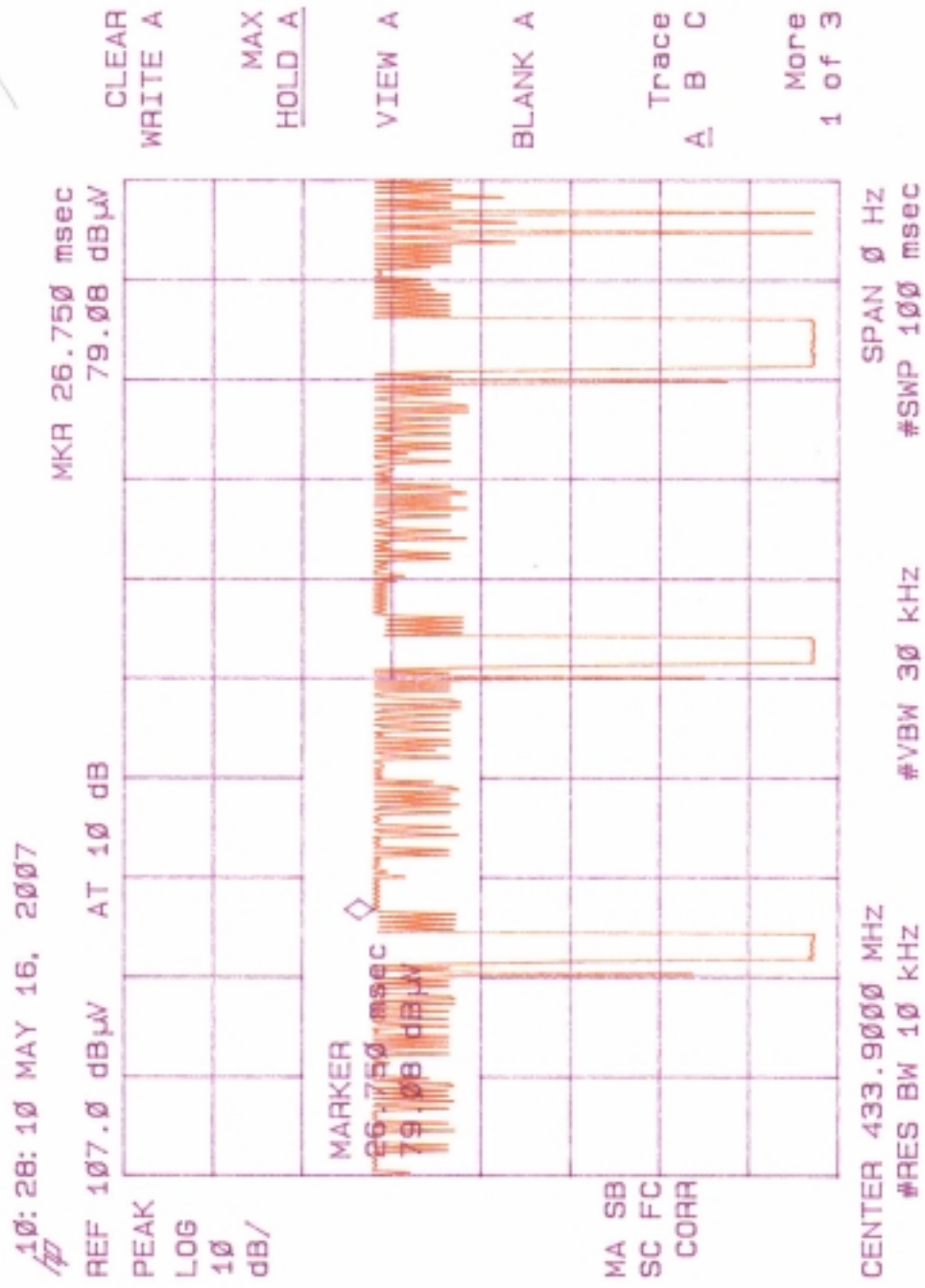
Frequency, GHz	Measurement Reading, dBμV/m	Corrected Reading, dBμV/m	FCC, Limit dBμV/m	Minimum Margin, dBμV/m
Vertical				
1.302	66.2	55.4	61.8	-6.4
1.738	58.8	50.5	61.8	-11.2
2.168	56.9	51.4	61.8	-10.4
2.605	60.5	56.9	61.8	-4.9
3.038	56.6	54.9	61.8	-6.9
3.471	50.0	50.0	61.8	-11.8
Horizontal				
1.303	64.7	52.8	61.8	-9.0
2.170	54.8	48.5	61.8	-13.3
3.038	53.4	51.7	61.8	-10.1

Section 6

DUTY CYCLE

Graph Data

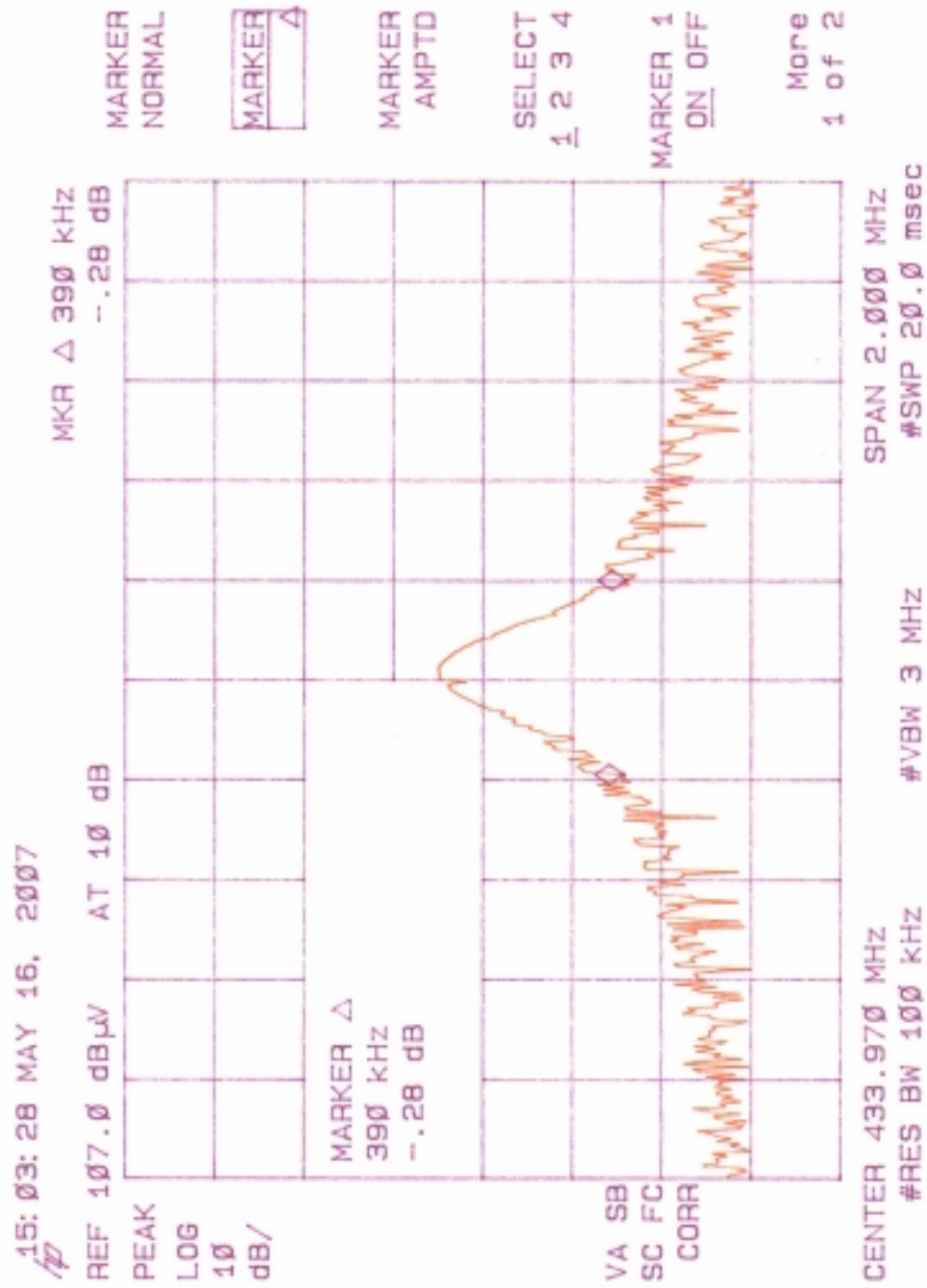
Good



Section 7

EMISSION BANDWIDTH

Graph Data



Section 8

PHOTOGRAPHS

Photographs cont...

Radiated emissions measurements



Section 9

TEST EQUIPMENT

<u>Test Equipment</u>	<u>Model No.</u>	<u>Cal. Due</u>
Spectrum Analyzer	HP 8565E	Oct.
Spectrum Analyzer	HP 8591A	Jan
Spectrum Analyzer	8592L	Jan
Signal Generator	83640L	Oct
Signal Generator	8644A	May
Signal Generator	8648A	Jan
LISN	94641-1	Jun
LISN	3825/2	Aug
LISN	LI-210	Jul
Preamplifier	QB-820	Jan
Preamplifier	8449B	Jan
Preamplifier	PA-840	Oct

All antennas are calibrated annually

<u>Antennas</u>	<u>Frequency Span</u>
Biconical	20 - 200 MHz
Log Periodic	200 - 1000 MHz
Dipoles	20 - 1000 MHz
Horn	1-18 GHz
Horn (2)	18 – 40 GHz

LAST PAGE ...