

F C C - TEST REPORT

REPORT NO.: 44744

FCC – Test Report

No. 44744

Date: 2006-03-28

Page 2 of 18

**FCC listed testlab
acc. to Section 2.948 of the FCC - Rules
in compliance with the requirements of
ANSI C63.4 - 2003**

Product : Toy Construction Vehicle
Product Class : Low Power Communication Device
Transmitter
Brand Name : -
Model : #8252-2, #7392-2
Applicant : WELBIG COMPANY

FCC – Test Report

No. 44744

Date: 2006-03-28

Page 3 of 18

TABLE OF CONTENTS

1. Cover sheet
2. Introduction
3. Table of Contents
4. Laboratory Report
5. Test Location and Summary of Test Results
6. Test Equipment List and Test Support Units
7. Radiated Emission Test Procedure (> 30MHz)
8. Radiated Emission Test Procedure (9kHz – 30MHz)
9. Measurement Data
- 10-11. Time Domain Plot
12. Measurement Data
13. Notes for Radiated Emission Measurement (acc. to ANSI C63.4 – 2003)
14. Measurement of Emissions within Band Edges (Band Edges Plot)
15. Notes for Measurement of Emissions within Band Edges
- 16-18. Photographs

FCC – Test Report

Date: 2006-03-28

No. 44744

Page 4 of 18

LABORATORY - REPORT

APPLICANT: WELBIG COMPANY
ADDRESS: Flat C, 20/F., Gold King Industrial Building
35-41 Tai Lin Pai Road
Kwai Chung, N.T.
Hong Kong

DATE OF SAMPLE RECEIVED: 2006-03-13

DATE OF TESTING: 2006-03-20 to 2006-03-24

DESCRIPTION OF SAMPLE:

Product: Toy Construction Vehicle
Product class: Low Power Communication Device Transmitter
Model number: #8252-2, #7392-2
Rating: DC 9V ('6F22' Size Battery x 1)

INVESTIGATIONS REQUESTED: Measurements to the relevant clauses of F.C.C. Rules and Regulations
Part 15 Subpart C - Intentional Radiators

RESULTS: See the attached test sheets

CONCLUSIONS: From the measurement data obtained, the tested sample was considered to have COMPLIED with the requirements for the relevant clauses of Federal Communications Commission Rules as specified above.

REMARK: The toy construction vehicles models #8252-2 and #7392-2 have the same transmitter unit.



Authorized Signature

FCC – Test Report

No. 44744

Date: 2006-03-28

Page 5 of 18

Test Location

International Electrical Certification Centre Ltd.
Unit 602-605, 31 Lok Yip Road, On Lok Tsuen, Fanling, N.T., Hong Kong

Summary of Test Results

Radiated Emission:

Test result: O.K.
Test data: See attached data sheet

Conducted Emission:

Test result: N.A.
Test data: N.A.

Measurement of Emissions within Band Edges

Test result: O.K.
Test data: See attached data sheet

FCC – Test Report

No. 44744

Date: 2006-03-28

Page 6 of 18

TEST EQUIPMENT LIST

Equipment	Manufacturer	Model	Serial No.	Remark
Test Receiver	Rohde & Schwarz	ESVP	860688/022	20MHz – 1,300 MHz
Test Receiver	Rohde & Schwarz	ESH 3	892580/006	9KHz – 30MHz
Antenna	Schaffner	CBL6111C	2791	30MHz – 1000MHz
Antenna	Schwarzbeck	BBA 9106 / UHALP 9107	--	30MHz – 1000MHz
Antenna Mast System	Schwarzbeck	AM9104	--	Max. 4 meters height
Loop Antenna	Rohde & Schwarz	HFH2-Z2	871336/48	9KHz-30MHz
Turntable with Controller	Drehtisch	DT312	--	φ120 cm
Spectrum Analyzer with Q. Peak	Advantest	R3132	140101852	9KHz – 3GHz

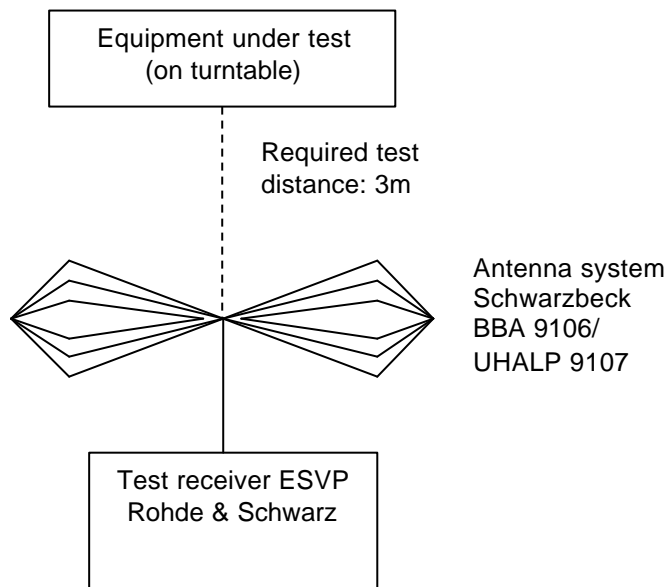
FCC – Test Report

No. 44744

Date: 2006-03-28

Page 7 of 18

Radiated Emission Test Procedure (> 30MHz)



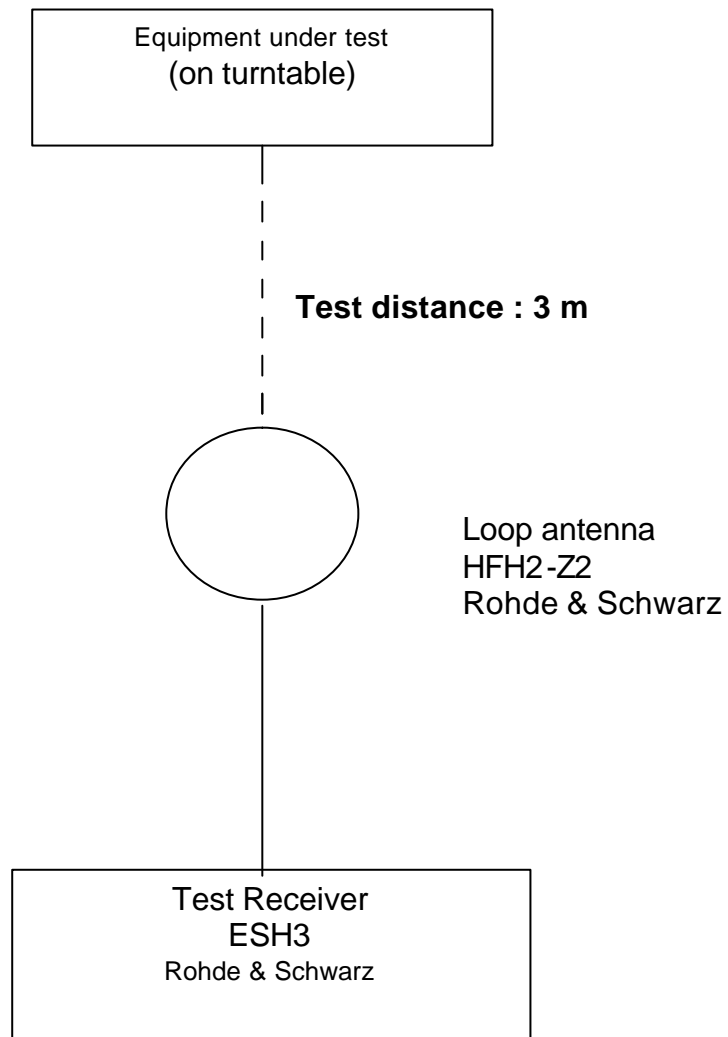
FCC – Test Report

No. 44744

Date: 2006-03-28

Page 8 of 18

Radiated Emission Test Procedure (9kHz – 30MHz)



Radiated Emission

Date : 2006-03-28

Page: 9 of 18

Measurement of Radiated Emissions
FCC Part 15 Subpart C (15.227)

IECC Ref: 44744
Model: #8252-2
Applicant: WELBIG COMPANY
Sample No.: 1
Set under test: Toy Construction Vehicle
Connected sets: -
Operating mode: Power "On"

Test Equipment
Receiver: ESVP Rohde & Schwarz
Antenna: HFH2-Z2 Rohde & Schwarz

Radiation Measurement (3 m) below 30MHz

a. Fundamental Frequency

Frequency (MHz)	Maximum Test Result (dB(μV/m))		FCC Limit (dB(μV/m))	
	Peak	Average *	Peak	Average
27.095	63.5	56.5	100	80

Note : (1) The above peak value is the maximum value of the measurement in 3 orthogonal planes

(2) * Calculation for radiation (average) :

Formula :

$$\text{Duty cycle} = (N_1L_1 + N_2L_2 + \dots + N_{n-1}L_{n-1} + N_nL_n) / 100 \text{ or } T$$

where N1 is number of type 1 pluse, L1 is length of type 1 pulse, etc.
T is the period of the pulse train (if less than 100 ms)

According to the time domain plots shown in page 10 & 11 :

$$\text{Duty cycle of the EUT} = (6 \times 1.5 + 10 \times 0.5) / 31.28 = 0.447$$

$$\begin{aligned} \text{Av correction factor} &= 20 \times \log(0.447) \text{ dB} \\ &= -6.98 \text{ dB} \end{aligned}$$

$$\text{Radiation (average)} = \text{Radiation (peak)} + \text{Av correction factor}$$

$$\begin{aligned} \text{Radiation (average) of the EUT} &= 63.5 - 6.98 \text{ dB(}\mu\text{V/m)} \\ &= 56.5 \text{ dB(}\mu\text{V/m)} \end{aligned}$$

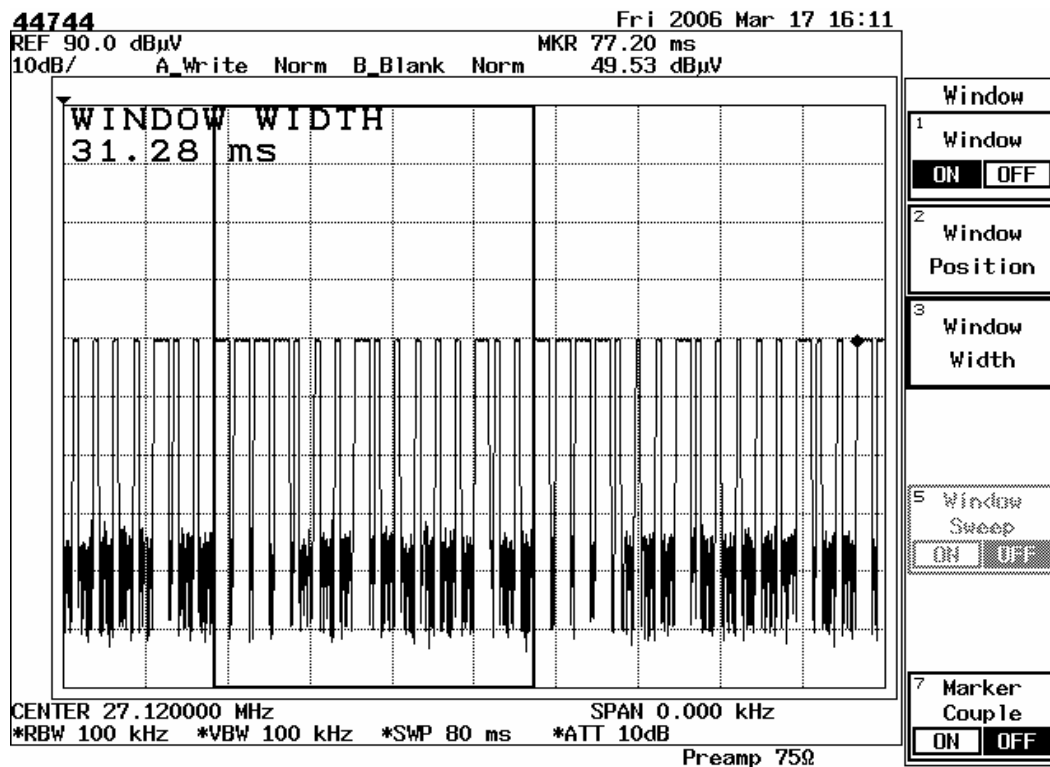
b. The measured radiation outside the operation band were negliginle

Radiated Emission

Date : 2006-03-28

Page: 10 of 18

Transmitter Emission - Time Domain Plots



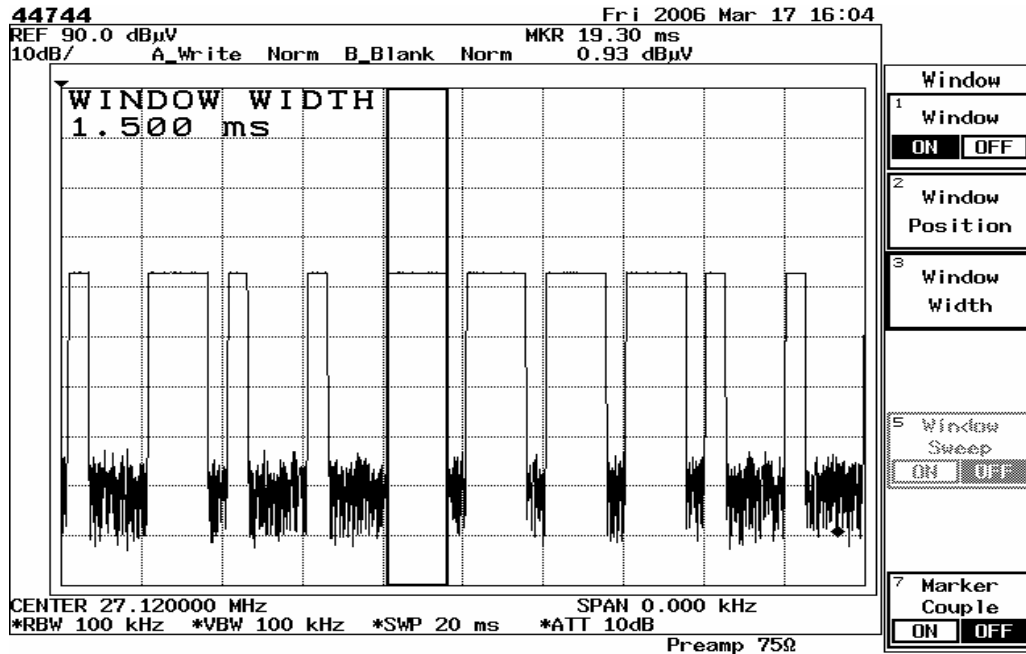
Pulse cycle period = 31.28 ms

Radiated Emission

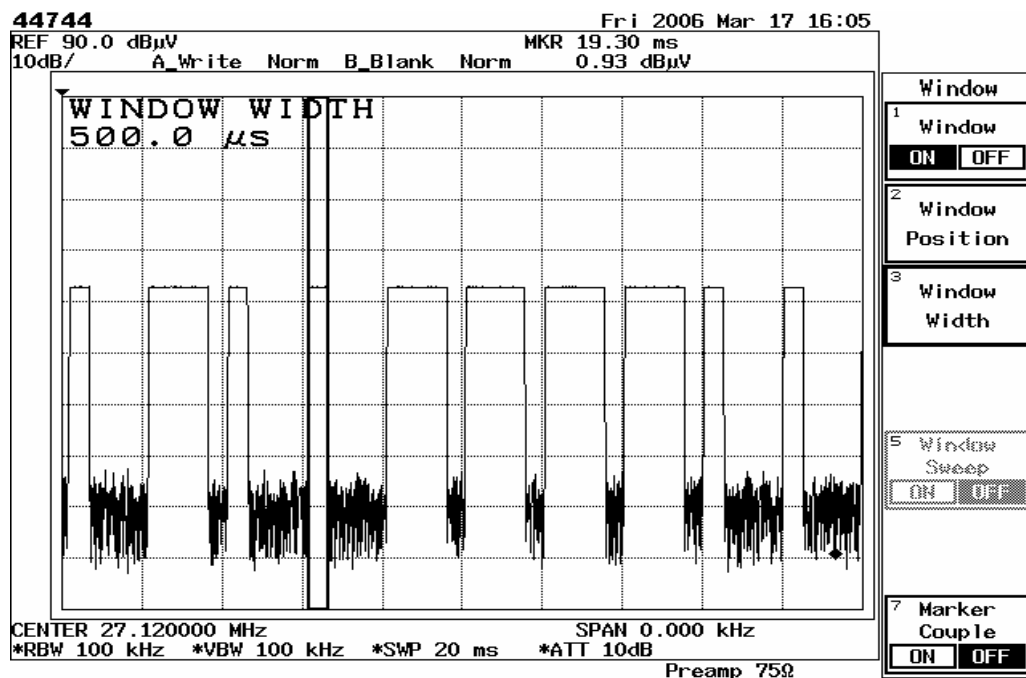
Date : 2006-03-28

Page: 11 of 18

Transmitter Emission - Time Domain Plots



Pulse width = 1.5 ms (total number of pulse : 6)



Pulse width = 0.5 ms (total number of pulse : 10)

Radiated Emission

Measurement of Radiated Emissions
FCC Part 15 Subpart C (15.209)

Date : 2006-03-28
Page 12 of 18

IECC Ref: 44744
Model: #8252-2
Applicant: WELBIG COMPANY

Test Equipment
Receiver: ESVP Rohde & Schwarz
Antenna: Schaffner CBL6111C

Sample No. : 1

Set under test: Toy Construction Vehicle
Connected sets: -
Operating mode: Power "On"

Fundamental Frequency : 27.095 MHz

Radiation Measurement over 30MHz

	Frequency (MHz)	Horz. Reading dB(μV)	Vert. Reading dB(μV)	Corr. Factor (dB)	Horiz. Test Result dB(μV/m)	Vert. Test Result dB(μV/m)	Limit dB(μV/m)
Harm. 2	54.19	< 16	< 16	6.1	< 22.1	< 22.1	40.0
Harm. 3	81.29	< 16	< 16	7.1	< 23.1	< 23.1	40.0
Harm. 4	108.38	< 16	< 16	10.2	< 26.2	< 26.2	43.5
Harm. 5	135.48	< 16	< 16	11.1	< 27.1	< 27.1	43.5
Harm. 6	162.57	< 16	< 16	9.6	< 25.6	< 25.6	43.5
Harm. 7	189.67	< 16	< 16	8.1	< 24.1	< 24.1	43.5
Harm. 8	216.76	< 16	< 16	8.2	< 24.2	< 24.2	46.0
Harm. 9	243.86	< 16	< 16	11.2	< 27.2	< 27.2	46.0
Harm. 10	270.95	< 16	< 16	12.6	< 28.6	< 28.6	46.0
Harm. 11	298.05	< 16	< 16	12.9	< 28.9	< 28.9	46.0
Harm. 12	325.14	< 16	< 16	13.6	< 29.6	< 29.6	46.0
Harm. 13	352.24	< 16	< 16	14.4	< 30.4	< 30.4	46.0
Harm. 14	379.33	< 16	< 16	15.3	< 31.3	< 31.3	46.0
Harm. 15	406.43	< 16	< 16	15.9	< 31.9	< 31.9	46.0
Harm. 16	433.52	< 16	< 16	16.6	< 32.6	< 32.6	46.0
Harm. 17	460.62	< 16	< 16	17.2	< 33.2	< 33.2	46.0
Harm. 18	487.71	< 16	< 16	17.7	< 33.7	< 33.7	46.0
Harm. 19	514.81	< 16	< 16	18.2	< 34.2	< 34.2	46.0
Harm. 20	541.90	< 16	< 16	19.4	< 35.4	< 35.4	46.0
Harm. 21	569.00	< 16	< 16	20.2	< 36.2	< 36.2	46.0
Harm. 22	596.09	< 16	< 16	19.3	< 35.3	< 35.3	46.0
Harm. 23	623.19	< 16	< 16	20.3	< 36.3	< 36.3	46.0
Harm. 24	650.28	< 16	< 16	20.1	< 36.1	< 36.1	46.0
Harm. 25	677.38	< 16	< 16	20.4	< 36.4	< 36.4	46.0
Harm. 26	704.47	< 16	< 16	20.9	< 36.9	< 36.9	46.0
Harm. 27	731.57	< 16	< 16	22.1	< 38.1	< 38.1	46.0
Harm. 28	758.66	< 16	< 16	22.4	< 38.4	< 38.4	46.0
Harm. 29	785.76	< 16	< 16	22.2	< 38.2	< 38.2	46.0
Harm. 30	812.85	< 16	< 16	22.2	< 38.2	< 38.2	46.0
Harm. 31	839.95	< 16	< 16	23.3	< 39.3	< 39.3	46.0
Harm. 32	867.04	< 16	< 16	23.5	< 39.5	< 39.5	46.0
Harm. 33	894.14	< 16	< 16	23.3	< 39.3	< 39.3	46.0
Harm. 34	921.23	< 16	< 16	24.3	< 40.3	< 40.3	46.0
Harm. 35	948.33	< 16	< 16	25.5	< 41.5	< 41.5	46.0
Harm. 36	975.42	< 16	< 16	25.1	< 41.1	< 41.1	54.0

Remark: All frequencies in the required range have been scanned and only those significant and representative readings are reported above.
All emissions not reported above are all well below the limit.

Note: Unless otherwise indicated, the recorded readings are in quasi-peak values.

Notes for Radiated Emission Measurement

1. Measurement facility:

Measurement facility located at Fanling (Hong Kong), placed on file with the FCC Pursuant to Section 2.948 of the FCC Rules (FCC Registration No. : 97774).

2. Distance between the EUT and measuring antenna:

3 meters.

3. Measuring instrumentations:

Rohde & Schwarz ESH3 Test Receiver (9kHz – 30MHz), ESVP Test Receiver (20 - 1300 MHz) with a CISPR weighting QP detector, 6 dB bandwidth set at 120 KHz.

4. Measuring antenna:

Broad-band antenna for the frequency range 30 - 1000 MHz, connected with 10 meters coaxial cable. Cable loss of the coaxial cable included in the Antenna Factor for measurement data. The antenna is capable of measuring both horizontal and vertical polarizations. The antenna was raised from 1 to 4 meters to find out the maximum emission level from the EUT.

Loop antenna for the frequency range 9kHz - 30MHz, connected with 10 meters coaxial cable. Cable loss of the coaxial cable included in the measurement data. The center of the loop 1 m above the ground plane, positioned with its plane vertical at the specified distance and rotated about its vertical axis and placed horizontal for maximum response at each azimuth about the EUT.

5. Frequency range scanned:

The frequency ranges 9kHz - 30MHz, 30 - 1000 MHz have been scanned. Readings of the highest emissions relating to the limit were reported as above.

6. Arrangement of EUT:

During the test, the sample was placed on a turn table and operated under various modes at rated supply voltage. The table is 0.8 meter above ground and can rotate 360 degrees to determine the position of the maximum emission level.

7. Measuring Procedure:

In **accordance** with the relevant sections of the American National Standards Institute (ANSI) C63.4-2003 ' Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9KHz to 40GHz' .

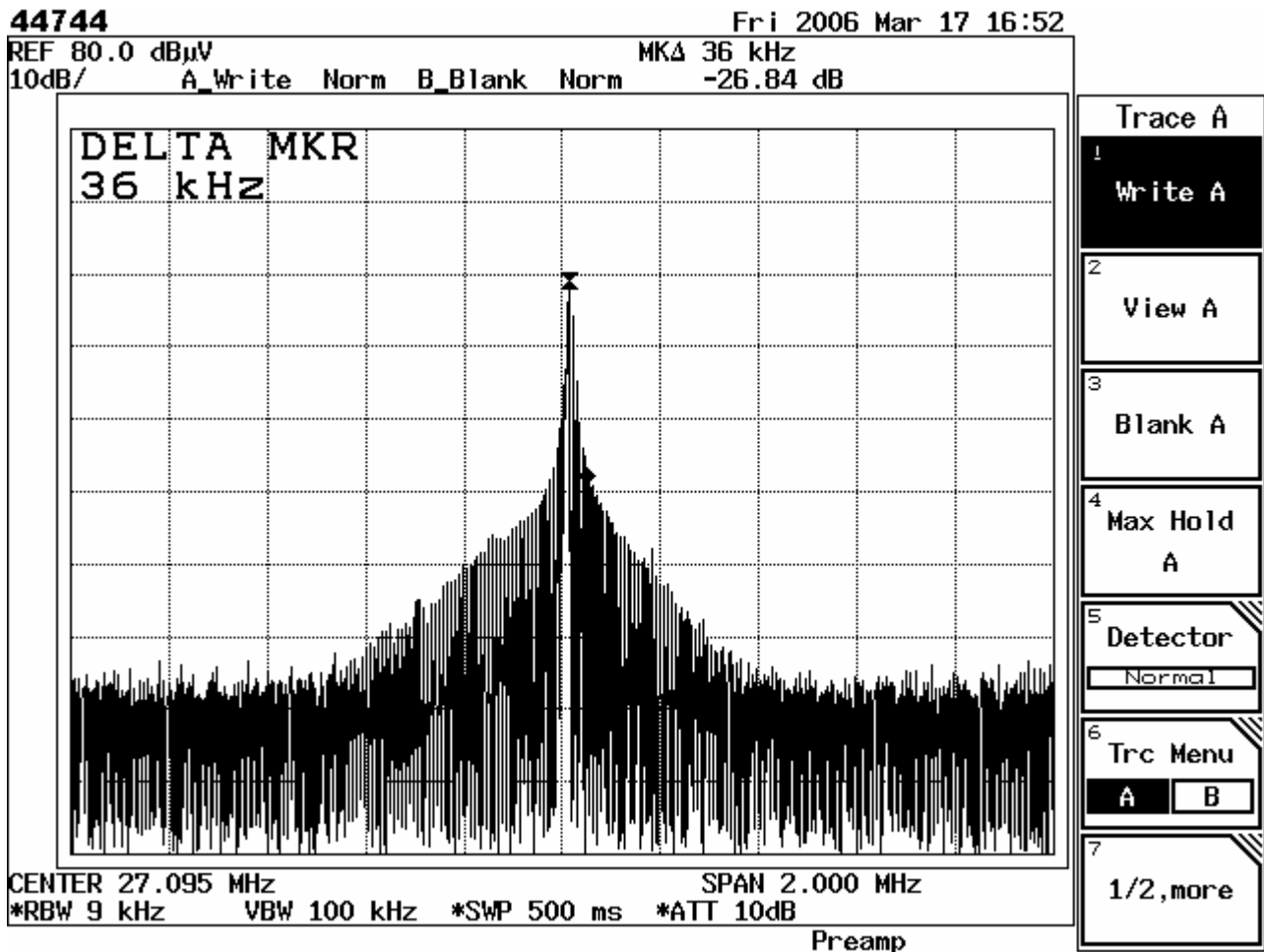
FCC – Test Report

Date: 2006-03-28

No. 44744

Page 14 of 18

Measurement Data of Emissions within Band Edges



Result : The field strength of any emission within the operation band did not exceed 80 dB(μV/m) for average value or 100 dB(μV/m) for peak value. Refer to page 9 for the recorded value for the emission at the fundamental frequency.

Notes for Measurement of Emissions within Band Edges

1. **Measurement facility:**
Measurement facility located at Fanling (Hong Kong) placed on file with the FCC Pursuant to Section 2.948 of the FCC Rules.
2. **Measuring instrumentations:**
Spectrum Analyzer: Advantest R3132
3. **Frequency range scanned:**
The frequency range acc. to FCC rules and regulations part 15 subpart C - Intentional Radiators.
4. **Arrangement of EUT:**
During the test, the sample was operated.
5. **Measuring Procedure:**
In accordance with the relevant sections of American National Standards Institute (ANSI) C63.4 - 2003 'Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz'.

FCC – Test Report

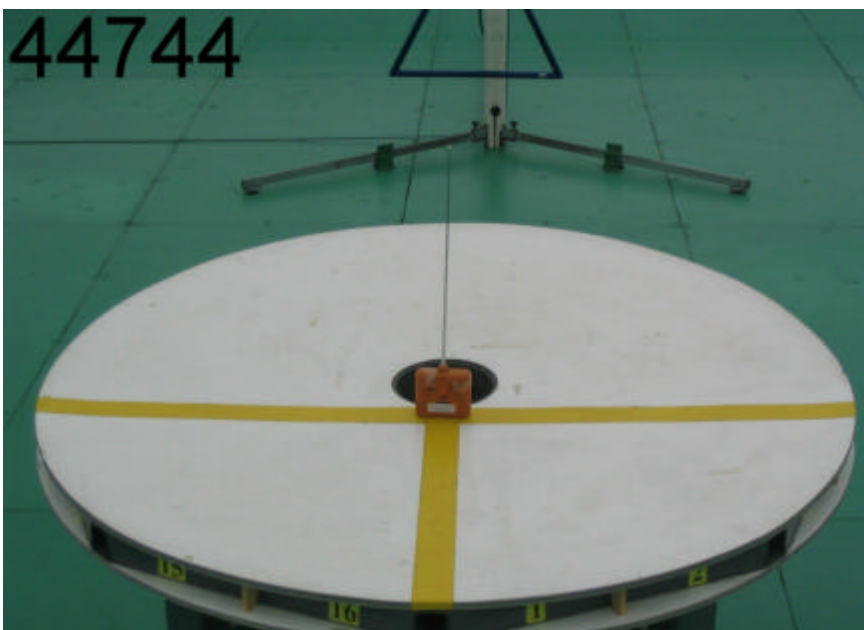
No. 44744

Date: 2006-03-28

Page 16 of 18

Photographs

Radiated Emission Test setup



FCC – Test Report

No. 44744

Date: 2006-03-28

Page 17 of 18

Sample Construction Details



FCC – Test Report

No. 44744

Date: 2006-03-28

Page 18 of 18

Sample Construction Details

