

**Spectrum Research  
& Testing Lab., Inc.**

No. 101-10, Ling 8,  
Shan-Tong Li, Chung-Li  
City, Taoyuan, Taiwan,  
R.O.C.

**TEST REPORT**

Reference No.:A05080201  
Report No.:FCCA05080201  
FCC ID:TJNFM-TX08  
Page:1 of 16  
Date:Aug. 25, 2005

Product Name: FM Transmitter-8 channel  
Model No.: FM-TX08  
Applicant: VANLI INTERNATIONAL LTD.  
Room 40, 12/F., Block D, Wah Lok Industrial Centre,  
31-41 Shan Mei Street, Fo Tan, Shatin, N. T., Hong Kong.  
Date of Receipt: Aug. 02, 2005  
Finished date of Test: Aug. 25, 2005  
Applicable Standards: 47 CFR Part 15, Subpart C  
ANSI C63.4:2003

We, **Spectrum Research & Testing Laboratory Inc.**, hereby certify that one sample of the above was tested in our laboratory with positive results according to the above-mentioned standards. The records in the report are an accurate account of the results. Details of the results are given in the subsequent pages of this report.

Checked By : \_\_\_\_\_ , Date: \_\_\_\_\_  
( Hugo Yeh )

Approved By : \_\_\_\_\_ , Date: \_\_\_\_\_  
( Johnson Ho, Director )



Lab Code: 200099-0



## Table of Contents

1.	DOCUMENT POLICY AND TEST STATEMENT .....	3
1.1	DOCUMENT POLICY .....	3
1.2	TEST STATEMENT .....	3
1.3	EUT MODIFICATION .....	3
2.	DESCRIPTION OF EUT AND TEST MODE .....	4
2.1	GENERAL DESCRIPTION OF EUT .....	4
2.2	DESCRIPTION OF EUT INTERNAL DEVICE .....	4
2.3	DESCRIPTION OF TEST MODE .....	5
2.4	DESCRIPTION OF SUPPORT UNIT .....	5
3.	DESCRIPTION OF APPLIED STANDARDS .....	5
4.	RADIATED EMISSION TEST .....	6
4.1	RADIATED EMISSION LIMIT .....	6
4.2	TEST EQUIPMENT .....	6
4.3	TEST SET-UP .....	7
4.4	TEST PROCEDURE .....	8
4.5	EUT OPERATING CONDITION .....	8
4.6	RADIATED EMISSION TEST RESULT .....	9
5.	BANDWIDTH TEST .....	12
5.1	LIMIT .....	12
5.2	TEST EQUIPMENT .....	12
5.3	TEST SET-UP .....	12
5.4	TEST PROCEDURE .....	12
5.5	EUT OPERATING CONDITION .....	12
5.6	TEST RESULT .....	13
6.	PHOTOS OF TESTING .....	15
7.	TERMS OF ABRIVATION .....	16

 <b>Spectrum Research &amp; Testing Lab., Inc.</b> No. 101-10, Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan, Taiwan, R.O.C.	<h1>TEST REPORT</h1>	Reference No.:A05080201 Report No.:FCCA05080201 FCC ID:TJNFM-TX08 Page:3 of 16 Date:Aug. 25, 2005
--	----------------------	---

## 1. DOCUMENT POLICY AND TEST STATEMENT

### 1.1 DOCUMENT POLICY

- The report shall not be reproduced except in full, without the written approval of SRT Lab, Inc.
- The report must not be used by the applicant to claim that the product is endorsed by NVLAP, TÜV, NEMKO and SRT.
- The NVLAP logo applies only to the applicable standards specified in this report.

### 1.2 TEST STATEMENT

- The test results in the report apply only to the unit tested by SRT Lab.
- There was no deviation from the requirements of test standards during the test.
- AC power source, 120 Vac/60 Hz, was used during the test.

### 1.3 EUT MODIFICATION

- No modification in SRT Lab.



**Spectrum Research  
& Testing Lab., Inc.**  
No. 101-10, Ling 8,  
Shan-Tong Li, Chung-Li  
City, Taoyuan, Taiwan,  
R.O.C.

## TEST REPORT

Reference No.:A05080201  
Report No.:FCCA05080201  
FCC ID:TJNFM-TX08  
Page:4 of 16  
Date:Aug. 25, 2005

## 2. DESCRIPTION OF EUT AND TEST MODE

### 2.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	FM Transmitter-8 channel
<b>MODEL NO.</b>	FM-TX08
<b>POWER SUPPLY</b>	DC 12V, 20mA
<b>FREQUENCY BAND</b>	88.1, 88.3, 88.5, 88.7, 107.3, 107.5, 107.7, 107.9MHz
<b>CARRIER FREQUENCY</b>	88.1, 88.3, 88.5, 88.7, 107.3, 107.5, 107.7, 107.9MHz
<b>NUMBER OF CHANNEL</b>	8
<b>CHANNEL SPACING</b>	±80 kHz
<b>RATED RF OUTPUT POWER</b>	-65dBm
<b>MODULATION TYPE</b>	FM
<b>MODE OF OPERATION</b>	Simplex
<b>CHANNEL BANDWIDTH</b>	0.2MHz

#### NOTE :

For more detailed features, please refer to the manufacturer's specification or User's Manual.

### 2.2 DESCRIPTION OF EUT INTERNAL DEVICE

DEVICE	BRAND / MAKER	MODEL #	FCC ID/DOC	REMARK
N/A				

 <b>Spectrum Research &amp; Testing Lab., Inc.</b> No. 101-10, Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan, Taiwan, R.O.C.	<h1>TEST REPORT</h1>	Reference No.:A05080201 Report No.:FCCA05080201 FCC ID:TJNFM-TX08 Page:5 of 16 Date:Aug. 25, 2005
--	----------------------	---

## 2.3 DESCRIPTION OF TEST MODE

The EUT was tested for emission measurement under the following situations:

Mode	
1	88.1MHz
2	88.7MHz
3	107.9MHz

## 2.4 DESCRIPTION OF SUPPORT UNIT

The EUT was configured by the requirement of ANSI C63.4:2003 and CISPR22:2003. All interface ports were connected to the appropriate support units via specific cables. The support units and cables are listed below.

NO	DEVICE	BRAND	MODEL #	FCC ID/DOC	CABLE
1	DC POWER SUPPLY	N/A	N/A	N/A	N/A
2					
3					


**NOTE :** For the actual test configuration, please refer to the photos of testing.

## 3. DESCRIPTION OF APPLIED STANDARDS

The EUT is a kind of wireless product for car. According to the specifications provided by the applicant, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C  
 ANSI C63.4:2003

All tests have been performed and recorded as per the above standards.

 <b>Spectrum Research &amp; Testing Lab., Inc.</b> No. 101-10, Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan, Taiwan, R.O.C.	<h1>TEST REPORT</h1>	Reference No.:A05080201 Report No.:FCCA05080201 FCC ID:TJNFM-TX08 Page:6 of 16 Date:Aug. 25, 2005
--	----------------------	---

## 4. RADIATED EMISSION TEST

### 4.1 RADIATED EMISSION LIMIT

FCC Part 15, Subpart C Section 15.239.

FREQUENCY (MHz)	DISTANCE (m)	FIELD STRENGTH (dB $\mu$ V/m)
88-808	3	48

FCC Part 15, Subpart B Section 15.209.

FREQUENCY (MHz)	DISTANCE (m)	FIELD STRENGTH (dB $\mu$ V/m)
30 - 88	3	40.0
88 - 216	3	43.5
216 - 960	3	46.0
Above 960	3	54.0

#### NOTE :

1. In the emission tables above , the tighter limit applies at the band edges.
2. Distance refers to the distance between measuring instrument, antenna, and the closest point of any part of the device or system.

CISPR 22:2003 limits of radiated emission measurement for frequency below 1000 MHz

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dB $\mu$ V/m	dB $\mu$ V/m
30 – 230	40	30
230 - 1000	47	37

#### NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dB $\mu$ V/m) = 20 log Emission level ( $\mu$ V/m).

### 4.2 TEST EQUIPMENT

The following test equipment was used during the radiated emission test:

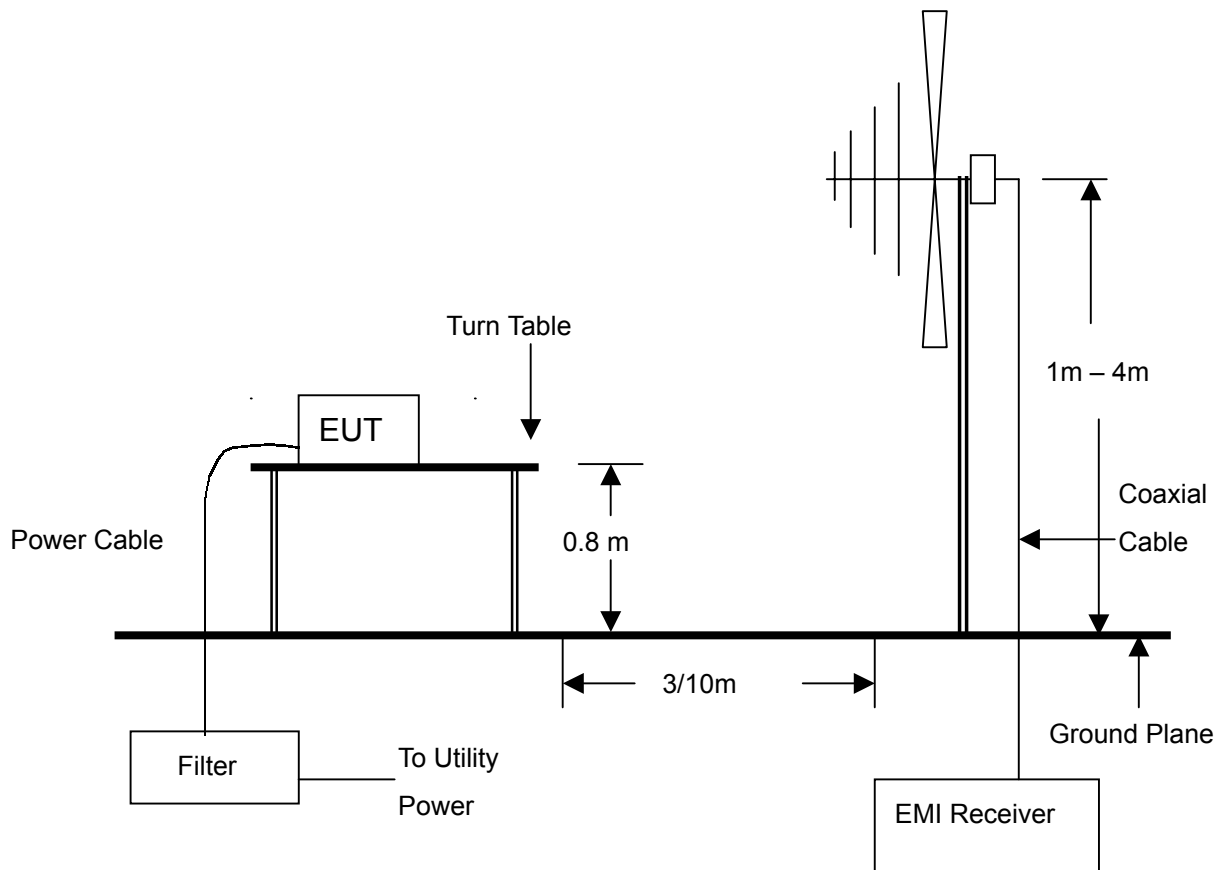
EQUIPMENT/ FACILITIES	MANUFACTURER	MODEL#	SERIAL#	DUE DATE OF CAL.
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESI26	SB3436	JUN. 29, 2006
AMN	SCHAFFNER	CBL6112B	SB3440	JUN. 29, 2006

#### NOTE:

1. The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.



## 4.3 TEST SET-UP



### NOTE :

1. The EUT system was put on a wooden table with 0.8m heights above a ground plane.
2. For the actual test configuration, please refer to the photos of testing.



## 4.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.4:2003 and CISPR 22:2003. The measurements were made at an open area test site with 10 meter measurement distance under 1 GHz and with 3m distance above 1GHz. The frequency spectrum measured started from 30 MHz. Under 1 GHz, all readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak or average values with 1 MHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency. First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.

## 4.5 EUT OPERATING CONDITION

- 1.Set the EUT under transmission condition continuously at specific channel frequency.
- 2.Ran "ES-K 1V1.60" program.



**Spectrum Research  
& Testing Lab., Inc.**No. 101-10, Ling 8,  
Shan-Tong Li, Chung-Li  
City, Taoyuan, Taiwan,  
R.O.C.**TEST REPORT**Reference No.:A05080201  
Report No.:FCCA05080201  
FCC ID:TJNFM-TX08  
Page:9 of 16  
Date:Aug. 25, 2005**4.6 RADIATED EMISSION TEST RESULT**

Temperature:	24°C	Humidity:	64 %RH
Frequency Range:	88 - 108 MHz	Measured Distance:	3m
Receiver Detector:	AV.	Tested Mode:	TX (Fundamental Frequency)
Tested Date:	July 15, 2005		88.1MHz

## Fundamental frequency of transmitter

Frequency (MHz)	Antenna Polarization	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
88.170(F)	H	1.74	7.74	22.8	32.3	48.0	-17.7
88.170(F)	V	1.74	7.74	29.0	38.5	48.0	-11.5

Receiver Detector: Q.P. Tested Mode: TX (Harmonic)

Frequency (MHz)	Antenna Polarization	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
176.4950	H	2.32	9.56	16.8	28.70	43.5	-14.8
264.5890	H	2.90	12.62	16.8	32.30	46.0	-13.7
40.2510	V	1.26	11.10	7.9	20.30	40.0	-19.7
176.5540	V	2.32	9.56	12.6	24.50	43.5	-19.0
264.7730	V	2.90	12.62	7.6	23.10	46.0	-22.9

**NOTE :**

1. Measurement uncertainty is less than +/- 2dB
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss
4. The field strength of other emission frequencies were very low against the limit.
5. (F) : Fundamental frequency of transmitter.

**Spectrum Research  
& Testing Lab., Inc.**No. 101-10, Ling 8,  
Shan-Tong Li, Chung-Li  
City, Taoyuan, Taiwan,  
R.O.C.**TEST REPORT**Reference No.:A05080201  
Report No.:FCCA05080201  
FCC ID:TJNFM-TX08  
Page:10 of 16  
Date:Aug. 25, 2005

Temperature:	23°C	Humidity:	67%RH
Frequency Range:	88 - 108 MHz	Measured Distance:	3m
Receiver Detector:	AV.	Tested Mode:	TX (Fundamental Frequency)
Tested Date:	July 10, 2005		88.7MHz

## Fundamental frequency of transmitter

Frequency (MHz)	Antenna Polarization	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
88.7060(F)	H	1.74	7.74	33.4	42.90	67.96	-25.06
88.7060(F)	V	1.74	7.74	36.3	45.80	67.96	-22.16

Receiver Detector: Q.P. Tested Mode: TX (Harmonic)

Frequency (MHz)	Antenna Polarization	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
39.2200	H	1.25	11.38	24.7	37.30	40.0	-2.7
177.8120	H	2.33	9.55	16.9	28.80	43.5	-14.7
266.7240	H	2.92	12.68	6.5	22.50	46.0	-23.5
102.7400	V	1.82	6.93	27.2	36.00	43.5	-7.5
177.8120	V	2.33	9.55	18.2	30.10	43.5	-13.4
266.7240	V	2.92	12.68	5.4	21.00	46.0	-25.0

**NOTE :**

1. Measurement uncertainty is less than +/- 2dB
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss
4. The field strength of other emission frequencies were very low against the limit.
5. (F) : Fundamental frequency of transmitter.



**Spectrum Research  
& Testing Lab., Inc.**  
No. 101-10, Ling 8,  
Shan-Tong Li, Chung-Li  
City, Taoyuan, Taiwan,  
R.O.C.

## TEST REPORT

Reference No.:A05080201  
Report No.:FCCA05080201  
FCC ID:TJNFM-TX08  
Page:11 of 16  
Date:Aug. 25, 2005

Temperature:	23°C	Humidity:	67%RH
Frequency Range:	88 - 108 MHz	Measured Distance:	3m
Receiver Detector:	AV.	Tested Mode:	TX (Fundamental Frequency)
Tested Date:	July 10, 2005		107.9MHz

### Fundamental frequency of transmitter

Frequency (MHz)	Antenna Polarization	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
107.922(F)	H	1.83	7.01	26.1	34.90	67.96	-33.06
107.922(F)	V	1.83	7.01	31.0	39.80	67.96	-28.16

Receiver Detector: Q.P. Tested Mode: TX (Harmonic)

Frequency (MHz)	Antenna Polarization	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
215.9920	H	2.59	10.52	19.0	32.10	43.5	-11.4
323.6610	H	3.14	14.28	20.1	37.50	46.0	-8.5
215.8830	V	2.59	10.52	15.0	28.10	43.5	-15.4
323.7710	V	3.14	14.28	10.5	27.90	46.0	-18.1

### NOTE :

1. Measurement uncertainty is less than +/- 2dB
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss
4. The field strength of other emission frequencies were very low against the limit.
5. (F) : Fundamental frequency of transmitter.

 <b>Spectrum Research &amp; Testing Lab., Inc.</b> No. 101-10, Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan, Taiwan, R.O.C.	<h1>TEST REPORT</h1>	Reference No.:A05080201 Report No.:FCCA05080201 FCC ID:TJNFM-TX08 Page:12 of 16 Date:Aug. 25, 2005
--	----------------------	--

## 5. BANDWIDTH TEST

### 5.1 LIMIT

FCC Part15, Subpart C Section 15.239. The 200kHz band shall lie wholly within the frequency range of 88-108 MHz.

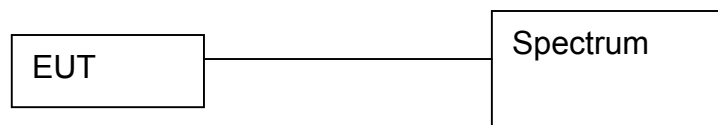
### 5.2 TEST EQUIPMENT

The following test equipment was used during the test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
SPECTRUM	9kHz-7GHz	ROHDE & SCHWARZ	FSP7/ 839511/010	APR. 2006 R&S

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

### 5.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

### 5.4 TEST PROCEDURE

The EUT was operating in the transmitter mode and could control its channels. The test result was printed by the hard copy function of the spectrum.

### 5.5 EUT OPERATING CONDITION

Same as section 4.5 of this report.

**Spectrum Research  
& Testing Lab., Inc.**

No. 101-10, Ling 8,  
Shan-Tong Li, Chung-Li  
City, Taoyuan, Taiwan,  
R.O.C.

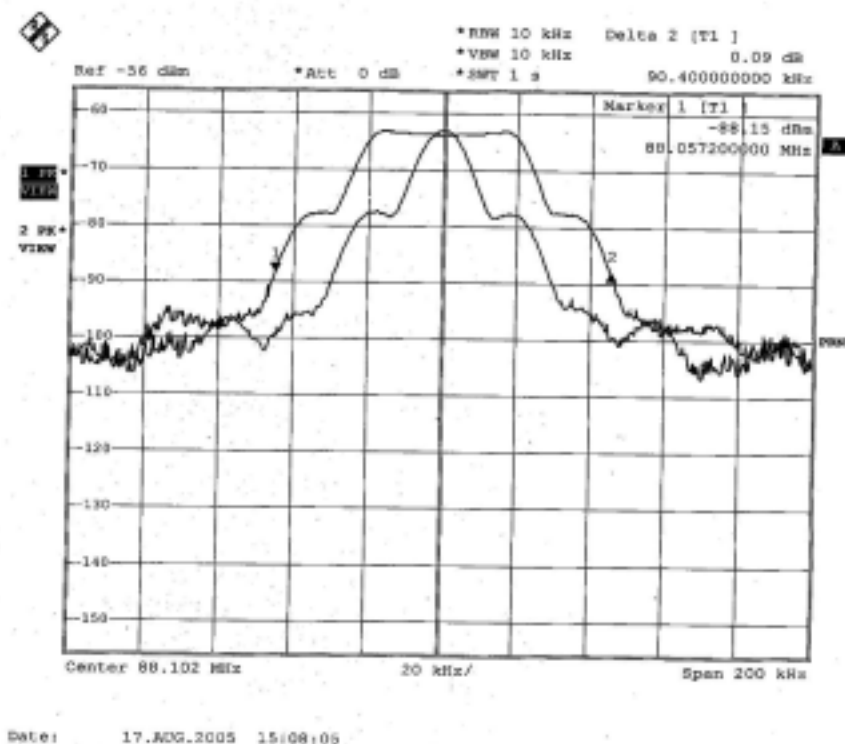
# TEST REPORT

Reference No.:A05080201  
Report No.:FCCA05080201  
FCC ID:TJNFM-TX08  
Page:13 of 16  
Date:Aug. 25, 2005

## 5.6 TEST RESULT

Temperature:	23°C	Humidity:	60%RH
Spectrum Detector:	PK.	Tested Mode:	88.1MHz
Tested Date:	Aug. 17, 2005		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	20dB DOWN BW (KHz)
1	88.0572	90.4



**Spectrum Research  
& Testing Lab., Inc.**

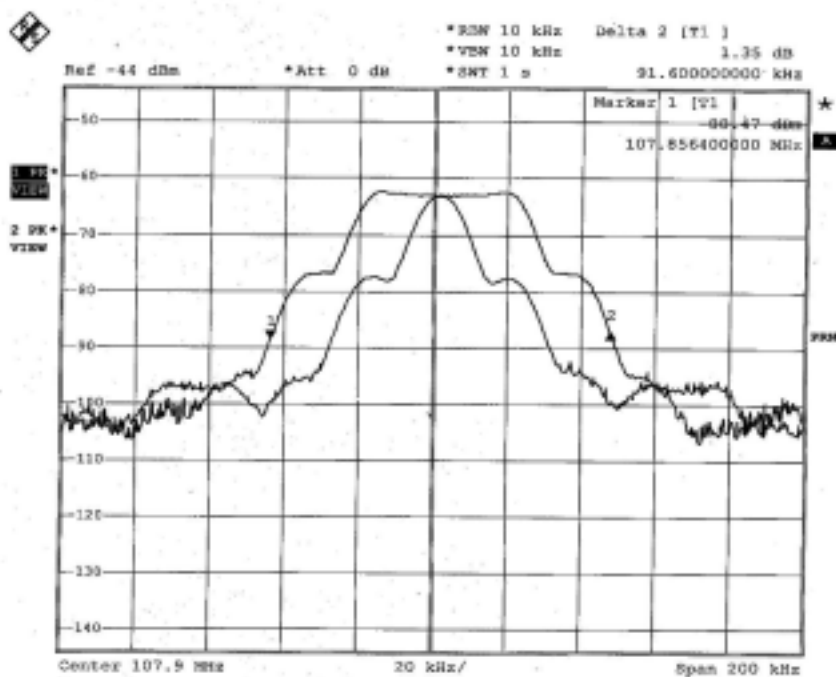
No. 101-10, Ling 8,  
Shan-Tong Li, Chung-Li  
City, Taoyuan, Taiwan,  
R.O.C.

# TEST REPORT

Reference No.:A05080201  
Report No.:FCCA05080201  
FCC ID:TJNFM-TX08  
Page:14 of 16  
Date:Aug. 25, 2005

Temperature:	23°C	Humidity:	60%RH
Spectrum Detector:	PK.	Tested Mode:	107.9MHz
Tested Date:	Aug. 17, 2005		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	20dB DOWN BW (KHz)
1	107.8564	91.6



Date: 17.AUG.2005 15:24:57



**Spectrum Research  
& Testing Lab., Inc.**

No. 101-10, Ling 8,  
Shan-Tong Li, Chung-Li  
City, Taoyuan, Taiwan,  
R.O.C.

## TEST REPORT

Reference No.:A05080201  
Report No.:FCCA05080201  
FCC ID:TJNFM-TX08  
Page:15 of 16  
Date:Aug. 25, 2005

### 6. PHOTOS OF TESTING

- Radiated test



**Spectrum Research  
& Testing Lab., Inc.**

No. 101-10, Ling 8,  
Shan-Tong Li, Chung-Li  
City, Taoyuan, Taiwan,  
R.O.C.

# TEST REPORT

Reference No.:A05080201  
Report No.:FCCA05080201  
FCC ID:TJNFM-TX08  
Page:16 of 16  
Date:Aug. 25, 2005

## 7. TERMS OF ABRIVATION

AV.	Average detection
AZ(°)	Turn table azimuth
Correct.	Correction
EL(m)	Antenna height (meter)
EUT	Equipment Under Test
Horiz.	Horizontal direction
LISN	Line Impedance Stabilization Network
NSA	Normalized Site Attenuation
Q.P.	Quasi-peak detection
SRT Lab	Spectrum Research & Testing Laboratory, Inc.
Vert.	Vertical direction