

**EMC TEST REPORT For FCC**

Test Report No. : CTK02-F033

Date of Issue : April 17, 2002

Model/Type No: : TX-101

Kind of Product : FM-TRANSMITTER

TX Frequency Range : 88.0 MHz, 88.4 MHz and 89.2 MHz.

Applicant : Sky Sound Corporation

Applicant Address : RM.803, Nok-Won Bldg., #302, Haan 1-Dong, Kwangmyung-City, Kyungki-Do, Korea

Manufacturer : D&A Corporation

Manufacturer Address : #305 Kyungki Venture Bldg., 1017, Inkye-Dong, Paldal-Gu, Suwon City, Kyungki-Do, Korea

Contact Person : Kwang-Hyung Lee /President

Telephone : +82-2-897-7676

Received Date : March 4, 2002

Test period : Start: March 4, 2002 End: March 27, 2002

Test Results :  **In Compliance**  **Not in Compliance**

The test results presented in this report relate only to the object tested.

CERTiTEK Standards Laboratory Co., Ltd. is accredited by Korea Laboratory Accreditation Scheme (KOLAS) which signed the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the above test item(s) and test method(s).

Tested by

Michael Jang  
EMC Test Engineer  
Date: April 17, 2002

Reviewed by

James Hong  
EMC Technical Manager  
Date: April 17, 2002



## REPORT REVISION HISTORY

Date	Revision	Page No
Apr. 17, 2002	(CTK02-F033) Issued	All

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## TABLE OF CONTENTS

1.0 General Product Description .....	4
1.1 Model Differences .....	4
1.2 Device Modifications .....	5
1.3 EUT Configuration(s) .....	6
1.4 Test Software .....	6
1.5 EUT Operating Mode(s) .....	6
1.6 Calibration Details of Equipment Used for Measurement .....	7
1.7 Test Facility .....	7
1.8 Measurement Procedure .....	7
1.9 Laboratory Accreditations and Listings .....	8
2.0 Emissions Test Regulations .....	9
2.1 Conducted Voltage Emissions .....	10
2.2 Radiated Electric Field Emissions .....	11
2.3 Intentional radiator 200 kHz Bandwidth .....	12
2.4 Intentional radiator Field Strength of Radiation .....	13
2.5 Intentional radiator Field Strength of Spurious .....	14
Configurations .....	15
APPENDIX A - TEST DATA .....	16
Conducted Voltage Emissions (Quasi-Peak reading) .....	16
Radiated Electric Field Emissions (Quasi-Peak reading) at 88.0 MHz with DC Power Supply .....	18
Radiated Electric Field Emissions (Quasi-Peak reading) at 88.4 MHz with DC Power Supply .....	19
Radiated Electric Field Emissions (Quasi-Peak reading) at 89.2 MHz with DC Power Supply .....	20
Intentional radiator 200 kHz Bandwidth .....	21
Intentional radiator Field Strength of Radiation (Quasi-Peak reading) with DC Power Supply .....	23
Intentional radiator Field Strength of Spurious (Quasi-Peak reading) at 88.0 MHz with DC Power Supply .....	24
Intentional radiator Field Strength of Spurious (Quasi-Peak reading) at 88.4 MHz with DC Power Supply .....	25
Intentional radiator Field Strength of Spurious (Quasi-Peak reading) at 89.2 MHz with DC Power Supply .....	26



## 1.0 General Product Description

The product is FM TRANSMITTER.

### 1.0.1 Tested Equipment

Unless otherwise indicated, all tests were conducted on Model SFM-1.

Tests performed on \_\_\_\_\_ were considered to be representative of Model(s) \_\_\_\_\_.

### 1.0.2 Equipment Size, Mobility and Identification

Dimensions: Approx. 76 by 16  mm  in  
Mobility:  Hand-Held  Table-top  Floor-standing  
 Used in a vehicle  
Serial No.: Not applicable

### 1.0.3 Electrical Ratings

Input: 6 V dc – 24 V dc  
Output: Not applicable

### 1.0.4 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

Voltage: 12 V dc (with DC Power Supply) and  
Frequency: Not applicable

### 1.0.5 Clock & Other Frequencies Utilized

7.6MHz

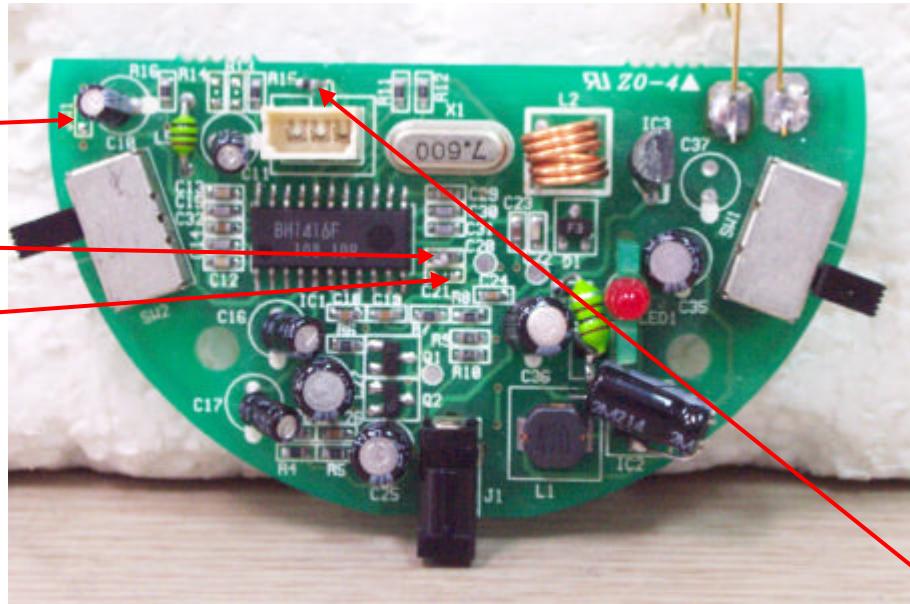
## 1.1 Model Differences

Not applicable

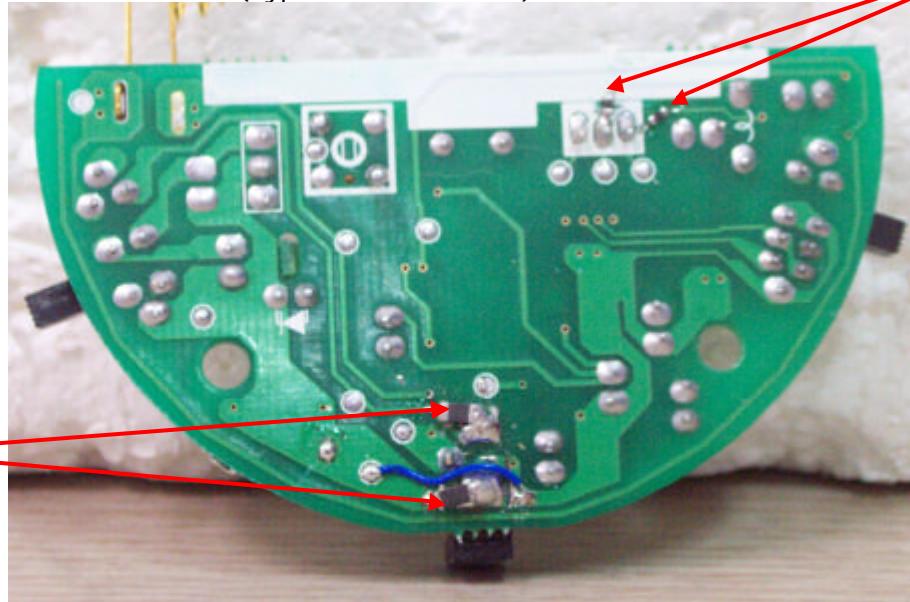
## 1.2 Device Modifications

The following modifications were necessary for compliance:

- 1) Capacitor (C21) was removed.
- 2) Resistor (68 ) was added to reduce the radiated emission.
- 3) JW1 was removed.



- 4) Beads were added. (Type: FCM1608K-601 T02)
- 5) Beads were added. (Type: FCI3216-R27K)





### 1.3 EUT Configuration(s)

See Appendix A for individual test set-up configuration(s). The following peripheral devices and/or interface cables were connected during the measurement:

## ☒ Peripheral Devices

Device	Manufacturer	Model No.	Serial No.	FCC ID or DoC
DC Power Supply	HP	E3620	KR40300004	-
Cassette	Ace-Ohayo Co., Ltd.	LL-2330	-	-

## ☒ Cable Description

#	Description	Ferrited	Length (m)	Other Details
1	DC Power Supply Power Cord, Unshielded	No	1.8	Connect to AC Power
2	DC Power Supply Output Cable, Unshielded	No	0.9	Connect to EUT Power Cable
3	EUT Power Cable, Unshielded	No	0.45	Connect to DC Power Supply Output
4	Cable, Unshielded	No	0.3	Between EUT and Cassette

N/a = Not available

## 1.4 Test Software

- Pinging
- Windows Media Player

## 1.5 EUT Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

<input type="checkbox"/> Test program (H-Pattern)	<input type="checkbox"/> Test program (color bar)
<input type="checkbox"/> Standby	<input checked="" type="checkbox"/> Practice operation



## 1.6 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

## 1.7 Test Facility

The measurement facility is located at 386-1, Ho-Dong, Yongin-City, Kyungki-Do, Korea 449-100. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

## 1.8 Measurement Procedure

Preliminary AC power line conducted emissions tests were performed shielded room. To find worst mode, several typical mode and typical cable position were tested.

Final AC power line conducted emissions test was performed shielded room. (location is same as Preliminary test)

Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

Preliminary radiated emissions test were performed anechoic chamber (Distance of antenna and EUT was 3 m). To find worst mode, several typical mode and typical cable position were tested and peak level and frequency were recorded.

Final radiated emissions test was performed Open Area Test Site. Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

\* Measurement procedures was In accordance with ANSI C63.4-1992 7.2.3, 7.2.4, 8.3.1.1, 8.3.1.2



## 1.9 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 and 10 meter Open Area Test Sites to perform FCC Part 15/18 measurements.	 93250
JAPAN	VCCI	10 meter Open Area Test Site and one conducted site.	 R-948, C-986
KOREA	MIC	EMI (CE, RE) EMS (ESD, Burst, RS, Surge, CS, Power-Frequency Susceptibility, Voltage Dips and Short Interruptions)	 No. 51, KR0025
International	KOLAS	EMC	



## 2.0 Emissions Test Regulations

The emissions tests were performed according to following regulations:

<input type="checkbox"/> EN 50081-1 /1992		
<input type="checkbox"/> EN 55011 /1998	<input type="checkbox"/> Group 1 <input type="checkbox"/> Class A	<input type="checkbox"/> Group 2 <input type="checkbox"/> Class B
<input type="checkbox"/> EN 55013 /A12:1994		
<input type="checkbox"/> EN 55014 /1987	<input type="checkbox"/> Household appliances and similar <input type="checkbox"/> Portable tools <input type="checkbox"/> Semiconductor devices	
<input type="checkbox"/> EN 55014 /A2:1990		
<input type="checkbox"/> EN 55014 /1993	<input type="checkbox"/> Household appliances and similar <input type="checkbox"/> Portable tools <input type="checkbox"/> Semiconductor devices	
<input type="checkbox"/> EN 55015 /1987 <input type="checkbox"/> EN 55015 /A1:1990 <input type="checkbox"/> EN 55015 /1993		
<input type="checkbox"/> EN 55022 /A1:1995	<input type="checkbox"/> Class A	<input type="checkbox"/> Class B
<input type="checkbox"/> EN 55022 /1998	<input type="checkbox"/> Class A	<input type="checkbox"/> Class B
<input type="checkbox"/> EN 61000-3-2 /1995 (EN 60555 Part 2 /4.87) <input type="checkbox"/> EN 61000-3-3 /1995 (EN 60555 Part 3 /4.87)		
<input type="checkbox"/> BS		
<input type="checkbox"/> VCCI V-3/99.05 : 1999	<input type="checkbox"/> Class A	<input type="checkbox"/> Class B
<input checked="" type="checkbox"/> FCC Part 15 SUBPART B	<input type="checkbox"/> Class A	<input checked="" type="checkbox"/> Class B
<input checked="" type="checkbox"/> FCC Part 15 SUBPART C	<input type="checkbox"/> Class A	<input checked="" type="checkbox"/> Class B
<input type="checkbox"/> AS 3548 (1992)	<input type="checkbox"/> Class A	<input type="checkbox"/> Class B
<input type="checkbox"/> CISPR 11 (1990)	<input type="checkbox"/> Group 1 <input type="checkbox"/> Class A	<input type="checkbox"/> Group 2 <input type="checkbox"/> Class B
<input type="checkbox"/> CISPR 22 (1993)	<input type="checkbox"/> Class A	<input type="checkbox"/> Class B



## 2.1 Conducted Voltage Emissions

**Test Date**

Not Applicable

**Test Location**

EMI-CE: Shielded Room

**Test Instruments**

<input type="checkbox"/> Field Strength Meter	Rohde Schwarz	ESHS30	828144/002
-----------------------------------------------	---------------	--------	------------

**Test Accessories**

<input type="checkbox"/> LISN	EMCO	3825/2	9409-2246
<input type="checkbox"/> LISN	EMCO	3825/2	9607-2574
<input type="checkbox"/> LISN	EMCO	3825/2	9206-1971
<input type="checkbox"/> Control PC	HP	Vectra 500	SG72000192

**Frequency Range of Measurement**

<input type="checkbox"/> 150 kHz to 30 MHz	
<input type="checkbox"/> 450 kHz to 30 MHz	
<input type="checkbox"/> _____	

**Instrument Settings**

IF Band Width: 9 kHz

**Test Results**

The requirements are:

<input type="checkbox"/> MET	minimum margin is _____ dB $\mu$ V at _____ MHz
<input type="checkbox"/> NOT MET	limit exceeded by maximum of _____ dB $\mu$ V at _____ MHz
<input type="checkbox"/> NOT APPLICABLE	

**Remarks**

See Appendix A for test data.



## 2.2 Radiated Electric Field Emissions

**Test Date**

March 27, 2002

**Test Location**

EMI-OATS: Testing was performed at a test distance of 10 m  
 EMI-OATS: Testing was performed at a test distance of 3 m

**Test Instruments**

Field Strength Meter Rohde Schwarz ESVS30 826638/008

**Test Accessories**

<input checked="" type="checkbox"/> ULTRA Broadband Antenna	R & S	HL562	361324/014
<input type="checkbox"/> Biconical Antenna	Schwarzbeck	BBA9106	41-00201
<input type="checkbox"/> Biconical Antenna	EMCO	3110B	9607-2564
<input type="checkbox"/> Log-periodic Antenna	EMCO	3146	9607-4567

**Frequency Range of Measurement**

30 MHz to 1 GHz

**Instrument Settings**

IF Band Width: 120 KHz

**Test Results**

The requirements are:

MET

With DC Power Supply:

At 88.0 MHz: Minimum margin is 11.5 dB $\mu$ V/m at 92.80 MHz.At 88.4 MHz: Minimum margin is 13.7 dB $\mu$ V/m at 83.30 MHz.At 89.2 MHz: Minimum margin is 10.7 dB $\mu$ V/m at 91.40 MHz.

NOT MET limit exceeded by maximum of \_\_\_\_\_ dB $\mu$ V/m at \_\_\_\_\_ MHz  
 NOT APPLICABLE

**Remarks**See Appendix A for test data



## 2.3 Intentional radiator 200kHz Bandwidth

**Test Date**

March 27, 2002

**Test Location**

Shielded Room

**Test Instruments**

<input checked="" type="checkbox"/> Spectrum Analyzer	HP	8590A	2839A03633
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**Test Accessories**

<input type="checkbox"/> ULTRA Broadband Antenna	R & S	HL562	361324/014
<input type="checkbox"/> Biconical Antenna	Schwarzbeck	BBA9106	41-00201
<input type="checkbox"/> Biconical Antenna	EMCO	3110B	9607-2564
<input type="checkbox"/> Log-periodic Antenna	EMCO	3146	9607-4567

**Frequency Range of Measurement**

88.0 MHz, 88.4 MHz and 89.2 MHz.

**Instrument Settings**

RES BW : 10 kHz  
VBW : 10 kHz

**Test Results**

The requirements are:

- MET
- NOT MET
- NOT APPLICABLE

**Remarks**See Appendix A for test data



## 2.4 Intentional radiator Field Strength of Radiation

**Test Date**

March 27, 2002

**Test Location**

EMI-OATS: Testing was performed at a test distance of 10 m  
 EMI-OATS: Testing was performed at a test distance of 3 m

**Test Instruments**

Field Strength Meter Rohde Schwarz ESVS30 826638/008

**Test Accessories**

<input checked="" type="checkbox"/> ULTRA Broadband Antenna	R & S	HL562	361324/014
<input type="checkbox"/> Biconical Antenna	Schwarzbeck	BBA9106	41-00201
<input type="checkbox"/> Biconical Antenna	EMCO	3110B	9607-2564
<input type="checkbox"/> Log-periodic Antenna	EMCO	3146	9607-4567

**Frequency Range of Measurement**

88.0 MHz, 88.4 MHz and 89.2 MHz.

**Instrument Settings**

IF Band Width: 120 kHz

**Test Results**

The requirements are:

MET

With DC Power Supply:

At 88.0 MHz: Minimum margin is 1.4 dB $\mu$ V/m at 88.00 MHz.At 88.4 MHz: Minimum margin is 1.4 dB $\mu$ V/m at 88.40 MHz.At 89.2 MHz: Minimum margin is 1.4 dB $\mu$ V/m at 89.20 MHz.

NOT MET limit exceeded by maximum of \_\_\_\_\_ dB $\mu$ V/m at \_\_\_\_\_ MHz  
 NOT APPLICABLE

**Remarks**See Appendix A for test data



## 2.5 Intentional radiator Field Strength of Spurious

**Test Date**

March 27, 2002

**Test Location**

EMI-OATS: Testing was performed at a test distance of 10 m  
 EMI-OATS: Testing was performed at a test distance of 3 m

**Test Instruments**

Field Strength Meter Rohde Schwarz ESVS30 826638/008

**Test Accessories**

<input checked="" type="checkbox"/> ULTRA Broadband Antenna	R & S	HL562	361324/014
<input type="checkbox"/> Biconical Antenna	Schwarzbeck	BBA9106	41-00201
<input type="checkbox"/> Biconical Antenna	EMCO	3110B	9607-2564
<input type="checkbox"/> Log-periodic Antenna	EMCO	3146	9607-4567

**Frequency Range of Measurement**

30 MHz to 1 GHz

**Instrument Settings**

IF Band Width: 120 KHz

**Test Results**

The requirements are:

MET

With DC Power Supply:

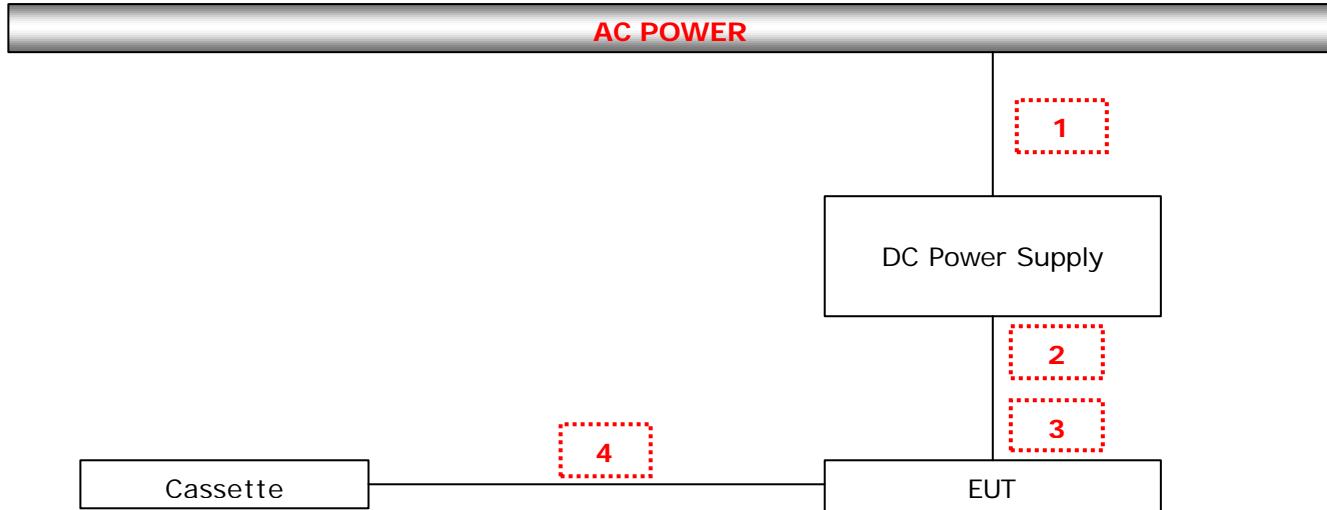
At 88.0 MHz: Minimum margin is 13.3 dB $\mu$ V/m at 175.80 MHz.  
At 88.4 MHz: Minimum margin is 14.0 dB $\mu$ V/m at 177.20 MHz.  
At 89.2 MHz: Minimum margin is 14.0 dB $\mu$ V/m at 178.50 MHz.

NOT MET limit exceeded by maximum of \_\_\_\_\_ dB $\mu$ V/m at \_\_\_\_\_ MHz  
 NOT APPLICABLE

**Remarks**See Appendix A for test data



## Configuration





## APPENDIX A – TEST DATA

## Conducted Voltage Emissions (Quasi-Peak reading)

*Not Applicable*



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*Not Applicable*

*Not Applicable*

**Radiated Electric Field Emissions (Quasi-Peak reading) at 88.0 MHz with DC Power Supply**

Frequency [MHz]	Reading [dBuV]	Pol.	Height [m]	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Cable			
56.30	17.8	V	1.0	3.6	0.6	40.0	22.0	18.0
84.00	13.7	V	1.0	8.7	0.9	40.0	23.3	16.7
92.80	22.1	V	1.0	9.0	0.9	43.5	32.0	11.5
101.60	15.5	V	1.0	9.4	1.0	43.5	25.9	17.6
119.80	13.7	V	1.0	9.7	1.1	43.5	24.5	19.0
123.20	18.7	V	1.0	9.6	1.1	43.5	29.3	14.2
124.50	18.9	V	1.0	9.4	1.1	43.5	29.4	14.1

**Radiated Electric Field Emissions (Quasi-Peak reading) at 88.4 MHz with DC Power Supply**

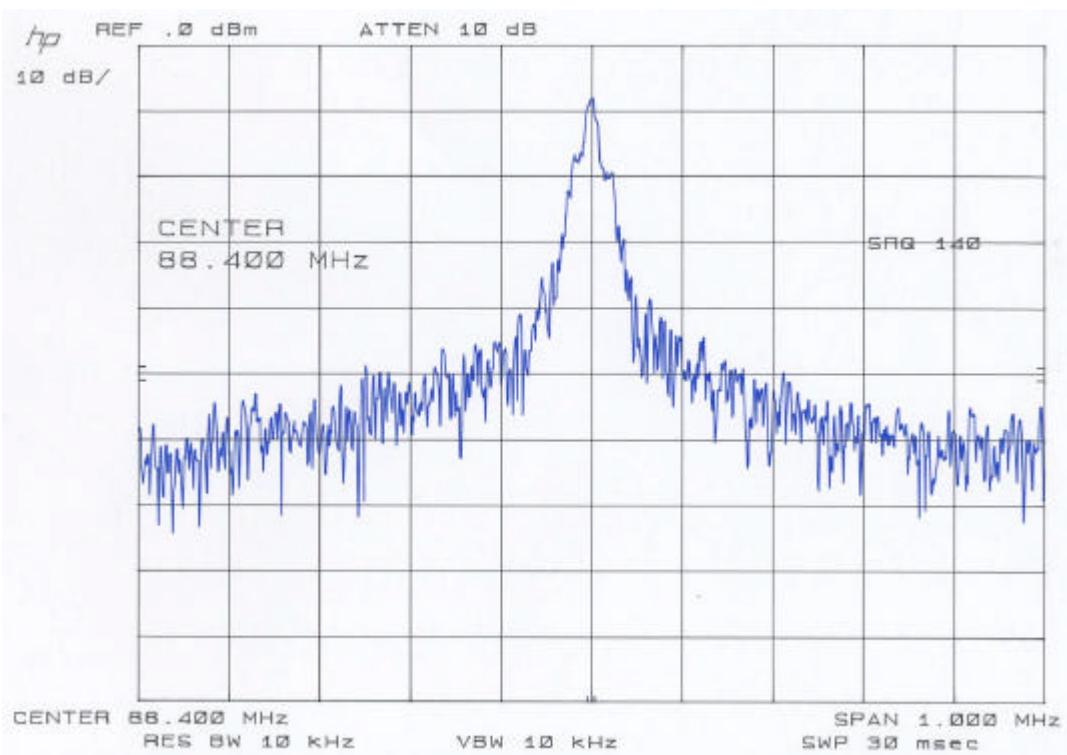
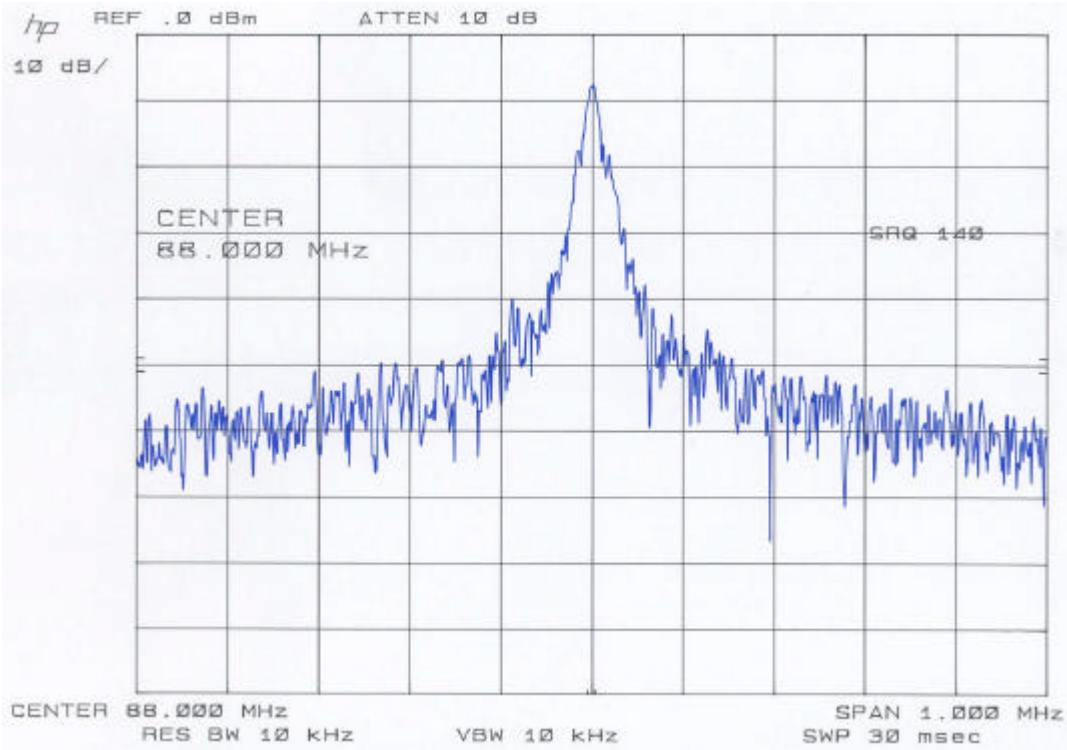
Frequency [MHz]	Reading [dBuV]	Pol.	Height [m]	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Cable			
53.00	18.5	V	1.0	6.2	0.6	40.0	25.3	14.7
56.30	18.6	V	1.0	3.6	0.6	40.0	22.8	17.2
83.30	16.8	H	4.0	8.6	0.9	40.0	26.3	13.7
92.80	13.5	V	1.0	9.0	0.9	43.5	23.4	20.1
122.50	18.4	V	1.0	9.6	1.1	43.5	29.0	14.5
144.80	14.8	V	1.0	7.8	1.4	43.5	24.0	19.5
229.80	16.0	H	4.0	8.4	2.0	46.0	26.4	19.7

**Radiated Electric Field Emissions (Quasi-Peak reading) at 89.2 MHz with DC Power Supply**

Frequency [MHz]	Reading [dBuV]	Pol.	Height [m]	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Cable			
84.70	14.7	V	1.0	8.7	0.9	40.0	24.3	15.8
87.40	17.5	V	1.0	8.8	1.0	40.0	27.3	12.7
91.40	22.9	V	1.0	9.0	0.9	43.5	32.8	10.7
95.50	15.0	V	1.0	8.9	0.9	43.5	24.8	18.7
117.80	14.1	V	1.0	9.6	1.1	43.5	24.8	18.7
121.10	19.0	V	1.0	9.7	1.1	43.5	29.8	13.7
125.20	15.0	V	1.0	9.4	1.1	43.5	25.5	18.0
169.10	17.3	V	1.0	7.1	1.6	43.5	26.0	17.6



## Intentional radiator 200kHz Bandwidth



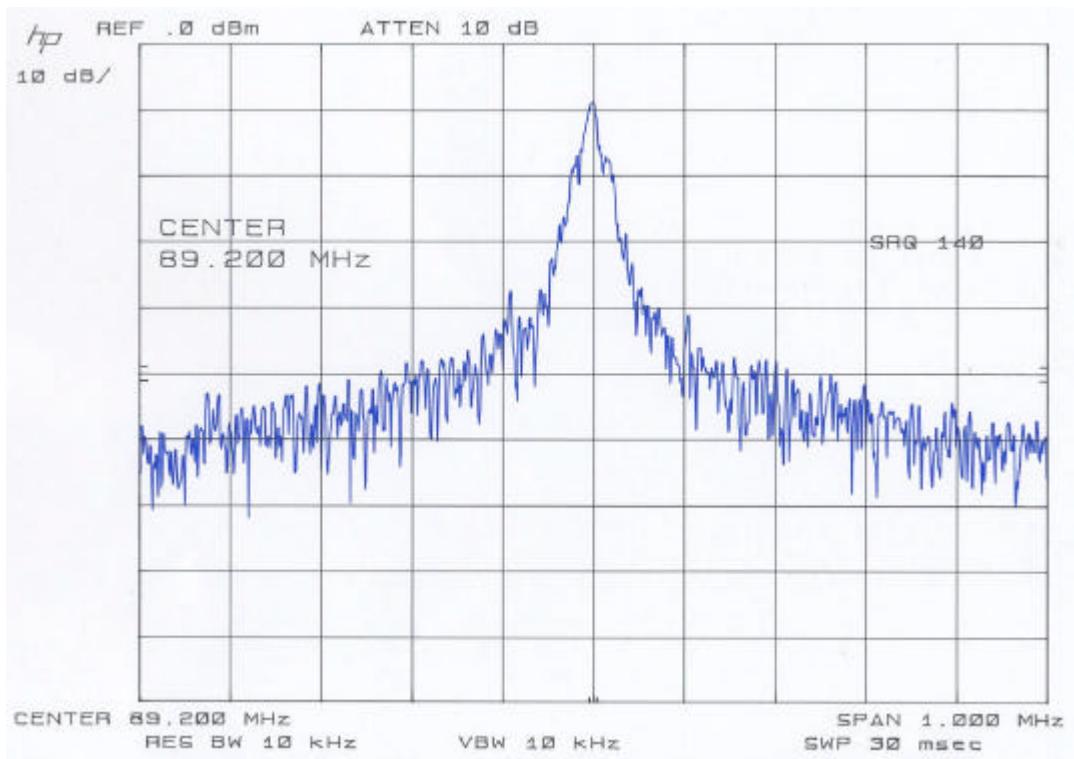


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**Intentional radiator Field Strength of Radiation (Quasi-Peak reading)  
with DC Power Supply**

Frequency [MHz]	Reading [dBuV]	Pol.	Height [m]	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Cable			
88.00	36.8	V	1.0	8.8	1.0	48.0	46.6	1.4
88.40	36.8	V	1.0	8.8	1.0	48.0	46.6	1.4
89.20	36.7	V	1.0	8.9	1.0	48.0	46.6	1.4

**Intentional radiator Field Strength of Spurious (Quasi-Peak reading)  
at 88.0 MHz with DC Power Supply**

Frequency [MHz]	Reading [dBuV]	Pol.	Height [m]	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Cable			
175.80	21.6	H	4.0	7.0	1.6	43.5	30.2	13.3
265.60	14.0	H	4.0	9.9	2.2	46.0	26.1	19.9

**Intentional radiator Field Strength of Spurious (Quasi-Peak reading)  
at 88.4 MHz with DC Power Supply**

Frequency [MHz]	Reading [dBuV]	Pol.	Height [m]	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Cable			
177.20	21.0	H	4.0	7.0	1.6	43.5	29.5	14.0
265.60	14.0	H	4.0	9.9	2.2	46.0	26.1	20.0

**Intentional radiator Field Strength of Spurious (Quasi-Peak reading)  
at 89.2 MHz with DC Power Supply**

Frequency [MHz]	Reading [dBuV]	Pol.	Height [m]	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Cable			
178.50	20.9	H	4.0	7.0	1.6	43.5	29.5	14.0
267.60	12.4	H	4.0	10.0	2.3	46.0	24.7	21.4