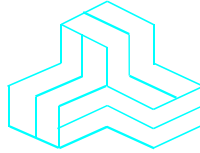


# ENGINEERING TEST REPORT



**800 RF MODULE**  
**Model No.: T1088**  
**FCC ID: IMA-T1088A**

**Applicant:** **Technisonic Industries Ltd.**  
240 Traders Blvd E,  
Mississauga, Ontario  
Canada, L4Z 1W7

**Tested in Accordance With**

**Federal Communications Commission (FCC)**  
**CFR 47, PARTS 2 and 90 (Subpart I)**

**UltraTech's File No.: TIL-046FCC90**

This Test report is Issued under the Authority of  
Tri M. Luu, Professional Engineer,  
Vice President of Engineering  
UltraTech Group of Labs

Date: May 25, 2004



Report Prepared by: Dharmajit Solanki,  
RFI Engineer

Tested by: Hung Trinh, EMI/RFI Technician

Issued Date: May 25, 2004

Test Dates: December 10 – 23, 2003,  
March 04, 2004

*The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.*

## UltraTech

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SL2-IN-E-1119R



00-034



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## EXHIBIT 1. SUBMITTAL CHECK LIST

| Annex No. | Exhibit Type            | Description of Contents                                                                                                                                                                                                                                                                                                                                                                     | Quality Check (OK) |
|-----------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| --        | Test Report             | <ul style="list-style-type: none"><li>Exhibit 1: Submittal check lists</li><li>Exhibit 2: Introduction</li><li>Exhibit 3: Performance Assessment</li><li>Exhibit 4: EUT Operation and Configuration during Tests</li><li>Exhibit 5: Summary of test Results</li><li>Exhibit 6: Measurement Data</li><li>Exhibit 7: Measurement Uncertainty</li><li>Exhibit 8: Measurement Methods</li></ul> | OK                 |
| 1         | Test Setup Photos       | Photos # 1 to 6                                                                                                                                                                                                                                                                                                                                                                             | OK                 |
| 2         | External Photos of EUT  | Photos # 1 to 2                                                                                                                                                                                                                                                                                                                                                                             | OK                 |
| 3         | Internal Photos of EUT  | Photos # 1 to 6                                                                                                                                                                                                                                                                                                                                                                             | OK                 |
| 4         | Cover Letters           | <ul style="list-style-type: none"><li>Letter from Ultratech for Certification Request</li><li>Letter from the Applicant to appoint Ultratech to act as an agent</li><li>Letter from the Applicant to request for Confidentiality Filing</li></ul>                                                                                                                                           | OK<br>OK<br>OK     |
| 5         | ID Label/Location Info  | ID Label & Location of ID Label <ul style="list-style-type: none"><li>RF Module (internal)</li><li>TDFM Transceiver (external)</li></ul>                                                                                                                                                                                                                                                    | OK<br>OK           |
| 6         | Block Diagrams          | Transceiver Block Diagram                                                                                                                                                                                                                                                                                                                                                                   | OK                 |
| 7         | Schematic Diagrams      | Schematic Diagrams                                                                                                                                                                                                                                                                                                                                                                          | OK                 |
| 8         | Parts List/Tune Up Info | <ul style="list-style-type: none"><li>Parts List</li><li>Tune Up Procedure</li></ul>                                                                                                                                                                                                                                                                                                        | OK                 |
| 9         | Operational Description | Operation Description                                                                                                                                                                                                                                                                                                                                                                       | OK                 |
| 10        | RF Exposure Info        | RF Exposure Warning                                                                                                                                                                                                                                                                                                                                                                         | OK                 |
| 11        | Users Manual            | Installation and Operational Manual <ul style="list-style-type: none"><li>Motorola XTS 5000 Manual</li><li>TDFM 600/6000 Manual</li></ul>                                                                                                                                                                                                                                                   | OK                 |

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## EXHIBIT 2. INTRODUCTION

### 2.1. SCOPE

|                          |                                                                                                                                                                                                                                                                                                              |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Reference:</b>        | FCC Parts 2 and 90                                                                                                                                                                                                                                                                                           |
| <b>Title:</b>            | Telecommunication - Code of Federal Regulations, CFR 47, Parts 2 & 90 Subpart I.                                                                                                                                                                                                                             |
| <b>Purpose of Test:</b>  | To gain FCC Certification Authorization for Radio operating in the frequency bands 764-869 MHz (12.5 kHz and 25 kHz Channel Spacing).                                                                                                                                                                        |
| <b>Test Procedures:</b>  | Both conducted and radiated emissions measurements were conducted in accordance with American National Standards Institute ANSI C63.4 - American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz. |
| <b>Modular Approval:</b> | This application is for Modular Approval for Airborne mobile and base station application with the antenna gain limit of 3dBi and the minimum antenna separation distance of 70 cm.                                                                                                                          |

### 2.2. RELATED SUBMITAL(S)/GRANT(S)

None

### 2.3. NORMATIVE REFERENCES

| Publication                      | Year         | Title                                                                                                                                                               |
|----------------------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FCC CFR 47<br>Parts 0-19, 80-End | 2003         | Code of Federal Regulations – Telecommunication                                                                                                                     |
| ANSI C63.4                       | 2003         | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz |
| CISPR 22 &<br>EN 55022           | 2003<br>2003 | Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment                                                         |
| CISPR 16-1                       | 2003         | Specification for Radio Disturbance and Immunity measuring apparatus and methods                                                                                    |

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## EXHIBIT 3. PERFORMANCE ASSESSMENT

### 3.1. CLIENT INFORMATION

| APPLICANT              |                                                                                                                                           |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Name:</b>           | TECHNISONIC INDUSTRIES LTD.                                                                                                               |
| <b>Address:</b>        | 240 Traders Blvd E<br>Mississauga, Ontario<br>Canada, L4Z 1W7                                                                             |
| <b>Contact Person:</b> | Richard Dalacker<br>Phone #: 905-890-2113<br>Fax #: 905-890-5338<br>Email Address: <a href="mailto:rdalacker@til.ca">rdalacker@til.ca</a> |

| MANUFACTURER           |                                                                                                                                |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Name:</b>           | MOTOROLA INC.                                                                                                                  |
| <b>Address:</b>        | 8000 West Sunrise Boulevard<br>Fort Lauderdale, Florida<br>USA 33322                                                           |
| <b>Contact Person:</b> | Mr. John McCoy<br>Phone #: 954-723-5722<br>Email Address: <a href="mailto:john.mccoy@motorola.com">john.mccoy@motorola.com</a> |

### 3.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

|                                             |                                                                                                                                         |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Brand Name:</b>                          | TECHNISONIC                                                                                                                             |
| <b>Product Name:</b>                        | 800 RF MODULE                                                                                                                           |
| <b>Model Name or Number:</b>                | T1088                                                                                                                                   |
| <b>Serial Number:</b>                       | 721CDN0696                                                                                                                              |
| <b>Type of Equipment:</b>                   | Non-broadcast Radio Transmitter Module used in Mobile Station                                                                           |
| <b>Oscillator's Frequency</b>               | 16.8 MHz                                                                                                                                |
| <b>CPU's Frequencies</b>                    | 18 MHz, 520 kHz                                                                                                                         |
| <b>Transmitting/Receiving Antenna Type:</b> | Non-integral, Antenna gain limit = 3 dBi maximum                                                                                        |
| <b>Primary User Functions of EUT:</b>       | The 800 RF MODULE is a modular Transceiver manufactured by Motorola, it will be used in Technisonic Multiband P25 Airborne Transceiver. |

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### 3.3. EUT'S TECHNICAL SPECIFICATIONS

| TRANSMITTER                     |                                                                                                                                                       |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Equipment Type:                 | <input type="checkbox"/> Portable<br><input checked="" type="checkbox"/> Mobile<br><input type="checkbox"/> Base station (fixed use)                  |
| Intended Operating Environment: | <input type="checkbox"/> Commercial<br><input type="checkbox"/> Light Industry & Heavy Industry<br><input checked="" type="checkbox"/> Airborne       |
| Power Supply Requirement:       | 7.5 Vdc                                                                                                                                               |
| RF Output Power Rating:         | 2.8 Watts (conducted)                                                                                                                                 |
| Operating Frequency Range:      | 764-869 MHz                                                                                                                                           |
| Duty cycle:                     | 50 %                                                                                                                                                  |
| RF Output Impedance:            | 50 Ohms                                                                                                                                               |
| Channel Spacing:                | 12.5 kHz & 25 kHz                                                                                                                                     |
| Occupied Bandwidth (99%):       | 10.4 kHz (FM voice in 12.5 kHz Channel Spacing)<br>15.6 kHz (FM voice in 25 kHz Channel Spacing)<br>10.5 kHz (FM digital in 12.5 kHz Channel Spacing) |
| Maximum Data Rate:              | 9600 bps                                                                                                                                              |
| Emission Designations*:         | 16K0F3E, 11K0F3E, 11K2F1D                                                                                                                             |
| Antenna Connector Type:         | Reversed thrust SMA female connector                                                                                                                  |

\* For an average case of commercial telephony, the Necessary Bandwidth is calculated as follows:

Bandwidth Calculations :

Carson's Rule for FM modulation is utilized to compute the bandwidth shown in the FCC emission designator. Carson's Rule is:  $BW = 2 \times (M + DK)$ , where M = Maximum modulating frequency, D = Deviation

1. For FM Voice Modulation:

Channel Spacing = 12.5 KHz, D = 2.5 KHz max., K = 1, M = 3 KHz

$B_n = 2M + 2DK = 2(3) + 2(2.5)(1) = \underline{11 \text{ KHz}}$

emission designation: 11K0F3E

Channel Spacing = 25 KHz, D = 5 KHz max., K = 1, M = 3 KHz

$B_n = 2M + 2DK = 2(3) + 2(5)(1) = \underline{16 \text{ KHz}}$

emission designation: 16K0F3E

2. For FM Digital Modulation: Channel Spacing = 12.5 KHz, Digital Data, D = 3.2 kHz

M = 9.6/2 kb/s, (FM modulation Level 4)

$B_n = 2M + 2DK = 2(9.6/4) + 2(3.2)(1) = \underline{11.2 \text{ KHz}}$

emission designation: 11K2F1D

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### 3.4. LIST OF EUT'S PORTS

| Port Number | EUT's Port Description | Number of Identical Ports | Connector Type                   | Cable Type (Shielded/Non-shielded) |
|-------------|------------------------|---------------------------|----------------------------------|------------------------------------|
| 1           | RF IN/OUT Port         | 1                         | Reversed SMA                     | Shielded                           |
| 2           | I/O Port               | 1                         | Controls Flex Assembly Connector | Non-shielded                       |

#### **NOTES:**

- (1) *Ports of the EUT which in normal operation were connected to ancillary equipment through interconnecting cables via a representative interconnecting cable to simulate the input/output characteristics. RF input/output was correctly terminated to the 50 Ohm RF Load.*

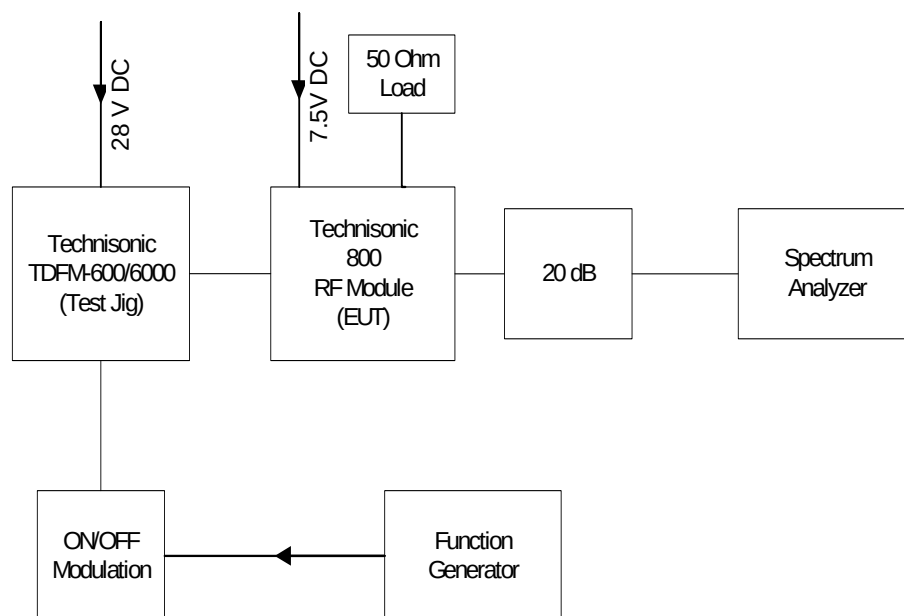
### 3.5. ANCILLARY EQUIPMENT

The EUT was tested while connected to the following representative configuration of ancillary equipment necessary to exercise the ports during tests:

| Ancillary Equipment # 1  |                                               |
|--------------------------|-----------------------------------------------|
| Description:             | Multiband P25 Airborne Transceiver (Test Jig) |
| Brand name:              | Technisonic                                   |
| Model Name or Number:    | TDFM-600/60000                                |
| Serial Number:           | Pre-production                                |
| Cable Length & Type:     | Non-shielded ribbon cable                     |
| Connected to EUT's Port: | Controls Flex Assembly Connector              |



### 3.6. BLOCK DIAGRAM OF TEST SETUP



## EXHIBIT 4. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

### 4.1. CLIMATE TEST CONDITIONS

The climate conditions of the test environment are as follows:

|                     |                 |
|---------------------|-----------------|
| Temperature:        | 21°C            |
| Humidity:           | 51%             |
| Pressure:           | 102 kPa         |
| Power input source: | 7.5 Vdc, 24 Vdc |

### 4.2. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TEST SIGNALS

|                                  |                                                                                                                                                |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Operating Modes:</b>          | The transmitter was operated in a continuous transmission mode with the carrier modulated as specified in the Test Data.                       |
| <b>Special Test Software:</b>    | N/A                                                                                                                                            |
| <b>Special Hardware Used:</b>    | The Technisonic Multiband P25 Airborne Transceiver, Model TDFM-600/6000 was used for setting & operating the EUT at different operating modes. |
| <b>Transmitter Test Antenna:</b> | The EUT is tested with the transmitter antenna port terminated to a 50 Ohms RF Load.                                                           |

| Transmitter Test Signals                           |                                                                                                          |
|----------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| <b>Frequency Band(s):</b>                          | Near lowest, near middle & near highest frequencies in each frequency bands that the transmitter covers: |
| ▪ 764-869 MHz band:                                | ▪ 764.0125, 821.0000 and 868.9875 MHz                                                                    |
| <b>Transmitter Wanted Output Test Signals:</b>     |                                                                                                          |
| ▪ RF Power Output (measured maximum output power): | ▪ 2.8 Watts (conducted)                                                                                  |
| ▪ Normal Test Modulation                           | ▪ External FM Sine Wave, Internal Digital                                                                |
| ▪ Modulating signal source:                        | ▪ External analog source and internal data source                                                        |

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## EXHIBIT 5. SUMMARY OF TEST RESULTS

### 5.1. LOCATION OF TESTS

All of the measurements described in this report were performed at Ultratech Group of Labs located in the city of Oakville, Province of Ontario, Canada.

- Radiated Emissions were performed at the Ultratech's 3 Meter Open Field Test Site (OFTS) situated in the Town of Oakville, province of Ontario.

The above sites have been calibrated in accordance with ANSI C63.4, and found to be in compliance with the requirements of Sec. 2.948 of the FCC Rules. The descriptions and site measurement data of the Oakville Open Field Test Site has been filed with FCC office (FCC File No.: 31040/SIT 1300B3) and Industry Canada office (Industry Canada File No.: IC2049). Last Date of Site Calibration: Nov. 4, 2003.

### 5.2. APPLICABILITY & SUMMARY OF EMISSION TEST RESULTS

| FCC PARAGRAPH.                                                                                                                                                                                                                                                                                    | TEST REQUIREMENTS                                        | APPLICABILITY (YES/NO)                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------------------------------------|
| 90.205 & 2.1046                                                                                                                                                                                                                                                                                   | RF Power Output                                          | Yes                                                                                      |
| 1.1307, 1.1310, 2.1091 & 2.1093                                                                                                                                                                                                                                                                   | RF Exposure Limit                                        | Yes                                                                                      |
| 90.213 & 2.1055                                                                                                                                                                                                                                                                                   | Frequency Stability                                      | Yes                                                                                      |
| 90.242(b)(8) & 2.1047(a)                                                                                                                                                                                                                                                                          | Audio Frequency Response                                 | Not applicable to new standard. However, tests are conducted under FCC's recommendation. |
| 90.210 & 2.1047(b)                                                                                                                                                                                                                                                                                | Modulation Limiting                                      | Yes                                                                                      |
| 90.543 & 2.1049                                                                                                                                                                                                                                                                                   | Emission Limitation                                      | Yes                                                                                      |
| 90.210 & 2.1049                                                                                                                                                                                                                                                                                   | Emission Mask                                            | Yes                                                                                      |
| 90.210, 2.1057 & 2.1051                                                                                                                                                                                                                                                                           | Emission Limits - Spurious Emissions at Antenna Terminal | Yes                                                                                      |
| 90.210, 2.1057 & 2.1053                                                                                                                                                                                                                                                                           | Emission Limits - Field Strength of Spurious Emissions   | Yes                                                                                      |
| 90.214                                                                                                                                                                                                                                                                                            | Transient Frequency Behavior                             | No                                                                                       |
| 800 RF MODULE, Model No.: T1088, by TECHNISONIC INDUSTRIES LTD. has also been tested and found to comply with FCC Part 15, Subpart B - Radio Receivers and Class A Digital Device. The engineering test report has been documented and kept in file and it is available anytime upon FCC request. |                                                          |                                                                                          |

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### **5.3. MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES**

None

### **5.4. DEVIATION OF STANDARD TEST PROCEDURES**

None

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## **EXHIBIT 6. MEASUREMENTS, EXAMINATIONS & TEST DATA FOR EMC EMISSIONS**

### **6.1. TEST PROCEDURES**

This section contains test results only. Details of test methods and procedures can be found in Exhibit 8 of this report

### **6.2. MEASUREMENT UNCERTAINTIES**

The measurement uncertainties stated were calculated in accordance with requirements of UKAS Document NIS 81 with a confidence level of 95%. Please refer to Exhibit 7 for Measurement Uncertainties.

### **6.3. MEASUREMENT EQUIPMENT USED:**

The measurement equipment used complied with the requirements of the Standards referenced in the Methods & Procedures ANSI C63.4:2003 and CISPR 16-1.

### **6.4. ESSENTIAL/PRIMARY FUNCTIONS AS DECLARED BY THE MANUFACTURER:**

The essential function of the EUT is to correctly communicate data to and from radios over RF link.

## 6.5. RF POWER OUTPUT @ FCC 2.1046 , 90.205 & 90.635

### 6.5.1. Limits @ FCC 90.635

Please refer to FCC CFR 47, Part 90, Subpart S, Para. 90.635 for specification details.

Also as per FCC CFR 47, Part 90, Subpart R, Para. 90.541, the transmitter output power of mobile and control Tx must not exceed 30 Watts.

### 6.5.2. Method of Measurements

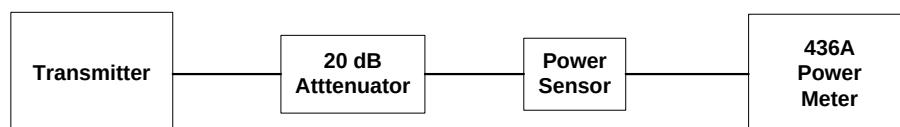
Refer to Exhibit 8, § 8.1 (Conducted) and 8.2 (Radiated) of this report for measurement details

### 6.5.3. Test Equipment List

| Test Instruments | Manufacturer    | Model No. | Serial No. | Frequency Range                   |
|------------------|-----------------|-----------|------------|-----------------------------------|
| Attenuator(s)    | Weinschel Corp  | 24-20-34  | BJ2357     | DC – 8.5 GHz                      |
| Power Meter      | Hewlett Packard | 436A      | 1725A02249 | 10 kHz – 50 GHz, sensor dependent |
| Power Sensor     | Hewlett Packard | 8481A     | 2702A68983 | 10 MHz – 18 GHz                   |

### 6.5.4. Test Arrangement

- Power at RF Power Output Terminals



### 6.5.5. Test Data

| Transmitter Output Channel | Fundamental Frequency (MHz) | Measured (Average) Low Power (Watts) | Power Rating (Watts) |
|----------------------------|-----------------------------|--------------------------------------|----------------------|
| Lowest                     | 764.0125                    | 0.97                                 | 1                    |
| Middle                     | 821.0000                    | 0.97                                 | 1                    |
| Highest                    | 868.9875                    | 1.08                                 | 1                    |

| Transmitter Output Channel | Fundamental Frequency (MHz) | Measured (Average) High Power (Watts) | Power Rating (Watts) |
|----------------------------|-----------------------------|---------------------------------------|----------------------|
| Lowest                     | 764.0125                    | 2.09                                  | 2.8                  |
| Middle                     | 821.0000                    | 2.76                                  | 2.8                  |
| Highest                    | 868.9875                    | 2.75                                  | 2.8                  |

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## 6.6. RF EXPOSURE REQUIRMENTS @ 1.1310 & 2.1091

### 6.6.1. Limits

- **FCC 1.1310:-** The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b).

| LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)                  |                               |                               |                                     |                        |
|----------------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|------------------------|
| Frequency Range (MHz)                                          | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm <sup>2</sup> ) | Average Time (minutes) |
| <b>(A) Limits for Occupational/Control Exposures</b>           |                               |                               |                                     |                        |
| 300-1500                                                       | ...                           | ...                           | F/300                               | 6                      |
| <b>(B) Limits for General Population/Uncontrolled Exposure</b> |                               |                               |                                     |                        |
| 300-1500                                                       | ...                           | ...                           | F/1500                              | 6                      |

F = Frequency in MHz

### 6.6.2. Method of Measurements

Refer to FCC @ 1.1310, 2.1091 and Public Notice DA 00-705 (March 30, 2000)

- In order to demonstrate compliance with MPE requirements (see Section 2.1091), the following information is typically needed:
  - (1) Calculation that estimates the minimum separation distance (20 cm or more) between an antenna and persons required to satisfy power density limits defined for free space.
  - (2) Antenna installation and device operating instructions for installers (professional/unskilled users), and the parties responsible for ensuring compliance with the RF exposure requirement
  - (3) Any caution statements and/or warning labels that are necessary in order to comply with the exposure limits
  - (4) Any other RF exposure related issues that may affect MPE compliance

**Calculation Method of RF Safety Distance:**

$$S = PG/4\pi r^2 = EIRP/4\pi r^2$$

Where: P: power input to the antenna in mW  
EIRP: Equivalent (effective) isotropic radiated power.  
S: power density mW/cm<sup>2</sup>  
G: numeric gain of antenna relative to isotropic radiator  
r: distance to centre of radiation in cm

FCC radio frequency exposure limits may be exceeded at distances closer than r cm from the antenna of this device

$$r = \sqrt{PG/4\pi S}$$

FCC radio frequency exposure limits may not be exceeded at distances closer than r cm from the antenna of this device

- For portable transmitters (see Section 2.1093), or devices designed to operate next to a person's body, compliance is determined with respect to the SAR limit (define in the body tissues) for near-field exposure conditions. If the maximum average output power, operating condition configurations and exposure conditions are comparable to those of existing cellular and PCS phones., an SAR evaluation may be required in order to determine if such a device complies with SAR limit. When SAR evaluation data is not available, and the additional supporting information cannot assure compliance, the Commission may request that an SAR evaluation be performed, as provided for in Section 1.1307(d)



### 6.6.3. Test Data

#### Antenna Gain Limit specified by Manufacturer: 3 dBi

| Measured Maximum RF Conducted Power (watts) | Calculated EIRP (watts) | Laboratory's Recommended Minimum RF Safety Distance r (cm) | Manufacturer's specified antenna separation distance (cm) |
|---------------------------------------------|-------------------------|------------------------------------------------------------|-----------------------------------------------------------|
| 2.76                                        | 5.50                    | 30.0                                                       | 70.0                                                      |

**Note 1:** RF EXPOSURE DISTANCE LIMITS:  $r = (PG/4\pi S)^{1/2} = (EIRP/4\pi S)^{1/2}$   
 $S = F/1500 = 764/1500 = 0.509 \text{ mW/cm}^2$

$$r = (PG/4\pi S)^{1/2} = (EIRP/4\pi S)^{1/2} = (5507/4\pi \times 0.509)^{1/2} \\ = 29.4 \text{ cm}$$

| Evaluation of RF Exposure Compliance Requirements                                                                                                                                          |                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| RF Exposure Requirements                                                                                                                                                                   | Compliance with FCC Rules                                                                     |
| Minimum calculated separation distance between antenna and persons required: 29.4 cm                                                                                                       | Manufacturer' instruction for separation distance between antenna and persons required: 70 cm |
| Antenna installation and device operating instructions for installers (professional/unskilled users), and the parties responsible for ensuring compliance with the RF exposure requirement | Please refer to page 1 of Users Manual                                                        |
| Caution statements and/or warning labels that are necessary in order to comply with the exposure limits                                                                                    | Please refer to page 3-1 of the Users/ Manual and FCC RF Exposure folder                      |
| Any other RF exposure related issues that may affect MPE compliance                                                                                                                        | N/A                                                                                           |

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## 6.7. FREQUENCY STABILITY @ FCC 2.1055 & 90.213

### 6.7.1. Limits @ FCC 90.213

Please refer to FCC CFR 47, Part 90, Subpart I, Para. 90.213 for specification details.

| FREQUENCY RANGE<br>(MHz) | MOBILE STATIONS<br>(ppm) |       |
|--------------------------|--------------------------|-------|
|                          | > 2 W                    | ≤ 2 W |
| 806-821                  | 2.5                      | 2.5   |
| 821-824                  | 1.5                      | 1.5   |
| 851-866                  | 2.5                      | 2.5   |
| 866-869                  | 1.5                      | 1.5   |

| FREQUENCY RANGE<br>(MHz) | MOBILE STATIONS<br>(ppm) |                       |
|--------------------------|--------------------------|-----------------------|
|                          | 12.5 kHz Ch.<br>Spacing  | 25 kHz Ch.<br>Spacing |
| 764-776                  | 1.5                      | 2.5                   |
| 794-806                  | 1.5                      | 2.5                   |

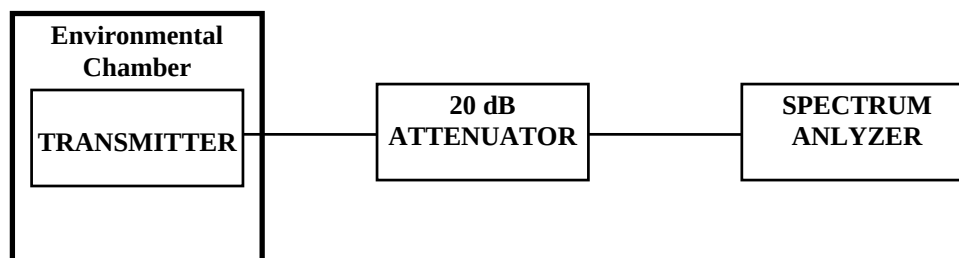
### 6.7.2. Method of Measurements

Refer to Exhibit 8, § 8.3 of this report for measurement details

### 6.7.3. Test Equipment List

| Test Instruments                  | Manufacturer    | Model No. | Serial No. | Frequency Range      |
|-----------------------------------|-----------------|-----------|------------|----------------------|
| EMI Receiver/<br>EMI Receiver     | Hewlett Packard | HP 8593EM | 3412A00103 | 9 kHz – 26.5 GHz     |
| Attenuator(s)                     | Bird            | ..        | ...        | DC – 22 GHz          |
| Temperature & Humidity<br>Chamber | Tenney          | T5        | 9723B      | -40° to +60° C range |

### 6.7.4. Test Arrangement



## 6.7.5. Test Data

|                                           |                      |
|-------------------------------------------|----------------------|
| <b>Product Name:</b>                      | 800 RF MODULE        |
| <b>Model No.:</b>                         | T1088                |
| <b>Center Frequency:</b>                  | 806.00 MHz           |
| <b>Full Power Level:</b>                  | 34.4 dBm             |
| <b>Frequency Tolerance Limit:</b>         | 1.5 ppm or 1146.0 Hz |
| <b>Max. Frequency Tolerance Measured:</b> | +870 Hz or +1.14 ppm |
| <b>Input Voltage Rating:</b>              | 7.5 Vdc, 1.8 Amps    |

| CENTER FREQUENCY & RF POWER OUTPUT VARIATION |                          |                                    |                                     |
|----------------------------------------------|--------------------------|------------------------------------|-------------------------------------|
| Ambient<br>Temperature<br>(°C)               | Supply Voltage (Nominal) | Supply Voltage<br>(85% of Nominal) | Supply Voltage<br>(115% of Nominal) |
|                                              | 7.5 Volts dc             | 6.4 Volts dc                       | 8.6 Volts dc                        |
|                                              | Hz                       | Hz                                 | Hz                                  |
| -30                                          | +870                     | N/A                                | N/A                                 |
| -20                                          | +669                     | N/A                                | N/A                                 |
| -10                                          | +409                     | N/A                                | N/A                                 |
| 0                                            | +69                      | N/A                                | N/A                                 |
| +10                                          | +14                      | N/A                                | N/A                                 |
| +20                                          | 0                        | - 14                               | - 20                                |
| +30                                          | -283                     | N/A                                | N/A                                 |
| +40                                          | -566                     | N/A                                | N/A                                 |
| +50                                          | -747                     | N/A                                | N/A                                 |

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## 6.8. AUDIO FREQUENCY RESPONSE @ FCC 2.1047(A) & 90.211

### 6.8.1. Limits @ FCC 2.1047(a)

Recommended audio filter attenuation characteristics are given below:

| RF Band         | Audio band                | Minimum Attenuation Rel. to 1 kHz Attenuation    |
|-----------------|---------------------------|--------------------------------------------------|
| 406.1 – 960 MHz | 3 – 20 kHz<br>20 – 30 kHz | $60 \log_{10}(f/3)$ dB where f is in kHz<br>50dB |

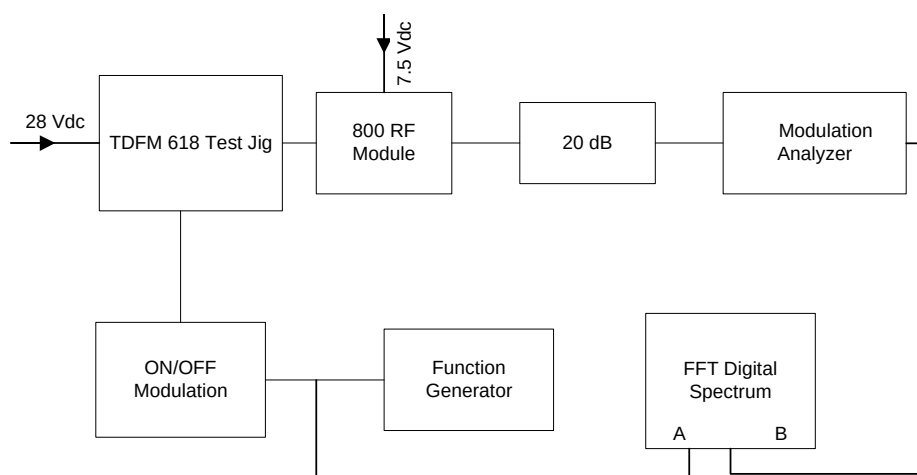
### 6.8.2. Method of Measurements

The rated audio input signal was applied to the input of the audio low-pass filter (or of all modulation stages) using an audio oscillator, this input signal level and its corresponding output signal were then measured and recorded using the FFT (Audio) EMI Receiver. Tests were repeated at different audio signal frequencies from 0 to 50 kHz.

### 6.8.3. Test Equipment List

| Test Instruments     | Manufacturer              | Model No. | Serial No. | Frequency Range       |
|----------------------|---------------------------|-----------|------------|-----------------------|
| Modulation Analyzer  | Hewlett Packard           | 8910B     | 3226A04606 | 150 kHz – 1300 MHz    |
| Function Generator   | Stanford Research Systems | DS345     | 34591      | 1 $\mu$ Hz – 30.2 MHz |
| FFT Digital Spectrum | Advantest                 | R9211E    | 82020336   | --                    |
| Attenuator           | Weinschel Crop.           | 46-20-34  | BM1347     | DC-18 GHz             |

### 6.8.4. Test Arrangement



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## 6.8.5. Test Data

### 6.8.5.1. Audio Frequency Response of All Modulation States - 12.5 kHz Channel Spacing

| FREQUENCY<br>(kHz) | AUDIO<br>IN<br>(dBV) | AUDIO<br>OUT<br>(dBV) | ATTEN.<br>(OUT - IN)<br>(dB) | ATTEN.<br>wrt. 1 kHz<br>(dB) | FCC LIMIT<br>(dB) | PASS/<br>FAIL |
|--------------------|----------------------|-----------------------|------------------------------|------------------------------|-------------------|---------------|
| 0.10               | -12.6                | -67.0                 | -54.4                        | -63.4                        | --                | PASS          |
| 0.20               | -12.6                | -57.0                 | -44.4                        | -53.4                        | --                | PASS          |
| 0.40               | -12.6                | -25.8                 | -13.2                        | -22.2                        | --                | PASS          |
| 0.60               | -12.6                | -14.7                 | -2.1                         | -11.1                        | --                | PASS          |
| 0.80               | -12.6                | -8.4                  | 4.3                          | -4.7                         | --                | PASS          |
| 1.00               | -12.6                | -3.6                  | 9.0                          | 0.0                          | --                | PASS          |
| 1.20               | -12.6                | -0.6                  | 12.0                         | 3.0                          | --                | PASS          |
| 1.40               | -12.6                | 2.0                   | 14.6                         | 5.6                          | --                | PASS          |
| 1.60               | -12.6                | 3.6                   | 16.2                         | 7.2                          | --                | PASS          |
| 1.80               | -12.6                | 3.7                   | 16.3                         | 7.3                          | --                | PASS          |
| 2.00               | -12.6                | 3.7                   | 16.3                         | 7.3                          | --                | PASS          |
| 2.50               | -12.6                | 3.6                   | 16.3                         | 7.3                          | --                | PASS          |
| 3.00               | -12.6                | 3.8                   | 16.4                         | 7.4                          | 0.0               | PASS          |
| 3.50               | -12.6                | -50.6                 | -38.0                        | -47.0                        | -4.0              | PASS          |
| 4.00               | -12.6                | -50.6                 | -38.0                        | -47.0                        | -7.5              | PASS          |
| 5.00               | -12.6                | <-60.0                | <-47.4                       | <-56.4                       | -13.3             | PASS          |
| 6.00               | -12.6                | <-60.0                | <-47.4                       | <-56.4                       | -18.1             | PASS          |
| 7.00               | -12.6                | <-60.0                | <-47.4                       | <-56.4                       | -22.1             | PASS          |
| 8.00               | -12.6                | <-60.0                | <-47.4                       | <-56.4                       | -25.6             | PASS          |
| 9.00               | -12.6                | <-60.0                | <-47.4                       | <-56.4                       | -28.6             | PASS          |
| 10.00              | -12.6                | <-60.0                | <-47.4                       | <-56.4                       | -31.4             | PASS          |
| 15.00              | -12.6                | <-60.0                | <-47.4                       | <-56.4                       | -41.9             | PASS          |
| 15.00              | -12.6                | <-60.0                | <-47.4                       | <-56.4                       | -41.9             | PASS          |
| 20.00              | -12.6                | <-60.0                | <-47.4                       | <-56.4                       | -49.4             | PASS          |
| 22.00              | -12.6                | <-60.0                | <-47.4                       | <-56.4                       | -50.0             | PASS          |
| 24.00              | -12.6                | <-60.0                | <-47.4                       | <-56.4                       | -50.0             | PASS          |
| 26.00              | -12.6                | <-60.0                | <-47.4                       | <-56.4                       | -50.0             | PASS          |
| 28.00              | -12.6                | <-60.0                | <-47.4                       | <-56.4                       | -50.0             | PASS          |
| 30.00              | -12.6                | <-60.0                | <-47.4                       | <-56.4                       | -50.0             | PASS          |
| 40.00              | -12.6                | <-60.0                | <-47.4                       | <-56.4                       | -50.0             | PASS          |
| 50.00              | -12.6                | <-60.0                | <-47.4                       | <-56.4                       | -50.0             | PASS          |

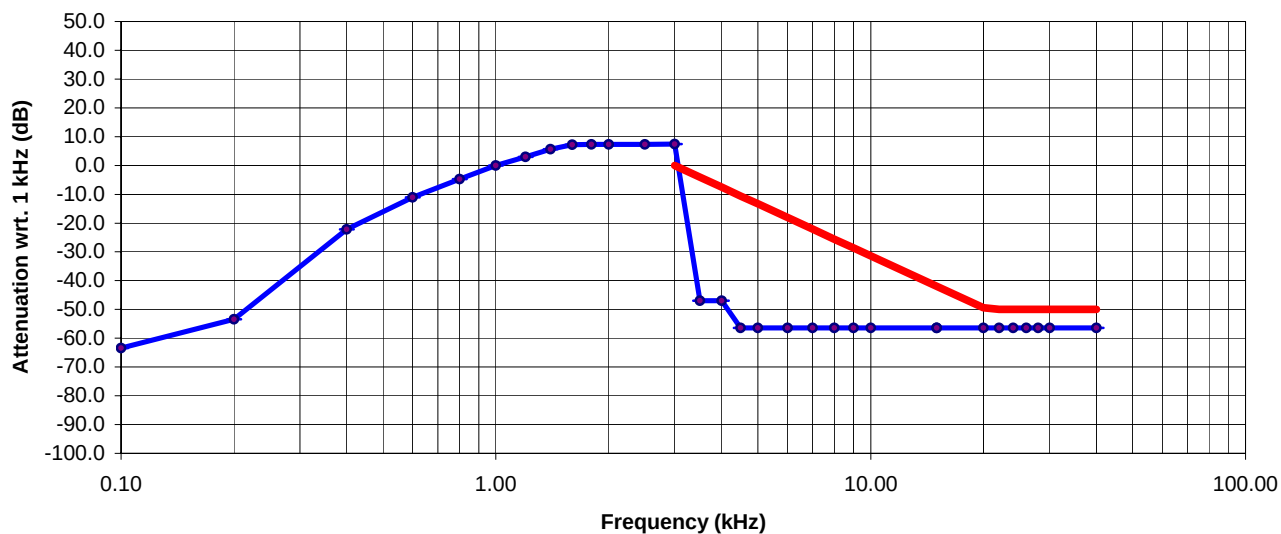
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AUDIO FREQUENCY REPSONSE @ FCC 2.987(a) & 90.242b(8)  
Technisonic 800 FM Transceiver (12.5 kHz Channel Spacing)



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### 6.8.5.2. Audio Frequency Response of All Modulation States - 25 kHz Channel Spacing

| FREQUENCY<br>(kHz) | AUDIO<br>IN<br>(dBV) | AUDIO<br>OUT<br>(dBV) | ATTEN.<br>(OUT - IN)<br>(dB) | ATTEN.<br>wrt. 1 kHz<br>(dB) | FCC LIMIT<br>@22.915D<br>(dB) | PASS/<br>FAIL |
|--------------------|----------------------|-----------------------|------------------------------|------------------------------|-------------------------------|---------------|
| 0.10               | -9.6                 | <-40.0                | -30.4                        | -45.1                        | --                            | PASS          |
| 0.20               | -9.6                 | <-40.0                | -30.4                        | -45.1                        | --                            | PASS          |
| 0.40               | -9.6                 | -16.6                 | -7.0                         | -21.7                        | --                            | PASS          |
| 0.60               | -9.6                 | -5.9                  | 3.7                          | -11.0                        | --                            | PASS          |
| 0.80               | -9.6                 | 0.4                   | 10.0                         | -4.7                         | --                            | PASS          |
| 1.00               | -9.6                 | 5.1                   | 14.7                         | 0.0                          | --                            | PASS          |
| 1.10               | -9.6                 | 4.3                   | 13.9                         | -0.8                         | --                            | PASS          |
| 1.20               | -9.6                 | -11.8                 | -2.2                         | -16.9                        | --                            | PASS          |
| 1.40               | -9.6                 | -10.3                 | -0.7                         | -15.4                        | --                            | PASS          |
| 1.50               | -9.6                 | -10.3                 | -0.7                         | -15.4                        | --                            | PASS          |
| 1.60               | -9.6                 | -10.3                 | -0.7                         | -15.4                        | --                            | PASS          |
| 1.80               | -9.6                 | -10.1                 | -0.5                         | -15.2                        | --                            | PASS          |
| 2.00               | -9.6                 | -10.1                 | -0.5                         | -15.2                        | --                            | PASS          |
| 2.20               | -9.6                 | -10.1                 | -0.5                         | -15.2                        | --                            | PASS          |
| 2.40               | -9.6                 | -10.1                 | -0.5                         | -15.2                        | --                            | PASS          |
| 2.50               | -9.6                 | -10.1                 | -0.5                         | -15.2                        | --                            | PASS          |
| 2.60               | -9.6                 | -10.1                 | -0.5                         | -15.2                        | --                            | PASS          |
| 2.80               | -9.6                 | -10.0                 | -0.4                         | -15.1                        | --                            | PASS          |
| 3.00               | -9.6                 | -10.1                 | -0.5                         | -15.2                        | 0.0                           | PASS          |
| 3.50               | -9.6                 | -41.1                 | -31.5                        | -46.2                        | -4.0                          | PASS          |
| 4.00               | -9.6                 | <-62.0                | <-52.4                       | <-67.1                       | -7.5                          | PASS          |
| 4.50               | -9.6                 | <-62.0                | <-52.4                       | <-67.1                       | -10.6                         | PASS          |
| 5.00               | -9.6                 | <-62.0                | <-52.4                       | <-67.1                       | -13.3                         | PASS          |
| 6.00               | -9.6                 | <-62.0                | <-52.4                       | <-67.1                       | -18.1                         | PASS          |
| 7.00               | -9.6                 | <-62.0                | <-52.4                       | <-67.1                       | -22.1                         | PASS          |
| 8.00               | -9.6                 | <-62.0                | <-52.4                       | <-67.1                       | -25.6                         | PASS          |
| 9.00               | -9.6                 | <-62.0                | <-52.4                       | <-67.1                       | -28.6                         | PASS          |
| 10.00              | -9.6                 | <-62.0                | <-52.4                       | <-67.1                       | -31.4                         | PASS          |
| 15.00              | -9.6                 | <-62.0                | <-52.4                       | <-67.1                       | -41.9                         | PASS          |
| 15.00              | -9.6                 | <-62.0                | <-52.4                       | <-67.1                       | -41.9                         | PASS          |
| 20.00              | -9.6                 | <-62.0                | <-52.4                       | <-67.1                       | -49.4                         | PASS          |
| 22.00              | -9.6                 | <-62.0                | <-52.4                       | <-67.1                       | -50.0                         | PASS          |
| 24.00              | -9.6                 | <-62.0                | <-52.4                       | <-67.1                       | -50.0                         | PASS          |
| 26.00              | -9.6                 | <-62.0                | <-52.4                       | <-67.1                       | -50.0                         | PASS          |
| 28.00              | -9.6                 | <-62.0                | <-52.4                       | <-67.1                       | -50.0                         | PASS          |
| 30.00              | -9.6                 | <-62.0                | <-52.4                       | <-67.1                       | -50.0                         | PASS          |
| 40.00              | -9.6                 | <-62.0                | <-52.4                       | <-67.1                       | -50.0                         | PASS          |
| 50.00              | -9.6                 | <-62.0                | <-52.4                       | <-67.1                       | -50.0                         | PASS          |

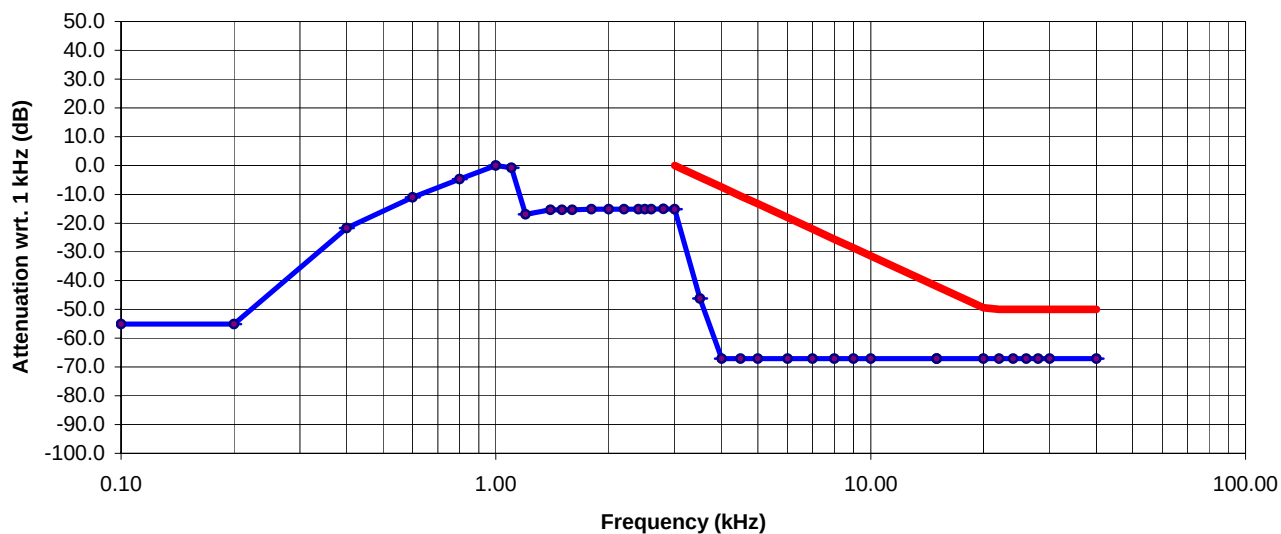
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AUDIO FREQUENCY REPSONSE @ FCC 2.987(a) & 90.242b(8)  
Technisonic 800 FM Transceiver (25 kHz Channel Spacing)



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## 6.9. MODULATION LIMITING @ FCC 2.1047(B) & 90.210

### 6.9.1. Limits @ FCC 2.1047(b) and 90.210

Recommended frequency deviation characteristics are given below:

- 2.5 kHz for 12.5 kHz Channel Spacing System
- 5 kHz for 25 kHz Channel Spacing System

### 6.9.2. Method of Measurements

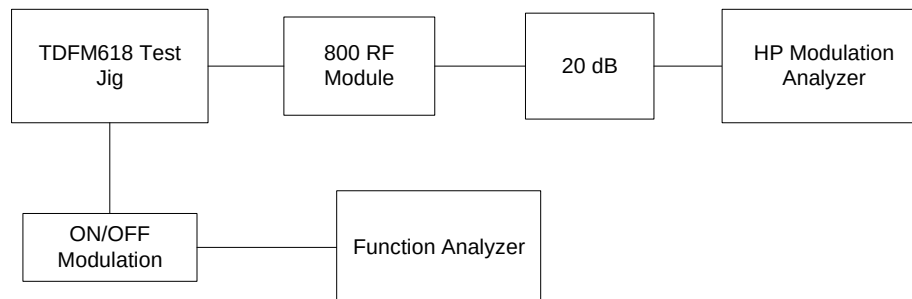
**For Audio Transmitter:-** The carrier frequency deviation was measured with the tone input signal level varied from 0 Vp to audio input rating level plus 16 dB at frequencies 0.1, 0.5, 1.0, 3.0 and 5.0 kHz. The maximum deviation was recorded at each test condition.

**For Data Transmitter with Maximum Frequency Deviation set by Factory:-** The EUT was set at maximum frequency deviation, and its peak frequency deviation was then measured using EUT's internal random data source.

### 6.9.3. Test Equipment List

| Test Instruments    | Manufacturer              | Model No. | Serial No. | Frequency Range    |
|---------------------|---------------------------|-----------|------------|--------------------|
| Modulation Analyzer | Hewlett Packard           | 8910B     | 3226A04606 | 150 Khz – 1300 MHZ |
| Function Generator  | Stanford Research Systems | DS345     | 34591      | 1μHz – 30.2 MHz    |
| Attenuator          | Weinchel Corp.            | 46-20-34  | BM1347     | DC – 18 GHz        |

### 6.9.4. Test Arrangement



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## 6.9.5. Test Data

### 6.9.5.1. Data Modulation Limiting: FM modulation with random data and Modulation Limiter set at a Maximum Frequency Deviation (Factory Setting).

#### 6.9.5.1.1. 12.5 kHz Channel Spacing

| Data Baud Rate | Peak Deviation (kHz) | Recommended Maximum Limit (kHz) |
|----------------|----------------------|---------------------------------|
| 9600           | 3.2                  | 2.5                             |

#### 6.9.5.1.2. 25 kHz Channel Spacing

| Data Baud Rate | Peak Deviation (kHz) | Recommended Maximum Limit (kHz) |
|----------------|----------------------|---------------------------------|
| N/A            | N/A                  | 5 kHz                           |

\* FM Data modulation is not available for 25 kHz channel spacing operation

## 6.9.5.2. Voice Modulation Limiting:

### 6.9.5.2.1. 12.5 kHz Channel Spacing

| MODULATING<br>SIGNAL LEVEL<br>(mVrms) | PEAK FREQUENCY DEVIATION (kHz)<br>at the following modulating frequency: |         |         |         |         | MAXIMUM LIMIT<br>(kHz) |
|---------------------------------------|--------------------------------------------------------------------------|---------|---------|---------|---------|------------------------|
|                                       | 0.1 kHz                                                                  | 0.5 kHz | 1.0 kHz | 3.0 kHz | 5.0 kHz |                        |
| 50                                    | 0.7                                                                      | 0.7     | 0.7     | 1.6     | 0.7     | 2.5                    |
| 100                                   | 0.7                                                                      | 0.7     | 0.8     | 2.7     | 0.7     | 2.5                    |
| 150                                   | 0.7                                                                      | 0.7     | 1.1     | 2.7     | 0.7     | 2.5                    |
| 200                                   | 0.7                                                                      | 0.7     | 1.3     | 2.5     | 0.7     | 2.5                    |
| 250                                   | 0.7                                                                      | 0.8     | 1.5     | 2.5     | 0.7     | 2.5                    |
| 300                                   | 0.7                                                                      | 0.8     | 1.7     | 2.5     | 0.7     | 2.5                    |
| 350                                   | 0.7                                                                      | 0.8     | 1.9     | 2.5     | 0.7     | 2.5                    |
| 400                                   | 0.7                                                                      | 0.8     | 1.9     | 2.5     | 0.7     | 2.5                    |
| 450                                   | 0.7                                                                      | 0.9     | 2.2     | 2.5     | 0.7     | 2.5                    |
| 500                                   | 0.7                                                                      | 0.9     | 2.4     | 2.5     | 0.7     | 2.5                    |
| 600                                   | 0.7                                                                      | 0.9     | 2.4     | 2.5     | 0.7     | 2.5                    |
| 700                                   | 0.7                                                                      | 1.2     | 2.3     | 2.5     | 0.7     | 2.5                    |
| 800                                   | 0.7                                                                      | 1.4     | 2.3     | 2.5     | 0.7     | 2.5                    |
| 900                                   | 0.7                                                                      | 1.6     | 2.5     | 2.5     | 0.7     | 2.5                    |
| 1000                                  | 0.7                                                                      | 1.9     | 2.5     | 2.5     | 0.7     | 2.5                    |
| 1500                                  | 0.7                                                                      | 2.4     | 2.4     | 2.5     | 0.7     | 2.5                    |
| 2000                                  | 0.7                                                                      | 2.4     | 2.4     | 2.5     | 0.7     | 2.5                    |
| 2500                                  | 0.7                                                                      | 2.4     | 2.4     | 2.5     | 0.7     | 2.5                    |
| 3000                                  | 0.7                                                                      | 2.4     | 2.4     | 2.5     | 0.7     | 2.5                    |
| 3500                                  | 0.7                                                                      | 2.4     | 2.4     | 2.5     | 0.7     | 2.5                    |
| 4000                                  | 0.7                                                                      | 2.4     | 2.4     | 2.5     | 0.7     | 2.5                    |
| 4500                                  | 0.7                                                                      | 2.4     | 2.3     | 2.5     | 0.7     | 2.5                    |
| 5000                                  | 0.7                                                                      | 2.4     | 2.3     | 2.5     | 0.7     | 2.5                    |
| 5500                                  | 0.7                                                                      | 2.4     | 2.3     | 2.5     | 0.7     | 2.5                    |
| 6000                                  | 0.7                                                                      | 2.4     | 2.2     | 2.5     | 0.7     | 2.5                    |
| 6500                                  | 0.7                                                                      | 2.4     | 2.2     | 2.5     | 0.7     | 2.5                    |
| 7000                                  | 0.7                                                                      | 2.4     | 2.2     | 2.5     | 0.7     | 2.5                    |

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Voice Signal Input Level = STD MOD Level + 16 dB = 47.96 dBmVrms + 16 = 63.96 dBmV or 1.57 Vrms

| MODULATING<br>FREQUENCY (KHz) | PEAK FREQUENCY<br>DEVIATION (KHz) | MAXIMUM LIMIT<br>(KHz) |
|-------------------------------|-----------------------------------|------------------------|
| 0.1                           | 0.7                               | 2.5                    |
| 0.2                           | 0.7                               | 2.5                    |
| 0.4                           | 2.1                               | 2.5                    |
| 0.6                           | 2.4                               | 2.5                    |
| 0.8                           | 2.4                               | 2.5                    |
| 1.0                           | 2.4                               | 2.5                    |
| 1.2                           | 2.0                               | 2.5                    |
| 1.4                           | 1.5                               | 2.5                    |
| 1.6                           | 2.1                               | 2.5                    |
| 1.8                           | 2.1                               | 2.5                    |
| 2.0                           | 2.2                               | 2.5                    |
| 2.5                           | 2.6                               | 2.5                    |
| 3.0                           | 2.6                               | 2.5                    |
| 3.5                           | 0.7                               | 2.5                    |
| 4.0                           | 0.7                               | 2.5                    |
| 4.5                           | 0.7                               | 2.5                    |
| 5.0                           | 0.7                               | 2.5                    |
| 6.0                           | 0.7                               | 2.5                    |
| 7.0                           | 0.7                               | 2.5                    |
| 8.0                           | 0.7                               | 2.5                    |
| 9.0                           | 0.7                               | 2.5                    |
| 10.0                          | 0.7                               | 2.5                    |

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**6.9.5.2.2. 25 kHz Channel Spacing**

| MODULATING<br>SIGNAL LEVEL<br>(mVrms) | PEAK FREQUENCY DEVIATION (kHz)<br>at the following modulating frequency: |         |         |         |         | MAXIMUM LIMIT<br>(kHz) |
|---------------------------------------|--------------------------------------------------------------------------|---------|---------|---------|---------|------------------------|
|                                       | 0.1 kHz                                                                  | 0.5 kHz | 1.0 kHz | 3.0 kHz | 5.0 kHz |                        |
| 50                                    | 0.7                                                                      | 0.7     | 0.9     | 2.5     | 0.7     | 5                      |
| 100                                   | 0.7                                                                      | 0.7     | 1.4     | 5.0     | 0.7     | 5                      |
| 150                                   | 0.7                                                                      | 0.7     | 1.6     | 5.0     | 0.7     | 5                      |
| 200                                   | 0.7                                                                      | 0.8     | 2.1     | 5.0     | 0.7     | 5                      |
| 250                                   | 0.7                                                                      | 0.9     | 2.5     | 5.0     | 0.7     | 5                      |
| 300                                   | 0.7                                                                      | 0.9     | 2.6     | 5.0     | 0.7     | 5                      |
| 350                                   | 0.7                                                                      | 1.0     | 2.9     | 5.0     | 0.7     | 5                      |
| 400                                   | 0.7                                                                      | 1.0     | 2.9     | 5.0     | 0.7     | 5                      |
| 450                                   | 0.7                                                                      | 1.1     | 3.2     | 5.0     | 0.7     | 5                      |
| 500                                   | 0.7                                                                      | 1.2     | 3.7     | 5.0     | 0.7     | 5                      |
| 600                                   | 0.7                                                                      | 1.3     | 4.4     | 5.0     | 0.7     | 5                      |
| 700                                   | 0.7                                                                      | 1.8     | 4.8     | 5.0     | 0.7     | 5                      |
| 800                                   | 0.7                                                                      | 2.3     | 4.8     | 5.0     | 0.7     | 5                      |
| 900                                   | 0.7                                                                      | 2.6     | 4.6     | 5.0     | 0.7     | 5                      |
| 1000                                  | 0.7                                                                      | 3.5     | 4.0     | 5.0     | 0.7     | 5                      |
| 1500                                  | 0.7                                                                      | 4.5     | 3.9     | 5.0     | 0.7     | 5                      |
| 2000                                  | 0.7                                                                      | 4.6     | 3.9     | 5.0     | 0.7     | 5                      |
| 2500                                  | 0.7                                                                      | 4.1     | 4.5     | 5.0     | 0.7     | 5                      |
| 3000                                  | 0.7                                                                      | 4.5     | 4.5     | 5.0     | 0.7     | 5                      |
| 3500                                  | 0.7                                                                      | 4.5     | 3.6     | 5.0     | 0.7     | 5                      |
| 4000                                  | 0.7                                                                      | 4.5     | 3.5     | 5.0     | 0.7     | 5                      |
| 4500                                  | 0.7                                                                      | 4.5     | 3.5     | 5.0     | 0.7     | 5                      |
| 5000                                  | 0.7                                                                      | 4.9     | 4.3     | 5.0     | 0.7     | 5                      |
| 5500                                  | 0.7                                                                      | 4.9     | 4.5     | 5.0     | 0.7     | 5                      |
| 6000                                  | 0.7                                                                      | 4.7     | 4.1     | 5.0     | 0.7     | 5                      |
| 6500                                  | 0.7                                                                      | 4.7     | 3.6     | 5.0     | 0.7     | 5                      |
| 7000                                  | 0.7                                                                      | 4.7     | 3.6     | 5.0     | 0.7     | 5                      |

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Voice Signal Input Level = STD MOD Level + 16 dB = 50.88 dBmVrms + 16 = 66.88 dBmV or 2.208Vrms

| MODULATING<br>FREQUENCY (KHz) | PEAK FREQUENCY<br>DEVIATION (KHz) | MAXIMUM LIMIT<br>(KHz) |
|-------------------------------|-----------------------------------|------------------------|
| 0.1                           | 0.7                               | 5                      |
| 0.2                           | 1.5                               | 5                      |
| 0.4                           | 4.8                               | 5                      |
| 0.6                           | 4.6                               | 5                      |
| 0.8                           | 4.3                               | 5                      |
| 1.0                           | 4.5                               | 5                      |
| 1.2                           | 4.1                               | 5                      |
| 1.4                           | 4.2                               | 5                      |
| 1.6                           | 3.2                               | 5                      |
| 1.8                           | 4.9                               | 5                      |
| 2.0                           | 4.2                               | 5                      |
| 2.5                           | 4.9                               | 5                      |
| 3.0                           | 5.0                               | 5                      |
| 3.5                           | 0.7                               | 5                      |
| 4.0                           | 0.7                               | 5                      |
| 4.5                           | 0.7                               | 5                      |
| 5.0                           | 0.7                               | 5                      |
| 6.0                           | 0.7                               | 5                      |
| 7.0                           | 0.7                               | 5                      |
| 8.0                           | 0.7                               | 5                      |
| 9.0                           | 0.7                               | 5                      |
| 10.0                          | 0.7                               | 5                      |

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## 6.10. 99% OCCUPIED BANDWIDTH & EMISSION MASK @ FCC 2.1049, 90.209 & 90.210

### 6.10.1. Limits @ FCC 90.209 & 90.210

Emissions shall be attenuated below the mean output power of the transmitter as follows:

| FREQUENCY RANGE (MHz) | Maximum Authorized BW (KHz) | CHANNEL SPACING (KHz) | Recommended Max. FREQ. DEVIATION (KHz) | FCC APPLICABLE MASK @ FCC 90.210 |
|-----------------------|-----------------------------|-----------------------|----------------------------------------|----------------------------------|
| 806-821/ 851-866      | 20                          | 25                    | 5                                      | MASK B (Voice) & MASK G (Data)   |
| 821-824/ 866-869      | 20                          | 12.5                  | 5                                      | MASK B (Voice) & MASK H (Data)   |

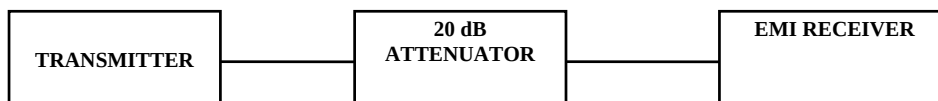
### 6.10.2. Method of Measurements

Refer to Exhibit 8, § 8.4 of this report for measurement details

### 6.10.3. Test Equipment List

| Test Instruments              | Manufacturer    | Model No. | Serial No. | Frequency Range  |
|-------------------------------|-----------------|-----------|------------|------------------|
| EMI Receiver/<br>EMI Receiver | Hewlett Packard | HP 8593EM | 3412A00103 | 9 kHz – 26.5 GHz |
| Attenuator(s)                 | Bird            | ..        | ...        | DC – 22 GHz      |
| Audio Oscillator              | Hewlett Packard | HP 204C   | 0989A08798 | DC to 1.2 MHz    |

### 6.10.4. Test Arrangement



## 6.10.5. Test Data

### 6.10.5.1. 99% Occupied Bandwidth

| Frequency (MHz) | Channel Spacing (kHz) | Modulation             | Measured 99% OBW (kHz) | Recommended 99% OBW (kHz) |
|-----------------|-----------------------|------------------------|------------------------|---------------------------|
| 764.0125        | 12.5                  | FM Analog Voice        | 10.2                   | 11.25                     |
| 766.0000        | 12.5                  | FM Analog Voice        | 10.1                   | 11.25                     |
| 775.9875        | 12.5                  | FM Analog Voice        | 10.2                   | 11.25                     |
| 794.0125        | 12.5                  | FM Analog Voice        | 10.2                   | 11.25                     |
| 803.0125        | 12.5                  | FM Analog Voice        | 10.0                   | 11.25                     |
| 806.0000        | 12.5                  | FM Analog Voice        | 10.0                   | 11.25                     |
| 821.0000        | 12.5                  | FM Analog Voice        | 10.4                   | 11.25                     |
| 823.9875        | 12.5                  | FM Analog Voice        | 10.2                   | 11.25                     |
| 866.0000        | 12.5                  | FM Analog Voice        | 10.1                   | 11.25                     |
| 868.9875        | 12.5                  | FM Analog Voice        | 10.1                   | 11.25                     |
|                 |                       |                        |                        |                           |
| 764.0125        | 25.0                  | FM Analog Voice        | 15.2                   | 20.0                      |
| 766.0000        | 25.0                  | FM Analog Voice        | 15.2                   | 20.0                      |
| 775.9875        | 25.0                  | FM Analog Voice        | 15.3                   | 20.0                      |
| 794.0125        | 25.0                  | FM Analog Voice        | 15.3                   | 20.0                      |
| 803.0125        | 25.0                  | FM Analog Voice        | 14.9                   | 20.0                      |
| 806.0000        | 25.0                  | FM Analog Voice        | 15.0                   | 20.0                      |
| 813.5000        | 25.0                  | FM Analog Voice        | 15.4                   | 20.0                      |
| 821.0000        | 25.0                  | FM Analog Voice        | 15.6                   | 20.0                      |
| 851.0125        | 25.0                  | FM Analog Voice        | 15.2                   | 20.0                      |
| 858.5000        | 25.0                  | FM Analog Voice        | 15.1                   | 20.0                      |
| 866.0000        | 25.0                  | FM Analog Voice        | 15.0                   | 20.0                      |
|                 |                       |                        |                        |                           |
| 764.0125        | 12.5                  | FM digital Synthesized | 9.7                    | 11.25                     |
| 766.0000        | 12.5                  | FM digital Synthesized | 9.7                    | 11.25                     |
| 775.9875        | 12.5                  | FM digital Synthesized | 10.3                   | 11.25                     |
| 794.0125        | 12.5                  | FM digital Synthesized | 9.8                    | 11.25                     |
| 803.0125        | 12.5                  | FM digital Synthesized | 9.6                    | 11.25                     |
| 806.0000        | 12.5                  | FM digital Synthesized | 9.6                    | 11.25                     |
| 821.0000        | 12.5                  | FM digital Synthesized | 10.3                   | 11.25                     |
| 823.9875        | 12.5                  | FM digital Synthesized | 10.5                   | 11.25                     |
| 866.0000        | 12.5                  | FM digital Synthesized | 9.7                    | 11.25                     |
| 868.9875        | 12.5                  | FM digital Synthesized | 9.6                    | 11.25                     |

Conform. Please refer to following Plots # 1 through # 31 for details of measurements.

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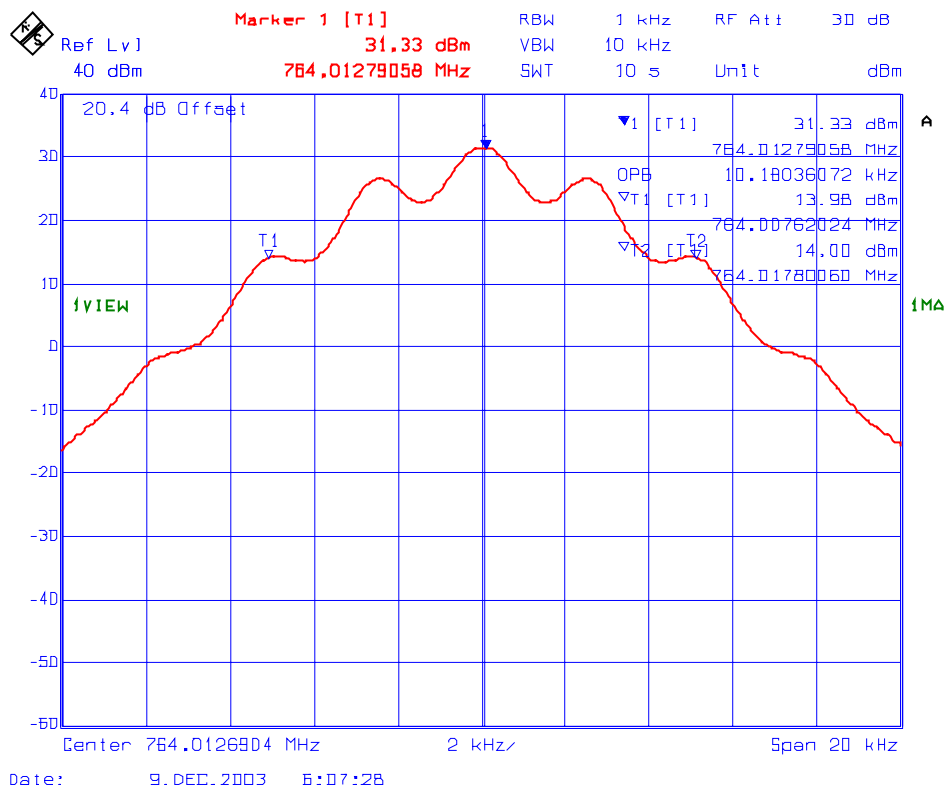
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**Plot #: 1      99% Occupied Bandwidth Measurement, Freq: 764.0125 MHz**  
**12.5 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



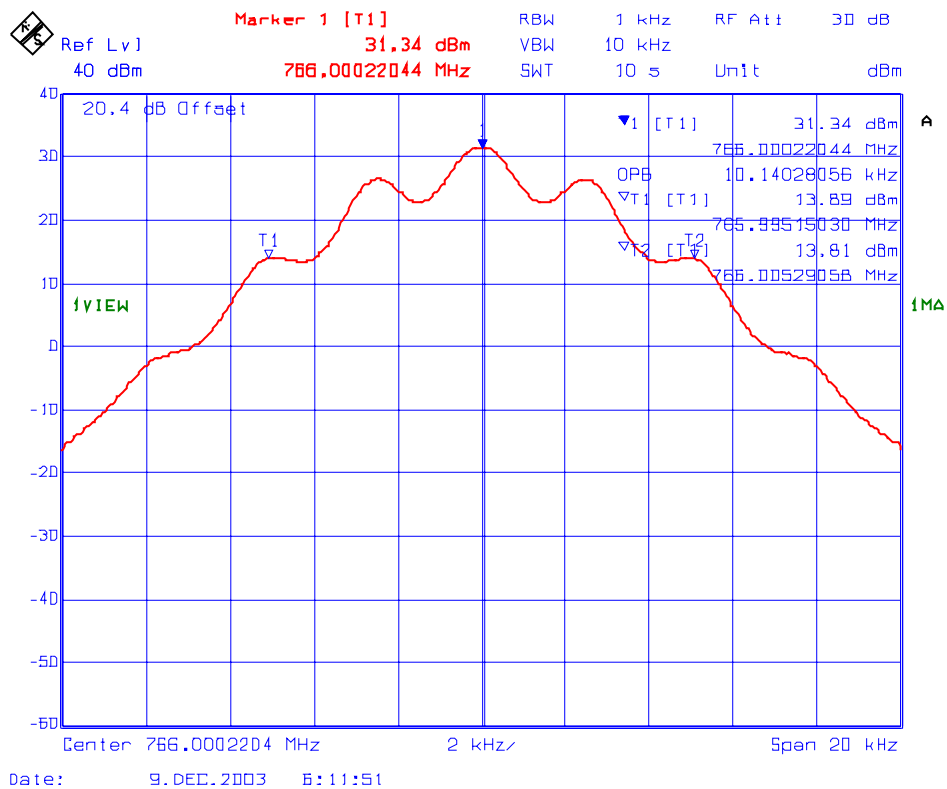
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**Plot #: 2      99% Occupied Bandwidth Measurement, Freq: 766.00 MHz**  
**12.5 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



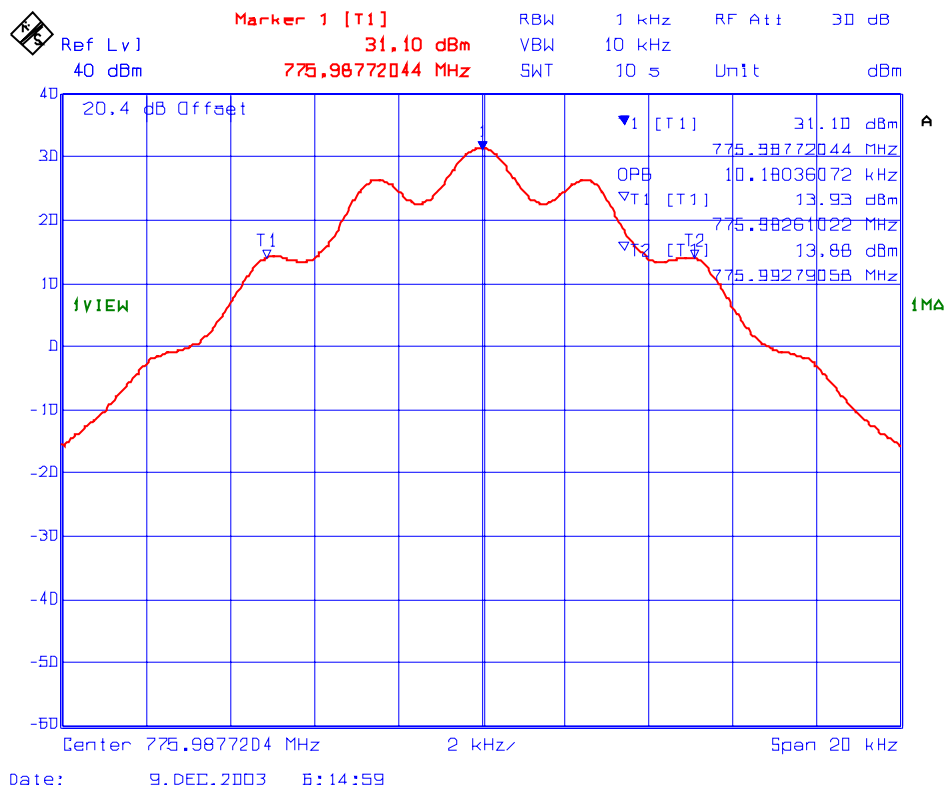
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**Plot #: 3      99% Occupied Bandwidth Measurement, Freq: 775.9875 MHz**  
**12.5 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



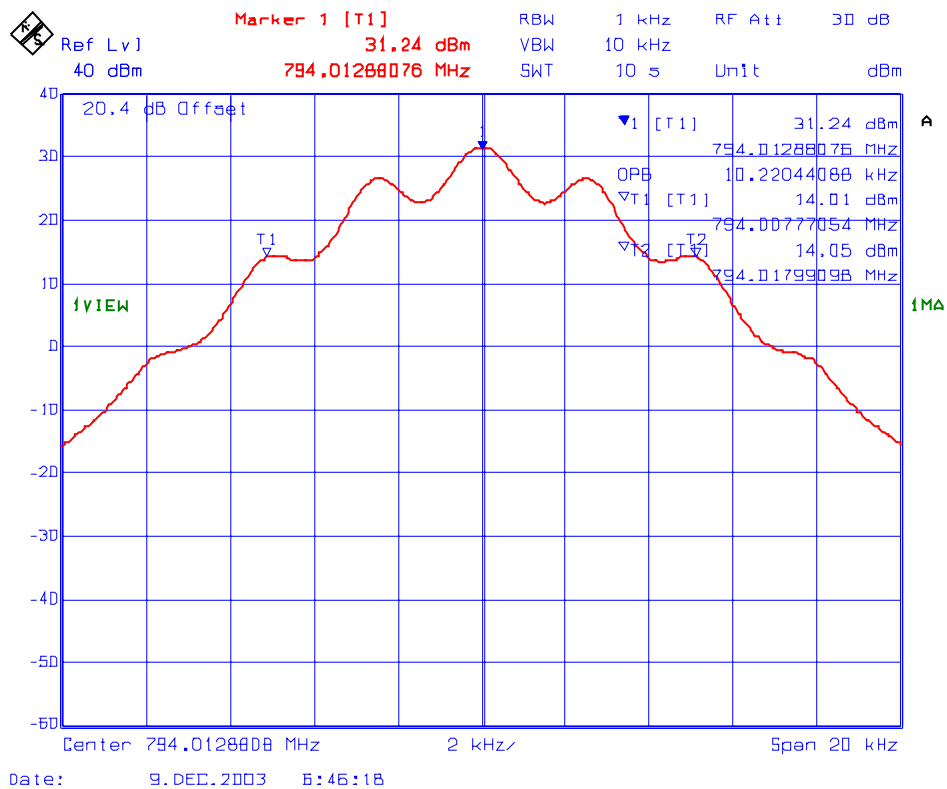
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**File #: TIL-046FCC90**

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**Plot #: 4      99% Occupied Bandwidth Measurement, Freq: 794.0125 MHz**  
**12.5 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



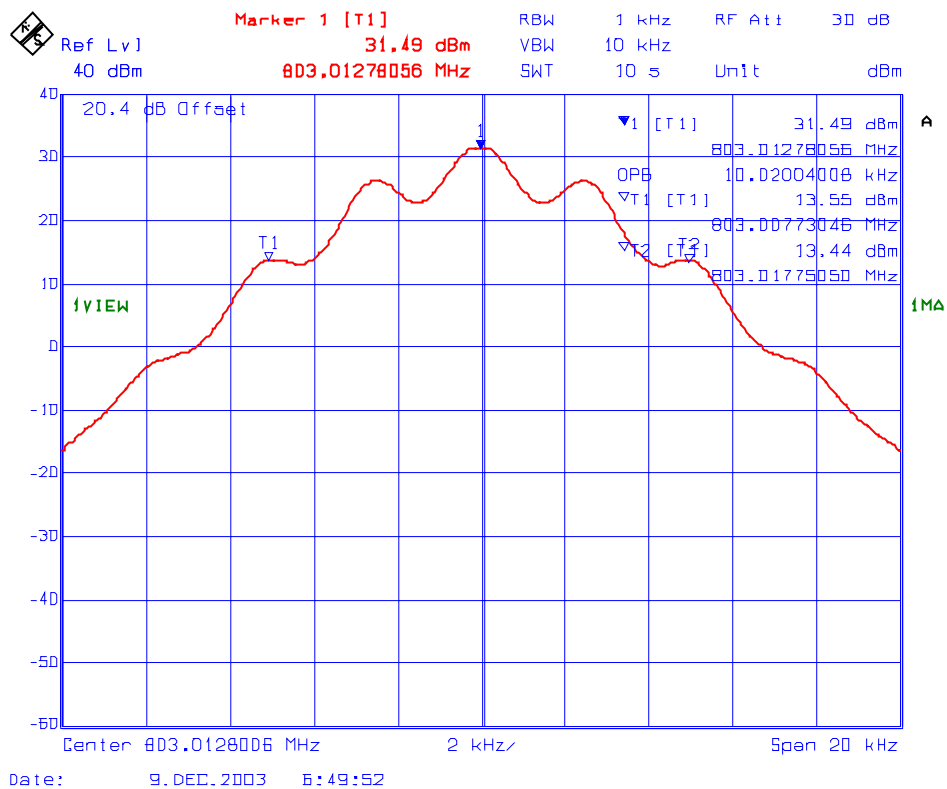
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**Plot #: 5      99% Occupied Bandwidth Measurement, Freq: 803.0125 MHz**  
**12.5 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



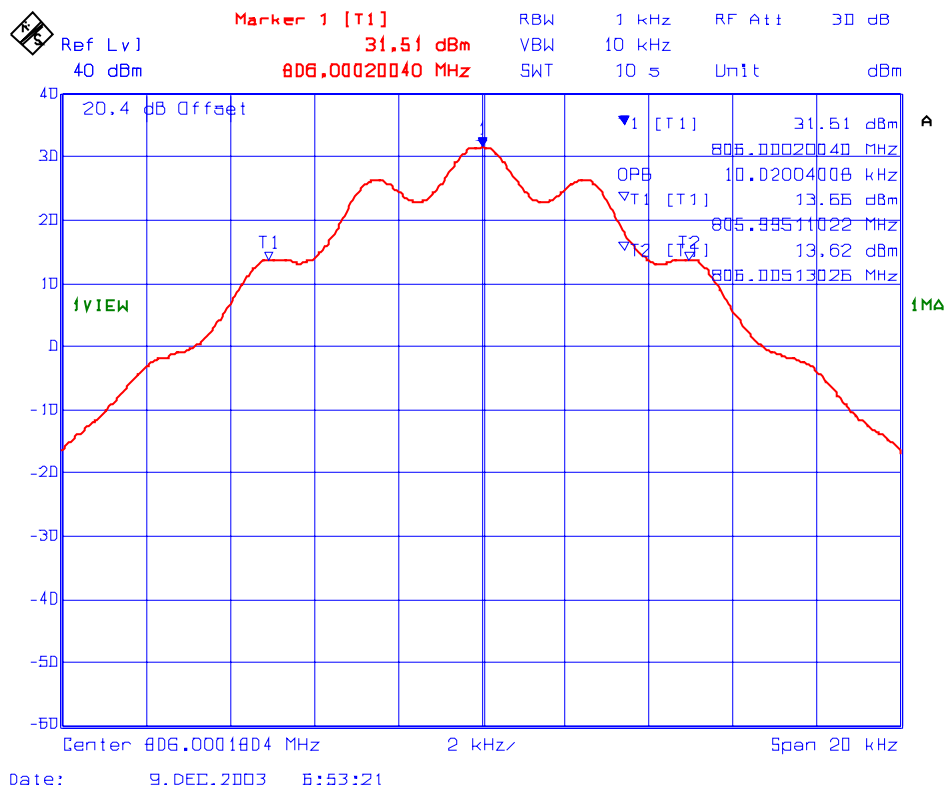
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**Plot #: 6      99% Occupied Bandwidth Measurement, Freq: 806.00 MHz**  
**12.5 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



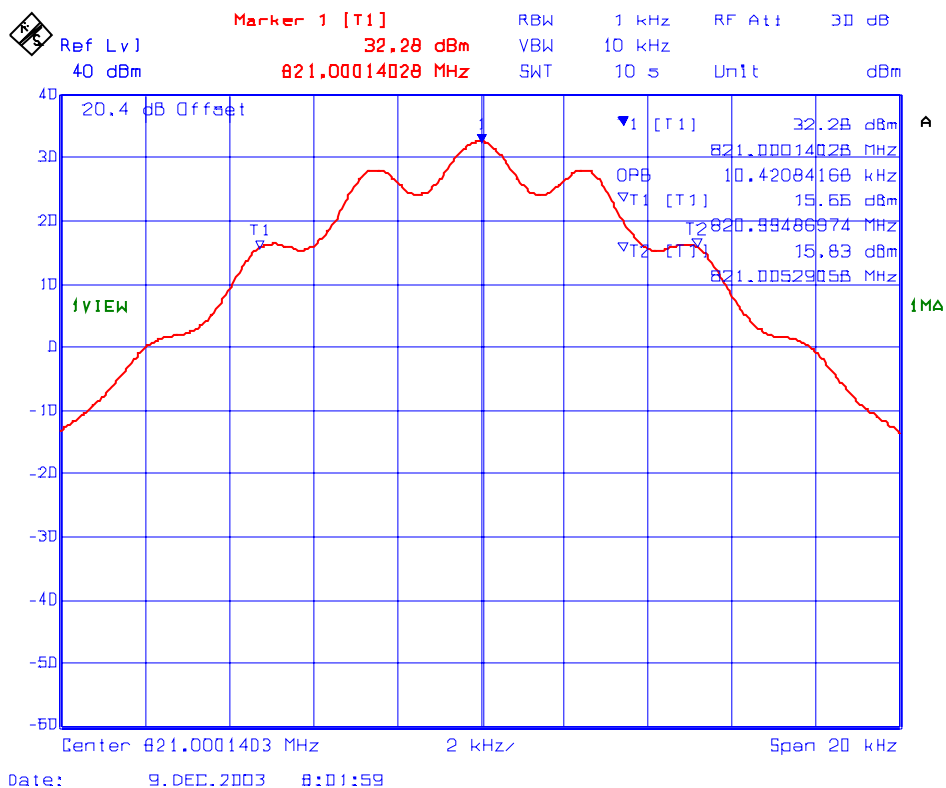
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Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: [vic@ultratech-labs.com](mailto:vic@ultratech-labs.com), Website: <http://www.ultratech-labs.com>

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Plot #: 7      **99% Occupied Bandwidth Measurement, Freq: 821.00 MHz**  
**12.5 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



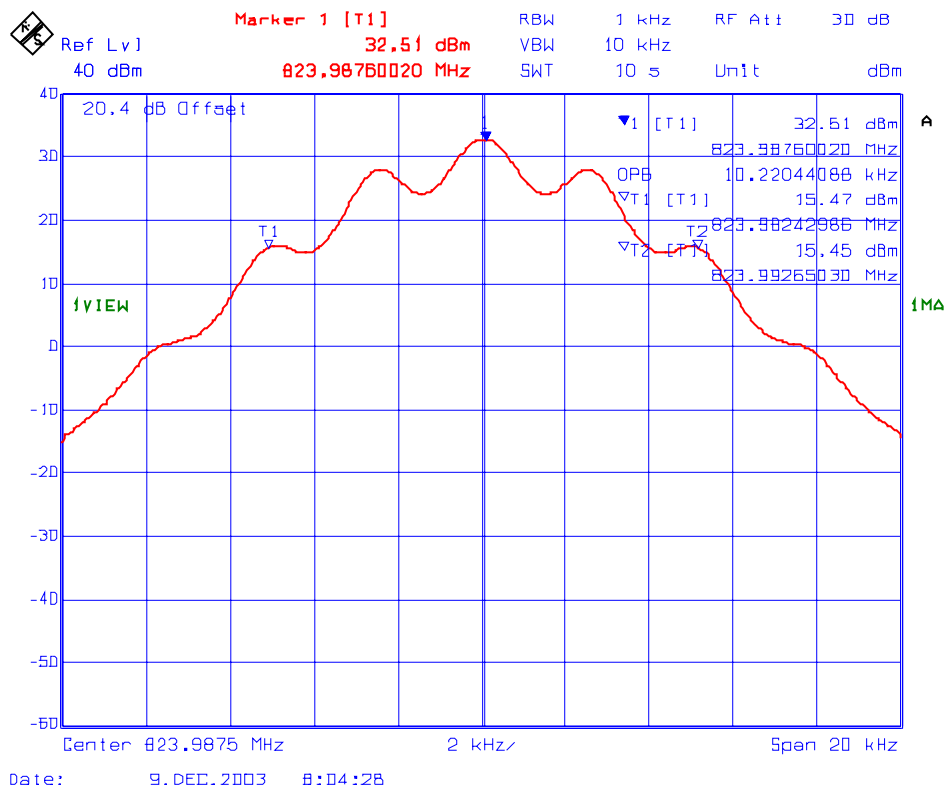
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**Plot #: 8**      **99% Occupied Bandwidth Measurement, Freq: 823.9875 MHz**  
**12.5 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



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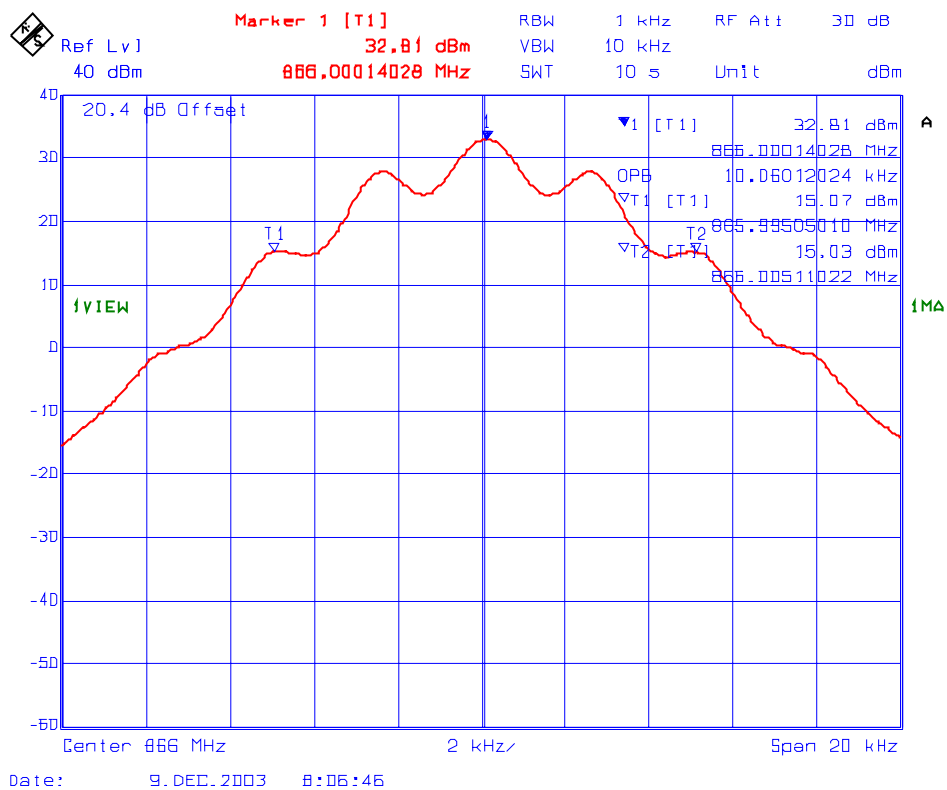
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4  
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: [vic@ultratech-labs.com](mailto:vic@ultratech-labs.com), Website: <http://www.ultratech-labs.com>

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**Plot #: 9**      **99% Occupied Bandwidth Measurement, Freq: 866.00 MHz**  
**12.5 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



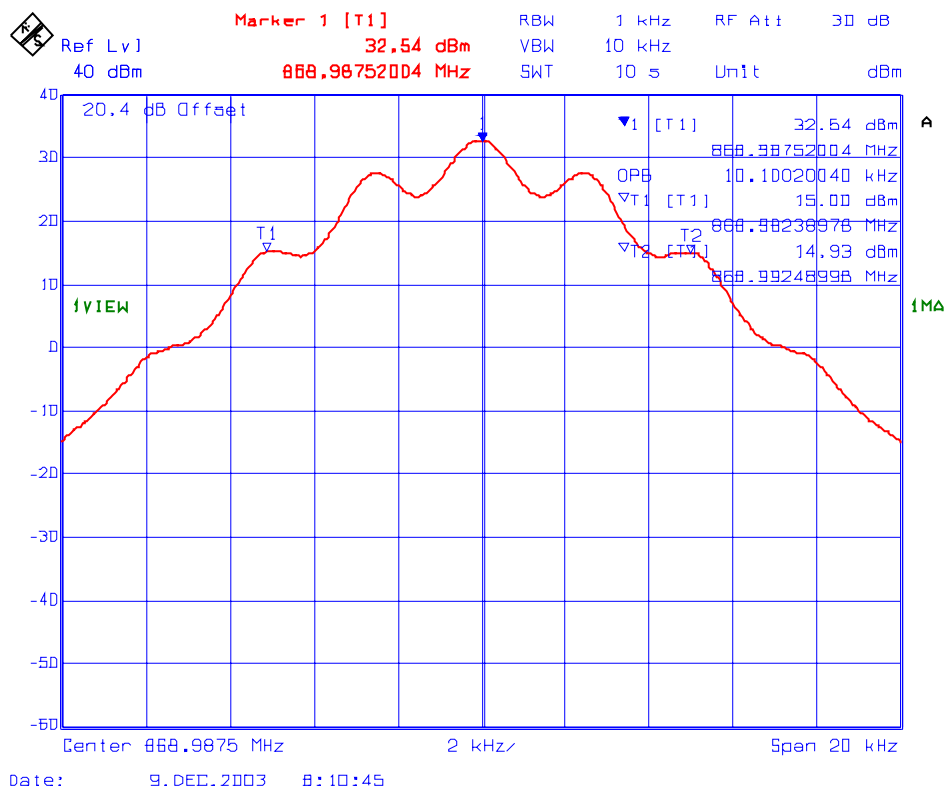
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**Plot #: 10      99% Occupied Bandwidth Measurement, Freq: 868.9875 MHz**  
**12.5 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



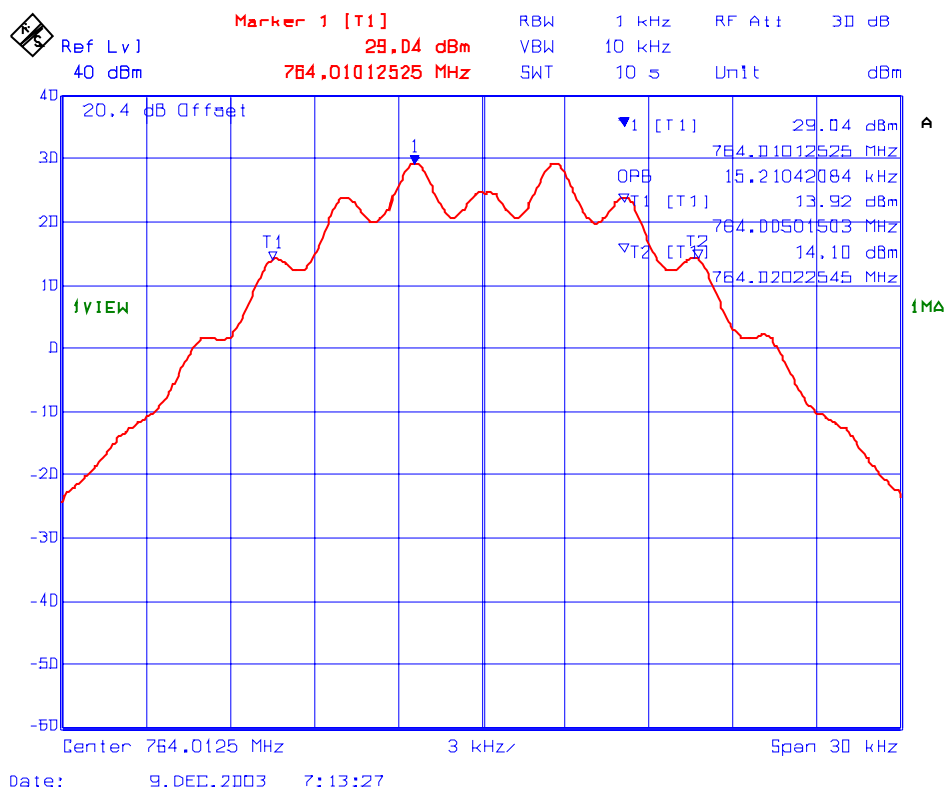
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**File #: TIL-046FCC90**

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**Plot #: 11**      **99% Occupied Bandwidth Measurement, Freq: 764.0125 MHz**  
**25 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



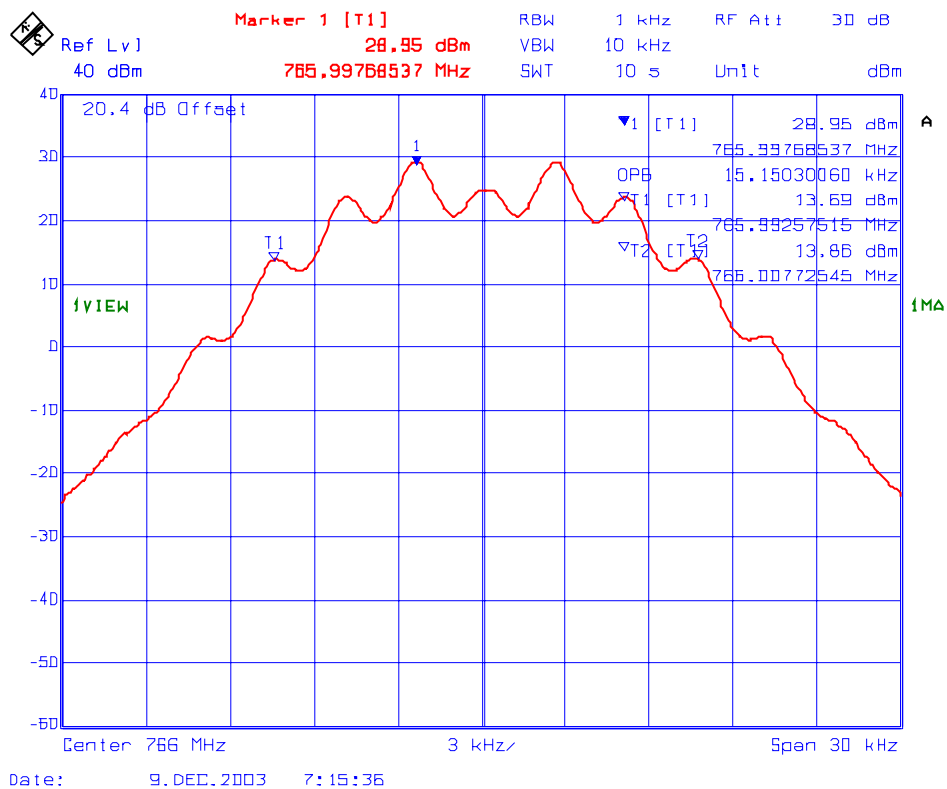
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**Plot #: 12      99% Occupied Bandwidth Measurement, Freq: 766.00 MHz**  
**25 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



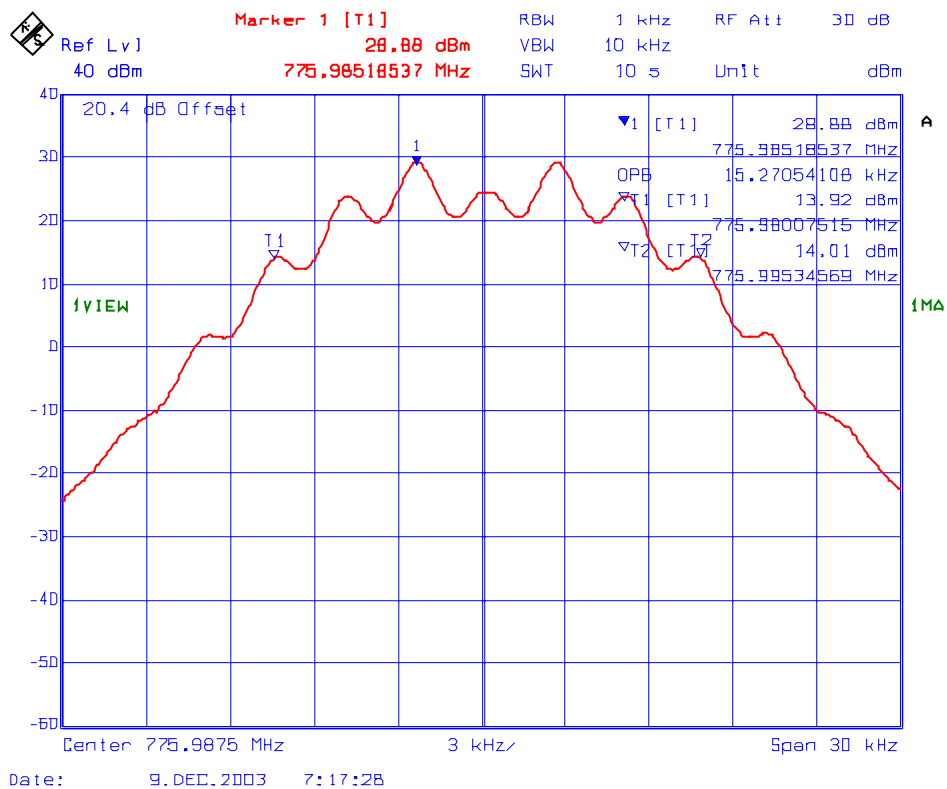
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**File #: TIL-046FCC90**

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**Plot #: 13**      **99% Occupied Bandwidth Measurement, Freq: 775.9875 MHz**  
**25 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



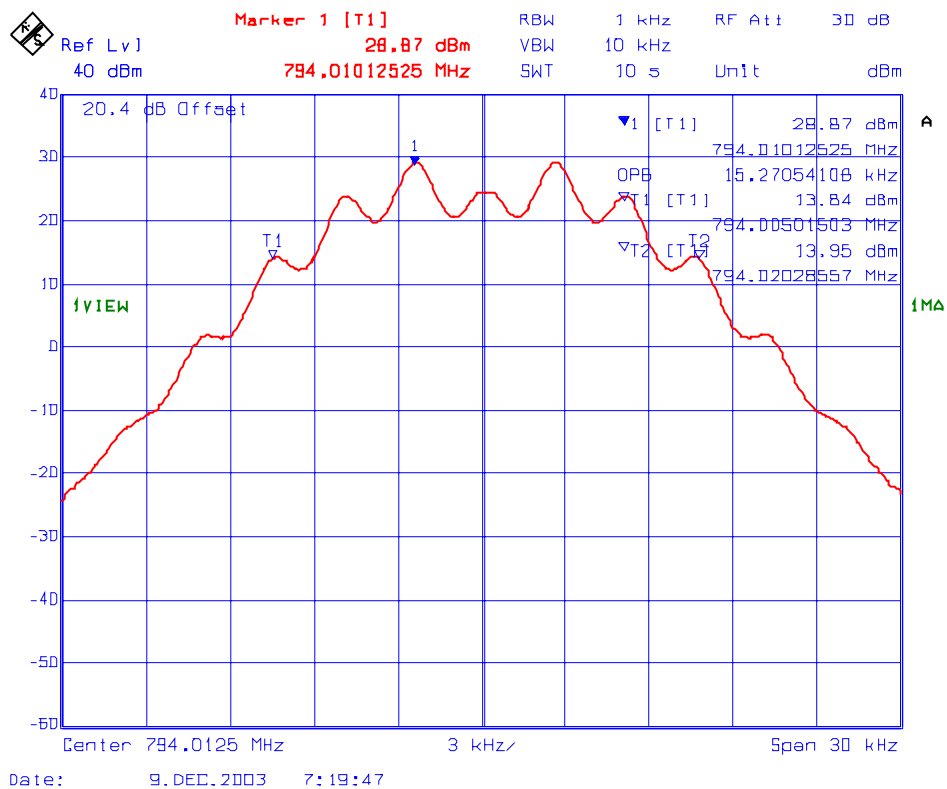
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**File #: TIL-046FCC90**

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**Plot #: 14      99% Occupied Bandwidth Measurement, Freq: 794.0125 MHz**  
**25 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



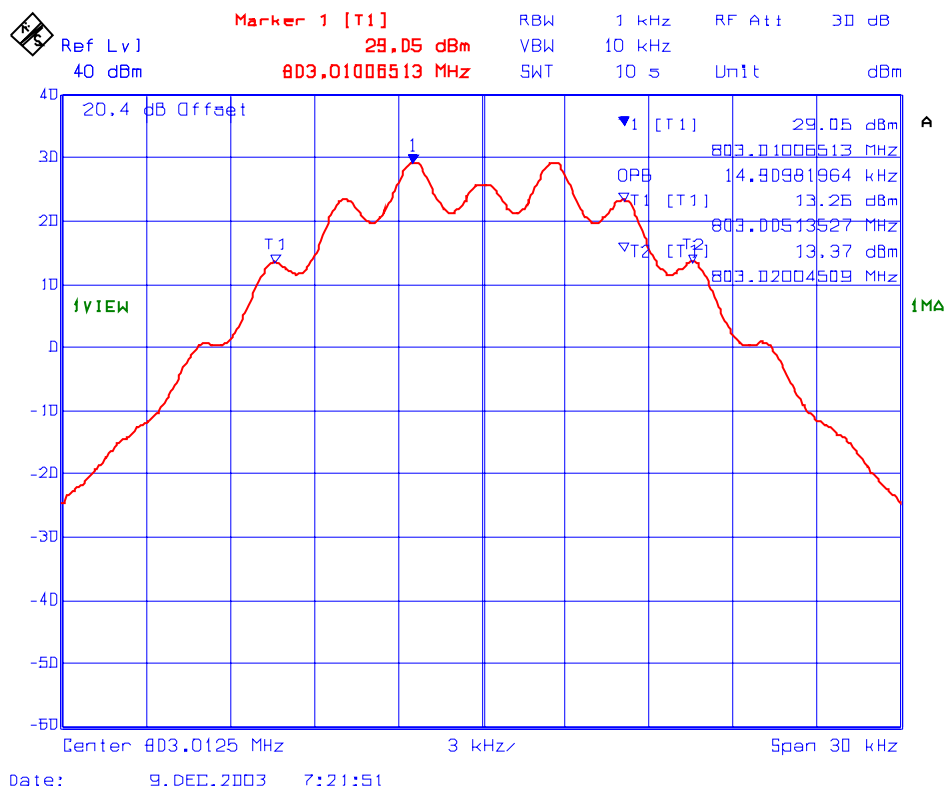
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**File #: TIL-046FCC90**

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**Plot #: 15      99% Occupied Bandwidth Measurement, Freq: 803.0125 MHz  
25 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



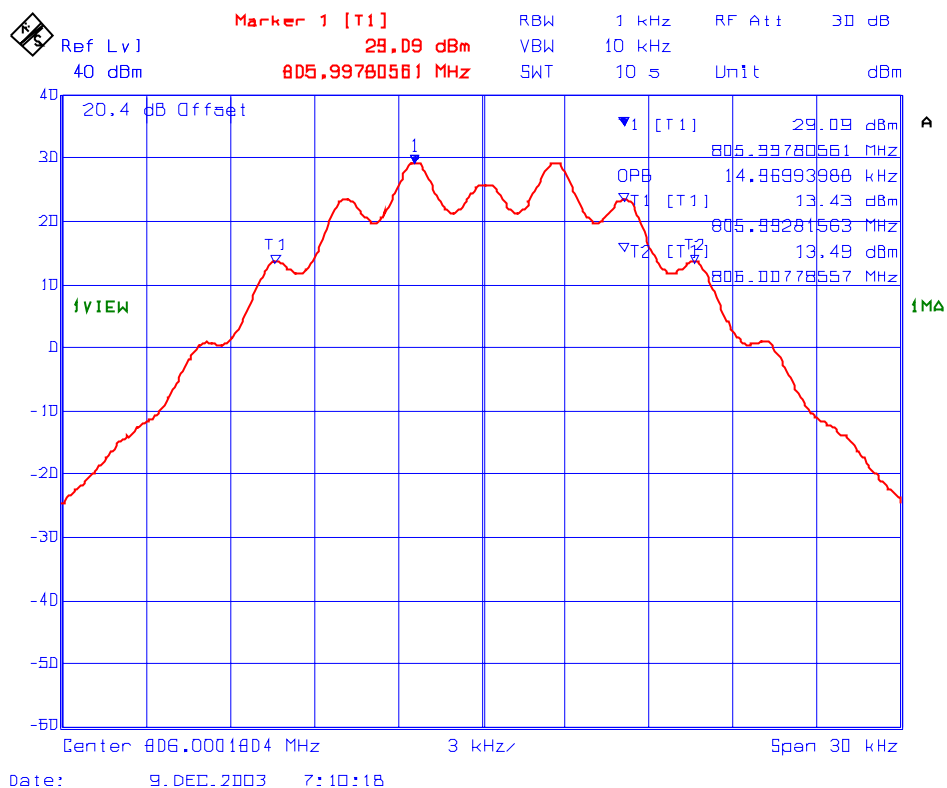
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**File #: TIL-046FCC90**

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**Plot #: 16**      **99% Occupied Bandwidth Measurement, Freq: 806.00 MHz**  
**25 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



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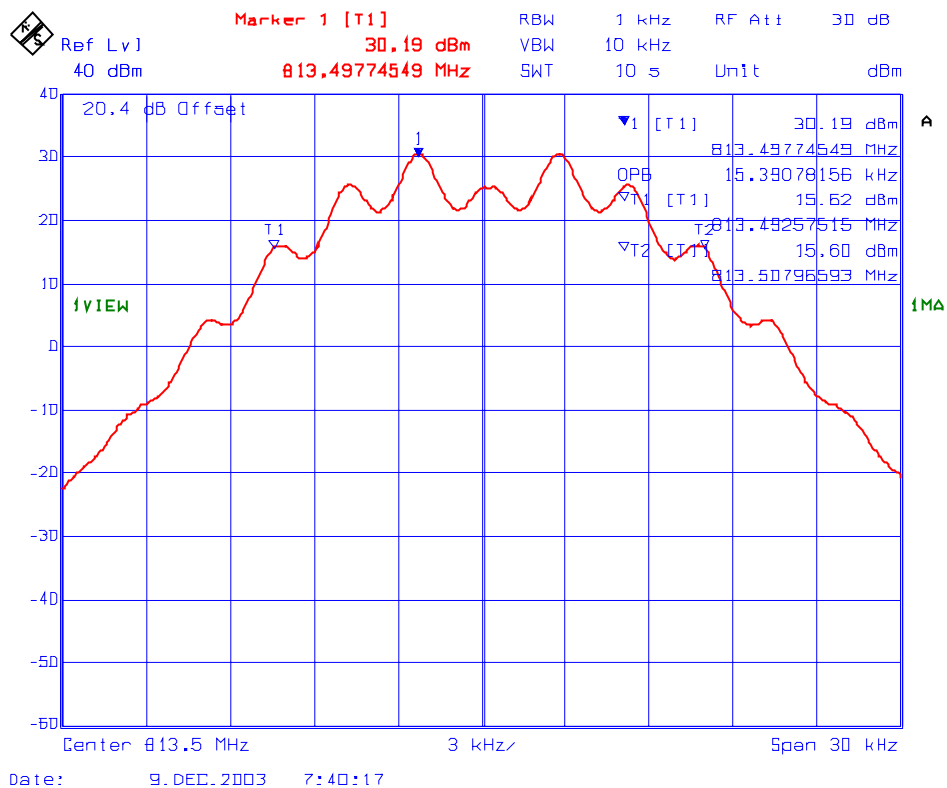
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4  
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: [vic@ultratech-labs.com](mailto:vic@ultratech-labs.com), Website: <http://www.ultratech-labs.com>

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**Plot #: 17      99% Occupied Bandwidth Measurement, Freq: 813.50 MHz**  
**25 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



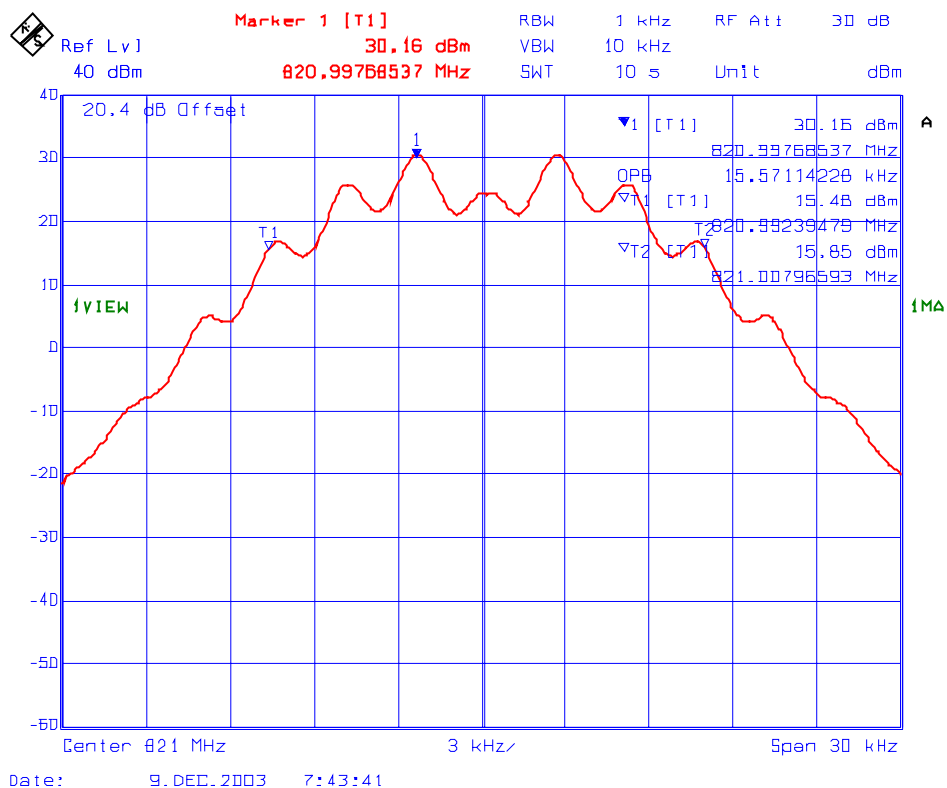
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**File #: TIL-046FCC90**

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**Plot #: 18**      **99% Occupied Bandwidth Measurement, Freq: 821.00 MHz**  
**25 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



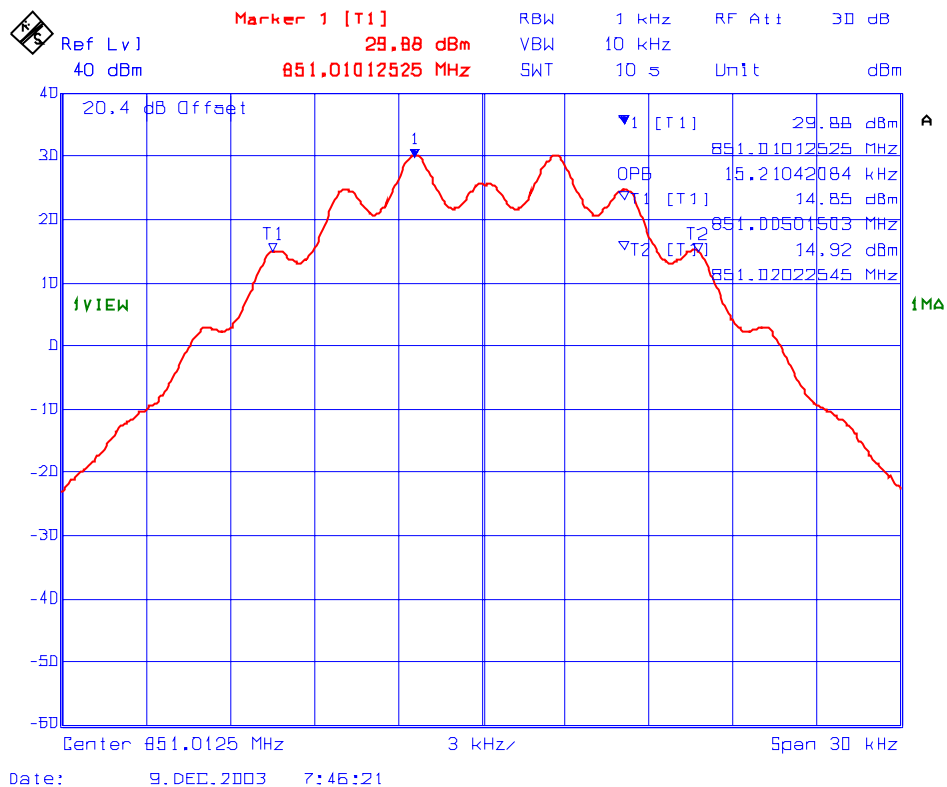
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**Plot #: 19**      **99% Occupied Bandwidth Measurement, Freq: 851.0125 MHz**  
**25 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



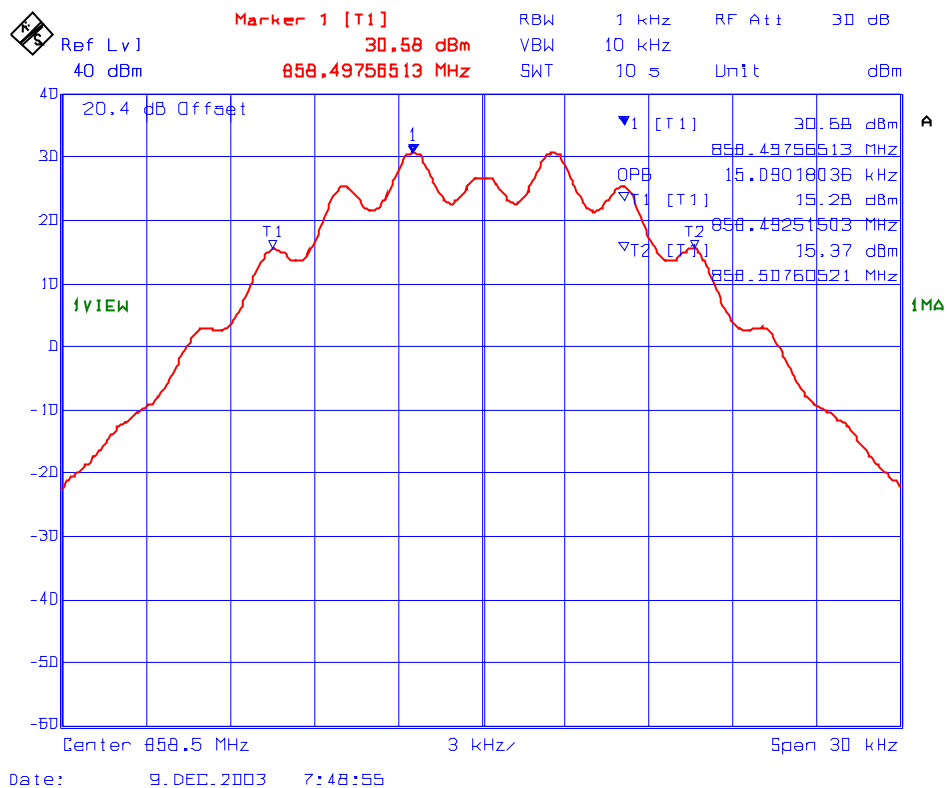
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**File #: TIL-046FCC90**

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**Plot #: 20**      **99% Occupied Bandwidth Measurement, Freq: 858.50 MHz**  
**25 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



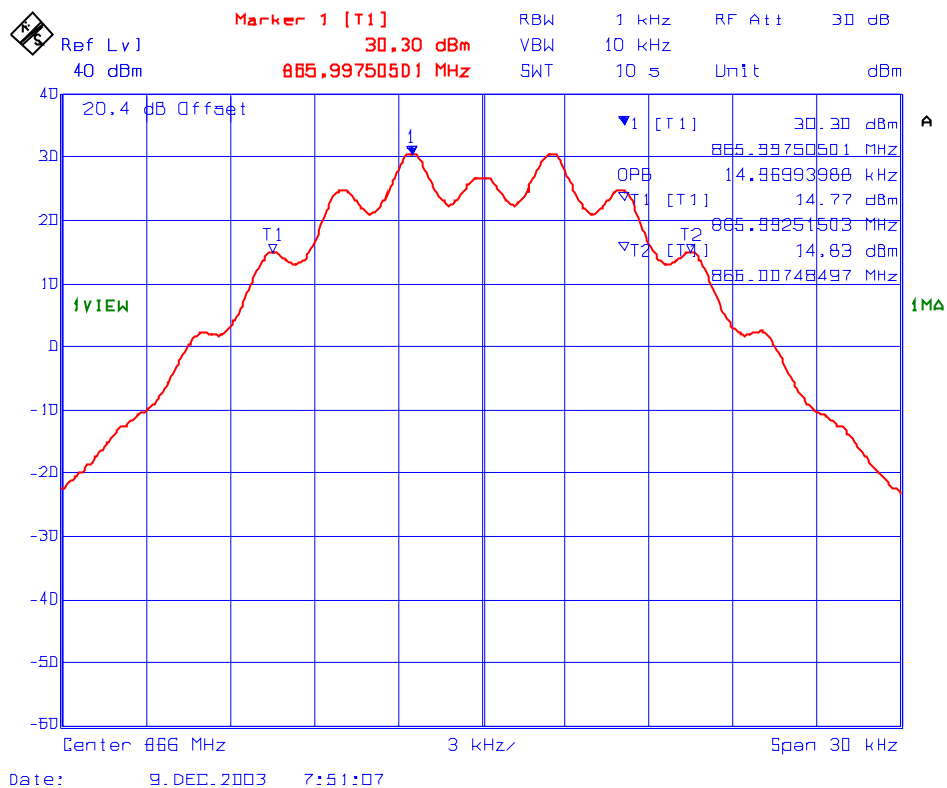
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**File #: TIL-046FCC90**

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**Plot #: 21      99% Occupied Bandwidth Measurement, Freq: 866.00 MHz**  
**25 kHz Channel Spacing, FM Modulation, 2.5 kHz Sine wave signal**



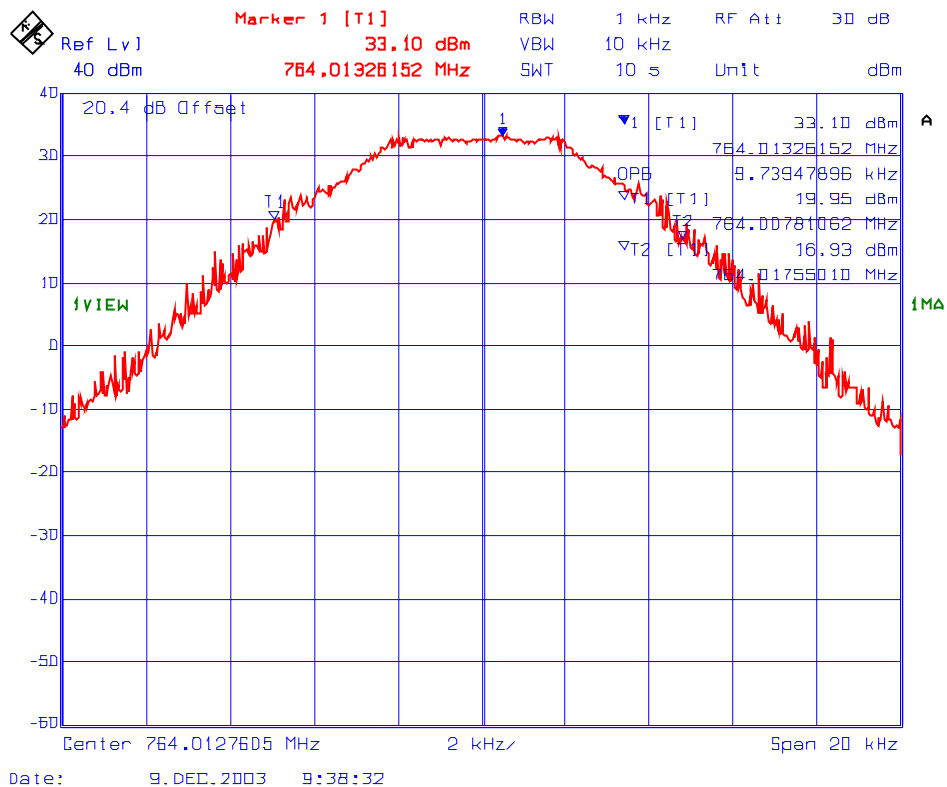
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**File #: TIL-046FCC90**

May 25, 2004

**Plot #: 22      99% Occupied Bandwidth Measurement, Freq: 764.0125 MHz  
12.5 kHz Channel Spacing, Digital Modulation**



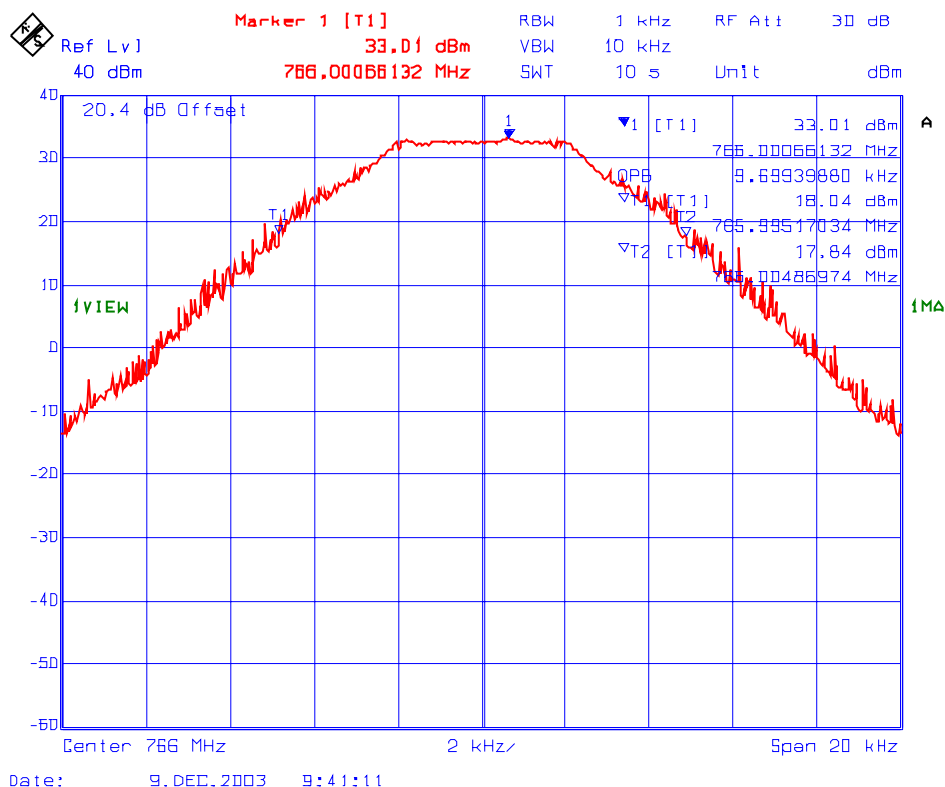
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**File #: TIL-046FCC90**

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**Plot #: 23      99% Occupied Bandwidth Measurement, Freq: 766.00 MHz**  
**12.5 kHz Channel Spacing, Digital Modulation**



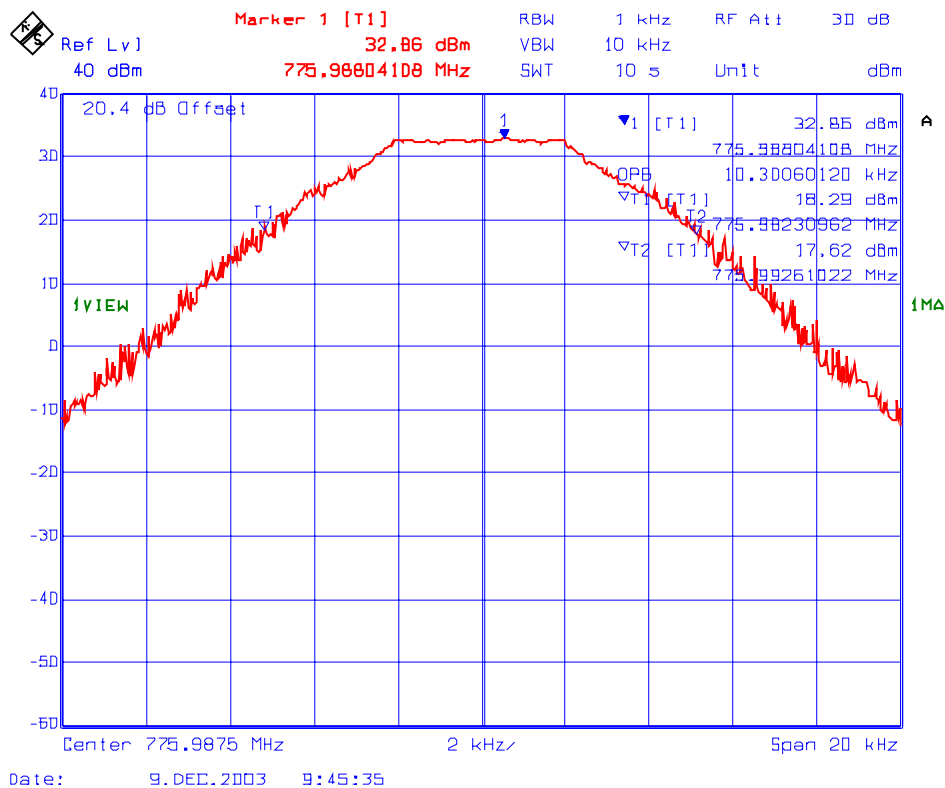
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**File #: TIL-046FCC90**

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**Plot #: 24      99% Occupied Bandwidth Measurement, Freq: 775.9875 MHz  
12.5 kHz Channel Spacing, Digital Modulation**



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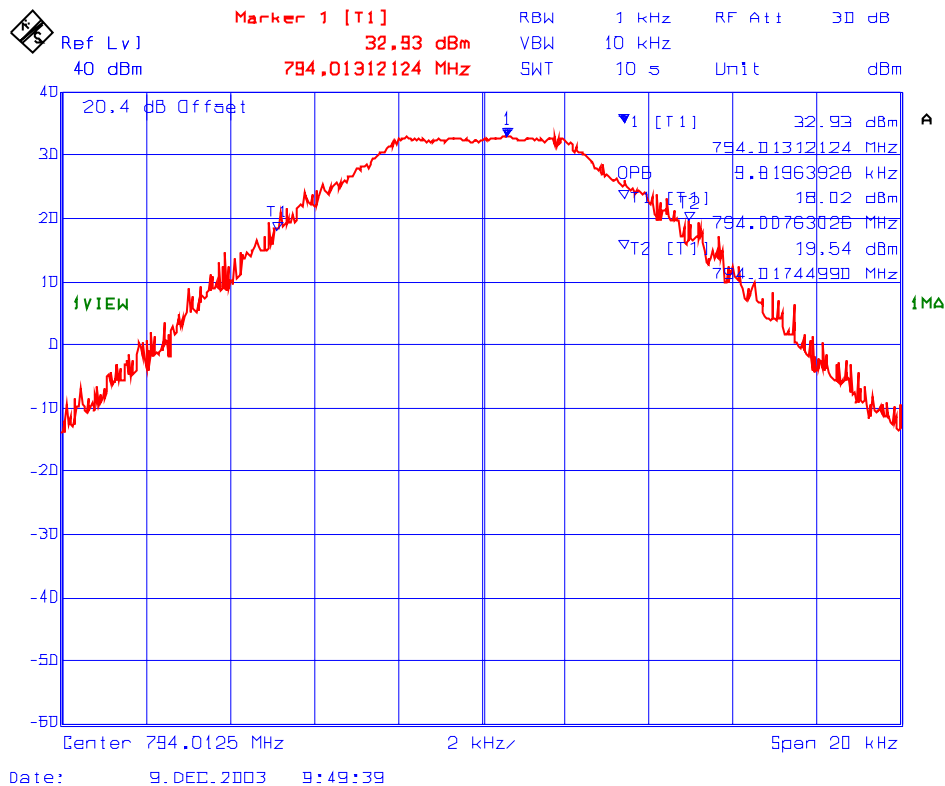
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4  
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**File #: TIL-046FCC90**

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**Plot #: 25      99% Occupied Bandwidth Measurement, Freq: 794.0125 MHz**  
**12.5 kHz Channel Spacing, Digital Modulation**



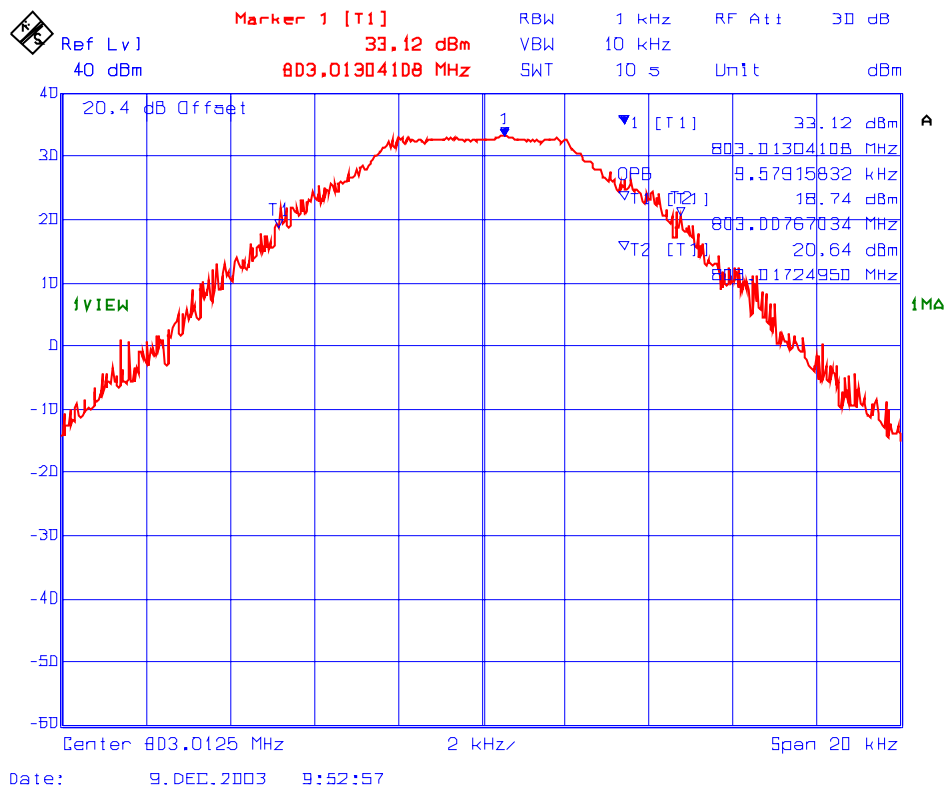
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**File #: TIL-046FCC90**

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**Plot #: 26      99% Occupied Bandwidth Measurement, Freq: 803.0125 MHz  
12.5 kHz Channel Spacing, Digital Modulation**



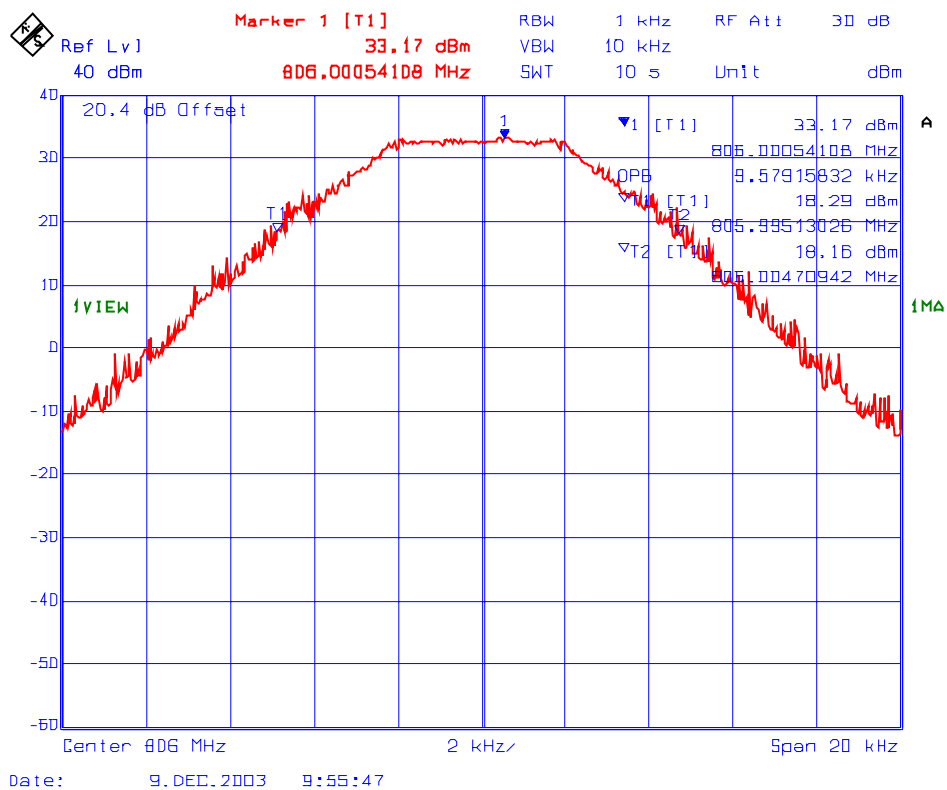
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**Plot #: 27      99% Occupied Bandwidth Measurement, Freq: 806.00 MHz**  
**12.5 kHz Channel Spacing, Digital Modulation**



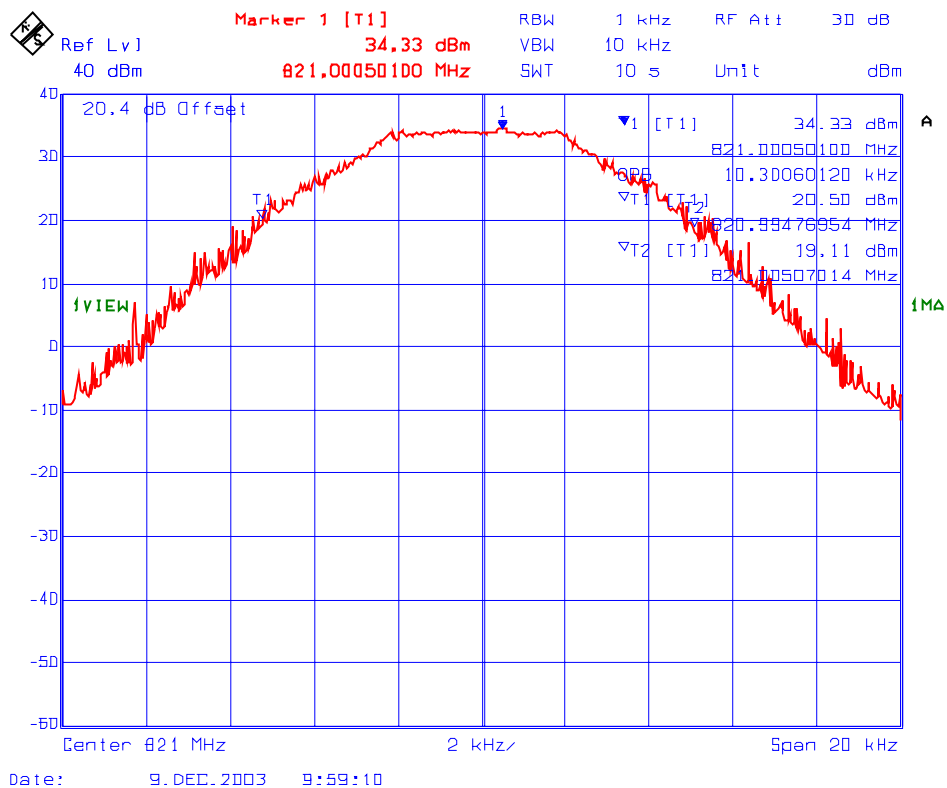
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**File #: TIL-046FCC90**

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**Plot #: 28      99% Occupied Bandwidth Measurement, Freq: 821.00 MHz**  
**12.5 kHz Channel Spacing, Digital Modulation**



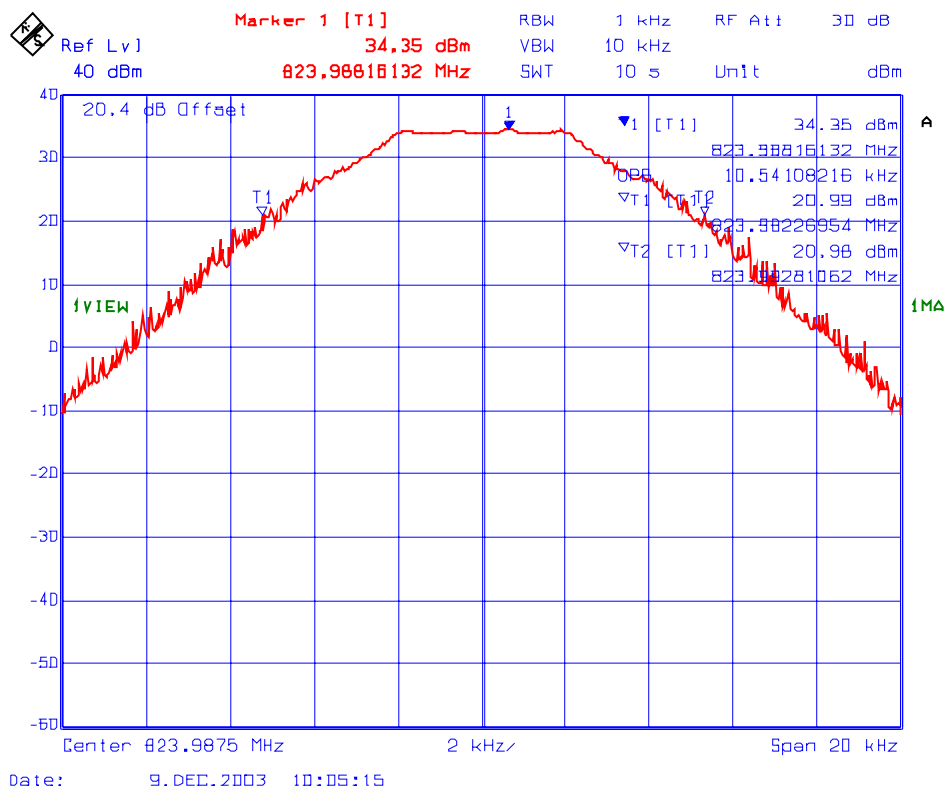
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**File #: TIL-046FCC90**

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**Plot #: 29      99% Occupied Bandwidth Measurement, Freq: 823.9875 MHz  
12.5 kHz Channel Spacing, Digital Modulation**



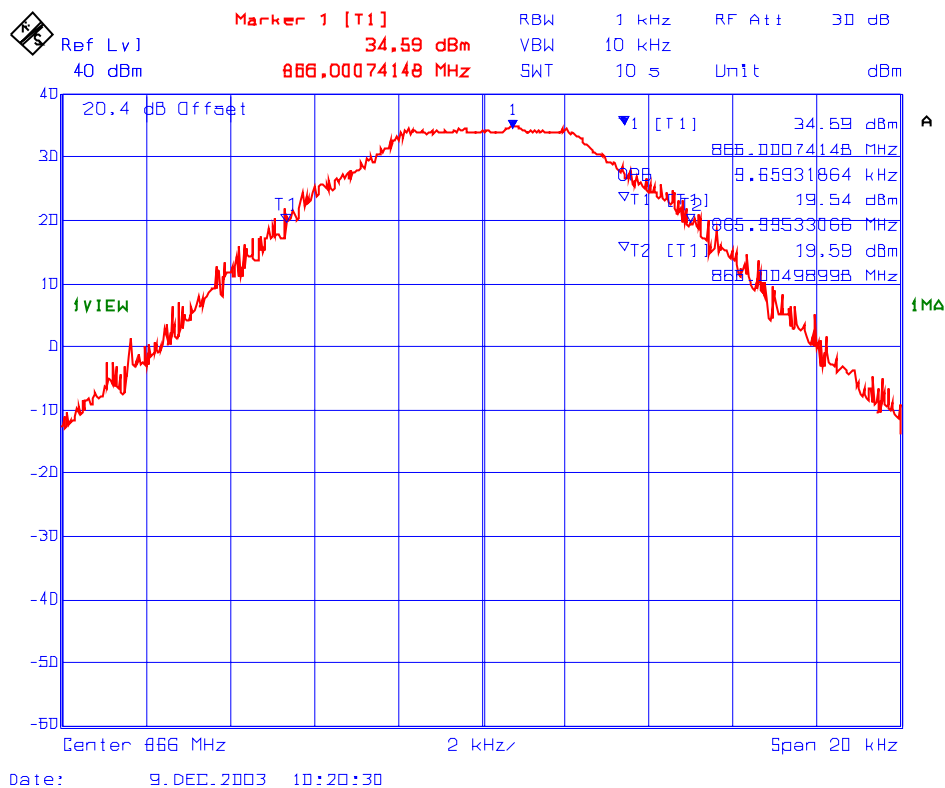
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**File #: TIL-046FCC90**

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**Plot #: 30      99% Occupied Bandwidth Measurement, Freq: 866.00 MHz**  
**12.5 kHz Channel Spacing, Digital Modulation**



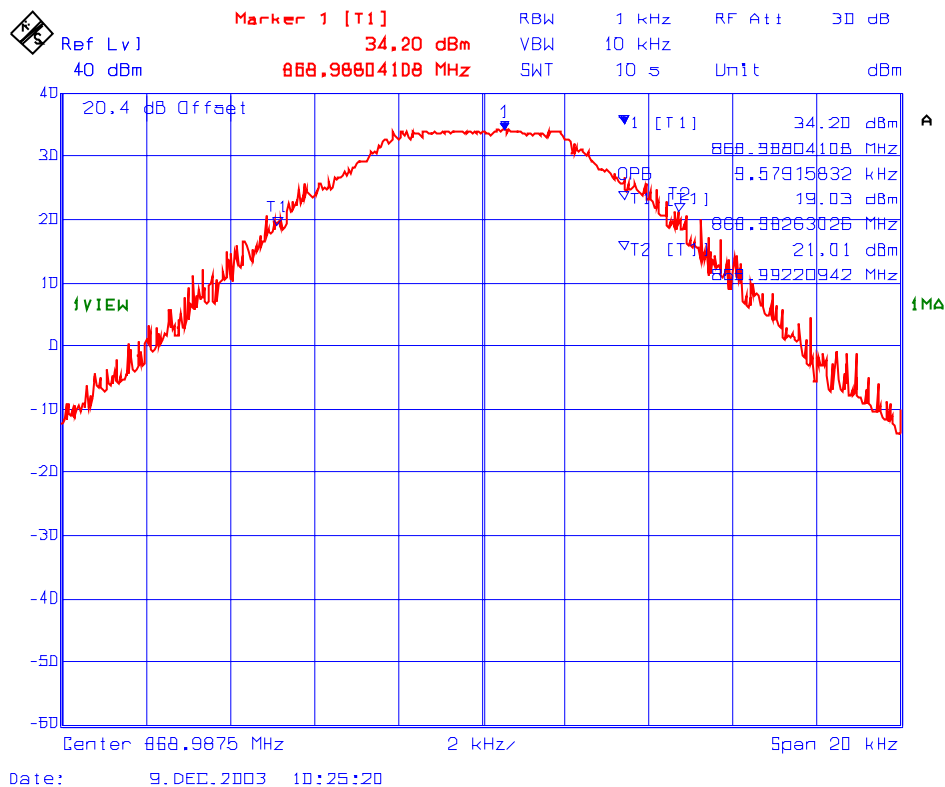
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**File #: TIL-046FCC90**

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**Plot #: 31      99% Occupied Bandwidth Measurement, Freq: 868.9875 MHz  
12.5 kHz Channel Spacing, Digital Modulation**



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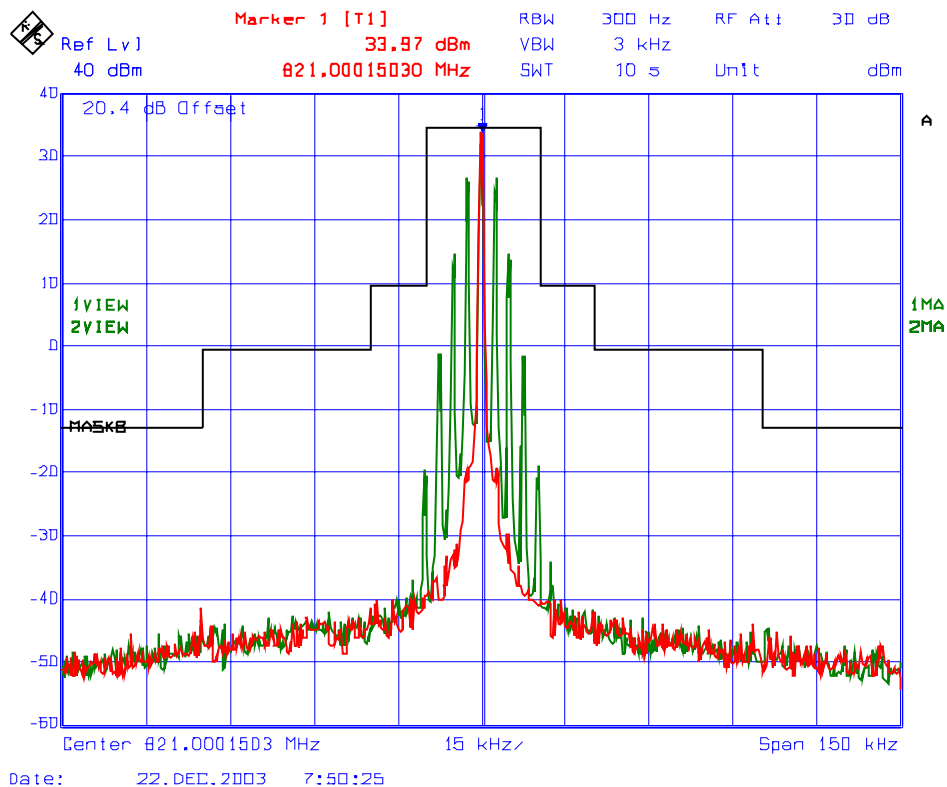
### 6.10.5.2. Emission Masks

Conform.

- Please refer to Plots # 32 and # 33 for Details of Emission Mask B (Voice) Measurements in high power mode for 12.5 kHz Channel Spacing operation in 821-824 MHz Band.
- Please refer to Plots # 34 and # 35 for Details of Emission Mask B (Voice) Measurements in high power mode for 12.5 kHz Channel Spacing operation in 866-869 MHz Band.
- Please refer to Plots # 36 and # 37 for Details of Emission Mask B (Voice) Measurements in low power mode for 12.5 kHz Channel Spacing operation in 821-824 MHz Band.
- Please refer to Plots # 38 and # 39 for Details of Emission Mask B (Voice) Measurements in low power mode for 12.5 kHz Channel Spacing operation in 866-869 MHz Band.
- Please refer to Plots # 40 through # 42 for Details of Emission Mask B (Voice) Measurements in high power mode for 25 kHz Channel Spacing operation in 806-821 MHz Band.
- Please refer to Plots # 43 through # 45 for Details of Emission Mask B (Voice) Measurements in high power mode for 25 kHz Channel Spacing operation in 851-866 MHz Band.
- Please refer to Plots # 46 through # 48 for Details of Emission Mask B (Voice) Measurements in low power mode for 25 kHz Channel Spacing operation in 806-821 MHz Band.
- Please refer to Plots # 49 through # 51 for Details of Emission Mask B (Voice) Measurements in low power mode for 25 kHz Channel Spacing operation in 851-866 MHz Band.
- Please refer to Plots # 52 and # 53 for Details of Emission Mask H (Data) Measurements in high power mode for 12.5 kHz Channel Spacing operation in 821-824 MHz Band.
- Please refer to Plots # 54 and # 55 for Details of Emission Mask H (Data) Measurements in high power mode for 12.5 kHz Channel Spacing operation in 866-869 MHz Band.
- Please refer to Plots # 56 and # 57 for Details of Emission Mask H (Data) Measurements in low power mode for 12.5 kHz Channel Spacing operation in 821-824 MHz Band.
- Please refer to Plots # 58 and # 59 for Details of Emission Mask H (Data) Measurements in low power mode for 12.5 kHz Channel Spacing operation in 866-869 MHz Band.



**Plot # 32**      **Emission Mask B (Voice), High Power, Freq. 821.00 MHz**  
**FM Modulation with 2.5 kHz Sine wave signal, 12.5 kHz Channel Spacing**



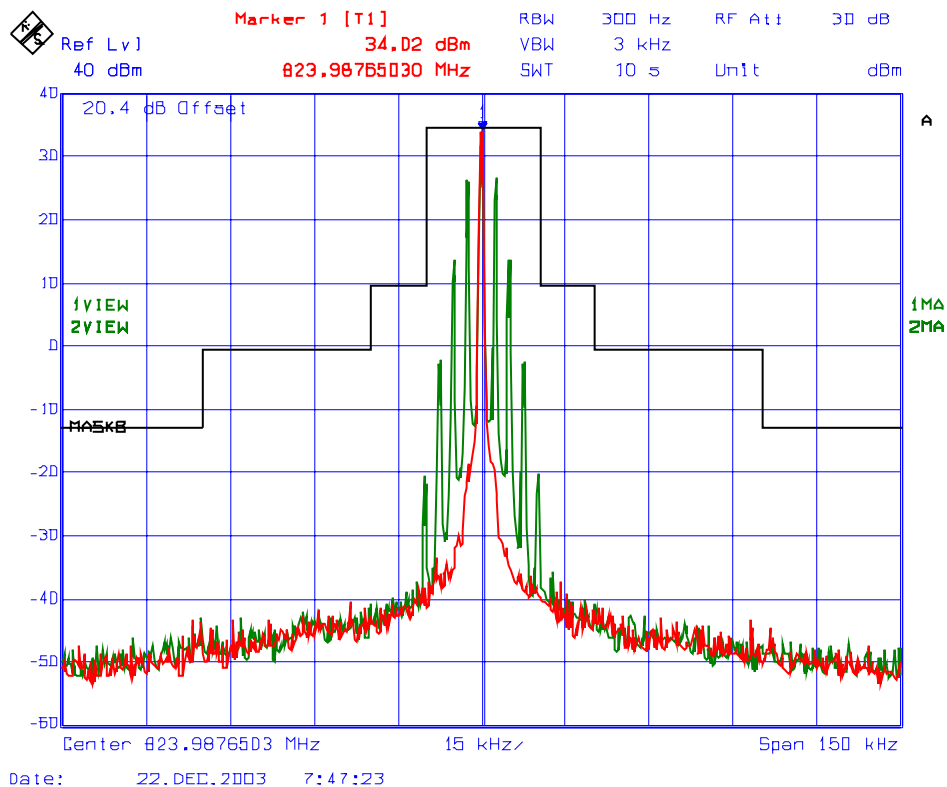
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**Plot # 33**      **Emission Mask B (Voice), High Power, Freq. 823.9875 MHz**  
**FM Modulation with 2.5 kHz Sine wave signal, 12.5 kHz Channel Spacing**



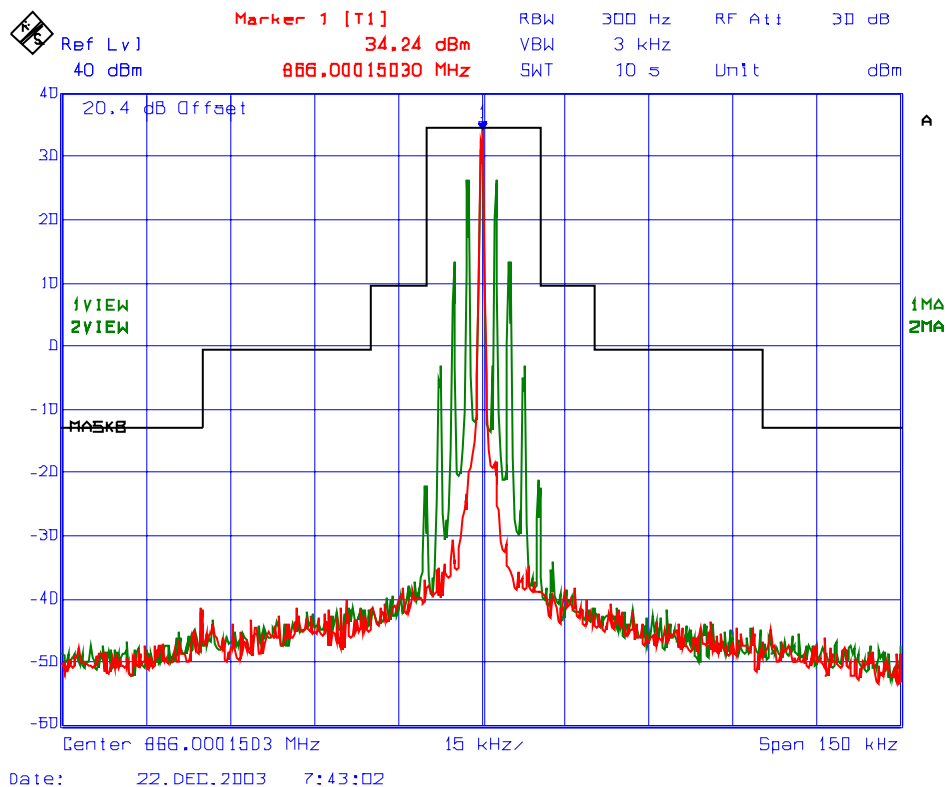
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**Plot # 34      Emission Mask B (Voice), High Power, Freq. 866.00 MHz**  
**FM Modulation with 2.5 kHz Sine wave signal, 12.5 kHz Channel Spacing**



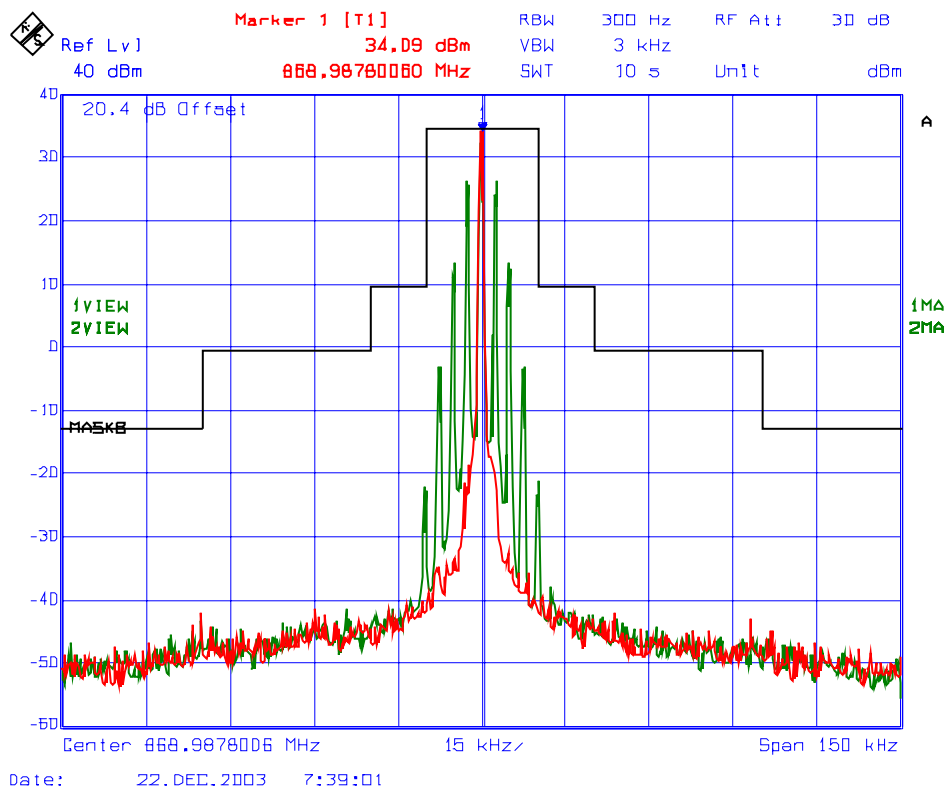
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**File #: TIL-046FCC90**

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**Plot # 35**      **Emission Mask B (Voice), High Power, Freq. 868.9875 MHz**  
**FM Modulation with 2.5 kHz Sine wave signal, 12.5 kHz Channel Spacing**



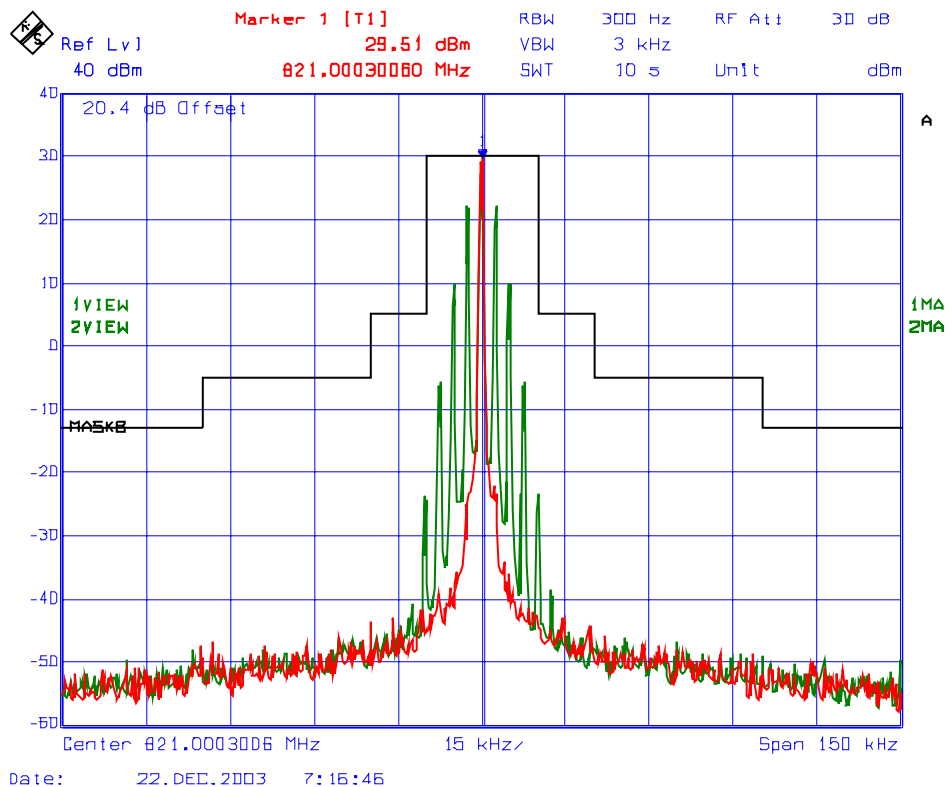
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**Plot # 36**      **Emission Mask B (Voice), Low Power, Freq. 821.00 MHz**  
**FM Modulation with 2.5 kHz Sine wave signal, 12.5 kHz Channel Spacing**



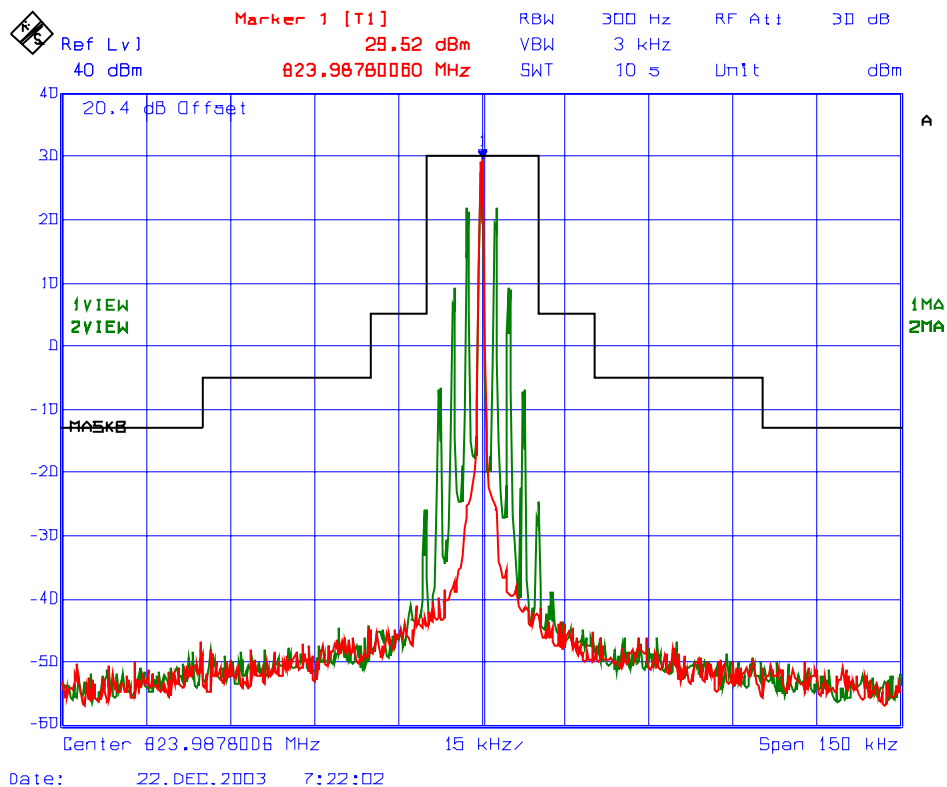
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**File #: TIL-046FCC90**

May 25, 2004

**Plot # 37**      **Emission Mask B (Voice), Low Power, Freq. 823.9875 MHz**  
**FM Modulation with 2.5 kHz Sine wave signal, 12.5 kHz Channel Spacing**



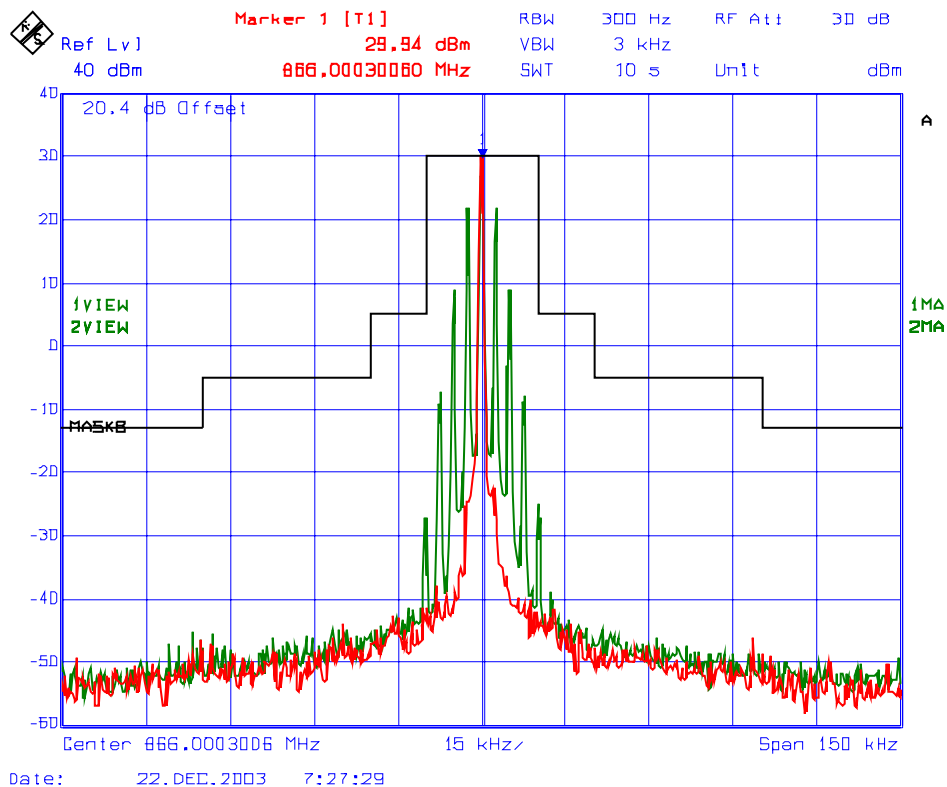
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**Plot # 38**      **Emission Mask B (Voice), Low Power, Freq. 866.00 MHz**  
**FM Modulation with 2.5 kHz Sine wave signal, 12.5 kHz Channel Spacing**



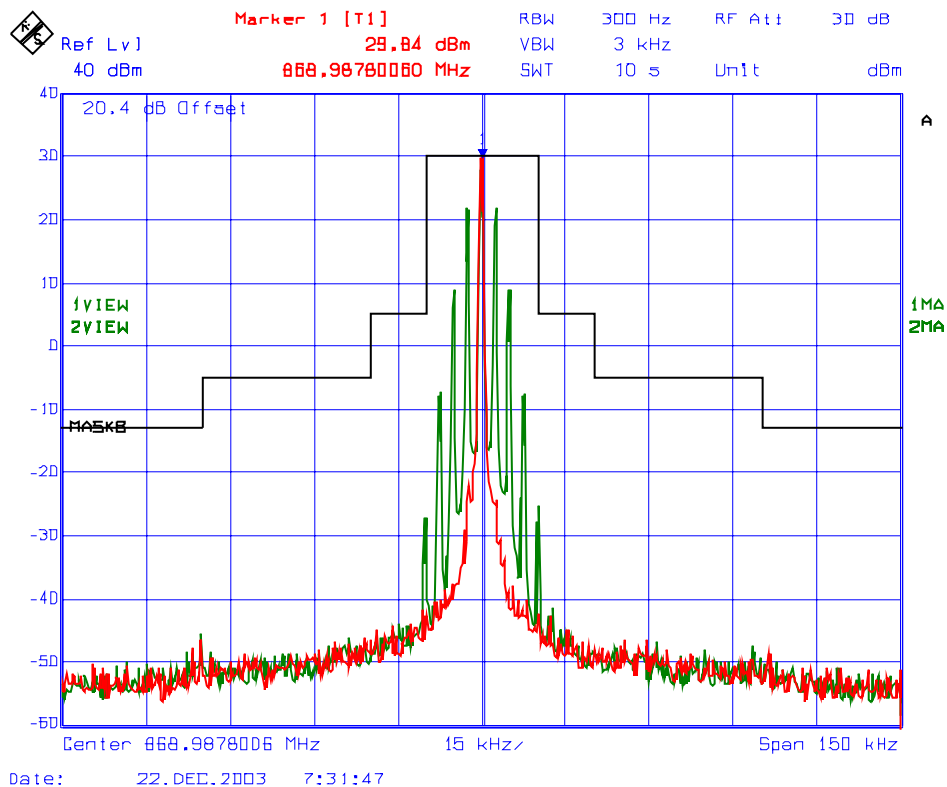
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Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: [vic@ultratech-labs.com](mailto:vic@ultratech-labs.com), Website: <http://www.ultratech-labs.com>

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**Plot # 39**      **Emission Mask B (Voice), Low Power, Freq. 868.9875 MHz**  
**FM Modulation with 2.5 kHz Sine wave signal, 12.5 kHz Channel Spacing**



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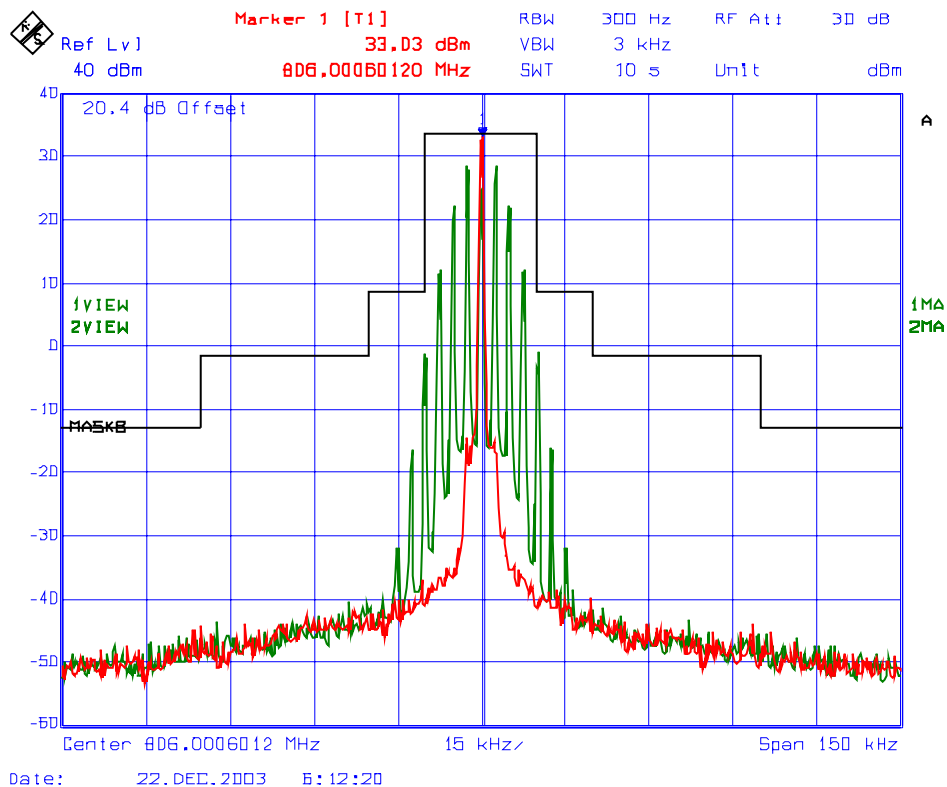
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4  
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: [vic@ultratech-labs.com](mailto:vic@ultratech-labs.com), Website: <http://www.ultratech-labs.com>

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**Plot # 40**      **Emission Mask B (Voice), High Power, Freq. 806.00 MHz**  
**FM Modulation with 2.5 kHz Sine wave signal, 25 kHz Channel Spacing**



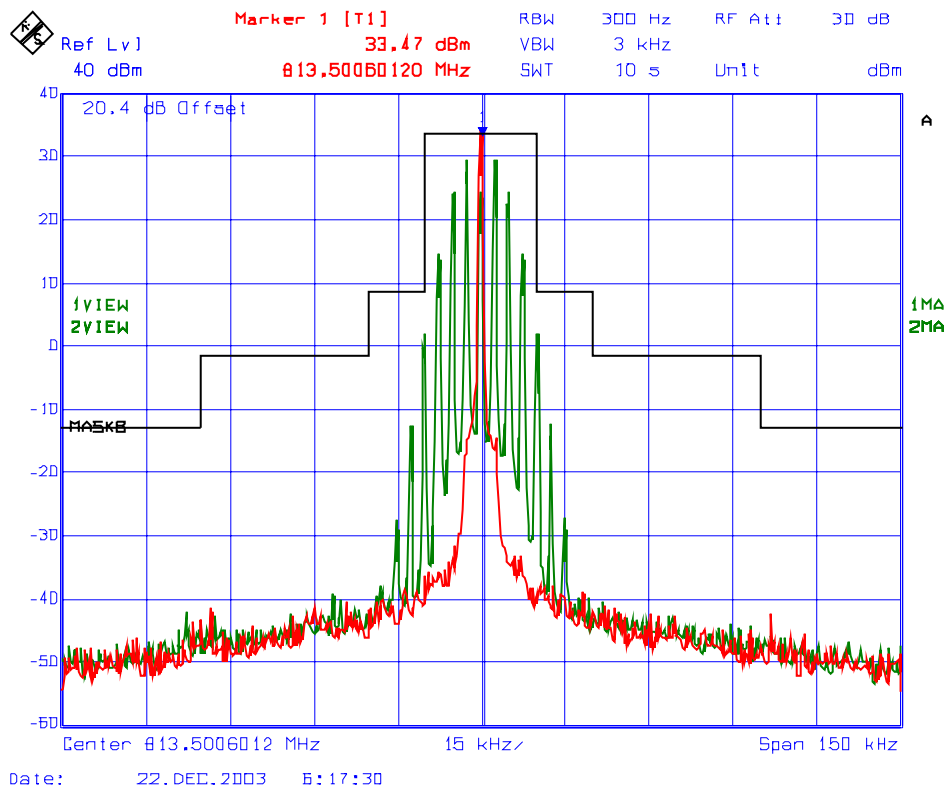
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**Plot # 41**      **Emission Mask B (Voice), High Power, Freq. 813.50 MHz**  
**FM Modulation with 2.5 kHz Sine wave signal, 25 kHz Channel Spacing**



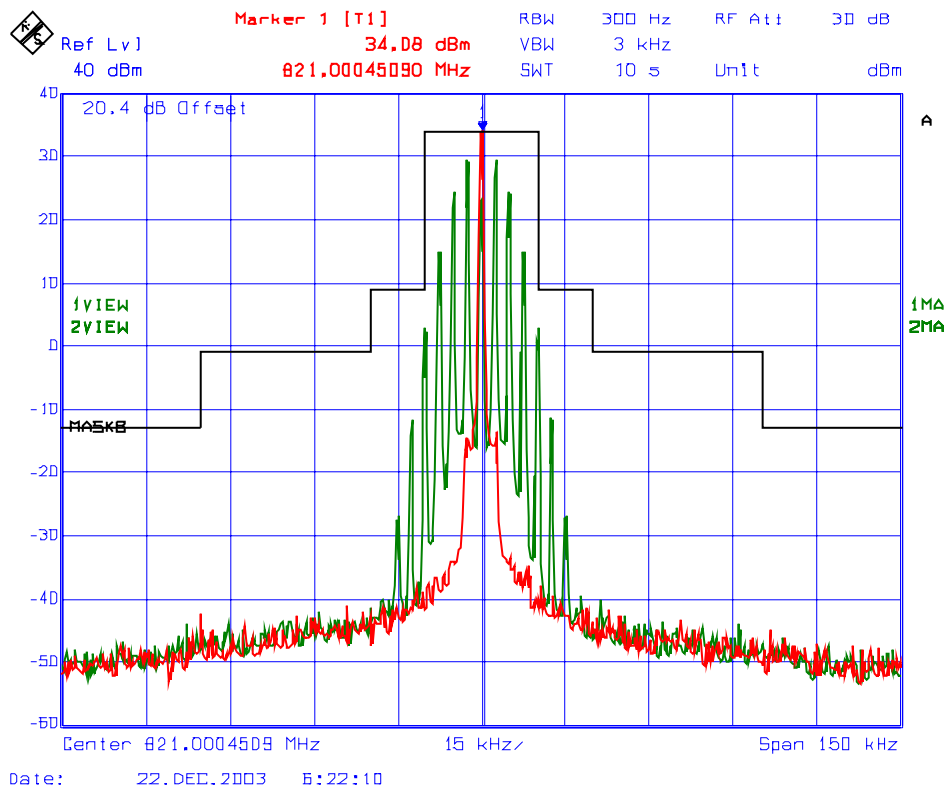
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**Plot # 42      Emission Mask B (Voice), High Power, Freq. 821.00 MHz**  
**FM Modulation with 2.5 kHz Sine wave signal, 25 kHz Channel Spacing**



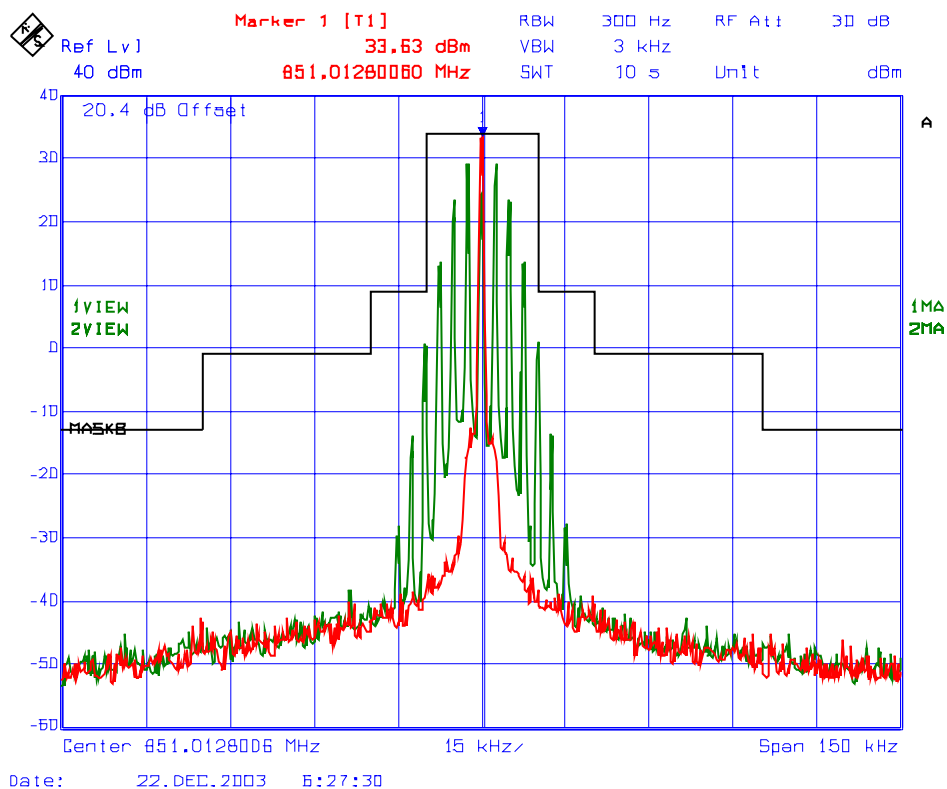
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**Plot # 43**      **Emission Mask B (Voice), High Power, Freq. 851.0125 MHz**  
**FM Modulation with 2.5 kHz Sine wave signal, 25 kHz Channel Spacing**



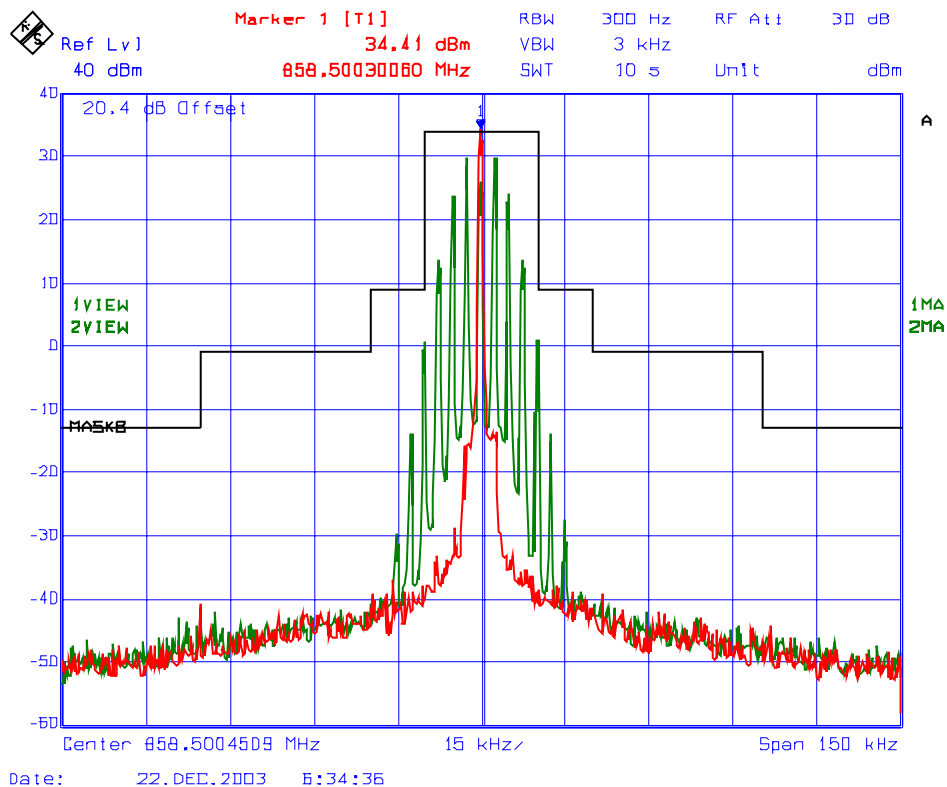
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**Plot # 44**      **Emission Mask B (Voice), High Power, Freq. 858.50 MHz**  
**FM Modulation with 2.5 kHz Sine wave signal, 25 kHz Channel Spacing**



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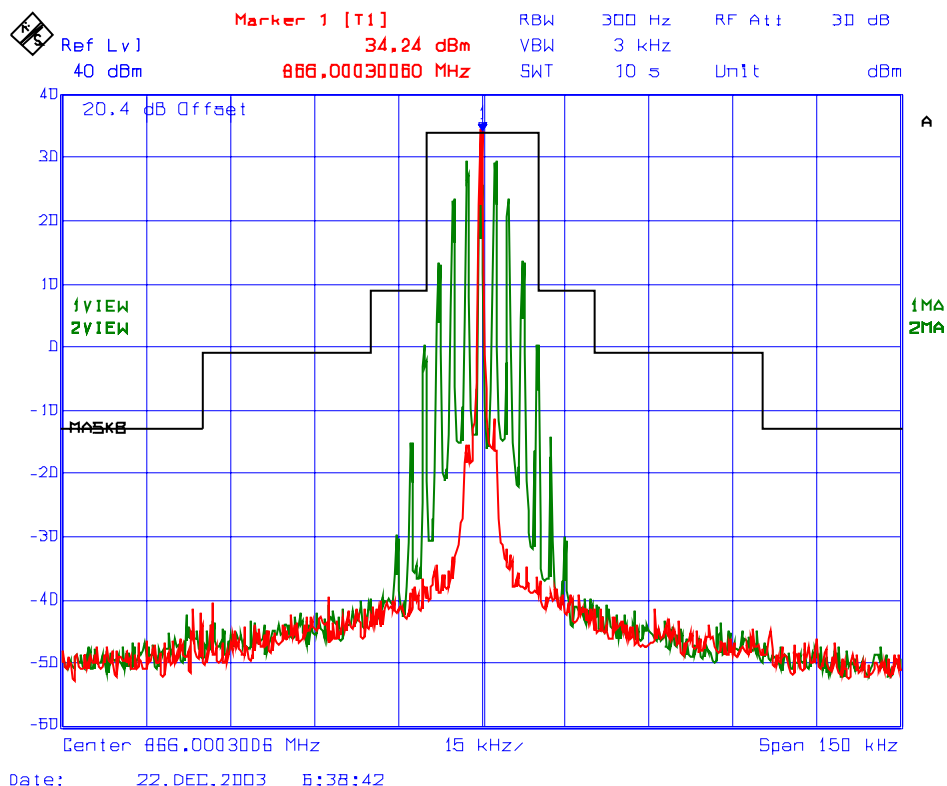
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4  
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: [vic@ultratech-labs.com](mailto:vic@ultratech-labs.com), Website: <http://www.ultratech-labs.com>

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**Plot # 45**      **Emission Mask B (Voice), High Power, Freq. 866.00 MHz**  
**FM Modulation with 2.5 kHz Sine wave signal, 25 kHz Channel Spacing**



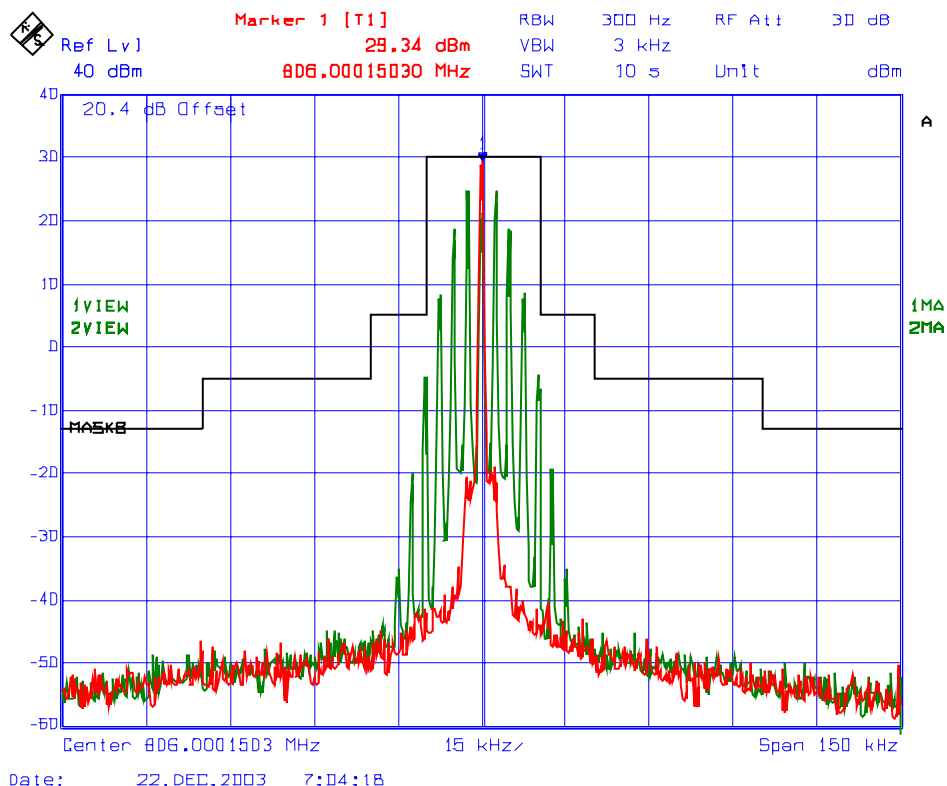
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**File #: TIL-046FCC90**

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**Plot # 46      Emission Mask B (Voice), Low Power, Freq. 806.00 MHz**  
**FM Modulation with 2.5 kHz Sine wave signal, 25 kHz Channel Spacing**



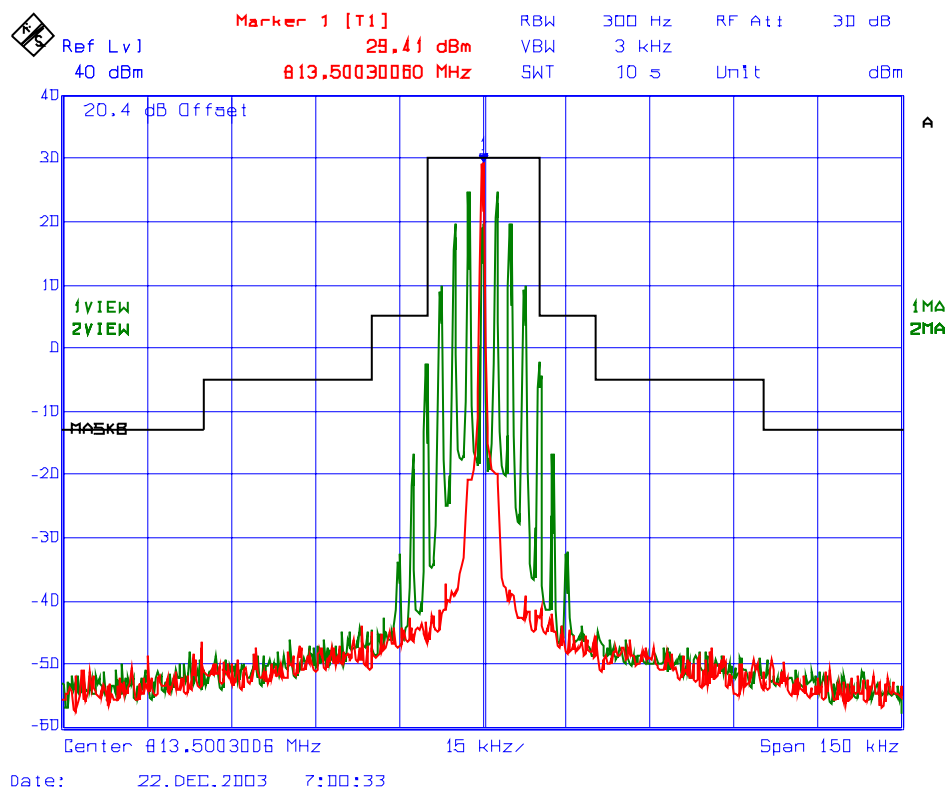
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**Plot # 47**      **Emission Mask B (Voice), Low Power, Freq. 813.50 MHz**  
**FM Modulation with 2.5 kHz Sine wave signal, 25 kHz Channel Spacing**



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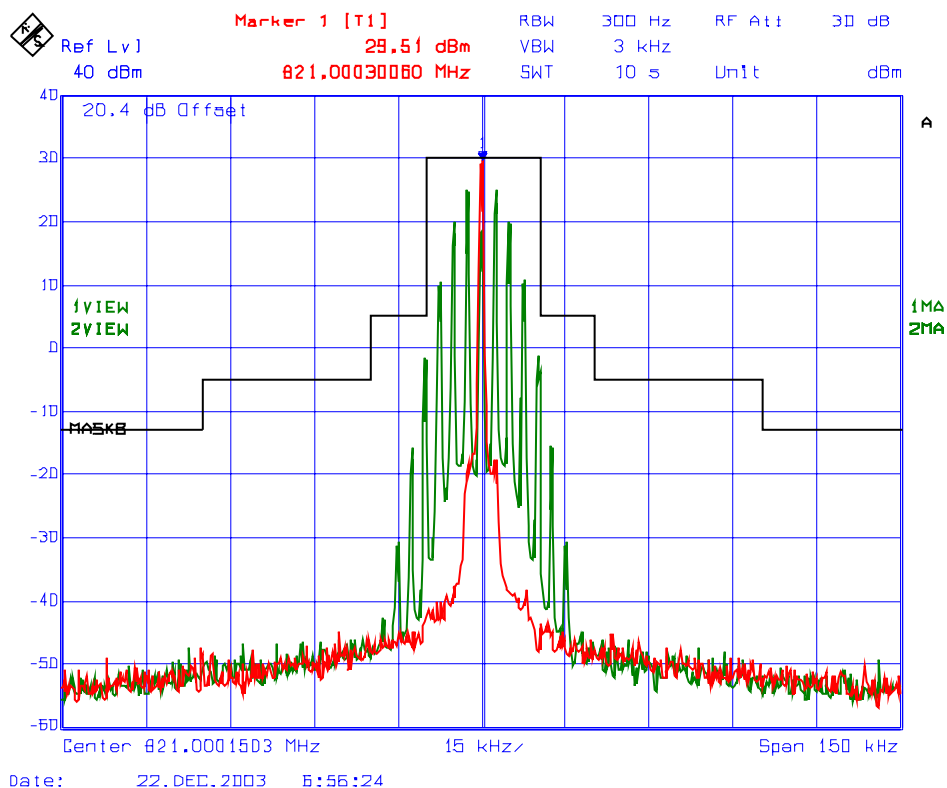
**File #: TIL-046FCC90**

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**Plot # 48**      **Emission Mask B (Voice), Low Power, Freq. 821.00 MHz**  
**FM Modulation with 2.5 kHz Sine wave signal, 25 kHz Channel Spacing**



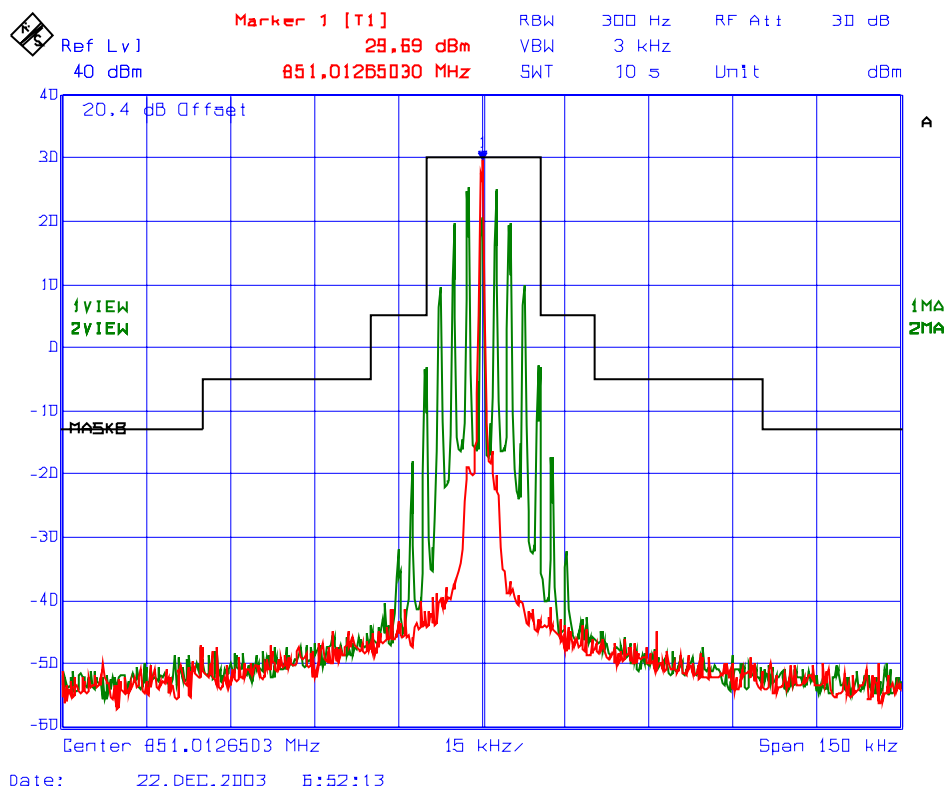
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Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: [vic@ultratech-labs.com](mailto:vic@ultratech-labs.com), Website: <http://www.ultratech-labs.com>

**File #: TIL-046FCC90**

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**Plot # 49**      **Emission Mask B (Voice), Low Power, Freq. 851.0125 MHz**  
**FM Modulation with 2.5 kHz Sine wave signal, 25 kHz Channel Spacing**



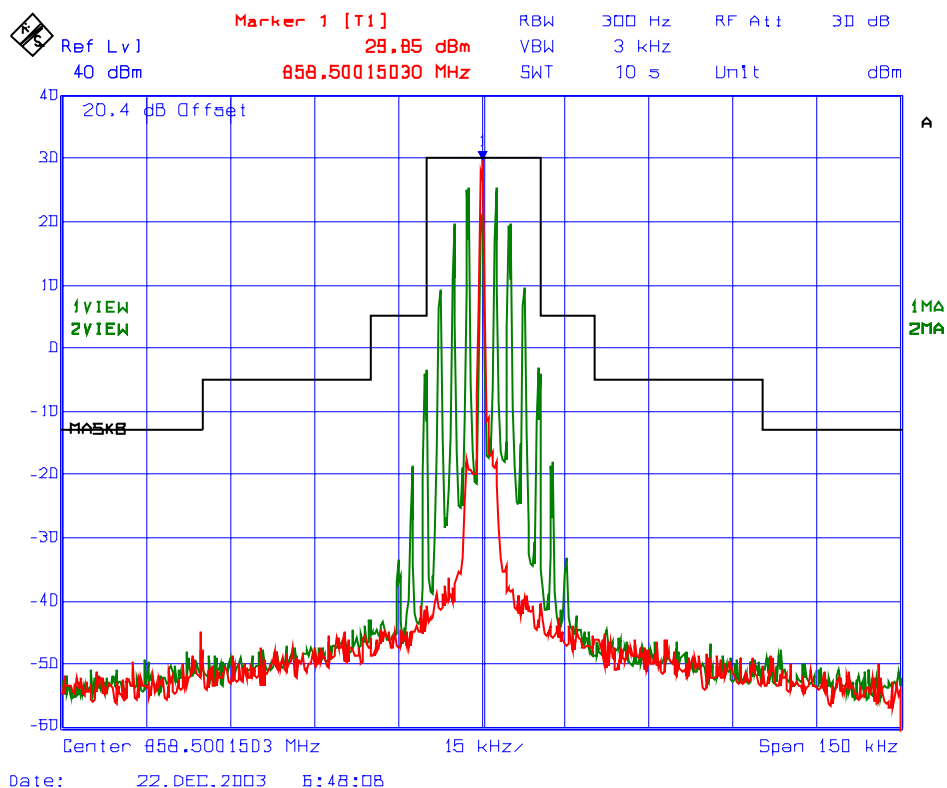
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**Plot # 50**      **Emission Mask B (Voice), Low Power, Freq. 858.50 MHz**  
**FM Modulation with 2.5 kHz Sine wave signal, 25 kHz Channel Spacing**



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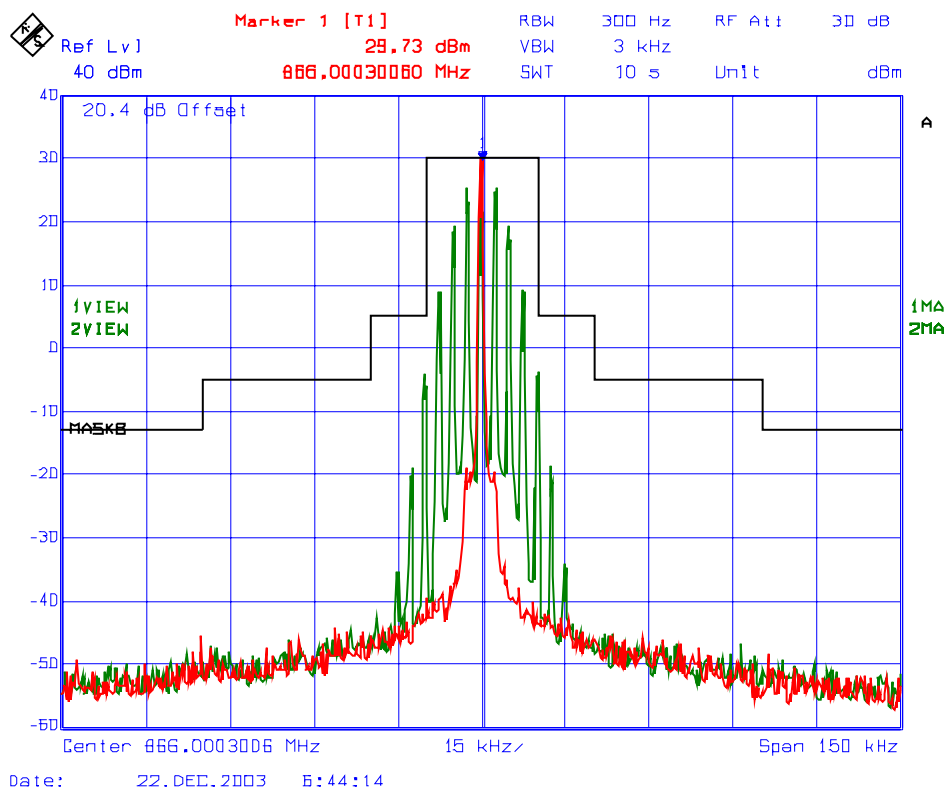
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4  
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: [vic@ultratech-labs.com](mailto:vic@ultratech-labs.com), Website: <http://www.ultratech-labs.com>

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**Plot # 51**      **Emission Mask B (Voice), Low Power, Freq. 866.00 MHz**  
**FM Modulation with 2.5 kHz Sine wave signal, 25 kHz Channel Spacing**



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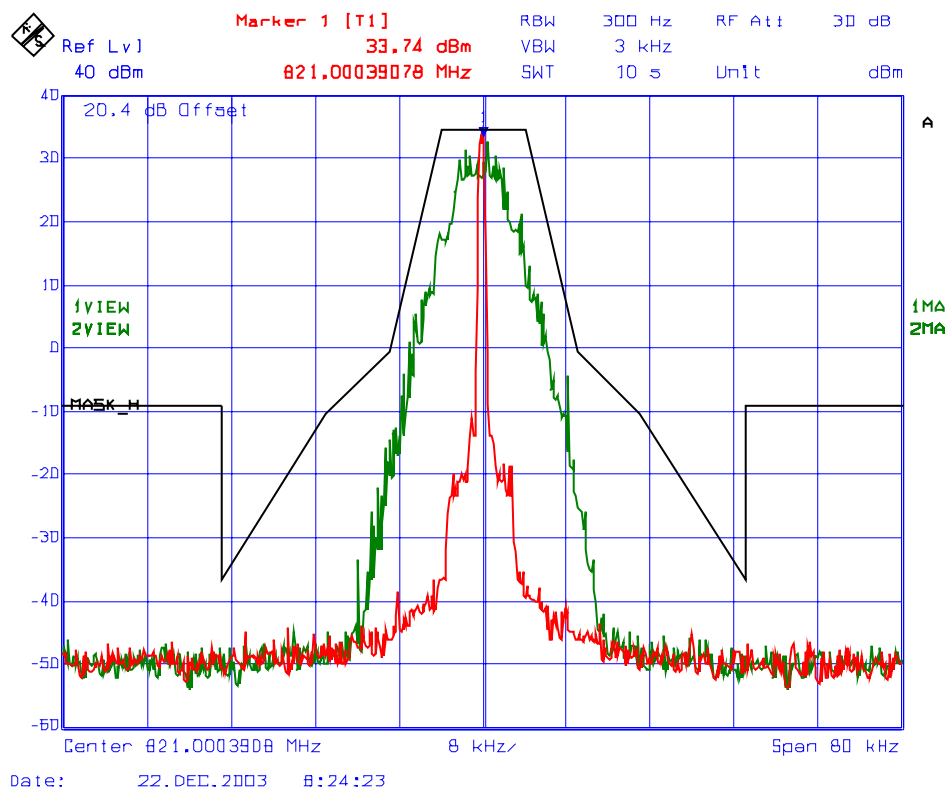
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4  
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: [vic@ultratech-labs.com](mailto:vic@ultratech-labs.com), Website: <http://www.ultratech-labs.com>

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**Plot # 52**      **Emission Mask H (Data), High Power, Freq. 821.00 MHz**  
**Digital Modulation, 12.5 kHz Channel Spacing**



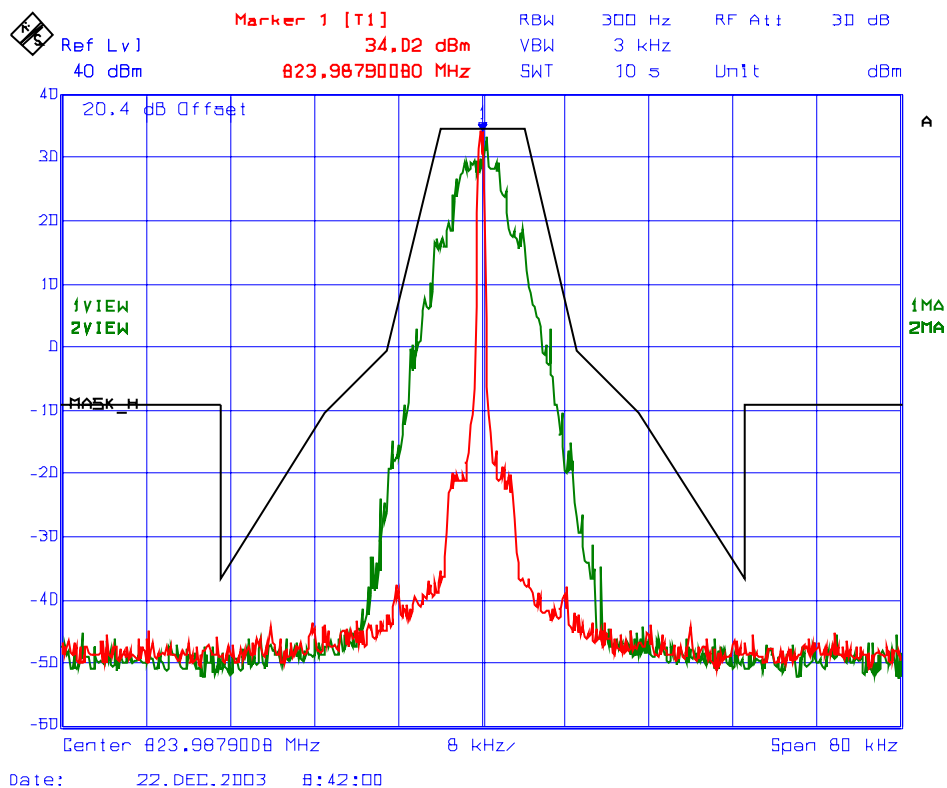
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**Plot # 53**      **Emission Mask H (Data), High Power, Freq. 823.9875 MHz**  
**Digital Modulation, 12.5 kHz Channel Spacing**



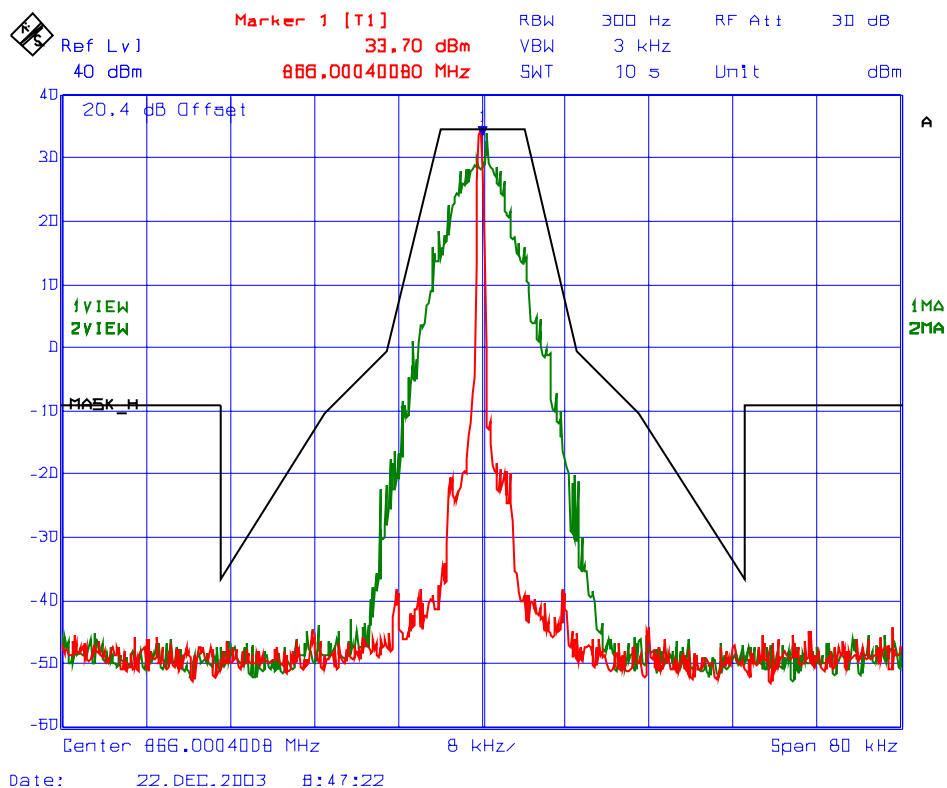
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**Plot # 54**      **Emission Mask H (Data), High Power, Freq. 866.00 MHz**  
**Digital Modulation, 12.5 kHz Channel Spacing**



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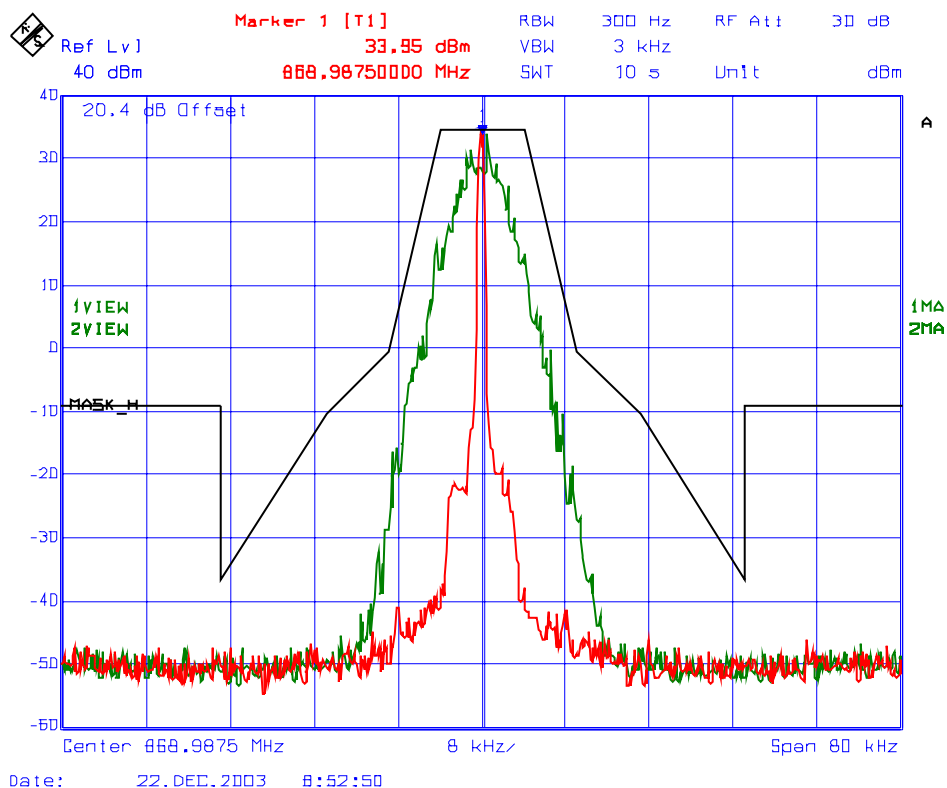
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4  
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: [vic@ultratech-labs.com](mailto:vic@ultratech-labs.com), Website: <http://www.ultratech-labs.com>

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**Plot # 55**      **Emission Mask H (Data), High Power, Freq. 868.9875 MHz**  
**Digital Modulation, 12.5 kHz Channel Spacing**



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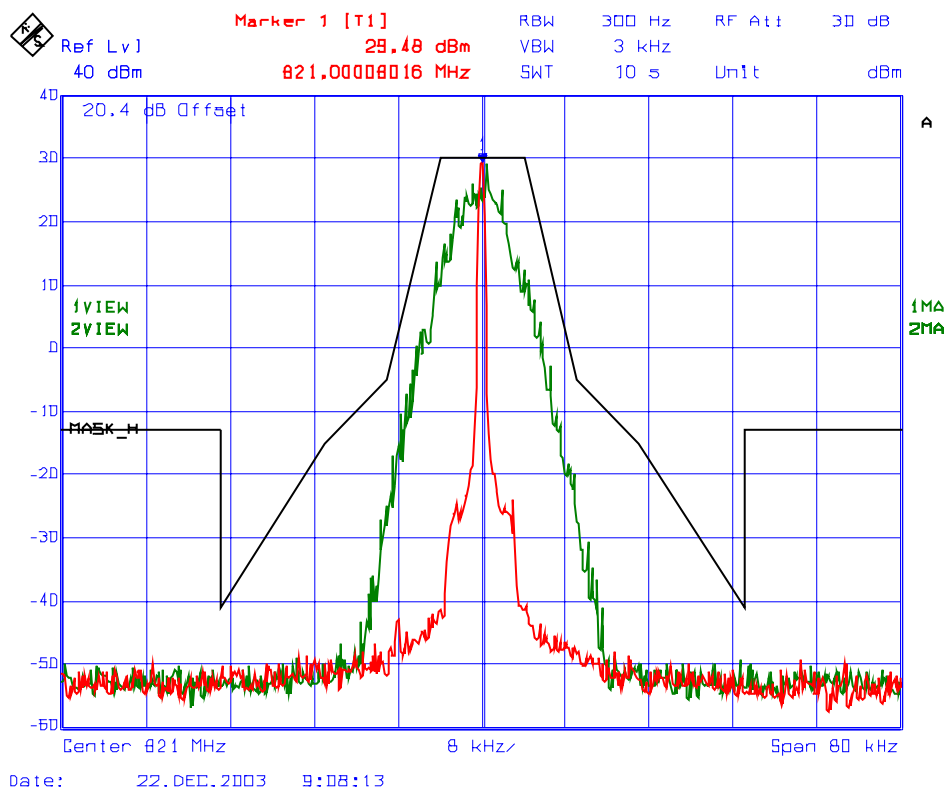
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4  
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: [vic@ultratech-labs.com](mailto:vic@ultratech-labs.com), Website: <http://www.ultratech-labs.com>

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**Plot # 56**      **Emission Mask H (Data), Low Power, Freq. 821.00 MHz**  
**Digital Modulation, 12.5 kHz Channel Spacing**



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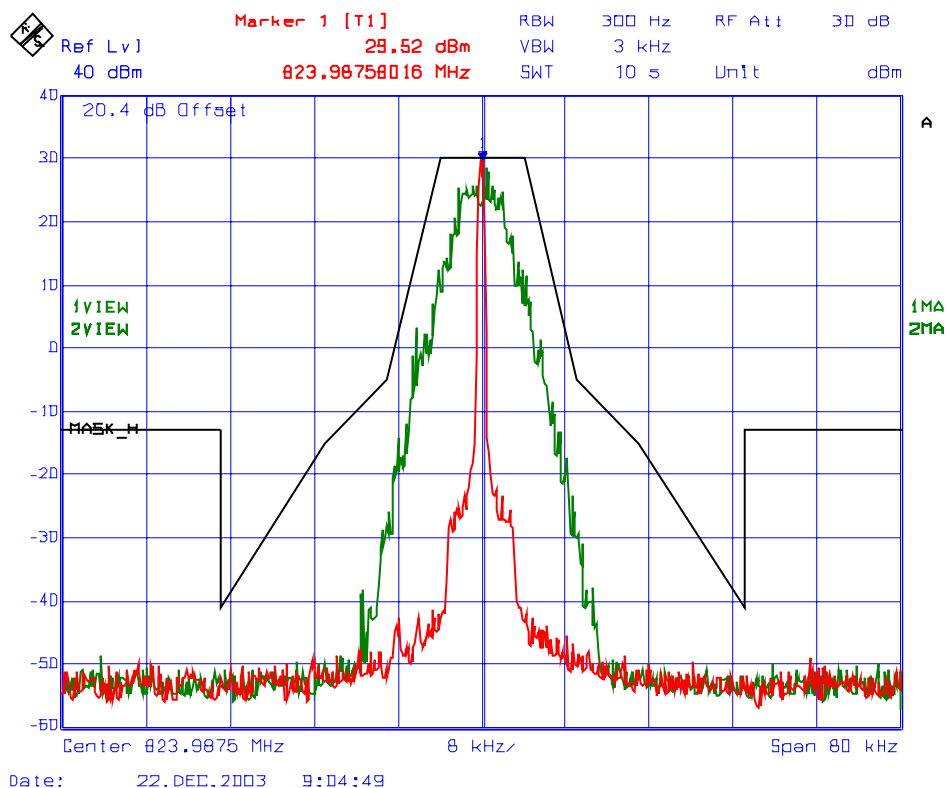
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4  
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: [vic@ultratech-labs.com](mailto:vic@ultratech-labs.com), Website: <http://www.ultratech-labs.com>

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**Plot # 57**      **Emission Mask H (Data), Low Power, Freq. 823.9875 MHz**  
**Digital Modulation, 12.5 kHz Channel Spacing**



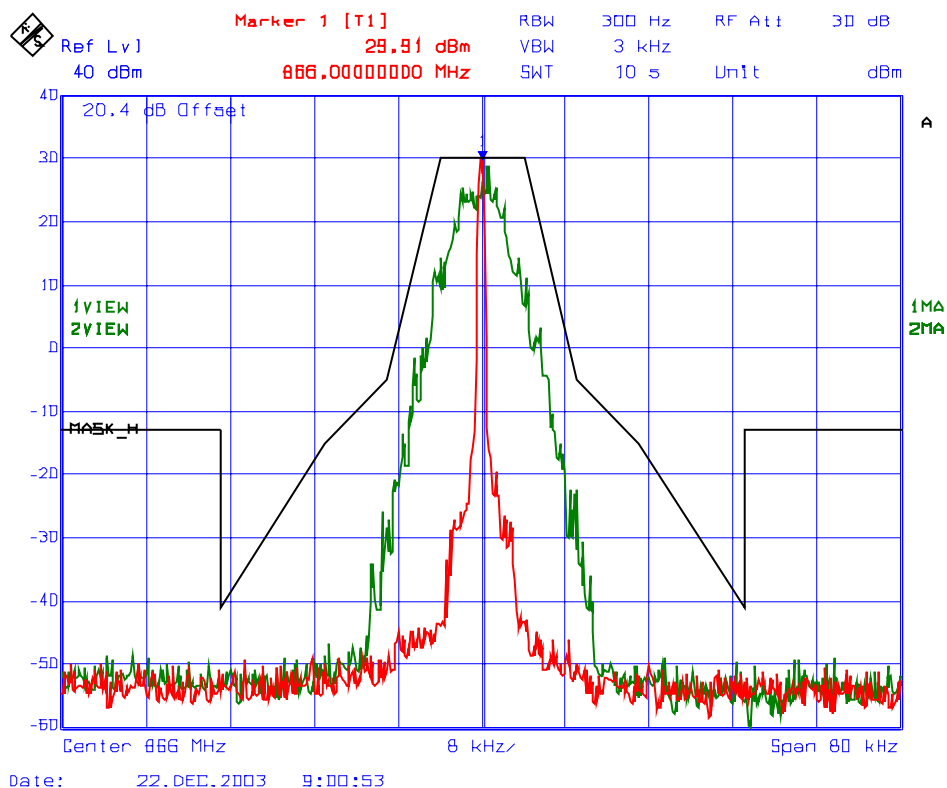
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**Plot # 58**      **Emission Mask H (Data), Low Power, Freq. 866.00 MHz**  
**Digital Modulation, 12.5 kHz Channel Spacing**



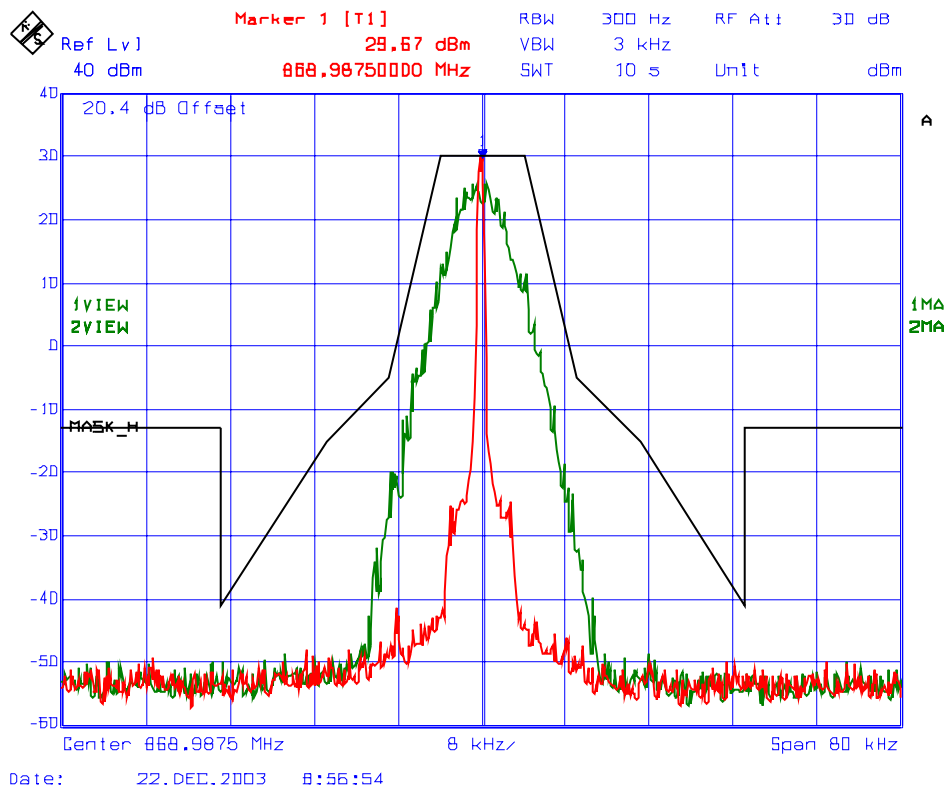
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**Plot # 59**      **Emission Mask H (Data), Low Power, Freq. 868.9875 MHz**  
**Digital Modulation, 12.5 kHz Channel Spacing**



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## 6.11. ADJACENT CHANNEL COUPLED POWER (ACCP) REQUIREMENTS FOR TRANSMITTER @FCC 90.543

### 6.11.1. Emissions Limitation @ 90.543

Transmitters designed to operate in 764-776 MHz and 794-806 MHz frequency bands must meet the emissions as per below:

#### 12.5 kHz Mobile Transmitter ACCP Requirements

| Offset from Center Frequency (kHz) | Measurement Bandwidth (kHz) | Maximum ACCP Relative (dBc) | Maximum ACCP Absolute (dBm) |
|------------------------------------|-----------------------------|-----------------------------|-----------------------------|
| 9.375                              | 6.25                        | -40                         | (\1\)                       |
| 15.625                             | 6.25                        | -60                         | -45                         |
| 21.875                             | 6.25                        | -60                         | -45                         |
| 37.5                               | 25                          | -65                         | -50                         |
| 62.5                               | 25                          | -65                         | -50                         |
| 87.5                               | 25                          | -65                         | -50                         |
| 150                                | 100                         | -65                         | -50                         |
| 250                                | 100                         | -65                         | -50                         |
| <ls-thn-eq>400 to receive band     | 30(s)                       | -75                         | -55                         |
| in the receive band                | 30(s)                       | -100                        | -70                         |

\1\ Not specified.

#### 25 kHz Mobile Transmitter ACCP Requirements

| Offset from Center Frequency (kHz) | Measurement Bandwidth (kHz) | Maximum ACCP Relative (dBc) | Maximum ACCP Absolute (dBm) |
|------------------------------------|-----------------------------|-----------------------------|-----------------------------|
| 15.625                             | 6.25                        | -40                         | (\1\)                       |
| 21.875                             | 6.25                        | -60                         | -45                         |
| 37.5                               | 25                          | -65                         | -50                         |
| 62.5                               | 25                          | -65                         | -50                         |
| 87.5                               | 25                          | -65                         | -50                         |
| 150                                | 100                         | -65                         | -50                         |
| 250                                | 100                         | -65                         | -50                         |
| <ls-thn-eq> 400 to receive band    | 30(s)                       | -75                         | -55                         |
| in the receive band                | 30(s)                       | -100                        | -70                         |

\1\ Not specified.

**Note:** As per FCC 02-272, sixth notice of proposed rule making adopted on September 27, 2002, FCC proposed deletion of ACCP absolute (dbm) values for Mobiles.

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## 6.11.2. Method of Measurements

- (b) ACCP measurement procedure. The following are procedures for making transmitter measurements. For time division multiple access (TDMA) systems, the measurements are to be made under TDMA operation only during time slots when the transmitter is on. All measurements must be made at the input to the transmitter's antenna. Measurement bandwidth used below implies an instrument that measures the power in many narrow bandwidths (e.g. 300 Hz) and integrates these powers across a larger band to determine power in the measurement bandwidth.
- (1) Setting reference level. Using a spectrum analyzer capable of ACCP measurements, set the measurement bandwidth to the channel size. For example, for a 6.25 kHz transmitter, set the measurement bandwidth to 6.25 kHz; for a 150 kHz transmitter, set the measurement bandwidth to 150 kHz. Set the frequency offset of the measurement bandwidth to zero and adjust the center frequency of the spectrum analyzer to give the power level in the measurement bandwidth. Record this power level in dBm as the "reference power level".
  - (2) Measuring the power level at frequency offsets  $<600\text{kHz}$ . Using a spectrum analyzer capable of ACCP measurements, set the measurement bandwidth as shown in the tables above. Measure the ACCP in dBm. These measurements should be made at maximum power. Calculate the coupled power by subtracting the measurements made in this step from the reference power measured in the previous step. The absolute ACCP values must be less than the values given in the table for each condition above.
  - (3) Measuring the power level at frequency offsets  $>600\text{kHz}$ . Set a spectrum analyzer to 30 kHz resolution bandwidth, 1 MHz video bandwidth and sample mode detection. Sweep  $\pm 6\text{ MHz}$  from the carrier frequency. Set the reference level to the RMS value of the transmitter power and note the absolute power. The response at frequencies greater than 600 kHz must be less than the values in the tables above.
  - (4) Upper power limit measurement. The absolute coupled power in dBm measured above must be compared to the table entry for each given frequency offset. For those mobile stations with power control, these measurements should be repeated with power control at maximum power reduction. The absolute ACCP at maximum power reduction must be less than the values in the tables above.
  - (c) Out-of-band emission limit. On any frequency outside of the frequency ranges covered by the ACCP tables in this section, the power of any emission must be reduced below the unmodulated carrier power (P) by at least  $43 + 10 \log (P)$  dB.
  - (d) Authorized bandwidth. Provided that the ACCP requirements of this section are met, applicants may request any authorized bandwidth that does not exceed the channel size.
  - (e) For operations in the 764 to 776 MHz and 794 to 806 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.
  - (f) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

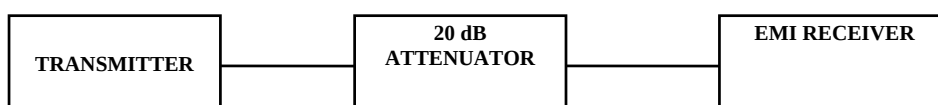
[63 FR 58651, Nov. 2, 1998, as amended at 65 FR 66655, Nov. 7, 2000]

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### 6.11.3. Test Equipment List

| Test Instruments              | Manufacturer    | Model No. | Serial No. | Frequency Range  |
|-------------------------------|-----------------|-----------|------------|------------------|
| EMI Receiver/<br>EMI Receiver | Hewlett Packard | HP 8593EM | 3412A00103 | 9 kHz – 26.5 GHz |
| Attenuator(s)                 | Bird            | ..        | ...        | DC – 22 GHz      |
| Audio Oscillator              | Hewlett Packard | HP 204C   | 0989A08798 | DC to 1.2 MHz    |

### 6.11.4. Test Arrangement



### 6.11.5. Test Data

We like to submit the test data supplied by the Motorola Inc., submitted to FCC for this Radio. This Module (EUT) is an identical unit with the one tested by Motorola except its enclosure (body cover). The conducted emissions results will remain same for both type of unit (with & without enclosure).

MOTOROLA INC.

FCC ID: AZ489FT5806

## Adjacent Channel Coupled Power Ratios

| 794.075 MHZ 25.0 kHz Channel Spacing ANALOG |               |  |        |  |       |            |
|---------------------------------------------|---------------|--|--------|--|-------|------------|
| Emission Designator 16K0F3E                 |               |  |        |  |       |            |
| Ref Power Level (dBm) = 13.3                |               |  |        |  |       |            |
| Offset (kHz)                                | Meas BW (kHz) |  | LOWER  |  | UPPER | Spec (dBc) |
| 15.625                                      | 6.250         |  | -76.7  |  | -76.8 | -40        |
| 21.875                                      | 6.250         |  | -79.9  |  | -80.0 | -60        |
| 37.500                                      | 25.000        |  | -75.5  |  | -75.5 | -65        |
| 62.500                                      | 25.000        |  | -76.1  |  | -76.1 | -65        |
| 87.500                                      | 25.000        |  | -76.2  |  | -76.1 | -65        |
| 150.000                                     | 100.000       |  | -70.6  |  | -70.5 | -65        |
| 250.000                                     | 100.000       |  | -71.2  |  | -71.2 | -65        |
| 350.000                                     | 100.000       |  | -71.4  |  | -71.4 | -65        |
| >400K - 12M                                 | 30 (Swept)    |  | < -75  |  |       | -75        |
| 12M - RX Band                               | 30 (Swept)    |  | < -75  |  |       | -75        |
| in RX Band                                  | 30 (Swept)    |  | < -100 |  |       | -100       |

| 794.075 MHZ 12.5 kHz Channel Spacing ANALOG |               |  |        |  |       |            |
|---------------------------------------------|---------------|--|--------|--|-------|------------|
| Emission Designator 11K0F3E                 |               |  |        |  |       |            |
| Ref Power Level (dBm) = 13.4                |               |  |        |  |       |            |
| Offset (kHz)                                | Meas BW (kHz) |  | LOWER  |  | UPPER | Spec (dBc) |
| 9.375                                       | 6.250         |  | -55.0  |  | -55.2 | -40        |
| 15.625                                      | 6.250         |  | -77.7  |  | -78.0 | -60        |
| 21.875                                      | 6.250         |  | -80.0  |  | -80.2 | -60        |
| 37.500                                      | 25.000        |  | -75.5  |  | -75.6 | -65        |
| 62.500                                      | 25.000        |  | -76.1  |  | -76.1 | -65        |
| 87.500                                      | 25.000        |  | -76.2  |  | -76.2 | -65        |
| 150.000                                     | 100.000       |  | -70.7  |  | -70.6 | -65        |
| 250.000                                     | 100.000       |  | -71.2  |  | -71.2 | -65        |
| 350.000                                     | 100.000       |  | -71.5  |  | -71.4 | -65        |
| >400K - 12M                                 | 30 (Swept)    |  | < -75  |  |       | -75        |
| 12M - RX Band                               | 30 (Swept)    |  | < -75  |  |       | -75        |
| in RX Band                                  | 30 (Swept)    |  | < -100 |  |       | -100       |

**Note:** This transmitter does not incorporate automatic power control. Therefore, it was tested to comply to the Maximum ACCP Relative (dBc) limits of FCC Rule Part 90.543(a).

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MOTOROLA INC.

FCC ID: AZ489FT5806

## Adjacent Channel Coupled Power Ratios

| 794.075 MHZ 12.5 kHz Channel Spacing DIGITAL DATA |               |  |        |  |       |            |
|---------------------------------------------------|---------------|--|--------|--|-------|------------|
| Emission Designator 8K1F3D                        |               |  |        |  |       |            |
| Ref Power Level (dBm) = 14.1                      |               |  |        |  |       |            |
| Offset (kHz)                                      | Meas BW (kHz) |  | LOWER  |  | UPPER | Spec (dBc) |
| 9.375                                             | 6.250         |  | -43.7  |  | -50.0 | -40        |
| 15.625                                            | 6.250         |  | -77.7  |  | -78.1 | -60        |
| 21.875                                            | 6.250         |  | -80.2  |  | -80.2 | -60        |
| 37.500                                            | 25.000        |  | -75.5  |  | -75.6 | -65        |
| 62.500                                            | 25.000        |  | -76.0  |  | -76.0 | -65        |
| 87.500                                            | 25.000        |  | -76.0  |  | -76.1 | -65        |
| 150.000                                           | 100.000       |  | -70.5  |  | -70.5 | -65        |
| 250.000                                           | 100.000       |  | -71.1  |  | -71.1 | -65        |
| 350.000                                           | 100.000       |  | -71.3  |  | -71.2 | -65        |
| >400K - 12M                                       | 30 (Swept)    |  | < -75  |  |       | -75        |
| 12M - RX Band                                     | 30 (Swept)    |  | < -75  |  |       | -75        |
| in RX Band                                        | 30 (Swept)    |  | < -100 |  |       | -100       |

| 794.075 MHZ 12.5 kHz Channel Spacing DIGITAL VOICE |               |  |        |  |       |            |
|----------------------------------------------------|---------------|--|--------|--|-------|------------|
| Emission Designator 8K1F3E                         |               |  |        |  |       |            |
| Ref Power Level (dBm) = 14.1                       |               |  |        |  |       |            |
| Offset (kHz)                                       | Meas BW (kHz) |  | LOWER  |  | UPPER | Spec (dBc) |
| 9.375                                              | 6.250         |  | -43.7  |  | -50.0 | -40        |
| 15.625                                             | 6.250         |  | -77.7  |  | -78.1 | -60        |
| 21.875                                             | 6.250         |  | -80.2  |  | -80.2 | -60        |
| 37.500                                             | 25.000        |  | -75.5  |  | -75.6 | -65        |
| 62.500                                             | 25.000        |  | -76.0  |  | -76.0 | -65        |
| 87.500                                             | 25.000        |  | -76.0  |  | -76.1 | -65        |
| 150.000                                            | 100.000       |  | -70.5  |  | -70.5 | -65        |
| 250.000                                            | 100.000       |  | -71.1  |  | -71.1 | -65        |
| 350.000                                            | 100.000       |  | -71.3  |  | -71.2 | -65        |
| >400K - 12M                                        | 30 (Swept)    |  | < -75  |  |       | -75        |
| 12M - RX Band                                      | 30 (Swept)    |  | < -75  |  |       | -75        |
| in RX Band                                         | 30 (Swept)    |  | < -100 |  |       | -100       |

**Note: This transmitter does not incorporate automatic power control. Therefore, it was tested to comply to the Maximum ACCP Relative (dBc) limits of FCC Rule Part 90.543(a).**

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FCC ID: AZ489FT5806

## Adjacent Channel Coupled Power Ratios

| 794.075 MHZ 12.5 kHz Channel Spacing DES ENCRYPTION<br>Emission Designator 8K1F3E |               |  |        |  |       |            |
|-----------------------------------------------------------------------------------|---------------|--|--------|--|-------|------------|
| Ref Power Level (dBm) = 14.1                                                      |               |  |        |  |       |            |
| Offset (kHz)                                                                      | Meas BW (kHz) |  | LOWER  |  | UPPER | Spec (dBc) |
| 9.375                                                                             | 6.250         |  | -44.3  |  | -49.3 | -40        |
| 15.625                                                                            | 6.250         |  | -77.8  |  | -78.2 | -60        |
| 21.875                                                                            | 6.250         |  | -80.2  |  | -80.3 | -60        |
| 37.500                                                                            | 25.000        |  | -75.4  |  | -75.5 | -65        |
| 62.500                                                                            | 25.000        |  | -76.1  |  | -76.1 | -65        |
| 87.500                                                                            | 25.000        |  | -76.0  |  | -76.1 | -65        |
| 150.000                                                                           | 100.000       |  | -70.5  |  | -70.6 | -65        |
| 250.000                                                                           | 100.000       |  | -71.1  |  | -71.1 | -65        |
| 350.000                                                                           | 100.000       |  | -71.2  |  | -71.3 | -65        |
| >400K - 12M                                                                       | 30 (Swept)    |  | < -75  |  |       | -75        |
| 12M - RX Band                                                                     | 30 (Swept)    |  | < -75  |  |       | -75        |
| in RX Band                                                                        | 30 (Swept)    |  | < -100 |  |       | -100       |

Note: This transmitter does not incorporate automatic power control. Therefore, it was tested to comply to the Maximum ACCP Relative (dBc) limits of FCC Rule Part 90.543(a).

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## 6.12. TRANSMITTER ANTENNA POWER SPURIOUS/HARMONIC CONDUCTED EMISSIONS @ FCC 90.210

### 6.12.1. Limits @ 90.210

Emissions shall be attenuated below the mean output power of the transmitter as follows:

| FCC Rules                | Frequency Range                                                                                            | Attenuation Limit (dBc)                             |
|--------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| 90.210(b) – Voice        | 10 MHz to Lowest frequency of the radio to 10 <sup>th</sup> harmonic of the highest frequency of the radio | 43+10*log(P) or -13 dBm                             |
| 90.210(d) – Voice & data | 10 MHz to Lowest frequency of the radio to 10 <sup>th</sup> harmonic of the highest frequency of the radio | 50+10*log(P) or -20 dBm or 70 dBc whichever is less |

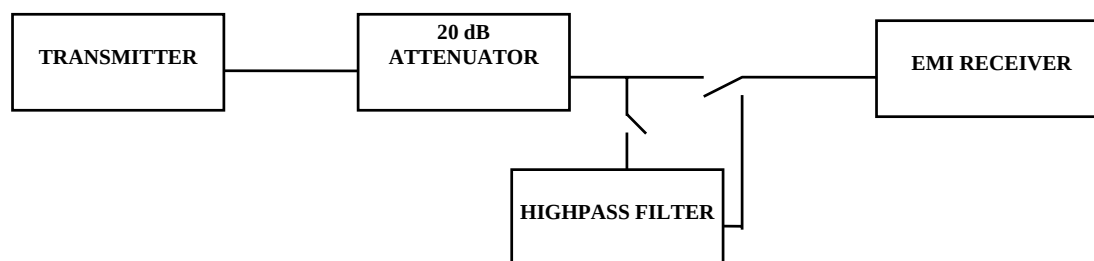
### 6.12.2. Method of Measurements

Refer to Exhibit 8 § 8.5 of this report for measurement details

### 6.12.3. Test Equipment List

| Test Instruments               | Manufacturer    | Model No. | Serial No. | Frequency Range                                   |
|--------------------------------|-----------------|-----------|------------|---------------------------------------------------|
| EMI Receiver/<br>EMI Receiver  | Hewlett Packard | HP 8593EM | 3412A00103 | 9 kHz – 26.5 GHz                                  |
| Attenuator(s)                  | Bird            | ..        | ...        | DC – 22 GHz                                       |
| Audio Oscillator               | Hewlett Packard | HP 204C   | 0989A08798 | DC to 1.2 MHz                                     |
| Highpass Filter,<br>Microphase | Microphase      | CR220HID  | IIT11000AC | Cut-off Frequency at 600 MHz,<br>1.3 GHz or 4 GHz |

### 6.12.4. Test Arrangement



## 6.12.5. Test Data

### Remarks:

- The transmitter conducted emissions were scanned from 10 MHz to 10 GHz at 12.5 kHz channel spacing / FM voice modulation, 12.5 kHz channel spacing / FM digital modulation and 25 kHz channel spacing / FM voice modulation and the results were found the same. The following tables show test data measured with the transmitter set at 12.5 kHz channel spacing / FM voice modulation as representative.
- The most stringent limit =  $50 + 10 \cdot \log(P \text{ in watts})$  were applied for both 12.5 kHz and 25 kHz channel spacing operation for worst case of measurements.

### 6.12.5.1. High Power Setting (33.20 dBm) at Lowest Frequency (764.0125 MHz)

| Fundamental Frequency:                                                                                                                                                      |                                            | 764.0125 MHz                                |                |                |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|---------------------------------------------|----------------|----------------|---------------|
| RF Output Power:                                                                                                                                                            |                                            | 33.20 dBm (Conducted)                       |                |                |               |
| Modulation:                                                                                                                                                                 |                                            | FM modulation with 2.5 kHz Sine Wave Signal |                |                |               |
| FREQUENCY<br>(MHz)                                                                                                                                                          | TRANSMITTER CONDUCTED<br>ANTENNA EMISSIONS |                                             | LIMIT<br>(dBc) | MARGIN<br>(dB) | PASS/<br>FAIL |
|                                                                                                                                                                             | (dBm)                                      | (dBc)                                       |                |                |               |
| 1523.0                                                                                                                                                                      | -35.8                                      | -69.0                                       | -53.2          | -15.8          | PASS          |
| The emissions were scanned from 10 MHz to 10 GHz and all emissions within 20 dB below the limits were recorded. Please refer to plots # 60 & 61 for details of measurement. |                                            |                                             |                |                |               |

### 6.12.5.2. High Power Setting (34.41 dBm) at Middle Frequency (821.00 MHz)

| Fundamental Frequency:                                                                                                                                                      |                                            | 821.00 MHz                                  |                |                |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|---------------------------------------------|----------------|----------------|---------------|
| RF Output Power:                                                                                                                                                            |                                            | 34.41 dBm (Conducted)                       |                |                |               |
| Modulation:                                                                                                                                                                 |                                            | FM modulation with 2.5 kHz Sine Wave Signal |                |                |               |
| FREQUENCY<br>(MHz)                                                                                                                                                          | TRANSMITTER CONDUCTED<br>ANTENNA EMISSIONS |                                             | LIMIT<br>(dBc) | MARGIN<br>(dB) | PASS/<br>FAIL |
|                                                                                                                                                                             | (dBm)                                      | (dBc)                                       |                |                |               |
| 10 -10000                                                                                                                                                                   | **                                         | **                                          | -54.4          | < -20.0        | PASS          |
| The emissions were scanned from 10 MHz to 10 GHz and all emissions within 20 dB below the limits were recorded. Please refer to plots # 62 & 63 for details of measurement. |                                            |                                             |                |                |               |

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### 6.12.5.3. High Power Setting (34.39 dBm) at Highest Frequency (868.9875 MHz)

| Fundamental Frequency: | 868.9875 MHz                                |       |                |                |               |
|------------------------|---------------------------------------------|-------|----------------|----------------|---------------|
| RF Output Power:       | 34.39 dBm (Conducted)                       |       |                |                |               |
| Modulation:            | FM modulation with 2.5 kHz Sine Wave Signal |       |                |                |               |
| FREQUENCY<br>(MHz)     | TRANSMITTER CONDUCTED<br>ANTENNA EMISSIONS  |       | LIMIT<br>(dBc) | MARGIN<br>(dB) | PASS/<br>FAIL |
|                        | (dBm)                                       | (dBc) |                |                |               |
| 4336.67                | -31.9                                       | -66.3 | -54.4          | -11.9          | PASS          |

The emissions were scanned from 10 MHz to 10 GHz and all emissions within 20 dB below the limits were recorded. Please refer to plots # 64 & 65 for details of measurement.

### 6.12.5.4. Low Power Setting (29.86 dBm) at Lowest Frequency (764.0125 MHz)

| Fundamental Frequency: | 764.0125 MHz                                |       |                |                |               |
|------------------------|---------------------------------------------|-------|----------------|----------------|---------------|
| RF Output Power:       | 29.86 dBm (Conducted)                       |       |                |                |               |
| Modulation:            | FM modulation with 2.5 kHz Sine Wave Signal |       |                |                |               |
| FREQUENCY<br>(MHz)     | TRANSMITTER CONDUCTED<br>ANTENNA EMISSIONS  |       | LIMIT<br>(dBc) | MARGIN<br>(dB) | PASS/<br>FAIL |
|                        | (dBm)                                       | (dBc) |                |                |               |
| 1523.0                 | -37.9                                       | -67.8 | -49.9          | -17.9          | PASS          |

The emissions were scanned from 10 MHz to 10 GHz and no emissions within 20 dB below the limits were found. Please refer to plots # 66 & 67 for details of measurement.

### 6.12.5.5. Low Power Setting (29.86 dBm) at Middle Frequency (821.0 MHz)

| Fundamental Frequency: | 821.0 MHz                                   |       |                |                |               |
|------------------------|---------------------------------------------|-------|----------------|----------------|---------------|
| RF Output Power:       | 29.86 dBm (Conducted)                       |       |                |                |               |
| Modulation:            | FM modulation with 2.5 kHz Sine Wave Signal |       |                |                |               |
| FREQUENCY<br>(MHz)     | TRANSMITTER CONDUCTED<br>ANTENNA EMISSIONS  |       | LIMIT<br>(dBc) | MARGIN<br>(dB) | PASS/<br>FAIL |
|                        | (dBm)                                       | (dBc) |                |                |               |
| 10 -10000              | **                                          | **    | -49.9          | < -20.0        | PASS          |

The emissions were scanned from 10 MHz to 10 GHz and no emissions within 20 dB below the limits were found. Please refer to plots # 68 & 69 for details of measurement.

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**6.12.5.6. Low Power Setting (30.33 dBm) at Highest Frequency (868.9875 MHz)**

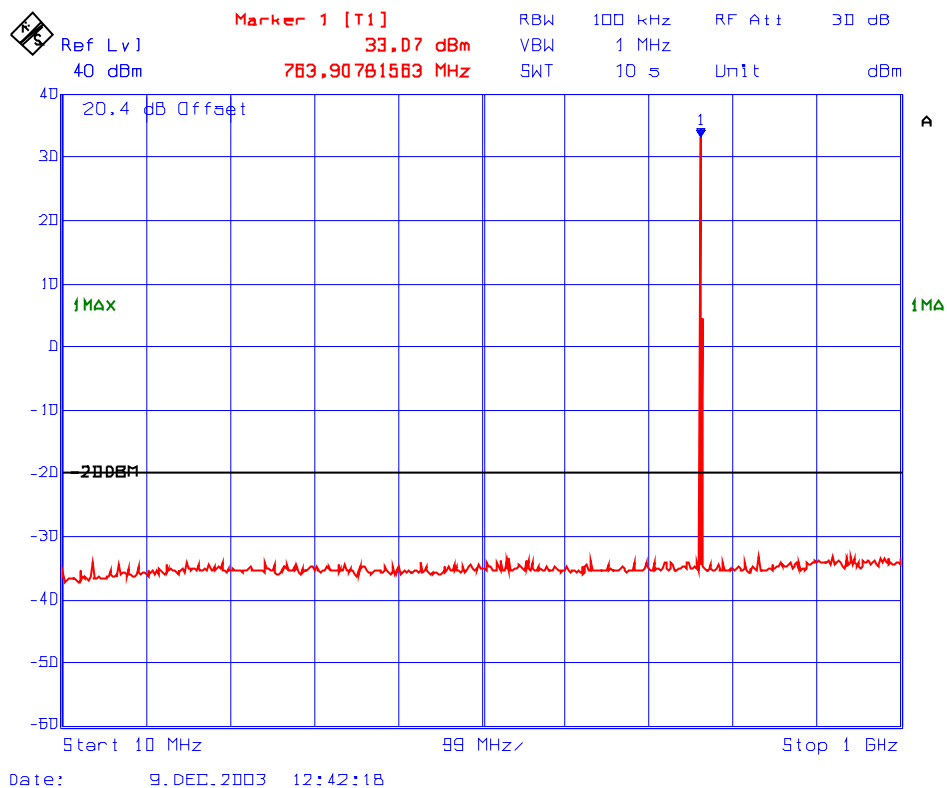
| Fundamental Frequency:                                                                                                                                                     | 868.9875 MHz                                |       |                |                |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------|----------------|----------------|---------------|
| RF Output Power:                                                                                                                                                           | 30.33 dBm (Conducted)                       |       |                |                |               |
| Modulation:                                                                                                                                                                | FM modulation with 2.5 kHz Sine Wave Signal |       |                |                |               |
| FREQUENCY<br>(MHz)                                                                                                                                                         | TRANSMITTER CONDUCTED<br>ANTENNA EMISSIONS  |       | LIMIT<br>(dBc) | MARGIN<br>(dB) | PASS/<br>FAIL |
|                                                                                                                                                                            | (dBm)                                       | (dBc) |                |                |               |
| 10 -10000                                                                                                                                                                  | **                                          | **    | -50.4          | < -20.0        | PASS          |
| The emissions were scanned from 10 MHz to 10 GHz and no emissions within 20 dB below the limits were found.<br>Please refer to plots # 70 & 71 for details of measurement. |                                             |       |                |                |               |

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**Plot # 60**      **Transmitter Antenna Power Conducted Emissions.**  
**Freq. 764.0125 MHz, High Power**



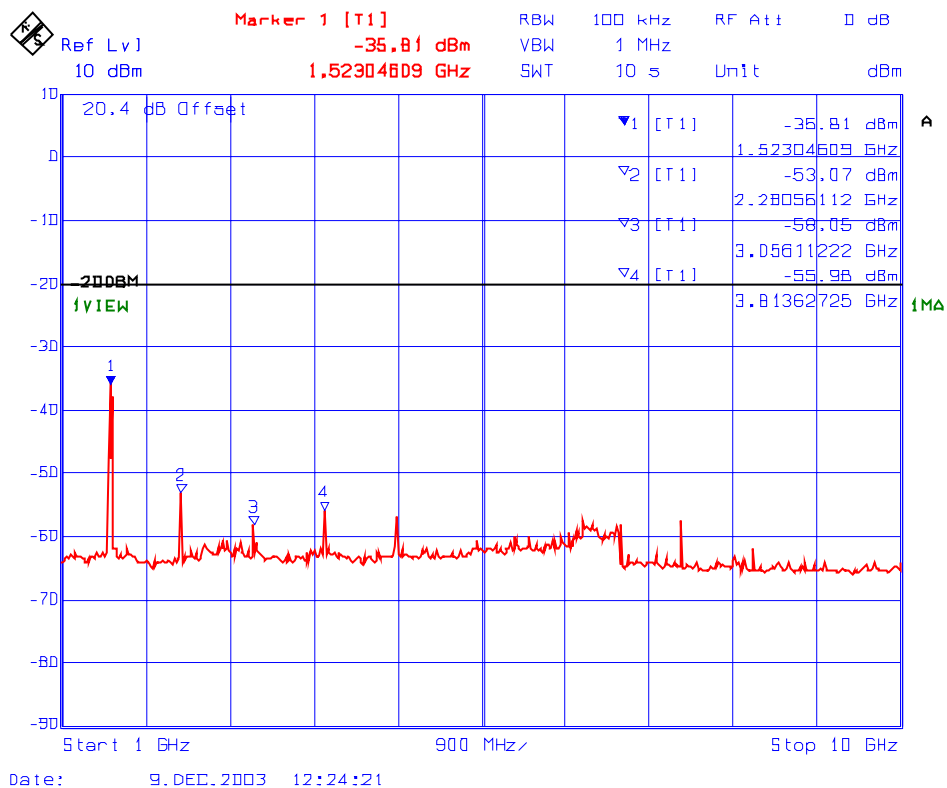
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**Plot # 61**      **Transmitter Antenna Power Conducted Emissions.**  
**Freq. 764.0125 MHz, High Power**



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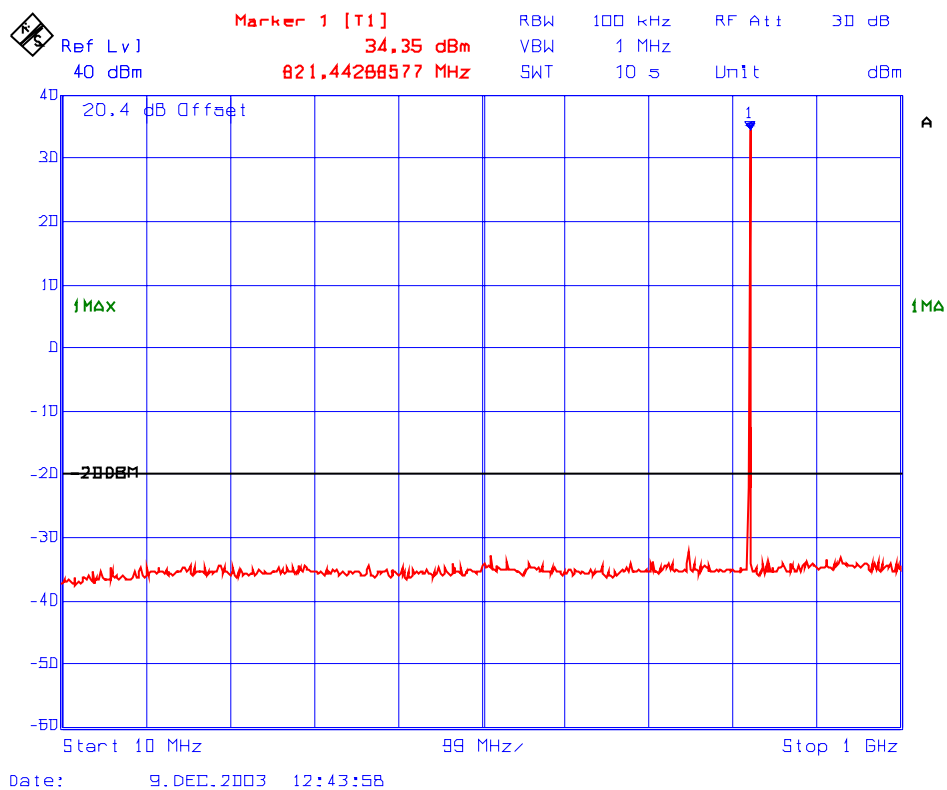
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4  
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**Plot # 62**      **Transmitter Antenna Power Conducted Emissions.**  
**Freq. 821.00 MHz, High Power**



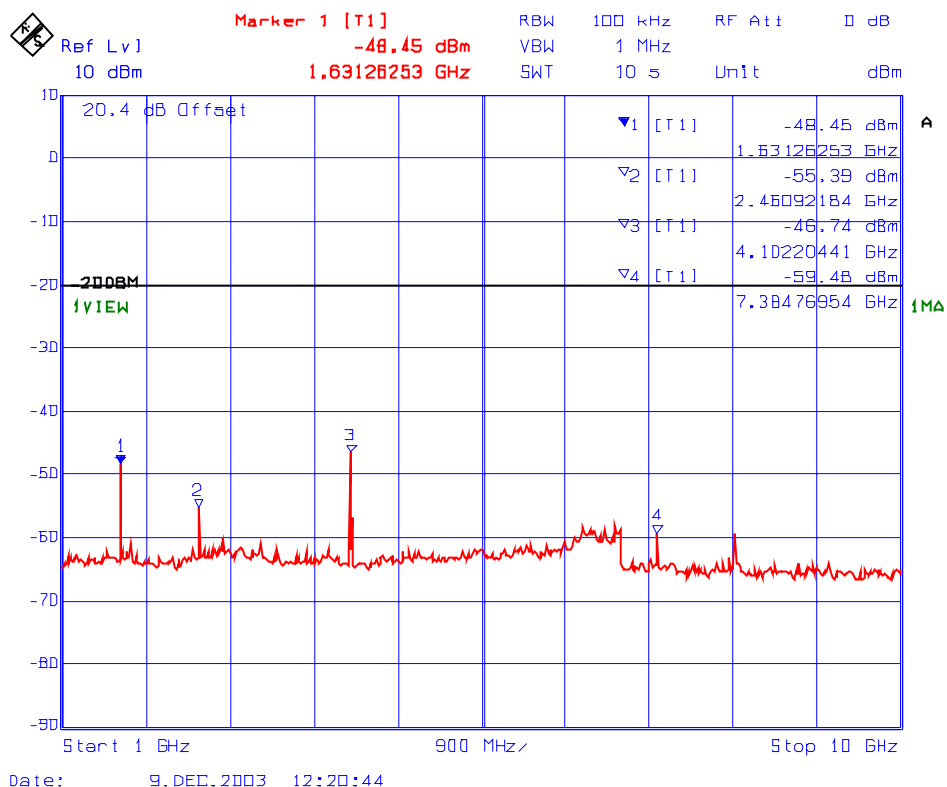
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**Plot # 63**      **Transmitter Antenna Power Conducted Emissions.**  
**Freq. 821.00 MHz, High Power**



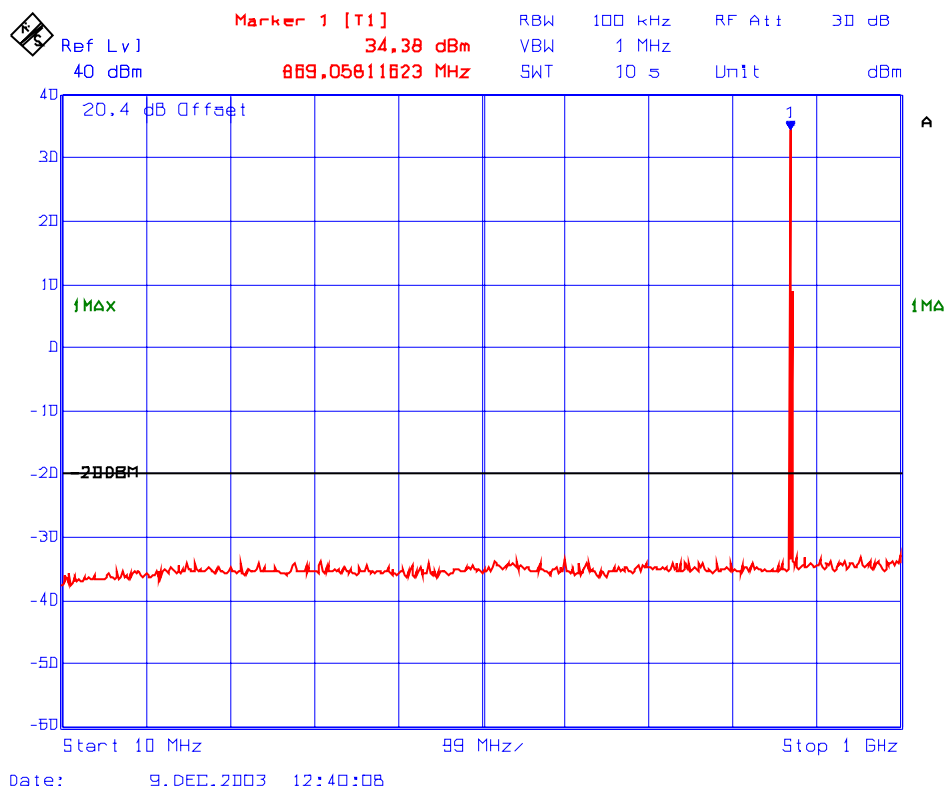
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**Plot # 64**      **Transmitter Antenna Power Conducted Emissions.**  
**Freq. 868.9875 MHz, High Power**



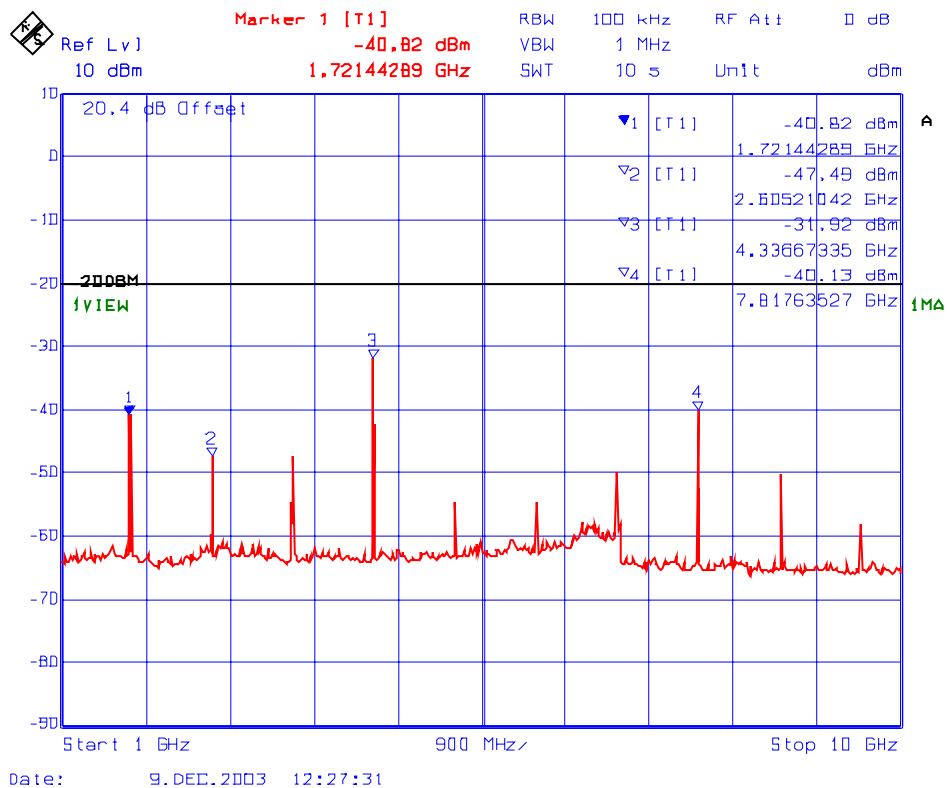
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**Plot # 65**      **Transmitter Antenna Power Conducted Emissions.**  
**Freq. 868.9875 MHz, High Power**



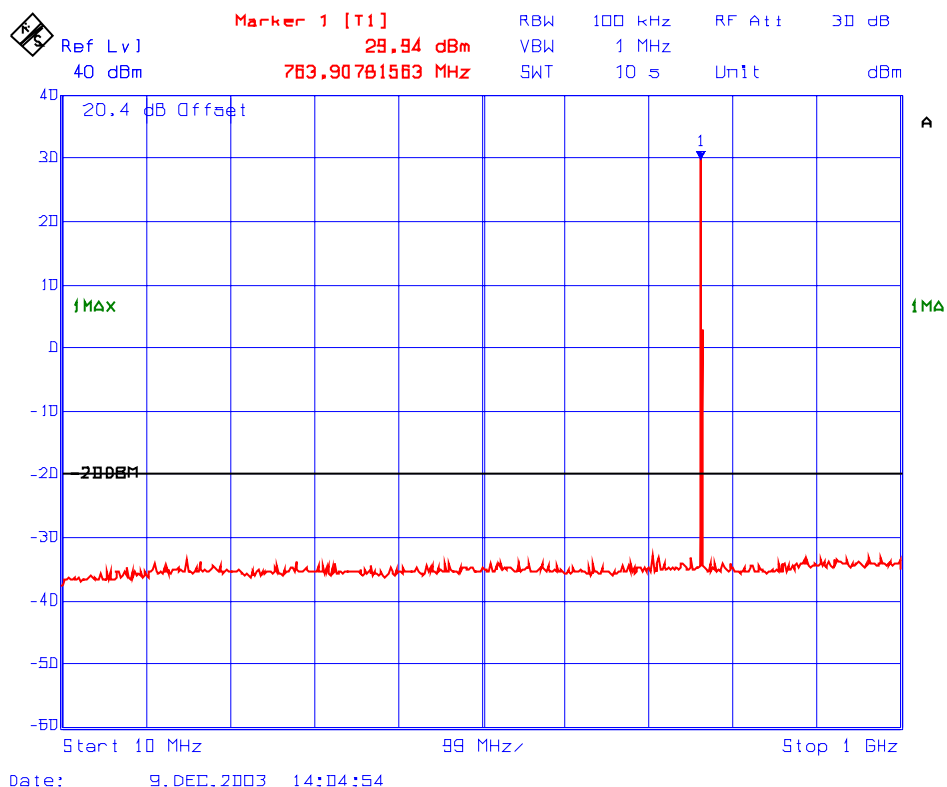
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**Plot # 66**      **Transmitter Antenna Power Conducted Emissions.**  
**Freq. 764.0125 MHz, Low Power**



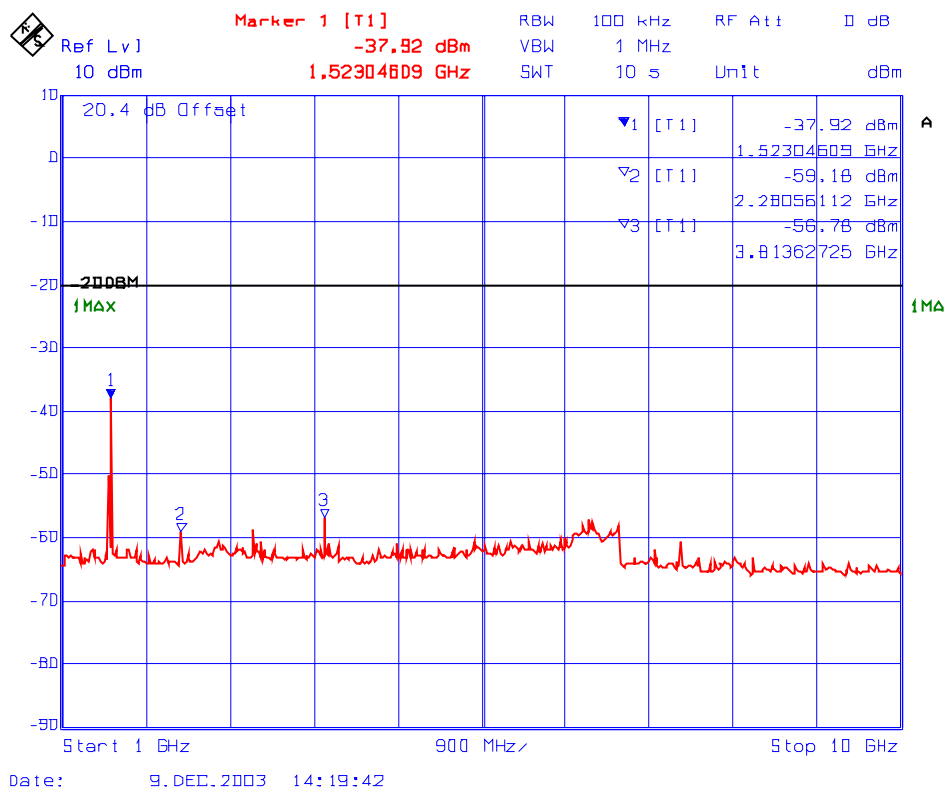
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**Plot # 67**      **Transmitter Antenna Power Conducted Emissions.**  
**Freq. 764.0125 MHz, Low Power**



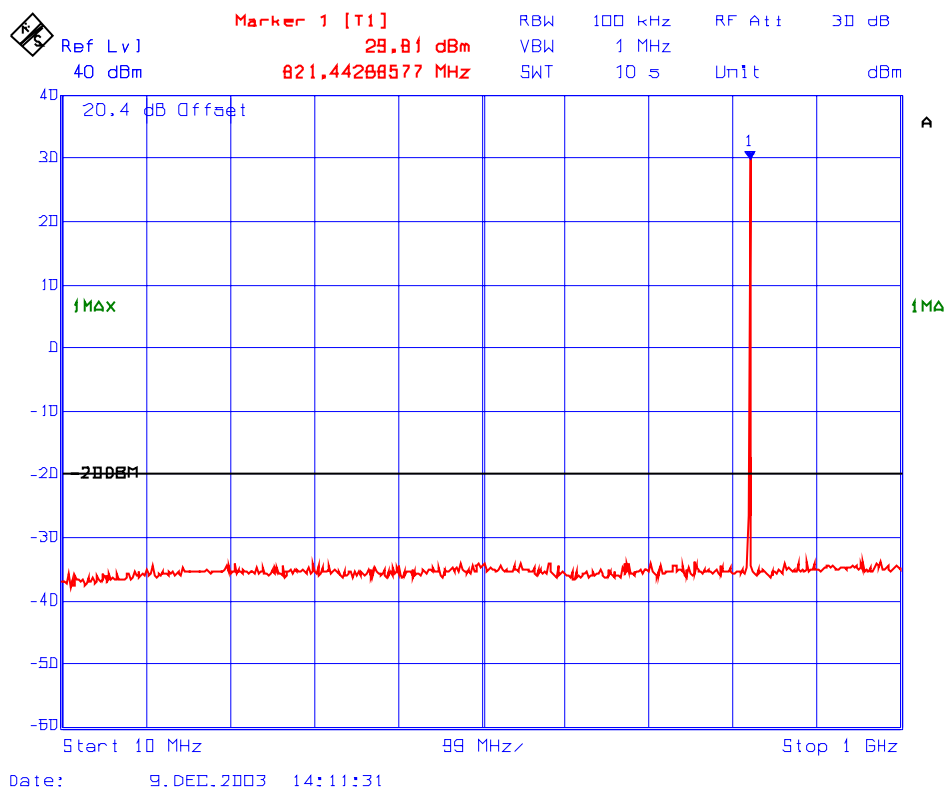
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**Plot # 68**      **Transmitter Antenna Power Conducted Emissions.**  
**Freq. 821.0 MHz, Low Power**



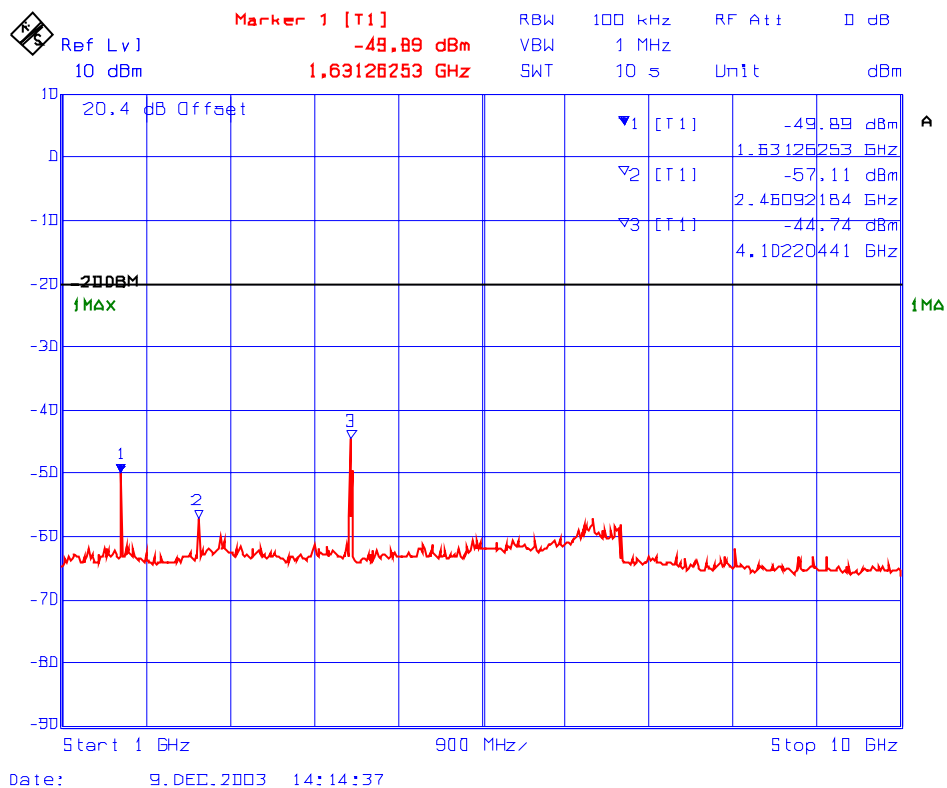
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**Plot # 69**      **Transmitter Antenna Power Conducted Emissions.**  
**Freq. 821.0 MHz, Low Power**



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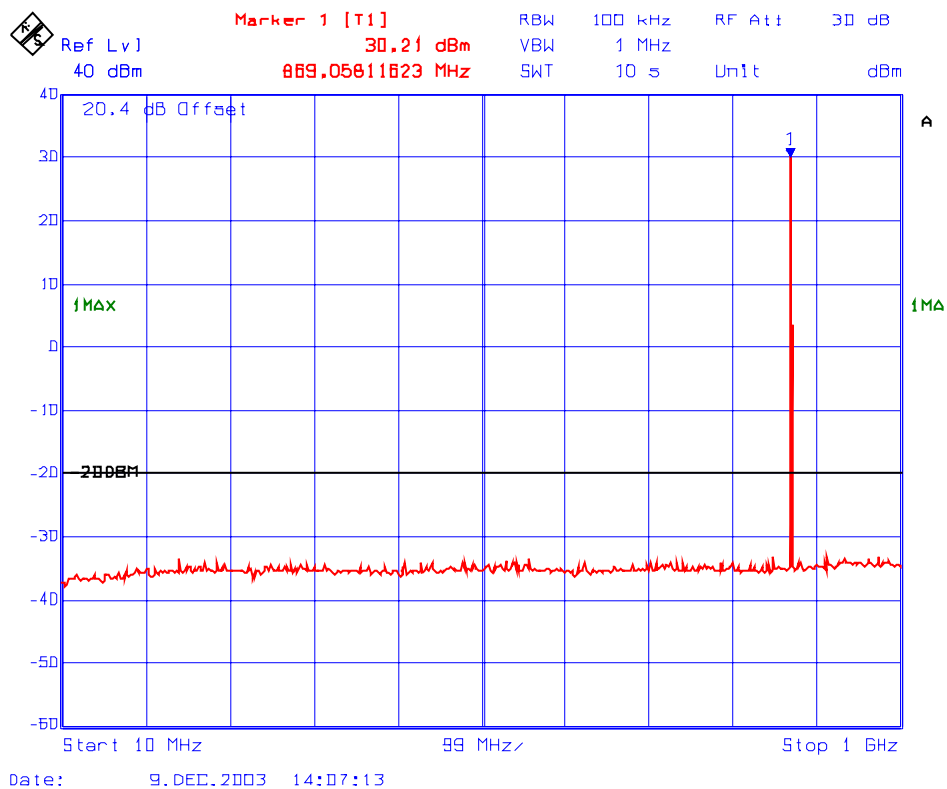
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4  
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**Plot # 70**      **Transmitter Antenna Power Conducted Emissions.**  
**Freq. 868.9875 MHz, Low Power**



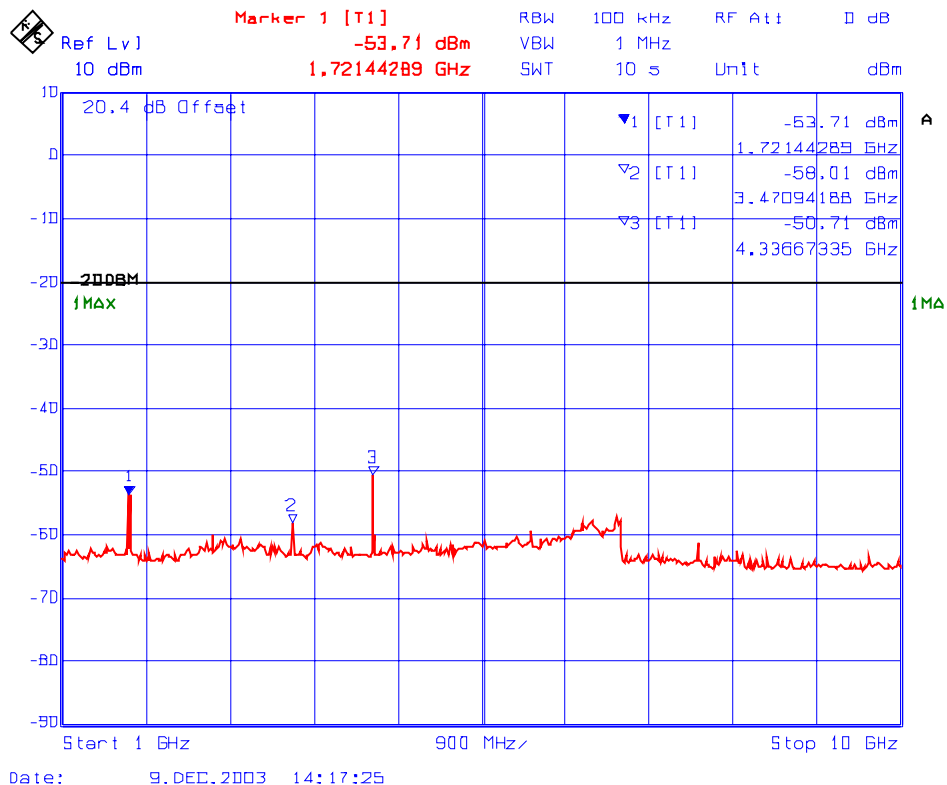
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**Plot # 71**      **Transmitter Antenna Power Conducted Emissions.**  
**Freq. 868.9875 MHz, Low Power**



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## 6.13. TRANSMITTER SPURIOUS/HARMONIC RADIATED EMISSIONS @ FCC 90.210

### 6.13.1. Limits @ FCC 90.210

Emissions shall be attenuated below the mean output power of the transmitter as follows:

| FCC Rules                | Frequency Range                                                                                            | Attenuation Limit (dBc)                             |
|--------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| 90.210(b) – Voice        | 10 MHz to Lowest frequency of the radio to 10 <sup>th</sup> harmonic of the highest frequency of the radio | 43+10*log(P) or -13 dBm                             |
| 90.210(d) – Voice & data | 10 MHz to Lowest frequency of the radio to 10 <sup>th</sup> harmonic of the highest frequency of the radio | 50+10*log(P) or -20 dBm or 70 dBc whichever is less |

### 6.13.2. Method of Measurements

The spurious/harmonic ERP measurements are using substitution method specified in Exhibit 8, § 8.2 of this report and its value in dBc is calculated as follows:

- (1) If the transmitter's antenna is an integral part of the EUT, the ERP is measured using substitution method.
- (2) If the transmitter's antenna is non-integral and diverse, the lowest ERP of the carrier with 0 dBi antenna gain is used for calculation of the spurious/harmonic emissions in dBc:  
Lowest ERP of the carrier = EIRP – 2.15 dB = P<sub>c</sub> + G – 2.15 dB = xxx dBm (conducted) + 0 dBi – 2.15 dB
- (3) Spurious /harmonic emissions levels expressed in dBc (dB below carrier) are as follows:

$$\text{ERP of spurious/harmonic (dBc)} = \text{ERP of carrier (dBm)} - \text{ERP of spurious/harmonic emission (dBm)}$$

### 6.13.3. Test Equipment List

| Test Instruments                   | Manufacturer    | Model No. | Serial No. | Frequency Range                                                                       |
|------------------------------------|-----------------|-----------|------------|---------------------------------------------------------------------------------------|
| Spectrum Analyzer/<br>EMI Receiver | Hewlett Packard | HP 8546A  | ...        | 9 kHz to 5.6 GHz with built-in 30 dB Gain Pre-selector, QP, Average & Peak Detectors. |
| RF Amplifier                       | Com-Power       | PA-102    |            | 1 MHz to 1 GHz, 30 dB gain nominal                                                    |
| Microwave Amplifier                | Hewlett Packard | HP 83017A |            | 1 GHz to 26.5 GHz, 30 dB nominal                                                      |
| Biconilog Antenna                  | EMCO            | 3142      | 10005      | 30 MHz to 2 GHz                                                                       |
| Dipole Antenna                     | EMCO            | 3121C     | 8907-434   | 30 GHz – 1 GHz                                                                        |
| Dipole Antenna                     | EMCO            | 3121C     | 8907-440   | 30 GHz – 1 GHz                                                                        |
| Horn Antenna                       | EMCO            | 3155      | 9701-5061  | 1 GHz – 18 GHz                                                                        |
| Horn Antenna                       | EMCO            | 3155      | 9911-5955  | 1 GHz – 18 GHz                                                                        |
| RF Signal Generator                | Hewlett Packard | HP 83752B | 3610A00457 | 0.01 – 20 GHz                                                                         |

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#### 6.13.4. Test Setup

Please refer to Photo 1 to 2 in Annex 1 for detailed of test setup.

#### 6.13.5. Test Data

##### Remarks:

- The transmitter radiated emissions were scanned from 10 MHz to 8.5 GHz at 12.5 kHz channel spacing / FM voice modulation, 12.5 kHz channel spacing / FM digital modulation and 25 kHz channel spacing / FM voice modulation and the results were found the same. The following tables show test data measured with the transmitter set at 12.5 kHz channel spacing / FM voice modulation as representative.
- The most stringent limit =  $50 + 10 \cdot \log(P \text{ in watts})$  were applied for both 12.5 kHz and 25 kHz channel spacing operation with high power setting for worst case of measurements.

##### 6.13.5.1. Near Lowest Frequency (764.0125 MHz) with High Power Setting (33.2 dBm)

| FREQUENCY<br>(MHz) | E-FIELD<br>@3m<br>(dBuV/m) | ERP measured by<br>Substitution Method<br>(dBm) (dBc) |       | EMI<br>DETECTOR<br>(Peak/QP) | ANTENNA<br>POLARIZATION<br>(H/V) | LIMIT<br>(dBc) | MARGIN<br>(dB) | PASS/<br>FAIL |
|--------------------|----------------------------|-------------------------------------------------------|-------|------------------------------|----------------------------------|----------------|----------------|---------------|
| 1528               | 67.7                       | -23.4                                                 | -56.6 | PEAK                         | V                                | -53.2          | -3.4           | PASS          |
| 1528               | 66.9                       | -25.5                                                 | -58.7 | PEAK                         | H                                | -53.2          | -5.5           | PASS          |

The emissions were scanned from 10 MHz to 8 GHz and all emissions within 20 dB below the limits were recorded.

##### 6.13.5.2. Near Middle Frequency (821.0 MHz) with High Power Setting (34.4 dBm)

| FREQUENCY<br>(MHz) | E-FIELD<br>@3m<br>(dBuV/m) | ERP measured by<br>Substitution Method<br>(dBm) (dBc) |       | EMI<br>DETECTOR<br>(Peak/QP) | ANTENNA<br>POLARIZATION<br>(H/V) | LIMIT<br>(dBc) | MARGIN<br>(dB) | PASS/<br>FAIL |
|--------------------|----------------------------|-------------------------------------------------------|-------|------------------------------|----------------------------------|----------------|----------------|---------------|
| 1642               | 60.7                       | -30.7                                                 | -65.1 | PEAK                         | V                                | -54.4          | -10.7          | PASS          |
| 1642               | 57.3                       | -36.8                                                 | -71.2 | PEAK                         | H                                | -54.4          | -16.8          | PASS          |
| 4105               | 58.5                       | -33.4                                                 | -67.8 | PEAK                         | V                                | -54.4          | -13.4          | PASS          |
| 4105               | 54.2                       | -40.6                                                 | -75.0 | PEAK                         | H                                | -54.4          | -20.6          | PASS          |

The emissions were scanned from 10 MHz to 8.5 GHz and all emissions within 20 dB below the limits were recorded.

##### 6.13.5.3. Highest Frequency (868.9875 MHz) with High Power Setting (34.4 dBm)

| FREQUENCY<br>(MHz) | E-FIELD<br>@3m<br>(dBuV/m) | ERP measured by<br>Substitution Method<br>(dBm) (dBc) |       | EMI<br>DETECTOR<br>(Peak/QP) | ANTENNA<br>POLARIZATION<br>(H/V) | LIMIT<br>(dBc) | MARGIN<br>(dB) | PASS/<br>FAIL |
|--------------------|----------------------------|-------------------------------------------------------|-------|------------------------------|----------------------------------|----------------|----------------|---------------|
| 1738               | 65.1                       | -24.1                                                 | -58.5 | PEAK                         | V                                | -54.4          | -4.1           | PASS          |
| 1738               | 59.9                       | -33.6                                                 | -68.0 | PEAK                         | H                                | -54.4          | -13.6          | PASS          |
| 4345               | 64.1                       | -26.5                                                 | -60.9 | PEAK                         | V                                | -54.4          | -6.5           | PASS          |
| 4345               | 57.1                       | -38.1                                                 | -72.5 | PEAK                         | H                                | -54.4          | -18.1          | PASS          |

The emissions were scanned from 10 MHz to 8.5 GHz and all emissions within 20 dB below the limits were recorded.

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## EXHIBIT 7. MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of NIST Technical Note 1297 and NIS 81 (1994)

### 7.1. RADIATED EMISSION MEASUREMENT UNCERTAINTY

| CONTRIBUTION<br>(Radiated Emissions)                                                                                                                         | PROBABILITY<br>DISTRIBUTION | UNCERTAINTY (+ dB) |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|--------------------|---------------|
|                                                                                                                                                              |                             | 3 m                | 10 m          |
| Antenna Factor Calibration                                                                                                                                   | Normal (k=2)                | $\pm 1.0$          | $\pm 1.0$     |
| Cable Loss Calibration                                                                                                                                       | Normal (k=2)                | $\pm 0.3$          | $\pm 0.5$     |
| EMI Receiver specification                                                                                                                                   | Rectangular                 | $\pm 1.5$          | $\pm 1.5$     |
| Antenna Directivit                                                                                                                                           | Rectangular                 | $\pm 0.5$          | $\pm 0.5$     |
| Antenna factor variation with height                                                                                                                         | Rectangular                 | $\pm 2.0$          | $\pm 0.5$     |
| Antenna phase center variation                                                                                                                               | Rectangular                 | 0.0                | $\pm 0.2$     |
| Antenna factor frequency interpolation                                                                                                                       | Rectangular                 | $\pm 0.25$         | $\pm 0.25$    |
| Measurement distance variation                                                                                                                               | Rectangular                 | $\pm 0.6$          | $\pm 0.4$     |
| Site imperfections                                                                                                                                           | Rectangular                 | $\pm 2.0$          | $\pm 2.0$     |
| Mismatch: Receiver VRC $\Gamma_1 = 0.2$<br>Antenna VRC $\Gamma_R = 0.67(\text{Bi}) 0.3 (\text{Lp})$<br>Uncertainty limits $20\text{Log}(1+\Gamma_1\Gamma_R)$ | U-Shaped                    | +1.1<br>-1.25      | $\pm 0.5$     |
| System repeatability                                                                                                                                         | Std. Deviation              | $\pm 0.5$          | $\pm 0.5$     |
| Repeatability of EUT                                                                                                                                         |                             | -                  | -             |
| Combined standard uncertainty                                                                                                                                | Normal                      | +2.19 / -2.21      | +1.74 / -1.72 |
| Expanded uncertainty U                                                                                                                                       | Normal (k=2)                | +4.38 / -4.42      | +3.48 / -3.44 |

Calculation for maximum uncertainty when 3m biconical antenna including a factor of k=2 is used:

$$U = 2u_c(y) = 2x(+2.19) = +4.38 \text{ dB} \quad \text{And} \quad U = 2u_c(y) = 2x(-2.21) = -4.42 \text{ dB}$$

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All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

## EXHIBIT 8. MEASUREMENT METHODS

### 8.1. CONDUCTED POWER MEASUREMENTS

- The following shall be applied to the combination(s) of the radio device and its intended antenna(e).
- If the RF level is user adjustable, all measurements shall be made with the highest power level available to the user for that combination.
- The following method of measurement shall apply to both conducted and radiated measurements.
- The radiated measurements are performed at the Ultratech Calibrated Open Field Test Site.
- The measurement shall be performed using normal operation of the equipment with modulation.

Test procedure shall be as follows:

**Step 1:** Duty Cycle measurements if the transmitter's transmission is transient

- Using a EMI Receiver with the frequency span set to 0 Hz and the sweep time set at a suitable value to capture the envelope peaks and the duty cycle of the transmitter output signal;
- The duty cycle of the transmitter,  $x = \text{Tx on} / (\text{Tx on} + \text{Tx off})$  with  $0 < x < 1$ , is measure and recorded in the test report. For the purpose of testing, the equipment shall be operated with a duty cycle that is equal or more than 0.1.

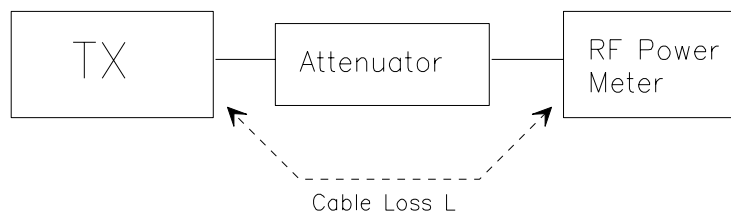
**Step 2:** Calculation of Average EIRP. See Figure 1

- The average output power of the transmitter shall be determined using a wideband, calibrated RF average power meter with the power sensor with an integration period that exceeds the repetition period of the transmitter by a factor 5 or more. The observed value shall be recorded as "A" (in dBm);
- The e.i.r.p. shall be calculated from the above measured power output "A", the observed duty cycle x, and the applicable antenna assembly gain "G" in dBi, according to the formula:

$$\text{EIRP} = A + G + 10\log(1/x)$$

{  $X = 1$  for continuous transmission  $\Rightarrow 10\log(1/x) = 0 \text{ dB}$  }

**Figure 1.**



## 8.2. RADIATED POWER MEASUREMENTS (ERP & EIRP) USING SUBSTITUTION METHOD

### 8.2.1. Maximizing RF Emission Level (E-Field)

- (a) The measurements was performed with full rf output power and modulation.
- (b) Test was performed at listed 3m open area test site (listed with FCC, IC, ITI, NVLAP, ACA & VCCI).
- (c) The transmitter under test was placed at the specified height on a non-conducting turntable (80 cm height)
- (d) The BICONILOG antenna (20 MHz to 1 GHz) or HORN antenna (1 GHz to 18 GHz) was used for measuring.
- (e) Load an appropriate correction factors file in EMI Receiver for correcting the field strength reading level

Total Correction Factor recorded in the EMI Receiver = Cable Loss + Antenna Factor

$E \text{ (dBuV/m)} = \text{Reading (dBuV)} + \text{Total Correction Factor (dB/m)}$

- (f) Set the EMI Receiver and #2 as follows:

|                   |                          |
|-------------------|--------------------------|
| Center Frequency: | test frequency           |
| Resolution BW:    | 100 kHz                  |
| Video BW:         | same                     |
| Detector Mode:    | positive                 |
| Average:          | off                      |
| Span:             | 3 x the signal bandwidth |

- (g) The test antenna was lowered or raised from 1 to 4 meters until the maximum signal level was detected.
- (h) The transmitter was rotated through 360° about a vertical axis until a higher maximum signal was received.
- (i) The test antenna was lowered or raised again from 1 to 4 meters until a maximum was obtained. This level was recorded.
- (j) The recorded reading was corrected to the true field strength level by adding the antenna factor, cable loss and subtracting the pre-amplifier gain.
- (k) The above steps were repeated with both transmitters' antenna and test receiving antenna placed in vertical and horizontal polarization. Both readings with the antennas placed in vertical and horizontal polarization shall be recorded.
- (l) Repeat for all different test signal frequencies

### 8.2.2. Measuring the EIRP of Spurious/Harmonic Emissions using Substitution Method

- (a) Set the EMI Receiver (for measuring E-Field) and Receiver #2 (for measuring EIRP) as follows:

|                   |                            |
|-------------------|----------------------------|
| Center Frequency: | equal to the signal source |
| Resolution BW:    | 10 kHz                     |
| Video BW:         | same                       |
| Detector Mode:    | positive                   |
| Average:          | off                        |
| Span:             | 3 x the signal bandwidth   |

- (b) Load an appropriate correction factors file in EMI Receiver for correcting the field strength reading level

Total Correction Factor recorded in the EMI Receiver = Cable Loss + Antenna Factor  
 $E \text{ (dBuV/m)} = \text{Reading (dBuV)} + \text{Total Correction Factor (dB/m)}$

- (c) Select the frequency and E-field levels obtained in the Section 8.2.1 for ERP/EIRP measurements.  
(d) Substitute the EUT by a signal generator and one of the following transmitting antenna (substitution antenna):  
    ♦ DIPOLE antenna for frequency from 30-1000 MHz or  
    ♦ HORN antenna for frequency above 1 GHz }.  
(e) Mount the transmitting antenna at 1.5 meter high from the ground plane.  
(f) Use one of the following antenna as a receiving antenna:  
    ♦ DIPOLE antenna for frequency from 30-1000 MHz or  
    ♦ HORN antenna for frequency above 1 GHz }.  
(g) If the DIPOLE antenna is used, tune it's elements to the frequency as specified in the calibration manual.  
(h) Adjust both transmitting and receiving antenna in a VERTICAL polarization.  
(i) Tune the EMI Receivers to the test frequency.  
(j) Lower or raise the test antenna from 1 to 4 meters until the maximum signal level was detected.  
(k) The transmitter was rotated through 360° about a vertical axis until a higher maximum signal was received.  
(l) Lower or raise the test antenna from 1 to 4 meters until the maximum signal level was detected.  
(m) Adjust input signal to the substitution antenna until an equal or a known related level to that detected from the transmitter was obtained in the test receiver.  
(n) Record the power level read from the Average Power Meter and calculate the ERP/EIRP as follows:

$$P = P1 - L1 = (P2 + L2) - L1 = P3 + A + L2 - L1$$

$$EIRP = P + G1 = P3 + L2 - L1 + A + G1$$

$$ERP = EIRP - 2.15 \text{ dB}$$

$$\text{Total Correction factor in EMI Receiver \# 2} = L2 - L1 + G1$$

Where: P: Actual RF Power fed into the substitution antenna port after corrected.  
P1: Power output from the signal generator  
P2: Power measured at attenuator A input  
P3: Power reading on the Average Power Meter  
EIRP: EIRP after correction  
ERP: ERP after correction

- (o) Adjust both transmitting and receiving antenna in a HORIZONTAL polarization, then repeat step (k) to (o)  
(p) Repeat step (d) to (o) for different test frequency  
(q) Repeat steps (c) to (j) with the substitution antenna oriented in horizontal polarization.  
(r) Actual gain of the EUT's antenna is the difference of the measured EIRP and measured RF power at the RF port. Correct the antenna gain if necessary.:



Figure 2

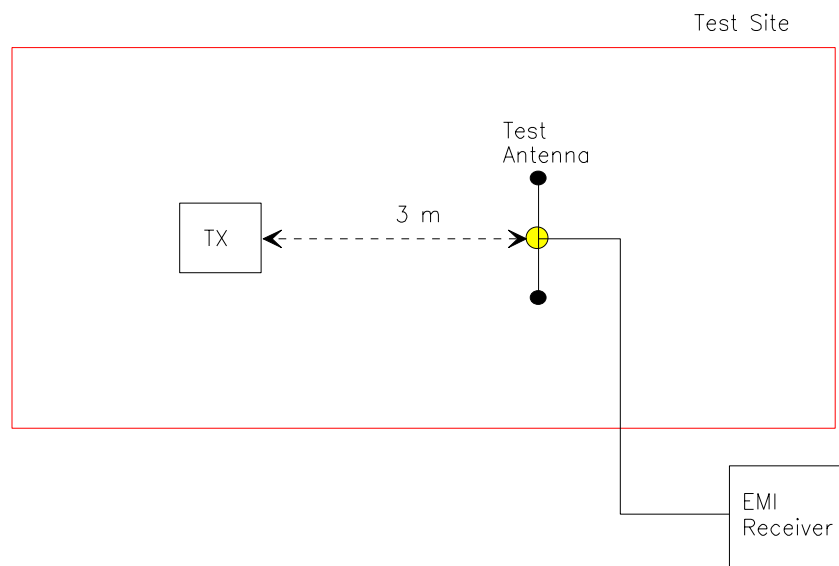
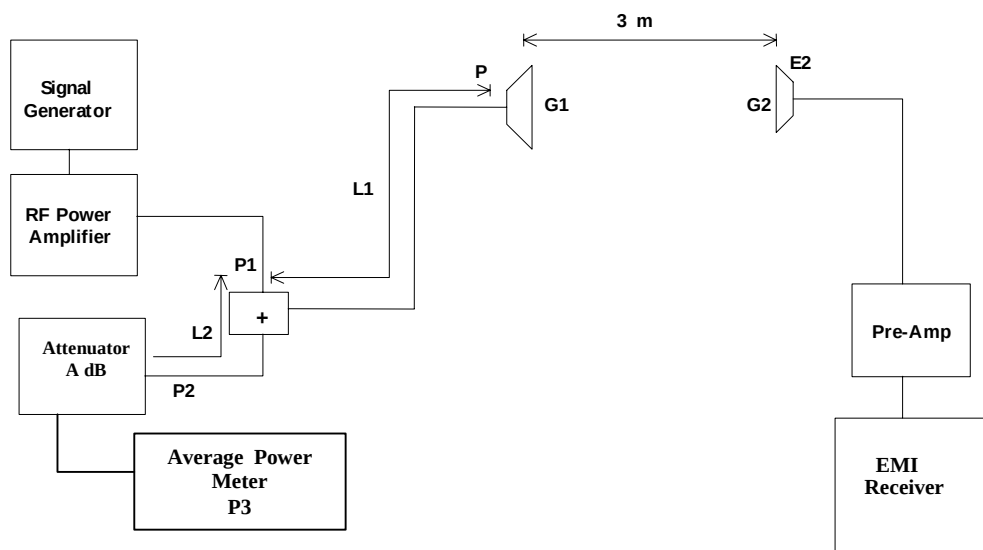


Figure 3



### 8.3. FREQUENCY STABILITY

Refer to FCC @ 2.1055.

- (a) The frequency stability shall be measured with variation of ambient temperature as follows: From -30 to +50 centigrade except that specified in subparagraph (2) & (3) of this paragraph.
- (b) Frequency measurements shall be made at extremes of the specified temperature range and at intervals of not more than 10 centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. The short-term transient effects on the frequency of the transmitter due to keying (except for broadcast transmitters) and any heating element cycling normally occurring at each ambient temperature level also shall be shown. Only the portion or portions of the transmitter containing the frequency determining and stability circuitry need be subjected to the temperature variation test.
- (d) The frequency stability supply shall be measured with variation of primary supply voltage as follows:
  - (1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.
  - (2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.
  - (3) The supply voltage shall be measured at the input to the cable normally provide with the equipment, or at the power supply terminals if cables are not normally provided. Effects on frequency of transmitter keying (except for broadcast transmitters) and any heating element cycling at the nominal supply voltage and at each extreme also shall be shown.
- (e) When deemed necessary, the Commission may require tests of frequency stability under conditions in addition to those specifically set out in paragraphs (a), (b), (c) and (d) of this section. (For example, measurements showing the effect of proximity to large metal objects, or of various types of antennas, may be required for portable equipment).

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## 8.4. EMISSION MASK

**Voice or Digital Modulation Through a Voice Input Port @ 2.1049(c)(i):** - The transmitter was modulated by a 2.5 KHz tone signal at an input level 16 dB greater than that required to produce 50% modulation (e.g.:  $\pm 2.5$  KHz peak deviation at 1 KHz modulating frequency). The input level was established at the frequency of maximum response of the audio modulating circuit.

**Digital Modulation Through a Data Input Port @ 2.1049(h):** - Transmitters employing digital modulation techniques - when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the Emission Masks shall be shown for operation with any devices used for modifying the spectrum when such devices are operational at the discretion of the user.

The following EMI Receiver bandwidth shall be used for measurement of Emission Mask/Out-of-Band Emission Measurements:

- (1) For 25 kHz Channel Spacing: RBW = 300 Hz
- (2) For 12.5 kHz or 6.25 kHz Channel Spacings: RBW = 100 Hz

The all cases the Video Bandwidth shall be equal or greater than the measuring bandwidth.

## 8.5. SPURIOUS EMISSIONS (CONDUCTED)

With transmitter modulation characteristics described in Out-of-Band Emissions measurements @ 2.1049, the transmitter spurious and harmonic emissions were scanned. The spurious and harmonic emissions were measured with the EMI Receiver controls set as RBW = 30 kHz minimum, VBW  $\geq$  RBW and SWEEP TIME = AUTO). The transmitter was operated at a full rated power output, and modulated as follows:

**FCC CFR 47, Para. 2.1057 - Frequency spectrum to be investigated:** - The spectrum was investigated from the lowest radio generated in the equipment up to at least the 10<sup>th</sup> harmonic of the carrier frequency or to the highest frequency practicable in the present state of the art of measuring techniques, whichever is lower. Particular attention should be paid to harmonics and subharmonics of the carrier frequency. Radiation at the frequencies of multiplier stages should be checked. The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

**FCC CFR 47, Para. 2.1051 - Spurious Emissions at Antenna Terminal:** - The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of the harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.