

# Laboratory Test Report

For the  
TMAL3D Mobile Transceiver

Tested In accordance with  
FCC 47 CFR Part 90

Report Revision: 1  
Issue Date: 15-Oct-2008  
FCC ID: CASTMAL3D

PREPARED BY: Robin Kidson \_\_\_\_\_  
Test Technician

CHECKED & APPROVED BY: Steve Crompton \_\_\_\_\_  
Laboratory Manager



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

This document must not be reproduced except in full, without the written permission of the Compliance Laboratory Manager.

## TABLE OF CONTENTS

REVISION HISTORY.....	3
INTRODUCTION.....	4
REPORT PREPARED FOR.....	4
DESCRIPTION OF SAMPLE.....	4
STATEMENT OF COMPLIANCE.....	4
TEST CONDITIONS.....	4
MODULATION TYPES AND EMISSION DESIGNATORS.....	5
TEST RESULTS.....	6
TRANSMITTER OUTPUT POWER (CONDUCTED).....	6
TRANSMITTER AUDIO FREQUENCY RESPONSE - PRE-EMPHASIS.....	7
TRANSMITTER MODULATION LIMITING.....	9
OCCUPIED BANDWIDTH.....	11
SPURIOUS EMISSIONS (CONDUCTED).....	28
SPURIOUS EMISSIONS (RADIATED).....	31
TRANSMITTER FREQUENCY STABILITY (TEMPERATURE).....	34
TRANSMITTER FREQUENCY STABILITY (VOLTAGE).....	36
TEST EQUIPMENT USED.....	37
ANNEX A.....	38
TEST SETUP DETAILS.....	38

## REVISION HISTORY

Date	Revision	Comments
15-Oct-2008	1	Initial test report

## INTRODUCTION

Type Approval Testing of the TMAB24-L301, Serial No 19473454 and frequency range 896 MHz → 941 MHz, in accordance with:

### **FCC CFR 47 Part 90**

## REPORT PREPARED FOR

Tait Electronics Ltd  
PO Box 1645  
558 Wairakei Rd  
Christchurch  
New Zealand

## DESCRIPTION OF SAMPLE

Manufacturer: Tait Electronics Limited  
Equipment: Mobile Transceiver  
Type: TMAL3D  
Product code: TMAB24-L301  
Serial Numbers: 19473454  
Quantity: 1  
Hardware & Software:

<b>Torso</b>	
Hardware ID,	TMAB24-L300_0111
Radio Application,	QMA2F_std_5.02.00.0194
Boot Code,	QMA2B_std_2.01.00.0002
FPGA Image,	QMA2G_std_2.01.00.0001
DSP	QMA2A_std_5.02.00.0194
<b>Head</b>	
Hardware ID,	TMAC40-0000_0004
Radio Application,	QCA2F_std_5.03.00.0001
Boot Code,	QCA2B_std_2.01.00.0002
FPGA Image,	QCA2G_std_2.01.00.0001

## STATEMENT OF COMPLIANCE

The TMAB24-L301 Mobile Transceiver as tested in this report was found to conform to the following standards:

### **FCC CFR 47 Part 90**

## TEST CONDITIONS

All testing was performed at the following conditions:

Ambient Temperature      15°C      → 30°C  
Relative Humidity          20%      → 75%  
Standard Test Voltage      13.8Vdc

## MODULATION TYPES AND EMISSION DESIGNATORS

### Modulation Types:

F3E	Analogue FM
F2D	FFSK Data (1200 bps, 2400 bps)
F1D	THSD (12000 bps)

### Channel Spacings:

12.5 kHz

### Emission Designators:

Analogue FM	11k0F3E
FFSK Data 1200bps	6k60F2D
FFSK Data 2400bps	7k80F2D
THSD	7k70F1D

## TEST RESULTS

### TRANSMITTER OUTPUT POWER (CONDUCTED)

SPECIFICATION: FCC 47 CFR 2.1046

GUIDE: TIA/EIA-603C 2.2.1

**MEASUREMENT PROCEDURE:**

1. Refer Annex A for Equipment set up.
2. The coaxial attenuator has an impedance of 50 Ohms.
3. The unmodulated output power was measured with an RF Power meter.

**MEASUREMENT RESULTS:**

Manufacturer's Rated Output Power: Switchable: 30 W and 2 W

900.9875 MHz	30 W nominal	2 W nominal
POWER (W)	31.2	2.2
Variation from Nominal (%)	+4.0	+10.0
Measurement Uncertainty	± 0.6 dB	

939.9875 MHz	30 W nominal	2 W nominal
POWER (W)	31.5	2.2
Variation from Nominal (%)	+5.0	+10.0
Measurement Uncertainty	± 0.6 dB	

LIMIT CLAUSE: FCC 47 CFR 90.205 (s)

Radio Type: Mobile Transceiver  
Frequency Band: 896 MHz ~ 941 MHz

The output power shall not exceed by more than 20% the manufacturer's rated output power for the particular transmitter specifically listed on the authorization.

**TRANSMITTER AUDIO FREQUENCY RESPONSE - PRE-EMPHASIS**

SPECIFICATION: FCC 47 CFR 2.1047 (a)

GUIDE: TIA/EIA-603C 2.2.6

**MEASUREMENT PROCEDURE:**

1. Refer Annex A for Equipment set up.
2. An audio input tone of 1000Hz was applied with the level set to obtain 20% of maximum deviation. This was used as the 0dB reference point.
3. The AF was varied while the audio level was held constant.
4. The response in dB relative to 1000Hz was measured.

**MEASUREMENT RESULTS:**

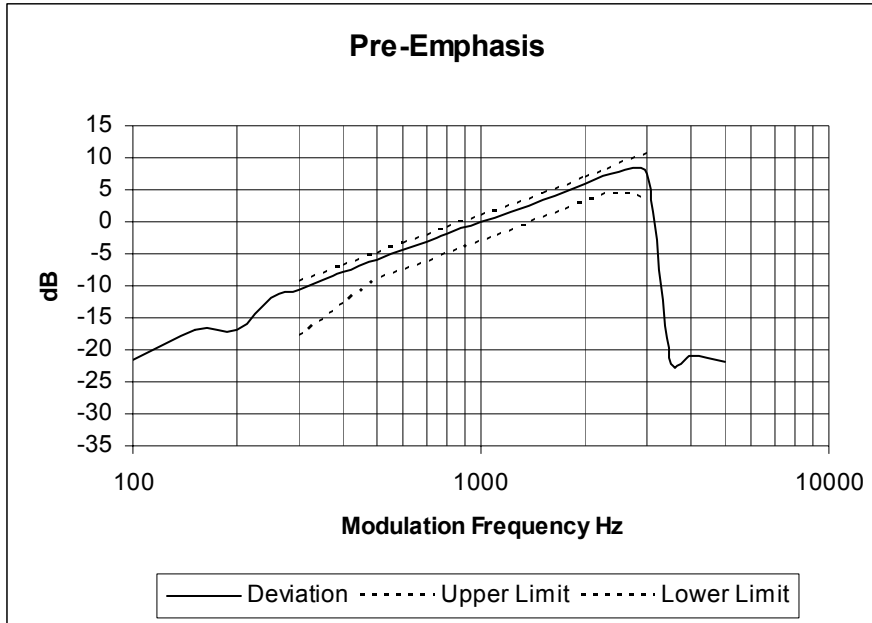
See the plots on the following pages for 12.5 kHz channel spacings.

LIMIT CLAUSE: TIA/EIA-603C 3.2.6

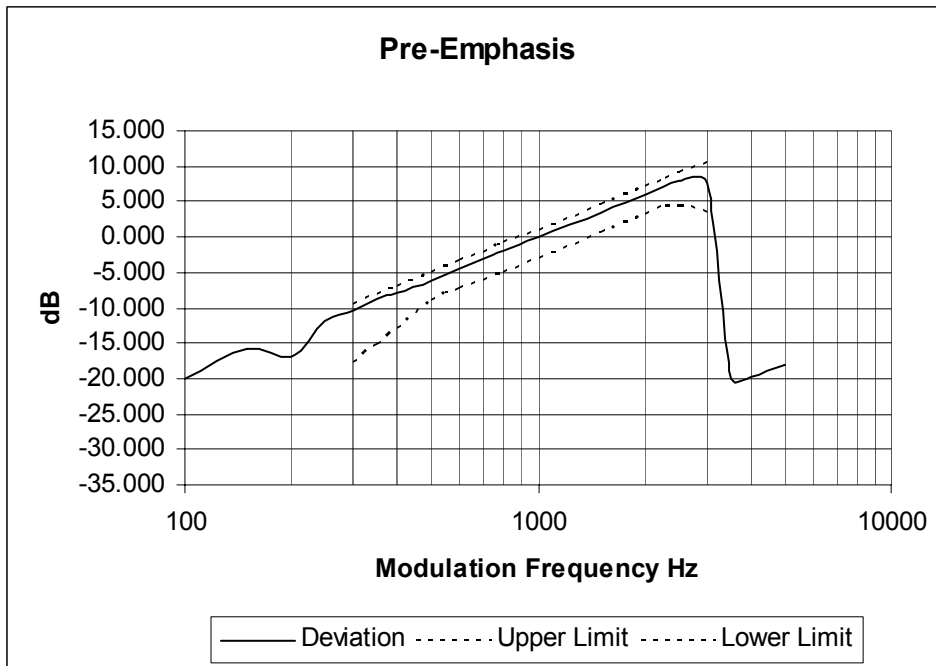
TRANSMITTER AUDIO FREQUENCY RESPONSE - PRE-EMPHASIS

SPECIFICATION: FCC CFR 2.1047 (a)

Tx FREQUENCY: 900.9875 MHz 12.5 kHz Channel Spacing



Tx FREQUENCY: 939.9875 MHz 12.5 kHz Channel Spacing





TRANSMITTER MODULATION LIMITING

SPECIFICATION: FCC 47 CFR 2.1047 (b)

MEASUREMENT PROCEDURE:

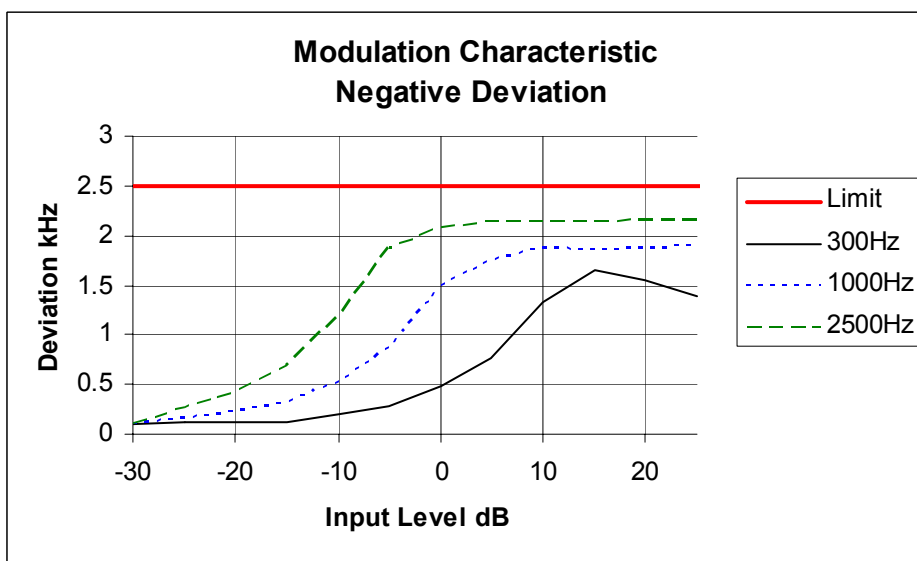
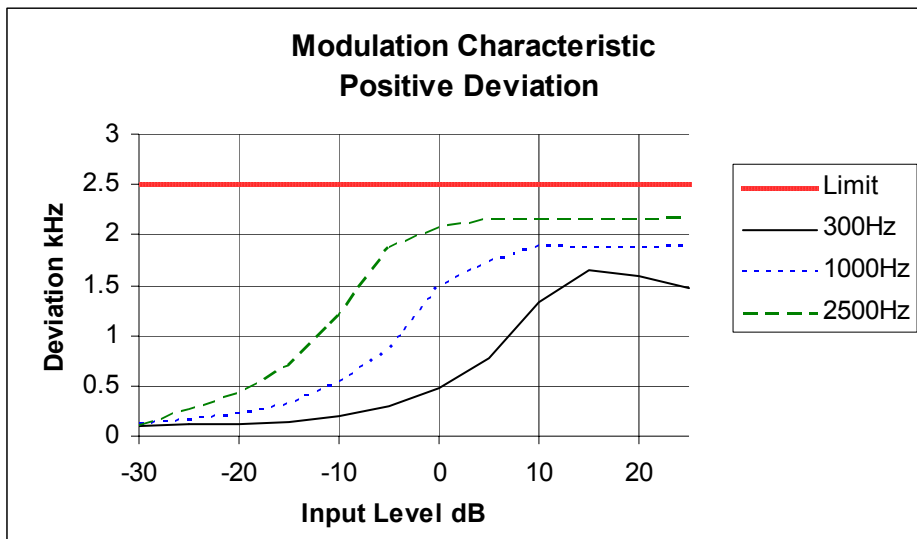
1. Refer Annex A for Equipment set up.
2. The modulation response was measured at three audio frequencies while varying the input level.
3. Measurements were made for both Positive and Negative Deviation.

MEASUREMENT RESULTS:

See the plots on the following pages for 12.5 kHz channel spacing.

LIMIT CLAUSE: TIA/EIA-603C 1.3.4.4

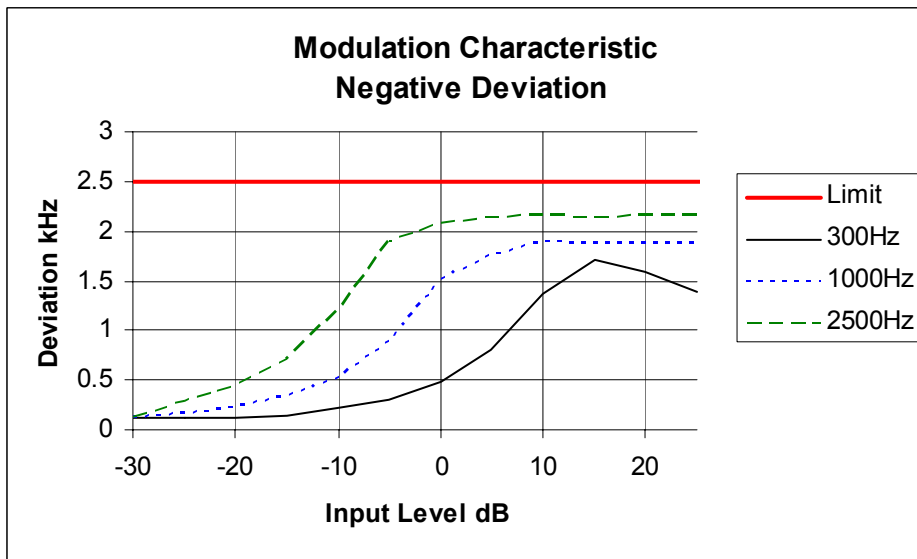
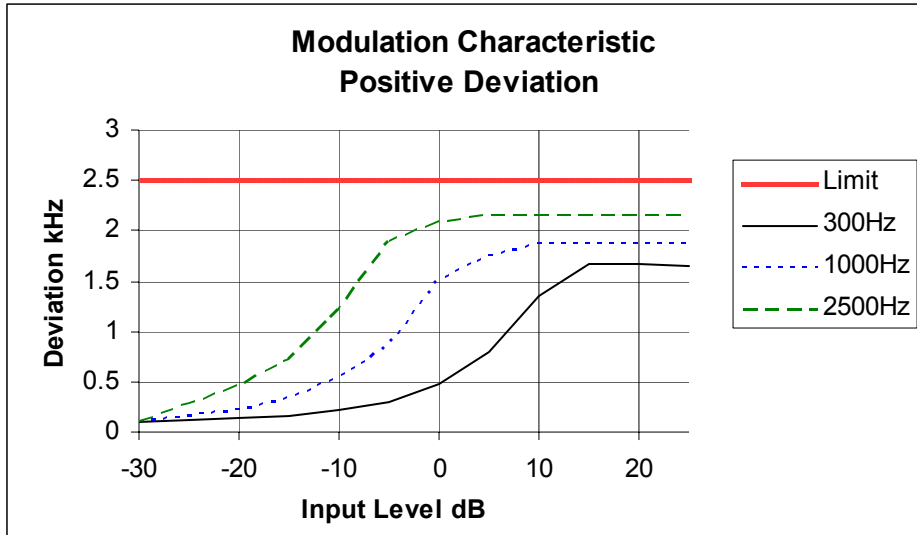
Tx FREQUENCY: 900.9875 MHz 12.5 kHz Channel Spacing



TRANSMITTER MODULATION LIMITING

SPECIFICATION: FCC CFR 2.1047 (b)

Tx FREQUENCY: 939.9875 MHz 12.5 kHz Channel Spacing



**OCCUPIED BANDWIDTH**

SPECIFICATION: FCC 47 CFR 2.1049 (c)

GUIDE: TIA/EIA-603C 2.2.11

**MEASUREMENT PROCEDURE:**

1. Refer Annex A for Equipment Set up.
2. For analog measurements: The EUT was modulated by a 2500Hz tone at an input level 16dB above a level that produced 50% deviation. The input level was established at the frequency of maximum response of the audio modulating circuit.  
For Data measurements: The EUT was modulated with an internally generated pseudo random bit sequence at the appropriate Baud rates.
3. The Occupied Bandwidth was measured on the Spectrum Analyser, with bandwidth settings as follows.

Emission Mask D – Resolution Bandwidth = 100Hz, Video Bandwidth = 1 kHz  
Emission Mask B, and C – Resolution bandwidth = 300Hz, Video Bandwidth = 3 kHz

**MEASUREMENT RESULTS:**

See the plots on the following pages for 12.5 kHz channel spacing.

LIMIT CLAUSE: FCC 47 CFR 90.210

**EMISSION MASKS**

Emission Mask I	12.5 kHz Channel Spacing	Analogue;
Emission Mask J	12.5 kHz Channel Spacing	FFSK; THSD

**DATA SPEED**

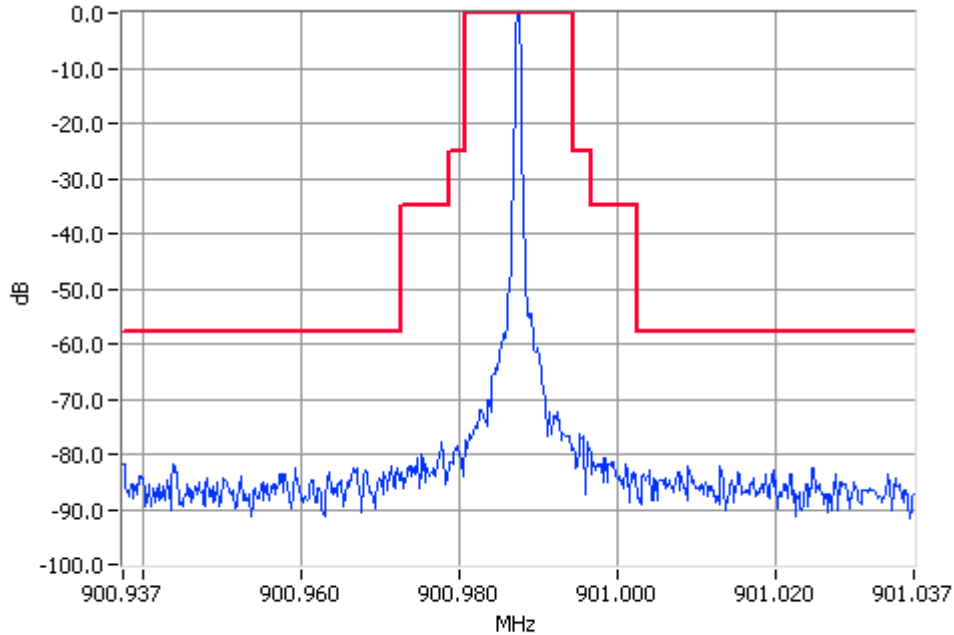
FFSK	12.5 kHz Channel Spacing	1200 bps
FFSK	12.5 kHz Channel Spacing	2400 bps
THSD	12.5 kHz Channel Spacing	12000 bps

OCCUPIED BANDWIDTH

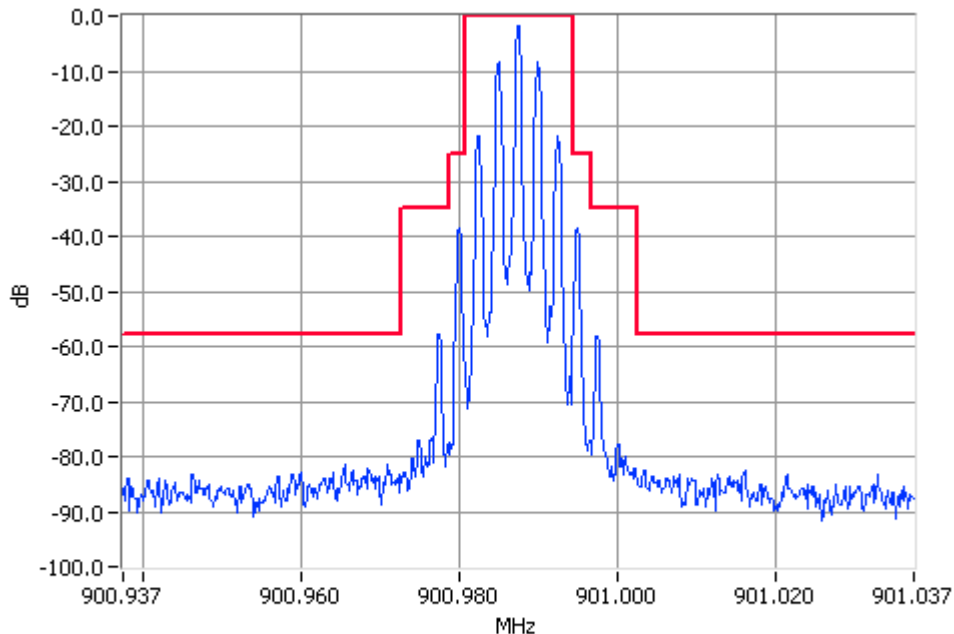
ANALOG VOICE

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 900.9875 MHz 30 W 12.5 kHz Channel Spacing



Unmodulated 900.9875MHz Mask I 30W Pass  
RBW=300Hz VBW=3000Hz



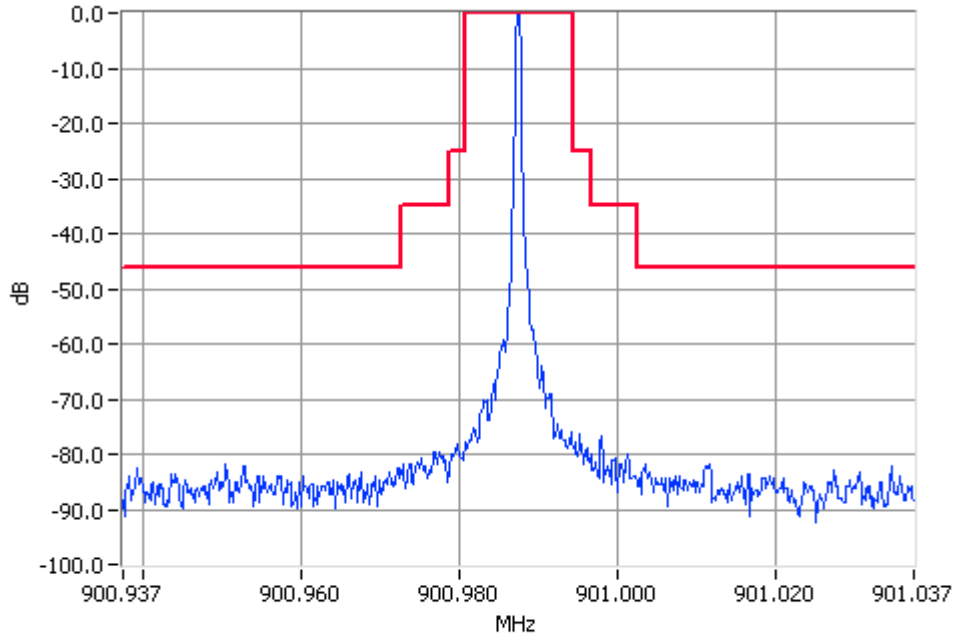
Analogue Modulation 900.9875MHz Mask I 30W Pass  
RBW=300Hz VBW=3000Hz

OCCUPIED BANDWIDTH

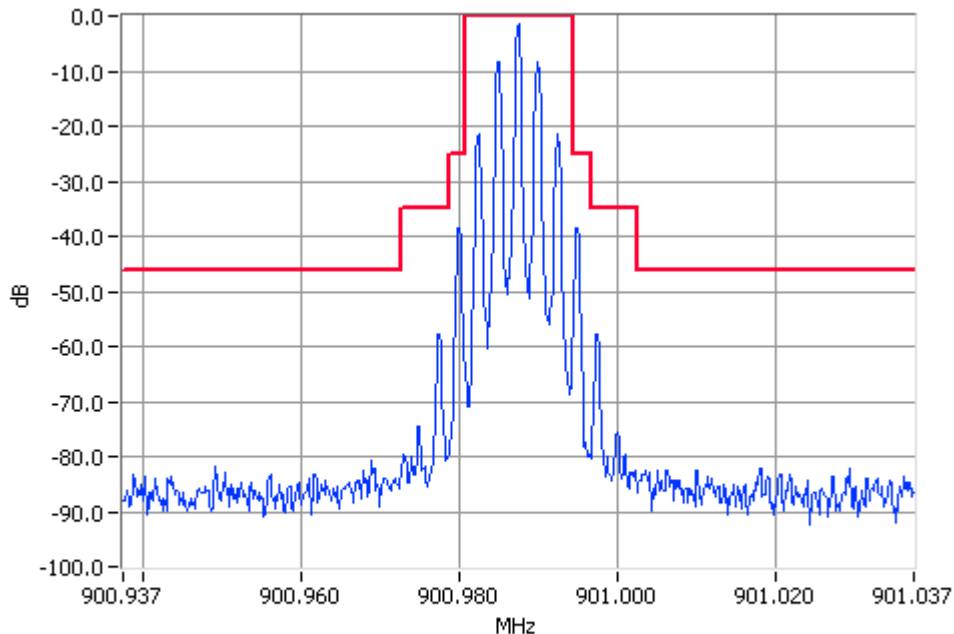
ANALOG VOICE

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 900.9875 MHz 2 W 12.5 kHz Channel Spacing



Unmodulated 900.9875MHz Mask I 2W Pass  
RBW=300Hz VBW=3000Hz



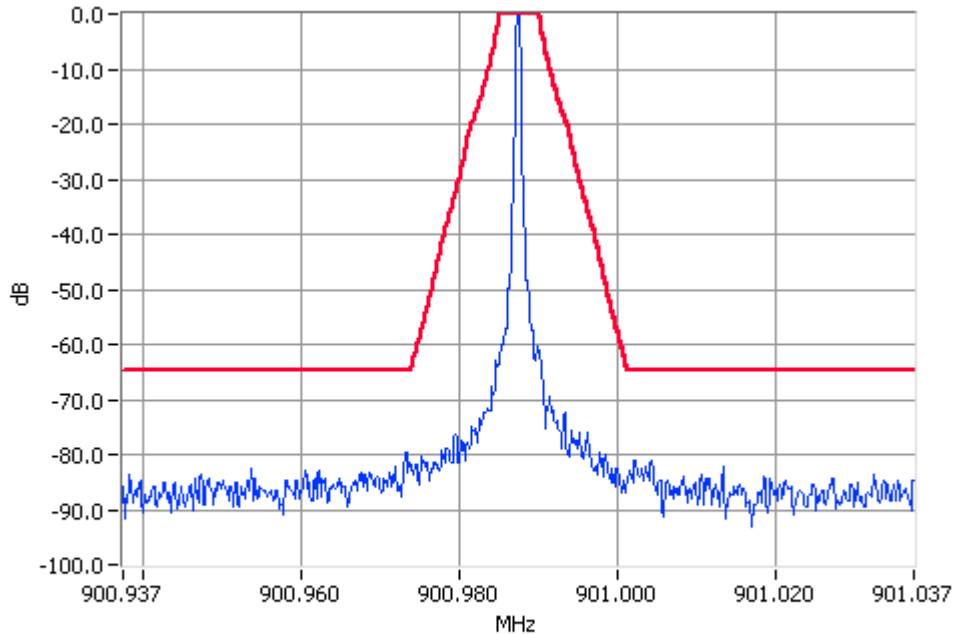
Analogue Modulation 900.9875MHz Mask I 2W Pass  
RBW=300Hz VBW=3000Hz

OCCUPIED BANDWIDTH

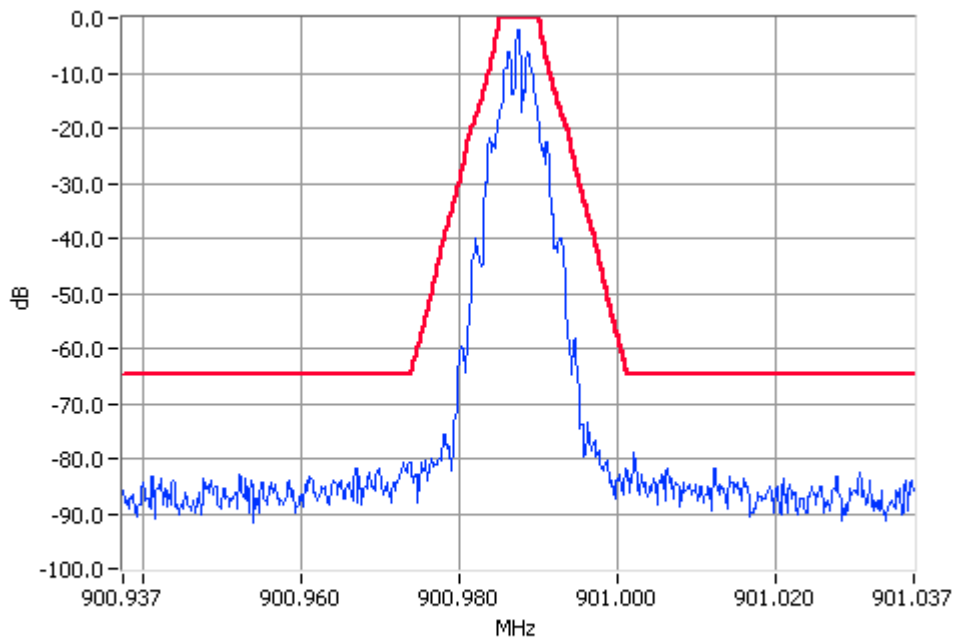
FFSK 1200 bps

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 900.9875 MHz 30 W 12.5 kHz Channel Spacing



Unmodulated 900.9875MHz Mask J 30W Pass  
RBW=300Hz VBW=3000Hz



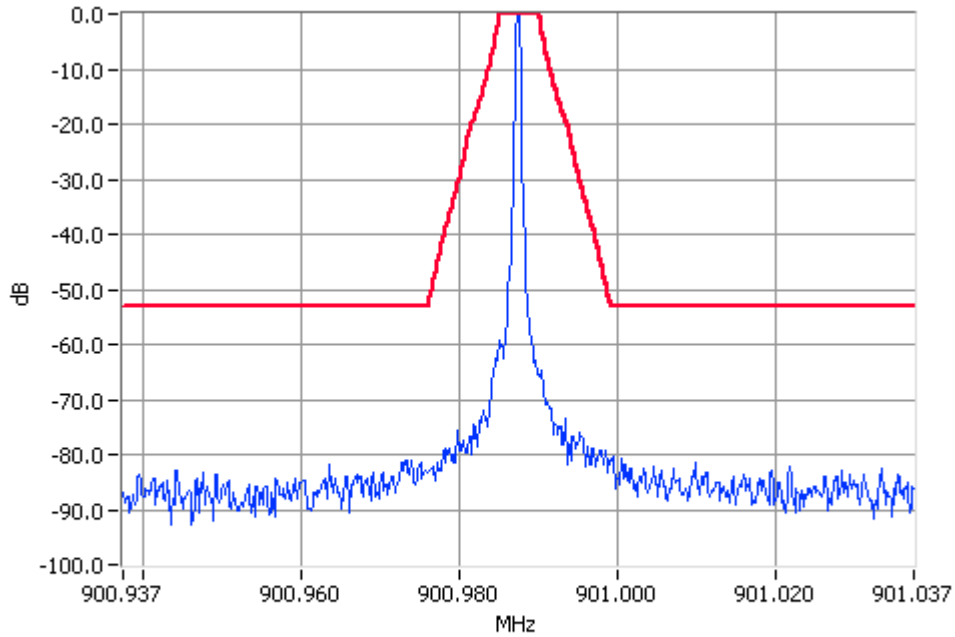
FFSK 900.9875MHz Mask J 30W Pass  
RBW=300Hz VBW=3000Hz

OCCUPIED BANDWIDTH

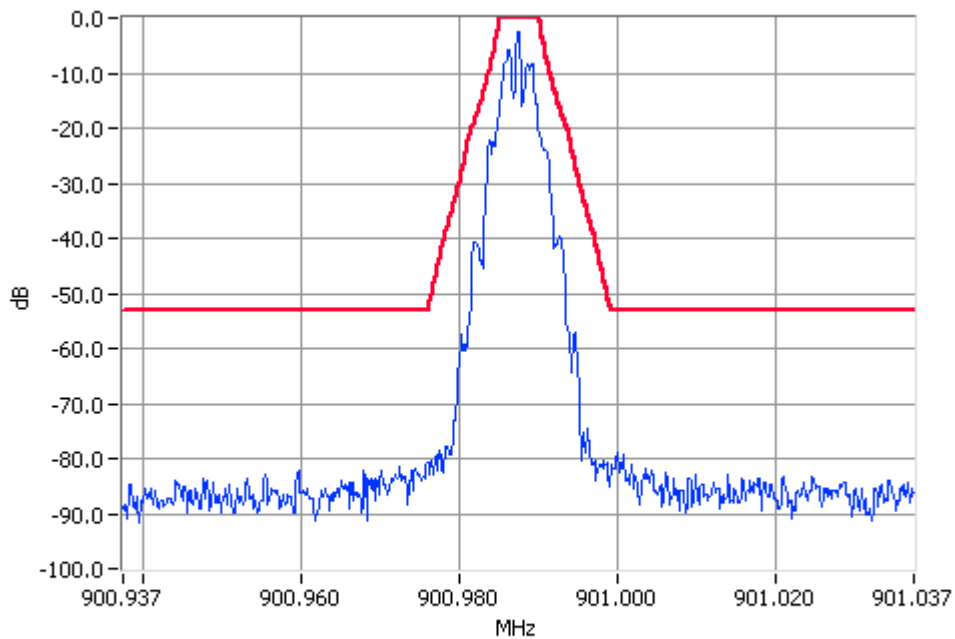
FFSK 1200 bps

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 900.9875 MHz 2 W 12.5 kHz Channel Spacing



Unmodulated 900.9875MHz Mask J 2W Pass  
RBW=300Hz VBW=3000Hz



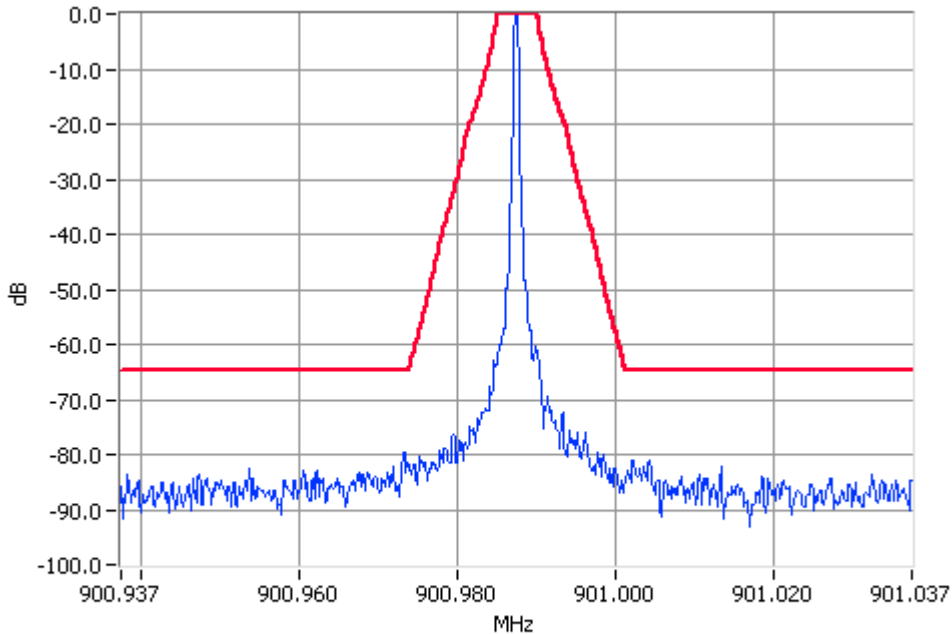
FFSK 900.9875MHz Mask J 2W Pass  
RBW=300Hz VBW=3000Hz

OCCUPIED BANDWIDTH

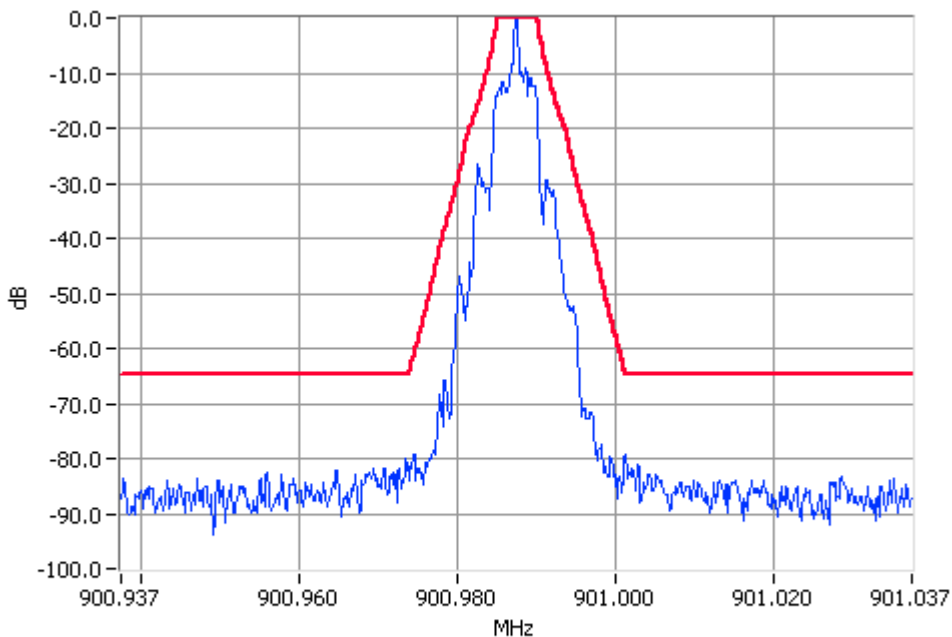
FFSK 2400 bps

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 900.9875 MHz 30 W 12.5 kHz Channel Spacing



Unmodulated 900.9875MHz Mask J 30W Pass  
RBW=300Hz VBW=3000Hz



FFSK(2400Bps) 900.9875MHz Mask J 30W Pass  
RBW=300Hz VBW=3000Hz

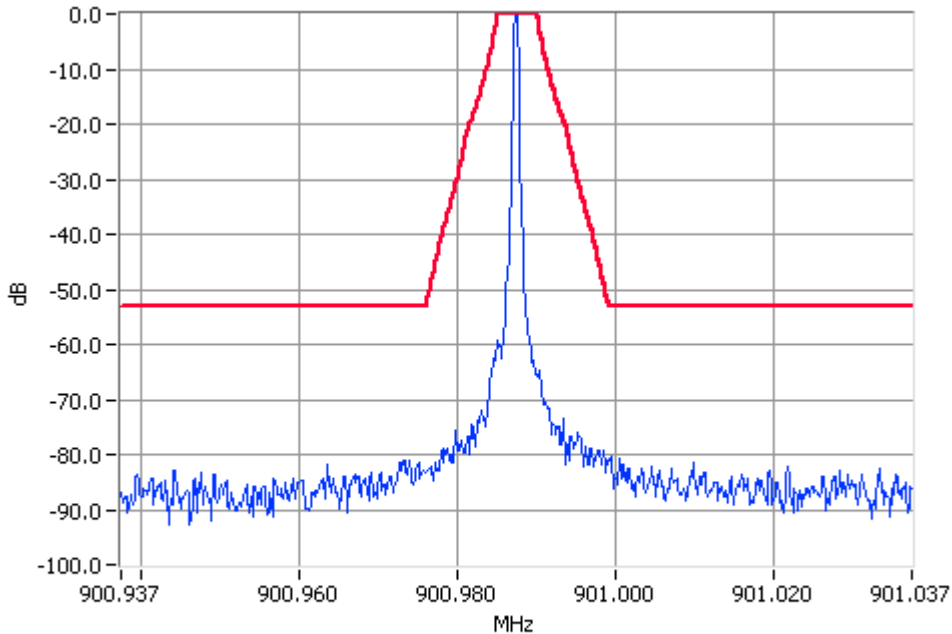


OCCUPIED BANDWIDTH

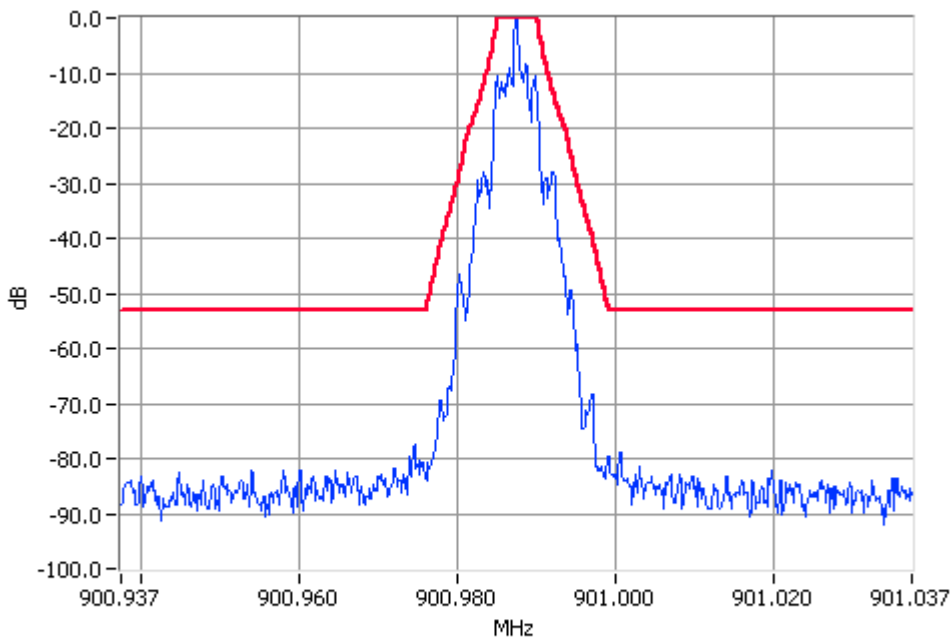
FFSK 2400 bps

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 900.9875 MHz 2 W 12.5 kHz Channel Spacing



Unmodulated 900.9875MHz Mask J 2W Pass  
RBW=300Hz VBW=3000Hz



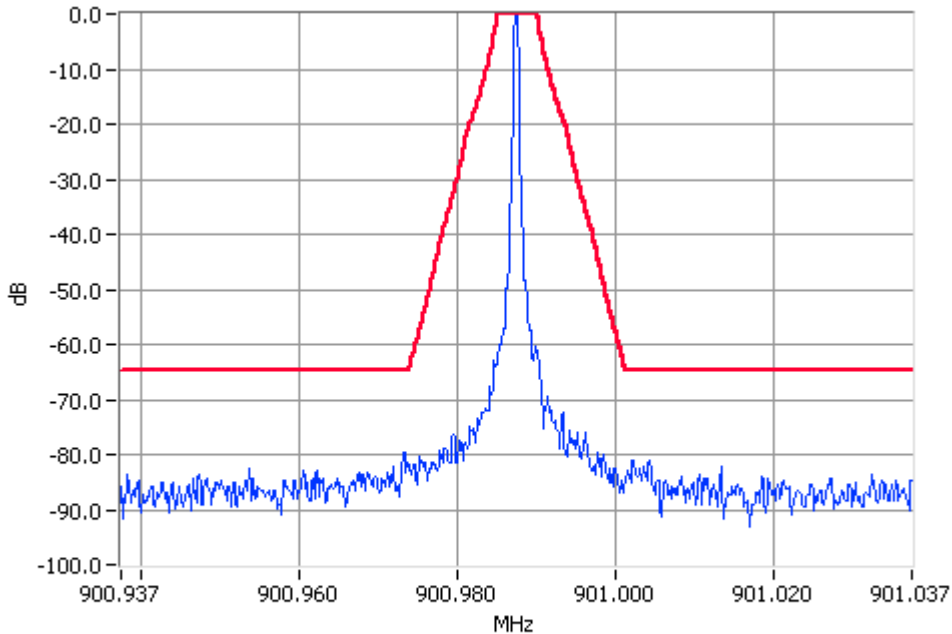
FFSK(2400Bps) 900.9875MHz Mask J 2W Pass  
RBW=300Hz VBW=3000Hz

OCCUPIED BANDWIDTH

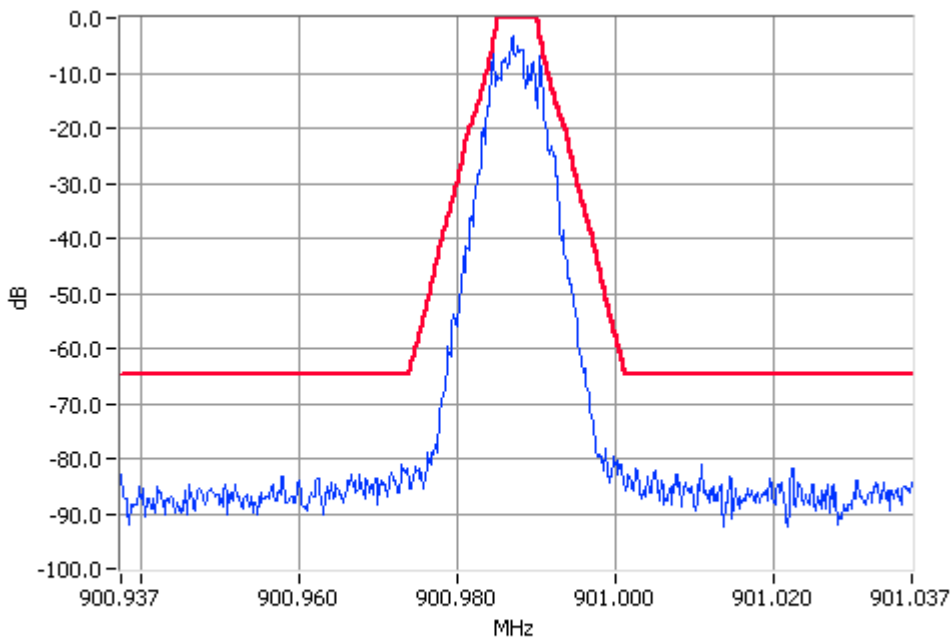
THSD

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 900.9875 MHz 30 W 12.5 kHz Channel Spacing



Unmodulated 900.9875MHz Mask J 30W Pass  
RBW=300Hz VBW=3000Hz



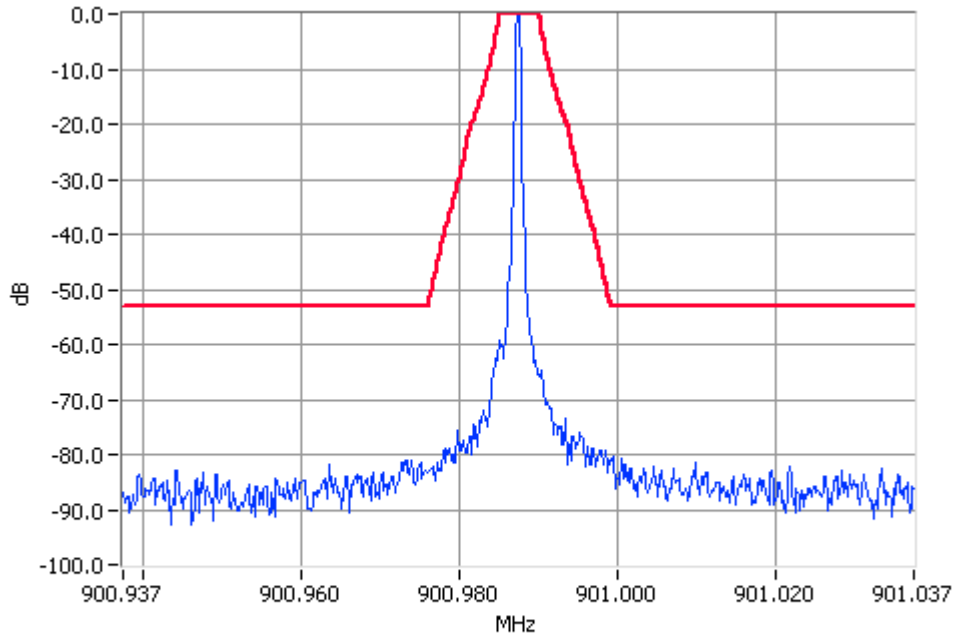
THSD 900.9875MHz Mask J 30W Pass  
RBW=300Hz VBW=3000Hz

OCCUPIED BANDWIDTH

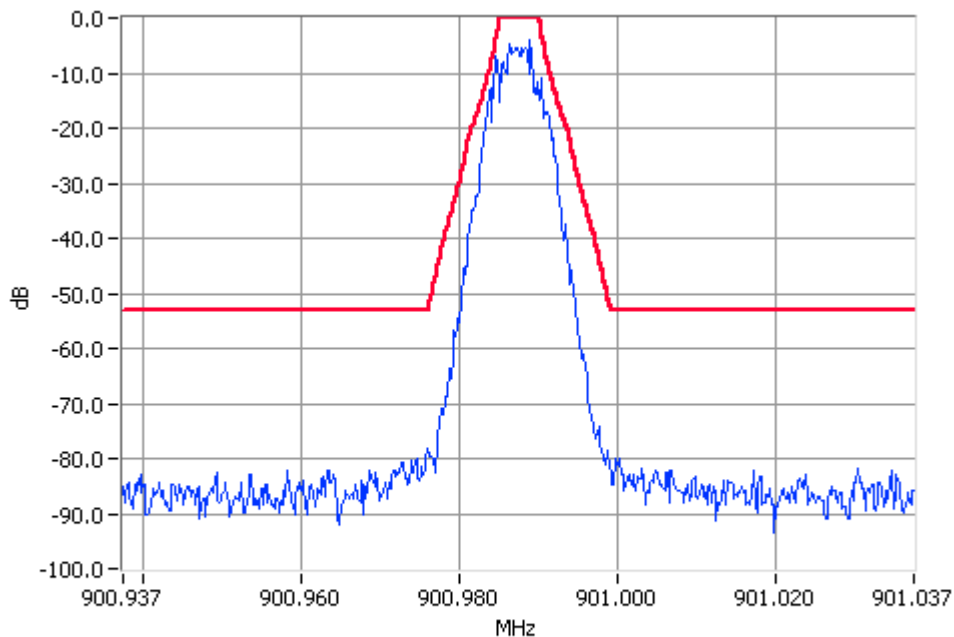
THSD

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 900.9875 MHz 2 W 12.5 kHz Channel Spacing



Unmodulated 900.9875MHz Mask J 2W Pass  
RBW=300Hz VBW=3000Hz



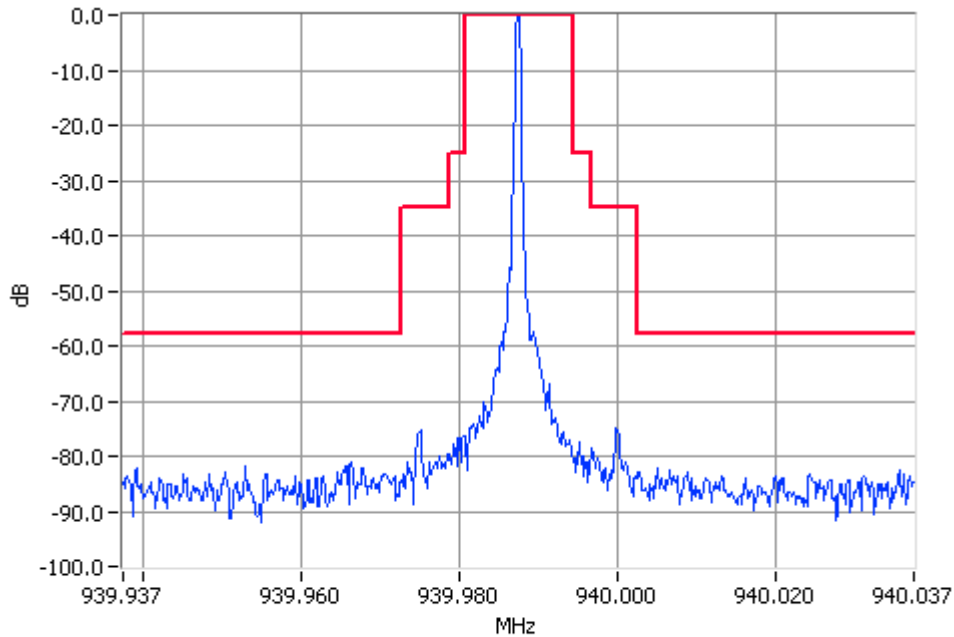
THSD 900.9875MHz Mask J 2W Pass  
RBW=300Hz VBW=3000Hz

OCCUPIED BANDWIDTH

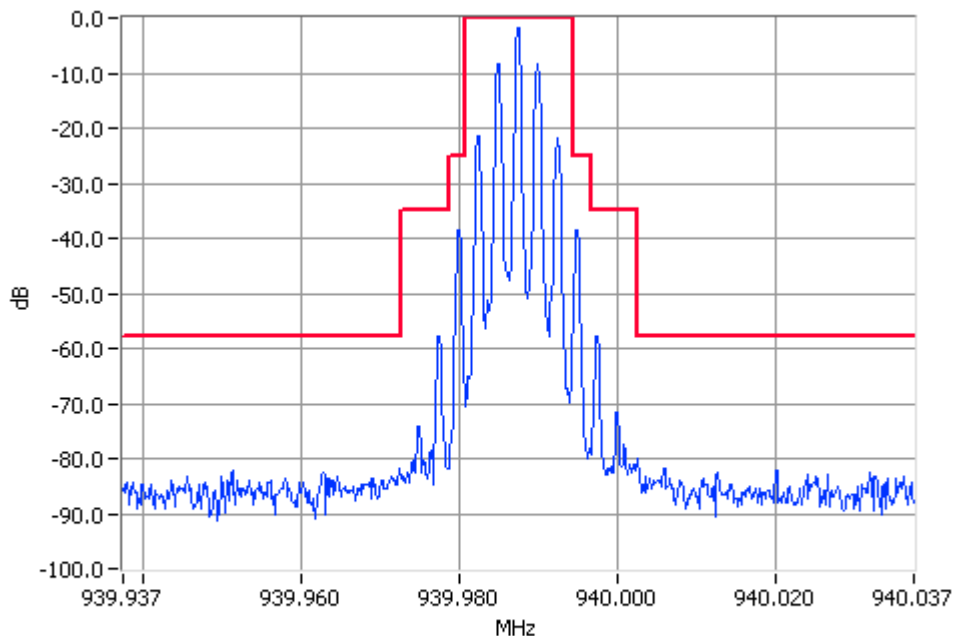
ANALOG VOICE

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 939.9875 MHz 30 W 12.5 kHz Channel Spacing



Unmodulated 939.9875MHz Mask I 30W Pass  
RBW=300Hz VBW=3000Hz



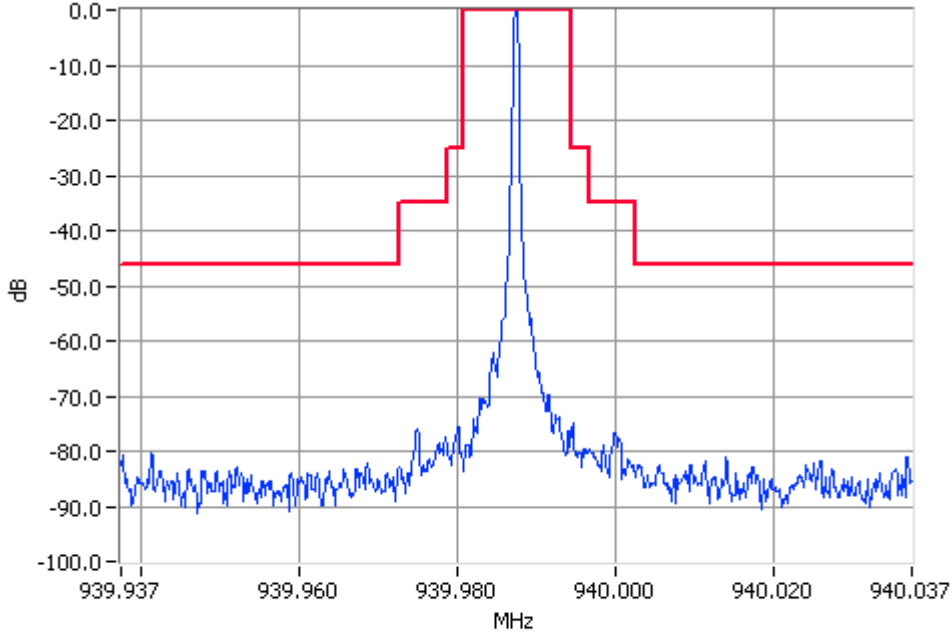
Analogue Modulation 939.9875MHz Mask I 30W Pass  
RBW=300Hz VBW=3000Hz

OCCUPIED BANDWIDTH

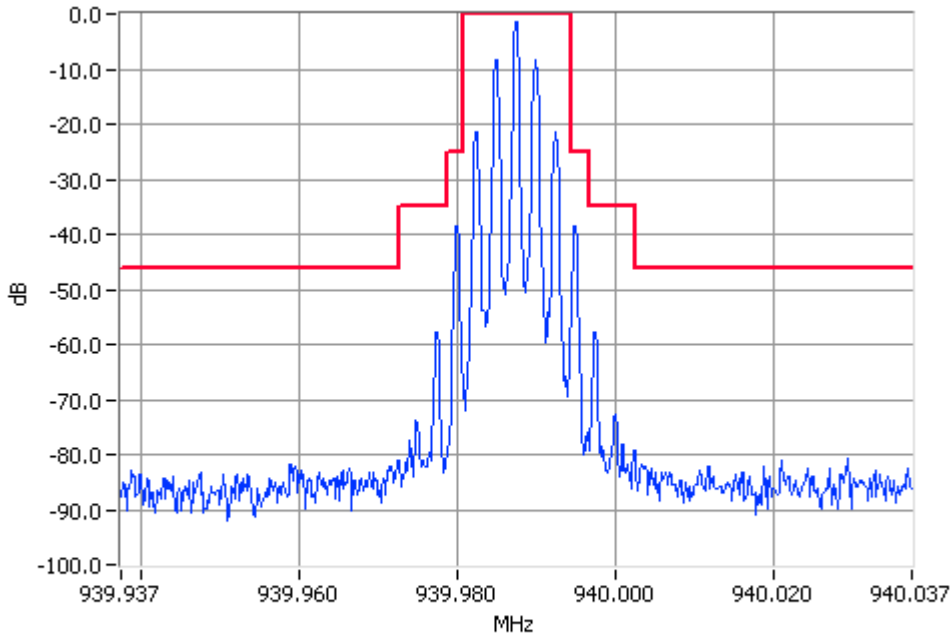
ANALOG VOICE

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 939.9875 MHz 2 W 12.5 kHz Channel Spacing



Unmodulated 939.9875MHz Mask I 2W Pass  
RBW=300Hz VBW=3000Hz



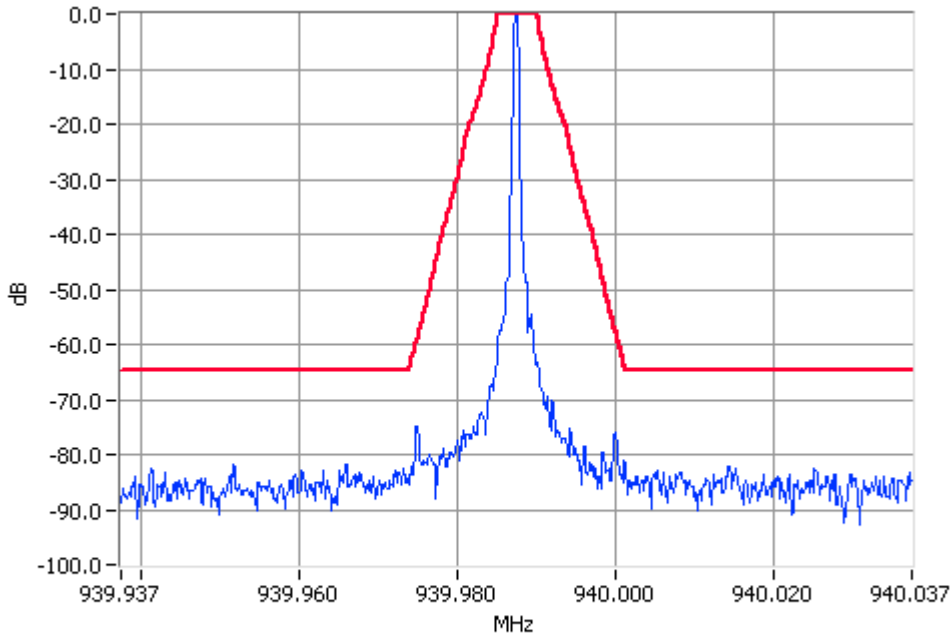
Analogue Modulation 939.9875MHz Mask I 2W Pass  
RBW=300Hz VBW=3000Hz

OCCUPIED BANDWIDTH

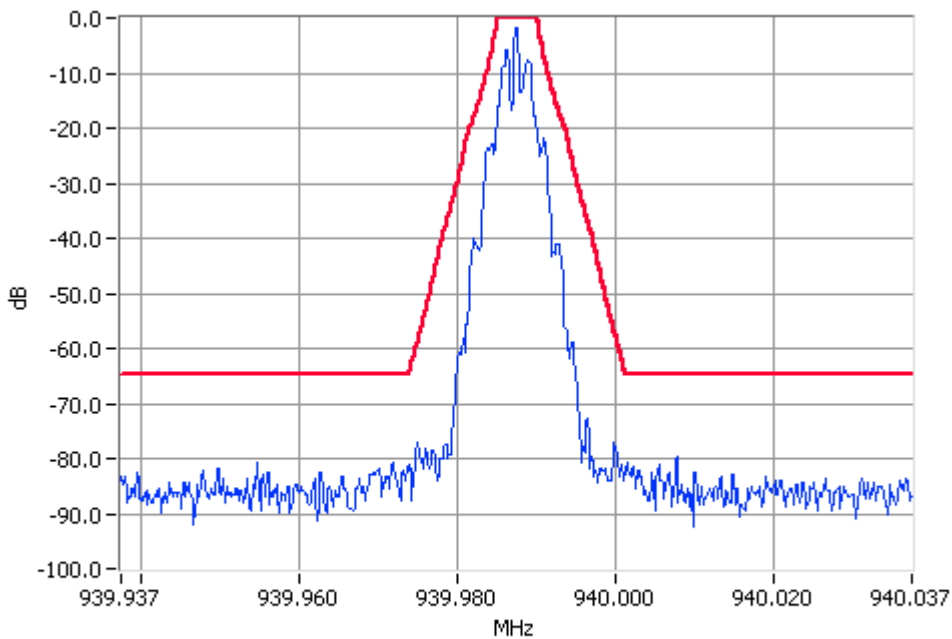
FFSK 1200 bps

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 939.9875 MHz 30 W 12.5 kHz Channel Spacing



Unmodulated 939.9875MHz Mask J 30W Pass  
RBW=300Hz VBW=3000Hz



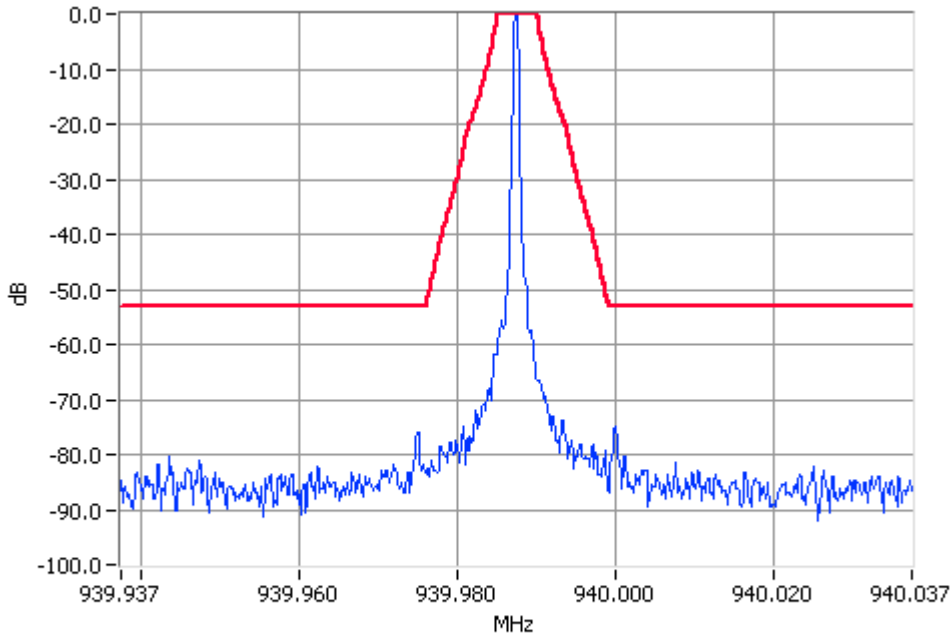
FFSK 939.9875MHz Mask J 30W Pass  
RBW=300Hz VBW=3000Hz

OCCUPIED BANDWIDTH

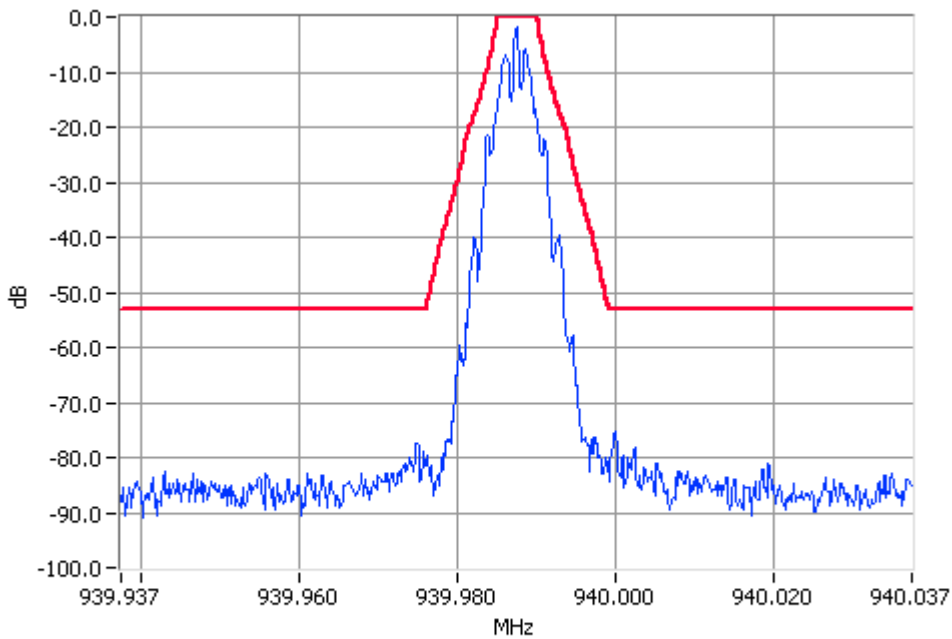
FFSK 1200 bps

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 939.9875 MHz 2 W 12.5 kHz Channel Spacing



Unmodulated 939.9875MHz Mask J 2W Pass  
RBW=300Hz VBW=3000Hz



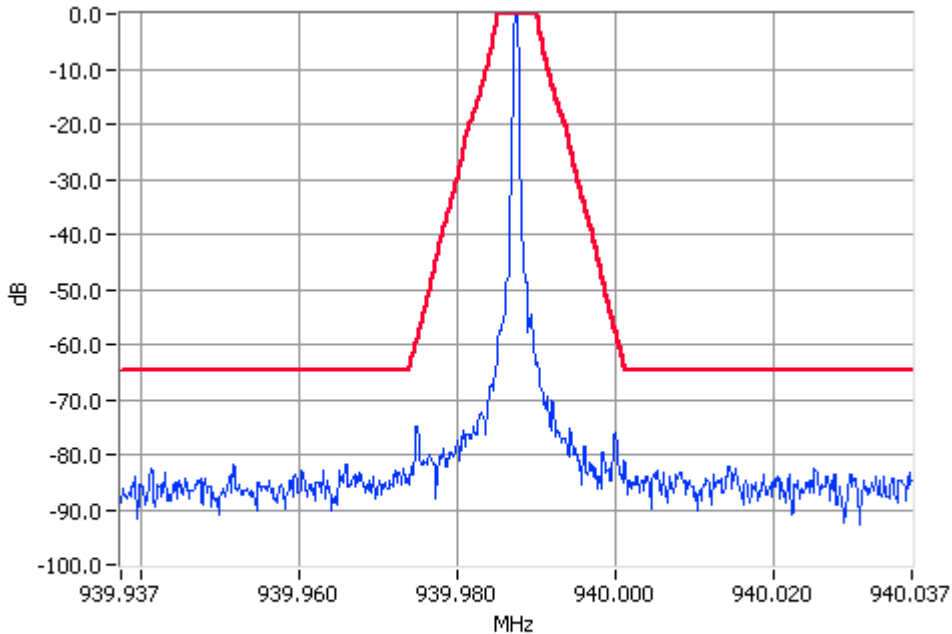
FFSK 939.9875MHz Mask J 2W Pass  
RBW=300Hz VBW=3000Hz

OCCUPIED BANDWIDTH

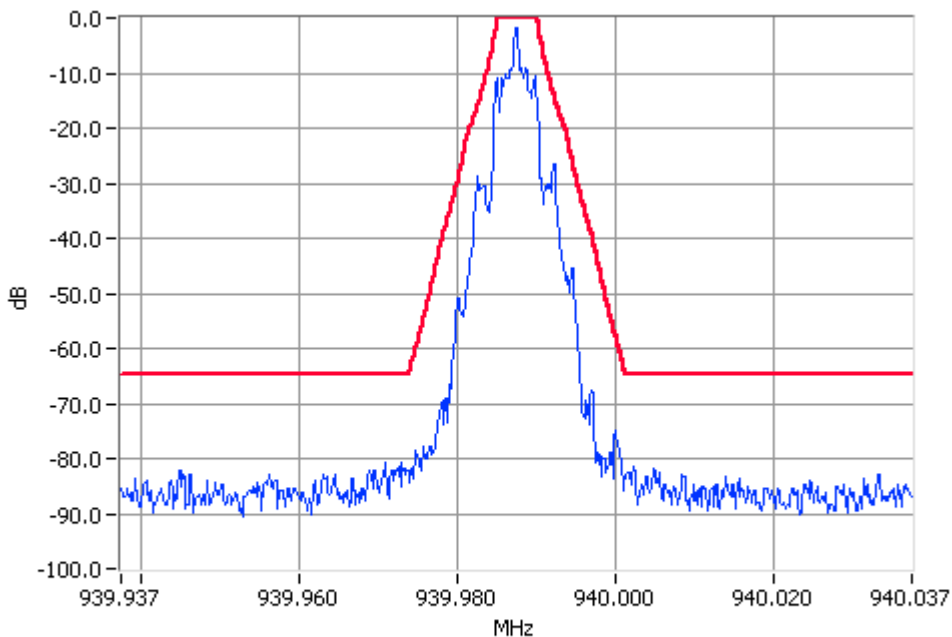
FFSK 2400 bps

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 939.9875 MHz 30 W 12.5 kHz Channel Spacing



Unmodulated 939.9875MHz Mask J 30W Pass  
RBW=300Hz VBW=3000Hz



FFSK(2400Bps) 939.9875MHz Mask J 30W Pass  
RBW=300Hz VBW=3000Hz

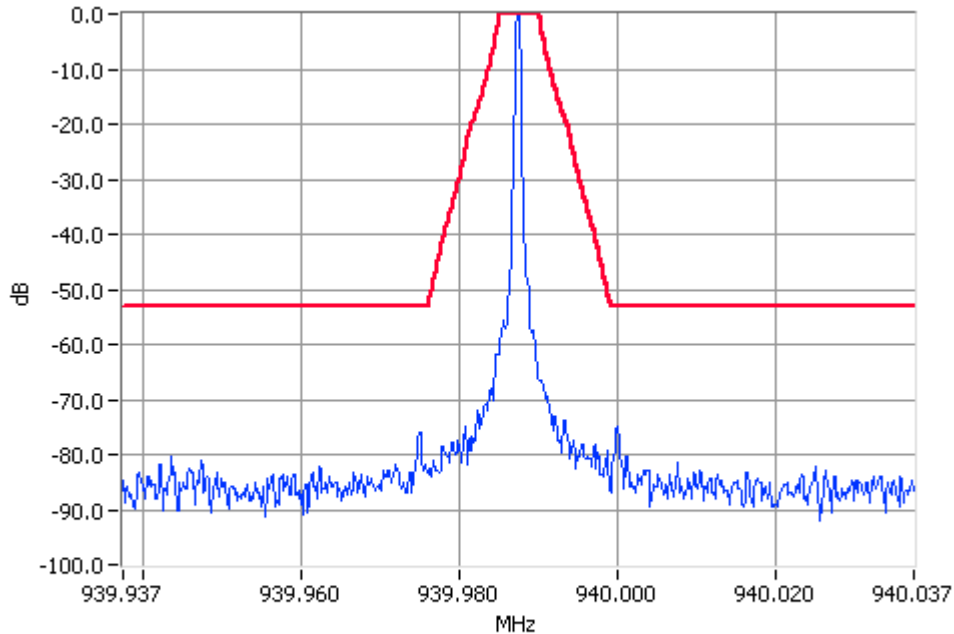


OCCUPIED BANDWIDTH

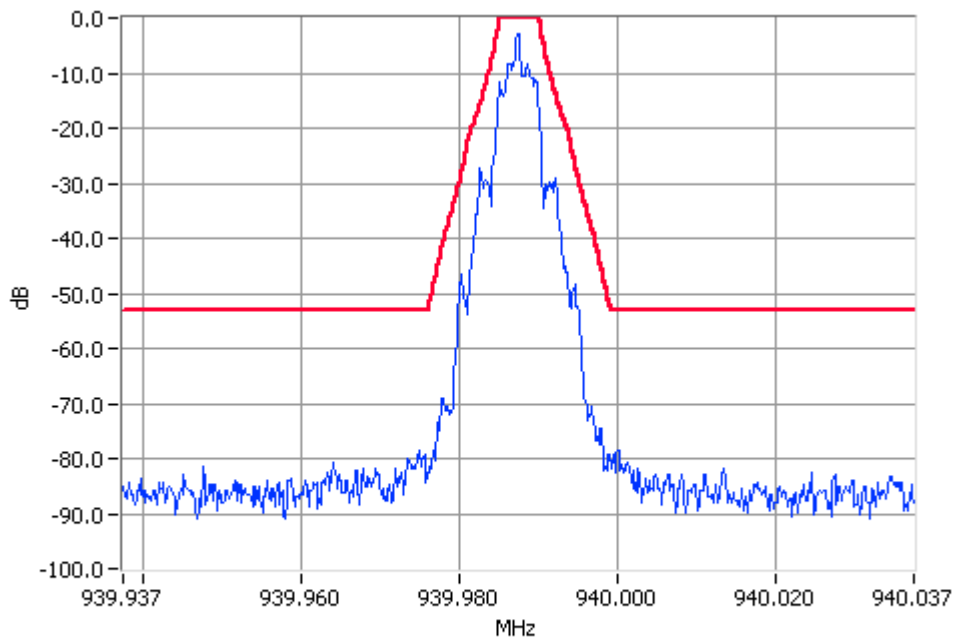
FFSK 2400 bps

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 939.9875 MHz 2 W 12.5 kHz Channel Spacing



Unmodulated 939.9875MHz Mask J 2W Pass  
RBW=300Hz VBW=3000Hz



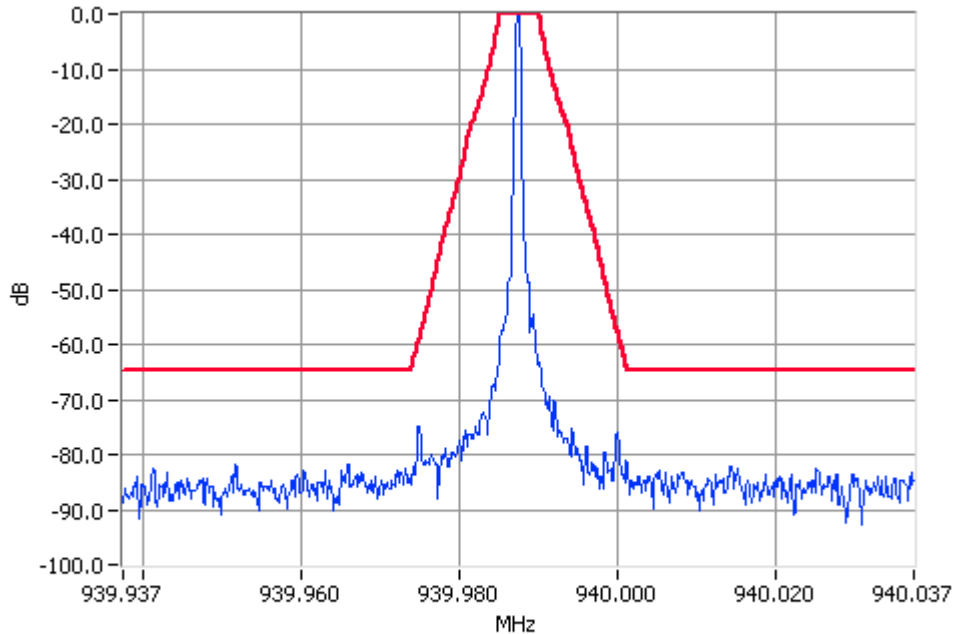
FFSK(2400Bps) 939.9875MHz Mask J 2W Pass  
RBW=300Hz VBW=3000Hz

OCCUPIED BANDWIDTH

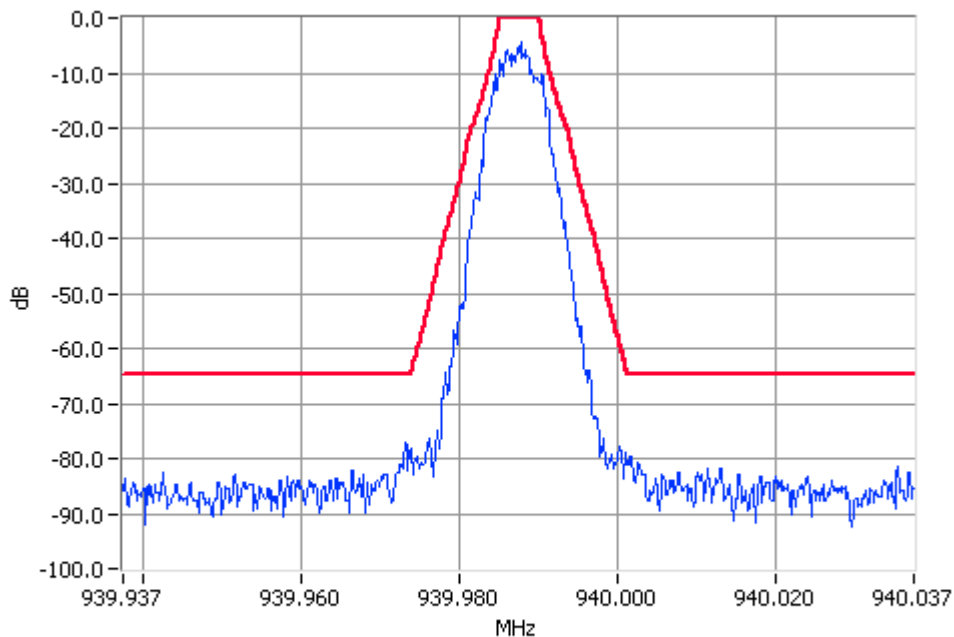
THSD

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 939.9875 MHz 30 W 12.5 kHz Channel Spacing



Unmodulated 939.9875MHz Mask J 30W Pass  
RBW=300Hz VBW=3000Hz



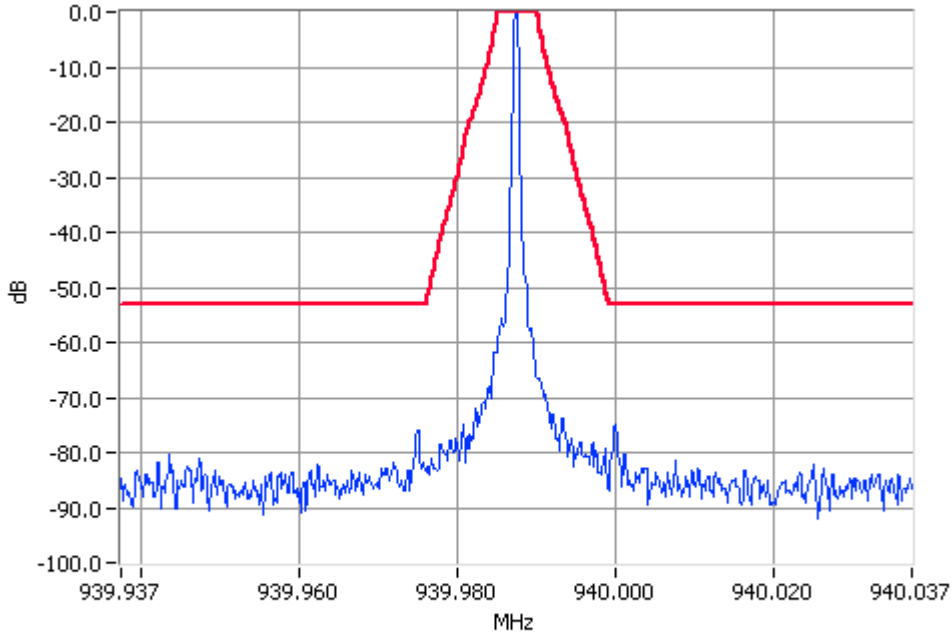
THSD 939.9875MHz Mask J 30W Pass  
RBW=300Hz VBW=3000Hz

OCCUPIED BANDWIDTH

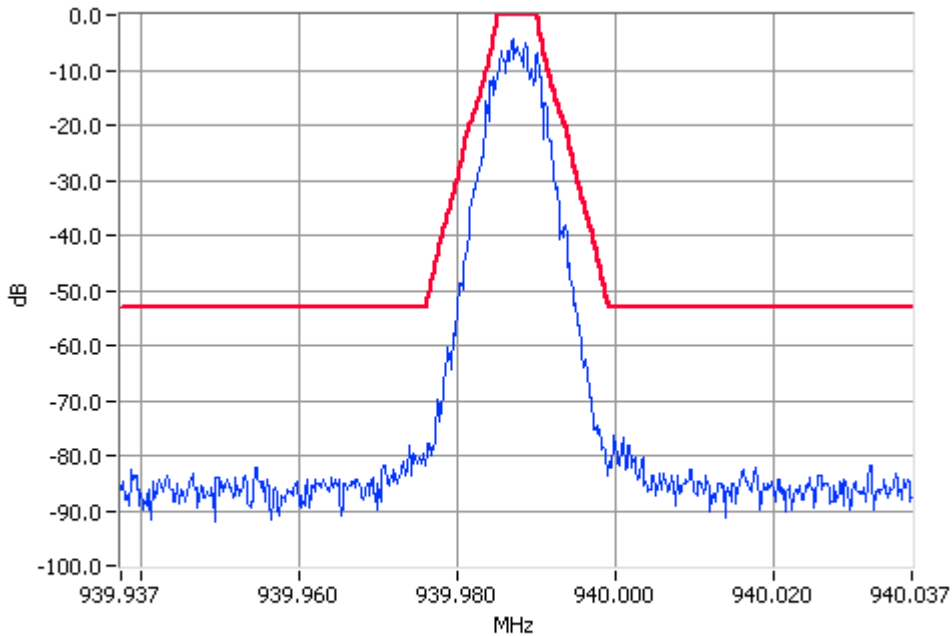
THSD

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 939.9875 MHz 2 W 12.5 kHz Channel Spacing



Unmodulated 939.9875MHz Mask J 2W Pass  
RBW=300Hz VBW=3000Hz



THSD 939.9875MHz Mask J 2W Pass  
RBW=300Hz VBW=3000Hz



**SPURIOUS EMISSIONS (CONDUCTED)**

SPECIFICATION: FCC CFR 2.1051

Tx FREQUENCY: 900.9875 MHz

12.5 kHz Channel Spacing		900.9875 MHz @ 30 W	Emission Mask J
Emission Frequency (MHz)	Level (dBm)	Level (dBc)	
~	~	~	
No emissions were detected at a level greater than 20 dB below the limit.			

12.5 kHz Channel Spacing		900.9875 MHz @ 2 W	Emission Mask J
Emission Frequency (MHz)	Level (dBm)	Level (dBc)	
~	~	~	
No emissions were detected at a level greater than 20 dB below the limit.			

LIMITS:

Carrier Output Power Watts	Emission Mask I 12.5 kHz Channel Spacing $43 + 10 \text{ Log}_{10} (P_{\text{Watts}})$	
30 W	-13.0 dBm	-57.8dBc
2 W	-13.0 dBm	-46.0 dBc

Carrier Output Power Watts	Emission Mask J 12.5 kHz Channel Spacing $50 + 10 \text{ Log}_{10} (P_{\text{Watts}})$	
30 W	-20.0 dBm	-64.8dBc
2 W	-20.0 dBm	-53.0 dBc

Measurement Uncertainty	± 3.0 dB
-------------------------	----------

**SPURIOUS EMISSIONS (CONDUCTED)**

SPECIFICATION: FCC CFR 2.1051

Tx FREQUENCY: 939.9875 MHz

12.5 kHz Channel Spacing		939.9875 MHz @ 30 W	Emission Mask J
Emission Frequency (MHz)	Level (dBm)	Level (dBc)	
~	~	~	
No emissions were detected at a level greater than 20 dB below the limit.			

12.5 kHz Channel Spacing		939.9875 MHz @ 2 W	Emission Mask J
Emission Frequency (MHz)	Level (dBm)	Level (dBc)	
~	~	~	
No emissions were detected at a level greater than 20 dB below the limit.			

LIMITS:

Carrier Output Power Watts	Emission Mask I 12.5 kHz Channel Spacing $43 + 10 \text{ Log}_{10} (P_{\text{Watts}})$	
30 W	-13.0 dBm	-57.8dBc
2 W	-13.0 dBm	-46.0 dBc

Carrier Output Power Watts	Emission Mask J 12.5 kHz Channel Spacing $50 + 10 \text{ Log}_{10} (P_{\text{Watts}})$	
30 W	-20.0 dBm	-64.8dBc
2 W	-20.0 dBm	-53.0 dBc

Measurement Uncertainty	± 3.0 dB
-------------------------	----------

**SPURIOUS EMISSIONS (RADIATED)**

SPECIFICATION: FCC 47 CFR 2.1053

GUIDE: TIA/EIA-603C 2.2.12

**MEASUREMENT PROCEDURE:**

**Initial Scan:**

1. The EUT is placed in the S-Line TEM cell and emissions are measured from 30MHz to 1000MHz. Any emission within 10dB of the limit is then re-tested on the OATS along with measurements from 1000MHz to the 10<sup>th</sup> harmonic of the fundamental frequency.
2. The EUT is then placed on a wooden turntable at a distance of 0.5 metres from the test antenna and emissions are measured from 1000MHz to the upper frequency required. Any emission within 10 dB of the limit is then re-tested on the OATS.

**OATS Measurement:**

1. The EUT is placed on a wooden turntable at a distance of three metres from the test antenna. The output terminal is connected to an RF dummy load.
2. The test antenna is raised from 1m to 4m to obtain a maximum reading, the turntable is then rotated through 360° to obtain the maximum response of each spurious emission. Valid emissions are determined by switching the EUT on and off.
3. The EUT is then replaced by a signal generator and substitution antenna to make measurements by the substitution method.

**MEASUREMENT RESULTS:**

See the tables on the following pages

LIMIT CLAUSE: FCC 47 CFR 90.210

**SPURIOUS EMISSIONS (RADIATED)**

SPECIFICATION: FCC CFR 2.1053

Tx FREQUENCY: 900.9875 MHz

12.5 kHz Channel Spacing		900.9875 MHz @ 30 W	Emission Mask J
Emission Frequency (MHz)	Level (dBm)	Level (dBc)	
1801.975	-27.3	-72.1	
8108.8875	-29.5	-74.3	
No other emissions were detected at a level greater than 10 dB below the limit.			

12.5 kHz Channel Spacing		900.9875 MHz @ 2 W	Emission Mask J
Emission Frequency (MHz)	Level (dBm)	Level (dBc)	
~	~	~	
No emissions were detected at a level greater than 10 dB below the limit.			

LIMITS:

Carrier Output Power Watts	Emission Mask I 12.5 kHz Channel Spacing $43 + 10 \text{ Log}_{10} (P_{\text{Watts}})$	
30 W	-13.0 dBm	-57.8dBc
2 W	-13.0 dBm	-46.0 dBc

Carrier Output Power Watts	Emission Mask J 12.5 kHz Channel Spacing $50 + 10 \text{ Log}_{10} (P_{\text{Watts}})$	
30 W	-20.0 dBm	-64.8dBc
2 W	-20.0 dBm	-53.0 dBc

Measurement Uncertainty	$\pm 3.0 \text{ dB}$
-------------------------	----------------------



**SPURIOUS EMISSIONS (RADIATED)**

SPECIFICATION: FCC CFR 2.1053

Tx FREQUENCY: 939.9875 MHz

12.5 kHz Channel Spacing		939.9875 MHz @ 30 W	Emission Mask J
Emission Frequency (MHz)	Level (dBm)	Level (dBc)	
4699.9375	-23.3	-68.1	
No other emissions were detected at a level greater than 10 dB below the limit.			

12.5 kHz Channel Spacing		939.9875 MHz @ 2 W	Emission Mask J
Emission Frequency (MHz)	Level (dBm)	Level (dBc)	
~	~	~	
No emissions were detected at a level greater than 10 dB below the limit.			

LIMITS:

Carrier Output Power Watts	Emission Mask I 12.5 kHz Channel Spacing $43 + 10 \text{ Log}_{10} (P_{\text{Watts}})$	
30 W	-13.0 dBm	-57.8dBc
2 W	-13.0 dBm	-46.0 dBc

Carrier Output Power Watts	Emission Mask J 12.5 kHz Channel Spacing $50 + 10 \text{ Log}_{10} (P_{\text{Watts}})$	
30 W	-20.0 dBm	-64.8dBc
2 W	-20.0 dBm	-53.0 dBc

Measurement Uncertainty	± 3.0 dB
-------------------------	----------

**TRANSMITTER FREQUENCY STABILITY (TEMPERATURE)**

SPECIFICATION: FCC 47 CFR 2.1055 (a) (1)

GUIDE: TIA/EIA-603C 2.2.2

MEASUREMENT PROCEDURE:

1. Refer Annex A for equipment set up.
2. The EUT was tested for frequency error from  $-30^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  in  $10^{\circ}\text{C}$  increments
3. The frequency error was recorded in parts per million (ppm).

MEASUREMENT RESULTS:

See the plots on the following pages for 12.5 kHz channel spacing.

LIMIT CLAUSE: FCC 47 CFR 90.213

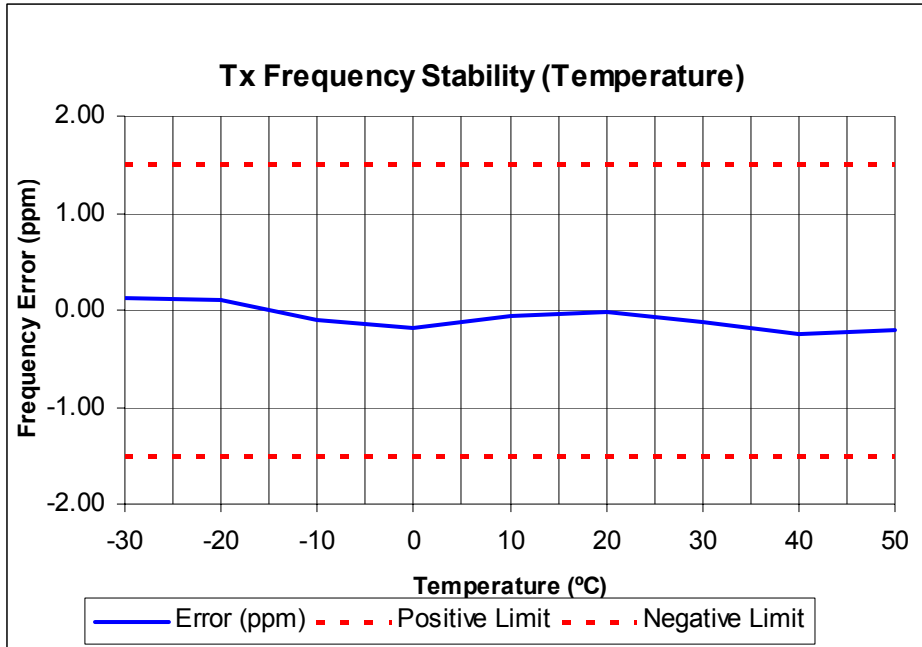
Frequency Range: 896 MHz ~ 940 MHz

Channel Spacing (kHz)	Frequency Error (ppm)
12.5	1.5

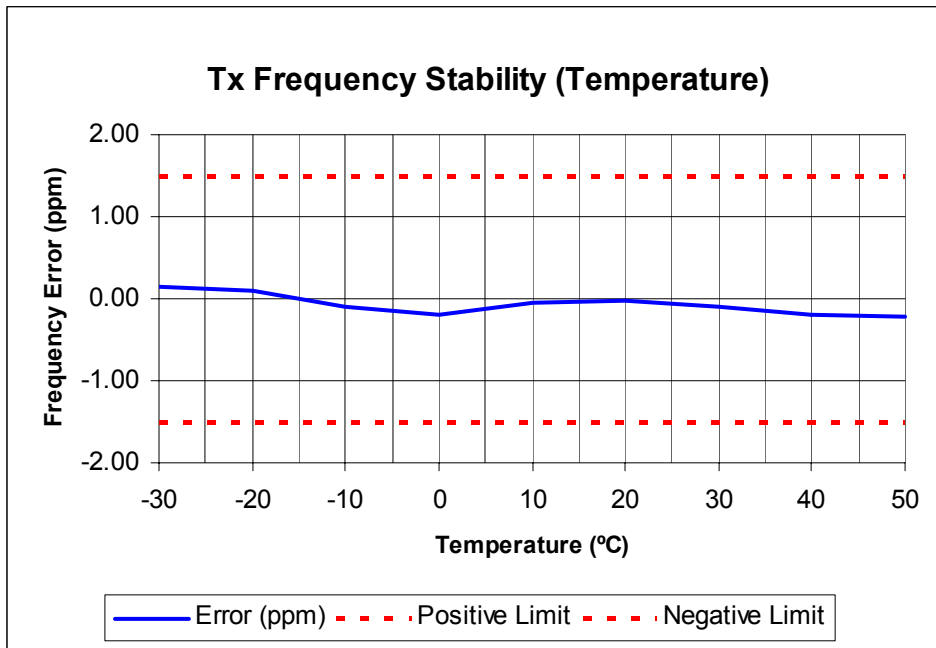
TRANSMITTER FREQUENCY STABILITY (TEMPERATURE)

SPECIFICATION: FCC 47 CFR 2.1055 (a) (1)

Tx FREQUENCY: 900.9875 MHz 30 W 12.5 kHz channel Spacing



Tx FREQUENCY: 939.9875 MHz 30 W 12.5 kHz channel Spacing



**TRANSMITTER FREQUENCY STABILITY (VOLTAGE)**

SPECIFICATION: FCC 47 CFR 2.1055 (d) (1)

GUIDE: TIA/EIA-603C 2.2.2

MEASUREMENT PROCEDURE:

1. Refer Annex A for equipment set up.
2. The EUT was tested for frequency error at an input voltage to the radio of 85% to 115%.
3. The frequency error was recorded in parts per million (ppm).

MEASUREMENT RESULTS: Frequency Range: 896 MHz ~ 940 MHz

Voltage	FREQUENCY ERROR (ppm) for 12.5 kHz	
	900.9875 MHz	939.9875 MHz
13.8 V <sub>DC</sub>	-0.04	-0.02
11.7 V <sub>DC</sub>	-0.01	-0.02
15.9 V <sub>DC</sub>	0.01	-0.01

LIMIT CLAUSE: FCC 47 CFR 90.213

Channel Spacing (kHz)	Frequency Error (ppm)
12.5	1.5

**TELTEST Laboratories**  
Tait Electronics Limited  
Report Number 2834

---

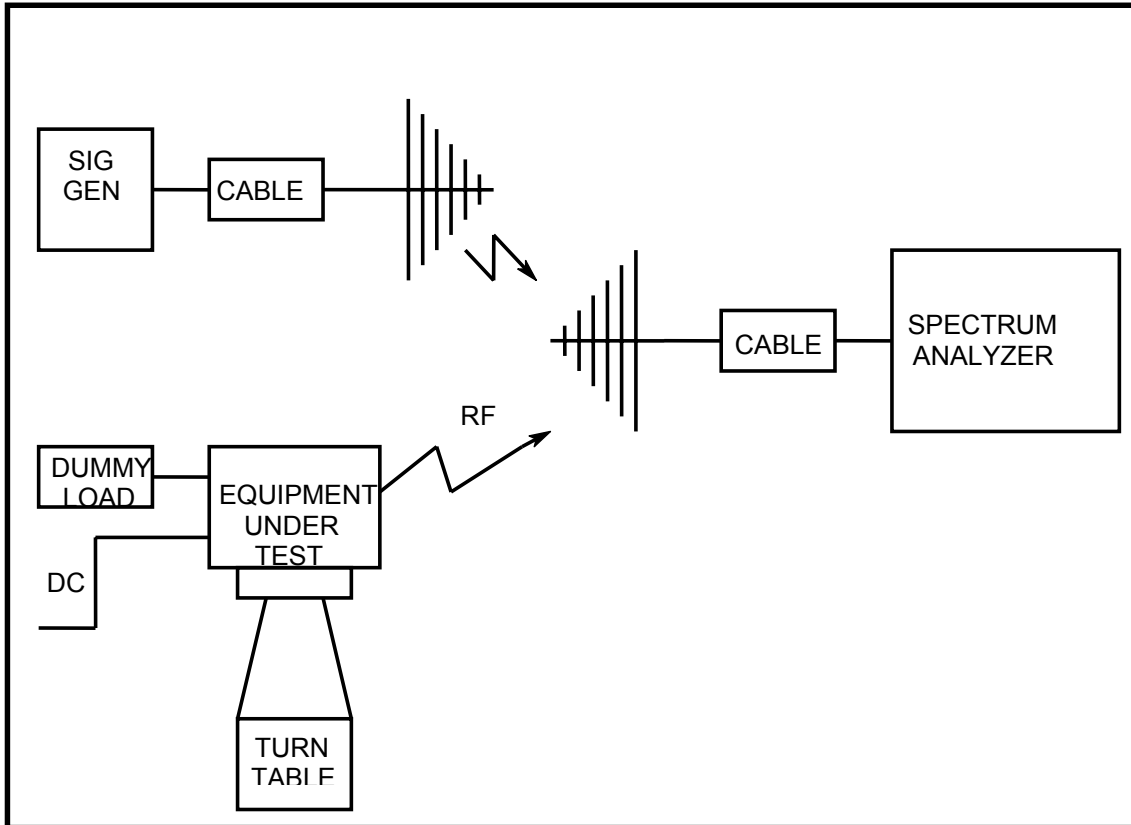
**TEST EQUIPMENT USED**

No#	Equipment	Manufacturer	Model No	Serial No#	Tait ID	Cal Due
11	Modulation Analyser	Hewlett Packard	HP8901B (Opt 002)	2441A00393	E3073	16-Nov-08
13	Audio Analyser	Hewlett Packard	HP8903A	2308A02597	E3074	16-Nov-08
20	Power Supply	Hewlett Packard	HP6032A	2441A00412	E3075	16-Nov-08
24	Environ. Chamber	Contherm	ChestI	E3397	E3397	12-Jul-12
24	Environ. Chamber	Contherm	Chest	E3397	E3397	30-Mar-09
40	Reference Dipoles	Emco	3121C DB1	9510-1164	E3559	23-Nov-09
42	Reference Horn Antenna	Emco	DRG3115	9512-4638	E3560	16-Nov-09
43	Horn Antenna	Emco	DRG3115	2084	E3076	25-Nov-09
46	S-LINE TEM CELL	Rohde & Schwarz	1089.9296.02	338232/003	E3636	20-Mar-09
52	Amplifier +21.7 dB	Tait	ZFL-1000LN	E3660	E3360	
61	RF Attenuator 150W	Weinschel	40-20-33	CJ404	E3387	17-Nov-08
64	RF Attenuator 50W	Weinschel	24-10-34	AZ0401	E3388	11-Dec-08
66	RF Attenuator 25W	Weinschel	33-20-33	BD5871	E3673	11-Dec-08
82	1m Coax Cable (BLUE)	Suhner	Sucoflex 104A	44610/4A	E4619	12-Nov-08
83	2m Coax (Black2)	Suhner	RG214HF/Nm/Nm/2000	Black2	E4623	16-Nov-08
84	2m Coax (Black3)	Suhner	RG214HF/Nm/Nm/2000	Black2	E4624	16-Nov-08
85	3m Coax Cable (BLUE)	Suhner	Sucoflex 104A	44611/4A	E4620	12-Nov-08
88	Spectrum Analyser	Hewlett Packard	HP8562E	3821A00779	E3715	13-Nov-08
118	RF Attenuator	Weinschel	Model 1	BL9958	E4081	
123	Spectrum Analyser	Agilent	E4445A	MY42510072	E4139	7-Aug-09
127	OATS Tower Cable	Intelcom	RG214	OATS1	E4621	13-Nov-08
128	OATS Turntable Cable	Intelcom	RG215	OATS2	E4622	13-Nov-08
129	Antenna Tower	Electrometrics	EM-4720-2	112	E4447	
130	Controller	Electrometrics	EM-4700	119	E4445	
131	Turntable	Electrometrics	EM-4704A	105	E4446	
135	Attenuator	Weinschel	67-30-33	BR0531	E4280	13-Nov-08
149	Log Periodic Antenna	Schwarzbeck	VUSLP	9111-219	E4617	

## ANNEX A

### TEST SETUP DETAILS

Radiated Emissions Set up.



**TELTEST Laboratories**  
Tait Electronics Limited  
Report Number 2834

---

All other testing is performed using the Teltest Radio **EVAL**uation system (TREVA), which is configured as shown below. The Spectrum Analyser is connected to the EUT via the attenuator network for Conducted Emissions testing, and Occupied Bandwidth.

