

# Laboratory Test Report

## Class II Permissive Change

On the

TBAH0 Base Station Transceiver

In accordance with

FCC 47 CFR Parts 22 and 90

Report Revision: 1  
Issue Date: 31-October-2007  
FCC ID: CASTBA8H0

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Laboratory Manager



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

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## Revision History

Date	Revision	Comments
31-Oct-2007	1	Initial Report

## Introduction

This is a Class II Permissive Change to TARF 1834, 1834-D, 2251 and 2445. It confirms the performance of Tait Simulcast Modulation (TSM) capability of the TBAH0 Base Station Transceiver, in accordance with:

**FCC CFR 47 Parts 22 & 90**

## Report Prepared For

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

## Description of Sample

Equipment: Base Station Transceiver

Manufacturer: Tait Electronics Limited  
PO Box 1645  
558 Wairakei Road  
Christchurch  
New Zealand

Type Code: TBAH0

### Module Details:

Reciter	Frequency Range	Serial Number	Software Revisions
TBA40H4-PA00	380-420 MHz	18041158	HW: 00.07 FW:03.12
TBA40H1-PA00	400-440 MHz	18041157	HW: 00.07 FW:03.12
TBA40H2-PA00	440-480 MHz	18036081	HW: 00.07 FW:03.12
TBA40H3-PA00	470-520 MHz	18040025	HW: 00.07 FW:03.12

Power Amplifier	Range	Serial Number	Software Revisions
TBA81H0-0000	380-520 MHz	18022803	HW: 00.01 FW: 03.00

Power Management Unit	Subrack	Serial Number	Software Revisions
N/A	TBA2321-A000 S/N: 18002627	N/A	N/A

## MODULATION TYPES AND EMISSION DESIGNATORS

### Modulation Types:

F1E, F7E	Digital Voice TSM	(9600 bps)
F1D, F7D	Digital Data TSM	(9600 bps)

### Channel Spacings:

12.5 kHz

### Emission Designators:

TSM	6K10F1E	Digital Voice Open/Encoded TSM
	6K10F7E	Digital Voice/Data TSM
	6K10F1D	Data TSM
	6K10F7D	Dual Data TSM

Rated Output Power: 50 Watts

## Statement of Compliance

The TBAH0 Base Station transceiver as tested in this report was found to conform to the following standards:

**FCC CFR 47 Parts 22, 90**

## Test Conditions

All testing was performed at the following conditions.

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

**99 % Bandwidth Measurement Results**

<b>TSM (H4)</b>					
Channel Spacing	Power	406.2 MHz			
12.5 kHz	50W	5.63 kHz			
12.5 kHz	5W	5.73 kHz			

<b>TSM (H1)</b>					
Channel Spacing	Power	406.2 MHz	429.9 MHz		
12.5 kHz	50W	5.69 kHz	5.75 kHz		
12.5 kHz	5W	5.71 kHz	5.76 kHz		

<b>TSM (H2)</b>					
Channel Spacing	Power	450.1 MHz	459.9 MHz	469.9 MHz	
12.5 kHz	50W	5.74 kHz	5.68 kHz	5.72 kHz	
12.5 kHz	5W	5.75 kHz	5.60 kHz	5.63 kHz	

<b>TSM (H3)</b>					
Channel Spacing	Power	511.9 MHz			
12.5 kHz	50W	5.44 kHz			
12.5 kHz	5W	5.58 kHz			

**Emission Designators**

TSM	6K10F1E	Digital Voice Open/Encoded TSM
	6K10F7E	Digital Voice/Data TSM
	6K10F1D	Data TSM
	6K10F7D	Dual Data TSM

## Test Results

### SIDEBAND SPECTRUM

SPECIFICATION: FCC 47 CFR 2.1049 (c)

GUIDE: TIA/EIA-603C 2.2.11

#### MEASUREMENT PROCEDURE:

1. Refer Annex A for Equipment Set up.  
For Data measurements: The EUT was modulated with an internally generated pseudo random bit sequence at the appropriate Baud rates using the Conformance 1011Hz test paten in the Service Kit and Telnet to select TSM.
2. The Sideband Spectrum was measured on the Spectrum Analyser, with bandwidth settings as follows.

Emission Mask D – Resolution Bandwidth = 100Hz, Video Bandwidth = 1 kHz

#### MEASUREMENT RESULTS:

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

LIMIT CLAUSE: FCC 47 CFR 90.210

#### EMISSION MASKS

Emission Mask D 12.5 kHz Channel Spacing

#### DATA SPEED

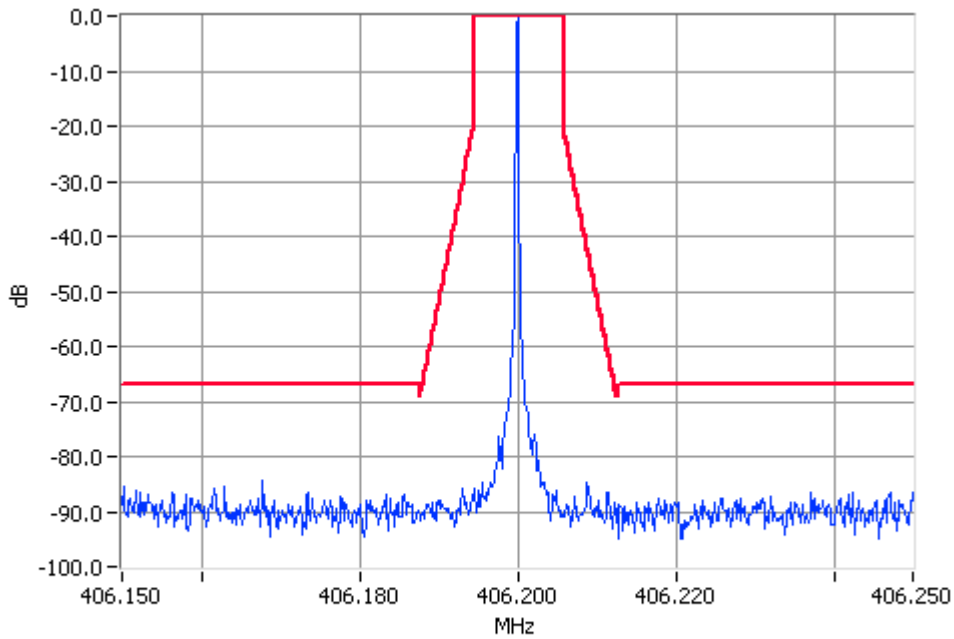
TSM 9600 bps 12.5 kHz Channel Spacing

## SIDEBAND SPECTRUM

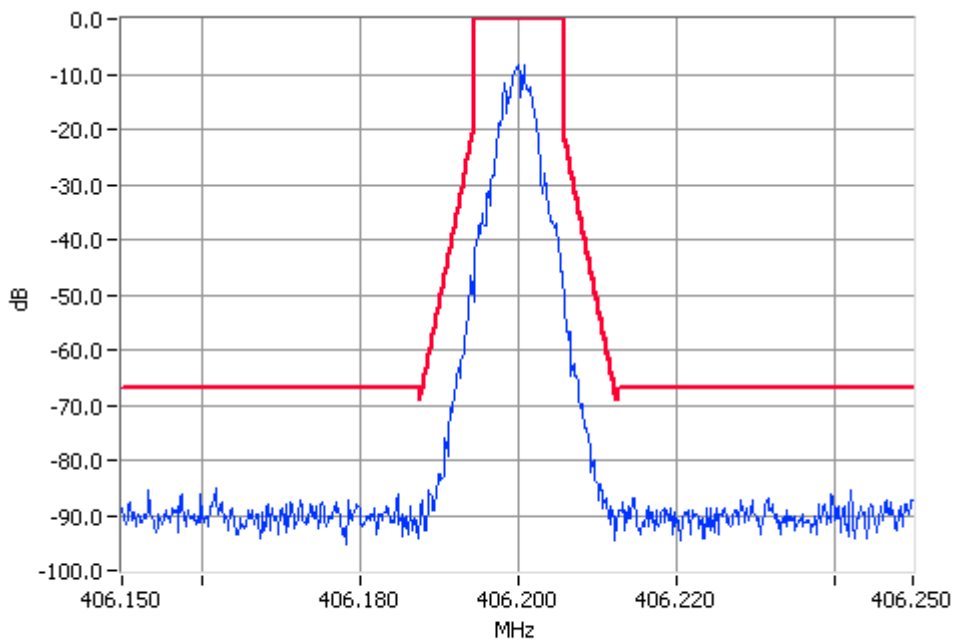
### TSM

SPECIFICATION: FCC CFR 2.1049 (c) H4 Reciter

Tx FREQUENCY: 406.2 MHz 50 W 12.5 kHz Channel Spacing



Unmodulated 406.200MHz Mask D 50W Pass  
RBW=100Hz VBW=1000Hz



TSM 406.200MHz Mask D 50W Pass  
RBW=100Hz VBW=1000Hz

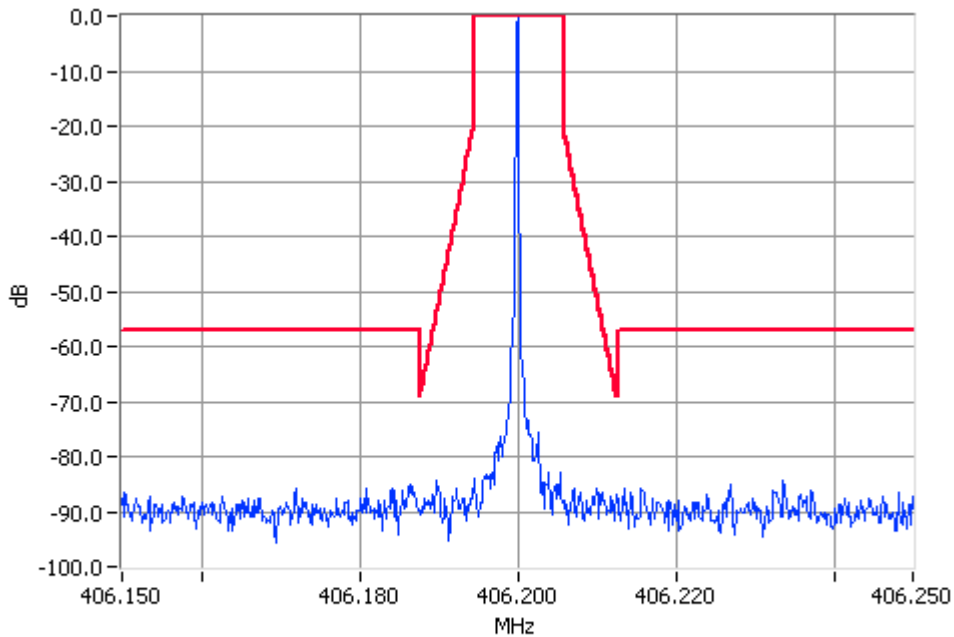


## SIDEBAND SPECTRUM

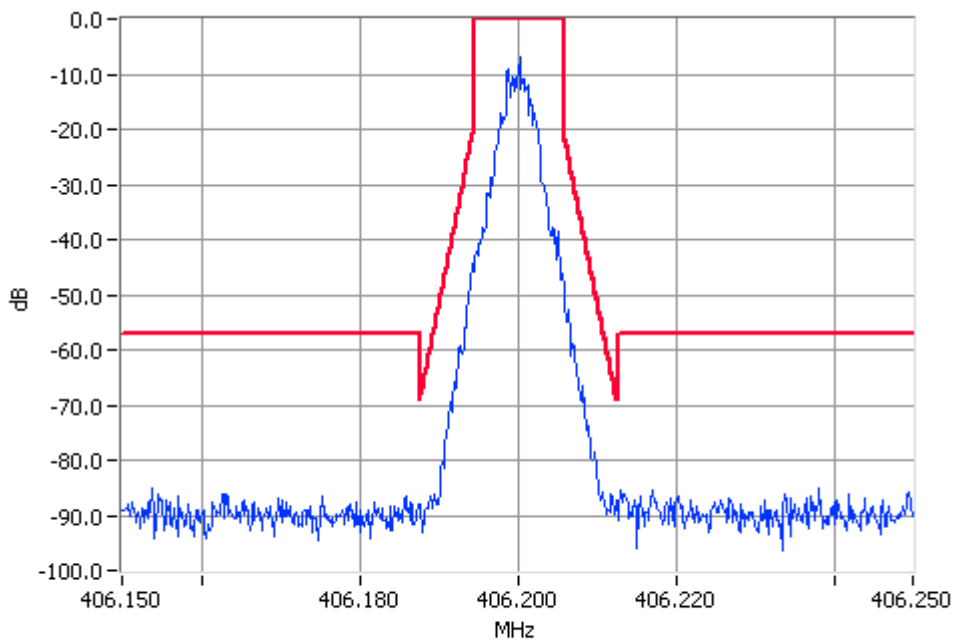
### TSM

SPECIFICATION: FCC CFR 2.1049 (c) H4 Reciter

Tx FREQUENCY: 406.2 MHz 5 W 12.5 kHz Channel Spacing



Unmodulated 406.2000MHz Mask D 5W Pass  
RBW=100Hz VBW=1000Hz



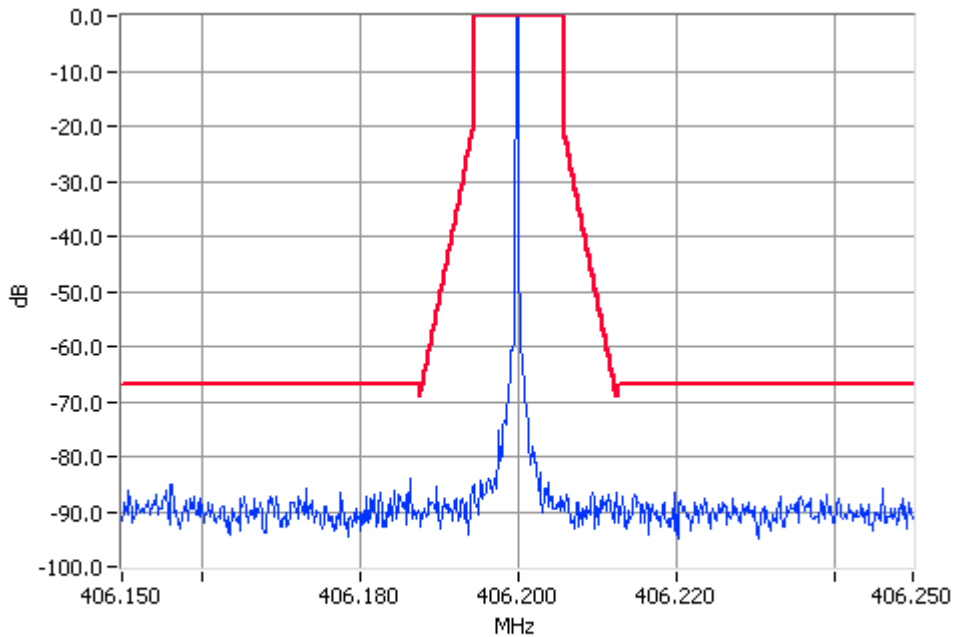
TSM 406.2000MHz Mask D 5W Pass  
RBW=100Hz VBW=1000Hz

## SIDEBAND SPECTRUM

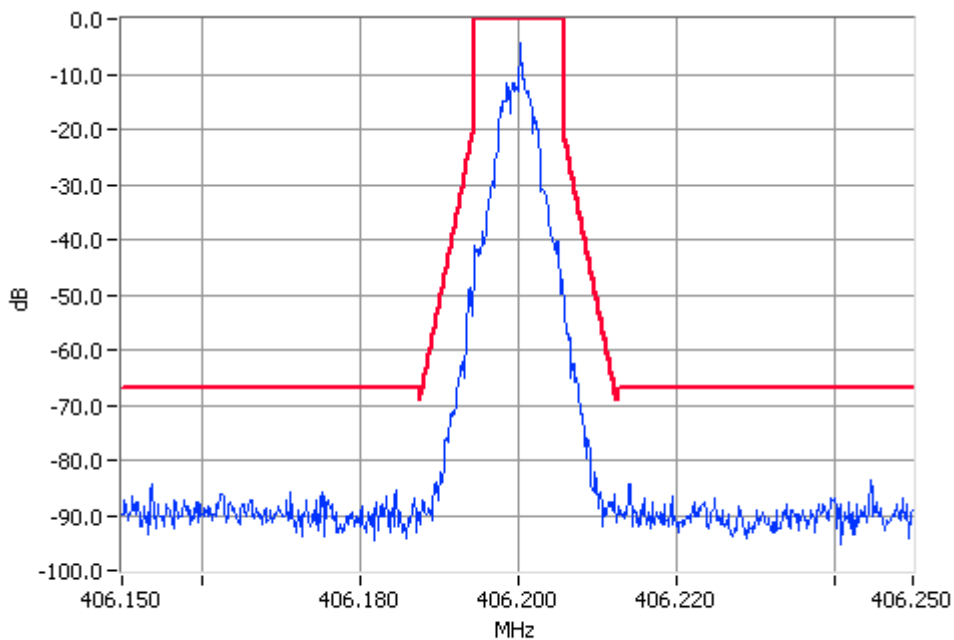
### TSM

SPECIFICATION: FCC CFR 2.1049 (c) H1 Reciter

Tx FREQUENCY: 406.2 MHz 50 W 12.5 kHz Channel Spacing



Unmodulated 406.200MHz Mask D 50W Pass  
RBW=100Hz VBW=1000Hz

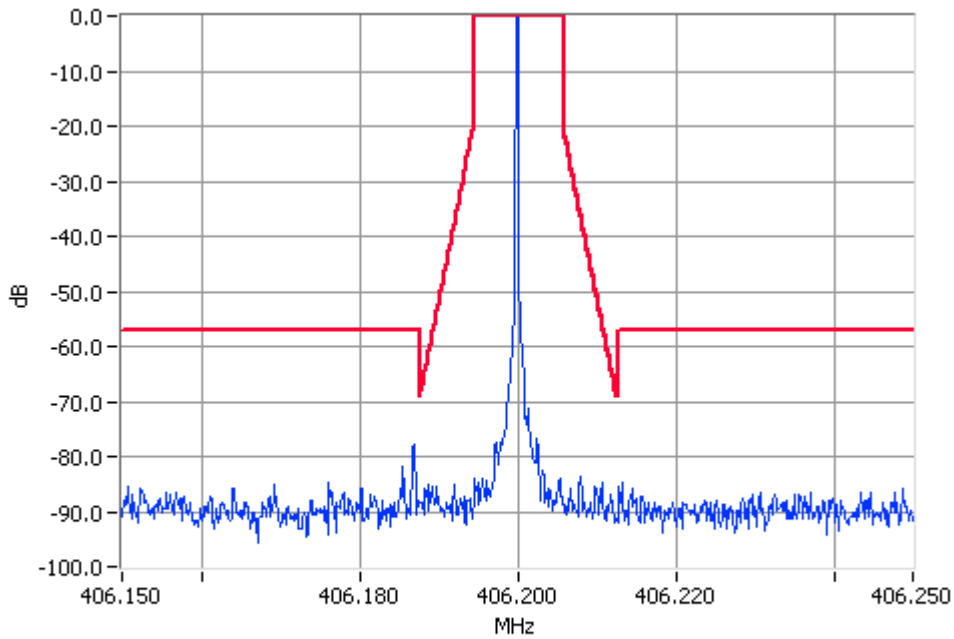


TSM 406.200MHz Mask D 50W Pass  
RBW=100Hz VBW=1000Hz

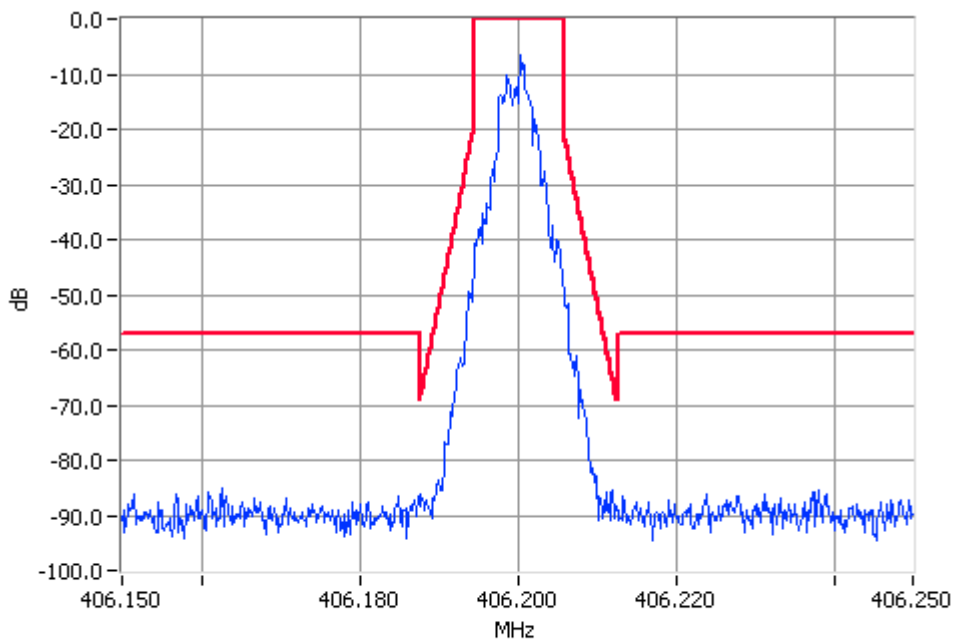
### SIDEBAND SPECTRUM

#### TSM

SPECIFICATION: FCC CFR 2.1049 (c) H1 Reciter  
Tx FREQUENCY: 406.2 MHz 5 W 12.5 kHz Channel Spacing



Unmodulated 406.2000MHz Mask D 5W Pass  
RBW=100Hz VBW=1000Hz



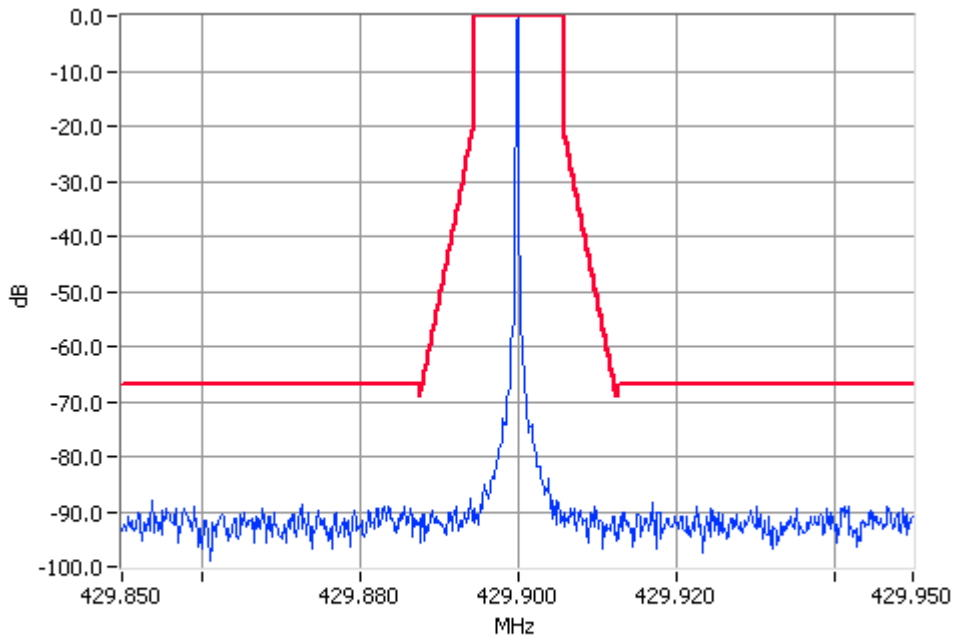
TSM 406.2000MHz Mask D 5W Pass  
RBW=100Hz VBW=1000Hz

### SIDEBAND SPECTRUM

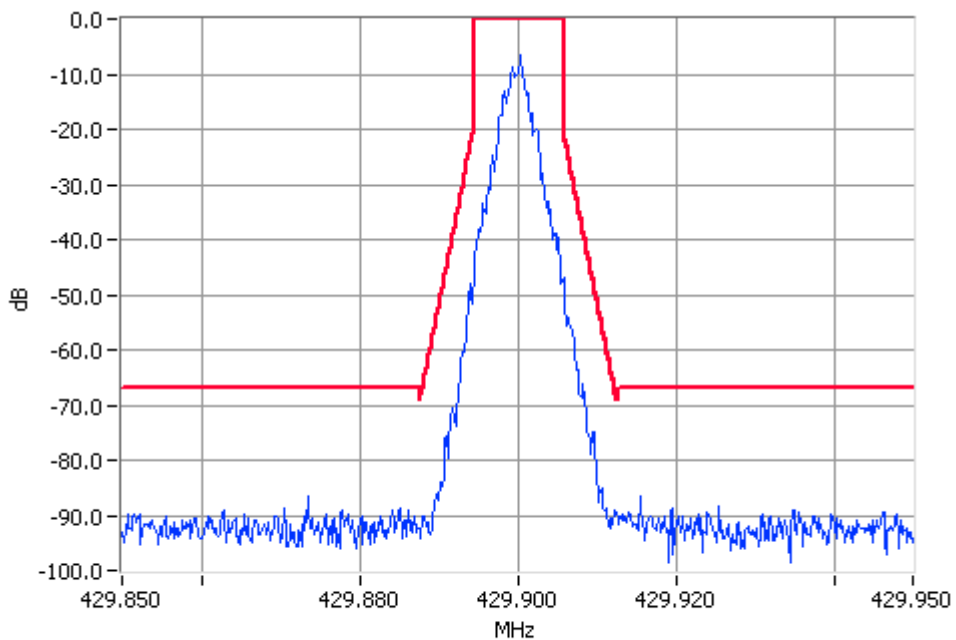
#### TSM

SPECIFICATION: FCC CFR 2.1049 (c) H1 Reciter

Tx FREQUENCY: 429.9 MHz 50 W 12.5 kHz Channel Spacing



Unmodulated 429.9000MHz Mask D 50W Pass  
RBW=100Hz VBW=1000Hz



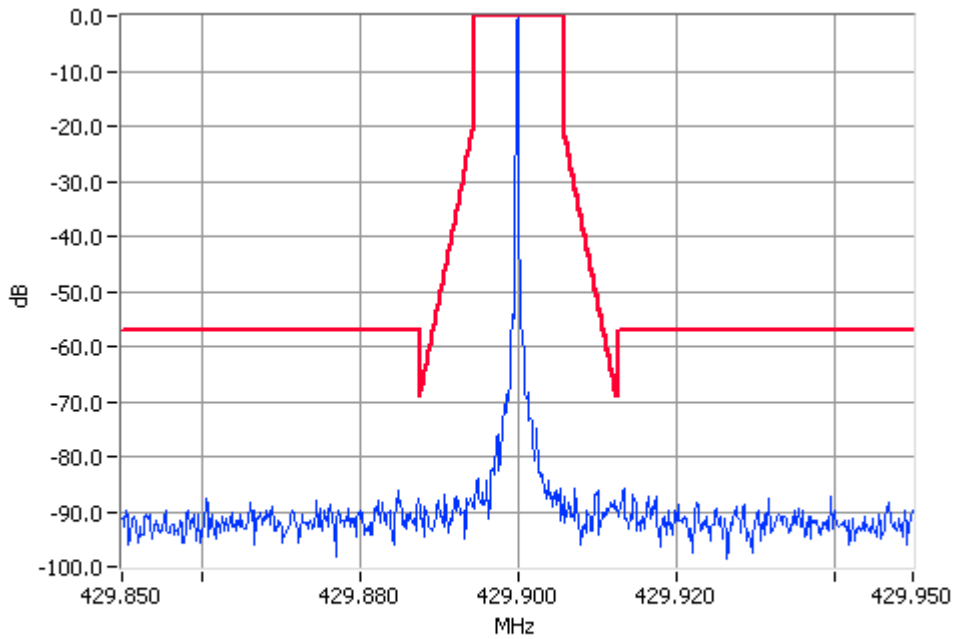
TSM 429.9000MHz Mask D 50W Pass  
RBW=100Hz VBW=1000Hz

## SIDEBAND SPECTRUM

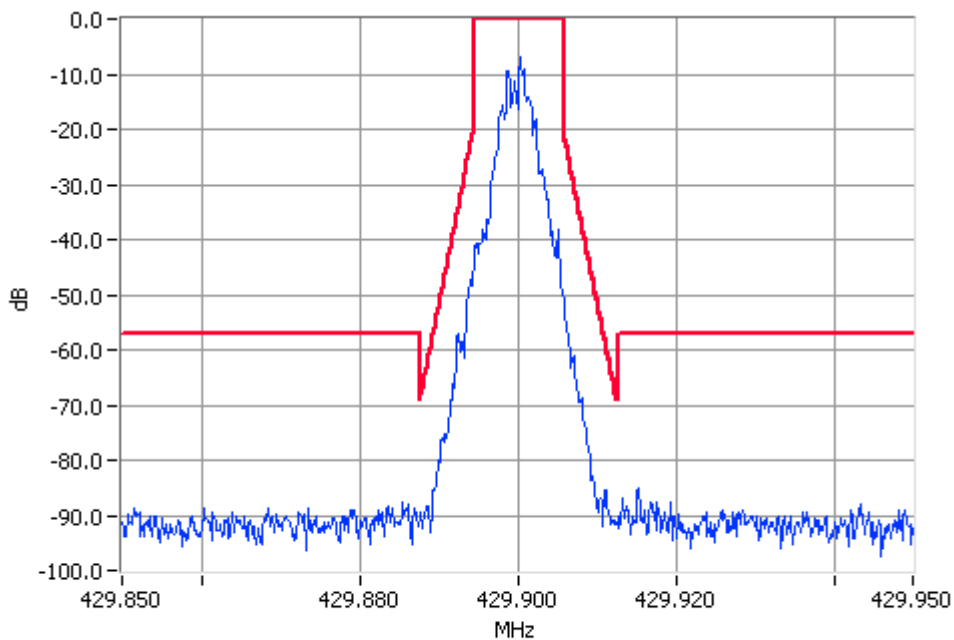
### TSM

SPECIFICATION: FCC CFR 2.1049 (c) H1 Reciter

Tx FREQUENCY: 429.9 MHz 5 W 12.5 kHz Channel Spacing



Unmodulated 429.9000MHz Mask D 5W Pass  
RBW=100Hz VBW=1000Hz



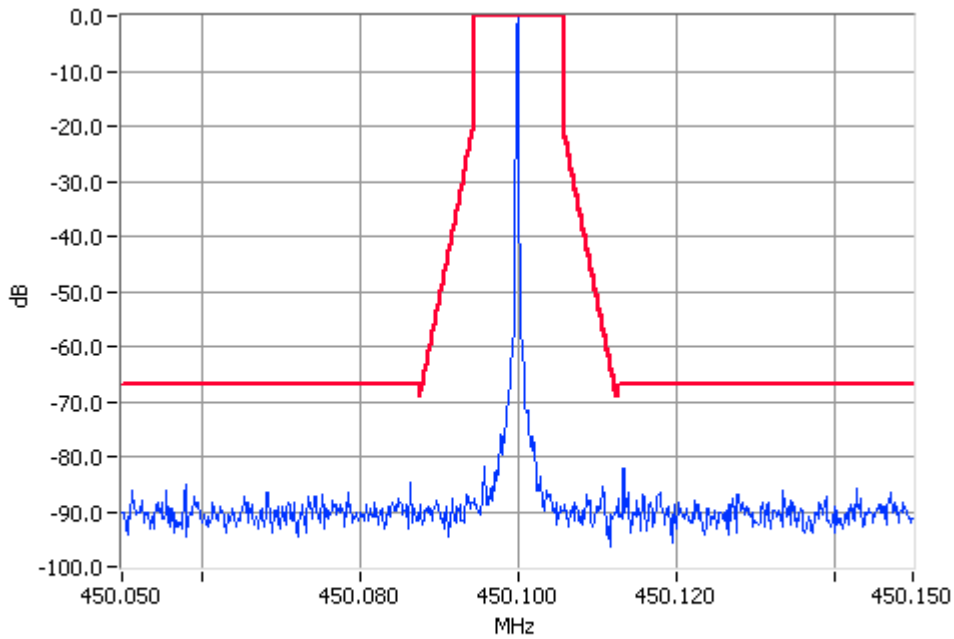
TSM 429.9000MHz Mask D 5W Pass  
RBW=100Hz VBW=1000Hz

## SIDEBAND SPECTRUM

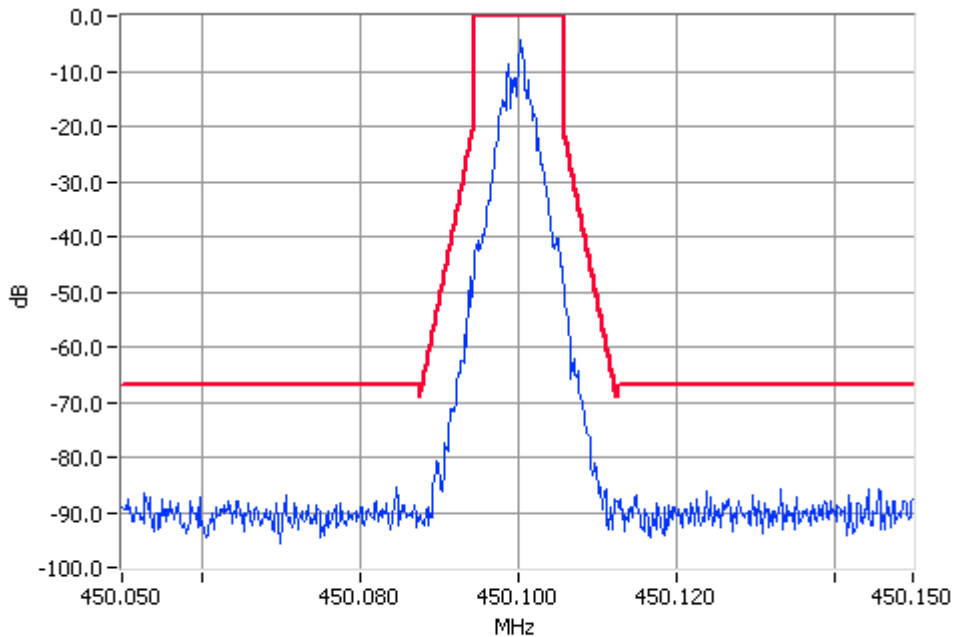
### TSM

SPECIFICATION: FCC CFR 2.1049 (c) H2 Reciter

Tx FREQUENCY: 450.1 MHz 50 W 12.5 kHz Channel Spacing



Unmodulated 450.1000MHz Mask D 50W Pass  
RBW=100Hz VBW=1000Hz



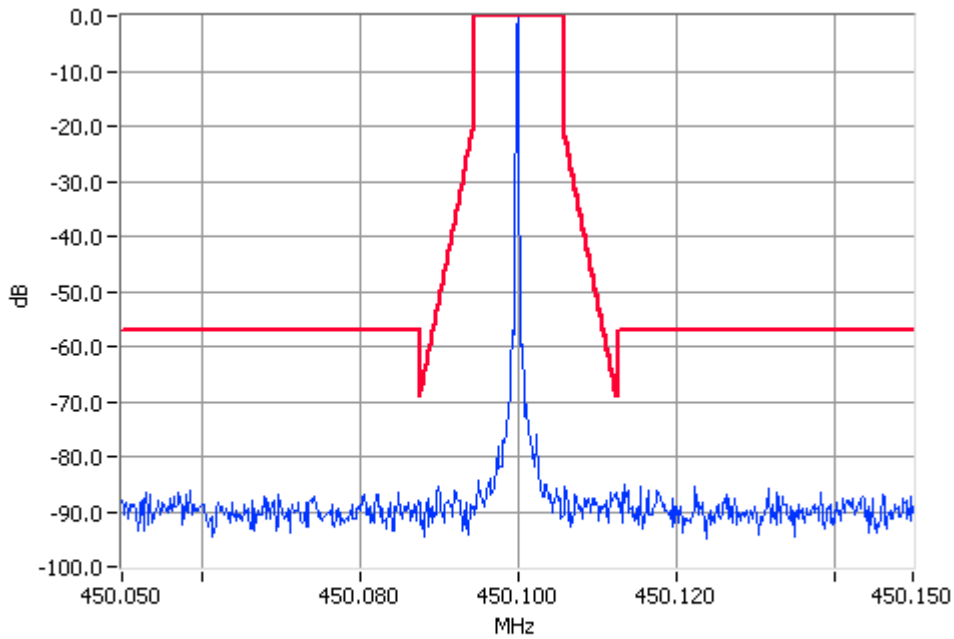
TSM 450.1000MHz Mask D 50W Pass  
RBW=100Hz VBW=1000Hz

## SIDEBAND SPECTRUM

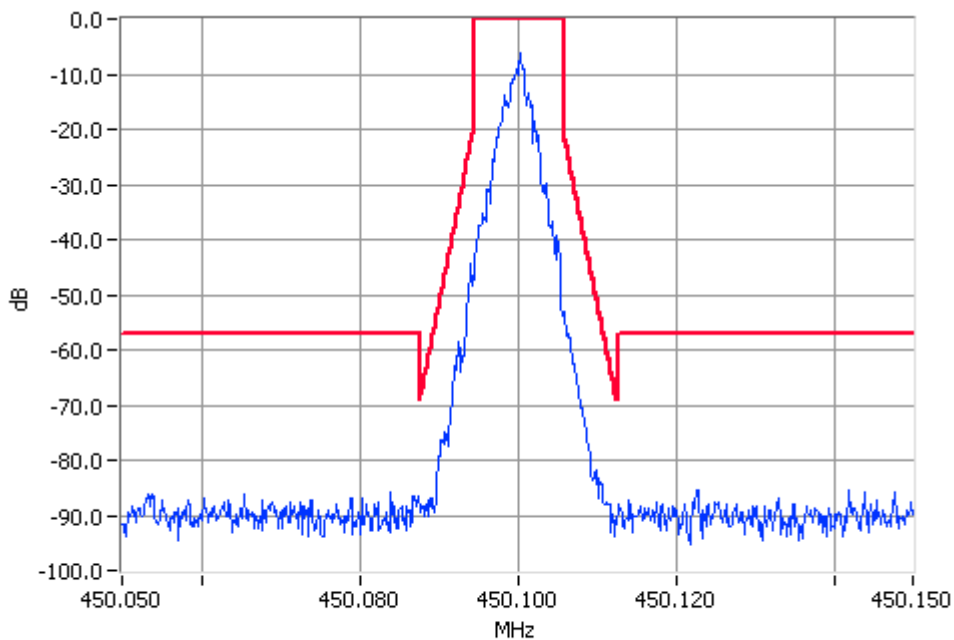
### TSM

SPECIFICATION: FCC CFR 2.1049 (c) H2 Reciter

Tx FREQUENCY: 450.1 MHz 5 W 12.5 kHz Channel Spacing



Unmodulated 450.1000MHz Mask D 5W Pass  
RBW=100Hz VBW=1000Hz



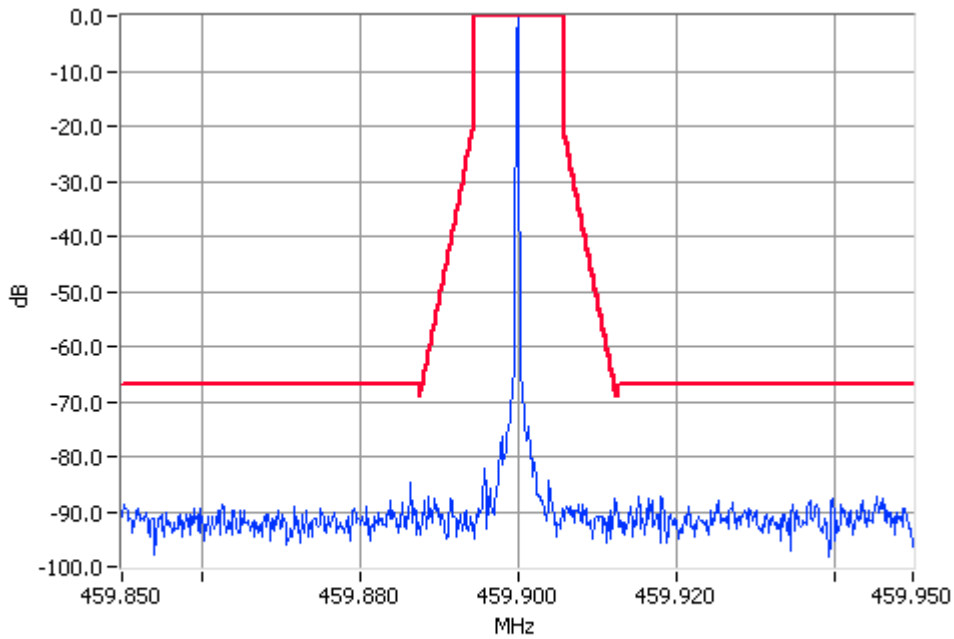
TSM 450.1000MHz Mask D 5W Pass  
RBW=100Hz VBW=1000Hz

### SIDEBAND SPECTRUM

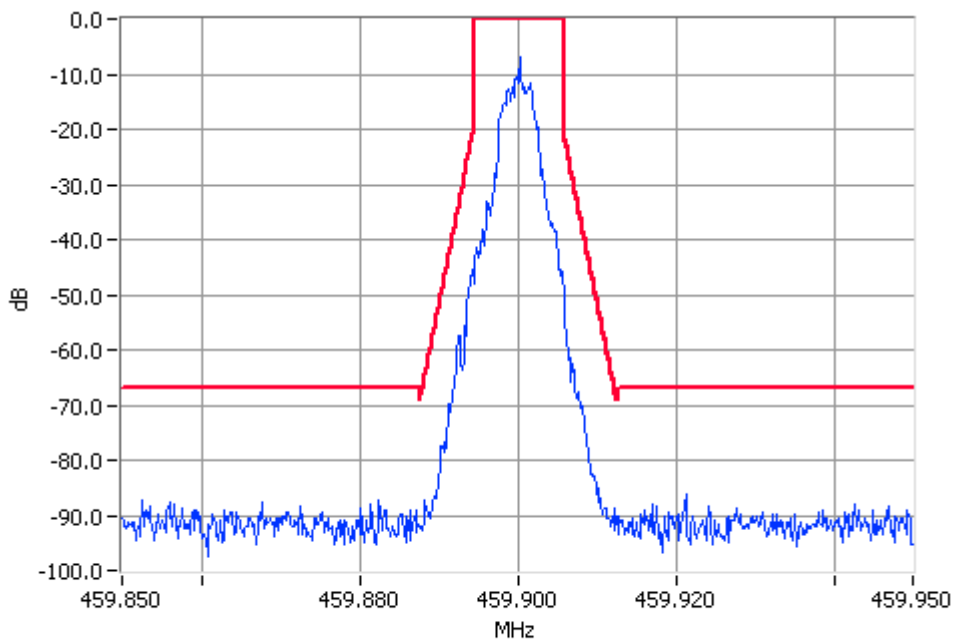
#### TSM

SPECIFICATION: FCC CFR 2.1049 (c) H2 Reciter

Tx FREQUENCY: 459.9 MHz 50 W 12.5 kHz Channel Spacing



Unmodulated 459.9000MHz Mask D 50W Pass  
RBW=100Hz VBW=1000Hz



TSM 459.9000MHz Mask D 50W Pass  
RBW=100Hz VBW=1000Hz

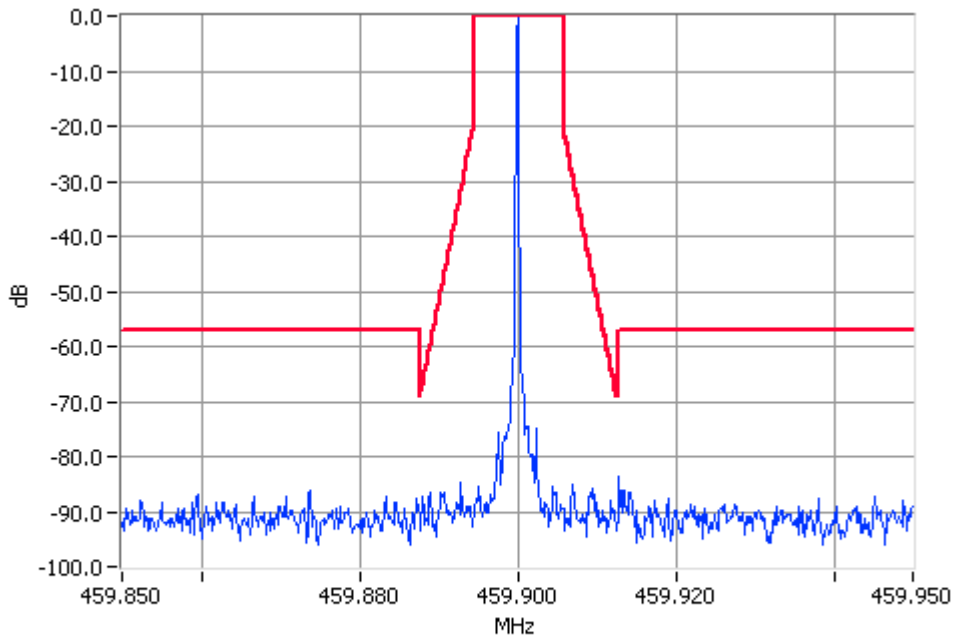


## SIDEBAND SPECTRUM

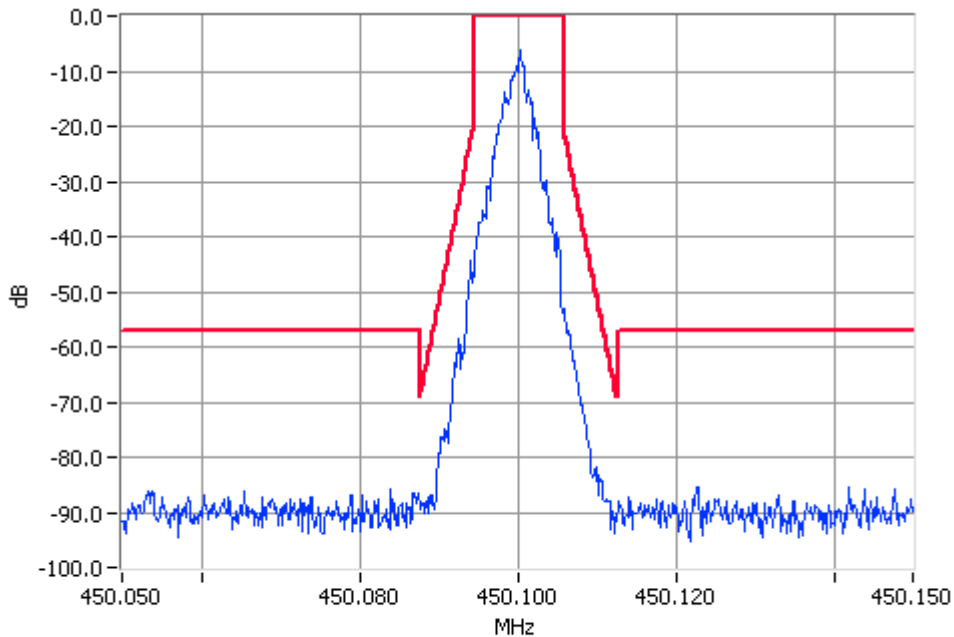
### TSM

SPECIFICATION: FCC CFR 2.1049 (c) H2 Reciter

Tx FREQUENCY: 459.9 MHz 5 W 12.5 kHz Channel Spacing



Unmodulated 459.9000MHz Mask D 5W Pass  
RBW=100Hz VBW=1000Hz



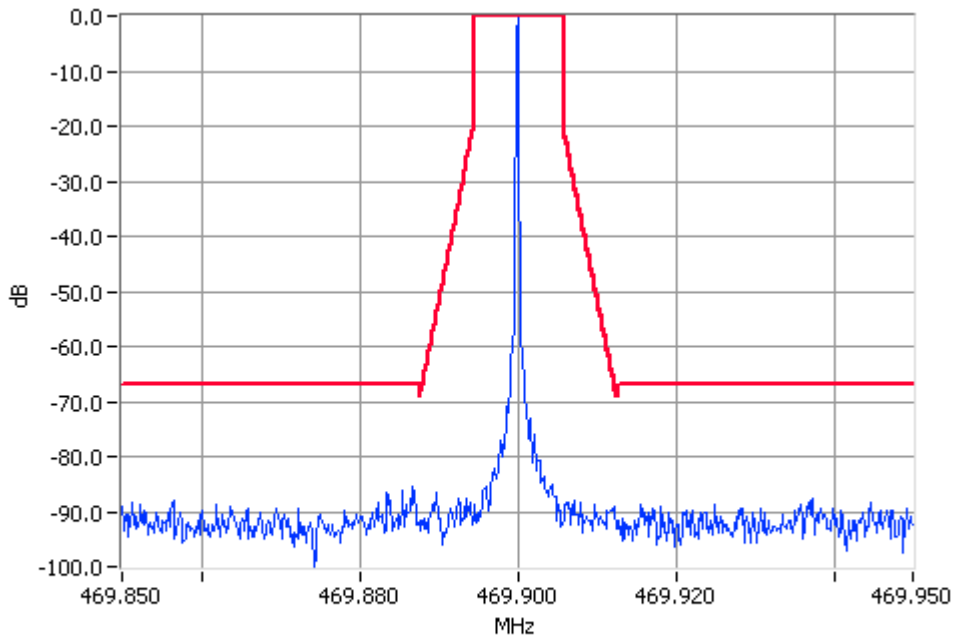
TSM 450.1000MHz Mask D 5W Pass  
RBW=100Hz VBW=1000Hz

## SIDEBAND SPECTRUM

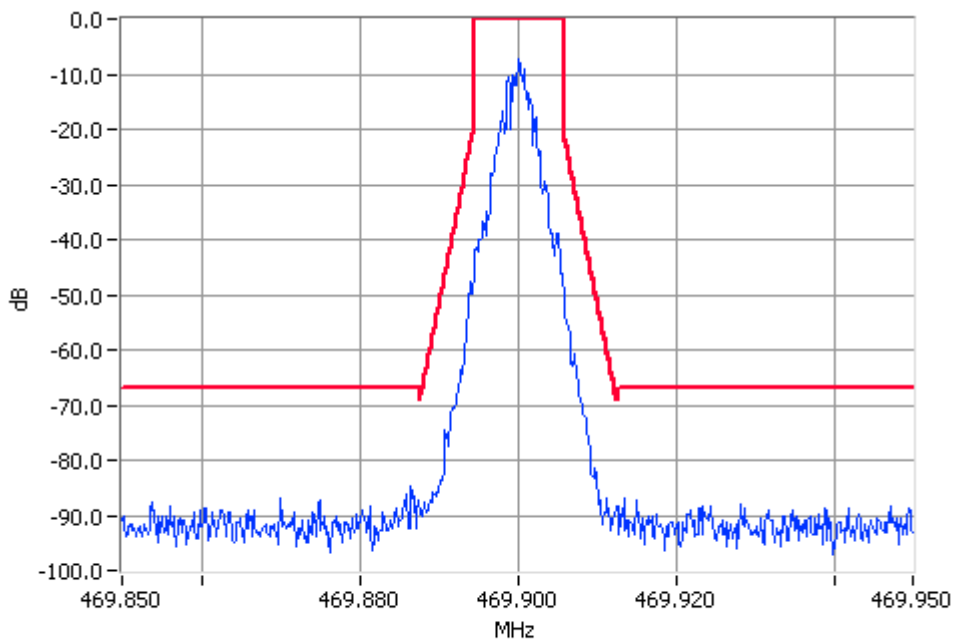
### TSM

SPECIFICATION: FCC CFR 2.1049 (c) H2 Reciter

Tx FREQUENCY: 469.9 MHz 50 W 12.5 kHz Channel Spacing



Unmodulated 469.9000MHz Mask D 50W Pass  
RBW=100Hz VBW=1000Hz



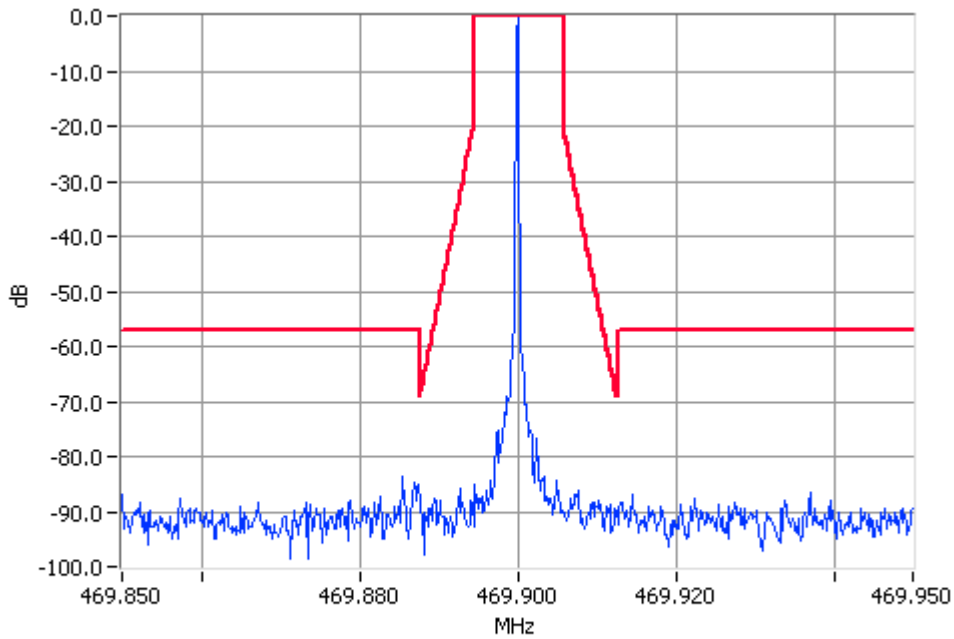
TSM 469.9000MHz Mask D 50W Pass  
RBW=100Hz VBW=1000Hz

## SIDEBAND SPECTRUM

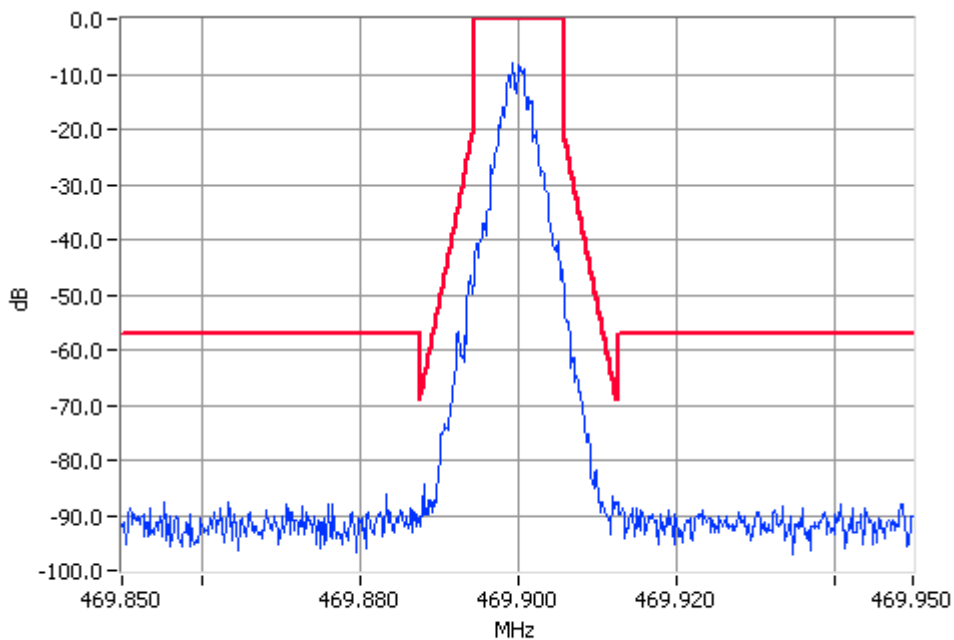
### TSM

SPECIFICATION: FCC CFR 2.1049 (c) H2 Reciter

Tx FREQUENCY: 469.9 MHz 5 W 12.5 kHz Channel Spacing



Unmodulated 469.9000MHz Mask D 5W Pass  
RBW=100Hz VBW=1000Hz



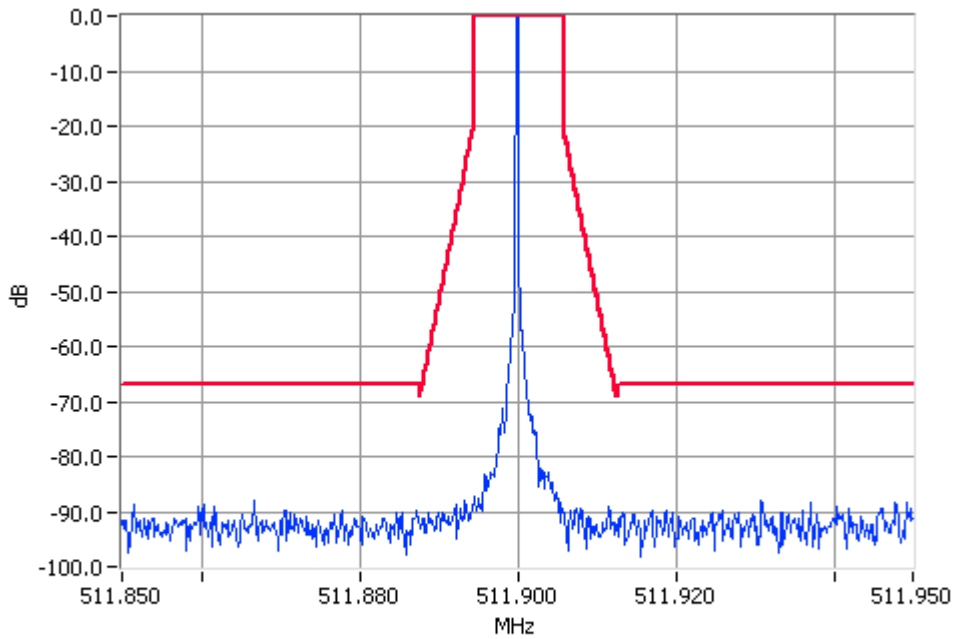
TSM 469.9000MHz Mask D 5W Pass  
RBW=100Hz VBW=1000Hz

## SIDEBAND SPECTRUM

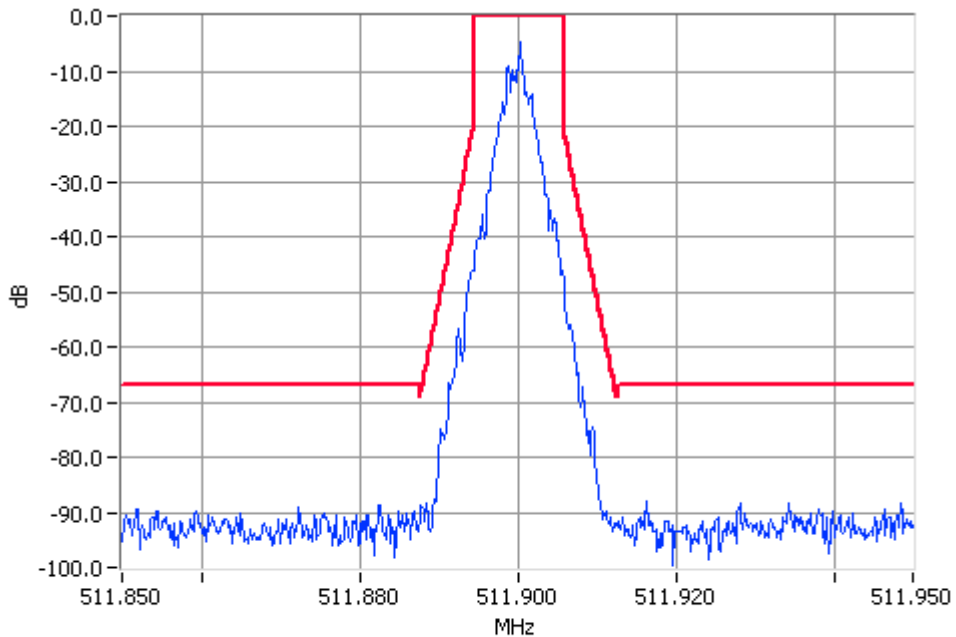
### TSM

SPECIFICATION: FCC CFR 2.1049 (c) H3 Reciter

Tx FREQUENCY: 511.9 MHz 50 W 12.5 kHz Channel Spacing



Unmodulated 511.9000MHz Mask D 50W Pass  
RBW=100Hz VBW=1000Hz



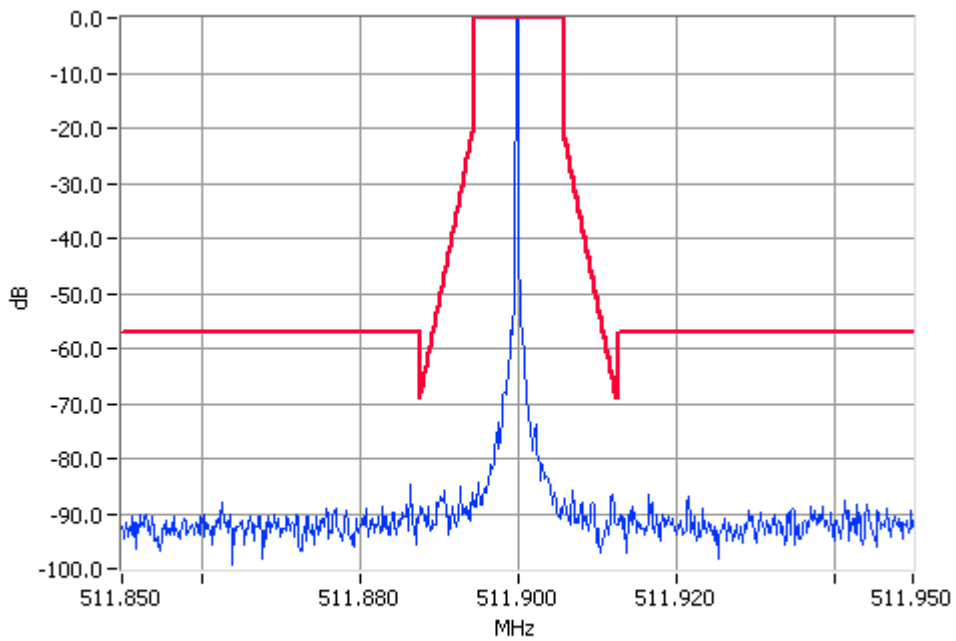
TSM 511.9000MHz Mask D 50W Pass  
RBW=100Hz VBW=1000Hz

### SIDEBAND SPECTRUM

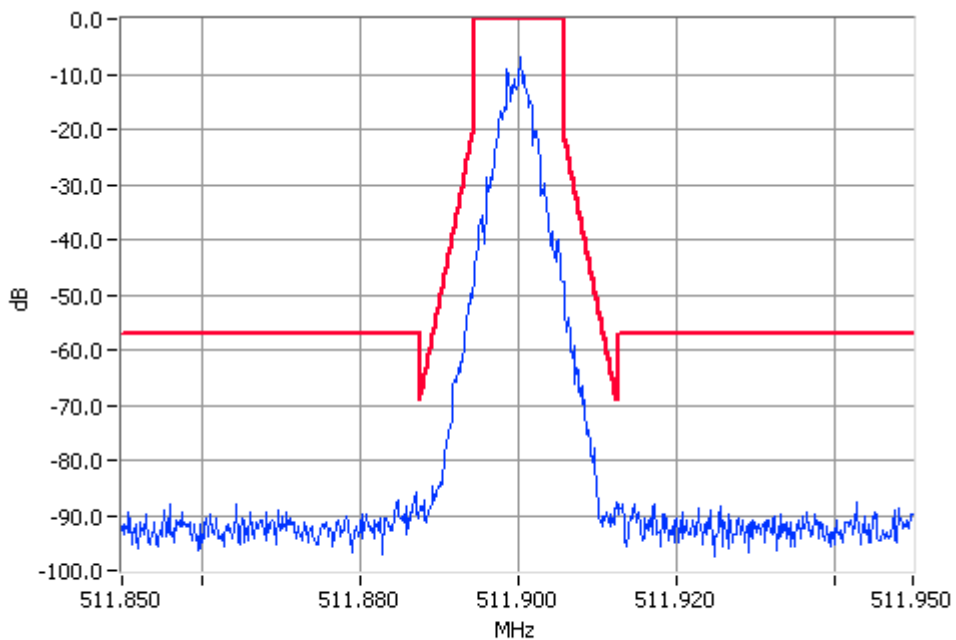
#### TSM

SPECIFICATION: FCC CFR 2.1049 (c) H3 Reciter

Tx FREQUENCY: 511.9 MHz 5 W 12.5 kHz Channel Spacing



Unmodulated 511.9000MHz Mask D 5W Pass  
RBW=100Hz VBW=1000Hz



TSM 511.9000MHz Mask D 5W Pass  
RBW=100Hz VBW=1000Hz

## TEST EQUIPMENT USED

No#	Equipment	Manufacturer	Model No	Serial No#	Tait ID	Cal Due
21	Power Supply	Rohde & Schwarz	NGS M32/10 192.0810.31	Fnr 434	E3556	17-Oct-08
67	RF Attenuator 150W Treva	Weinschel	40-20-33	CJ405	E3733	1-Nov-07
111	Modulation Analyser	Hewlett Packard	HP8901B (Opt 002)	3704A05837	E3786	1-Nov-07
114	Signal Generator	Rohde & Schwarz	SML03 1090.3000.13	100597	E4050	1-Nov-07
123	Spectrum Analyser	Agilent	E4445A	MY42510072	E4139	17-Jul-08

## Annex A

All 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 Sideband Spectrum and 99% Bandwidth measurements.

