

Laboratory Test Report

RADIO PERFORMANCE MEASUREMENTS

for the

TBAK2 Base Station Transceiver

Tested In accordance with

FCC 47 CFR Part 90

Report Revision: 1
Issue Date: 29-November-2010
FCC ID: CASTBA8K2

PREPARED BY: Garry Pringle _____
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

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REVISION HISTORY

| Date | Revision | Comments |
|------------------|----------|---------------------|
| 29-November-2010 | 1 | Initial test report |
| | | |

INTRODUCTION

This report is for a Class 1 Permissive Change to CASTBA7K2, CASTBA8K2, & CASTBA9K2 (TBAK2 Base Station) and demonstrates continued compliance to 47 CFR Part 90 after a change of firmware in the System Interface part of the Reciter module.

This test report is in addition to Reports 2113, 2245, 2695, & 2817.

| | | | |
|------------------------------|---------------|----------|----------|
| Type Approval Testing of the | TBA40K4-MA00 | | |
| Serial number | Reciter | PA | PMU |
| | 18108177 | 18107890 | 18095875 |
| Frequency range | 762 → 869 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: | Base Station Transmitter | | |
| Type: | TBAK2 | | |
| Product code: | TBA40K4-MA00 | | |
| Serial Numbers: | Reciter | PA | PMU |
| | 18108177 | 18107890 | 18095875 |
| Quantity: | 1 of each | | |
| Hardware & Software | Code & Version | | |
| Reciter Digital Board | FW: 03.42 | HW: 00.07 | |
| Power Amplifier | FW: 03.11 | HW: 00.02 | |

STATEMENT OF COMPLIANCE

The TBAK2 Base Station transmitter when fitted with a TBA40K4-MA00 as tested in this report was found to conform to the requirements of FCC CFR 47 Part 90. This covers CASTBA7K2, CASTBA8K2, and CASTBA9K2.

TEST CONDITIONS

All testing was performed between 26th → 29th November 2011, and under the following conditions:

| | | |
|-----------------------|---------|--------|
| Ambient Temperature | 15°C | → 30°C |
| Relative Humidity | 20% | → 75% |
| Standard Test Voltage | 120 Vac | |

MODULATION TYPES AND EMISSION DESIGNATORS

Modulation Types:

| | |
|-----|----------------------|
| F3E | ANALOG FM |
| F2D | FFSK Data (1200 bps) |

Channel Spacings:

12.5 kHz,
25.0 kHz

Emission Designators:

| | |
|-------------------|------------------|
| Analog FM | 11k0F3E, 16k0F3E |
| FFSK Data 1200bps | 6k60F2D, 9k60F2D |

TEST RESULTS

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:

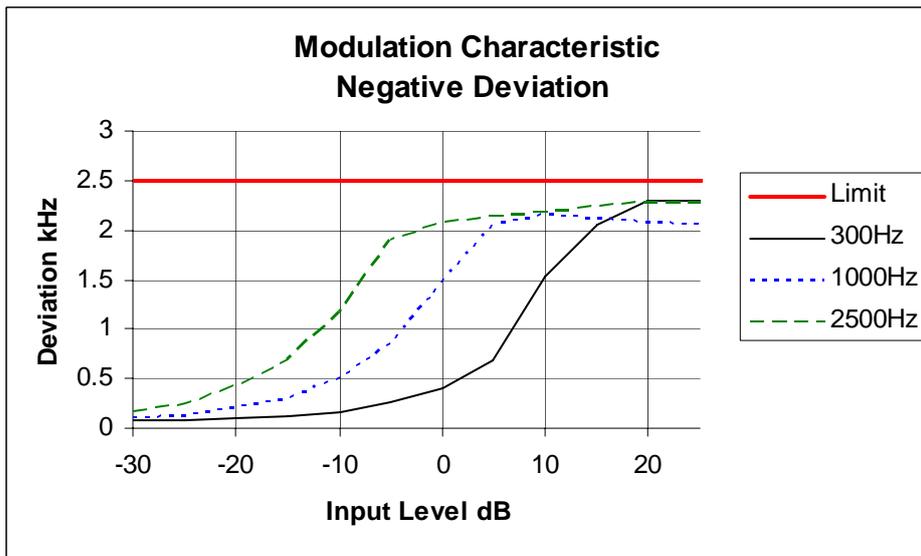
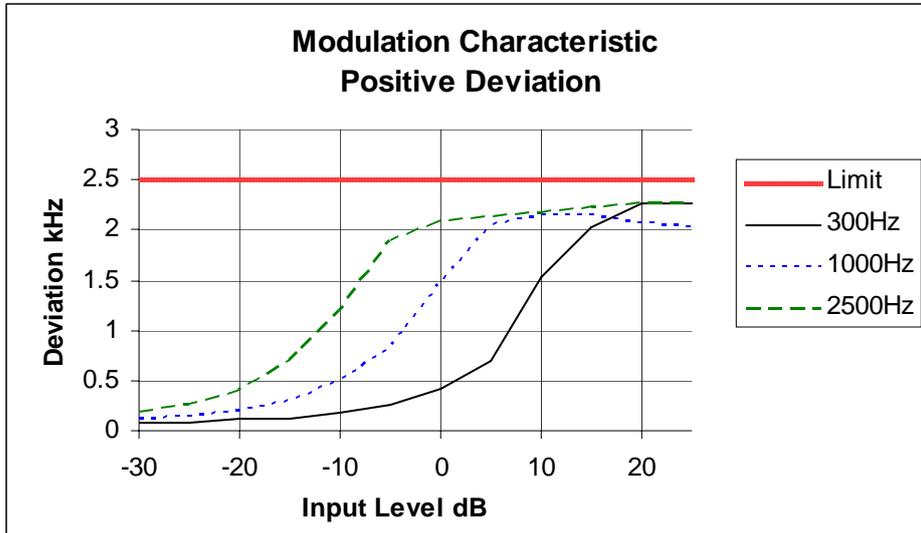
See the plots on the following pages for 12.5 kHz & 25.0 kHz channel spacings.

LIMIT CLAUSE: TIA/EIA-603C 1.3.4.4

TRANSMITTER MODULATION LIMITING

SPECIFICATION: FCC CFR 2.1047 (b)

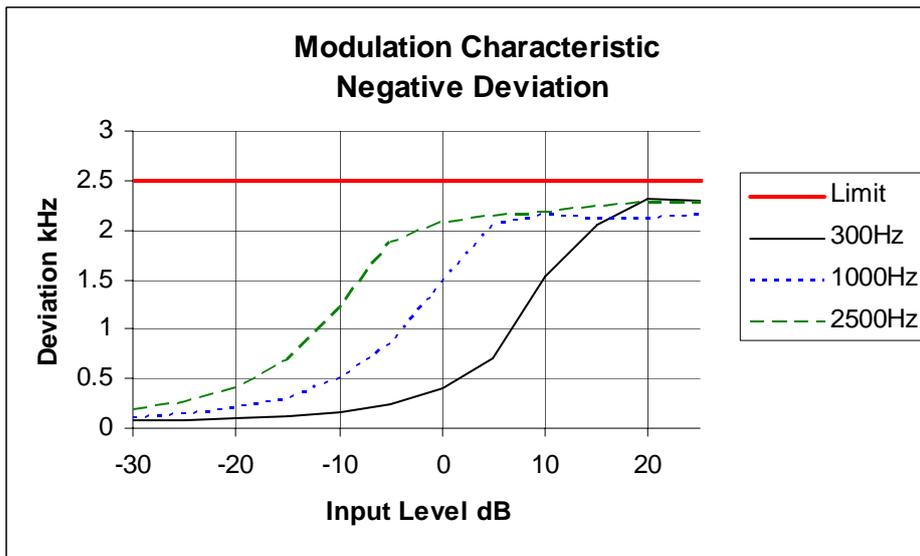
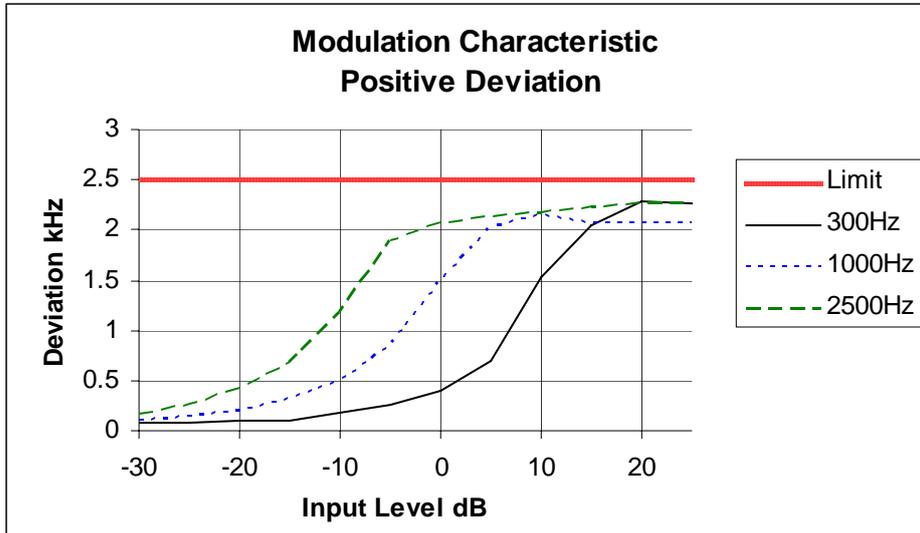
Tx FREQUENCY: 852.5125 MHz 12.5 kHz Channel Spacing



TRANSMITTER MODULATION LIMITING

SPECIFICATION: FCC CFR 2.1047 (b)

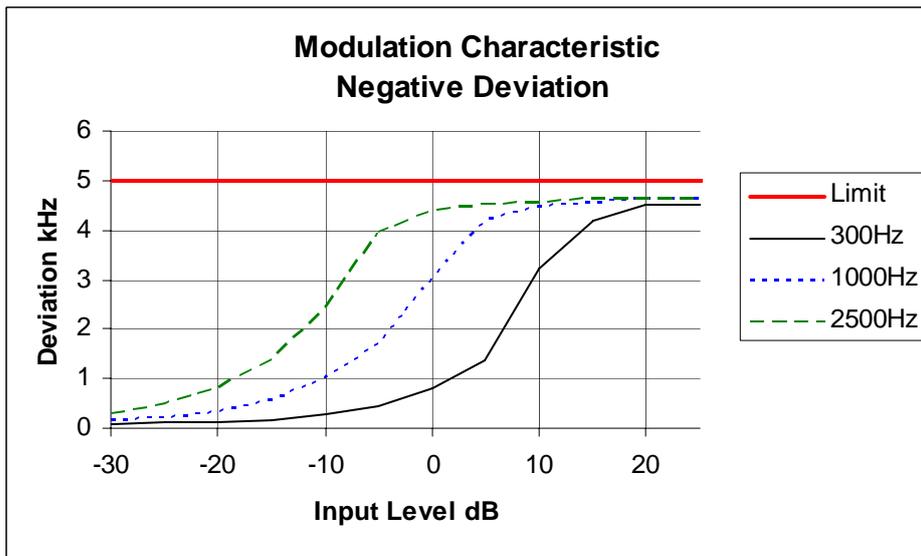
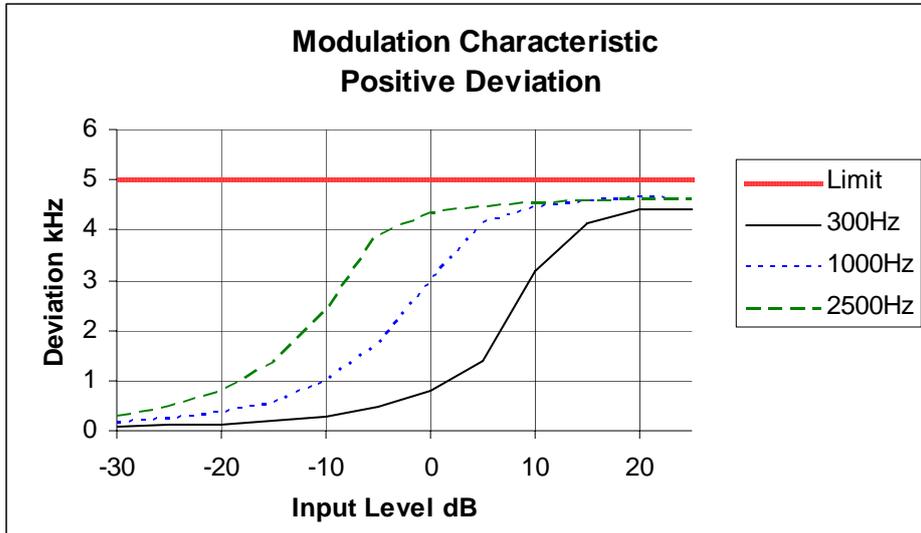
Tx FREQUENCY: 868.9875 MHz 12.5 kHz Channel Spacing



TRANSMITTER MODULATION LIMITING

SPECIFICATION: FCC CFR 2.1047 (b)

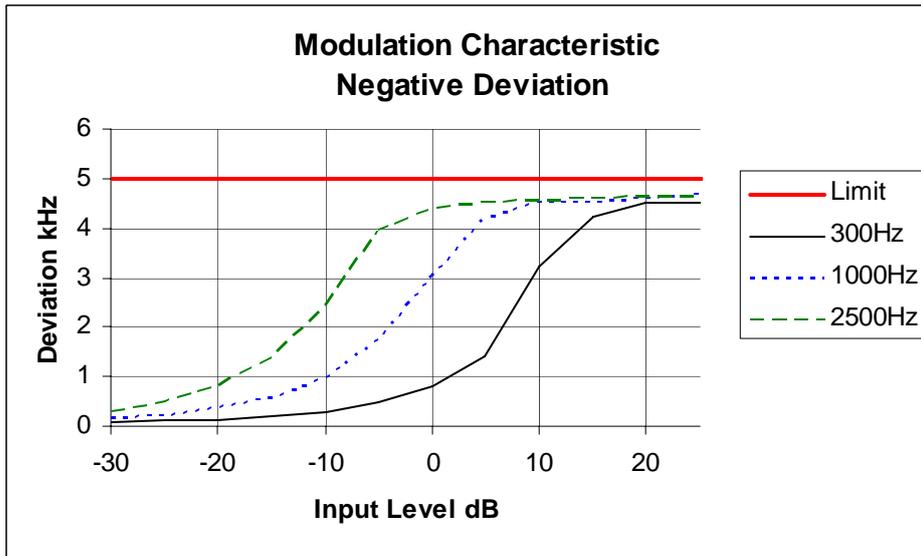
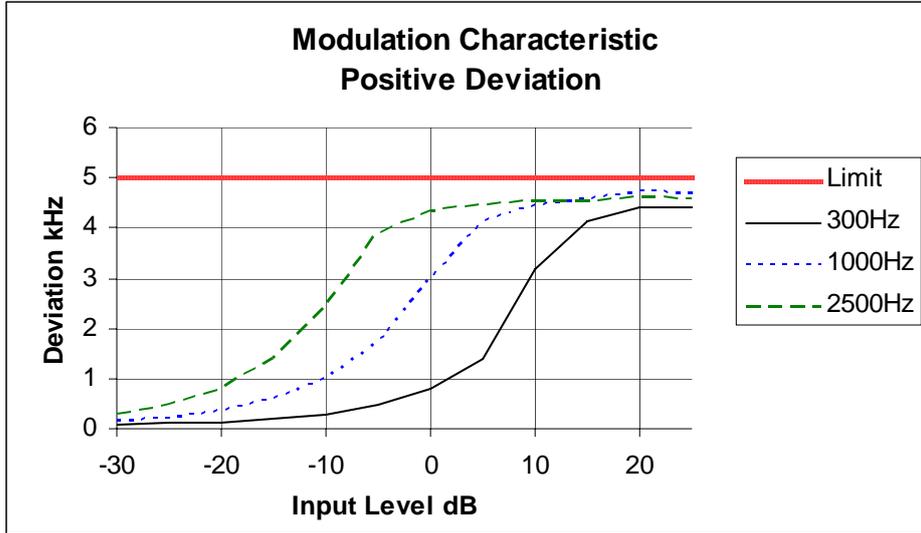
Tx FREQUENCY: 852.5125 MHz 25.0 kHz Channel Spacing



TRANSMITTER MODULATION LIMITING

SPECIFICATION: FCC CFR 2.1047 (b)

Tx FREQUENCY: 868.9875 MHz 25.0 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 B – Resolution Bandwidth = 300Hz, Video Bandwidth = 3 kHz

MEASUREMENT RESULTS:

See the plots on the following pages for 12.5 kHz & 25.0 kHz channel spacings.

LIMIT CLAUSE: FCC 47 CFR 90.210

EMISSION MASKS

| | | |
|-----------------|--------------------------|---------------|
| Emission Mask B | 12.5 kHz Channel Spacing | Analog; FFSK; |
| Emission Mask B | 25.0 kHz Channel Spacing | Analog; FFSK |

DATA SPEED

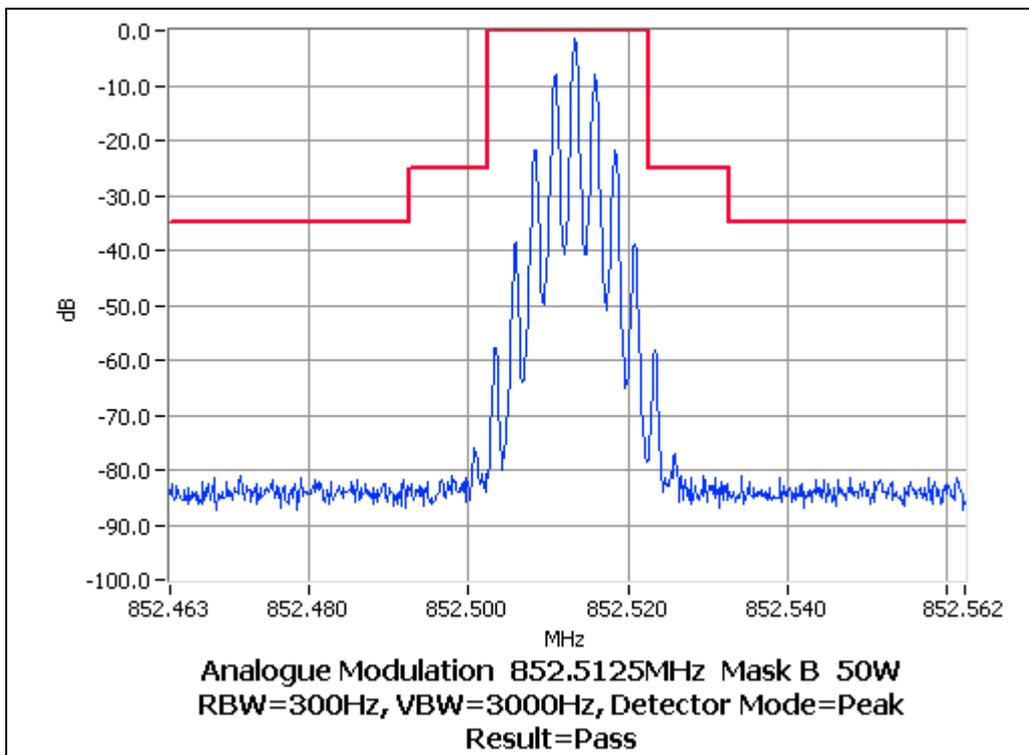
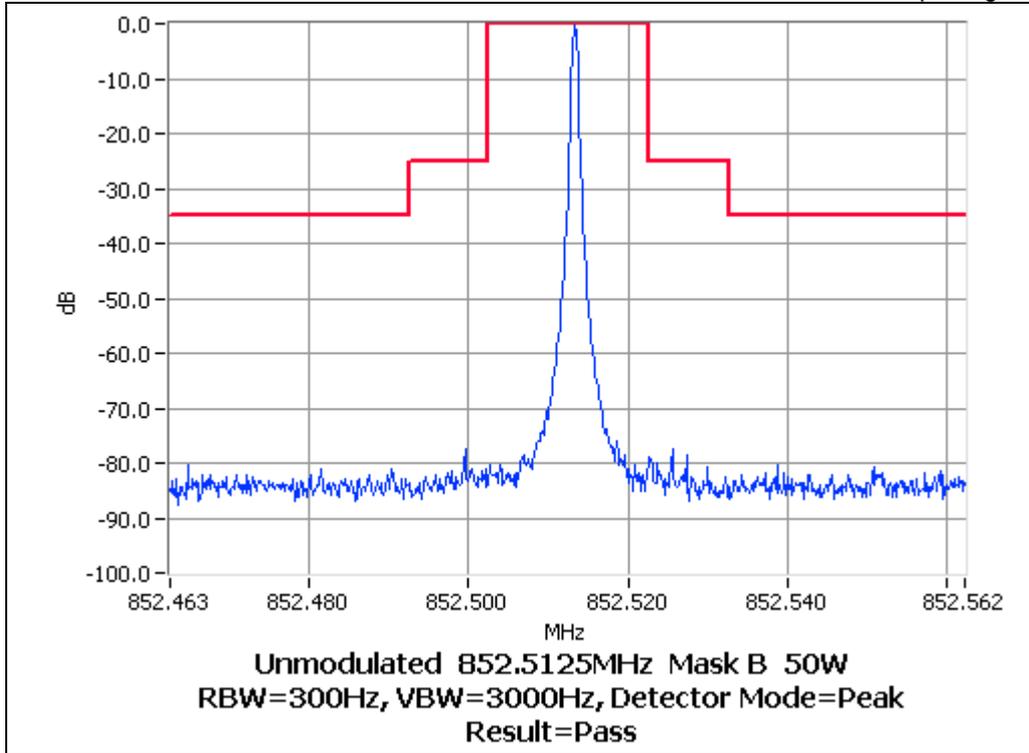
| | | |
|------|--------------------------|----------|
| FFSK | 12.5 kHz Channel Spacing | 1200 bps |
| FFSK | 25.0 kHz Channel Spacing | 1200 bps |

OCCUPIED BANDWIDTH

ANALOG VOICE

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 852.5125 MHz 50 W 12.5 kHz Channel Spacing

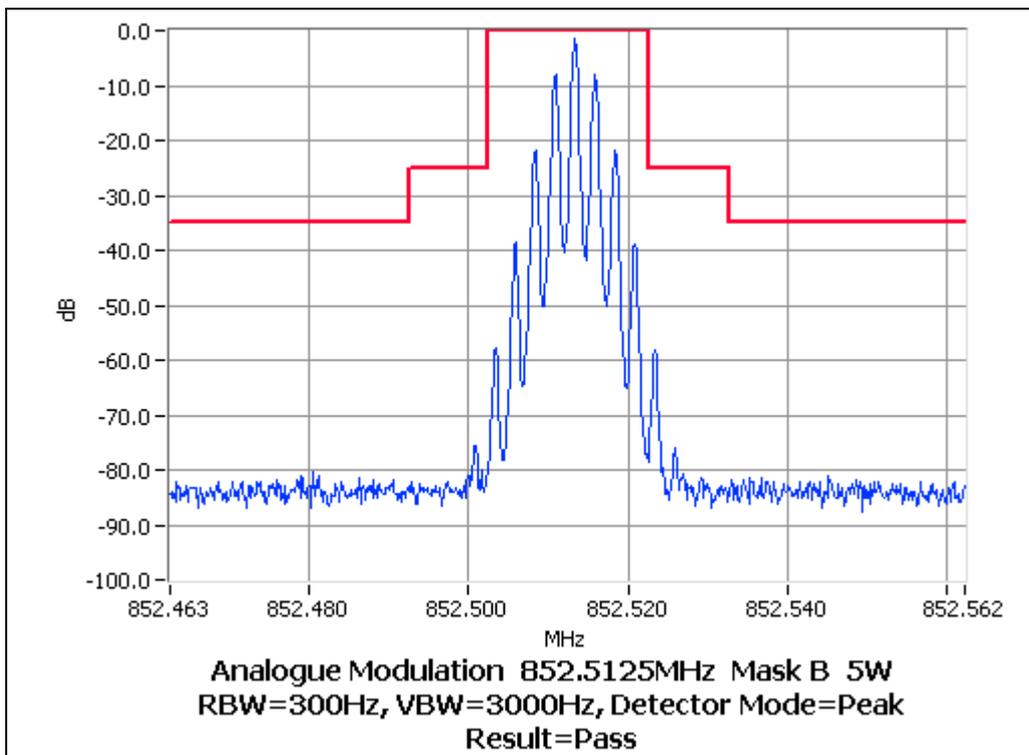
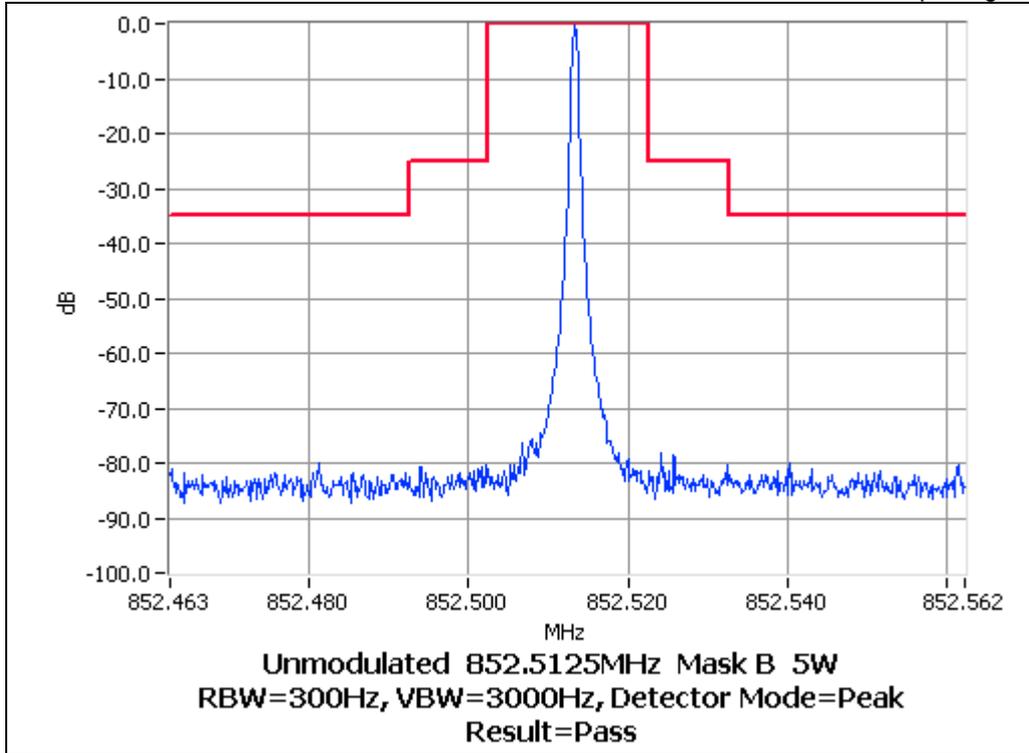


OCCUPIED BANDWIDTH

ANALOG VOICE

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 852.5125 MHz 5 W 12.5 kHz Channel Spacing

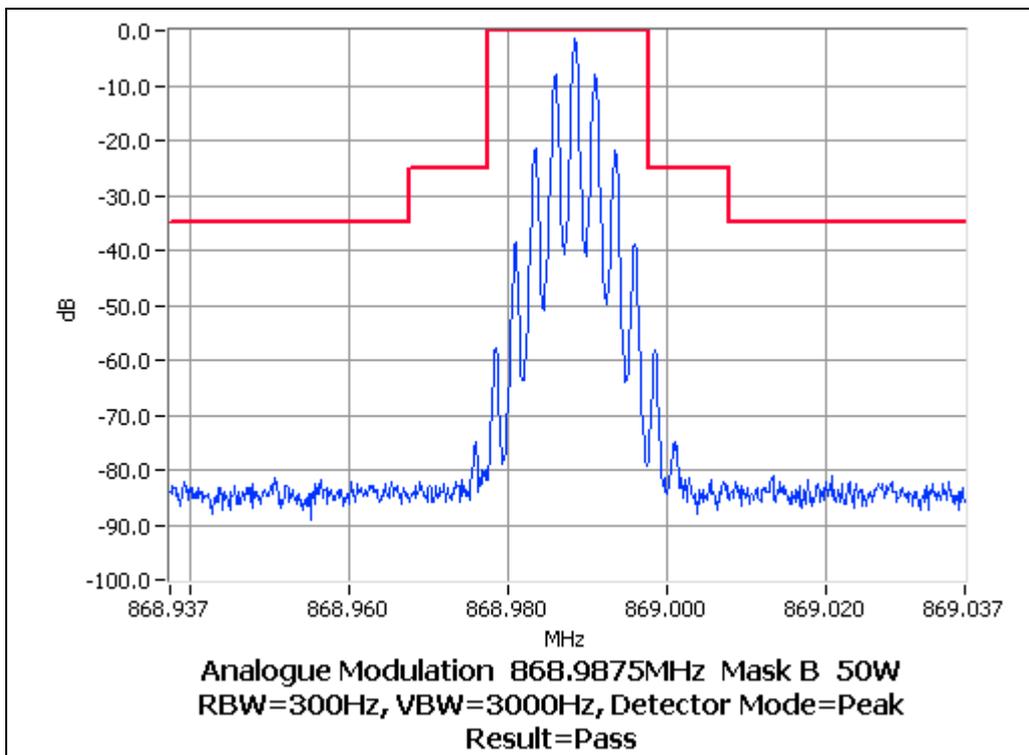
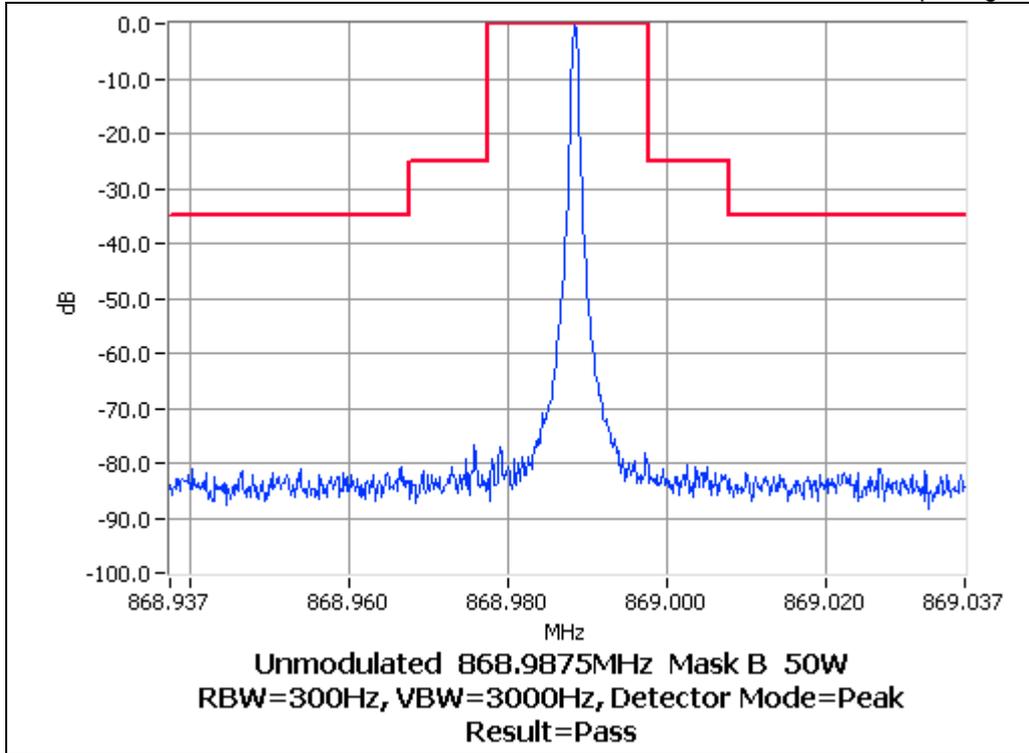


OCCUPIED BANDWIDTH

ANALOG VOICE

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 868.9875 MHz 50 W 12.5 kHz Channel Spacing

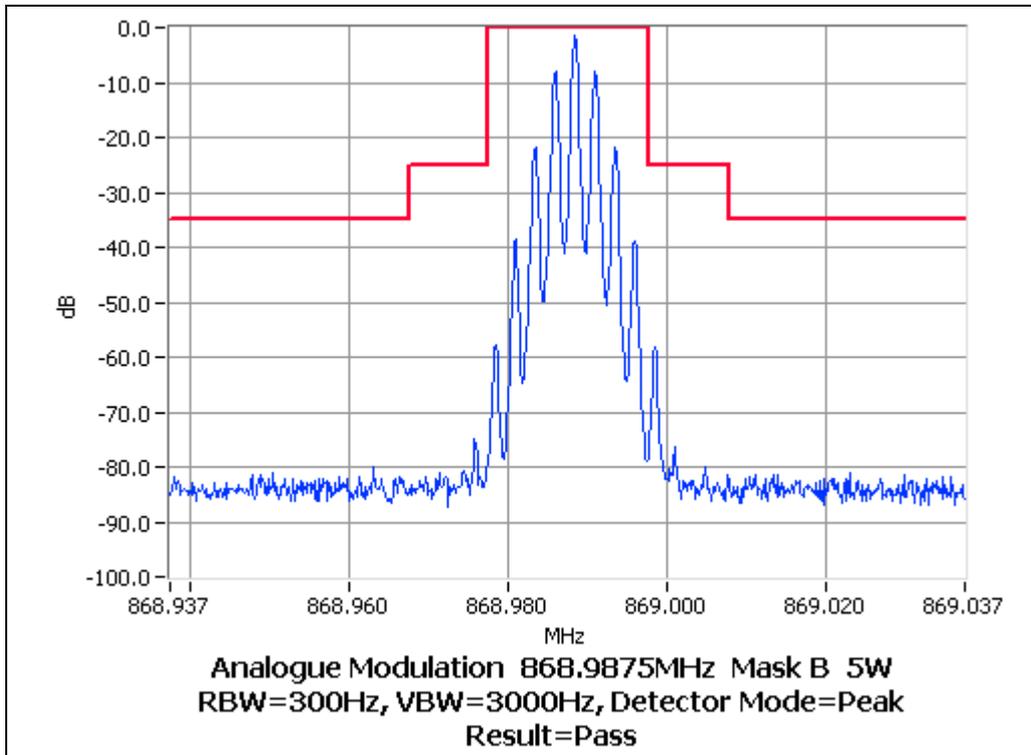
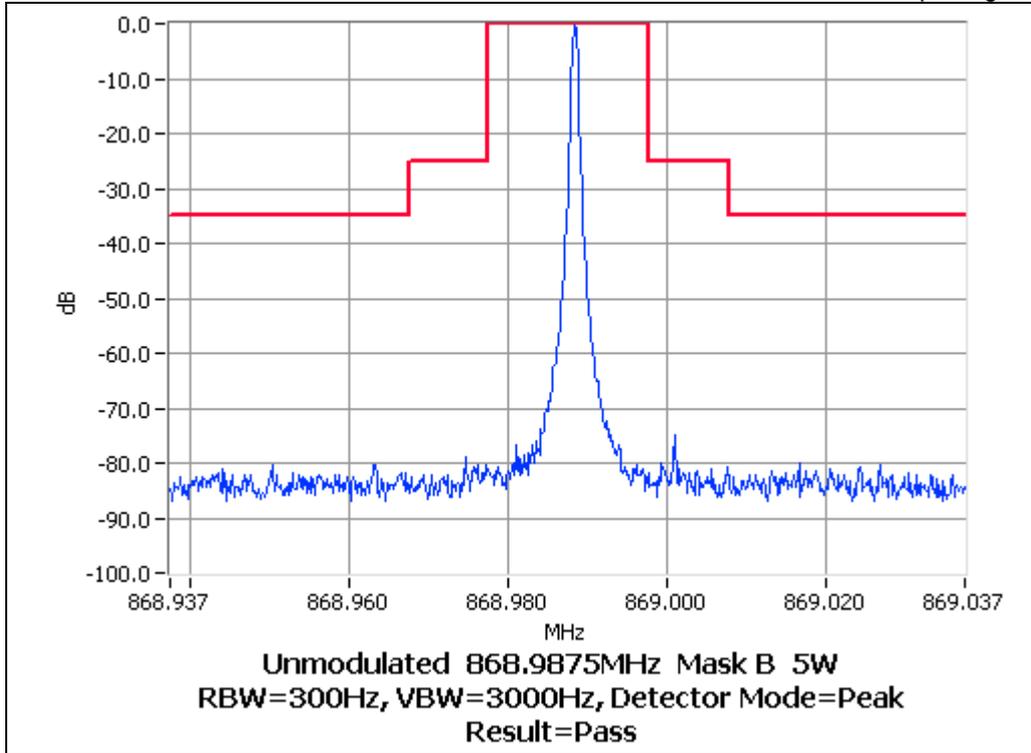


OCCUPIED BANDWIDTH

ANALOG VOICE

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 868.9875 MHz 5 W 12.5 kHz Channel Spacing

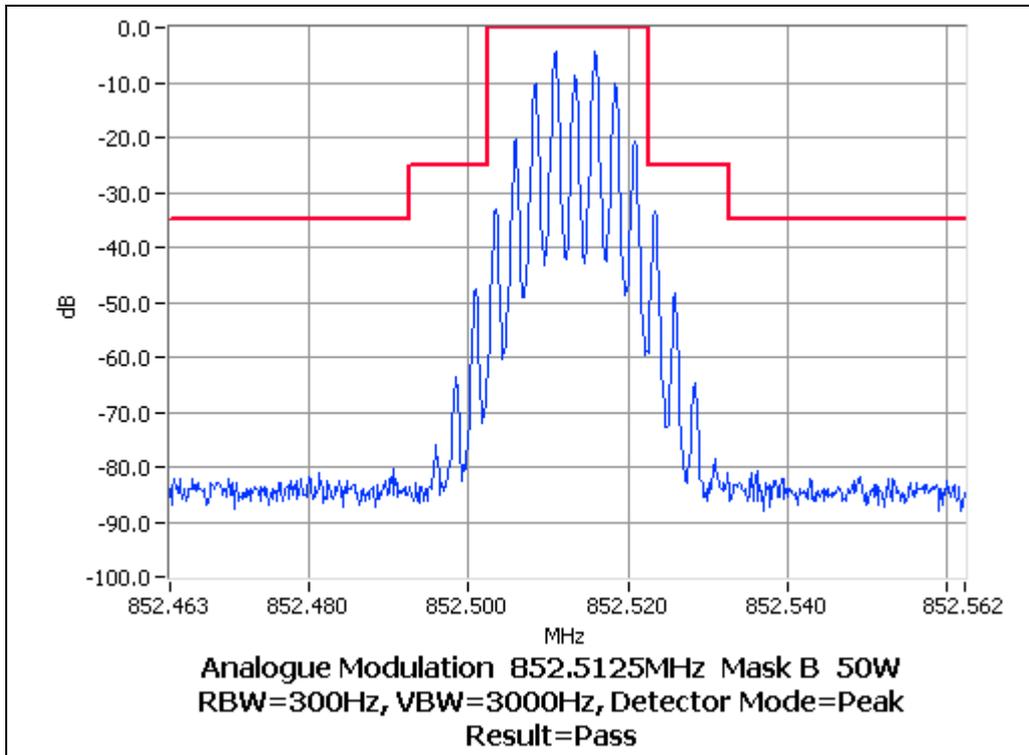
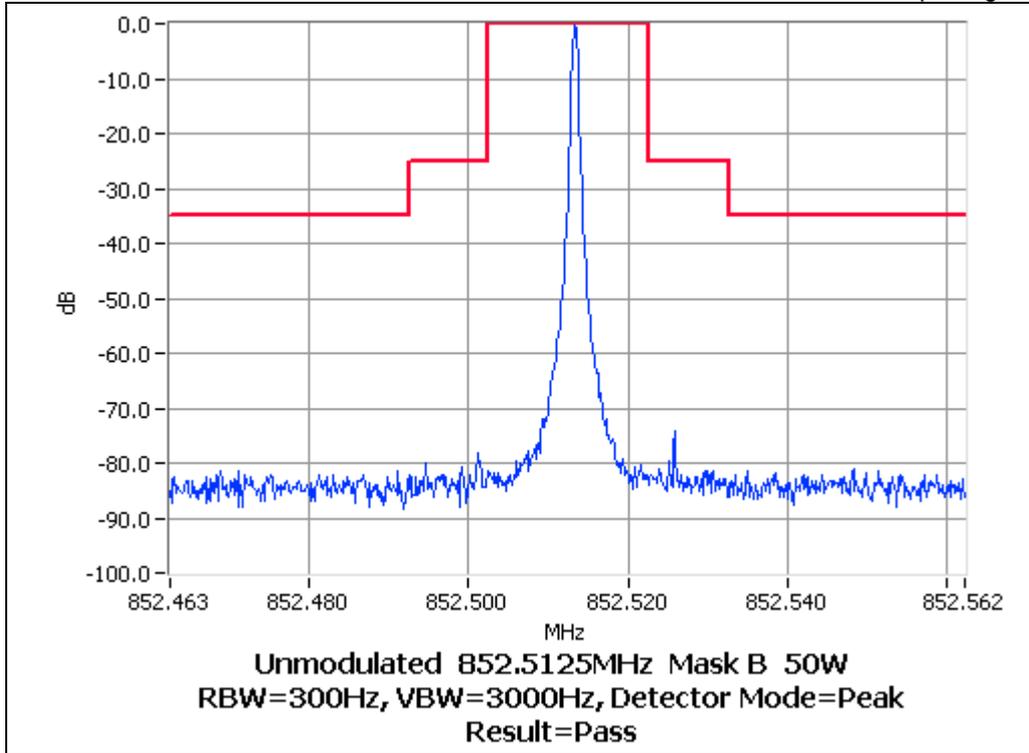


OCCUPIED BANDWIDTH

ANALOG VOICE

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 852.5125 MHz 50 W 25.0 kHz Channel Spacing

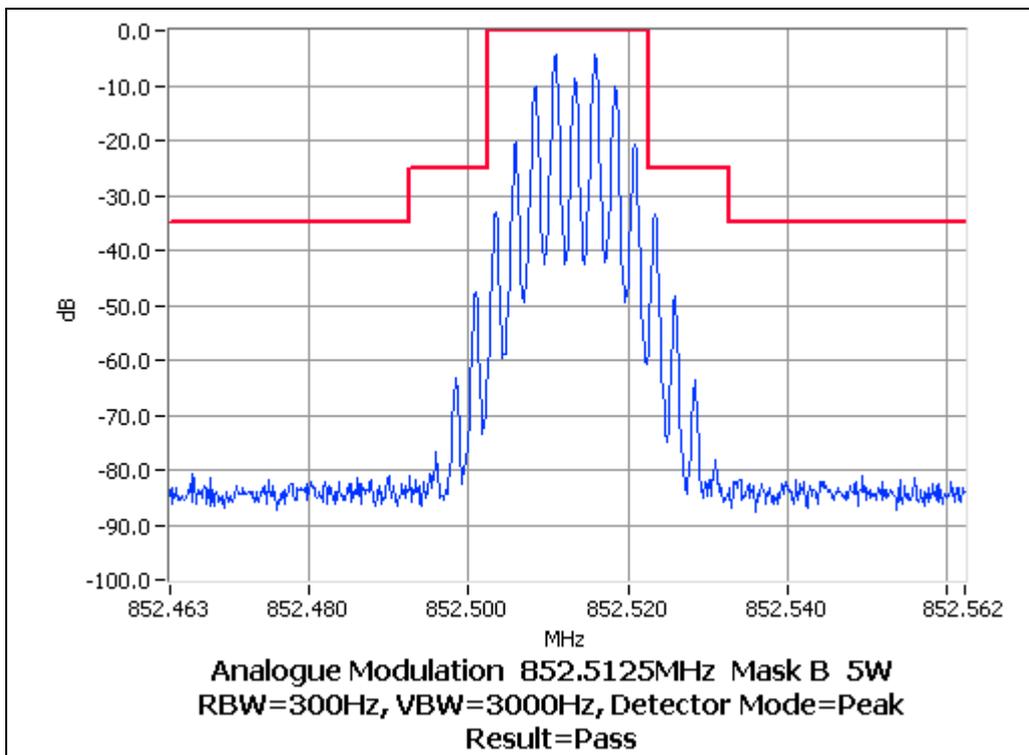
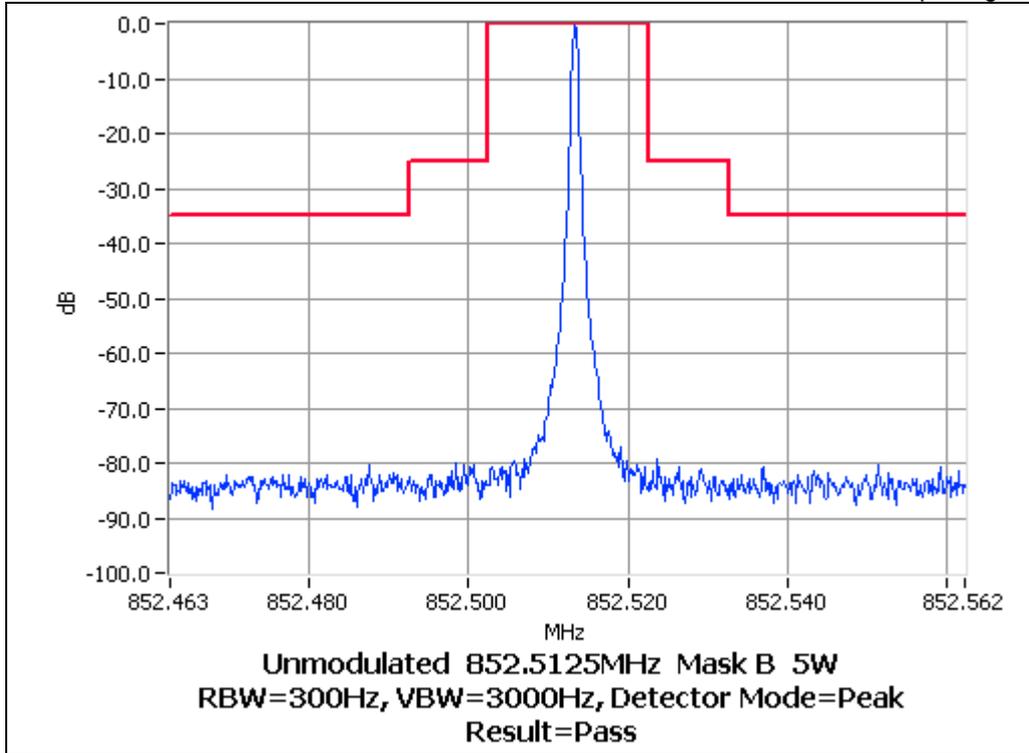


OCCUPIED BANDWIDTH

ANALOG VOICE

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 852.5125 MHz 5 W 25.0 kHz Channel Spacing

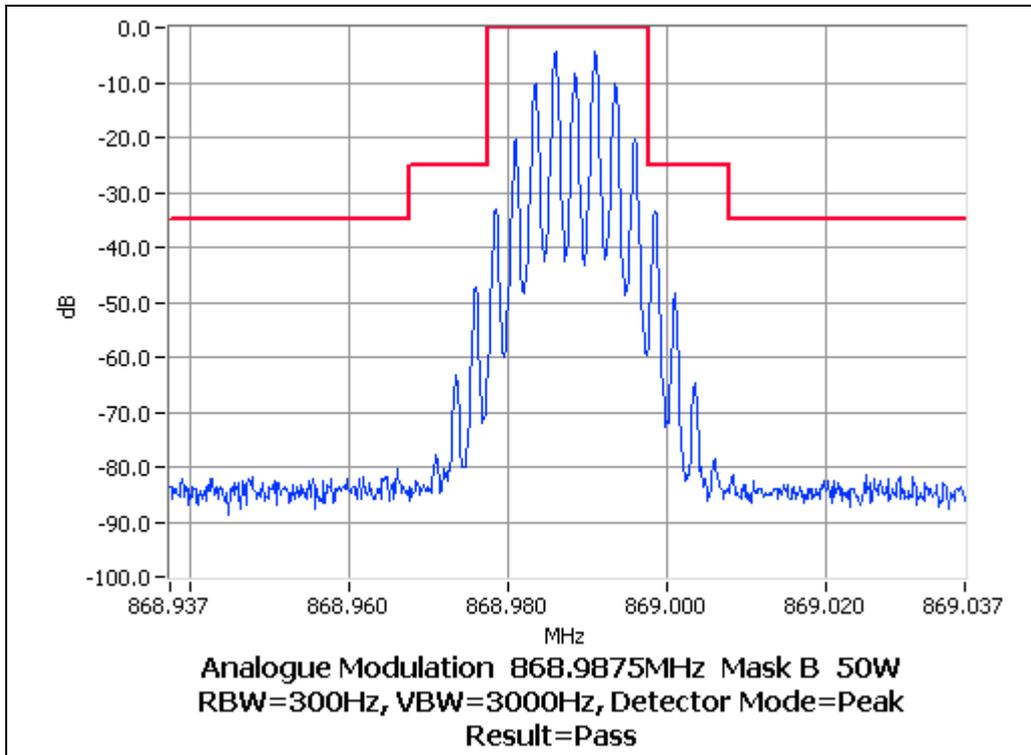
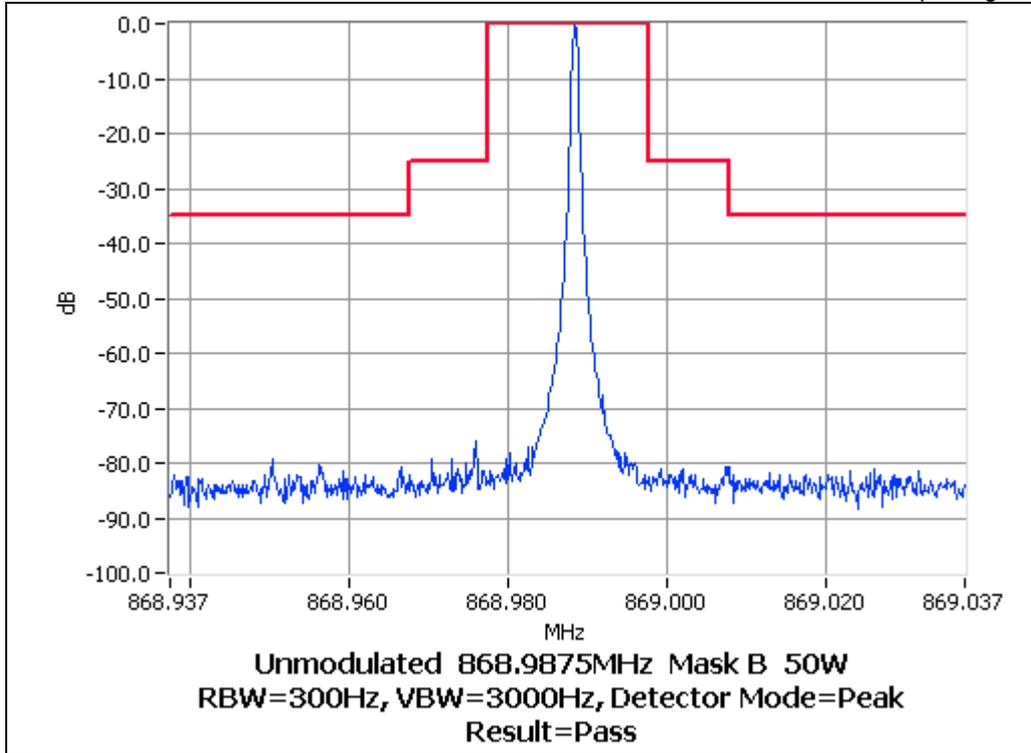


OCCUPIED BANDWIDTH

ANALOG VOICE

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 868.9875 MHz 50 W 25.0 kHz Channel Spacing

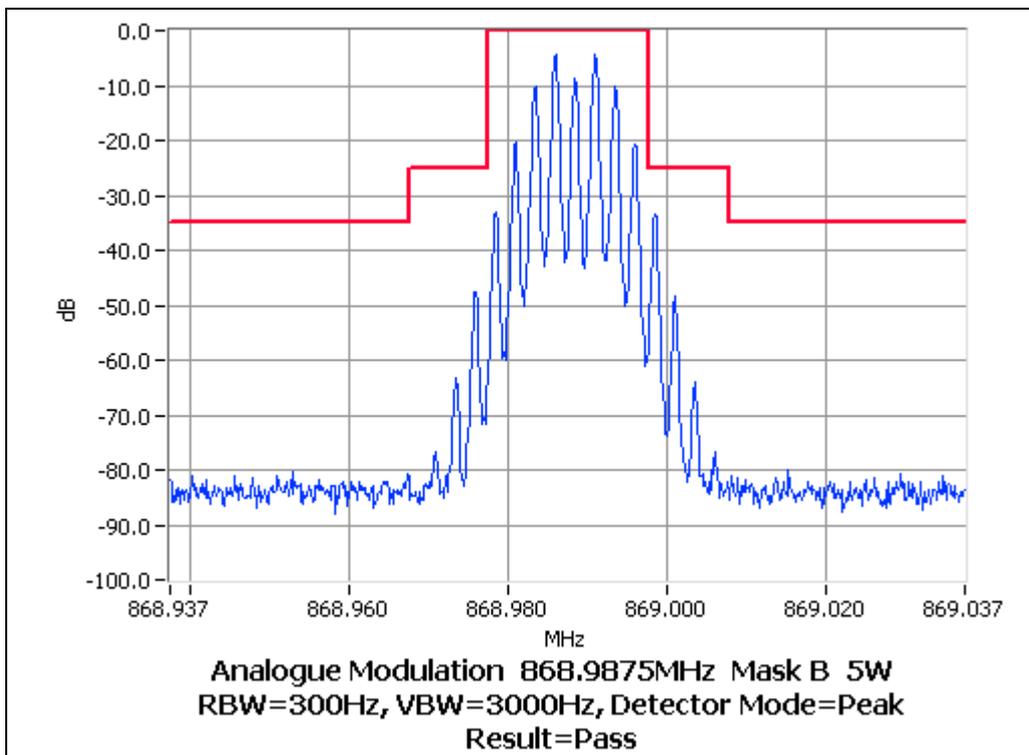
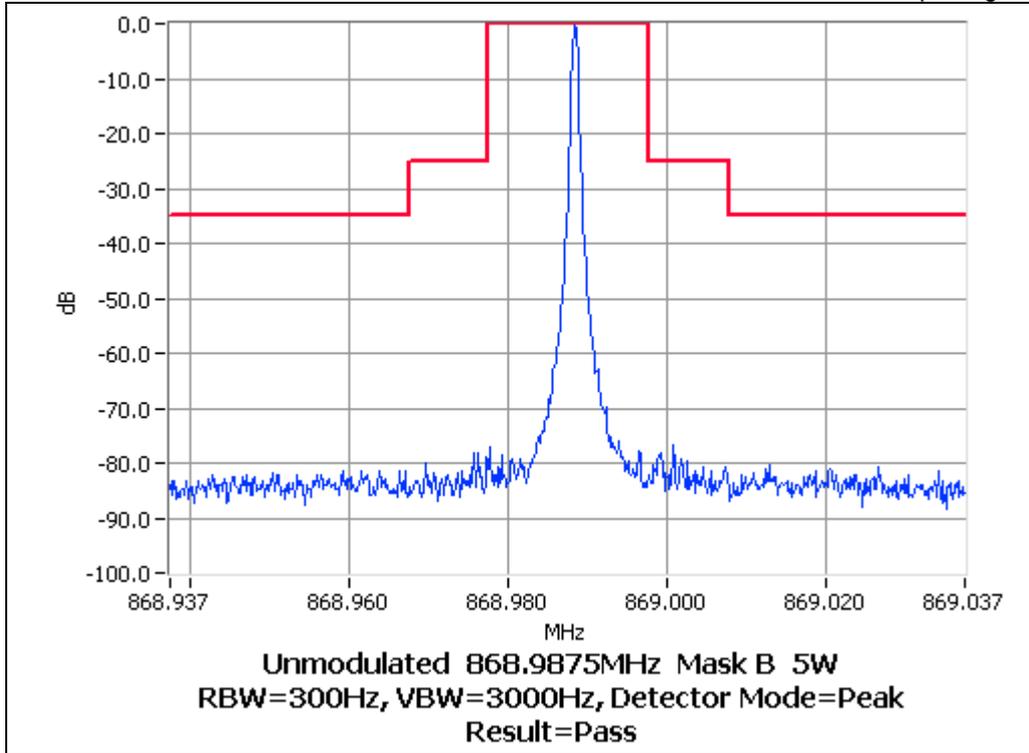


OCCUPIED BANDWIDTH

ANALOG VOICE

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 868.9875 MHz 5 W 25.0 kHz Channel Spacing

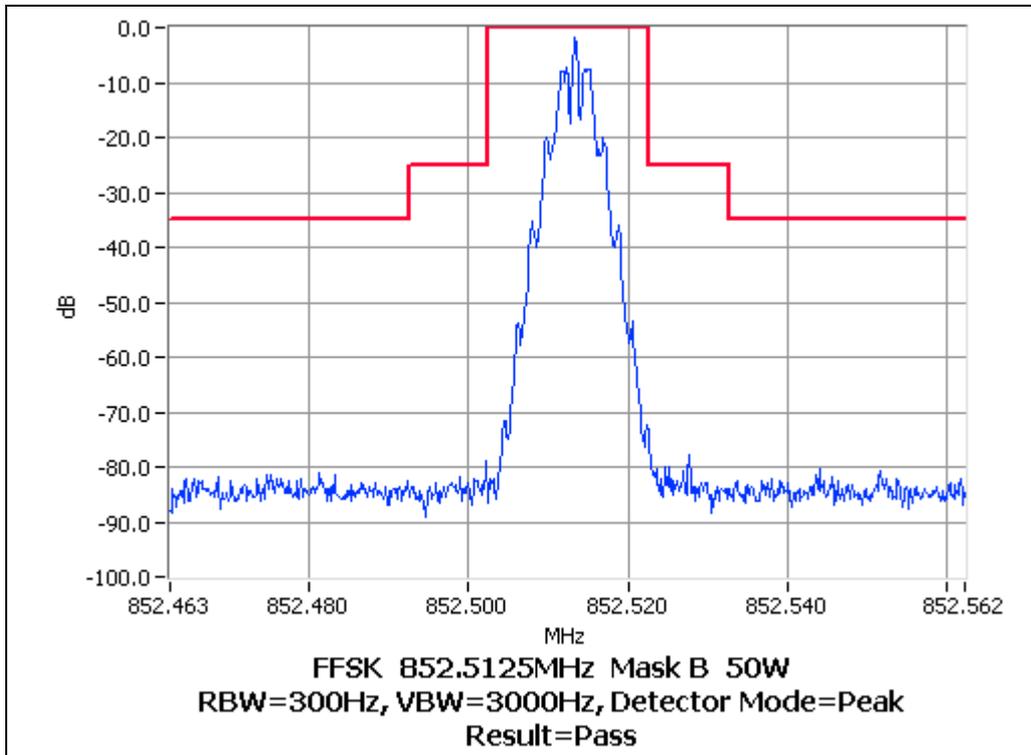
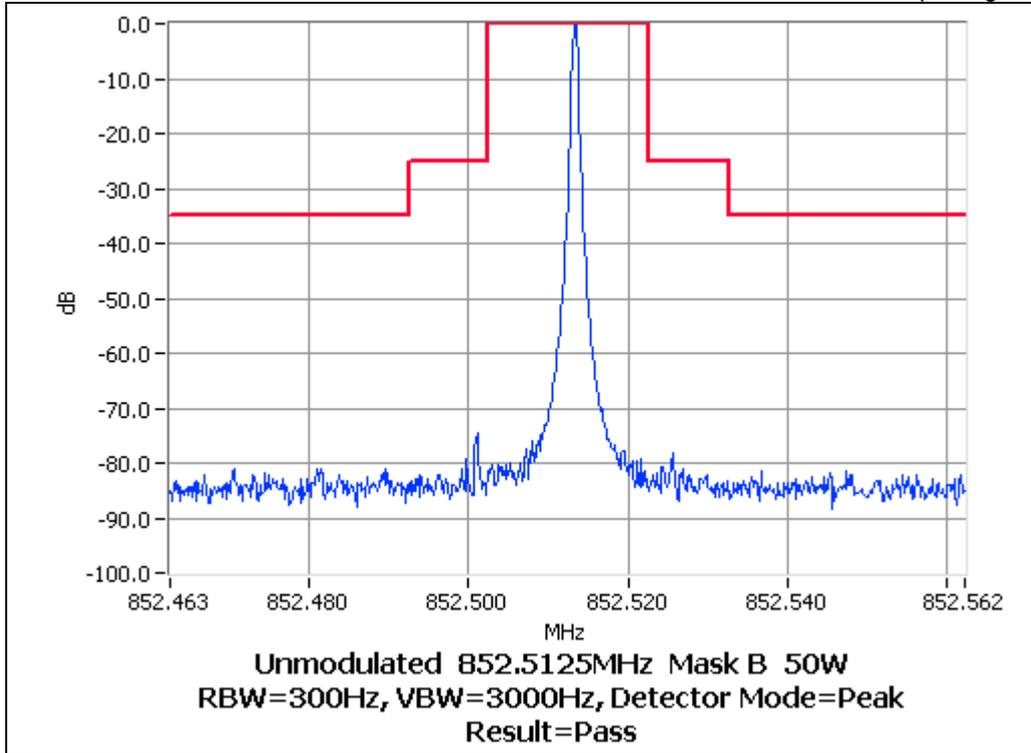


OCCUPIED BANDWIDTH

FFSK

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 852.5125 MHz 50 W 12.5 kHz Channel Spacing

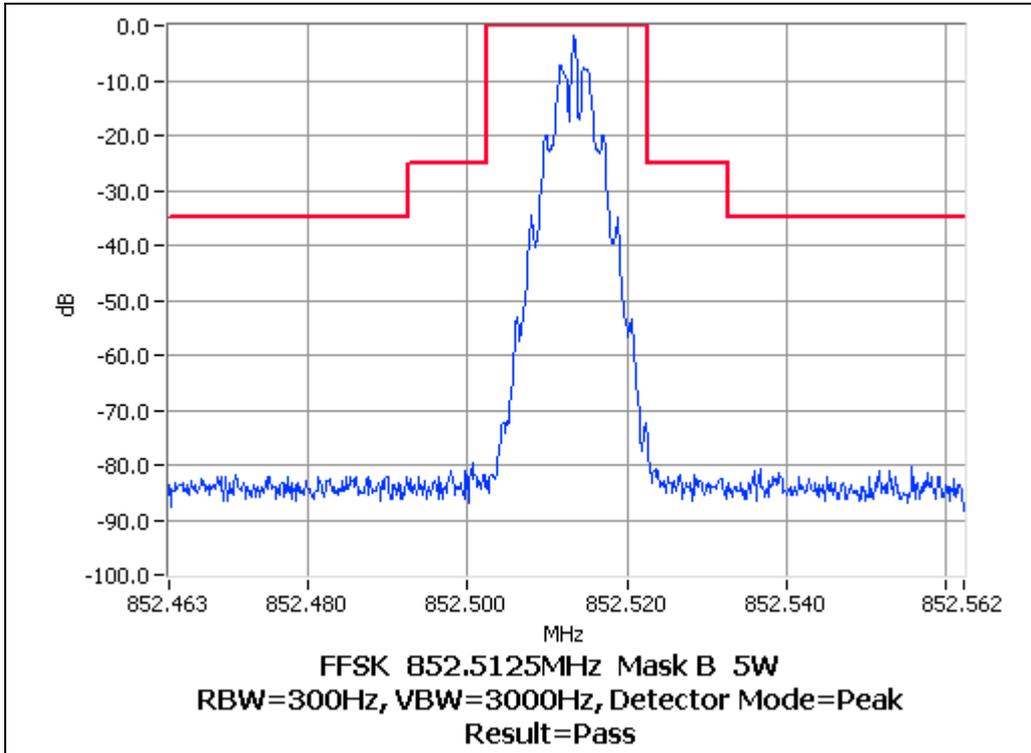
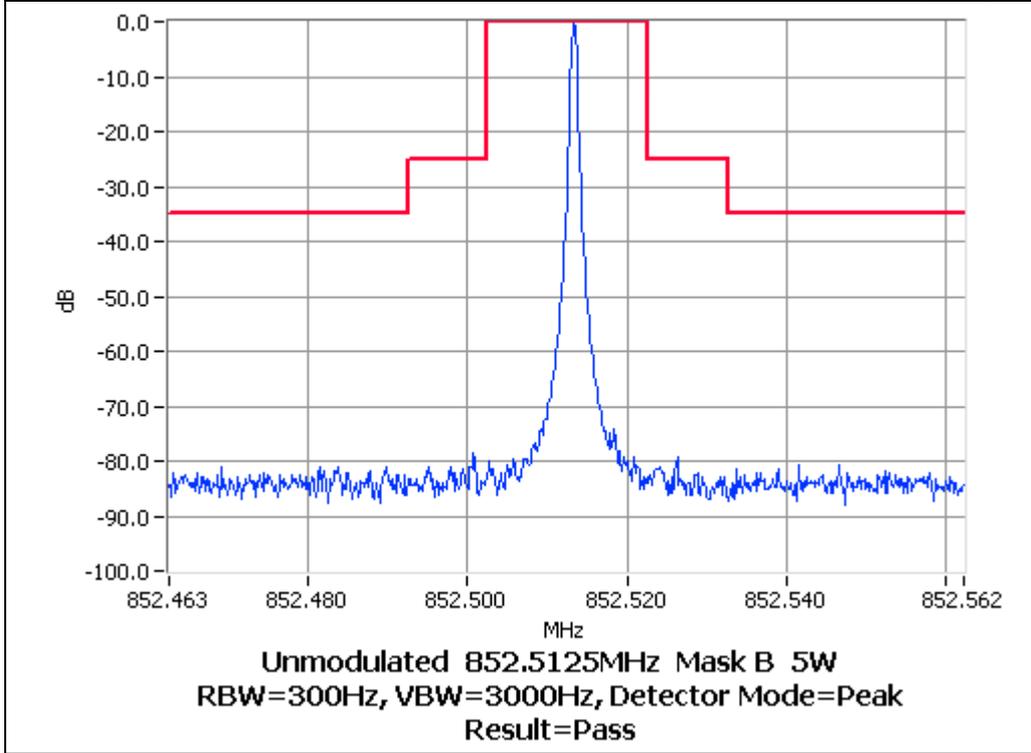


OCCUPIED BANDWIDTH

FFSK

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 852.5125 MHz 5 W 12.5 kHz Channel Spacing

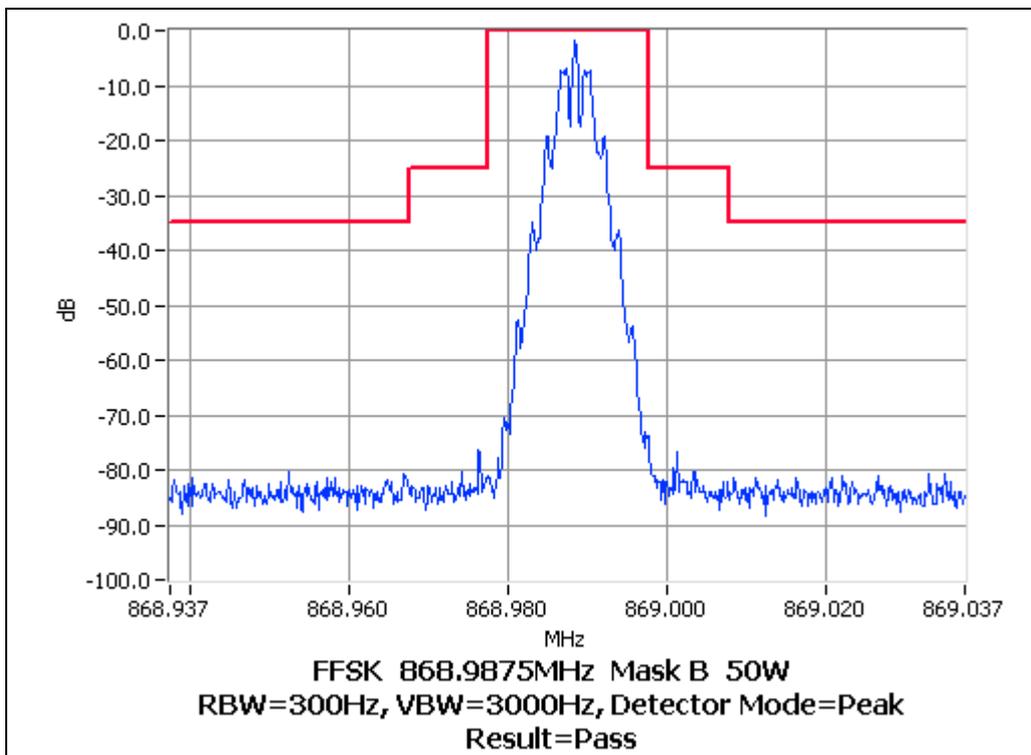
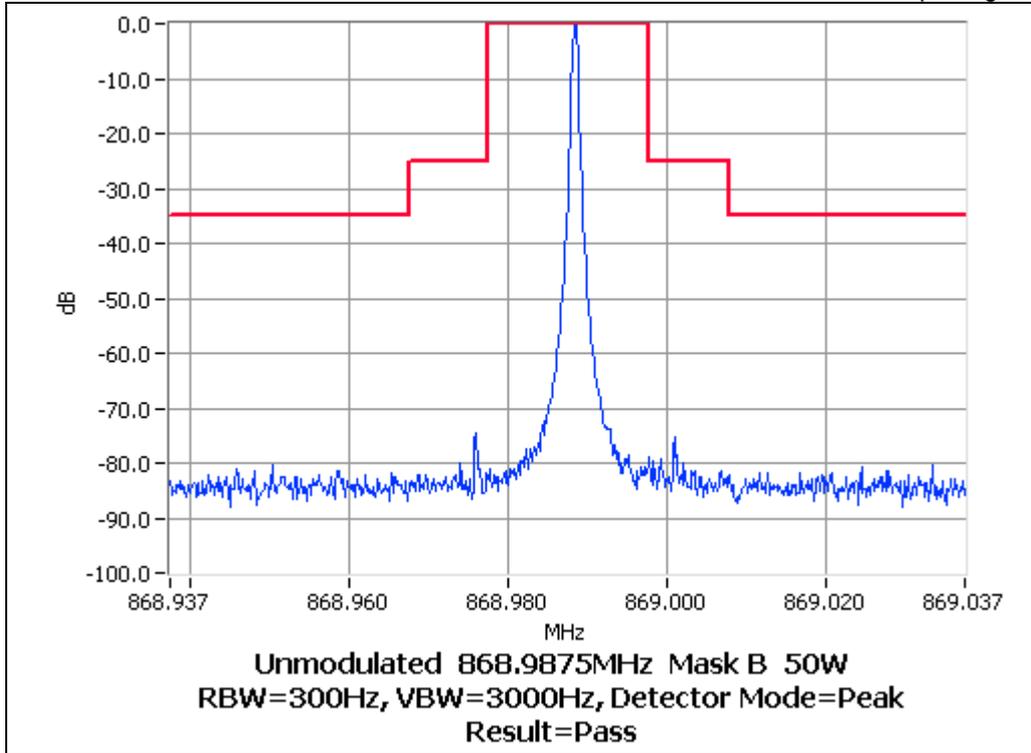


OCCUPIED BANDWIDTH

FFSK

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 868.9875 MHz 50 W 12.5 kHz Channel Spacing

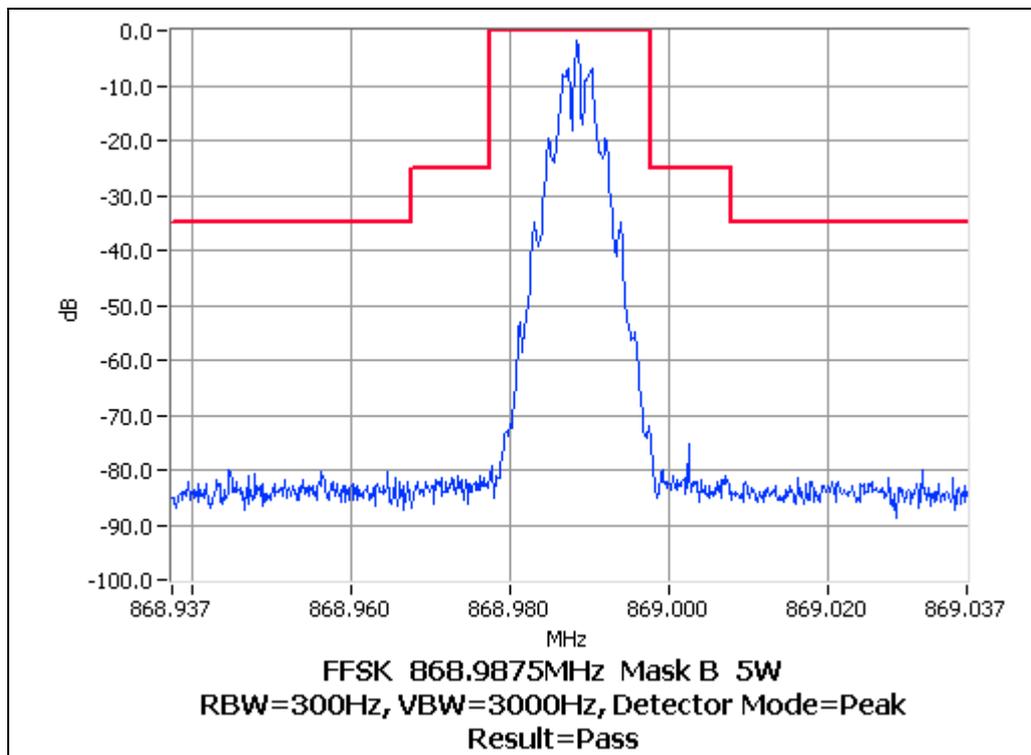
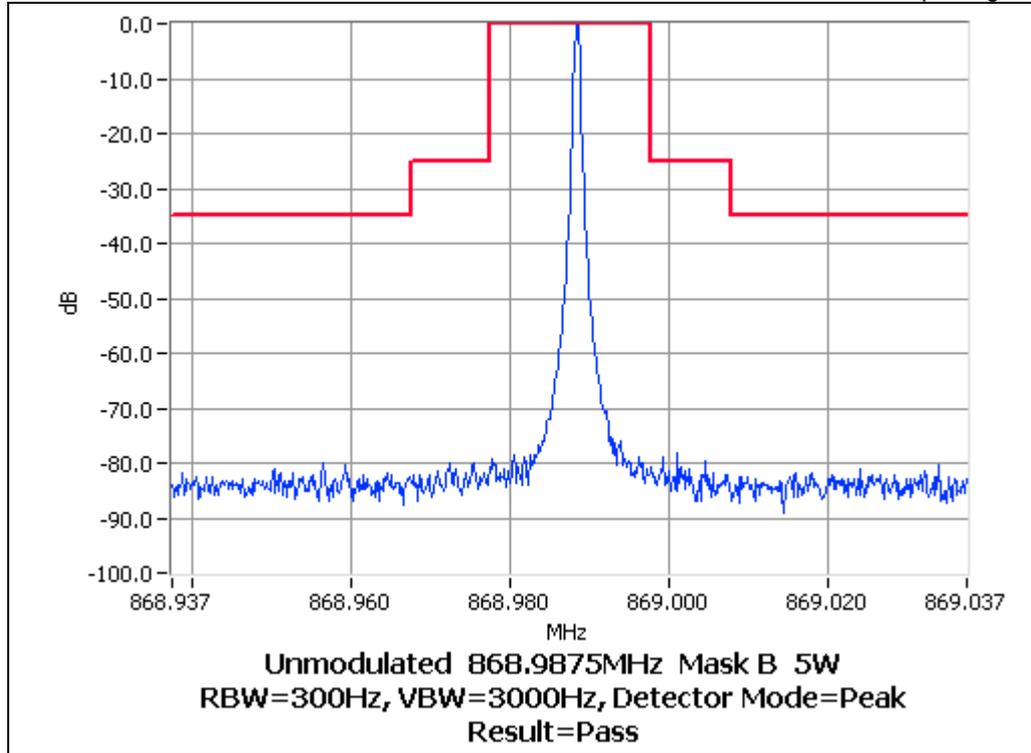


OCCUPIED BANDWIDTH

FFSK

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 868.9875 MHz 5 W 12.5 kHz Channel Spacing

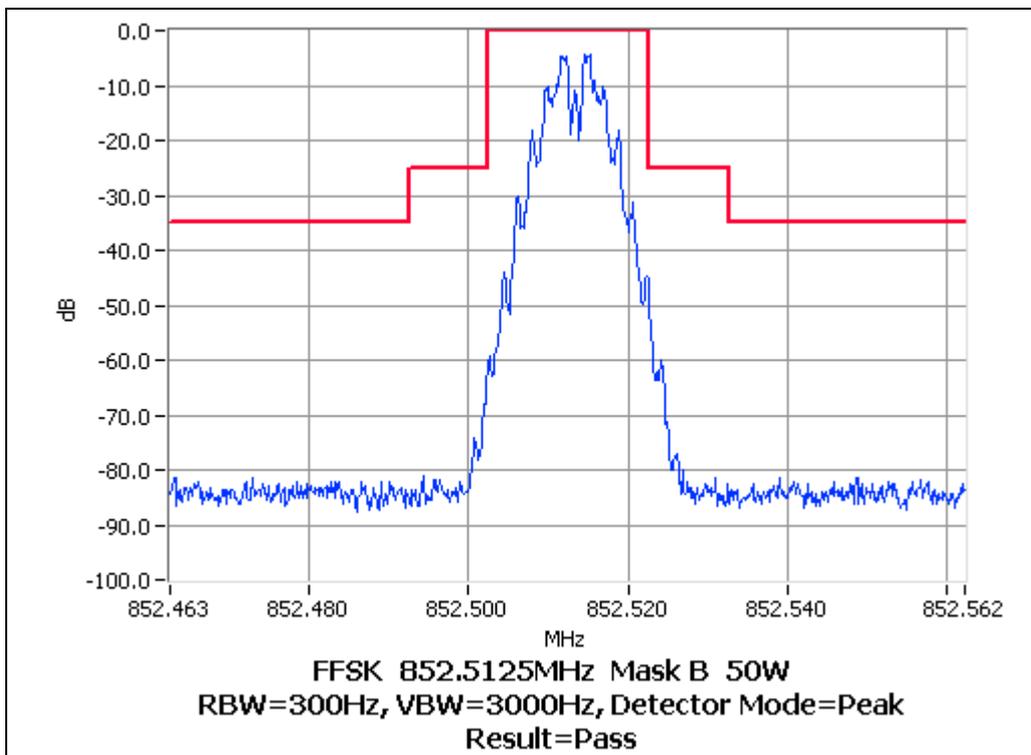
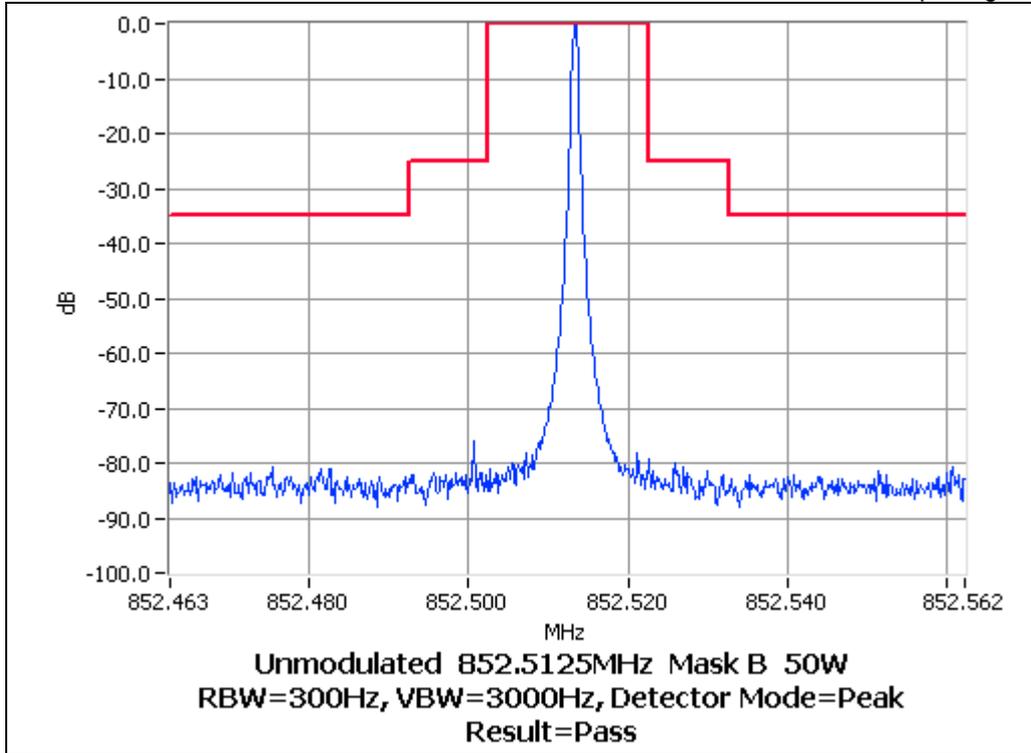


OCCUPIED BANDWIDTH

FFSK

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 852.5125 MHz 50 W 25.0 kHz Channel Spacing

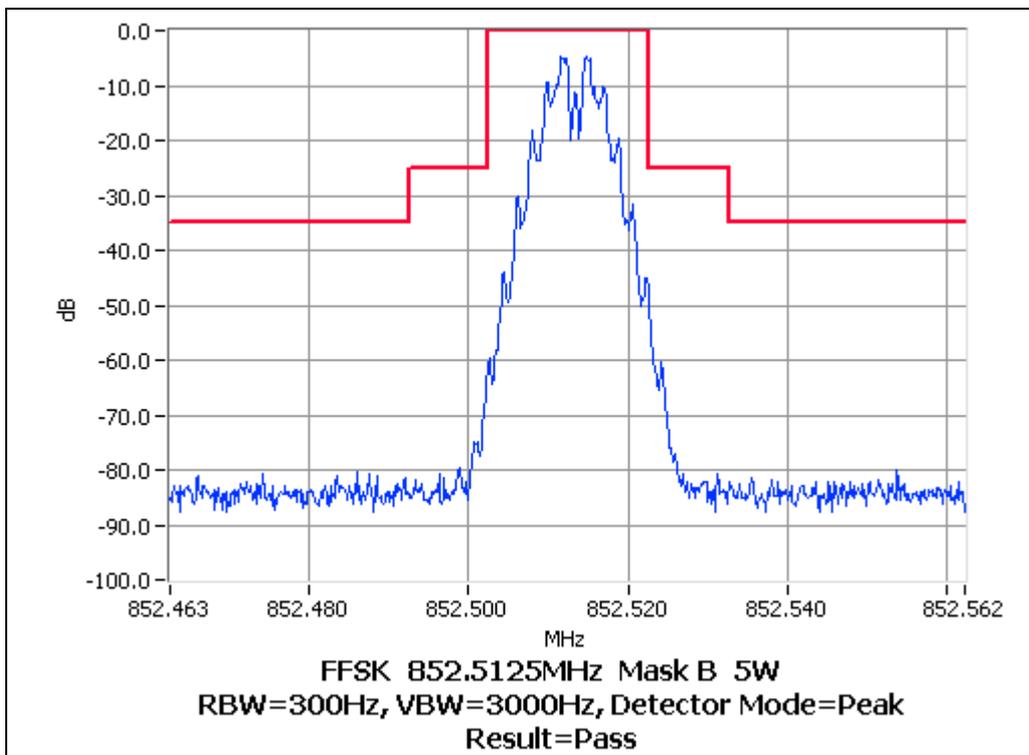
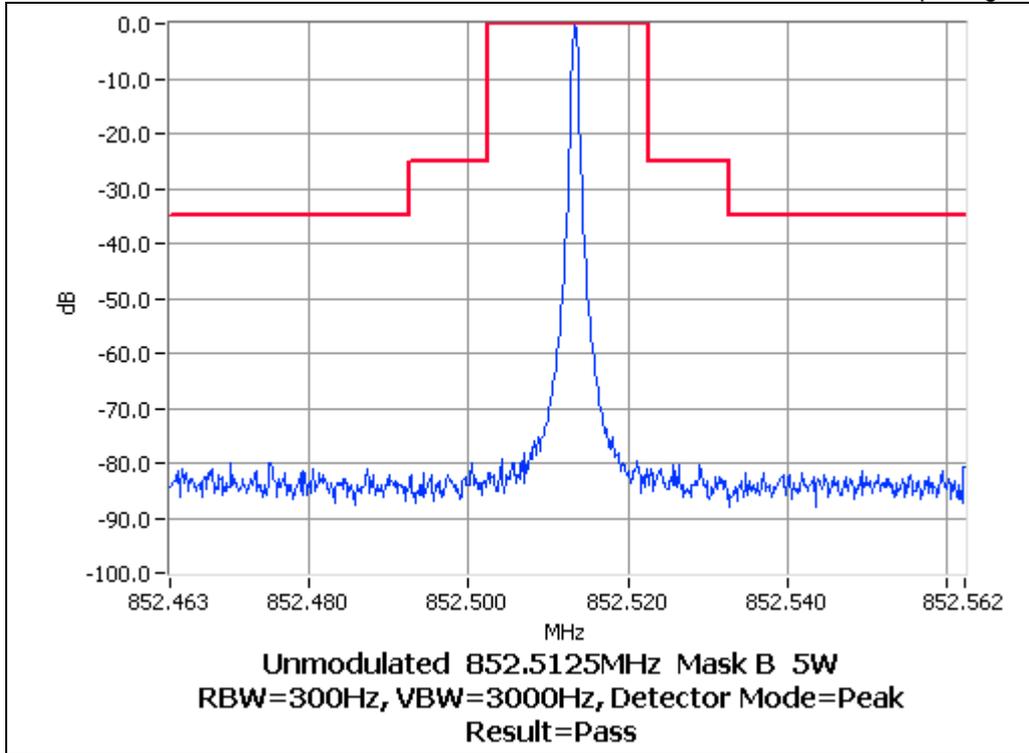


OCCUPIED BANDWIDTH

FFSK

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 852.5125 MHz 5 W 25.0 kHz Channel Spacing

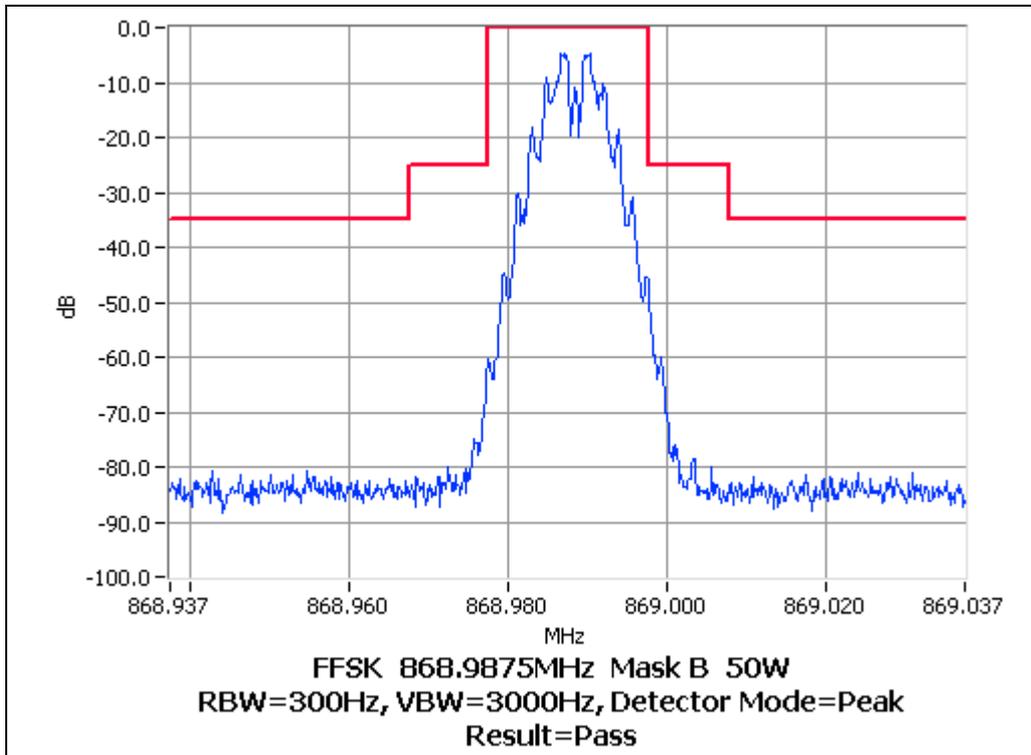
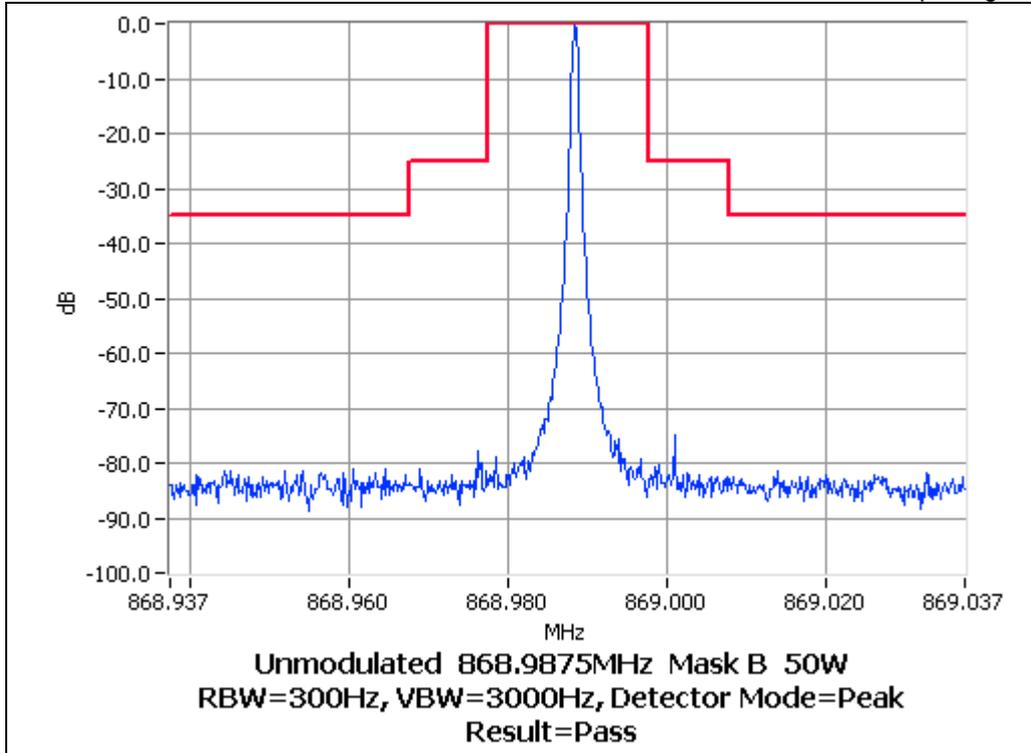


OCCUPIED BANDWIDTH

FFSK

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 868.9875 MHz 50 W 25.0 kHz Channel Spacing

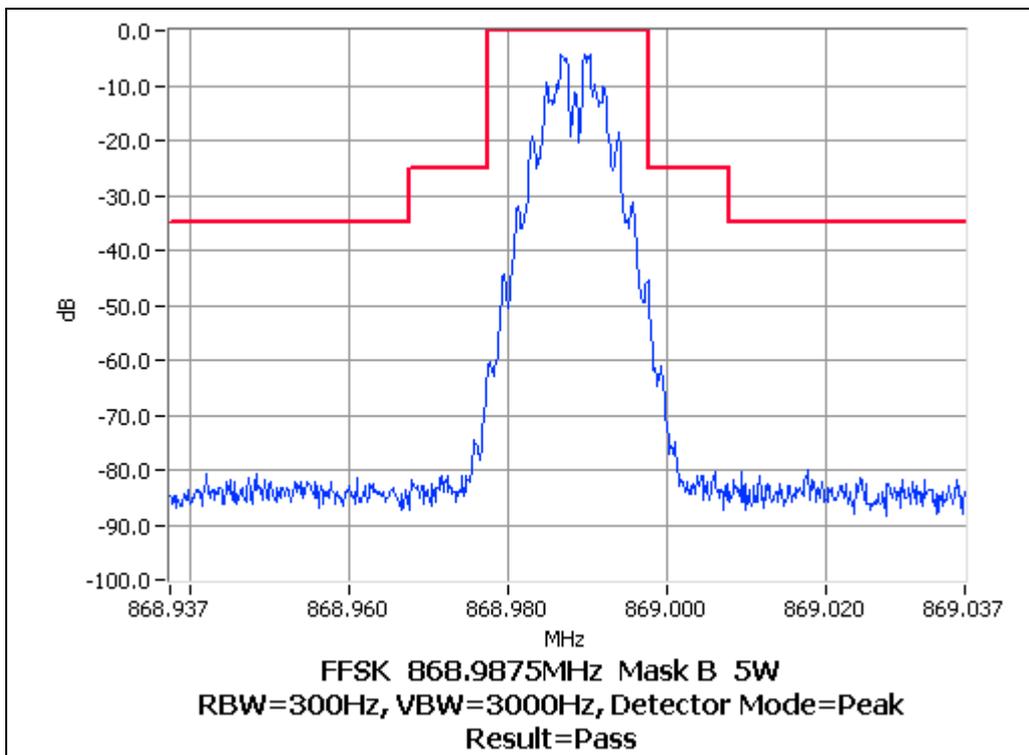
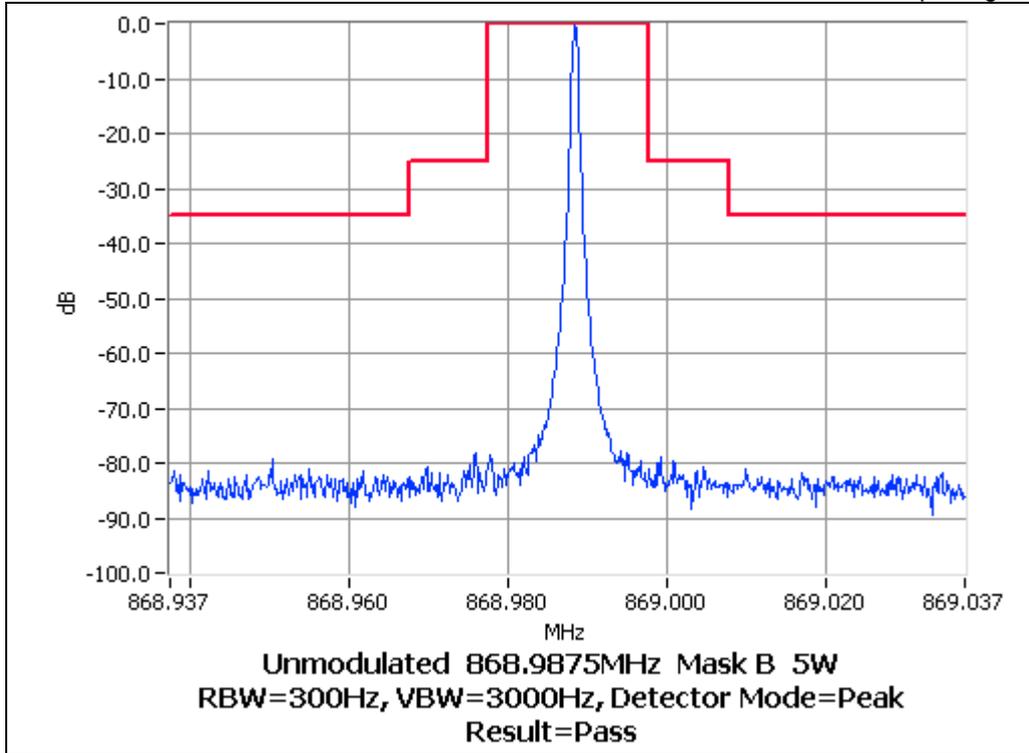


OCCUPIED BANDWIDTH

FFSK

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 868.9875 MHz 5 W 25.0 kHz Channel Spacing



TELTEST Laboratories
Tait Electronics Limited
Report Number 3217

TEST EQUIPMENT USED

| No# | Equipment | Manufacturer | Model No | Serial No# | Tait ID | Cal Due |
|------------|-------------------------|---------------------|-------------------|-------------------|----------------|----------------|
| 11 | Modulation Analyser | Hewlett Packard | HP8901B (Opt 002) | 2441A00393 | E3073 | 6-Oct-11 |
| 13 | Audio Analyser | Hewlett Packard | HP8903A | 2308A02597 | E3074 | 6-Oct-11 |
| 37 | Variac | Yamabishi | S-260-5 | TX-533 | E1737 | |
| 144 | AC Voltmeter for Variac | Tait | - | - | 1 | 31-Aug-11 |
| 61 | RF Attenuator 150W | Weinschel | 40-20-33 | CJ404 | E3387 | 6-Oct-11 |
| 85 | 3m Coax Cable (BLUE) | Suhner | Sucoflex 104A | 44611/4A | E4620 | 4-Oct-11 |
| 88 | Spectrum Analyser | Hewlett Packard | HP8562E | 3821A00779 | E3715 | 5-Oct-11 |

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 Conducted Emissions testing, and Occupied Bandwidth.

