

LABORATORY TEST REPORT

RADIO PERFORMANCE MEASUREMENTS

for the

TPGK5A Handportable Transceiver

Tested in accordance with:

FCC 47 CFR Parts 22 and 90

Report Revision: 1
Issue Date: 18 September 2019

PREPARED BY: L. M. White



Test Technician

CHECKED & APPROVED BY: M. C. James



Laboratory Technical Manager



IANZ
ACCREDITED LABORATORY

FCC REGISTRATION: 838288

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FCC ID: CASTPGK5A

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REVISION

Date	Revision	Comments
18 September 2019	1	Initial test report

INTRODUCTION

Type approval testing of the TPGK5A, 3 Watt, Handportable transceiver in order to demonstrate compliance with FCC 47 Parts 22 & 90. This radio supports analogue, digital FFSK, Digital Mobile Radio (DMR), APCO P25 phase-1 and APCO P25 phase-2 modulations.

REPORT PREPARED FOR

Tait International Ltd
245 Wooldridge Road
Harewood
Christchurch 8051
New Zealand

DESCRIPTION OF SAMPLE

Manufacturer: Tait International Limited
Equipment: Handportable Transceiver
Type: TPGK5A
Product Code: T03-00071-KBAA
Serial Number(s): 26201171
Frequency range: 762 → 870 MHz
Transmit Power: 3 W

Modulation		Speech Channels	Symbol Rate (symbols/sec)	Data Rate (bps)
Analogue FM		1	-	-
FFSK	Fast Frequency Shift Keying	-	1200	1200
		-	2400	2400
Digital Mobile Radio (DMR)	4 Level FSK (2 slot TDMA) (ETSI TS102 361-1)	2	4800	9600
APCO P25 Phase 1	C4FM (TIA 102)	1	4800	9600
APCO P25 Phase 2	H-CPM (2 slot TDMA) (TIA 102)	2	6000	12000

HARDWARE & SOFTWARE

Quantity: 1

	Analogue, FFSK and P25 tests	DMR tests
Hardware ID	TPGB1X-K500_0001	TPGB1X-K500_0001
Firmware Package	QIP25_TPG.0015	QIDMR_TPG.0015

TEST CONDITIONS

All testing was performed between 28 August → 17 September 2019, and under the following conditions:

Ambient temperature: 15°C → 30°C
Relative Humidity: 20% → 75%
Standard Test Voltage 7.5 V_{DC}

STATEMENT OF COMPLIANCE

We, TELTEST LABORATORIES of 558 Wairakei Road, Christchurch, New Zealand, declare under our sole responsibility that the product:

Equipment: Handportable Transceiver
Type: TPGK5A
Product Code: T03-00071-KBAA
Serial Number(s): 26201171
Quantity: 1

to which this declaration relates, is in conformity with the following standards:

FCC 47 CFR Parts 22 and 90

Signature: _____



M. C. James
Laboratory Technical Manager

Date: _____



MODULATION TYPES, NECESSARY BANDWIDTH & EMISSION DESIGNATORS

MODULATION TYPES:

F3E	Analogue Frequency Modulation (FM)	
F2D	FFSK	1200 bps and 2400 bps
FXW	DMR Digital Voice	9600 bps
FXD	DMR Digital Data	9600 bps
F1E, F7E	P25 phase 1 Digital Voice	9600 bps
F1D, F7D	P25 phase 1 Digital Data	9600 bps
F1W	P25 phase 2 Digital Voice / Data	12000 bps

CHANNEL SPACING: 12.5 kHz 25.0 kHz

EMISSION DESIGNATORS:

	12.5 kHz	25.0 kHz
Analog FM	11K0F3E	16K0F3E
FFSK Data 1200 bps	6K60F2D	9K60F2D
FFSK Data 2400 bps	7K80F2D	10K8F2D
Digital Voice DMR	7K60FXW	
Digital Data DMR	7K60FXD	
Digital Voice P25 phase 1	8K10F1E	
Digital Data P25 phase 1	8K10F1D	
Digital Data and Voice P25 phase 2	8K10F1W	

CALCULATIONS

Equation: $B_n = 2M + 2Dk$

(M is highest modulating frequency; D is peak allowable deviation; k is a constant of 1 for FM)

Analogue Voice 12.5 kHz Bandwidth

Necessary bandwidth

M = 3.0 kHz

D = 2.5 kHz

$$B_n = (2 \times 3.0) + (2 \times 2.5) \times 1 \\ = 11.0 \text{ kHz}$$

Emission Designator

11K0F3E

F3E represents an FM voice transmission

Analog Voice 25.0 kHz Bandwidth

Necessary bandwidth

M = 3.0 kHz

D = 5.0 kHz

$$B_n = (2 \times 3.0) + (2 \times 5.0) \times 1 \\ = 16.0 \text{ kHz}$$

Emission Designator

16K0F3E

F3E represents an FM voice transmission

Fast Frequency Shift Keying (FFSK – 1200 bps) 12.5 kHz Bandwidth

Necessary bandwidth

M = 1.8 kHz

D = 1.5 kHz (60% of peak deviation)

$$B_n = (2 \times 1.8) + (2 \times 1.5) \times 1 \\ = 6.6 \text{ kHz}$$

Emission Designator

6K60F2D

F2D represents a FM data transmission with the use of a modulating sub carrier

Fast Frequency Shift Keying (FFSK – 1200 bps) 25.0 kHz Bandwidth

Necessary bandwidth

M = 1.8 kHz

D = 3.0 kHz (60% of peak deviation)

$$B_n = (2 \times 1.8) + (2 \times 3.0) \times 1 \\ = 9.6 \text{ kHz}$$

Emission Designator

9K60F2D

F2D represents a FM data transmission with the use of a modulating sub carrier

Emission Designators – Continued

Fast Frequency Shift Keying (FFSK – 2400 bps) 12.5 kHz Bandwidth

Necessary bandwidth

M = 2.4 kHz

D = 1.5 kHz (60% of peak deviation)

$$B_n = (2 \times 2.4) + (2 \times 1.5) \times 1 \\ = 7.8 \text{ kHz}$$

Emission Designator

7K80F2D

F2D represents a FM data transmission with the use of a modulating sub carrier

Fast Frequency Shift Keying (FFSK – 2400 bps) 25.0 kHz Bandwidth

Necessary bandwidth

M = 2.4 kHz

D = 3.0 kHz (60% of peak deviation)

$$B_n = (2 \times 2.4) + (2 \times 3.0) \times 1 \\ = 10.8 \text{ kHz}$$

Emission Designator

10K80F2D

F2D represents a FM data transmission with the use of a modulating sub carrier

Digital Voice 12.5 kHz Bandwidth DMR

99% bandwidth

= 7.6 kHz

Emission Designator

7K60FXW

FXW represents a FM Time Division Multiple Access (TDMA) combination of data and telephony

Digital Data 12.5 kHz Bandwidth DMR

99% bandwidth

= 7.6 kHz

Emission Designator

7K60FXD

FXD represents FM Time Division Multiple Access (TDMA) data only

Digital Voice 12.5 kHz Bandwidth P25 phase 1

99% bandwidth

= 8.1 kHz

Emission Designator

8K10F1E

F1E represents a digital FM voice transmission

Digital Data 12.5 kHz Bandwidth P25 phase 1

99% bandwidth

= 8.1 kHz

Emission Designator

8K10F1D

F1D represents an digital FM data transmission

Digital Data and Voice 12.5 kHz Bandwidth P25 phase 2

99% bandwidth

= 8.1 kHz

Emission Designator

8K10F1W

F1W represents an FM channel with a combination of digital data and voice transmission

TEST RESULTS

TRANSMITTER OUTPUT POWER (CONDUCTED)

SPECIFICATION: FCC 47 CFR 2.1046

GUIDE: ANSI C63.26 5.2.4.2

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.

EXAMPLE CALCULATION:

Example calculation

$$\begin{aligned}\text{Power in dBm} &= \text{Measured power (dBm)} + \text{attenuator and cable loss (dB)} \\ \text{Chan 1 power (dBm)} &= 3.2 \text{ dBm} + 31.5 \text{ dB} \\ &= 34.7 \text{ dBm} \\ \text{Power in Watts} &= (10^{(34.7 \text{ dBm})}/10)/1000 \\ &= 3.0 \text{ W}\end{aligned}$$

MEASUREMENT RESULTS:

Manufacturer's Rated Output Power:

Switchable: 3 W and 1 W

Nominal 3 W	Measured (W)	Variation (%)	Variation (dB)
762.1 MHz	3.0	-1.7	-0.1
774.9 MHz	3.1	1.9	0.1
788.1 MHz	3.0	-0.7	0.0
804.9 MHz	2.9	-2.1	-0.1
806.1 MHz	3.0	-1.4	-0.1
816.0 MHz	3.0	0.5	0.0
852.0 MHz	3.0	0.9	0.0
869.0 MHz	3.0	0.7	0.0
Measurement Uncertainty		± 0.6 dB	

Transmitter Output Power (Conducted) - continued

Nominal 1 W	Measured (W)	Variation (%)	Variation (dB)
762.1 MHz	1.0	0.7	0.0
774.9 MHz	1.1	5.5	0.2
788.1 MHz	1.0	2.1	0.1
804.9 MHz	1.0	-4.3	-0.2
806.1 MHz	1.0	-4.0	-0.2
816.0 MHz	1.0	3.4	0.1
852.0 MHz	1.0	3.3	0.1
869.0 MHz	1.1	6.2	0.3
Measurement Uncertainty		± 0.6 dB	

LIMIT CLAUSES:

FCC 47 CFR 90.205 (s)

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: ANSI C63.26 5.3.3.2

MEASUREMENT PROCEDURE:

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

MEASUREMENT RESULTS:

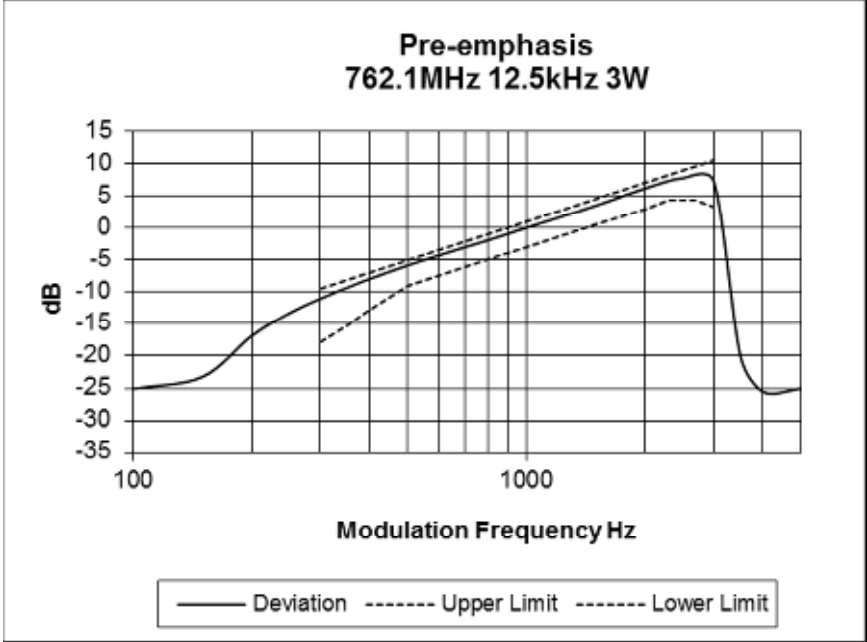
See the plots on the following pages for 12.5 kHz and 25 kHz channel spacings tested at 3 W transmit power.

LIMIT CLAUSE: TIA/EIA-603D 3.2.6

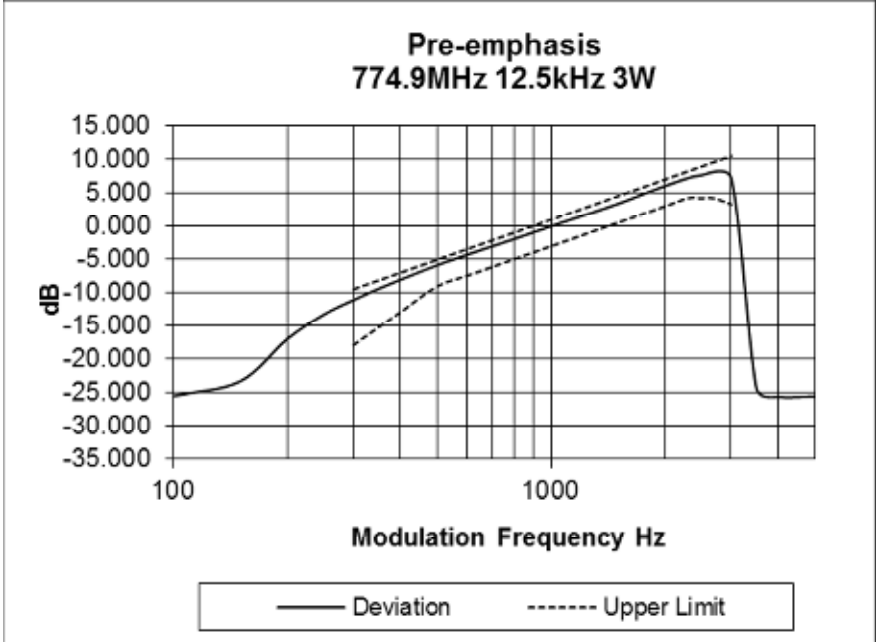
MEASUREMENT UNCERTAINTY: $\pm 1.5 \%$

Transmitter Audio Frequency Response – Pre-emphasis

Tx FREQUENCY: 762.1 MHz 12.5 kHz Channel Spacing

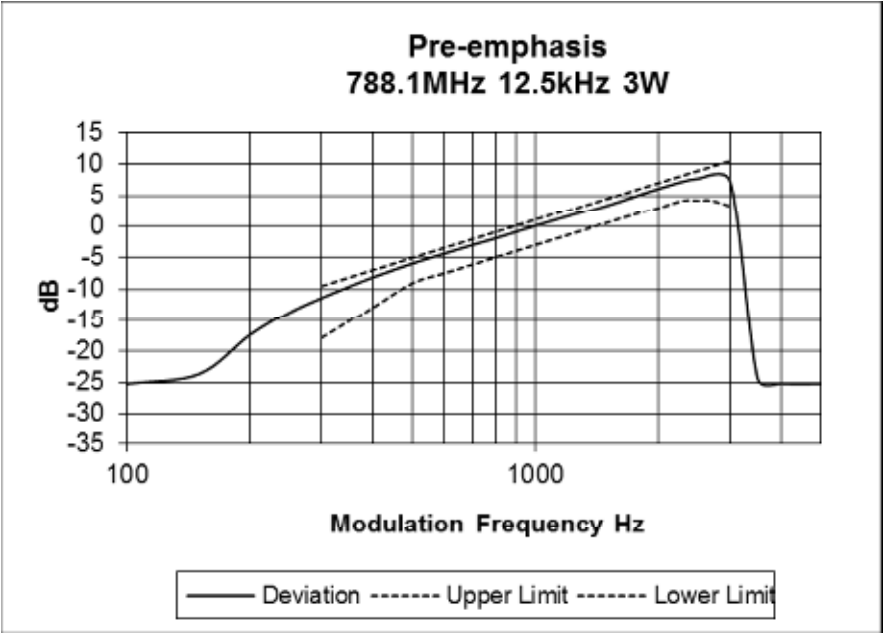


Tx FREQUENCY: 774.9 MHz 12.5 kHz Channel Spacing

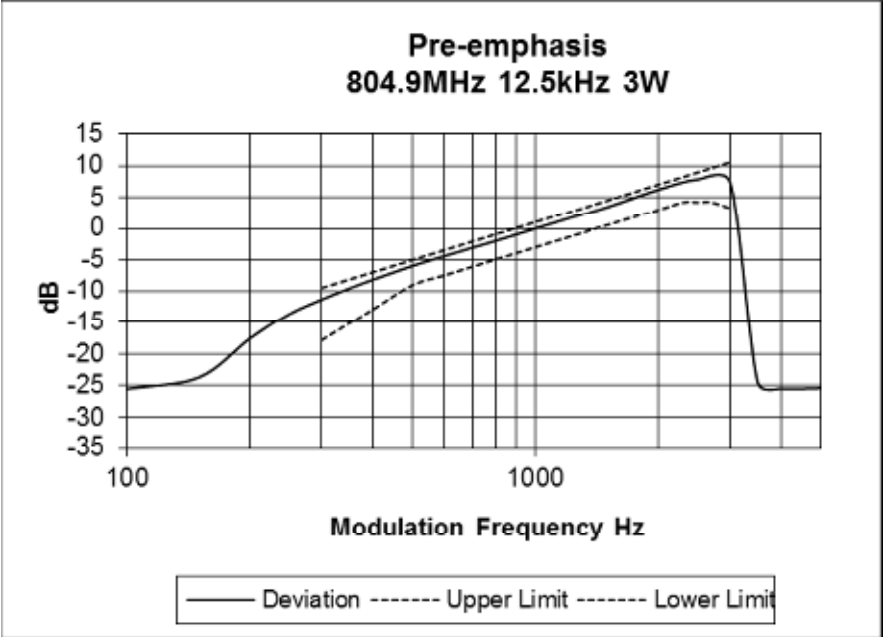


Transmitter Audio Frequency Response – Pre-emphasis

Tx FREQUENCY: 788.1 MHz 12.5 kHz Channel Spacing

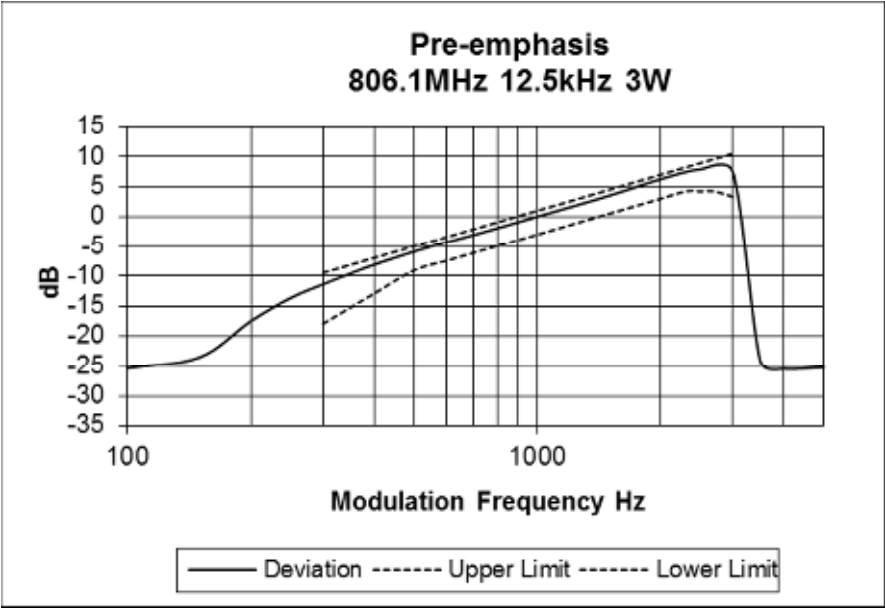


Tx FREQUENCY: 804.9 MHz 12.5 kHz Channel Spacing

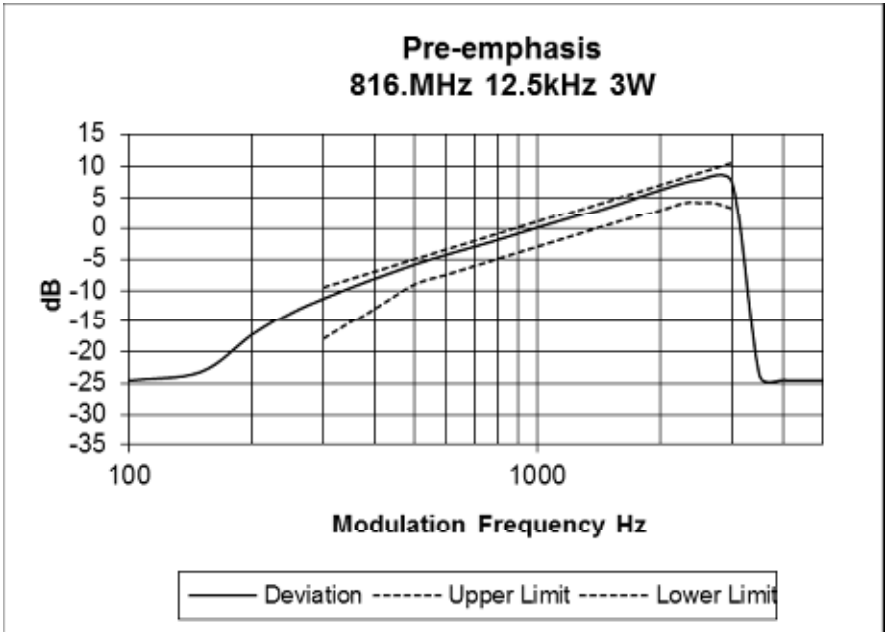


Transmitter Audio Frequency Response – Pre-emphasis

Tx FREQUENCY: 806.1 MHz 12.5 kHz Channel Spacing

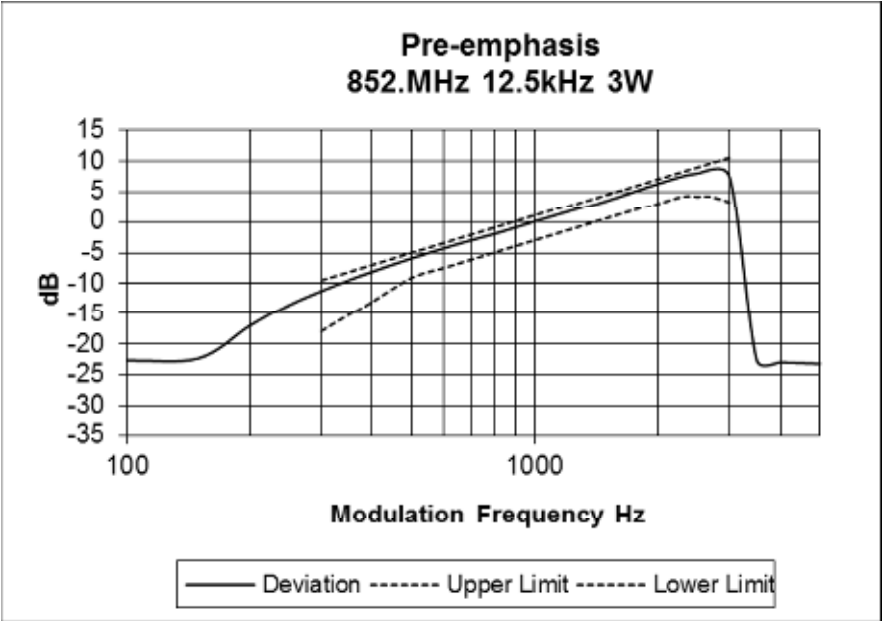


Tx FREQUENCY: 816.0 MHz 12.5 kHz Channel Spacing

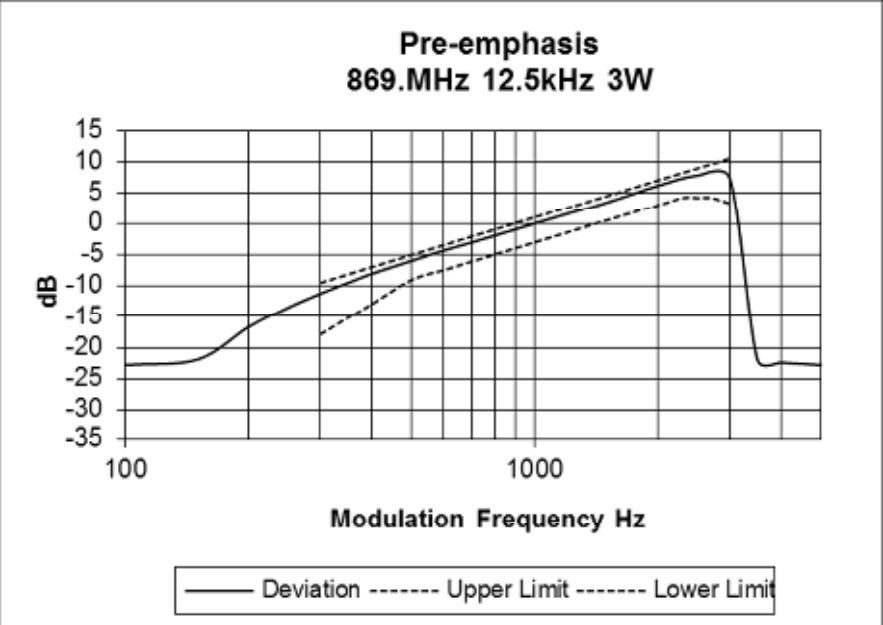


Transmitter Audio Frequency Response – Pre-emphasis

Tx FREQUENCY: 852.0 MHz 12.5 kHz Channel Spacing

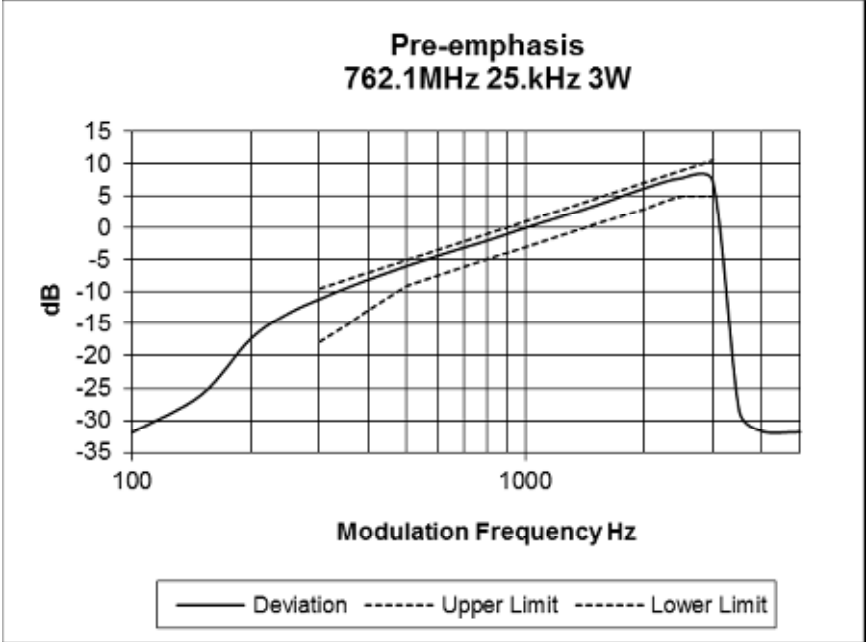


Tx FREQUENCY: 869.0 MHz 12.5 kHz Channel Spacing

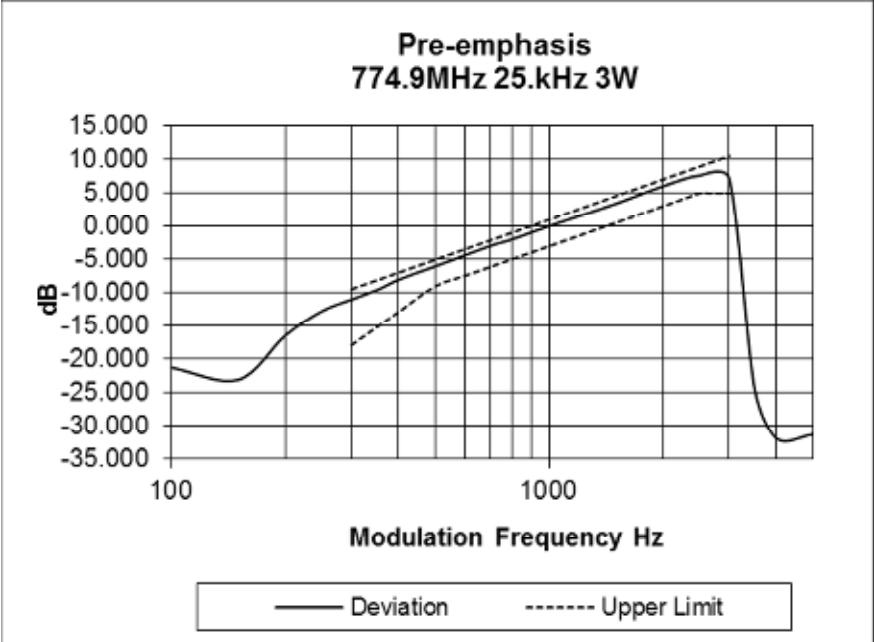


Transmitter Audio Frequency Response – Pre-emphasis

Tx FREQUENCY: 762.1 MHz 25 kHz Channel Spacing

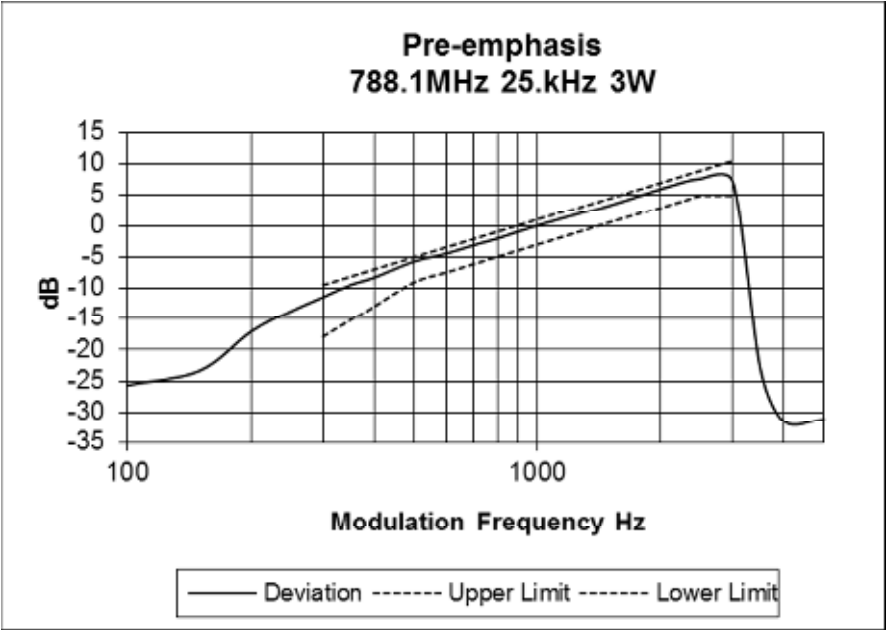


Tx FREQUENCY: 774.9 MHz 25 kHz Channel Spacing

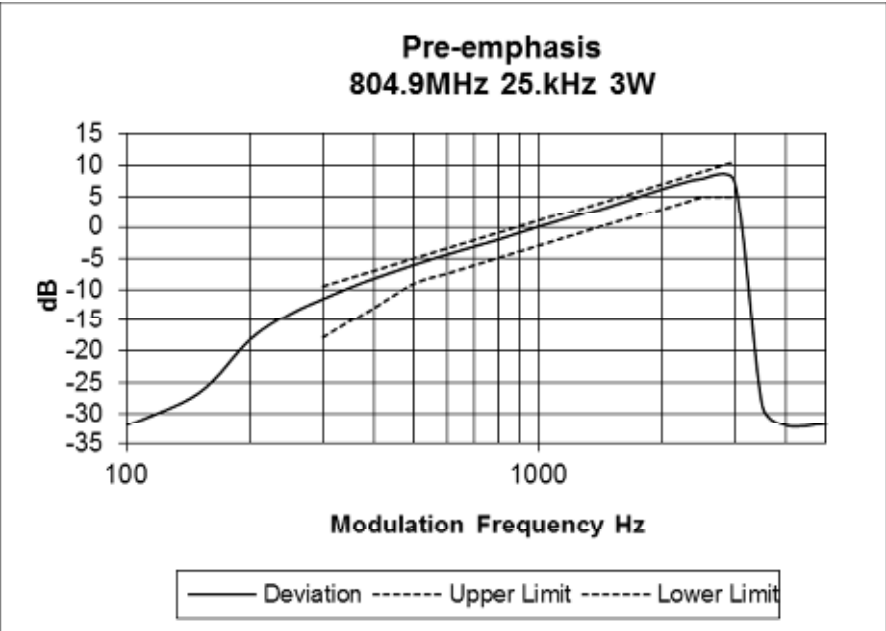


Transmitter Audio Frequency Response – Pre-emphasis

Tx FREQUENCY: 788.1 MHz 25 kHz Channel Spacing

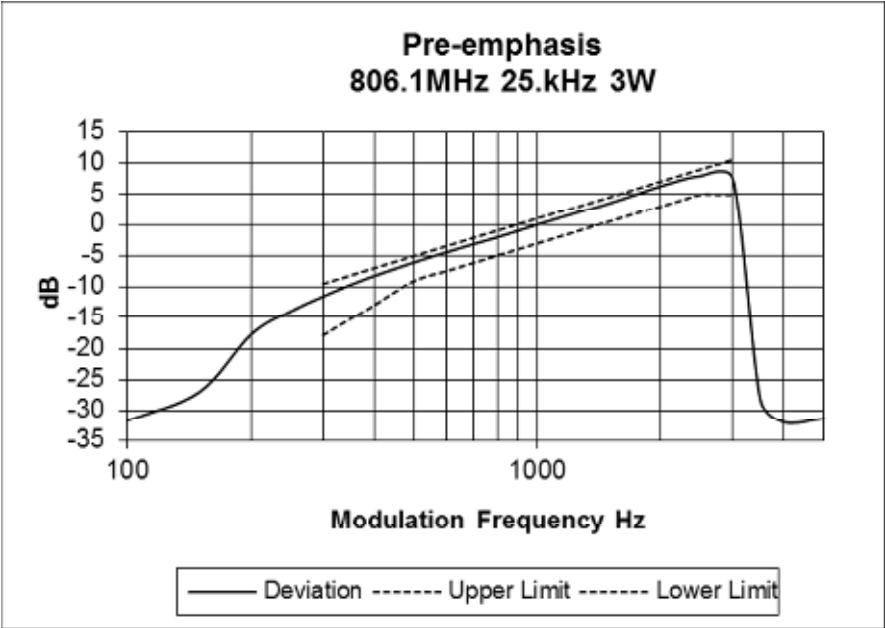


Tx FREQUENCY: 804.9 MHz 25 kHz Channel Spacing

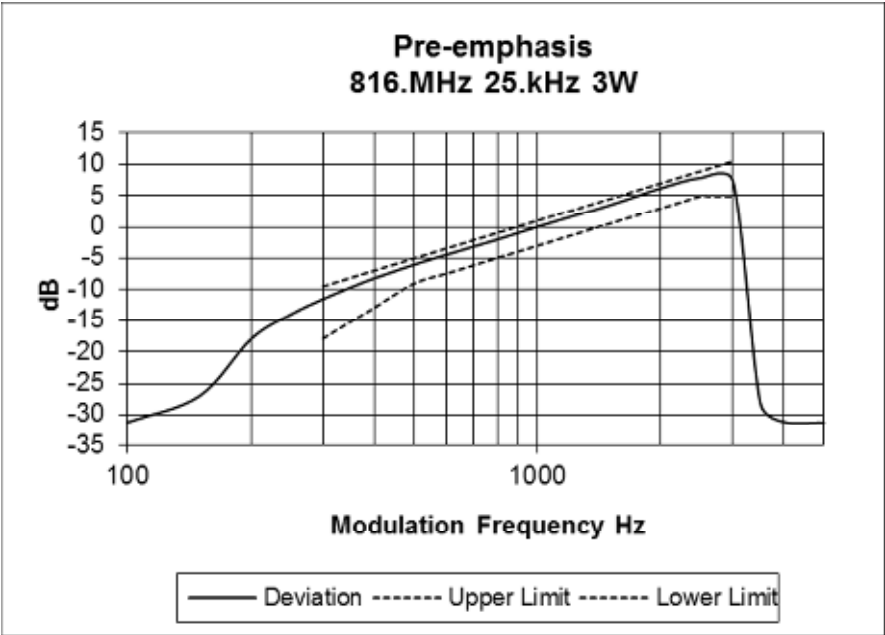


Transmitter Audio Frequency Response – Pre-emphasis

Tx FREQUENCY: 806.1 MHz 25 kHz Channel Spacing

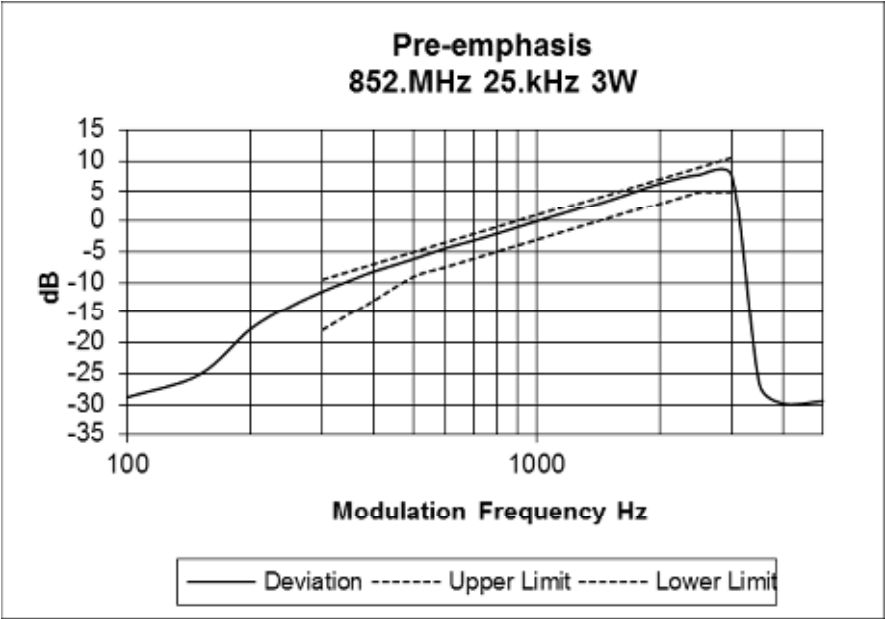


Tx FREQUENCY: 816.0 MHz 25 kHz Channel Spacing

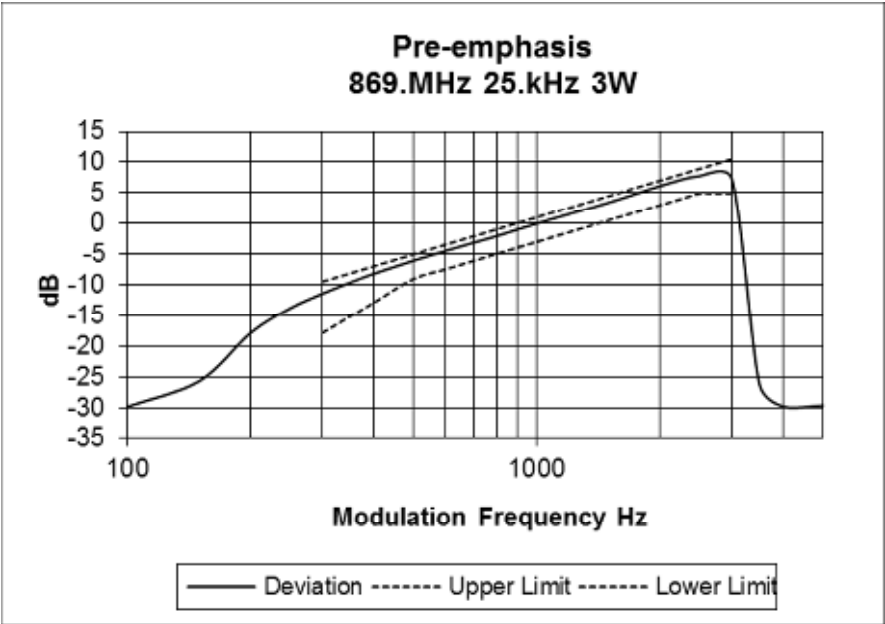


Transmitter Audio Frequency Response – Pre-emphasis

Tx FREQUENCY: 852.0 MHz 25 kHz Channel Spacing



Tx FREQUENCY: 869.0 MHz 25 kHz Channel Spacing



TRANSMITTER MODULATION LIMITING

SPECIFICATION: FCC 47 CFR 2.1047 (b)

GUIDE: ANSI C63.26 5.3.2

MEASUREMENT PROCEDURE:

1. Refer Annex A for Equipment set up.
2. An audio input tone of 1000 Hz was applied with the level set to obtain 60% of maximum deviation. This was used as the 0 dB reference point.
3. The modulation response was measured at four audio frequencies while increasing the input level in 5dB steps.
4. Additionally the level used to measure sideband spectrum (occupied bandwidth) was included in the level sweep.
5. Measurements were made for both Positive and Negative Deviation.

MEASUREMENT RESULTS:

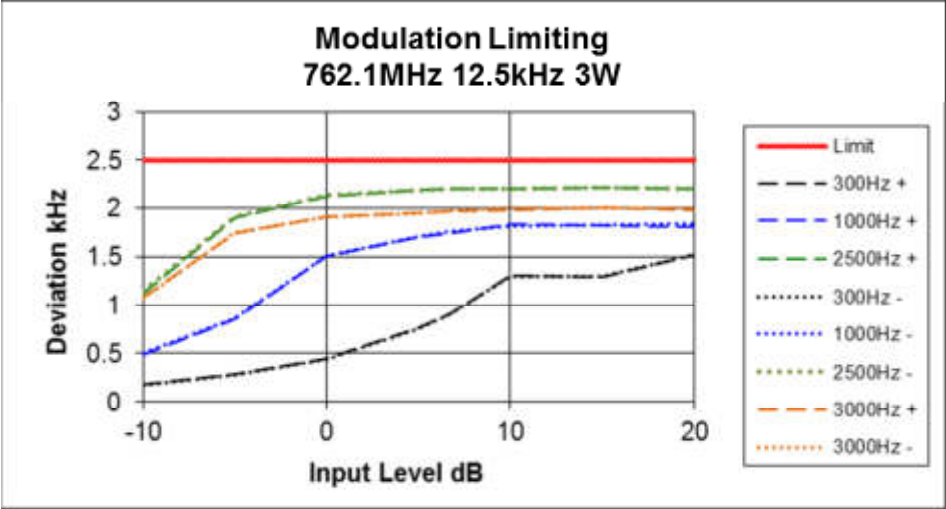
See the plots on the following pages for 12.5 kHz and 25 kHz channel spacing.

LIMIT CLAUSE: TIA/EIA-603D 1.3.4.4

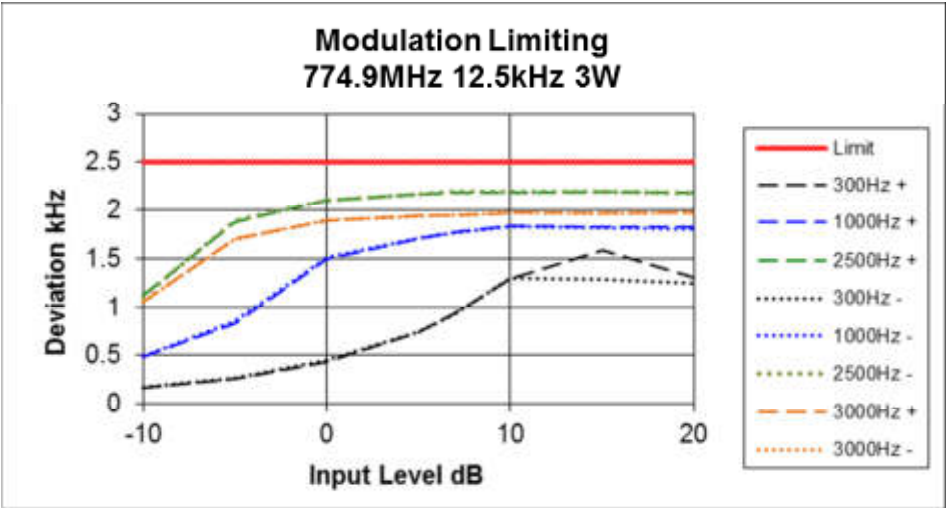
MEASUREMENT UNCERTAINTY: $\pm 1.5 \%$

Transmitter Modulation Limiting

Tx FREQUENCY: 762.1 MHz 12.5 kHz Channel Spacing

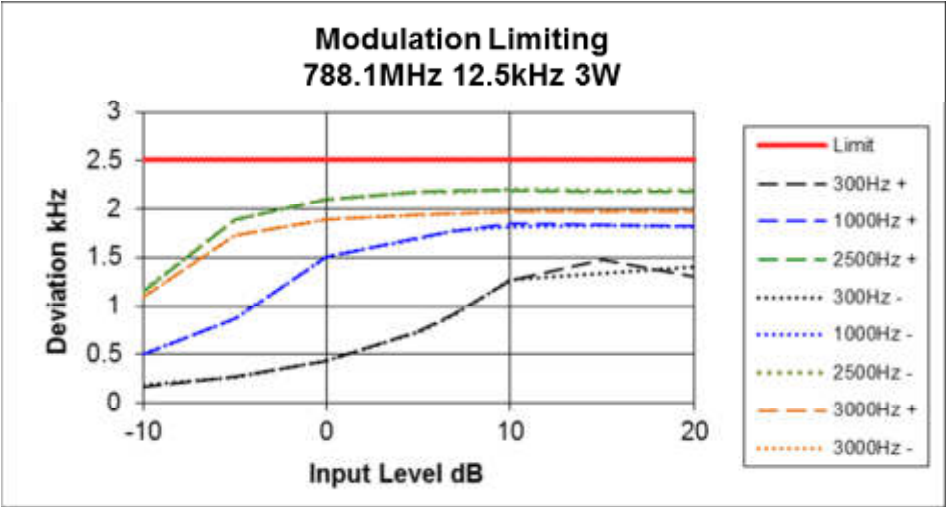


Tx FREQUENCY: 774.9 MHz 12.5 kHz Channel Spacing

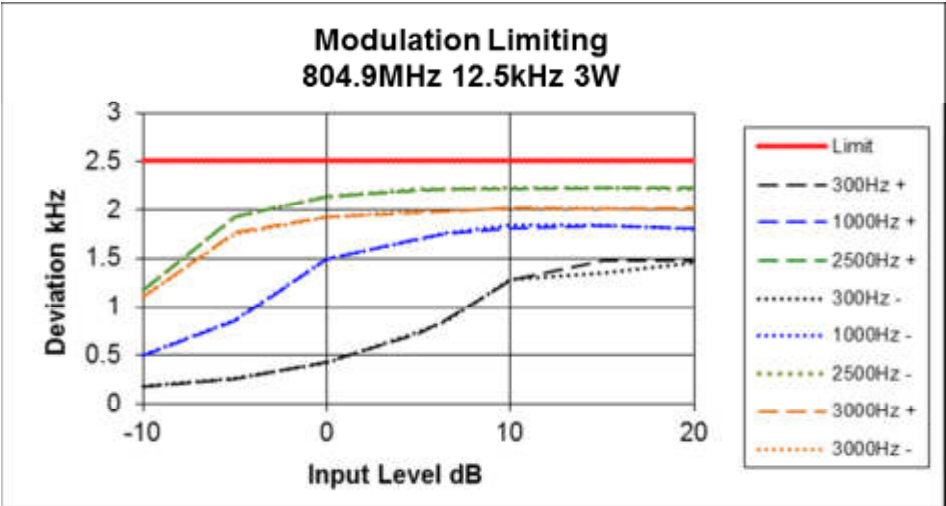


Transmitter Modulation Limiting

Tx FREQUENCY: 788.1 MHz 12.5 kHz Channel Spacing

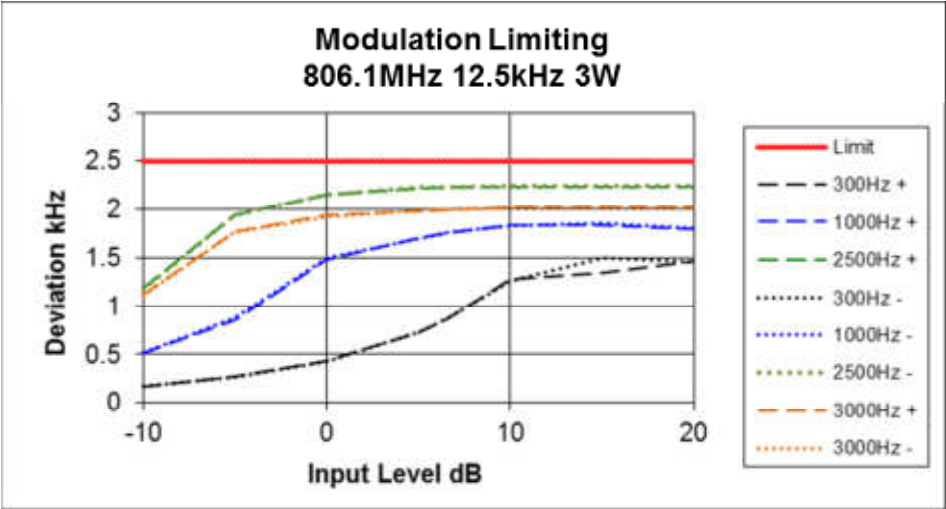


Tx FREQUENCY: 804.9 MHz 12.5 kHz Channel Spacing

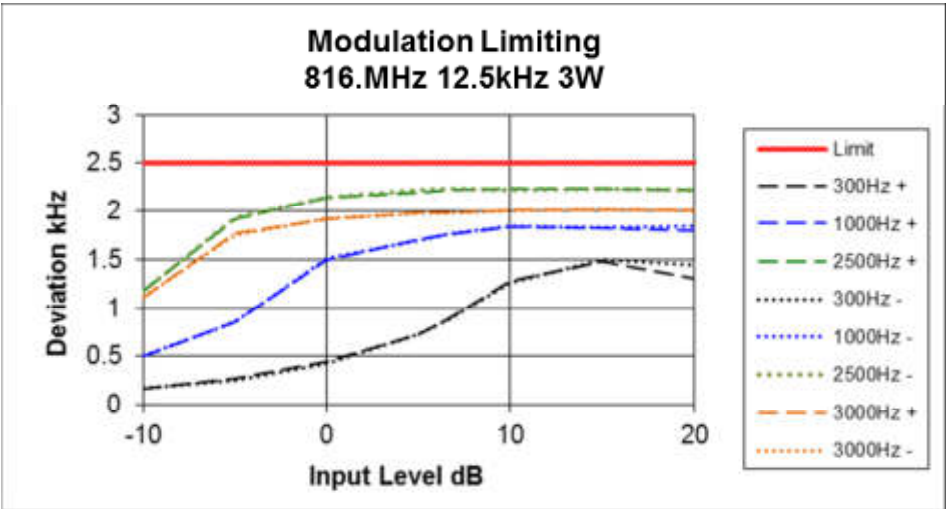


Transmitter Modulation Limiting

Tx FREQUENCY: 806.1 MHz 12.5 kHz Channel Spacing

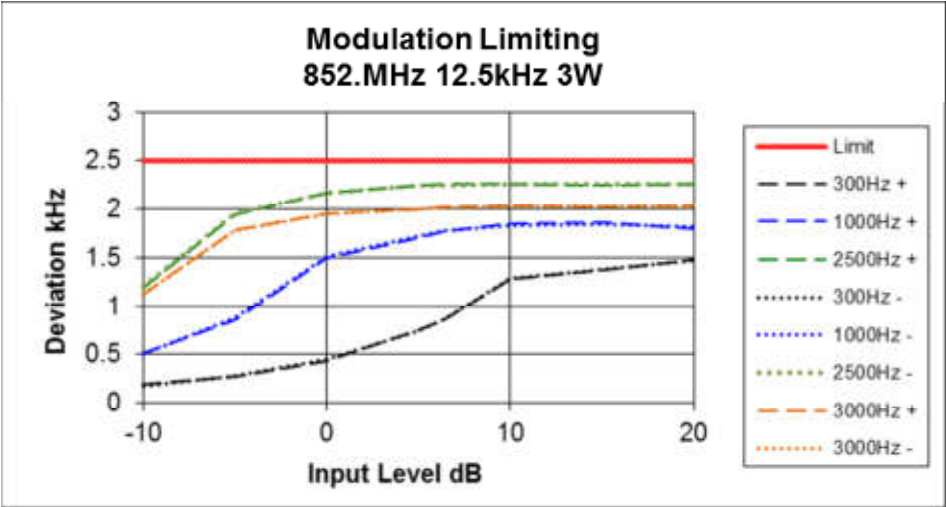


Tx FREQUENCY: 816.0 MHz 12.5 kHz Channel Spacing

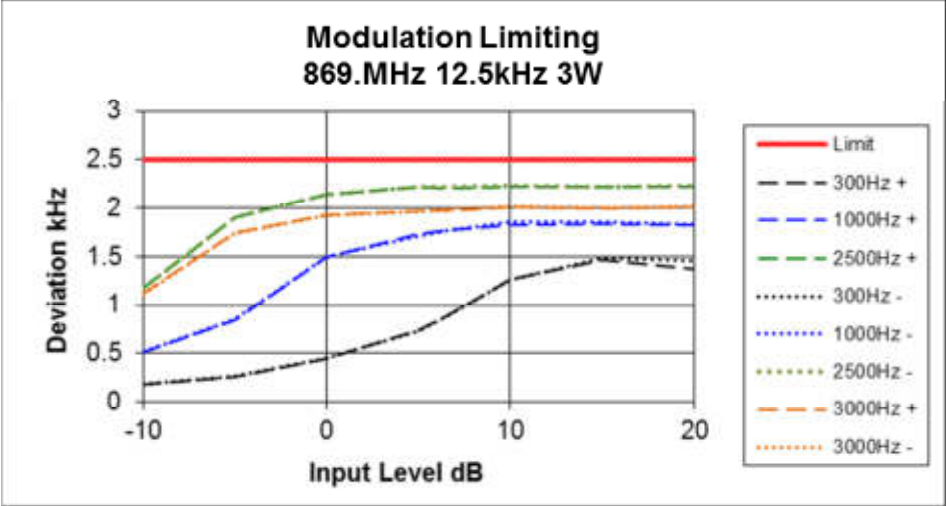


Transmitter Modulation Limiting

Tx FREQUENCY: 852.0 MHz 12.5 kHz Channel Spacing

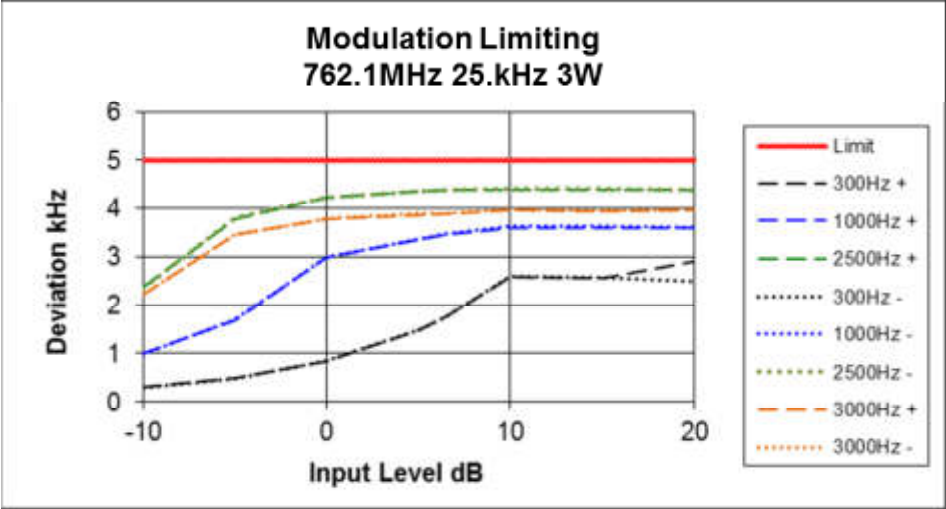


Tx FREQUENCY: 869.0 MHz 12.5 kHz Channel Spacing

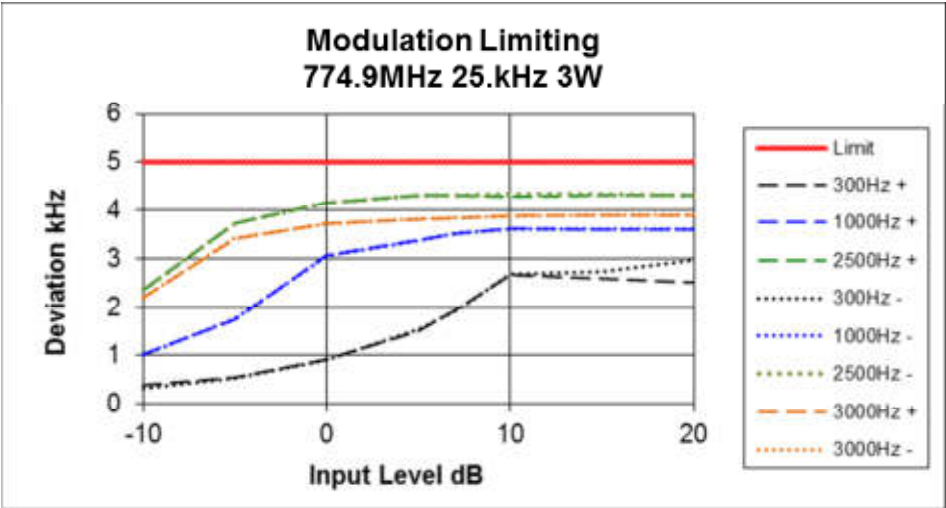


Transmitter Modulation Limiting

Tx FREQUENCY: 762.1 MHz 25 kHz Channel Spacing

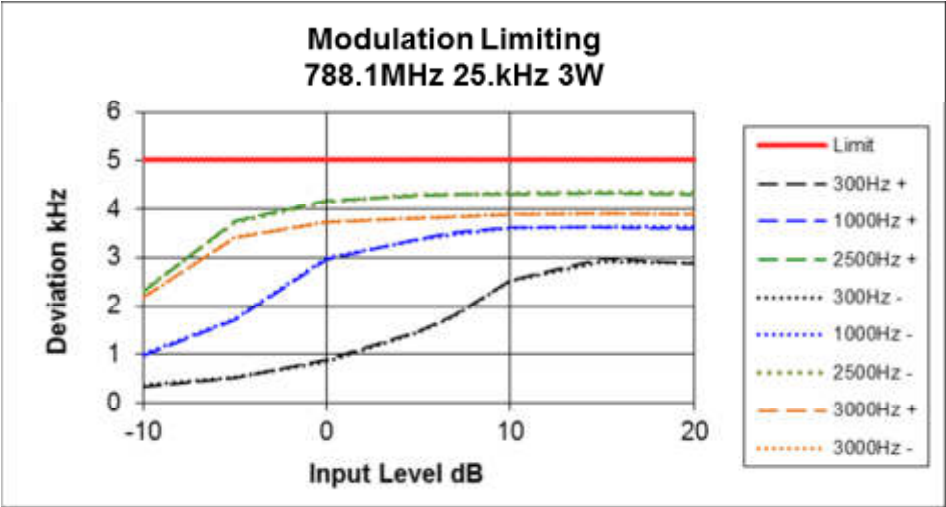


Tx FREQUENCY: 774.9 MHz 25 kHz Channel Spacing

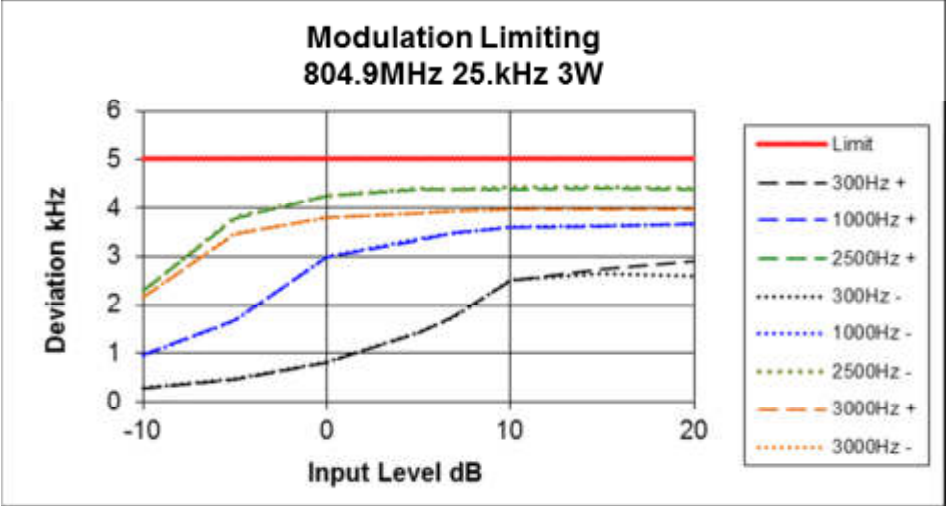


Transmitter Modulation Limiting

Tx FREQUENCY: 788.1 MHz 25 kHz Channel Spacing

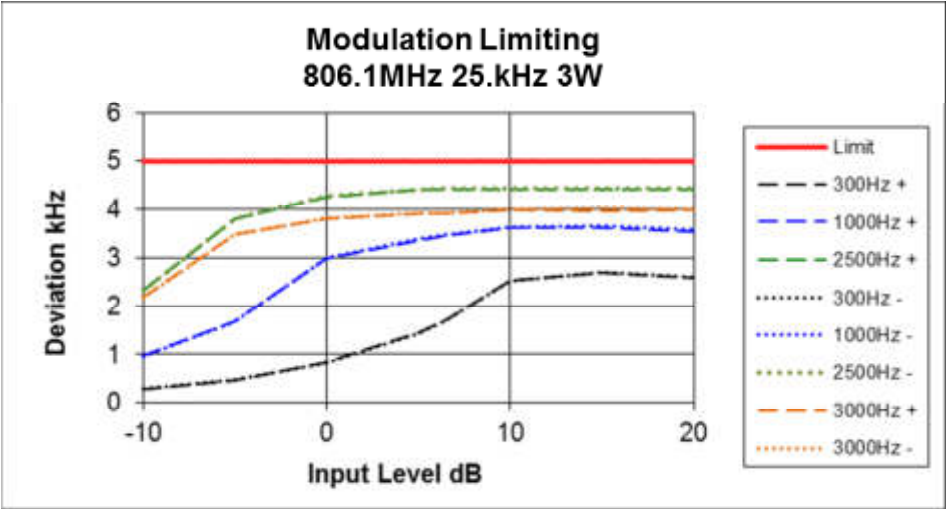


Tx FREQUENCY: 804.9 MHz 25 kHz Channel Spacing

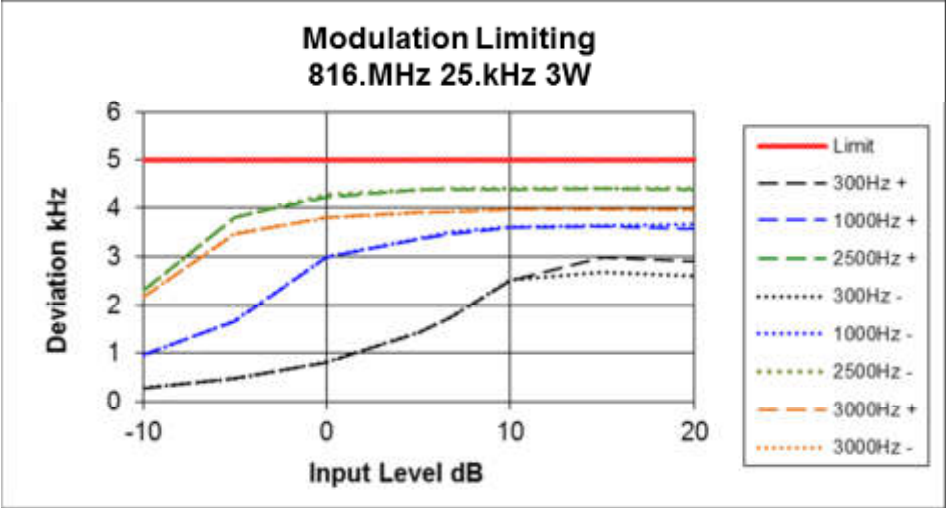


Transmitter Modulation Limiting

Tx FREQUENCY: 806.1 MHz 25 kHz Channel Spacing

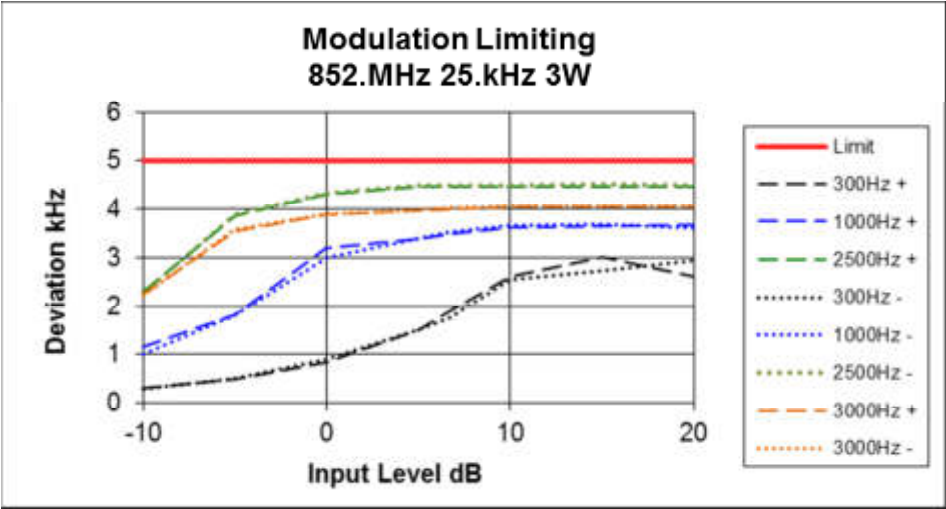


Tx FREQUENCY: 816.0 MHz 25 kHz Channel Spacing

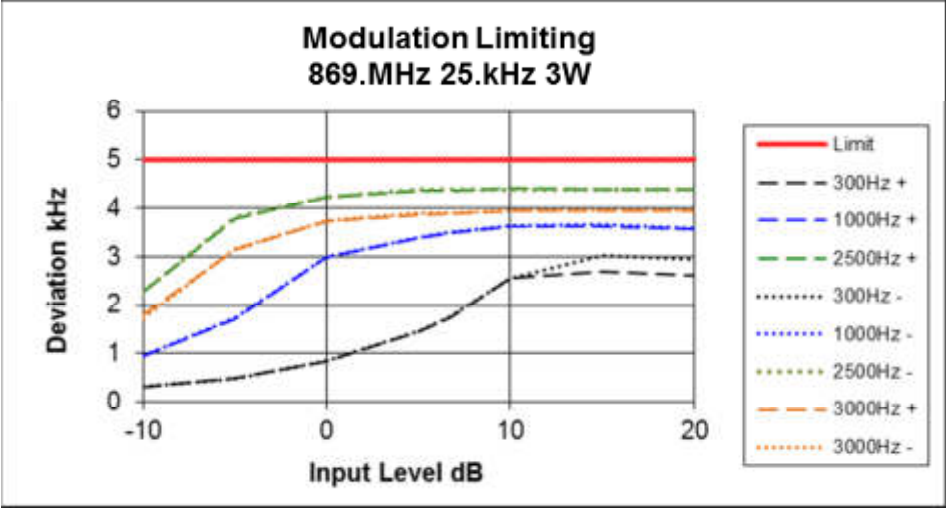


Transmitter Modulation Limiting

Tx FREQUENCY: 852.0 MHz 25 kHz Channel Spacing



Tx FREQUENCY: 869.0 MHz 25 kHz Channel Spacing



TRANSMITTER OCCUPIED BANDWIDTH AND SPECTRUM MASKS

SPECIFICATION: FCC 47 CFR 2.1049 (c)

GUIDE: TIA/EIA-603D 2.2.11 (Analogue)
TIA-102.CAAA-C 2.2.5 (Digital)

MEASUREMENT PROCEDURE:

1. Refer Annex A for Equipment Set up.
2. For Analogue measurements: The EUT was modulated by a 2500 Hz tone at an input level 16 dB 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 = 100 Hz, Video Bandwidth = 1 kHz

Emission Mask B, G and H – Resolution bandwidth = 300 Hz, Video Bandwidth = 3 kHz

MEASUREMENT RESULTS:

See the plots on the following pages for 12.5 kHz & 25 kHz channel spacings.

MEASUREMENT UNCERTAINTY 95% $\pm 0.65\text{dB}$

LIMIT CLAUSE: FCC 47 CFR 90.210

EMISSION MASKS for FCC

	Channel Spacing	
Emission Mask B	12.5 & 25.0 kHz	Analog
Emission Mask H	12.5 & 25.0 kHz	FFSK, Digital Voice/Data (806-809, 851-854 MHz)
Emission Mask G	12.5 & 25.0 kHz	FFSK, Digital Voice/Data (809-824/854-869 MHz)

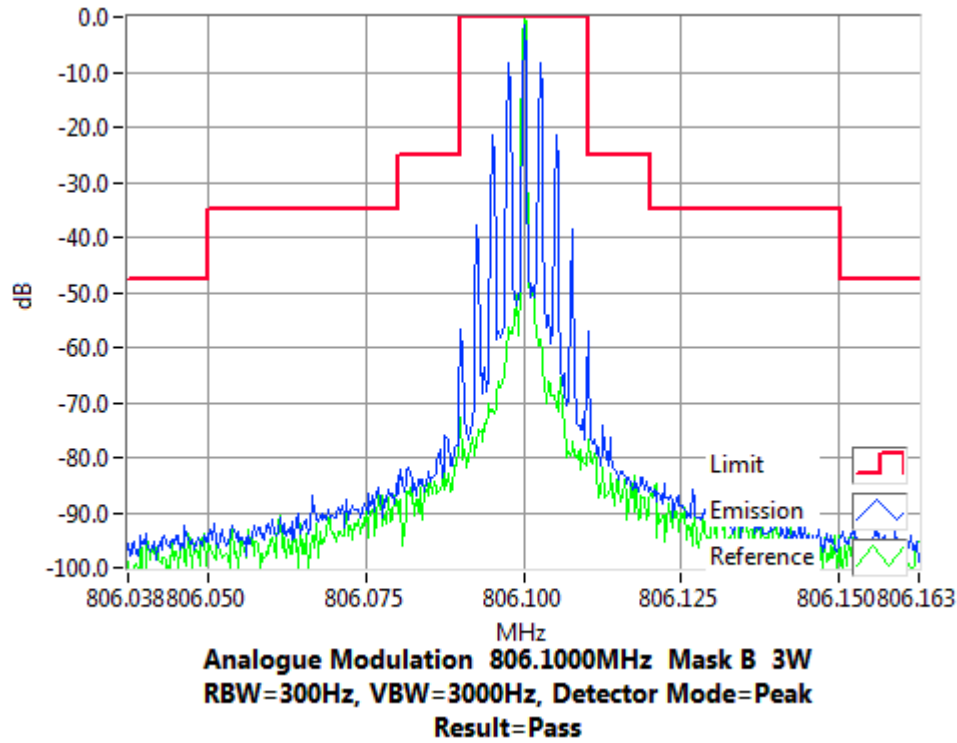
DATA SPEED

FFSK	12.5 kHz Channel Spacing	1200 bps & 2400 bps
FFSK	25.0 kHz Channel Spacing	1200 bps & 2400 bps
Digital Voice/Data	12.5 kHz Channel Spacing	9600 bps
Digital Voice/Data	12.5 kHz Channel Spacing	12000 bps

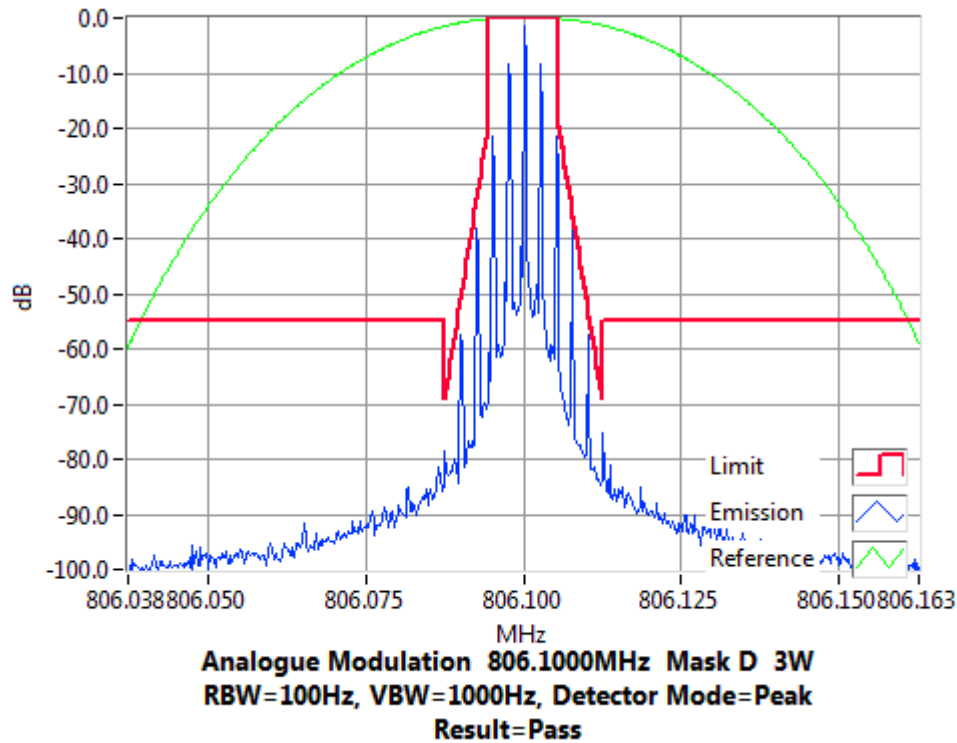
Occupied Bandwidth and Spectrum Masks

ANALOGUE VOICE

Tx FREQUENCY: 806.1 MHz 3 W 12.5 kHz Channel Spacing



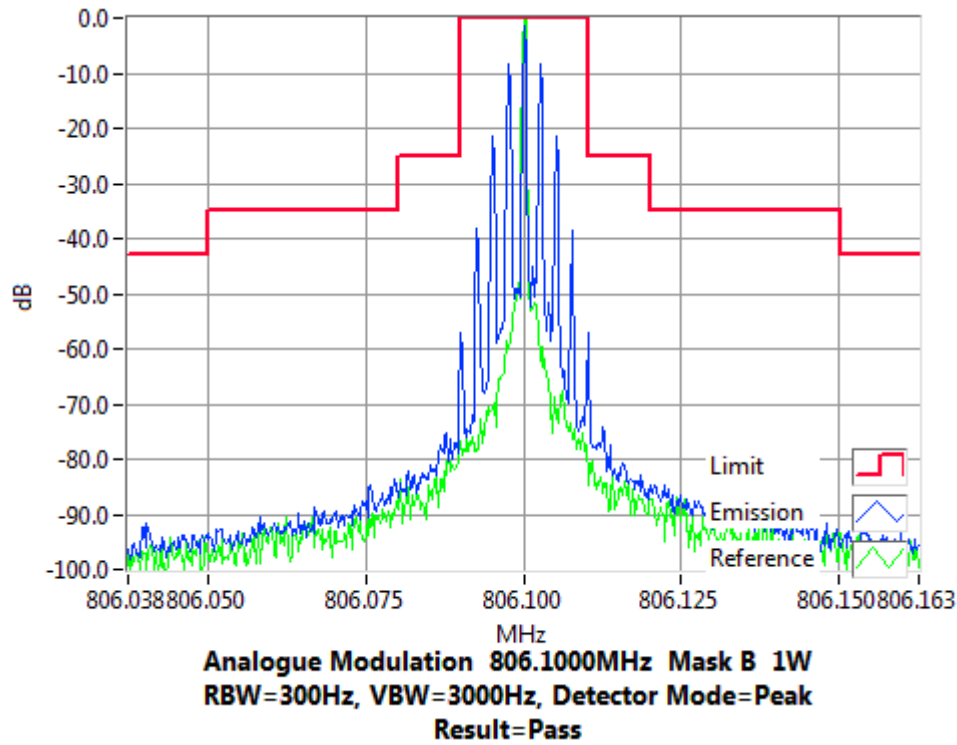
Tx FREQUENCY: 806.1 MHz 3 W 12.5 kHz Channel Spacing



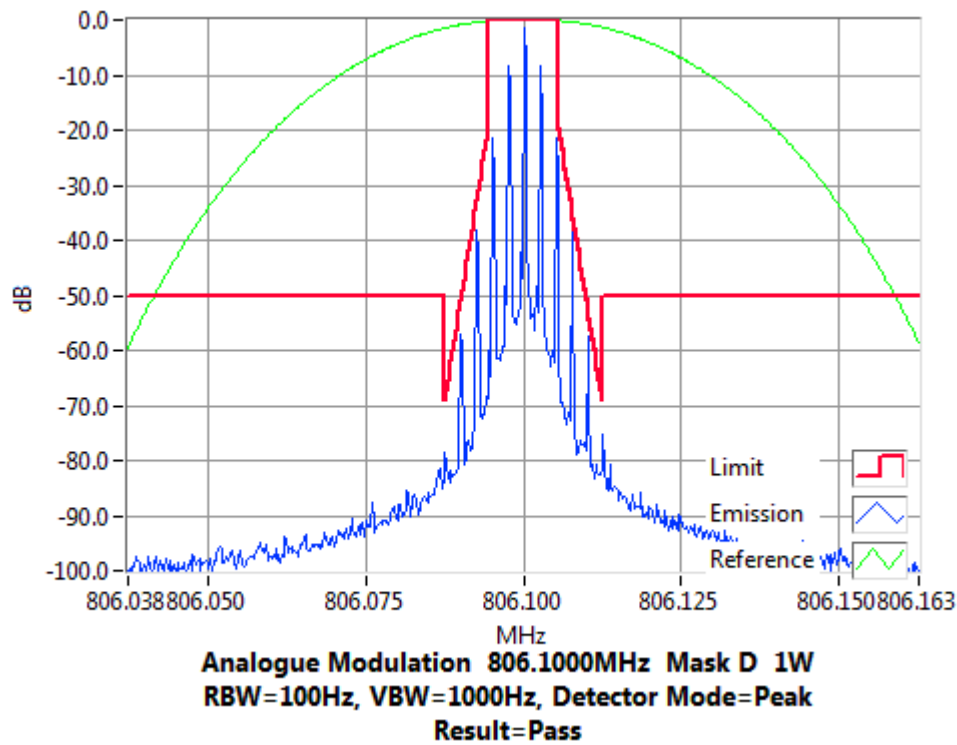
Occupied Bandwidth and Spectrum Masks

ANALOGUE VOICE

Tx FREQUENCY: 806.1 MHz 1 W 12.5 kHz Channel Spacing



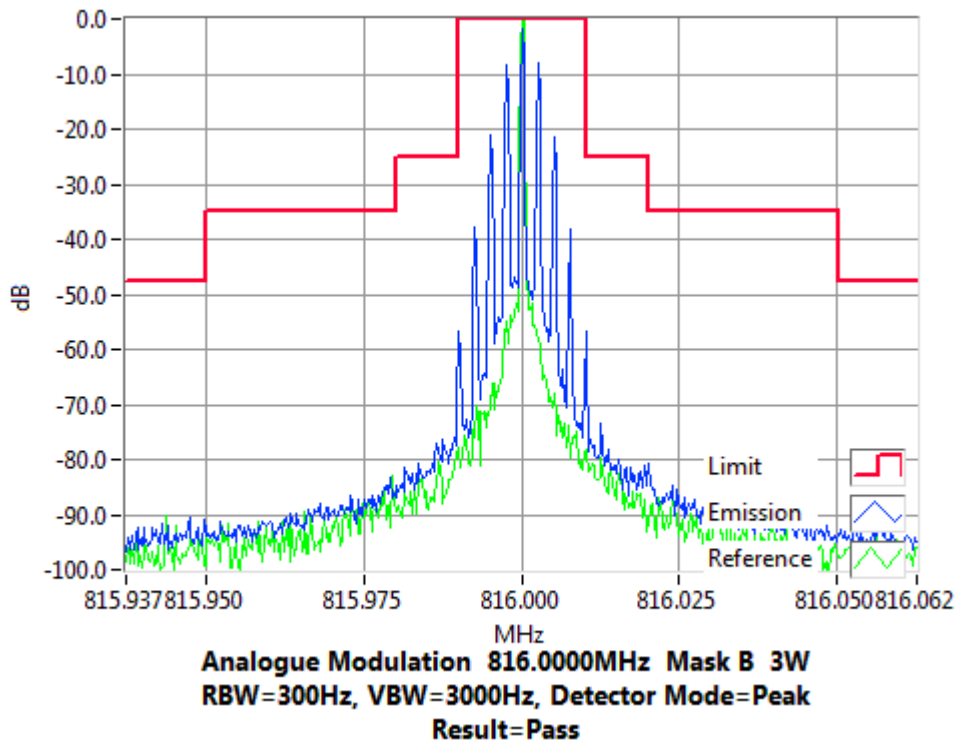
Tx FREQUENCY: 806.1 MHz 1 W 12.5 kHz Channel Spacing



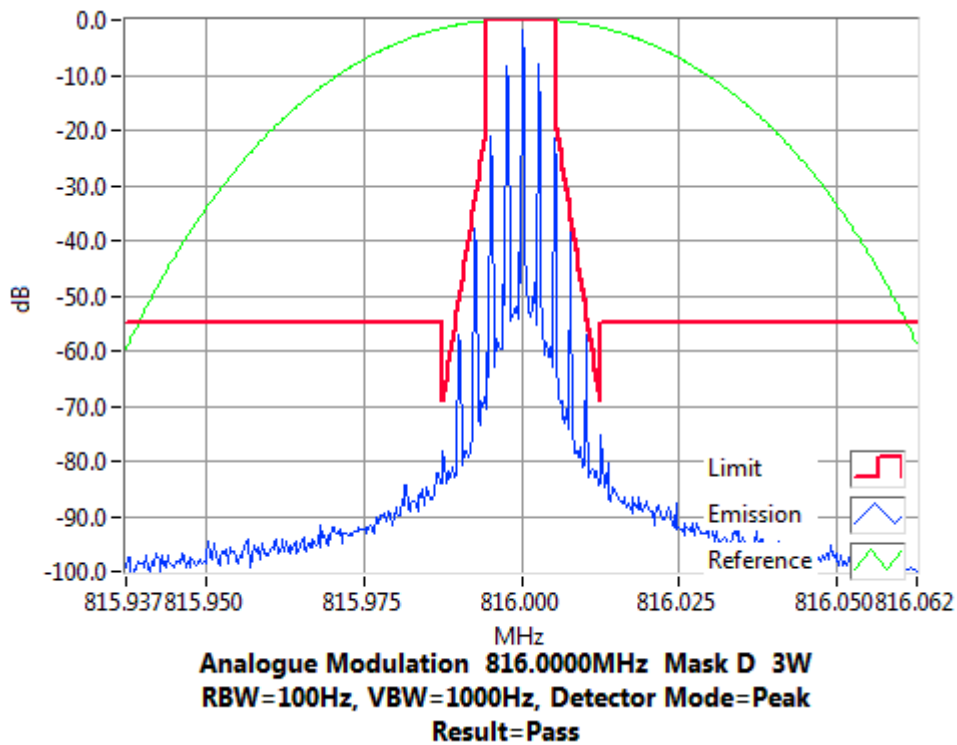
Occupied Bandwidth and Spectrum Masks

ANALOGUE VOICE

Tx FREQUENCY: 816.0 MHz 3 W 12.5 kHz Channel Spacing



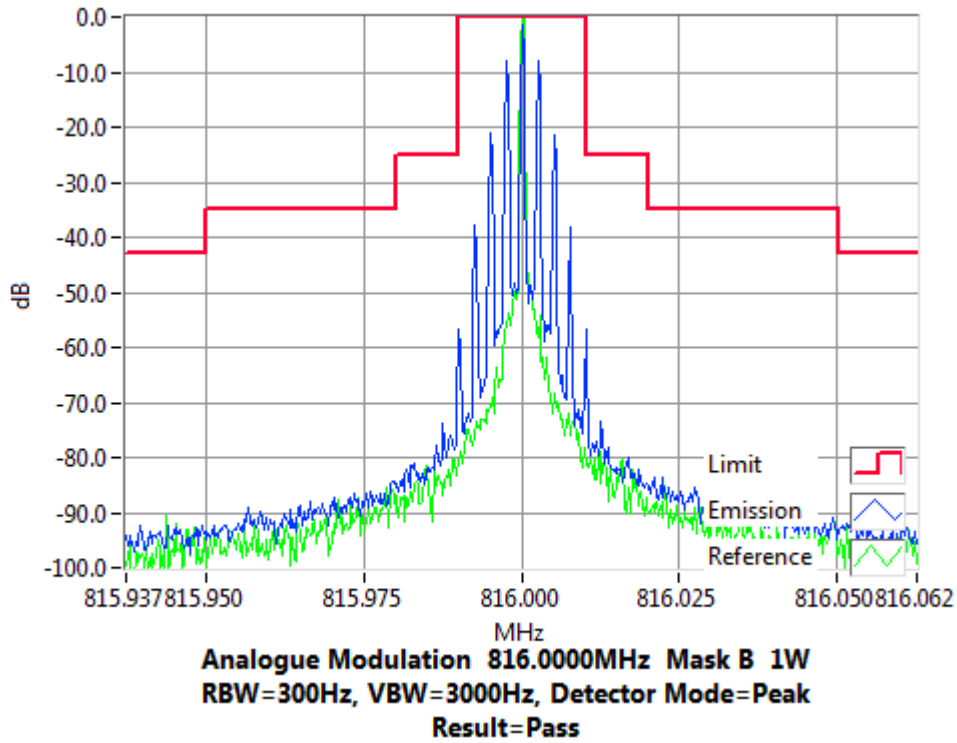
Tx FREQUENCY: 816.0 MHz 3 W 12.5 kHz Channel Spacing



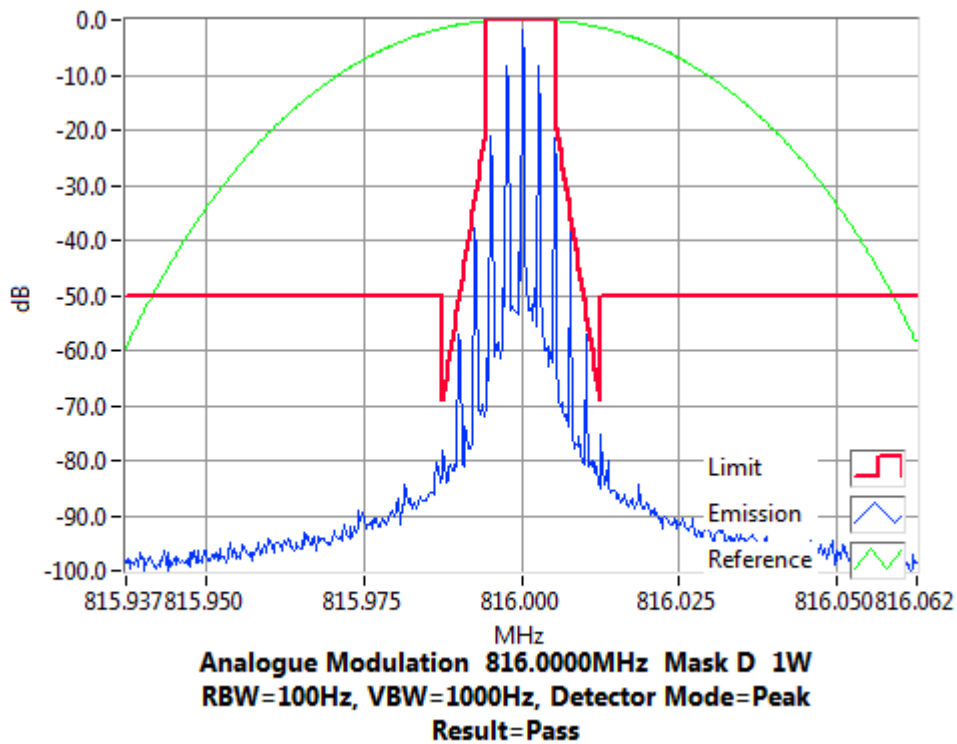
Occupied Bandwidth and Spectrum Masks

ANALOGUE VOICE

Tx FREQUENCY: 816.0 MHz 1 W 12.5 kHz Channel Spacing



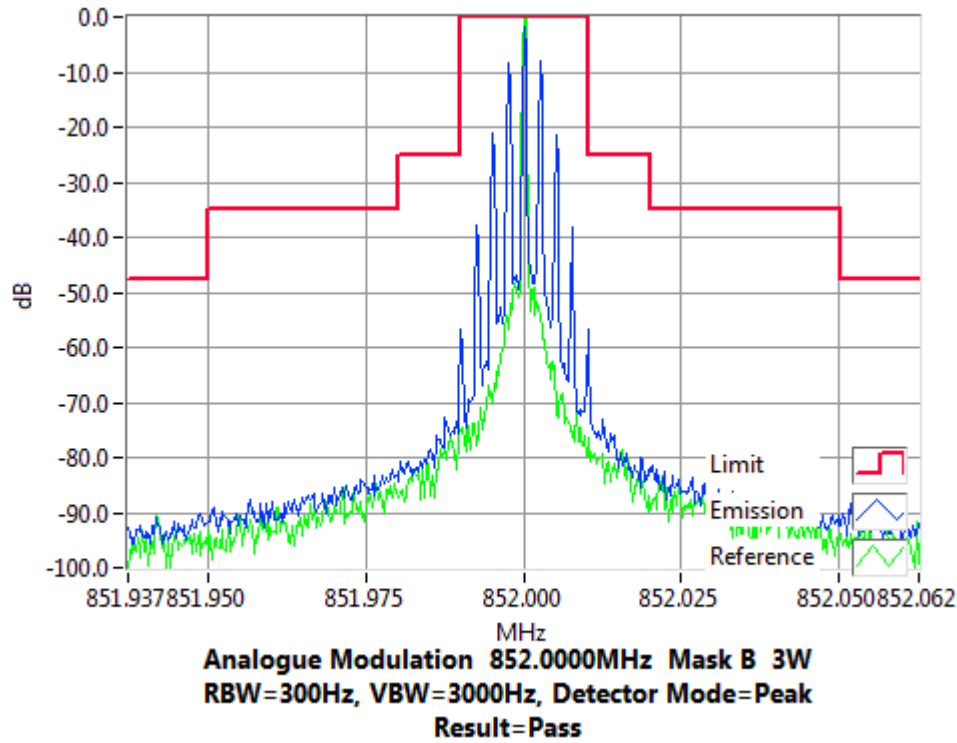
Tx FREQUENCY: 816.0 MHz 1 W 12.5 kHz Channel Spacing



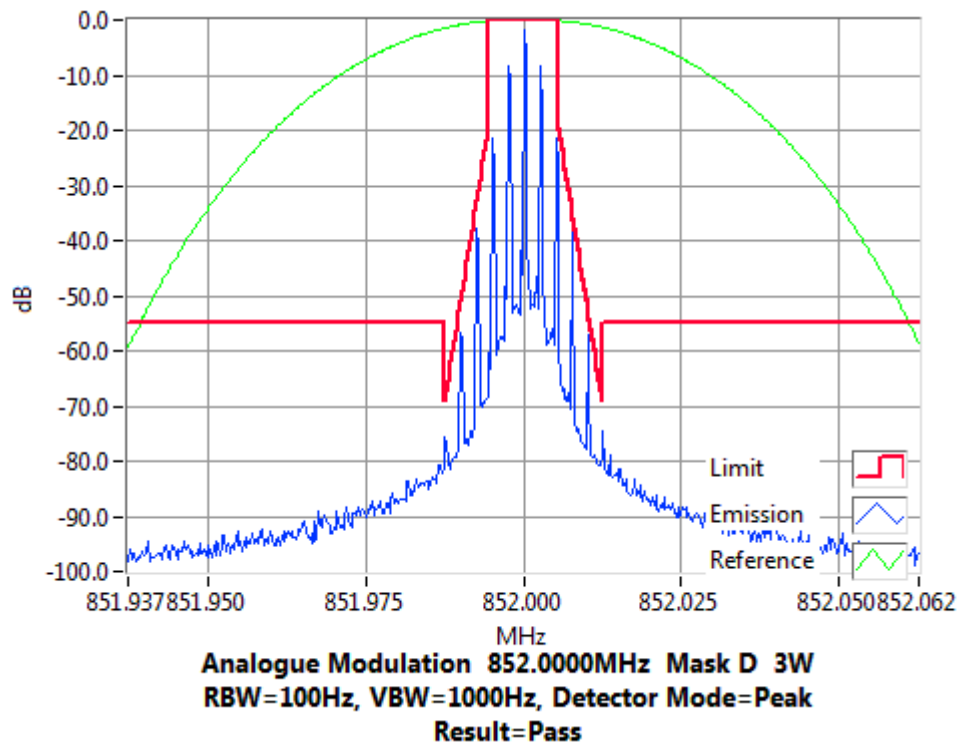
Occupied Bandwidth and Spectrum Masks

ANALOGUE VOICE

Tx FREQUENCY: 852.0 MHz 3 W 12.5 kHz Channel Spacing



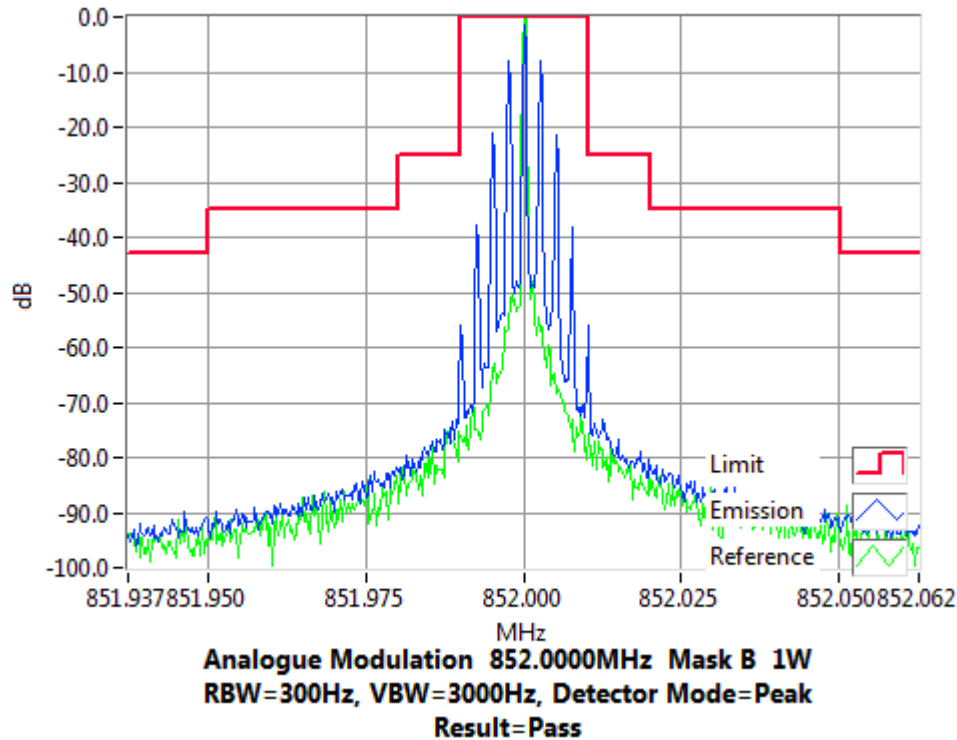
Tx FREQUENCY: 852.0 MHz 3 W 12.5 kHz Channel Spacing



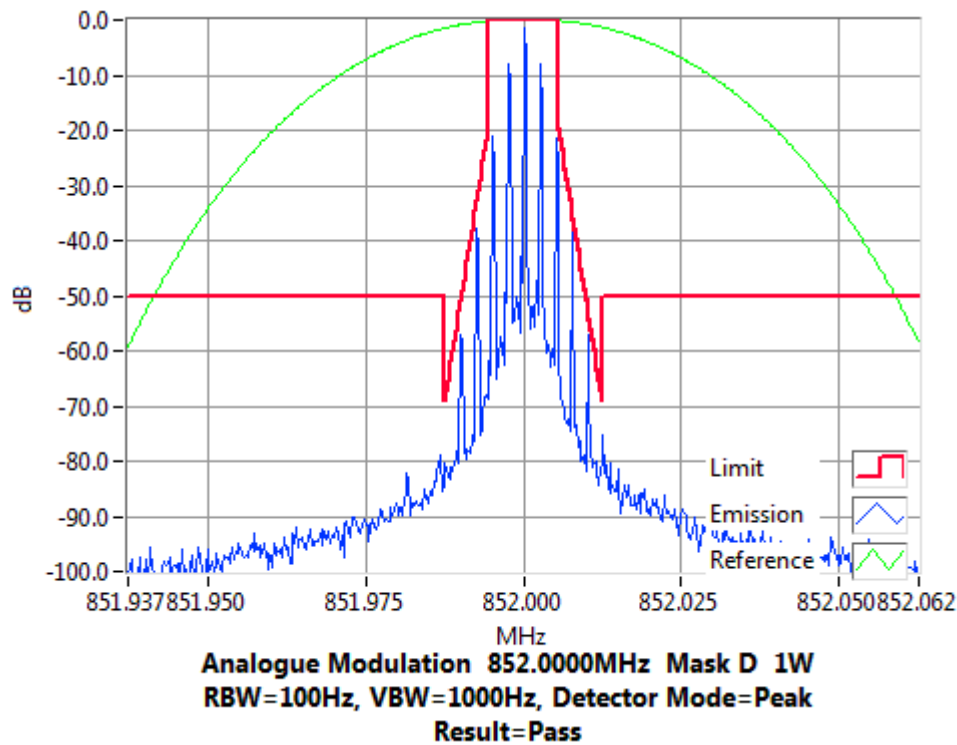
Occupied Bandwidth and Spectrum Masks

ANALOGUE VOICE

Tx FREQUENCY: 852.0 MHz 1 W 12.5 kHz Channel Spacing



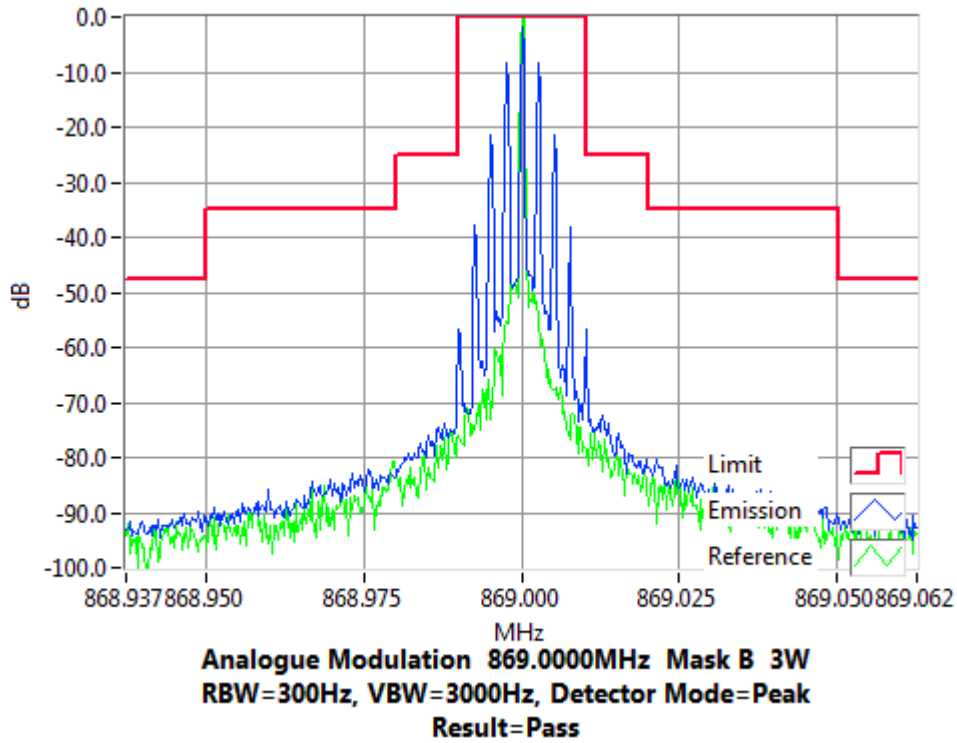
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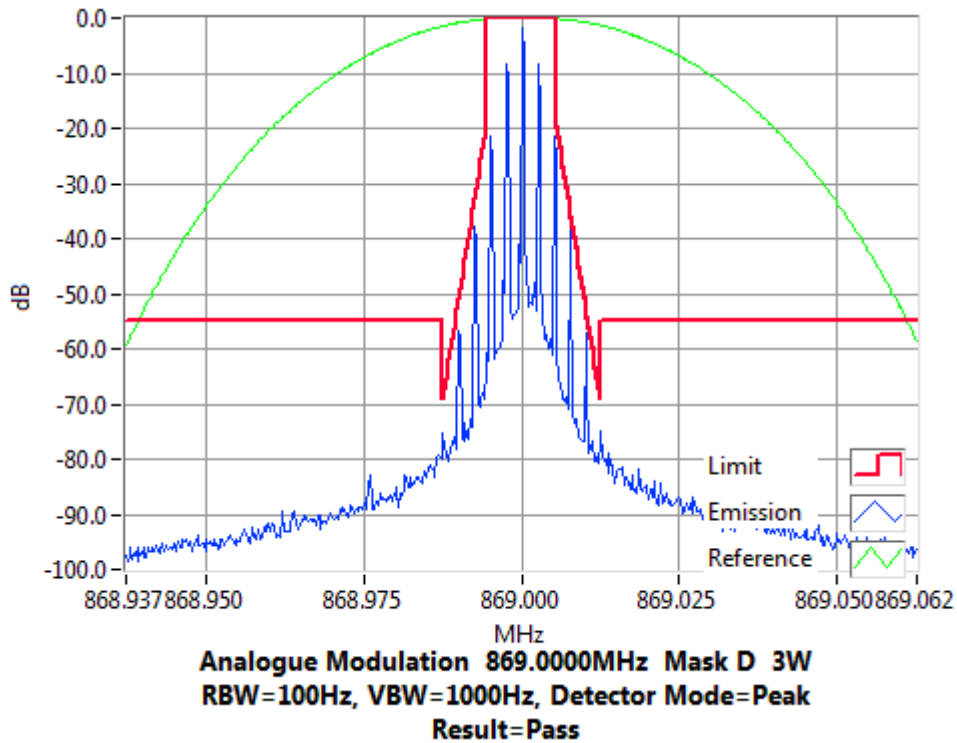
Occupied Bandwidth and Spectrum Masks

ANALOGUE VOICE

Tx FREQUENCY: 869.0 MHz 3 W 12.5 kHz Channel Spacing



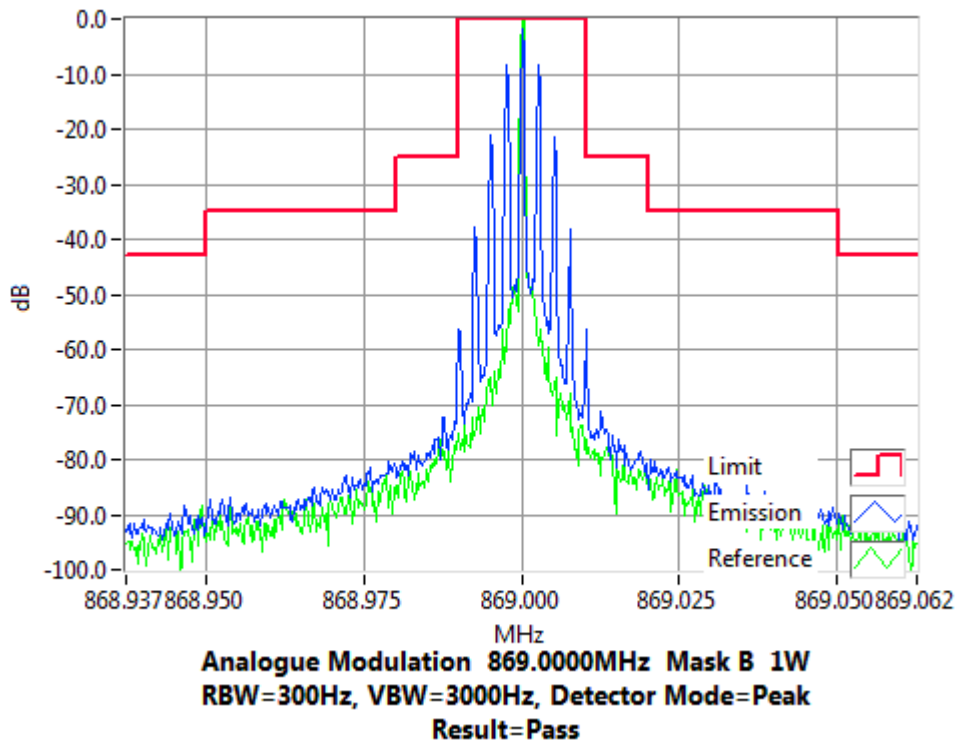
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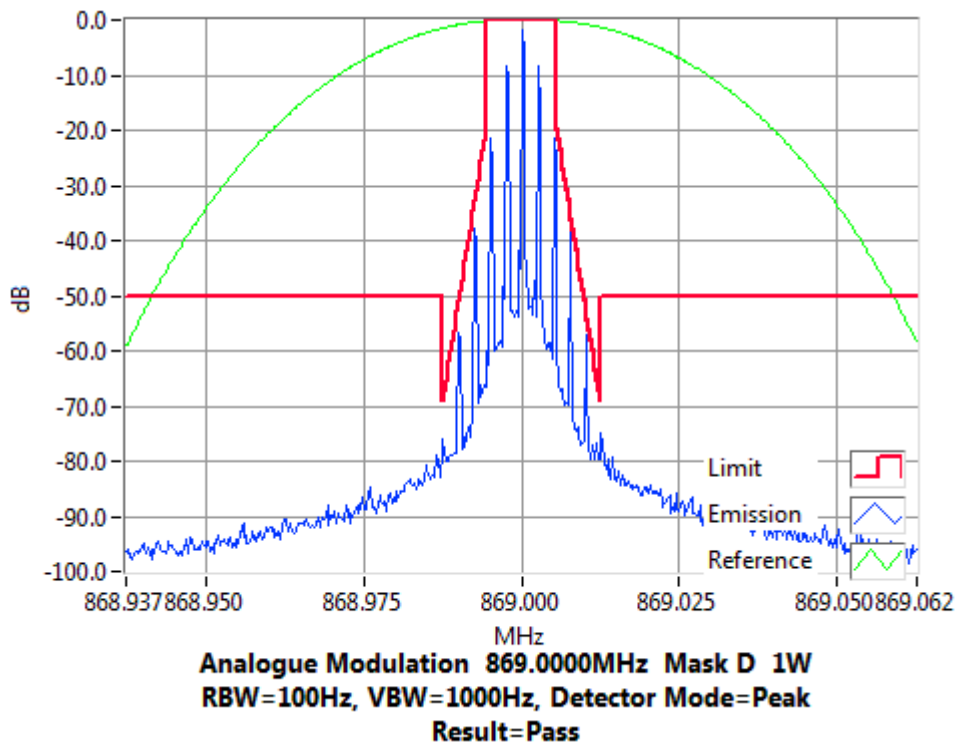
Occupied Bandwidth and Spectrum Masks

ANALOGUE VOICE

Tx FREQUENCY: 869.0 MHz 1 W 12.5 kHz Channel Spacing



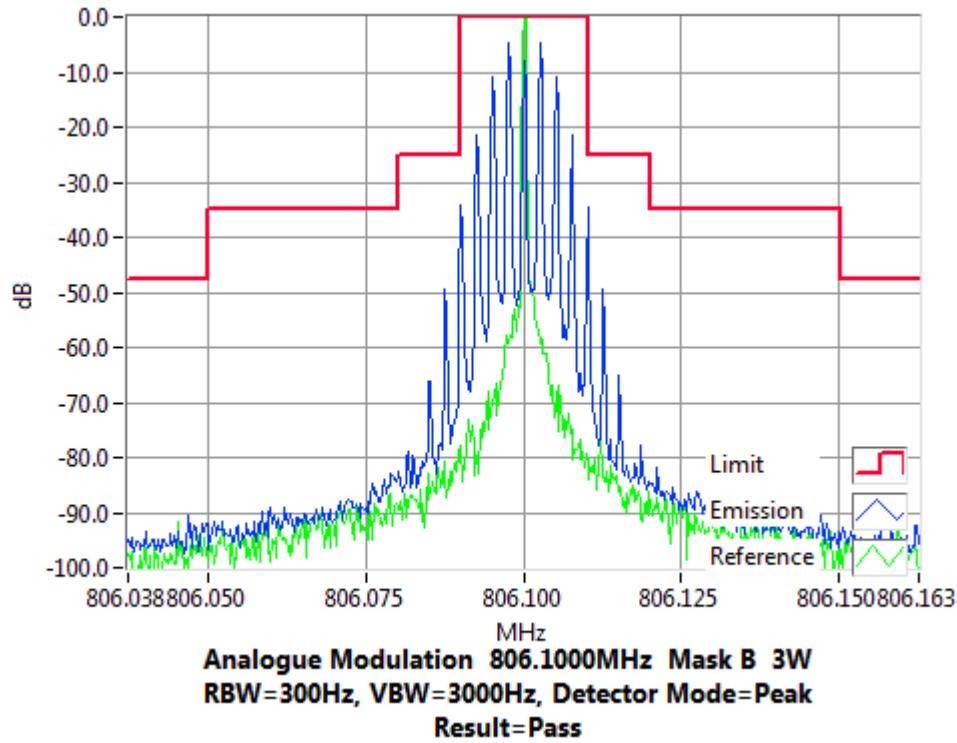
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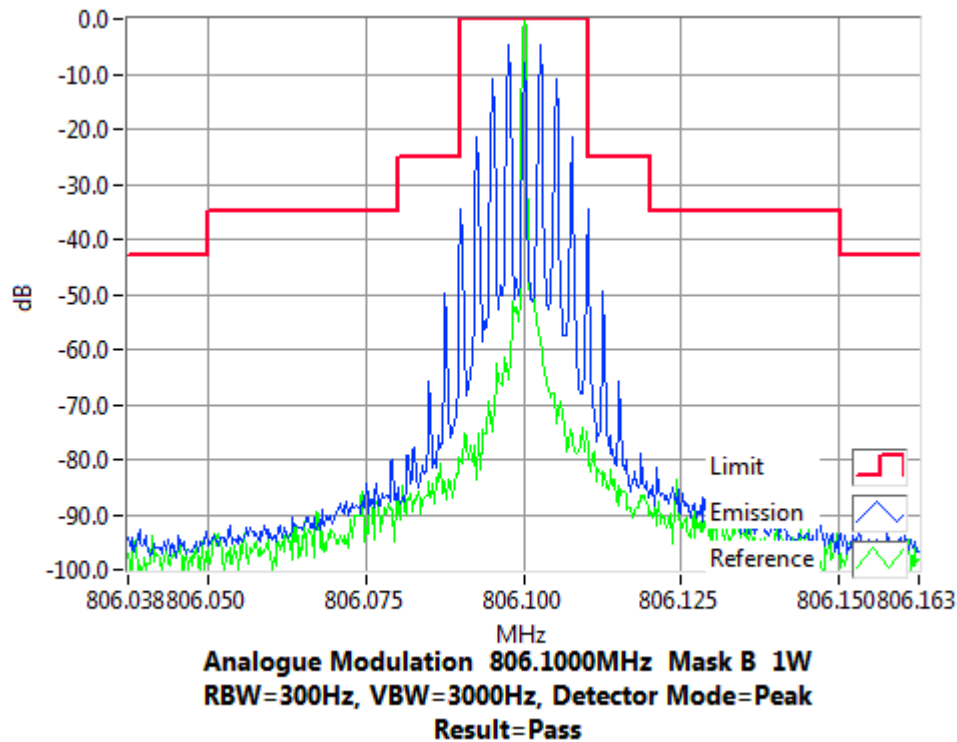
Occupied Bandwidth and Spectrum Masks

ANALOGUE VOICE

Tx FREQUENCY: 806.1 MHz 3 W 25 kHz Channel Spacing



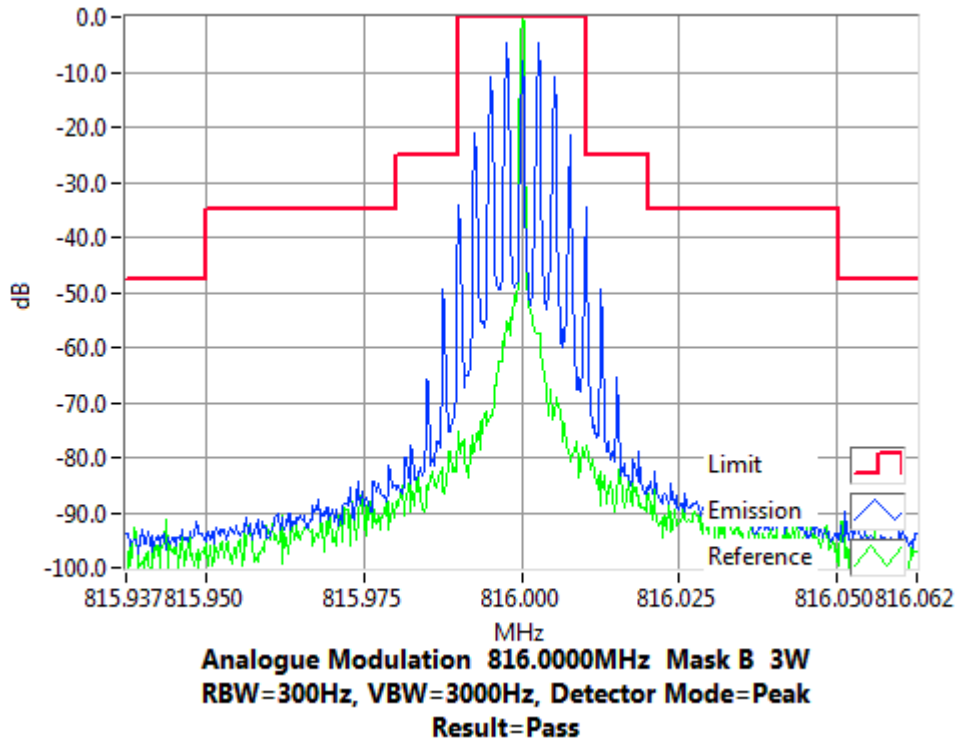
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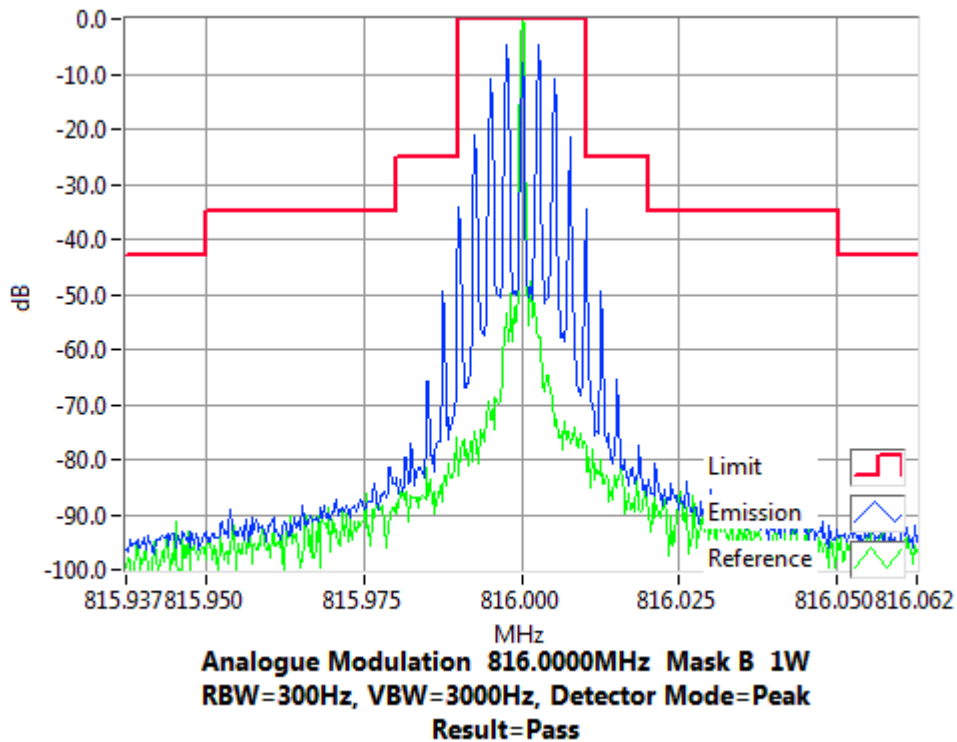
Occupied Bandwidth and Spectrum Masks

ANALOGUE VOICE

Tx FREQUENCY: 816.0 MHz 3 W 25 kHz Channel Spacing



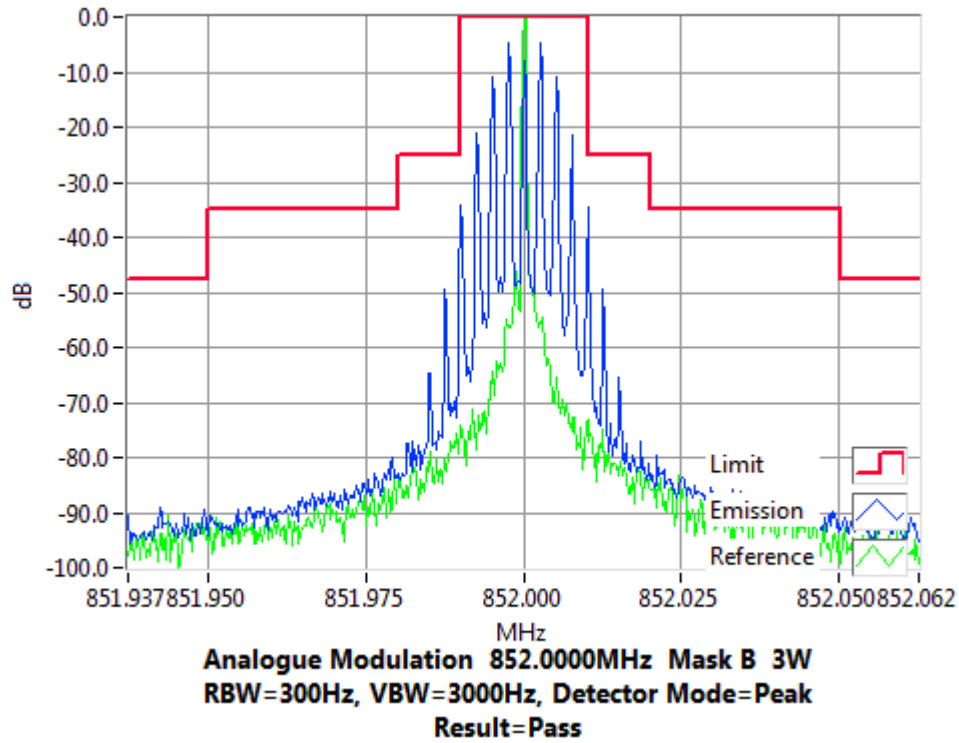
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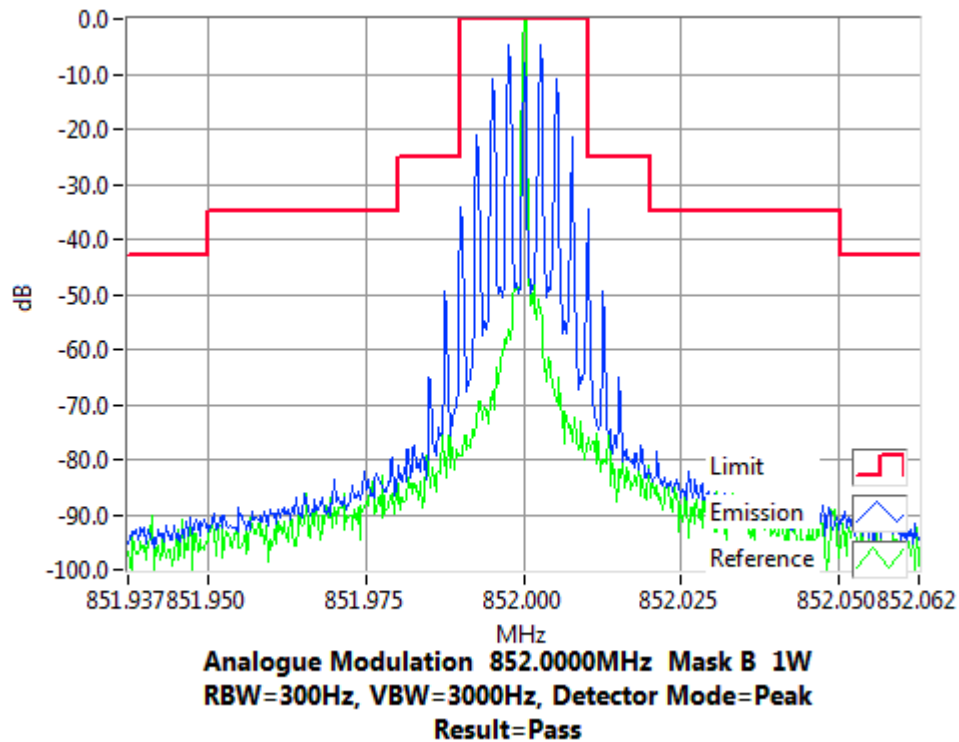
Occupied Bandwidth and Spectrum Masks

ANALOGUE VOICE

Tx FREQUENCY: 852.0 MHz 3 W 25 kHz Channel Spacing



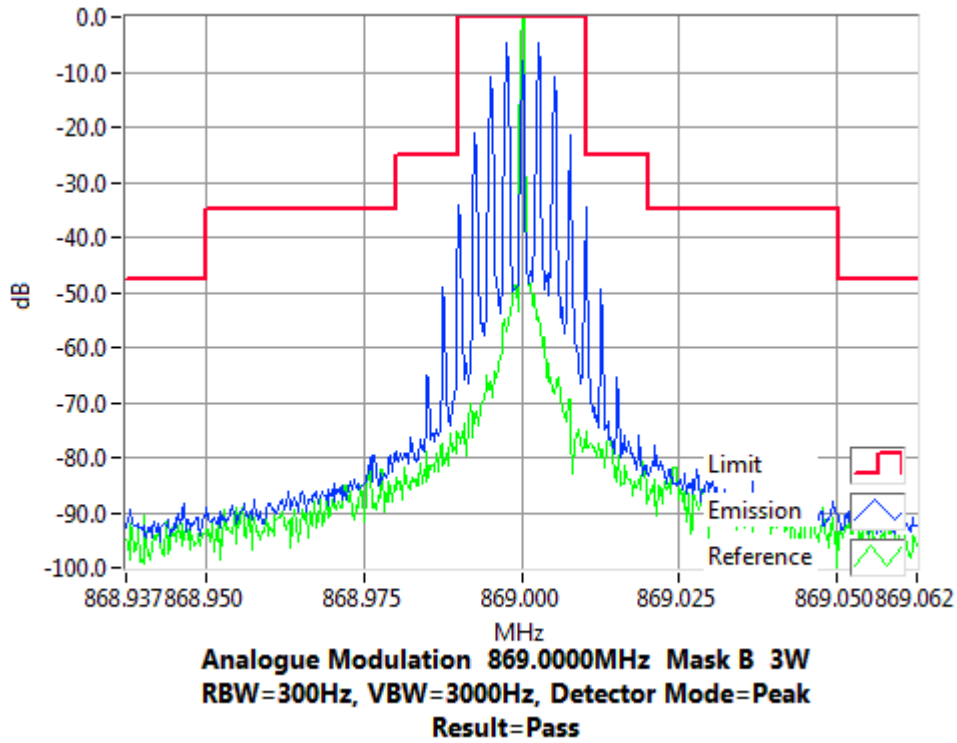
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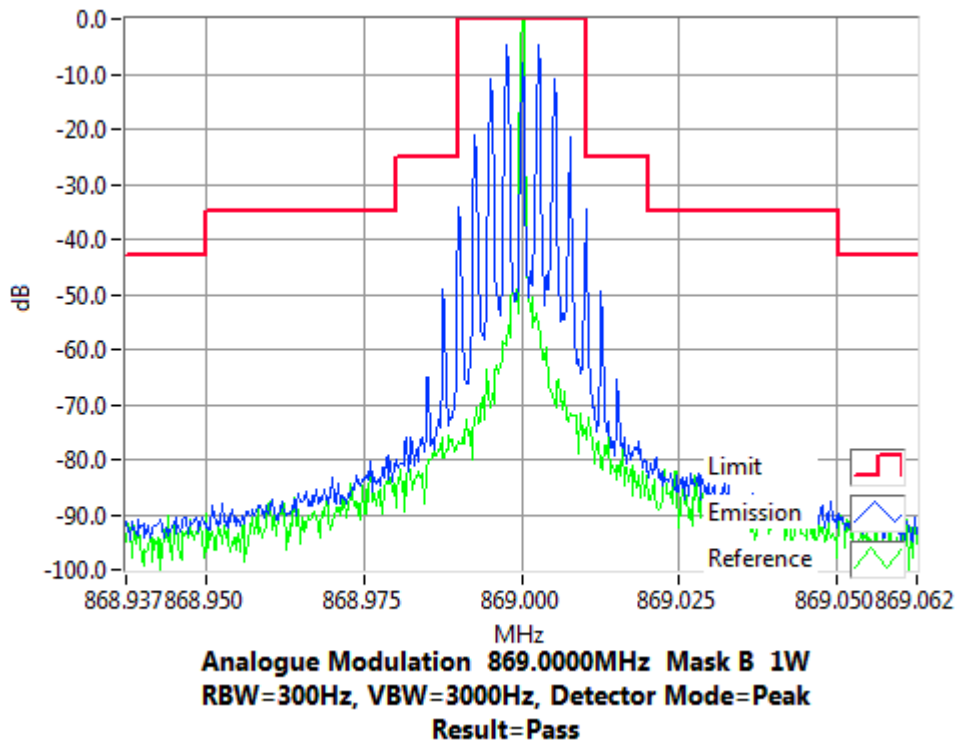
Occupied Bandwidth and Spectrum Masks

ANALOGUE VOICE

Tx FREQUENCY: 869.0 MHz 3 W 25 kHz Channel Spacing



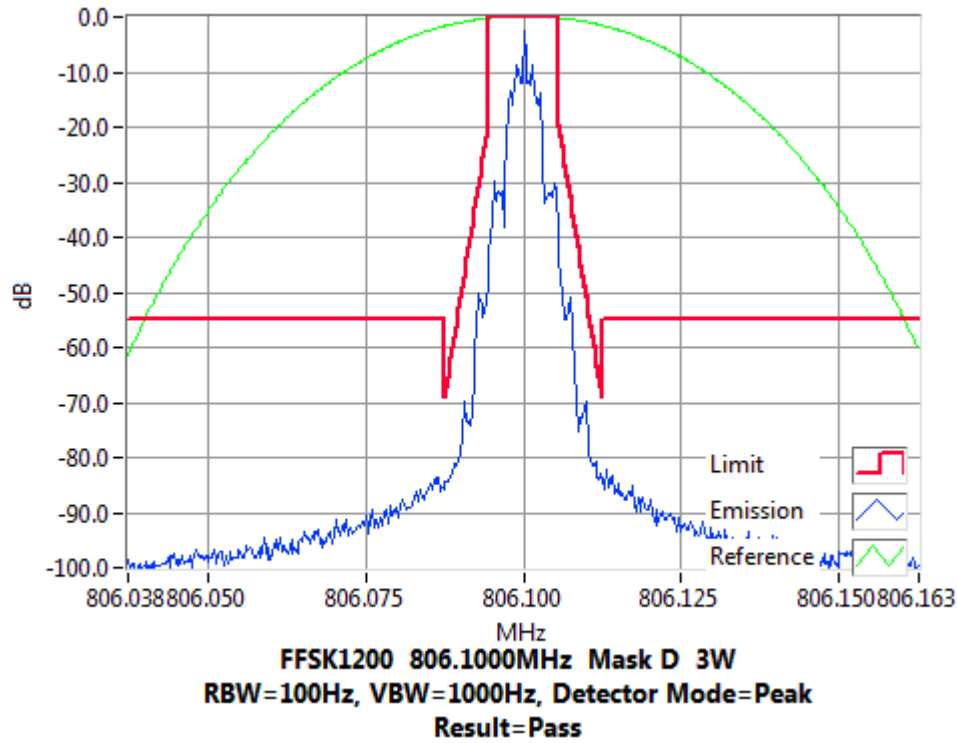
Tx FREQUENCY: 869.0 MHz 1 W 25 kHz Channel Spacing



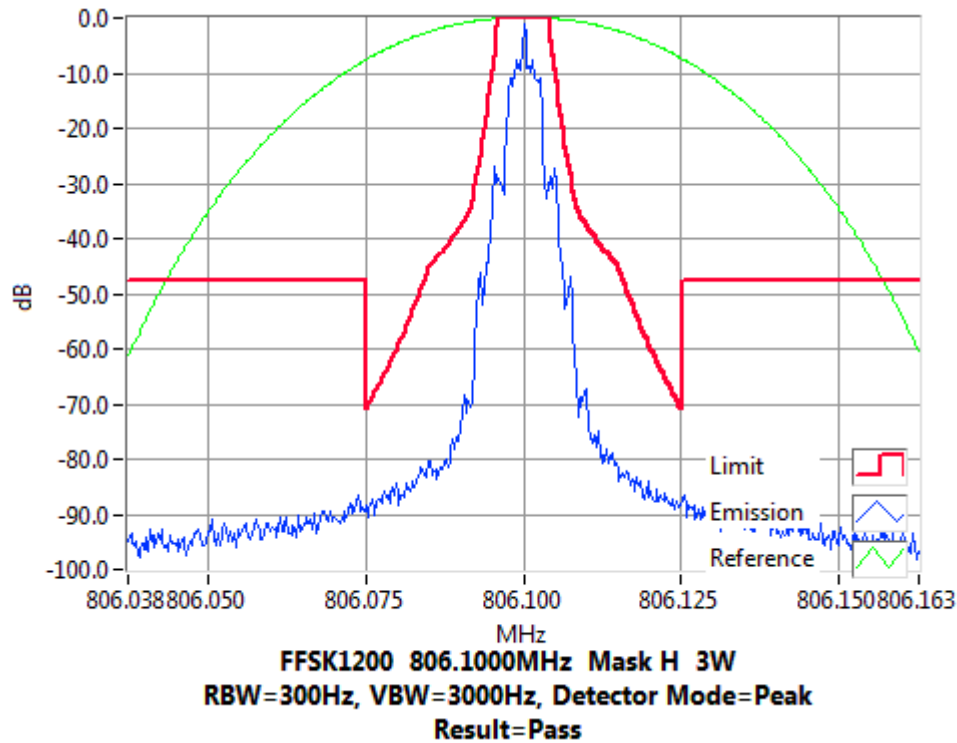
Occupied Bandwidth and Spectrum Masks

FSK 1200 bps

Tx FREQUENCY: 806.1 MHz 3 W 12.5 kHz Channel Spacing



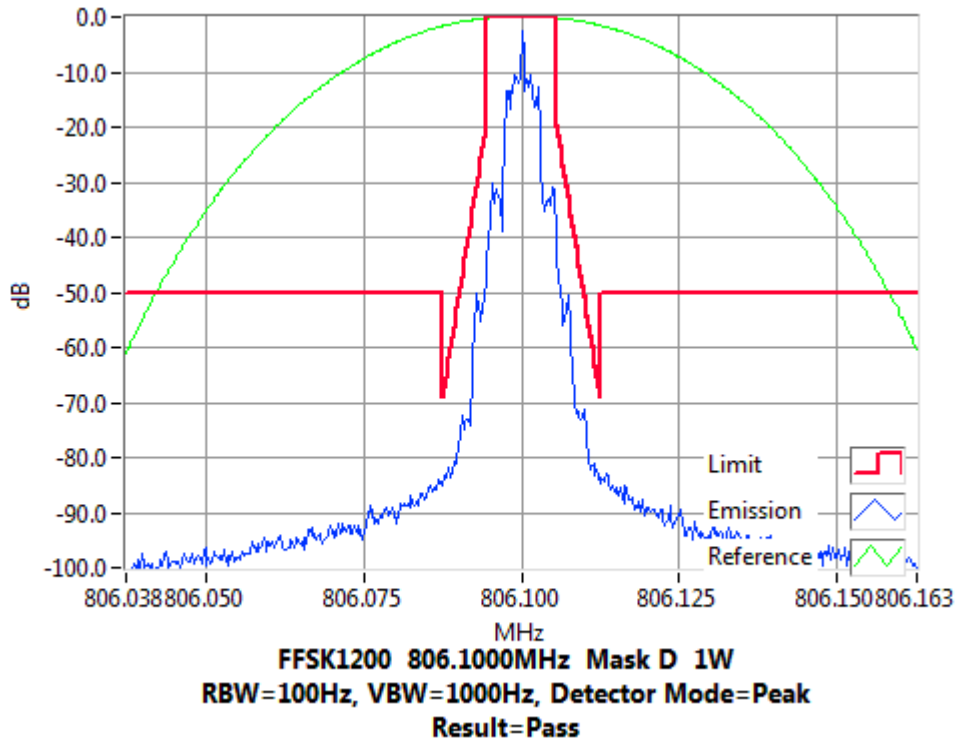
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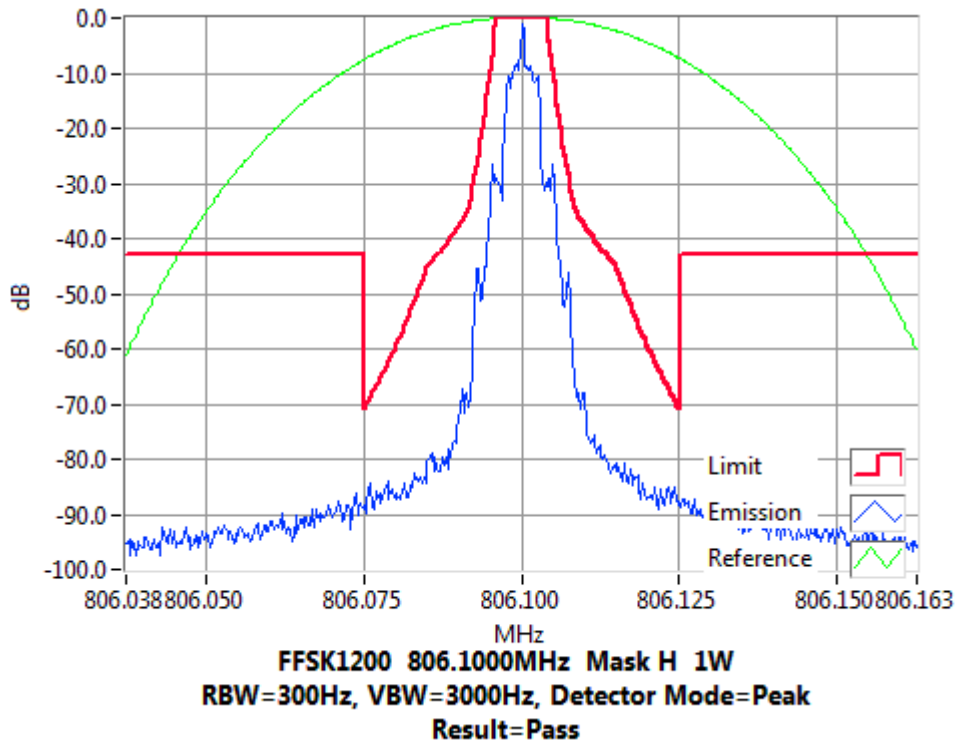
Occupied Bandwidth and Spectrum Masks

FSK 1200 bps

Tx FREQUENCY: 806.1 MHz 1 W 12.5 kHz Channel Spacing



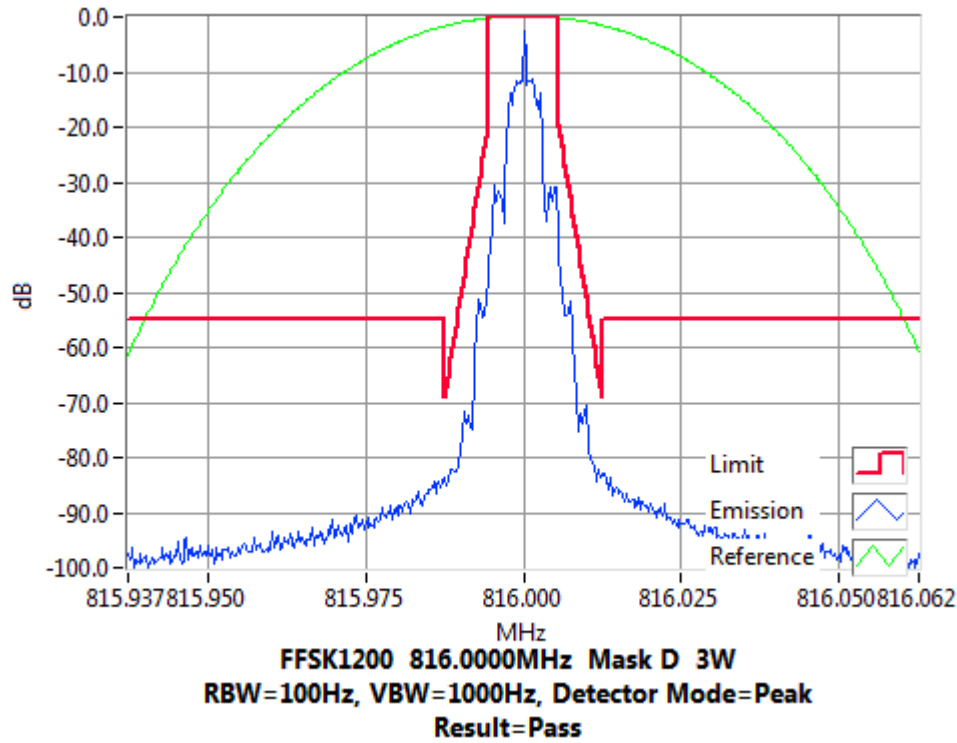
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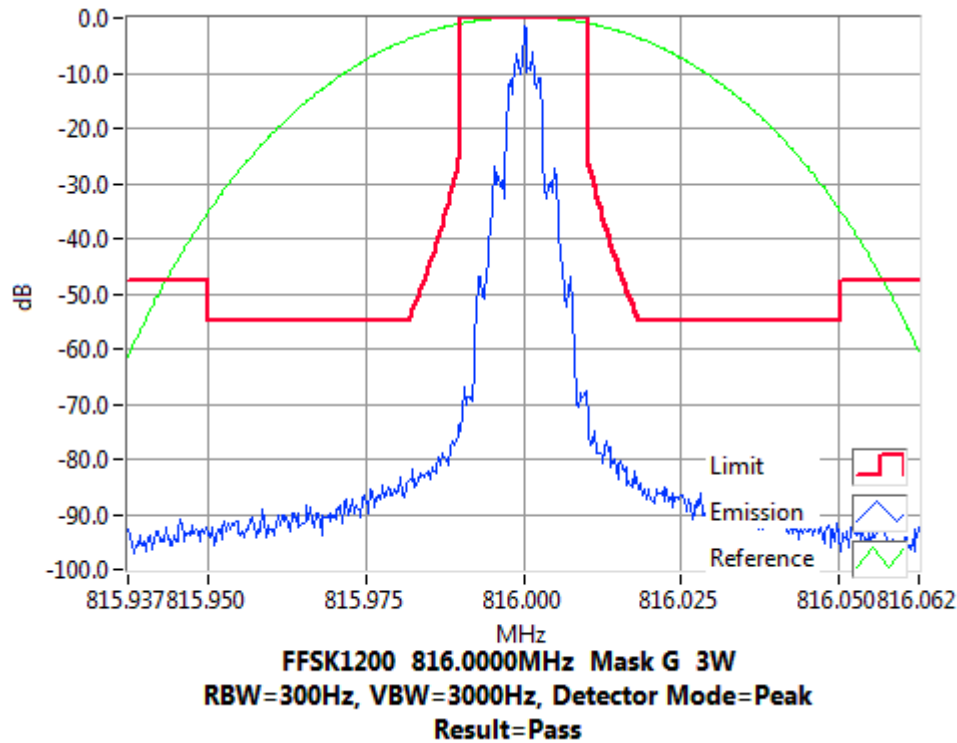
Occupied Bandwidth and Spectrum Masks

FSK 1200 bps

Tx FREQUENCY: 816.0 MHz 3 W 12.5 kHz Channel Spacing



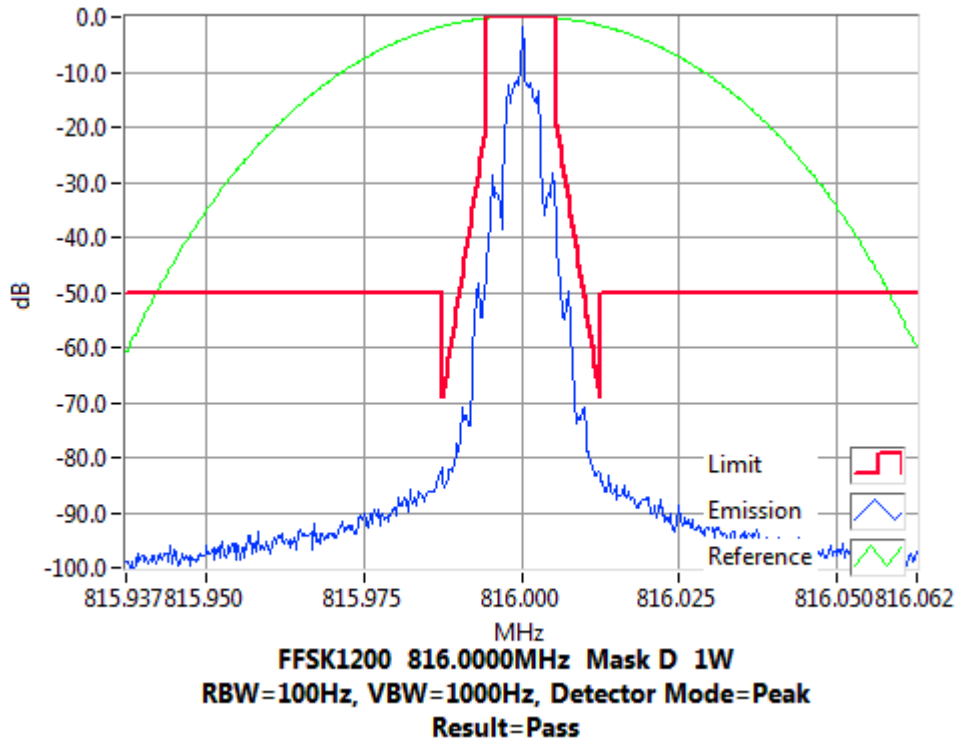
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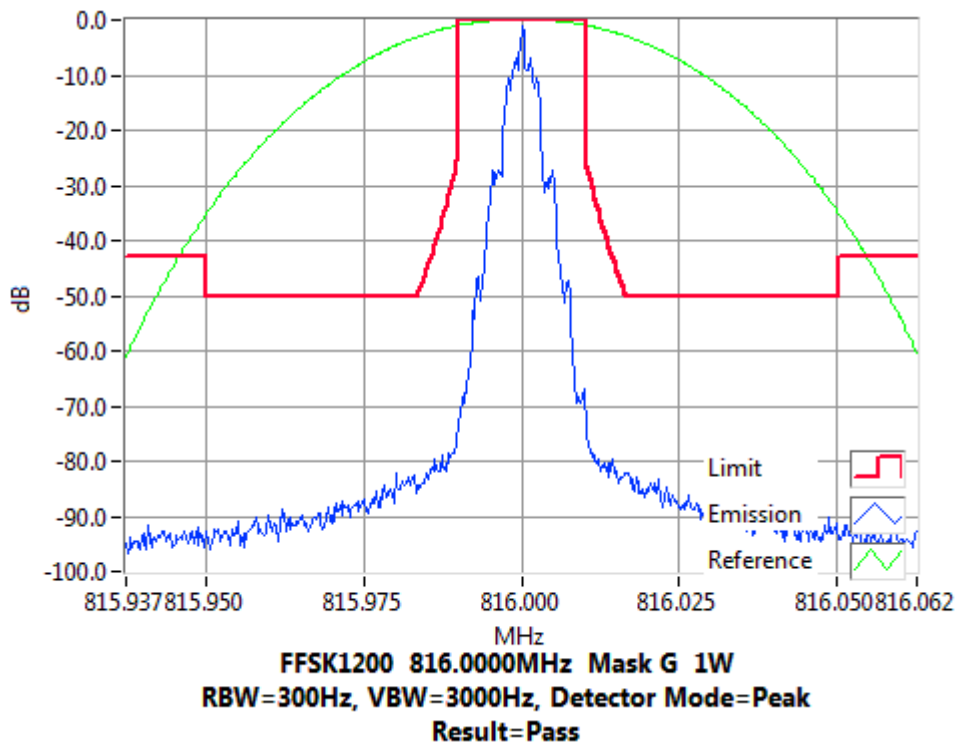
Occupied Bandwidth and Spectrum Masks

FSK 1200 bps

Tx FREQUENCY: 816.0 MHz 1 W 12.5 kHz Channel Spacing



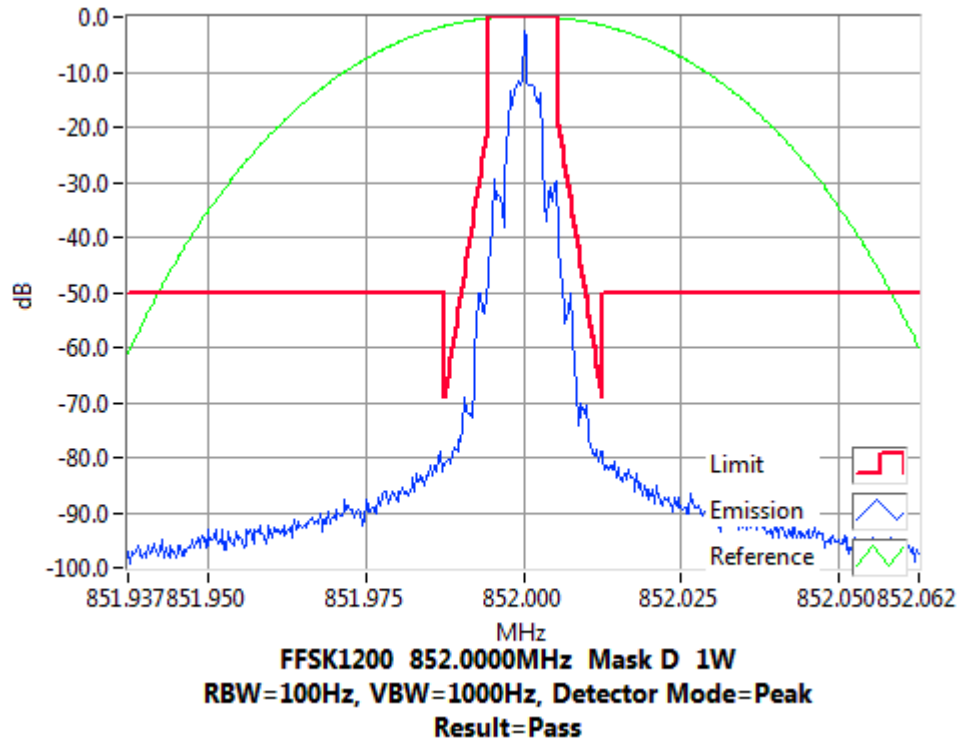
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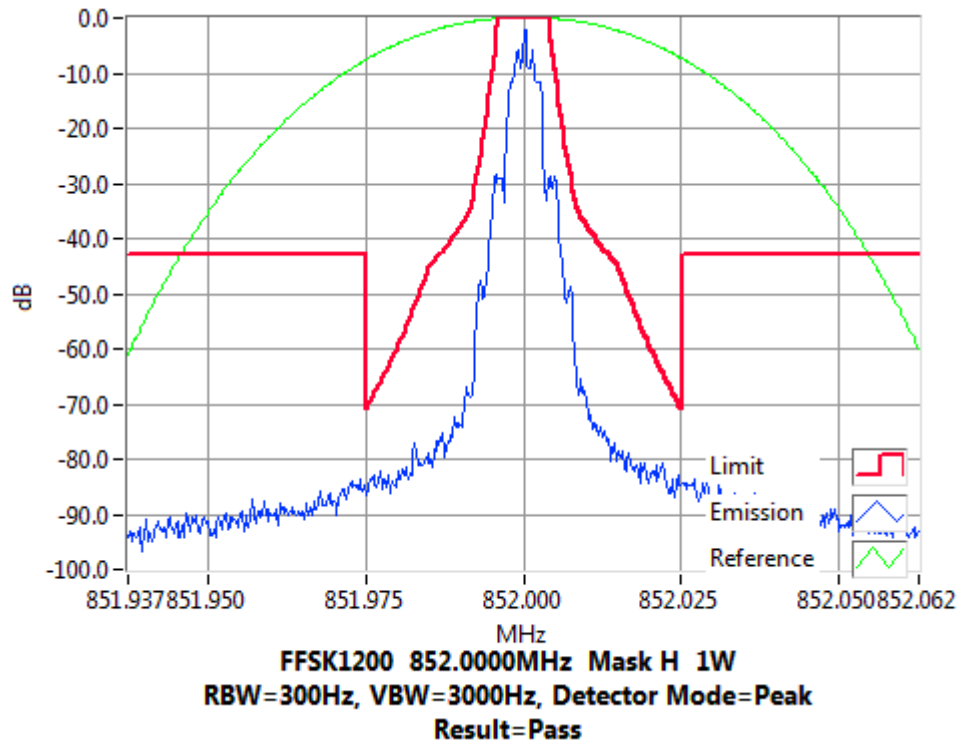
Occupied Bandwidth and Spectrum Masks

FFSK 1200 bps

Tx FREQUENCY: 852.0 MHz 1 W 12.5 kHz Channel Spacing



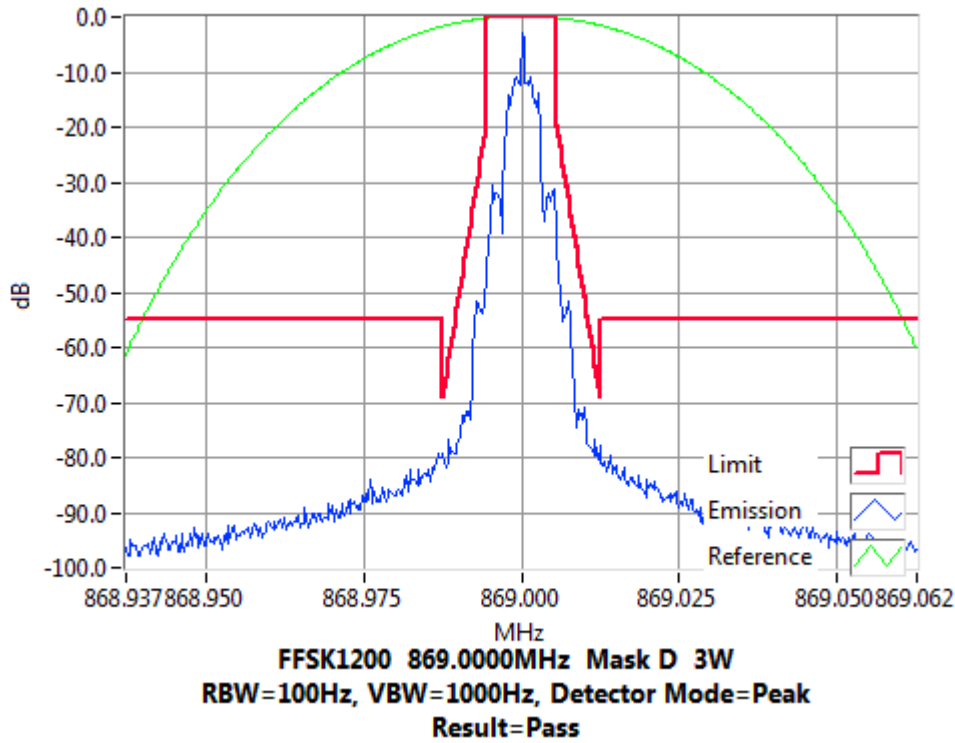
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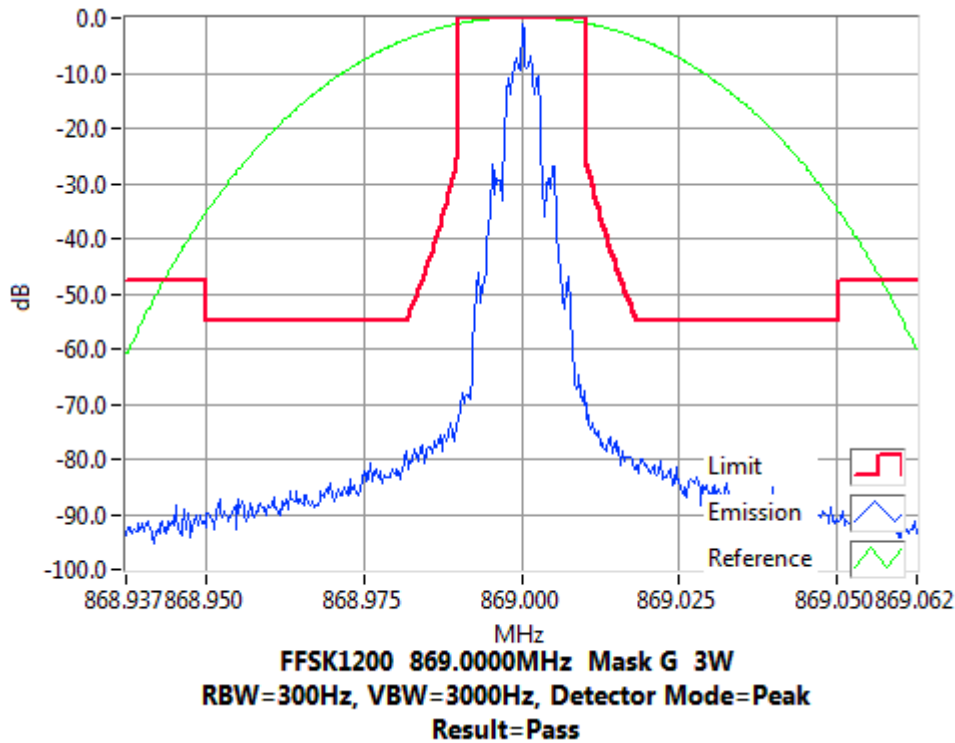
Occupied Bandwidth and Spectrum Masks

FFSK 1200 bps

Tx FREQUENCY: 869.0 MHz 3 W 12.5 kHz Channel Spacing



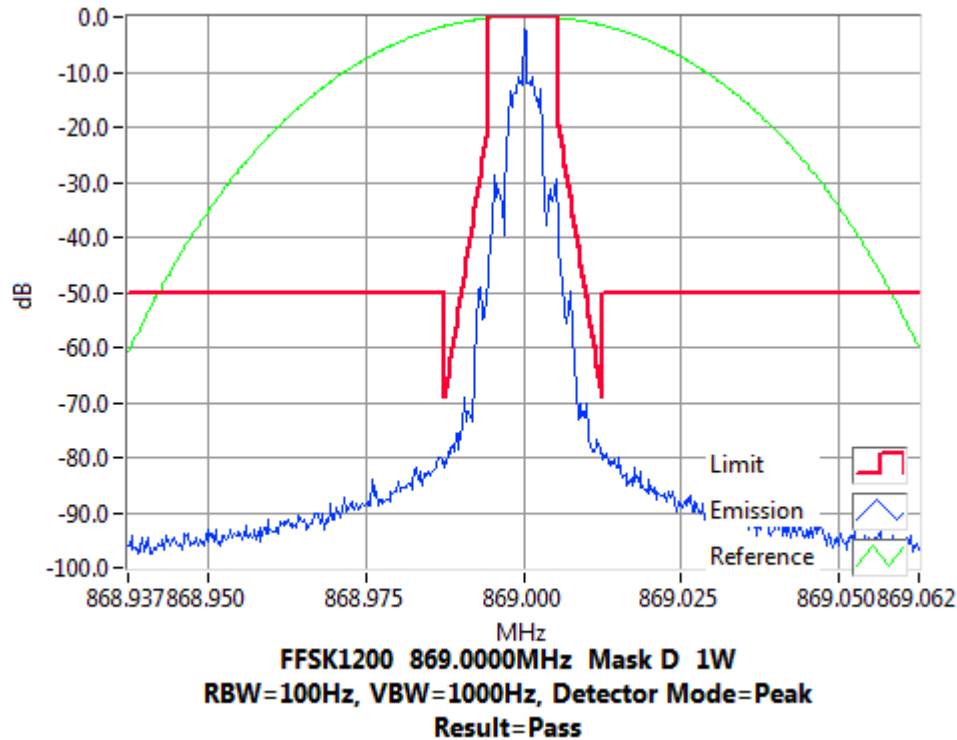
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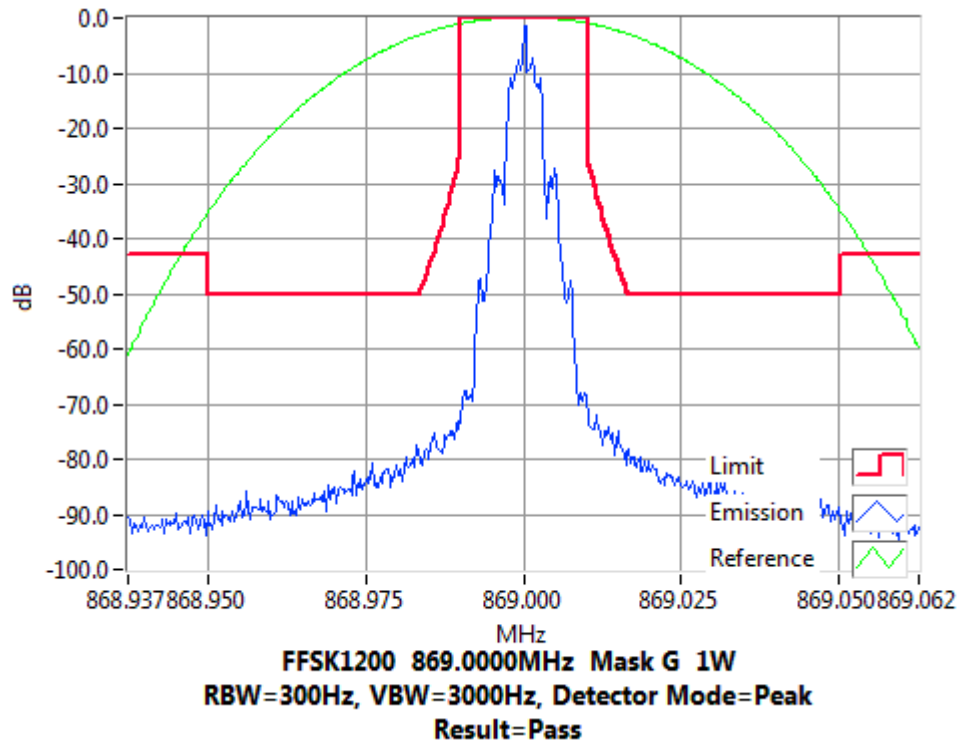
Occupied Bandwidth and Spectrum Masks

FSK 1200 bps

Tx FREQUENCY: 869.0 MHz 1 W 12.5 kHz Channel Spacing



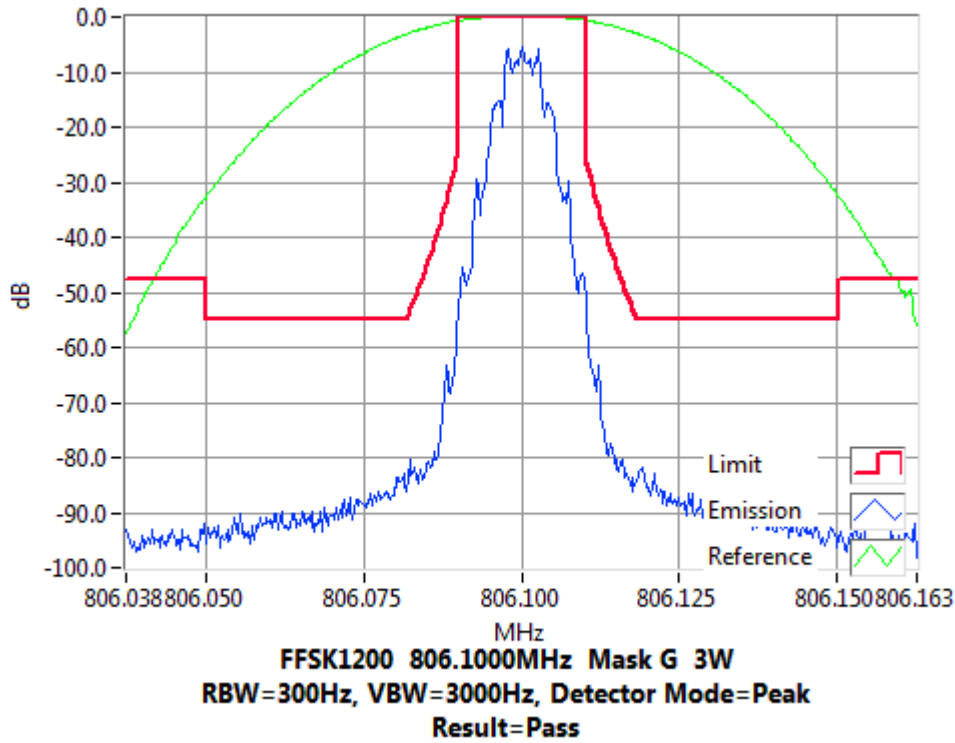
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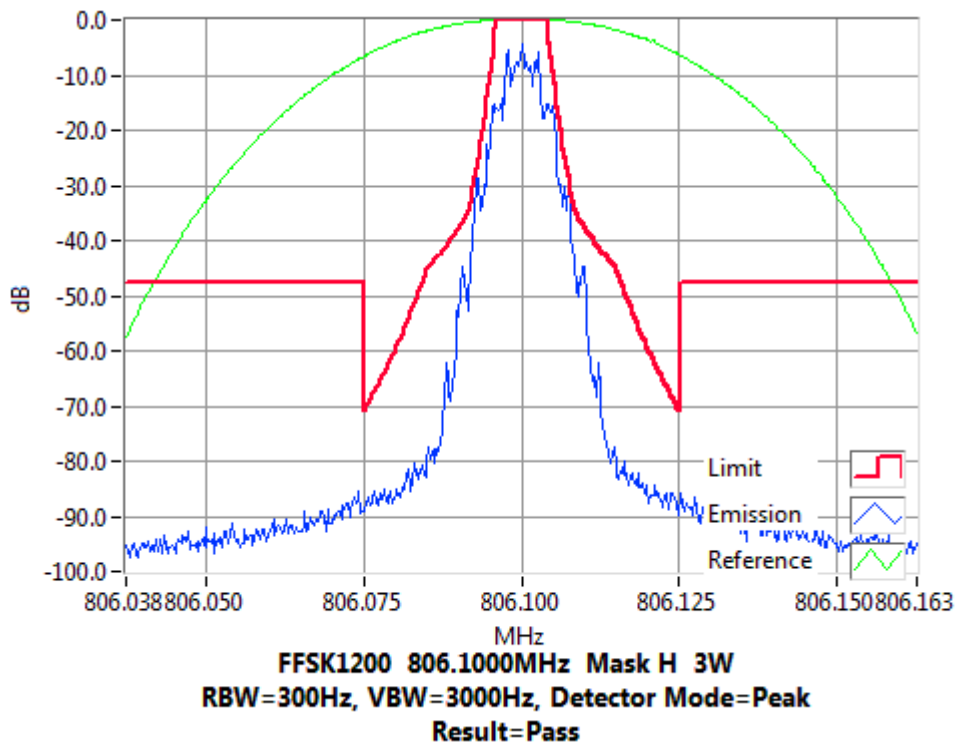
Occupied Bandwidth and Spectrum Masks

FSK 1200 bps

Tx FREQUENCY: 806.1 MHz 3 W 25 kHz Channel Spacing



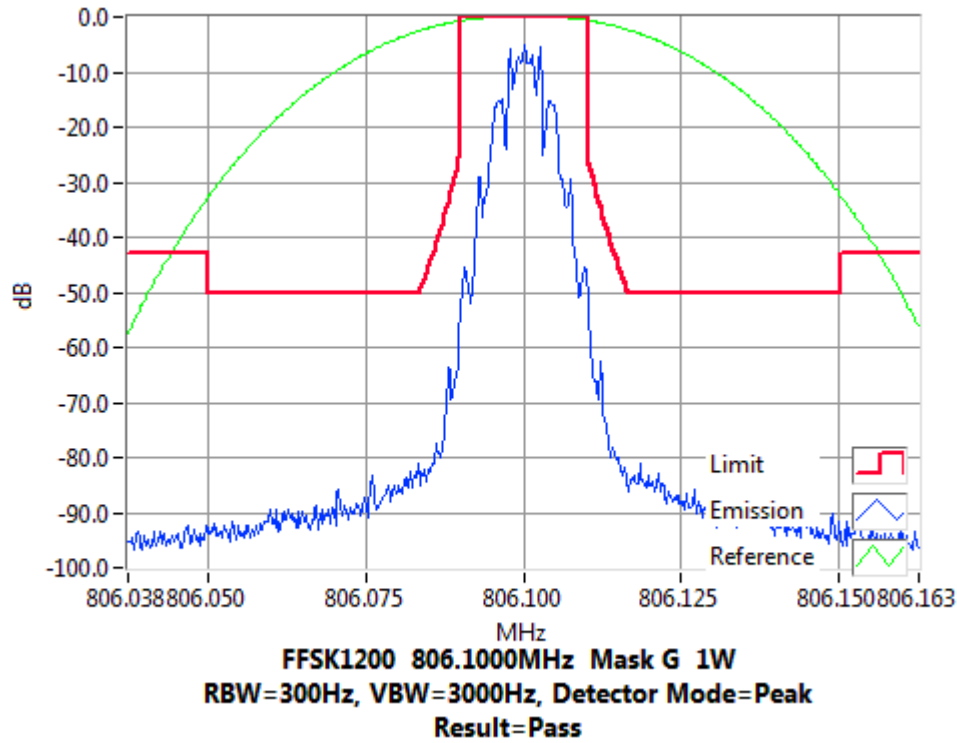
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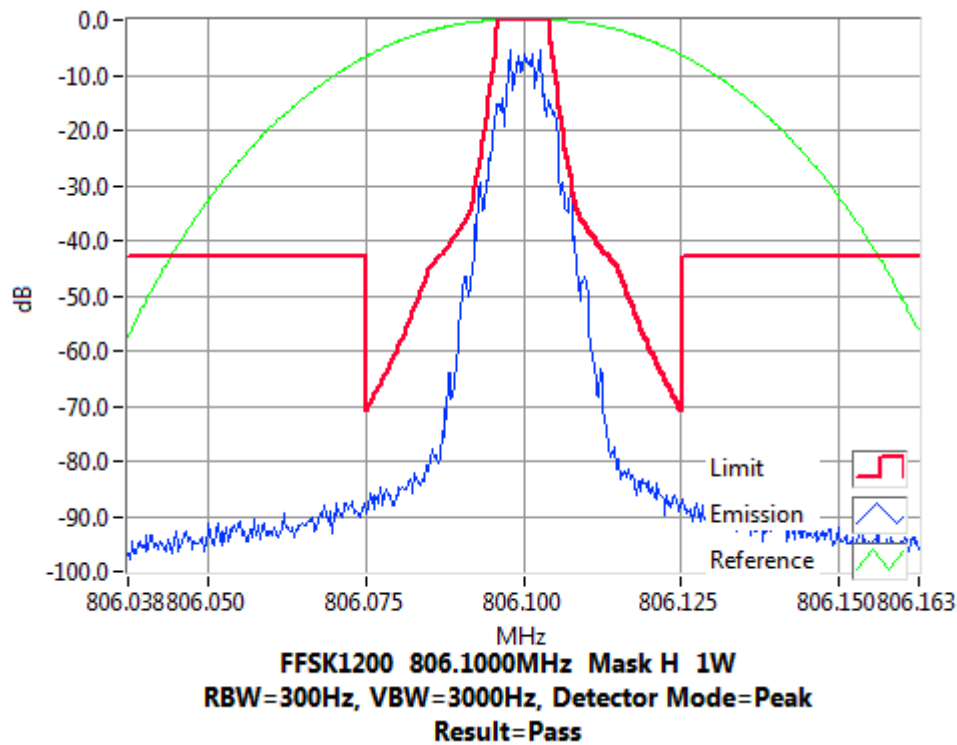
Occupied Bandwidth and Spectrum Masks

FFSK 1200 bps

Tx FREQUENCY: 806.1 MHz 1 W 25 kHz Channel Spacing



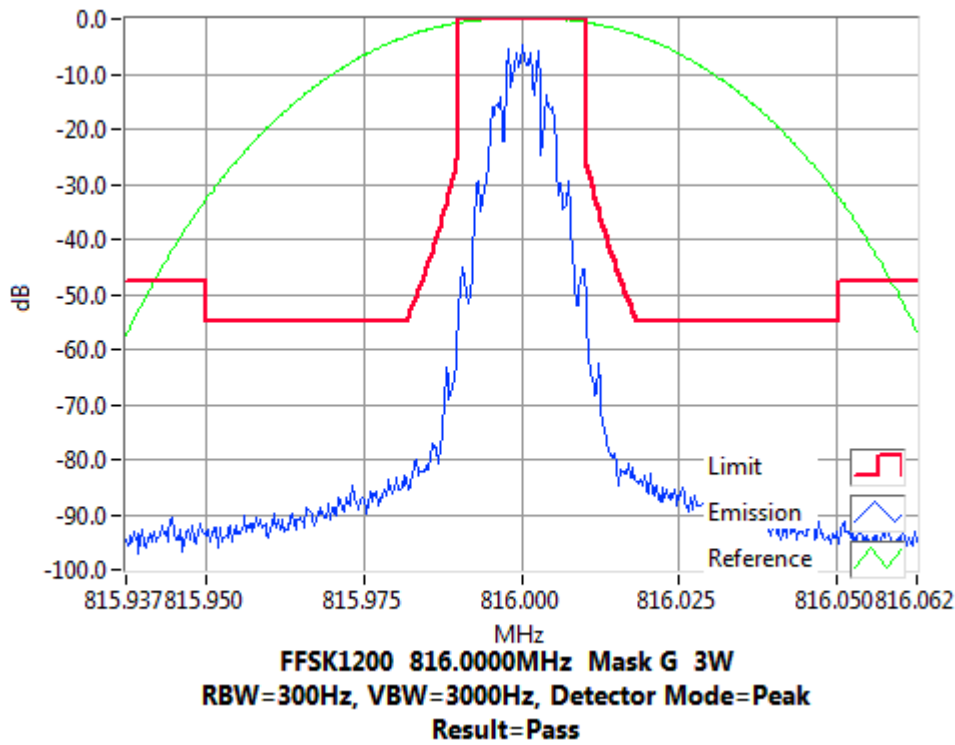
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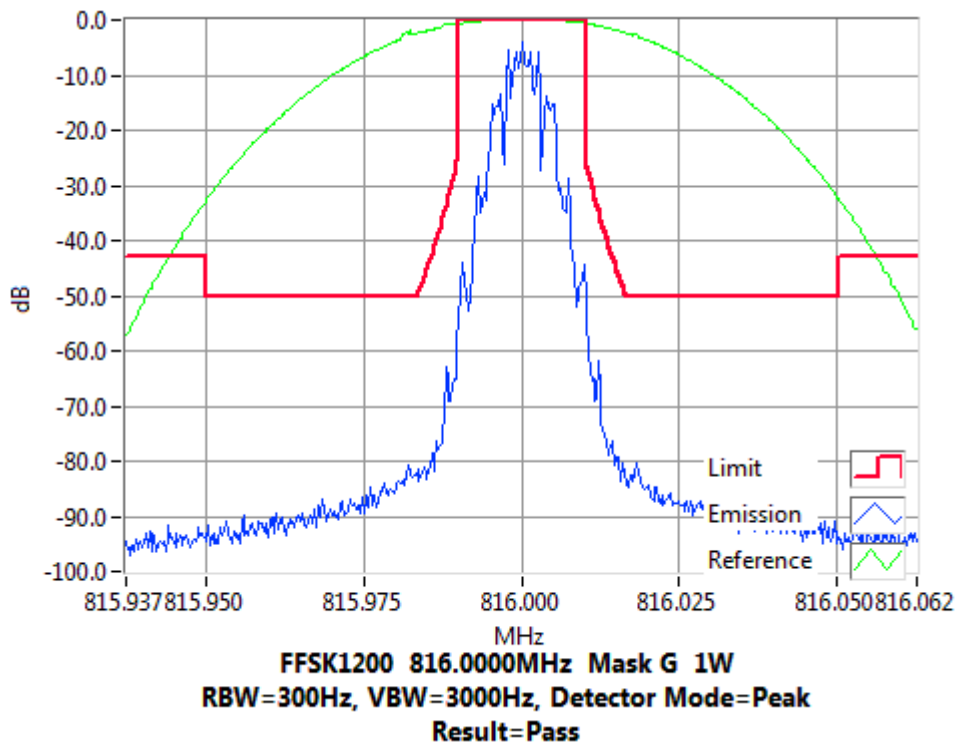
Occupied Bandwidth and Spectrum Masks

FSK 1200 bps

Tx FREQUENCY: 816.0 MHz 3 W 25 kHz Channel Spacing



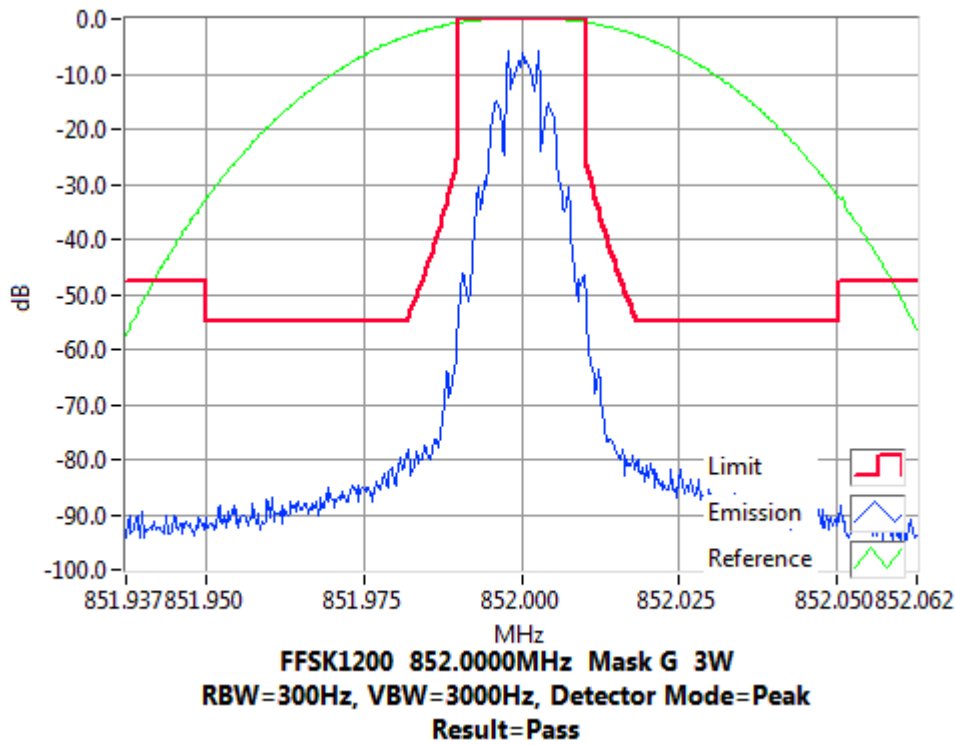
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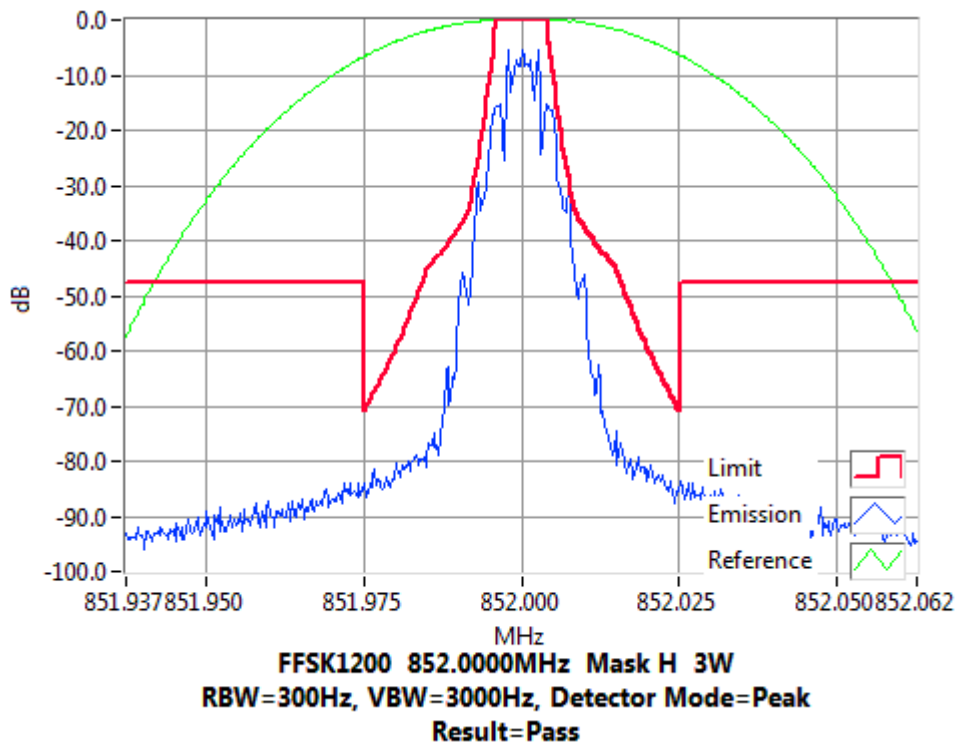
Occupied Bandwidth and Spectrum Masks

FSK 1200 bps

Tx FREQUENCY: 852.0 MHz 3 W 25 kHz Channel Spacing



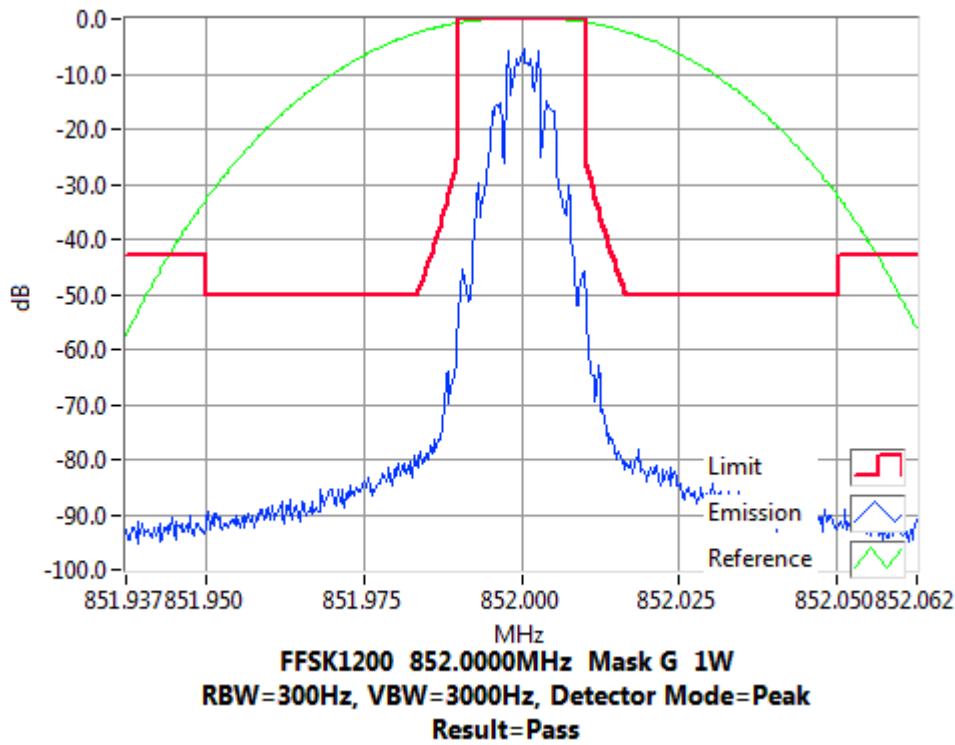
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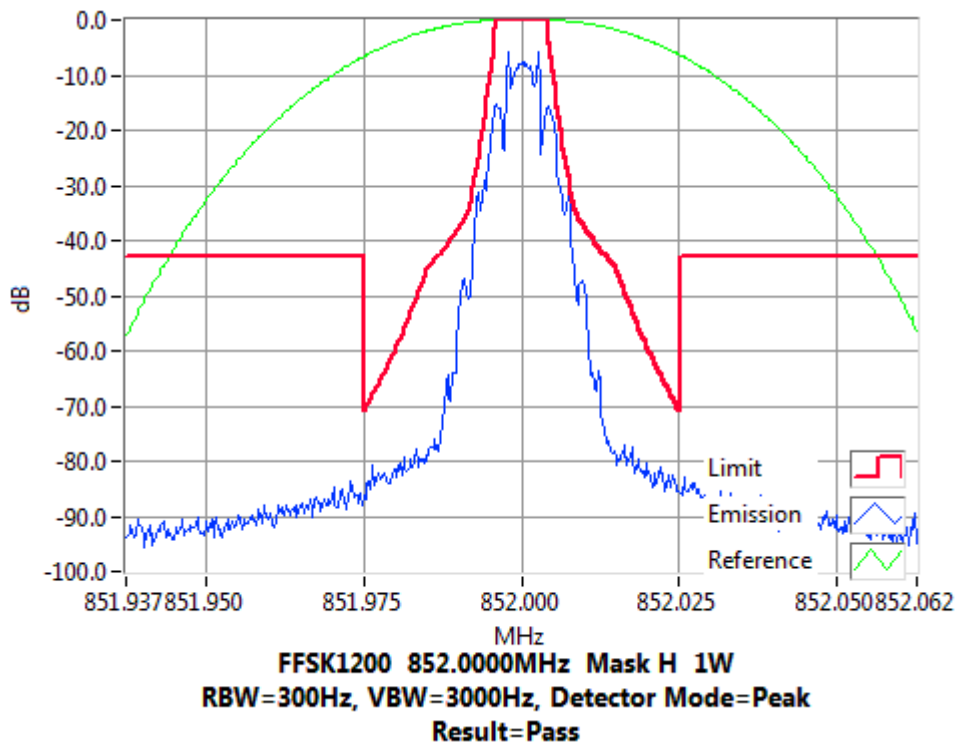
Occupied Bandwidth and Spectrum Masks

FFSK 1200 bps

Tx FREQUENCY: 852.0 MHz 1 W 25 kHz Channel Spacing



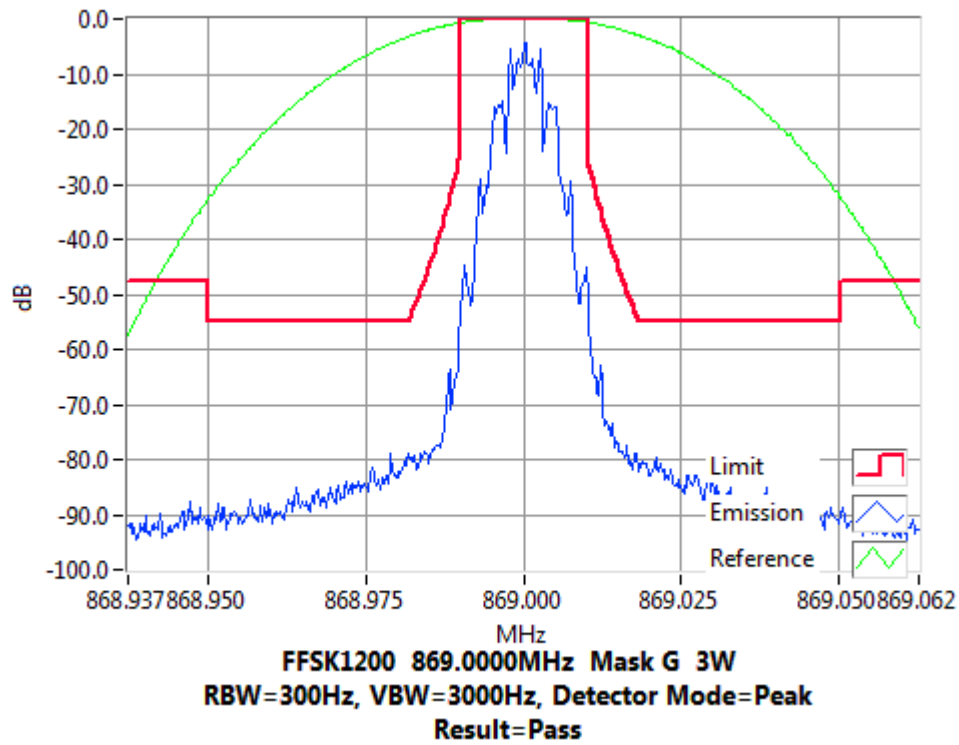
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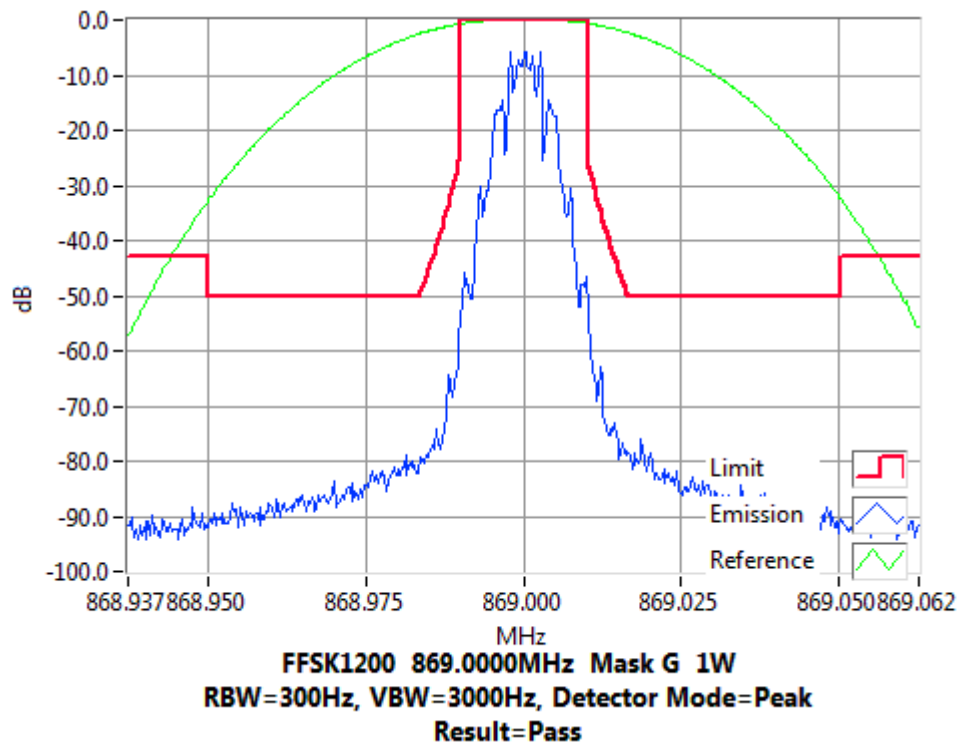
Occupied Bandwidth and Spectrum Masks

FFSK 1200 bps

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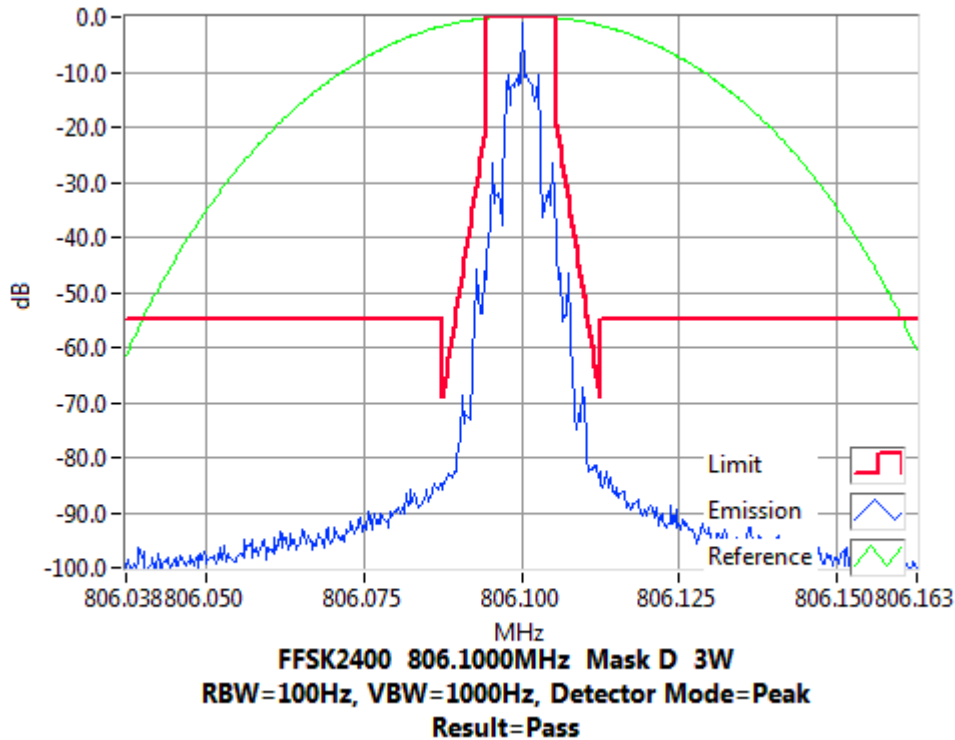
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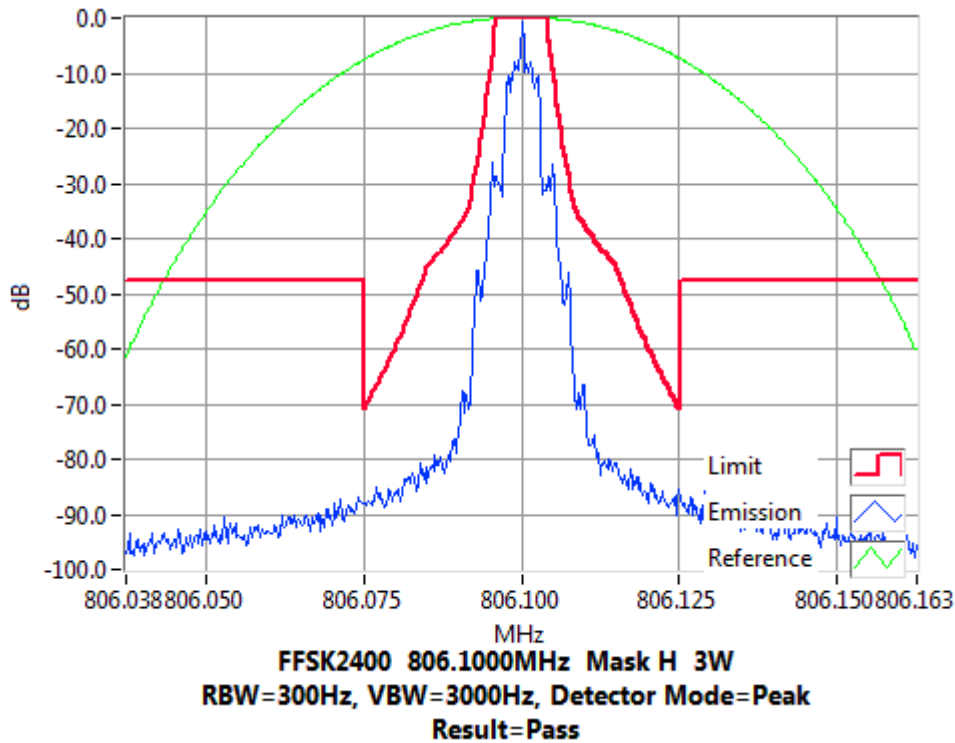
Occupied Bandwidth and Spectrum Masks

FFSK 2400 bps

Tx FREQUENCY: 806.1 MHz 3 W 12.5 kHz Channel Spacing



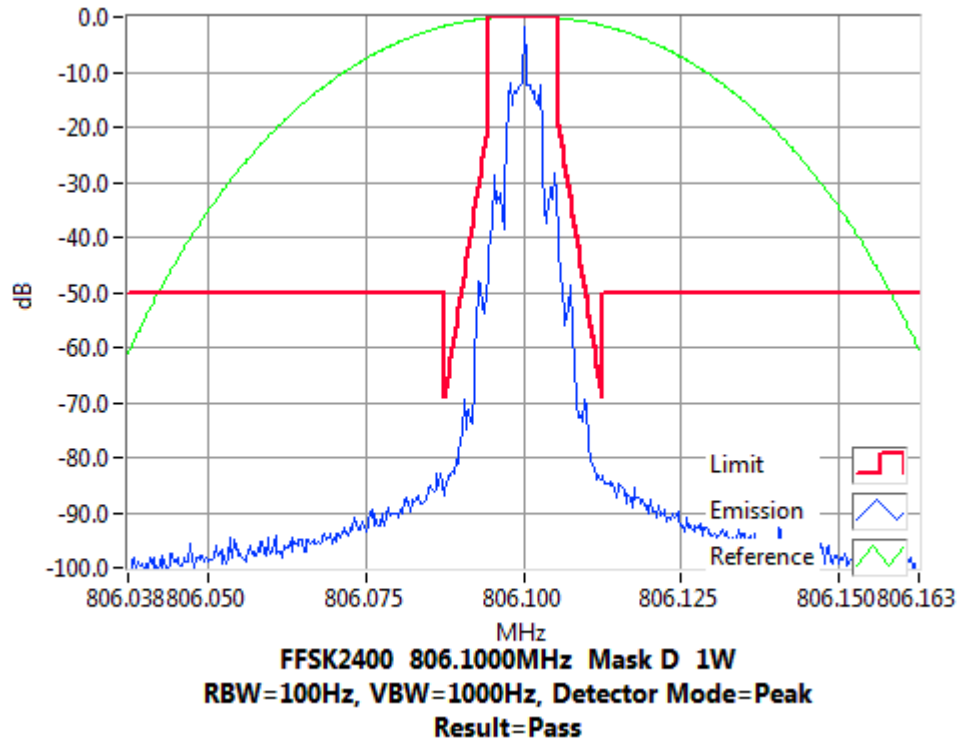
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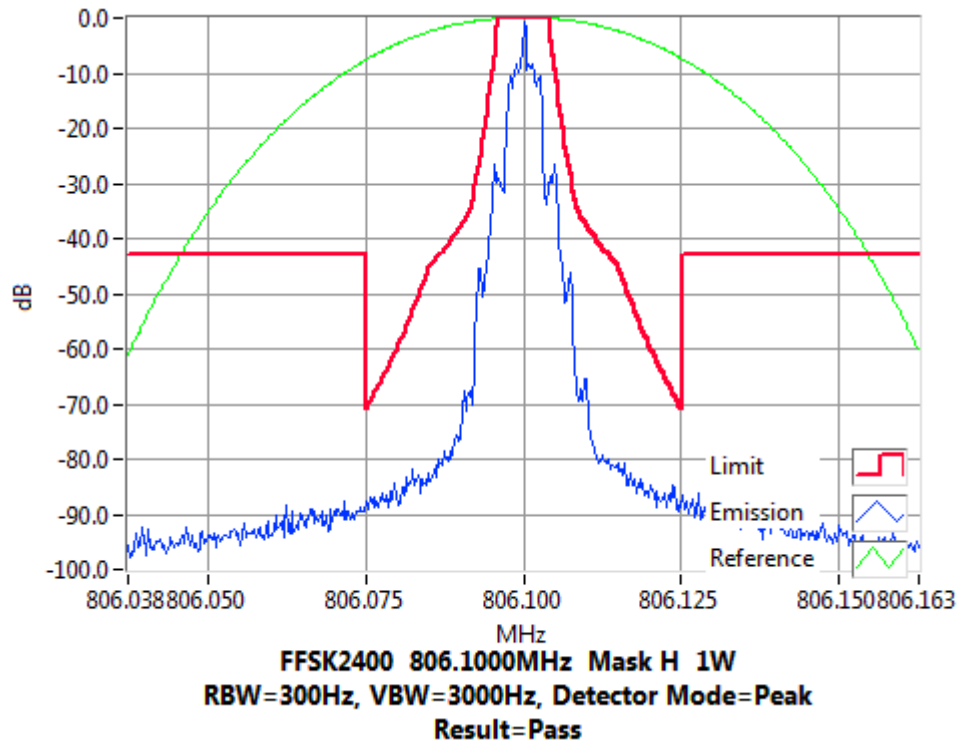
Occupied Bandwidth and Spectrum Masks

FSK 2400 bps

Tx FREQUENCY: 806.1 MHz 1 W 12.5 kHz Channel Spacing



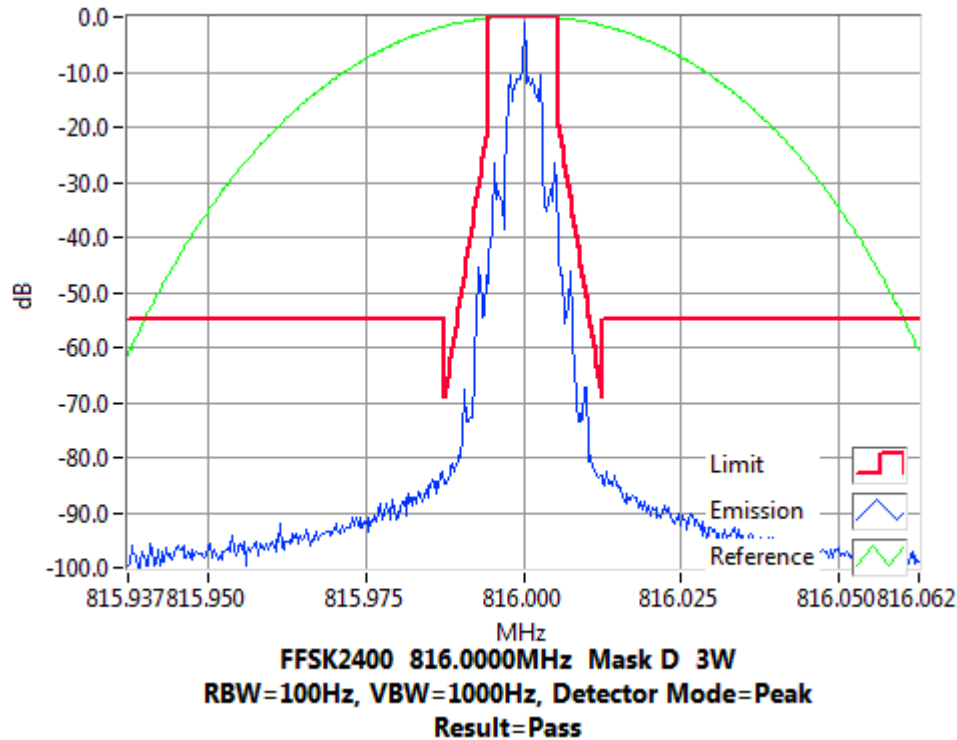
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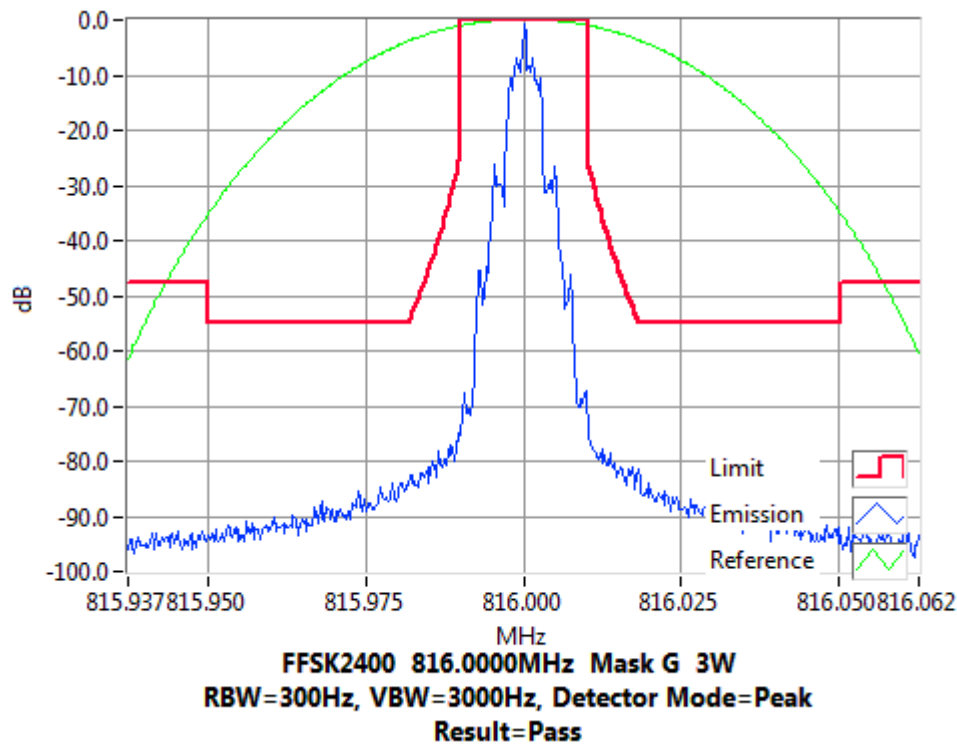
Occupied Bandwidth and Spectrum Masks

FSK 2400 bps

Tx FREQUENCY: 816.0 MHz 3 W 12.5 kHz Channel Spacing



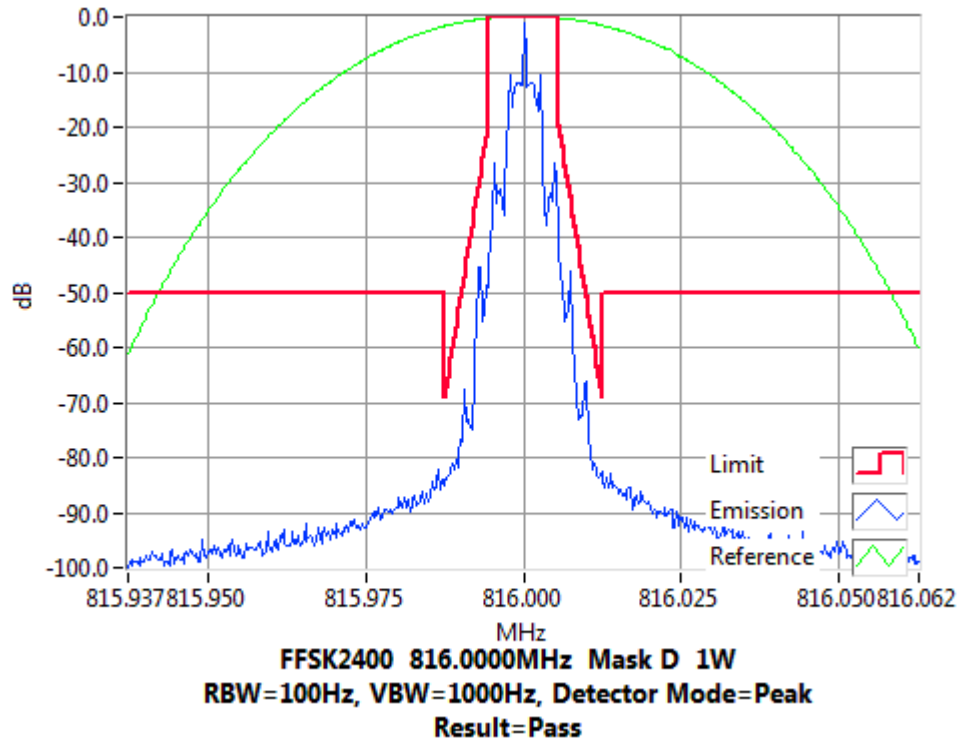
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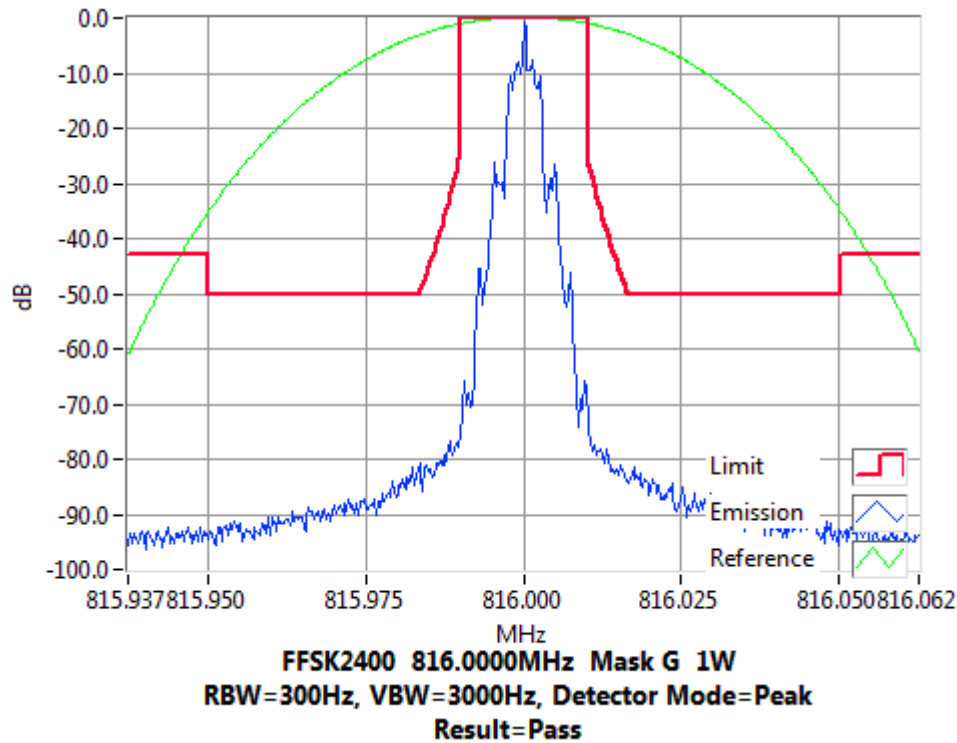
Occupied Bandwidth and Spectrum Masks

FFSK 2400 bps

Tx FREQUENCY: 816.0 MHz 1 W 12.5 kHz Channel Spacing



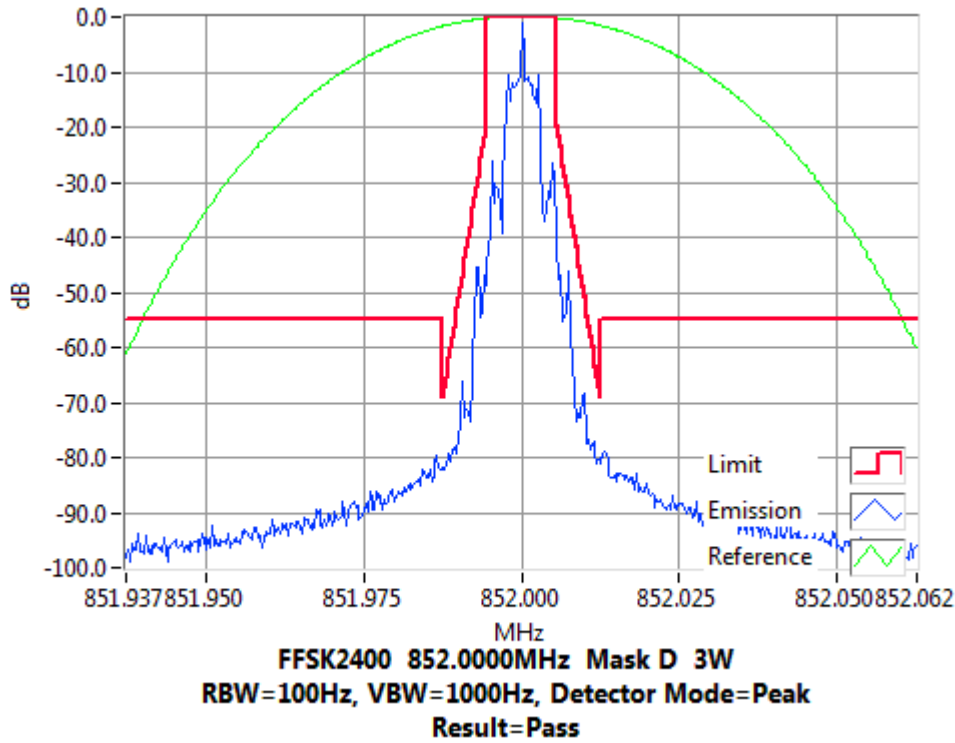
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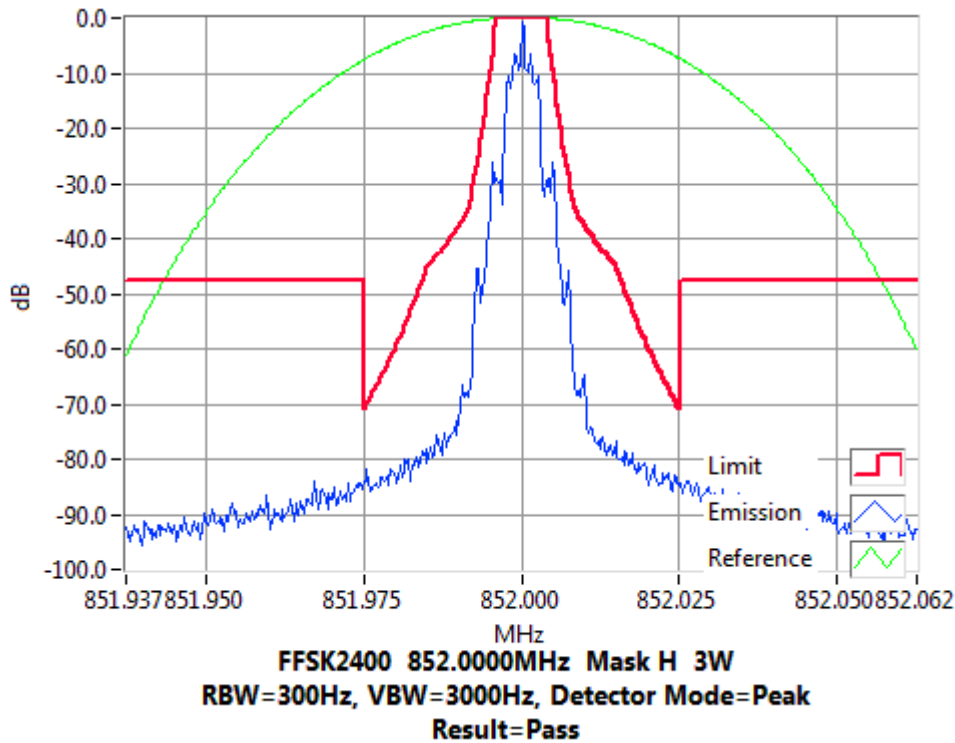
Occupied Bandwidth and Spectrum Masks

FSK 2400 bps

Tx FREQUENCY: 852.0 MHz 3 W 12.5 kHz Channel Spacing



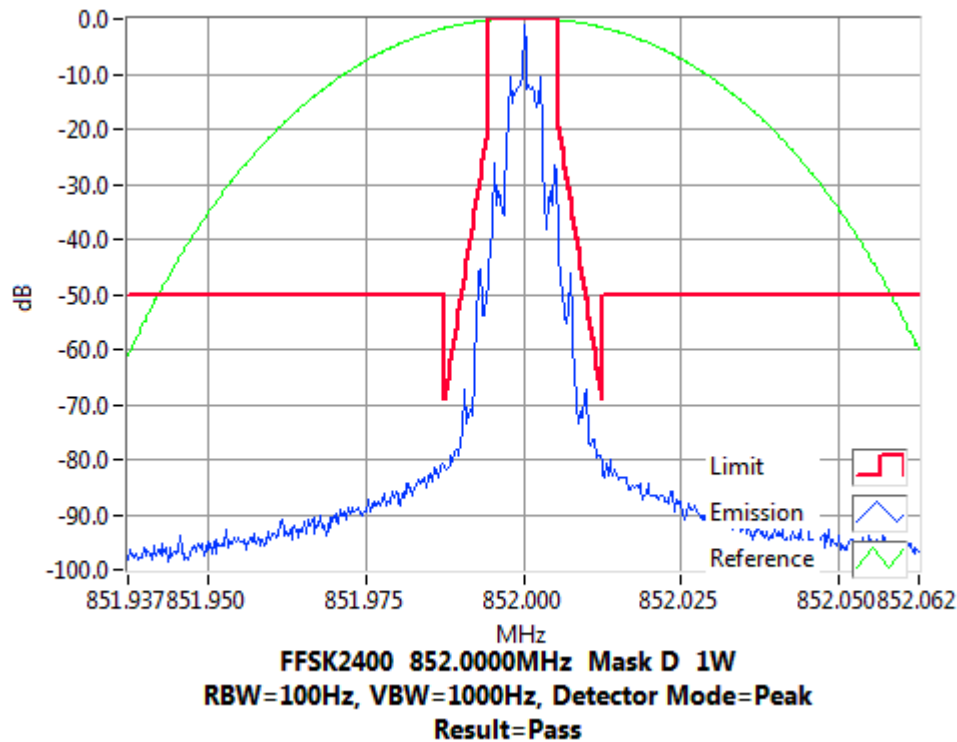
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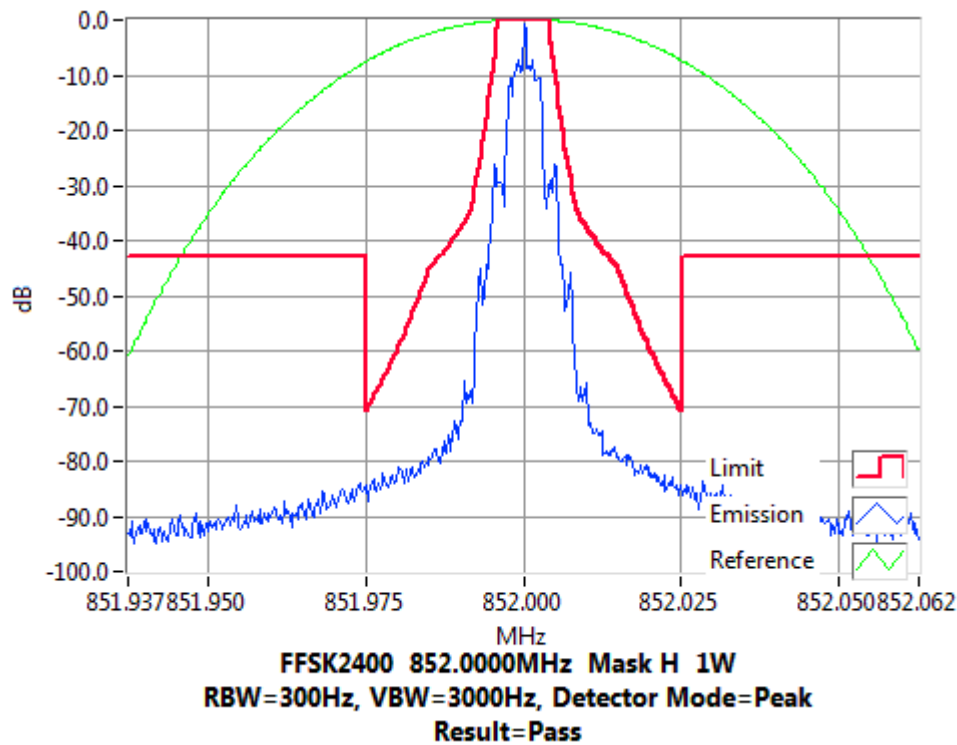
Occupied Bandwidth and Spectrum Masks

FSK 2400 bps

Tx FREQUENCY: 852.0 MHz 1 W 12.5 kHz Channel Spacing



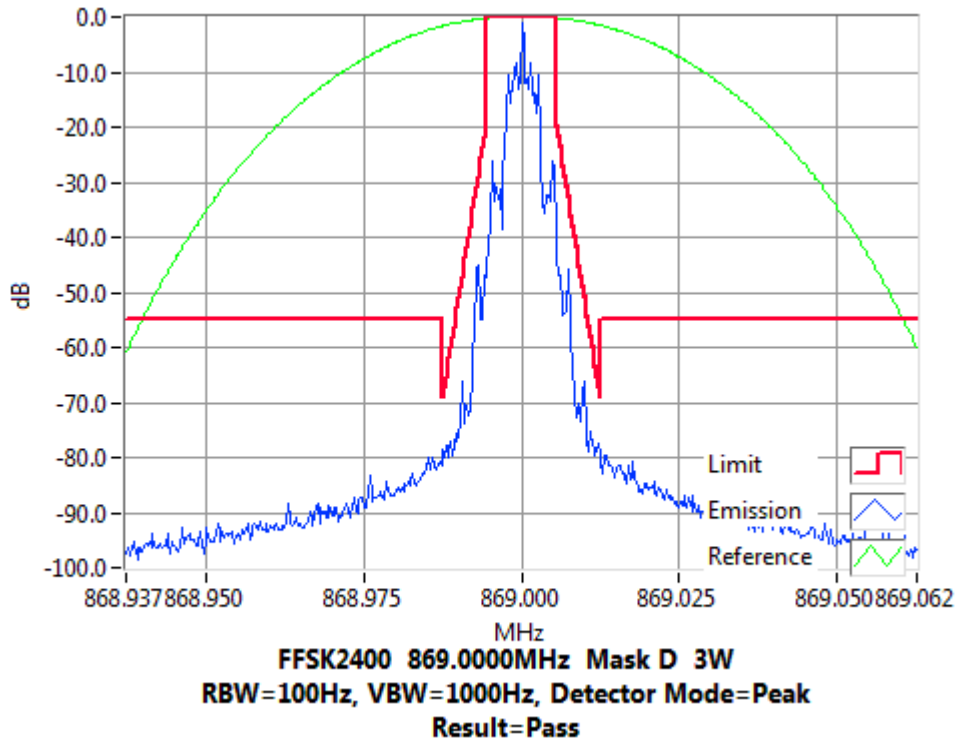
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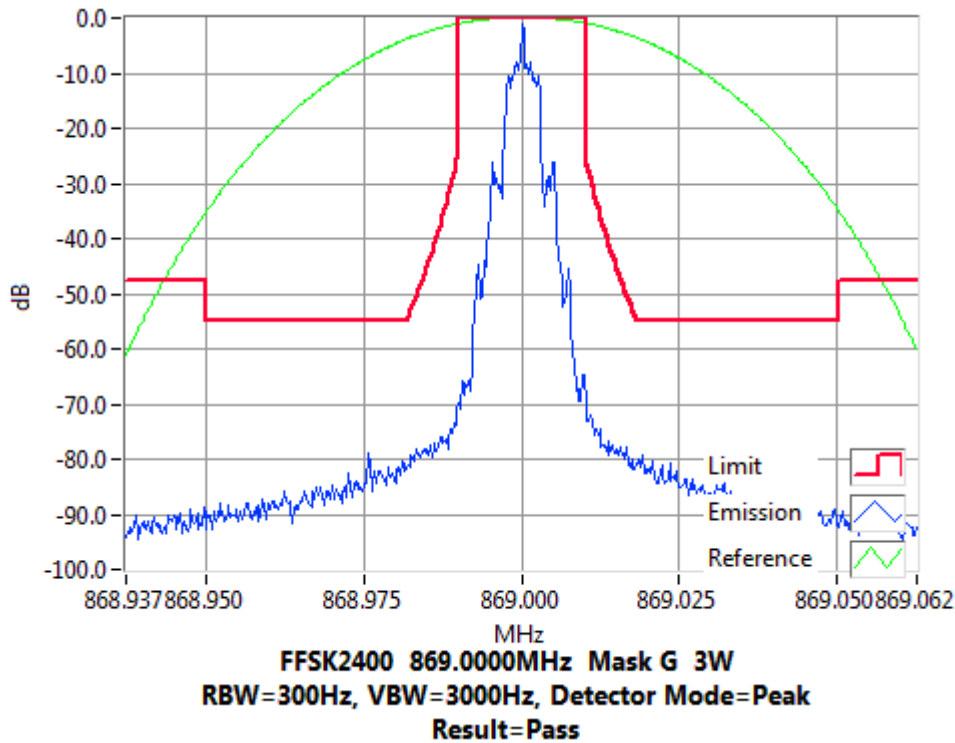
Occupied Bandwidth and Spectrum Masks

FFSK 2400 bps

Tx FREQUENCY: 869.0 MHz 3 W 12.5 kHz Channel Spacing



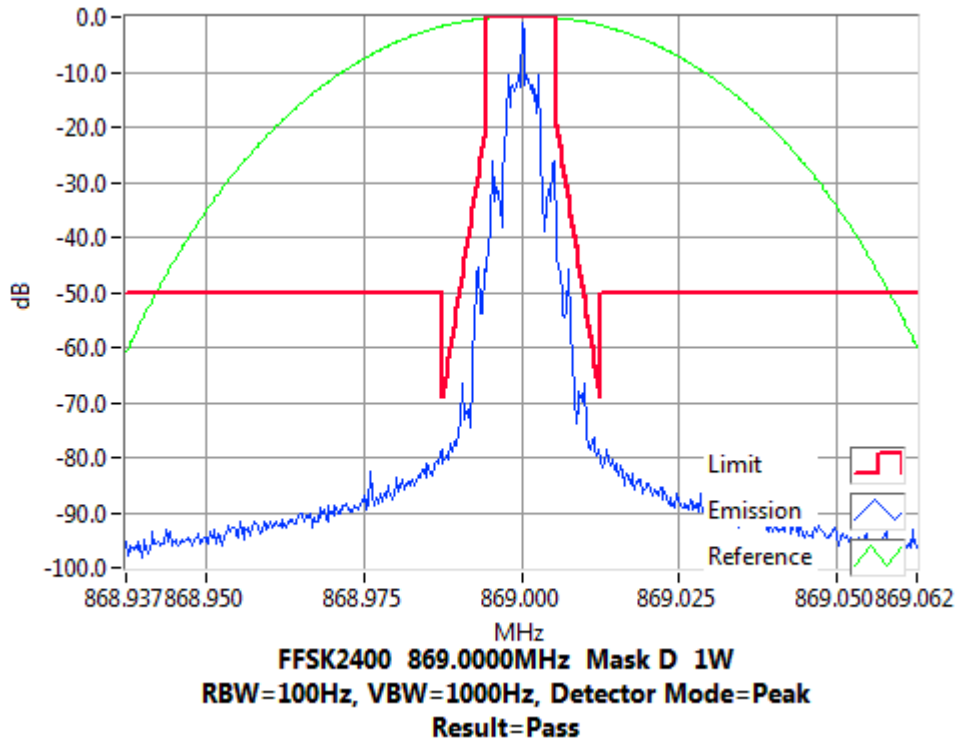
Tx FREQUENCY: 869.0 MHz 3 W 12.5 kHz Channel Spacing



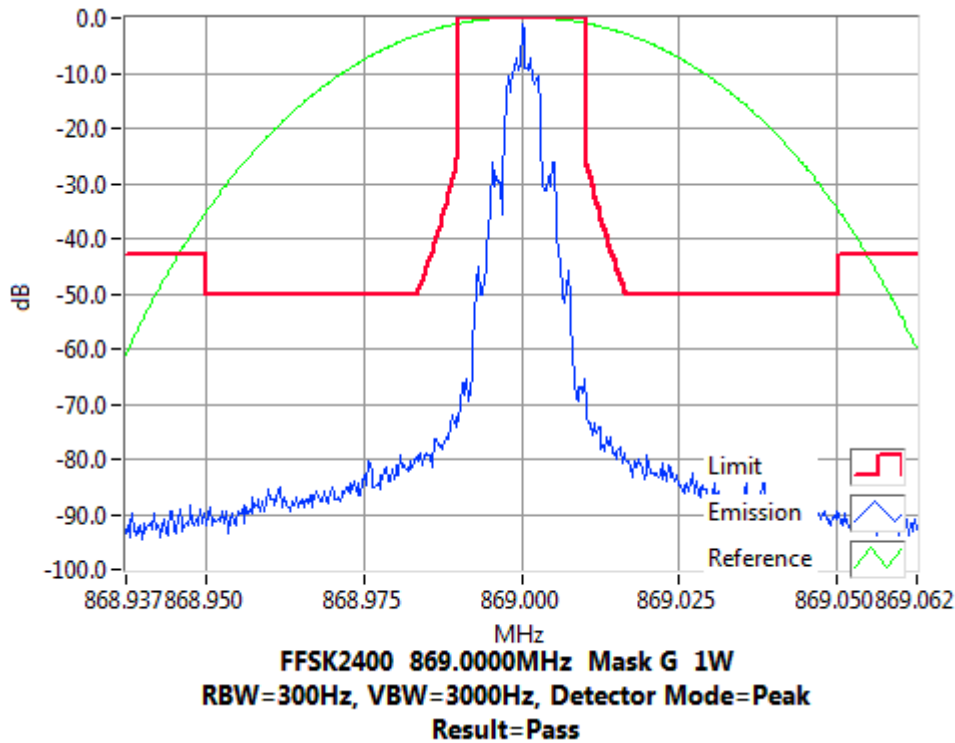
Occupied Bandwidth and Spectrum Masks

FFSK 2400 bps

Tx FREQUENCY: 869.0 MHz 1 W 12.5 kHz Channel Spacing



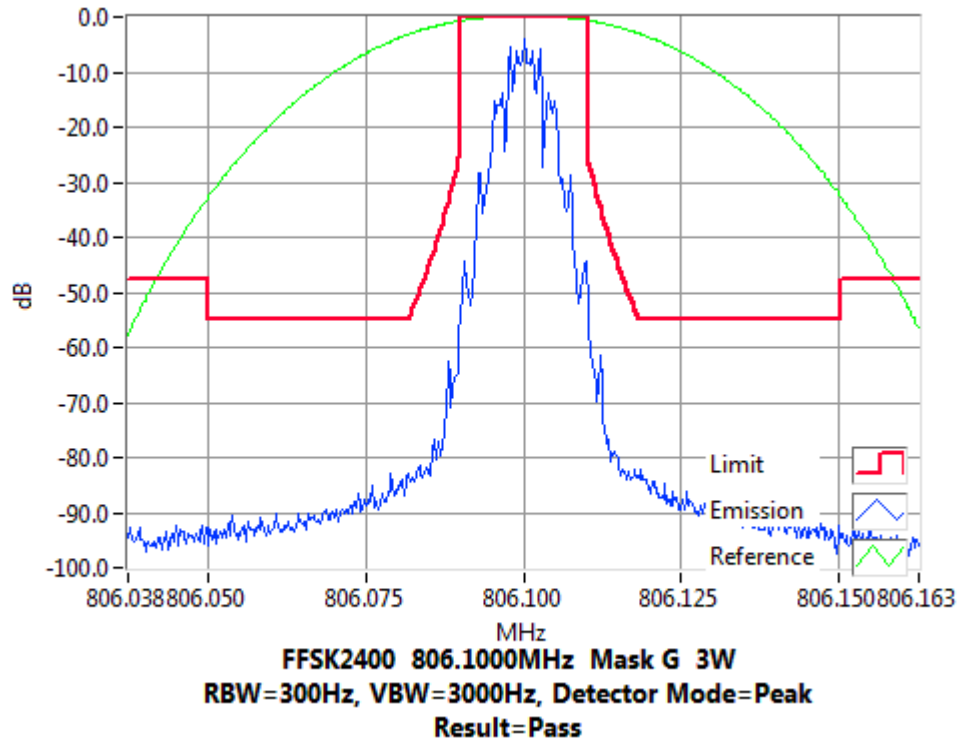
Tx FREQUENCY: 869.0 MHz 1 W 12.5 kHz Channel Spacing



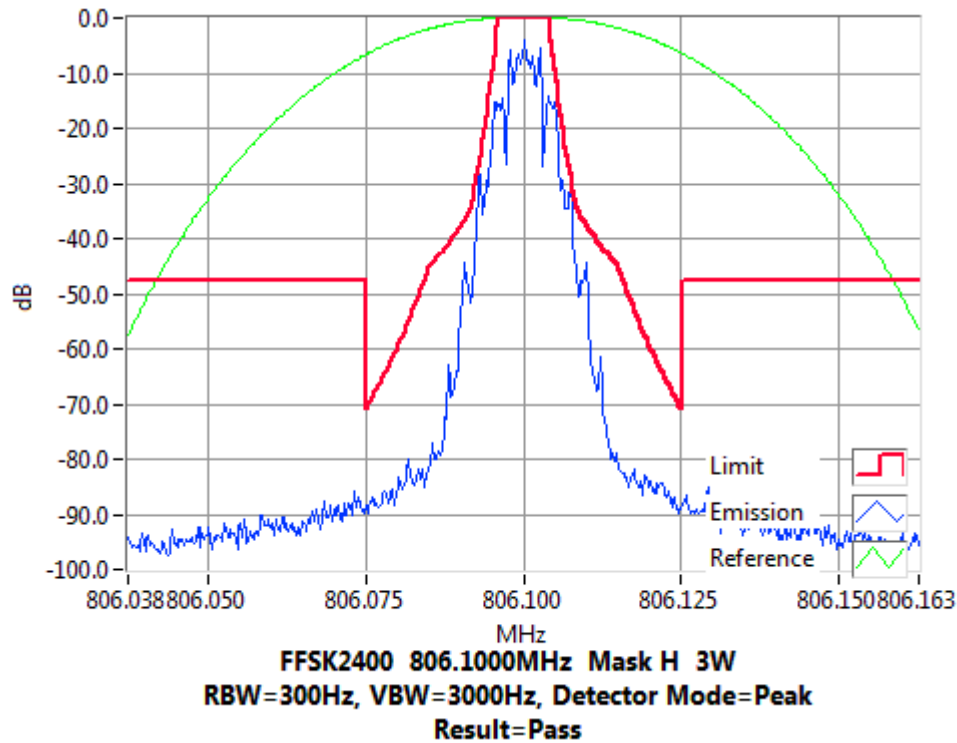
Occupied Bandwidth and Spectrum Masks

FSK 2400 bps

Tx FREQUENCY: 806.1 MHz 3 W 25 kHz Channel Spacing



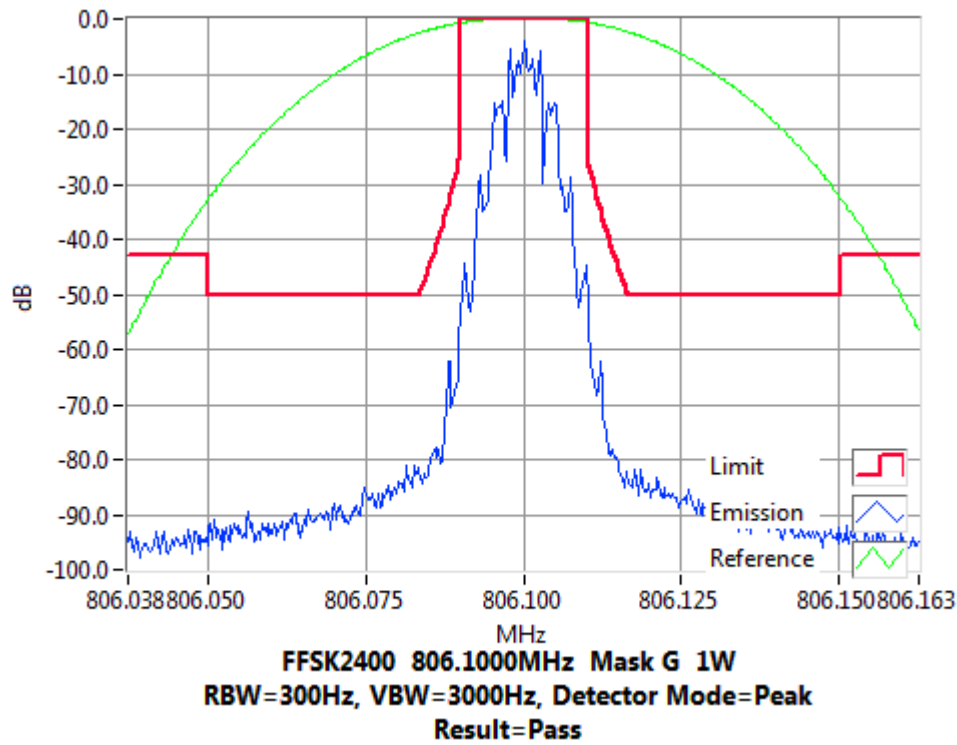
Tx FREQUENCY: 806.1 MHz 3 W 25 kHz Channel Spacing



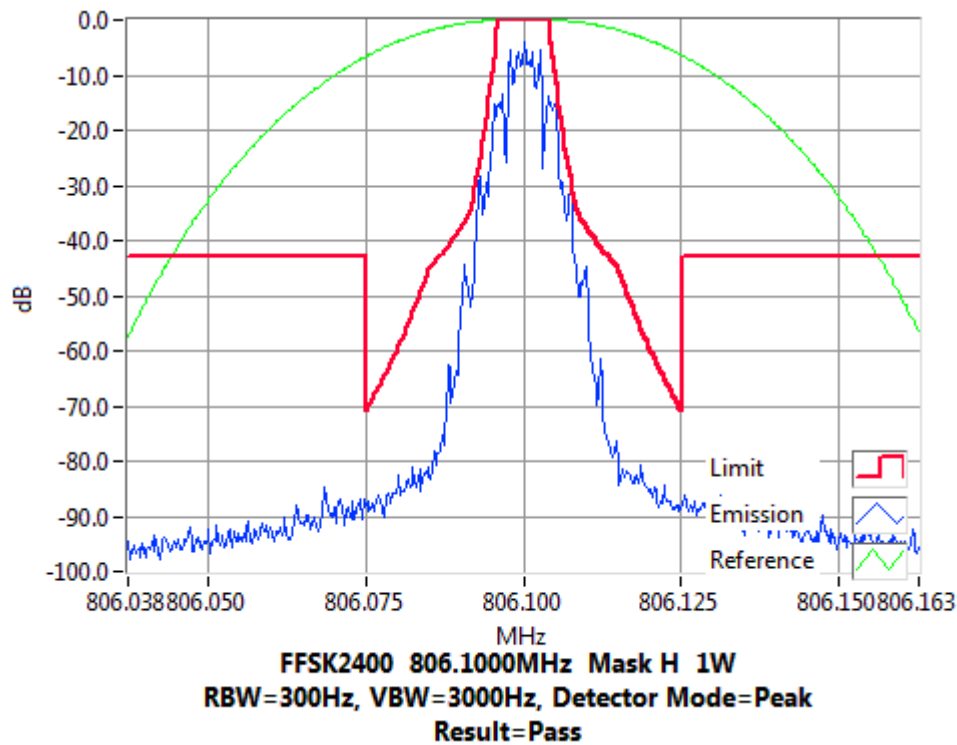
Occupied Bandwidth and Spectrum Masks

FSK 2400 bps

Tx FREQUENCY: 806.1 MHz 1 W 25 kHz Channel Spacing



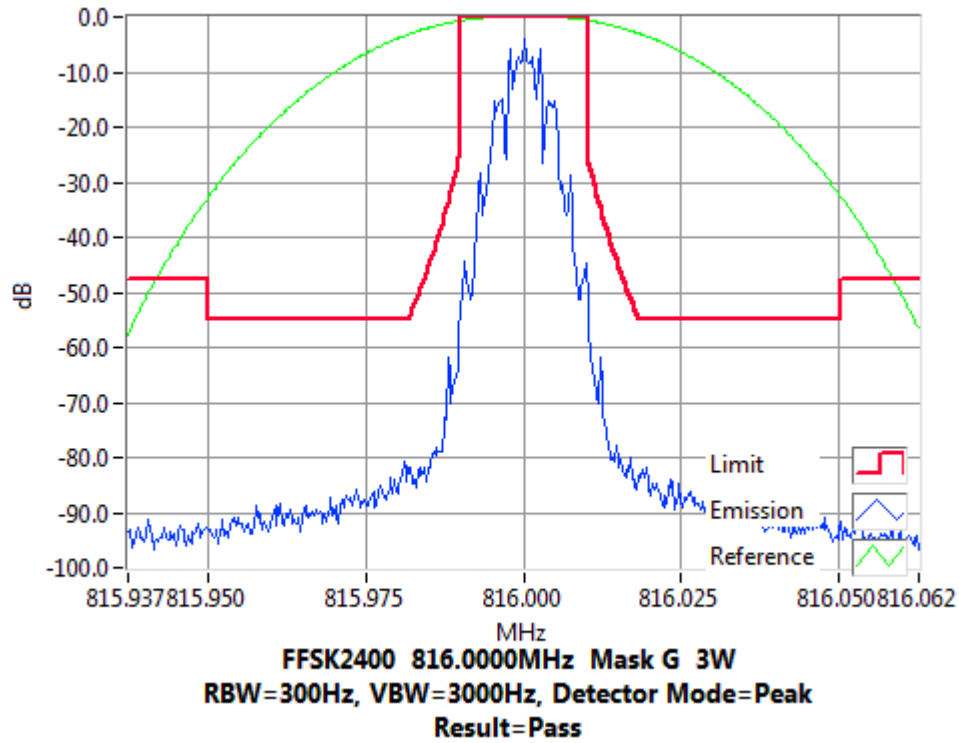
Tx FREQUENCY: 806.1 MHz 1 W 25 kHz Channel Spacing



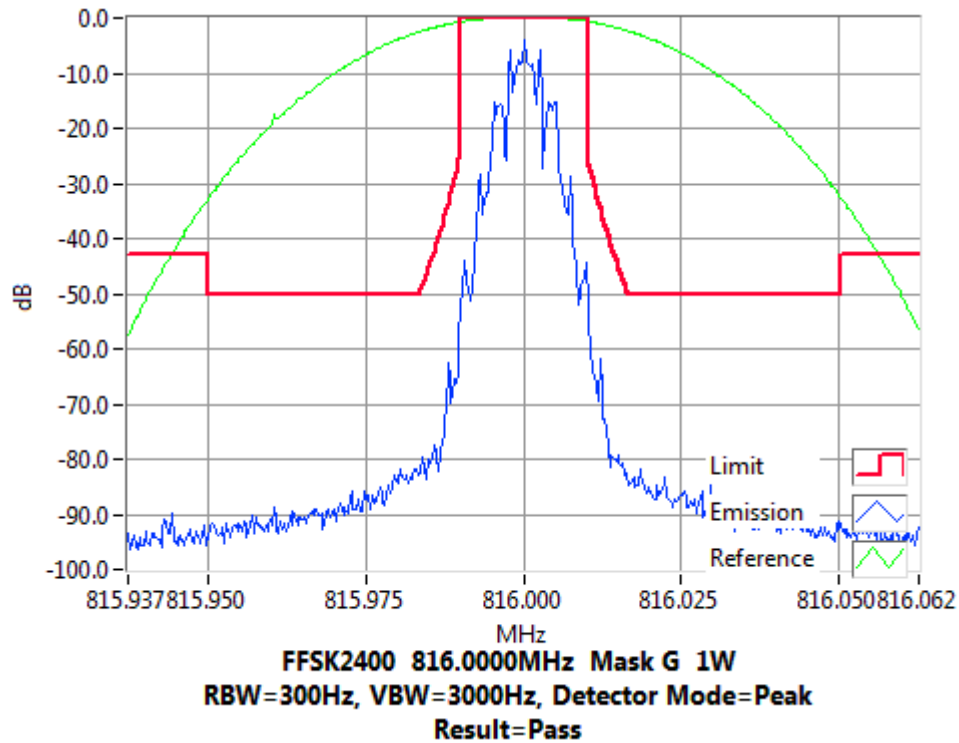
Occupied Bandwidth and Spectrum Masks

FFSK 2400 bps

Tx FREQUENCY: 816.0 MHz 3 W 25 kHz Channel Spacing



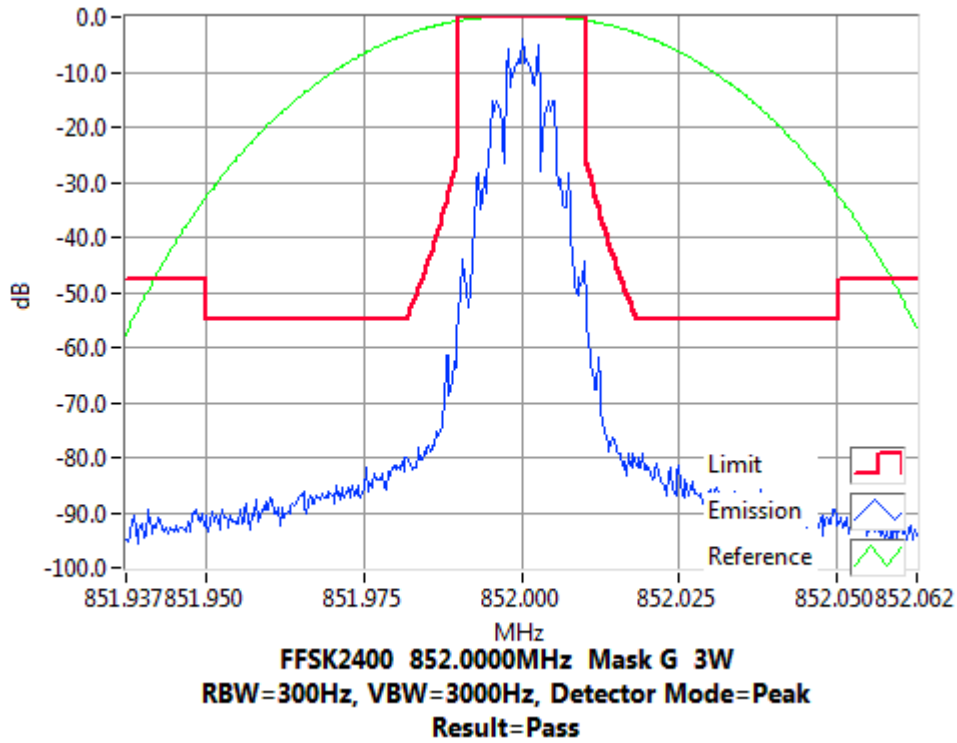
Tx FREQUENCY: 816.0 MHz 1 W 25 kHz Channel Spacing



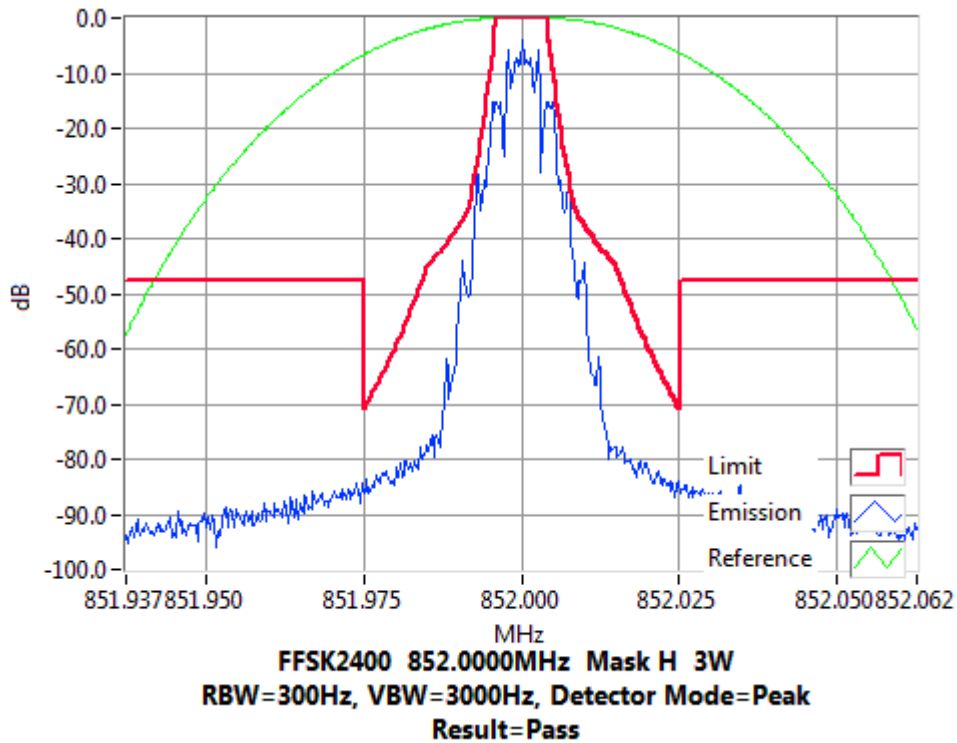
Occupied Bandwidth and Spectrum Masks

FFSK 2400 bps

Tx FREQUENCY: 852.0 MHz 3 W 25 kHz Channel Spacing



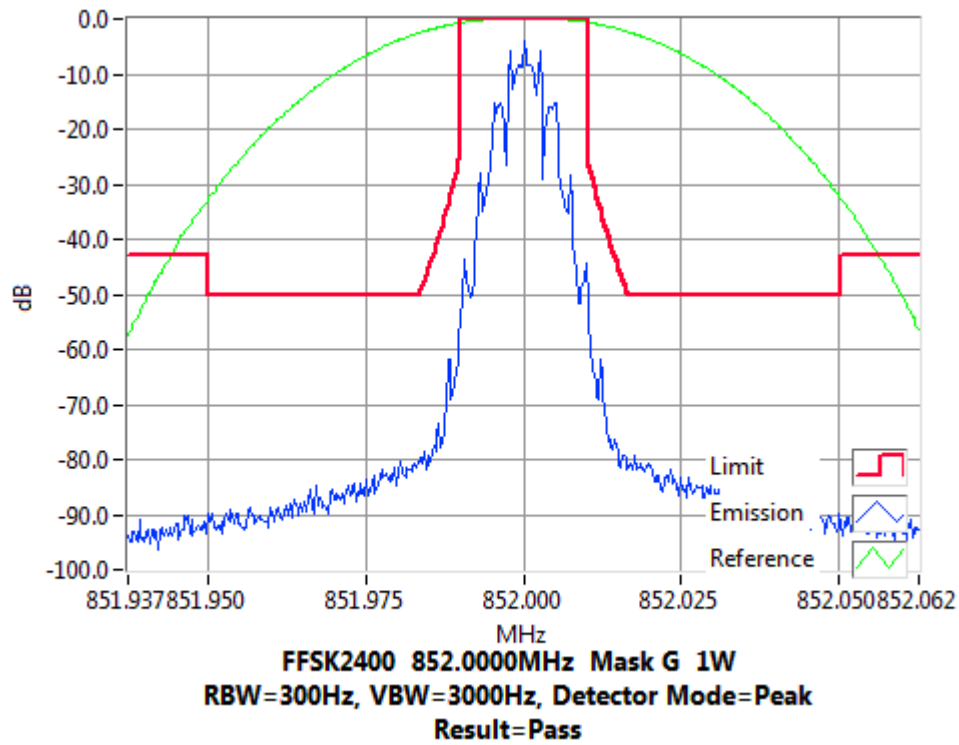
Tx FREQUENCY: 852.0 MHz 3 W 25 kHz Channel Spacing



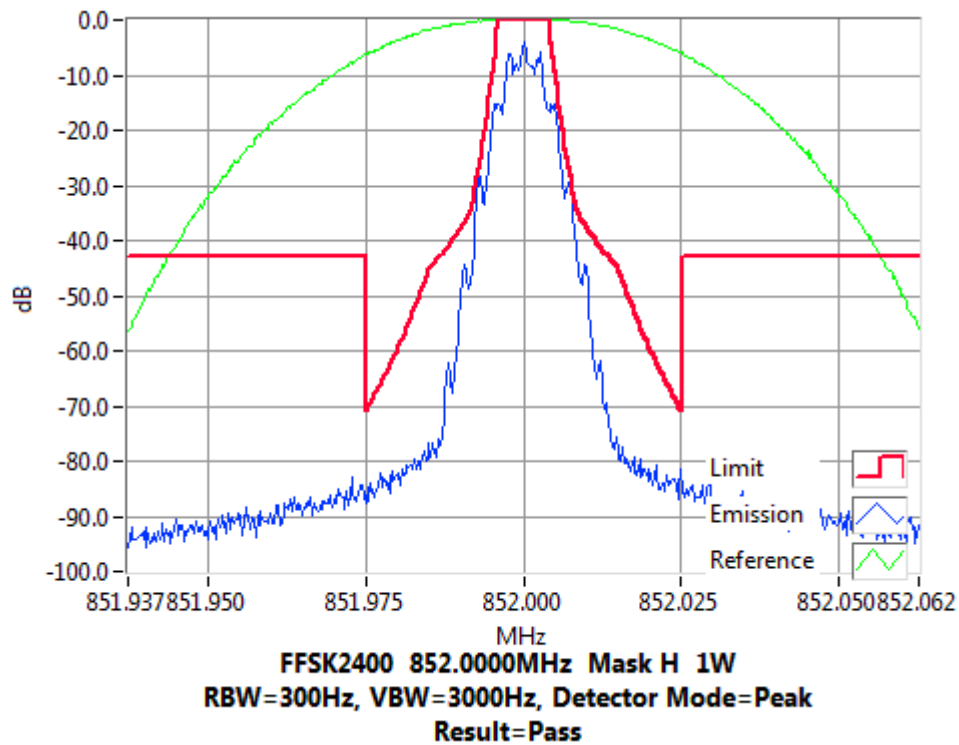
Occupied Bandwidth and Spectrum Masks

FFSK 2400 bps

Tx FREQUENCY: 852.0 MHz 1 W 25 kHz Channel Spacing



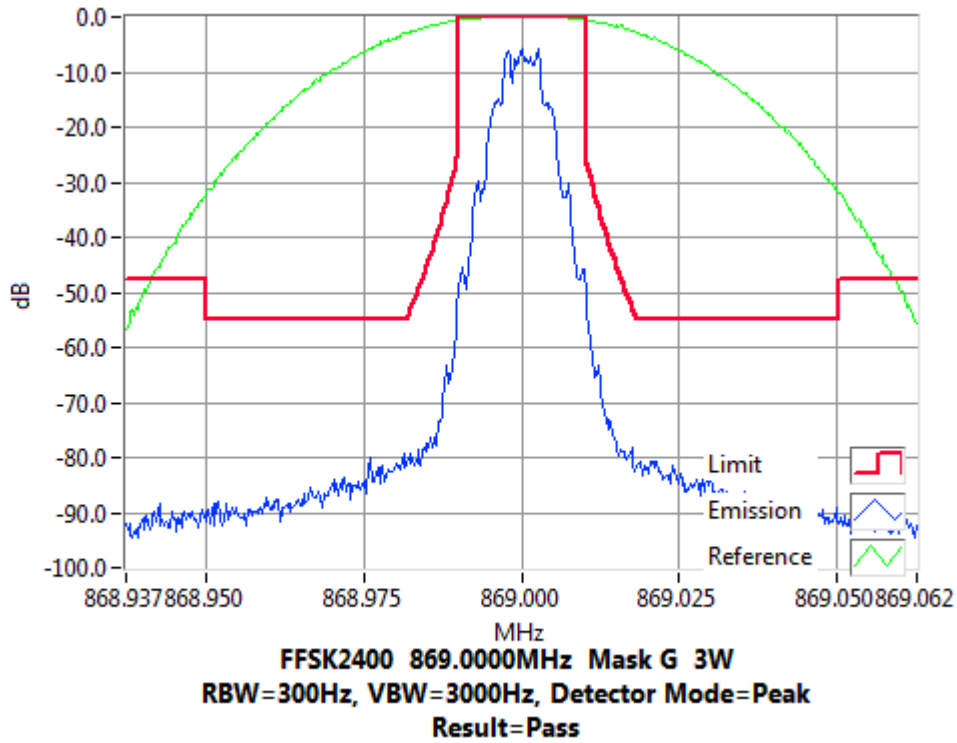
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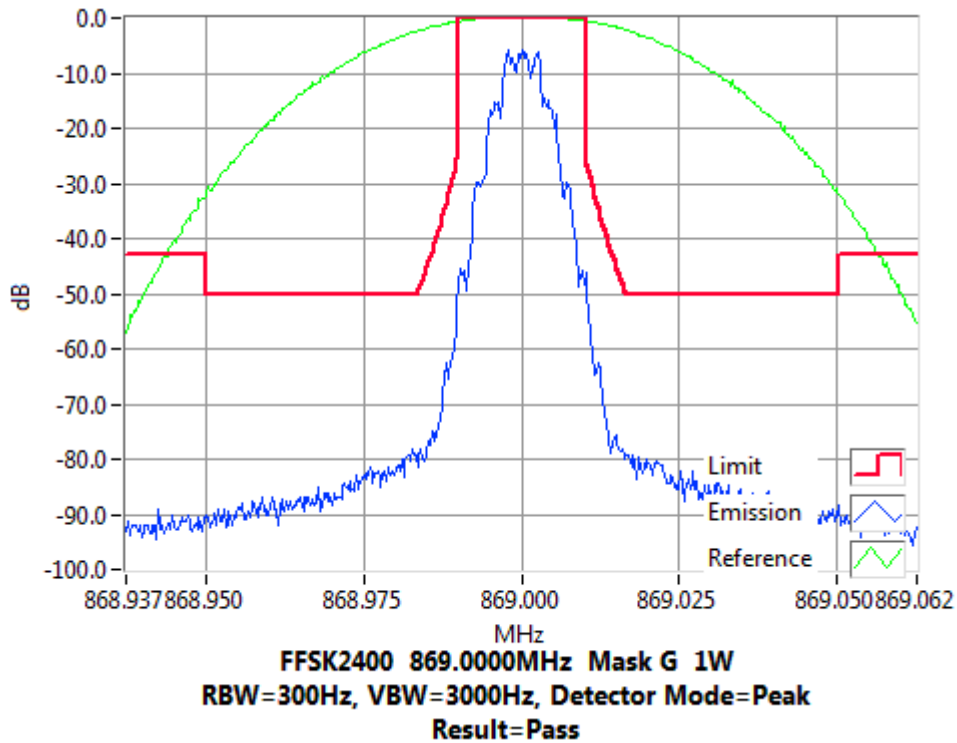
Occupied Bandwidth and Spectrum Masks

FFSK 2400 bps

Tx FREQUENCY: 869.0 MHz 3 W 25 kHz Channel Spacing



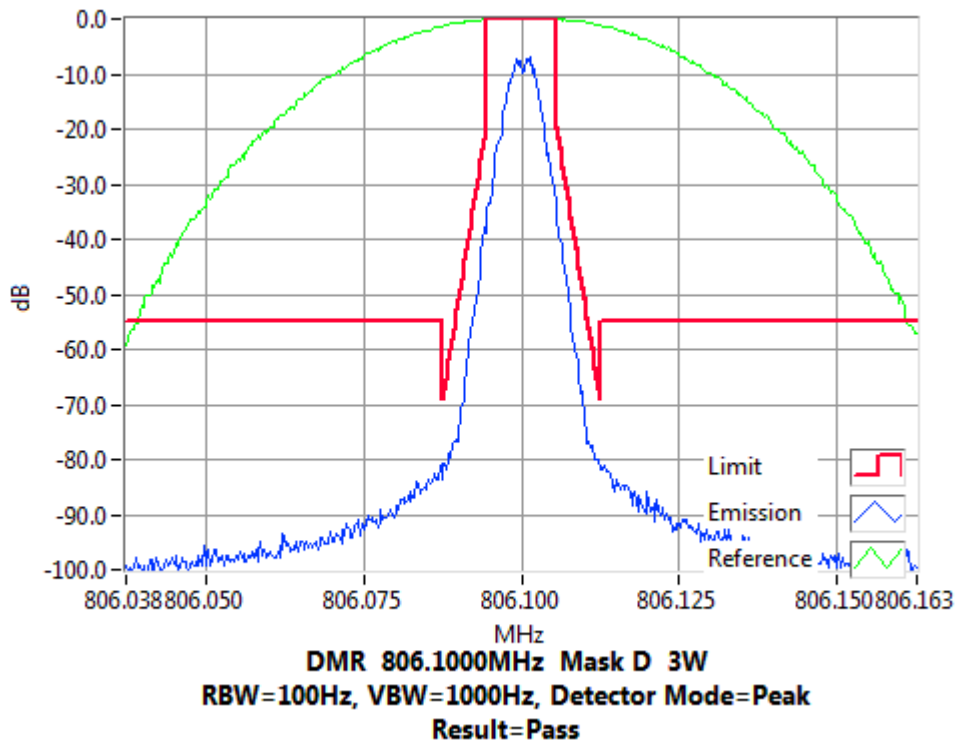
Tx FREQUENCY: 869.0 MHz 1 W 25 kHz Channel Spacing



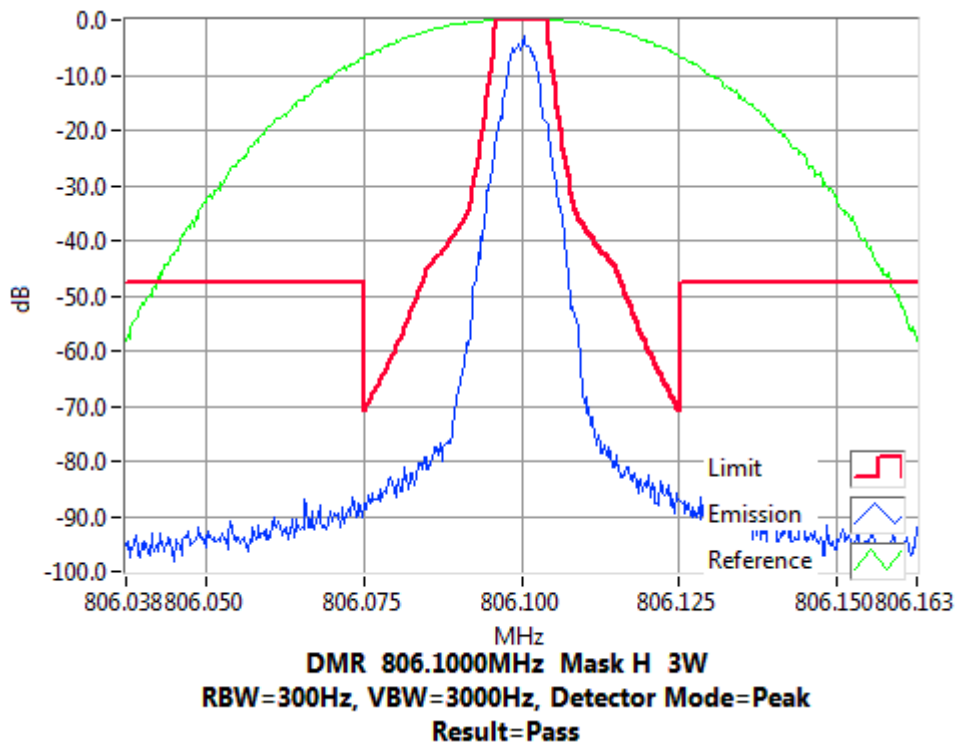
Occupied Bandwidth and Spectrum Masks

DMR

Tx FREQUENCY: 806.1 MHz 3 W 12.5 kHz Channel Spacing



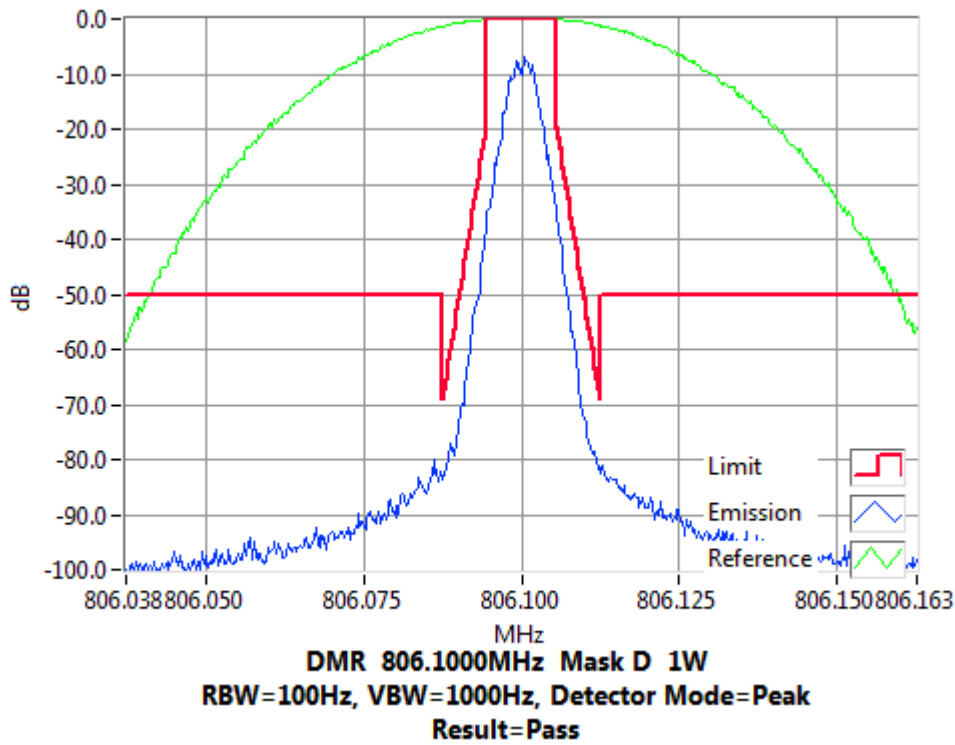
Tx FREQUENCY: 806.1 MHz 3 W 12.5 kHz Channel Spacing



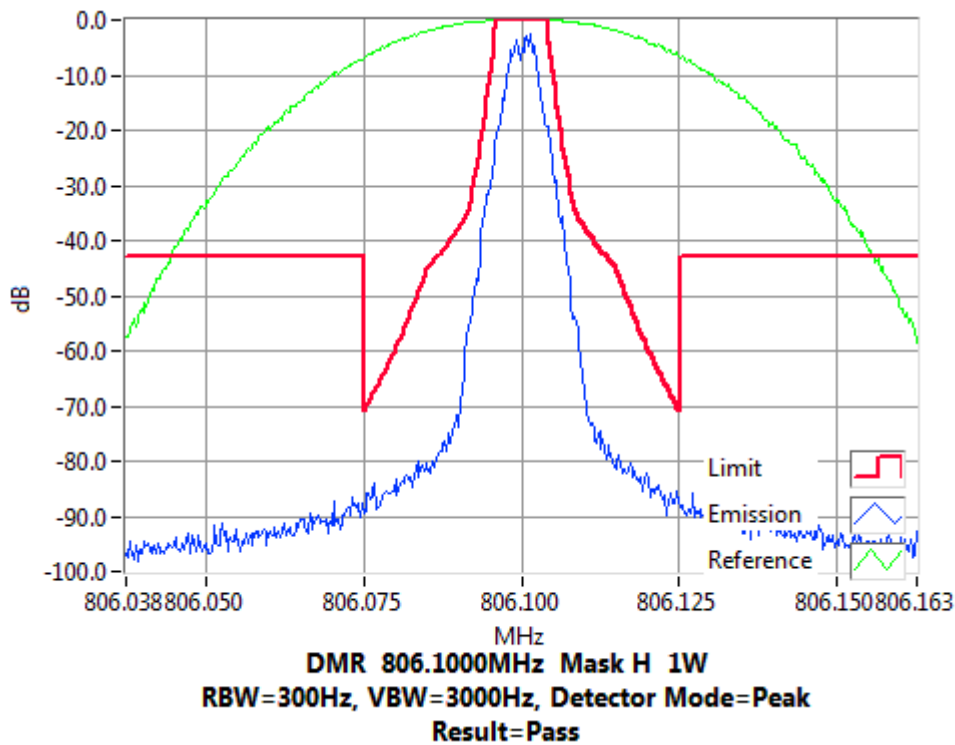
Occupied Bandwidth and Spectrum Masks

DMR

Tx FREQUENCY: 806.1 MHz 1 W 12.5 kHz Channel Spacing



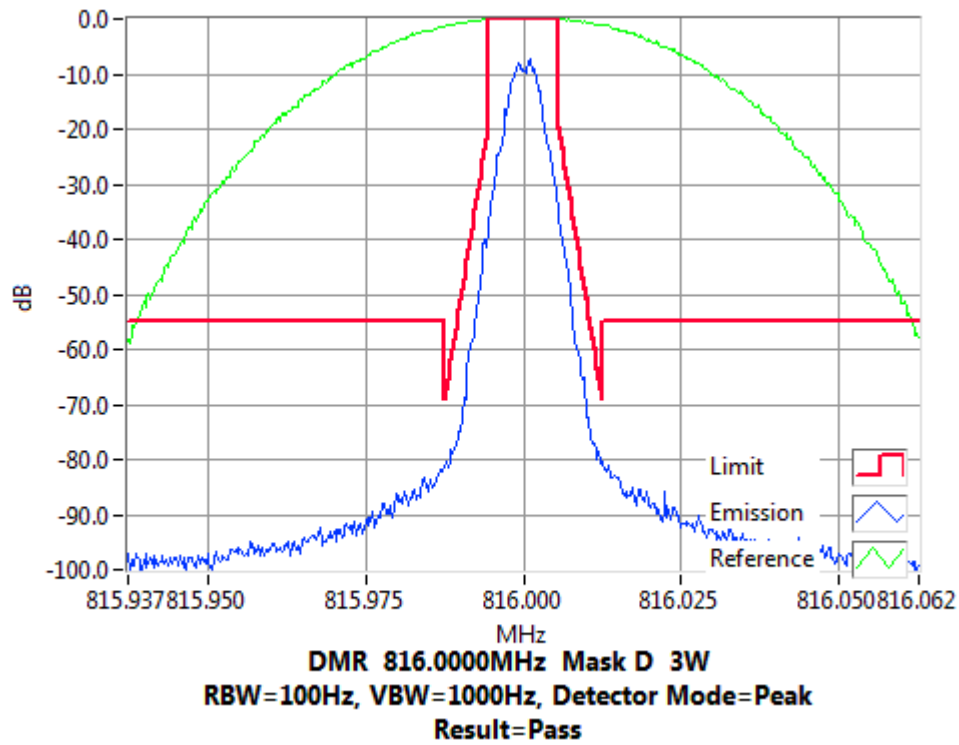
Tx FREQUENCY: 806.1 MHz 1 W 12.5 kHz Channel Spacing



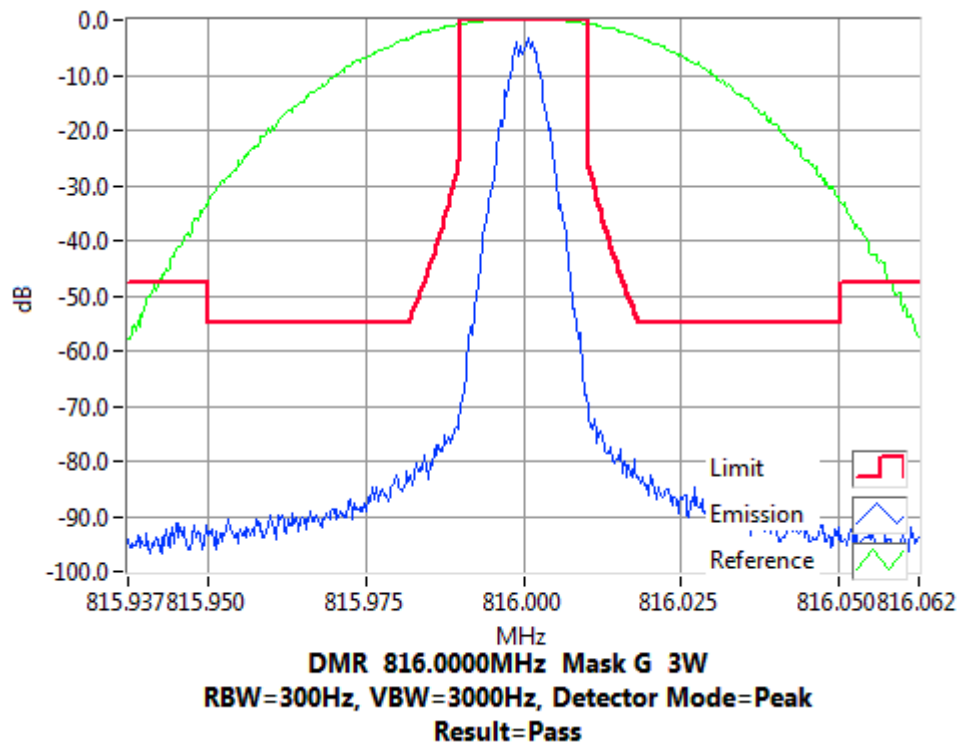
Occupied Bandwidth and Spectrum Masks

DMR

Tx FREQUENCY: 816.0 MHz 3 W 12.5 kHz Channel Spacing



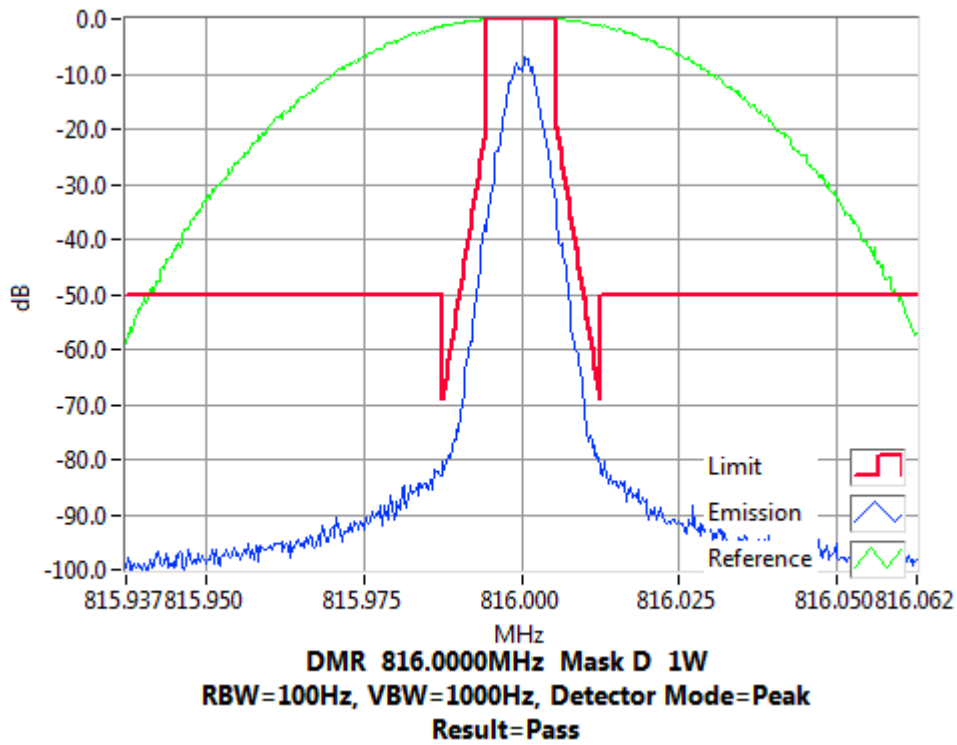
Tx FREQUENCY: 816.0 MHz 3 W 12.5 kHz Channel Spacing



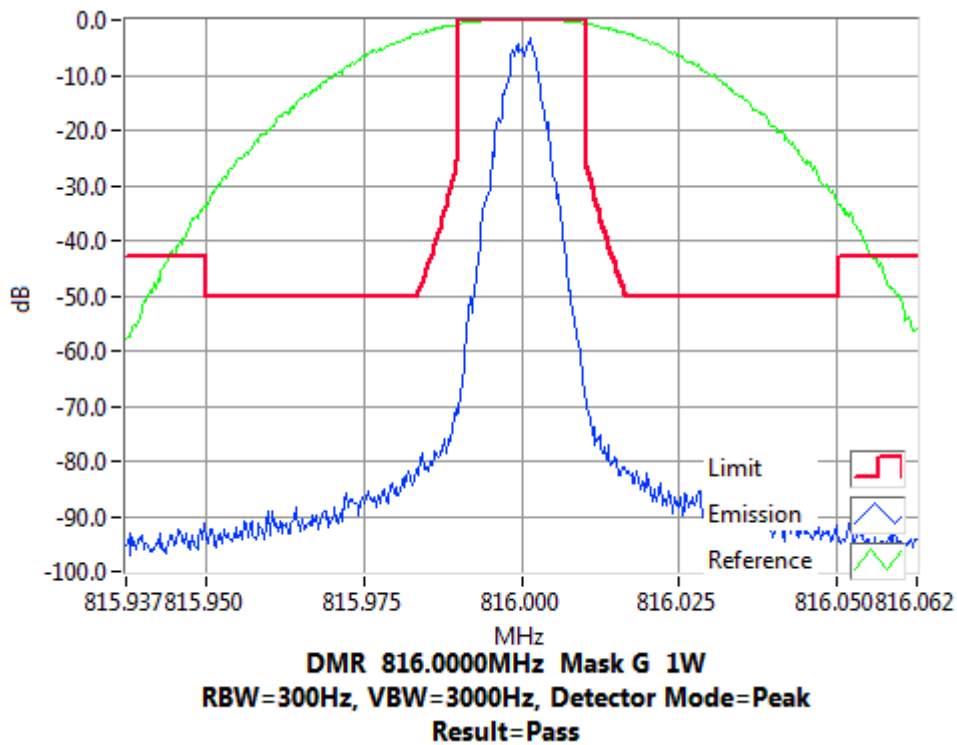
Occupied Bandwidth and Spectrum Masks

DMR

Tx FREQUENCY: 816.0 MHz 1 W 12.5 kHz Channel Spacing



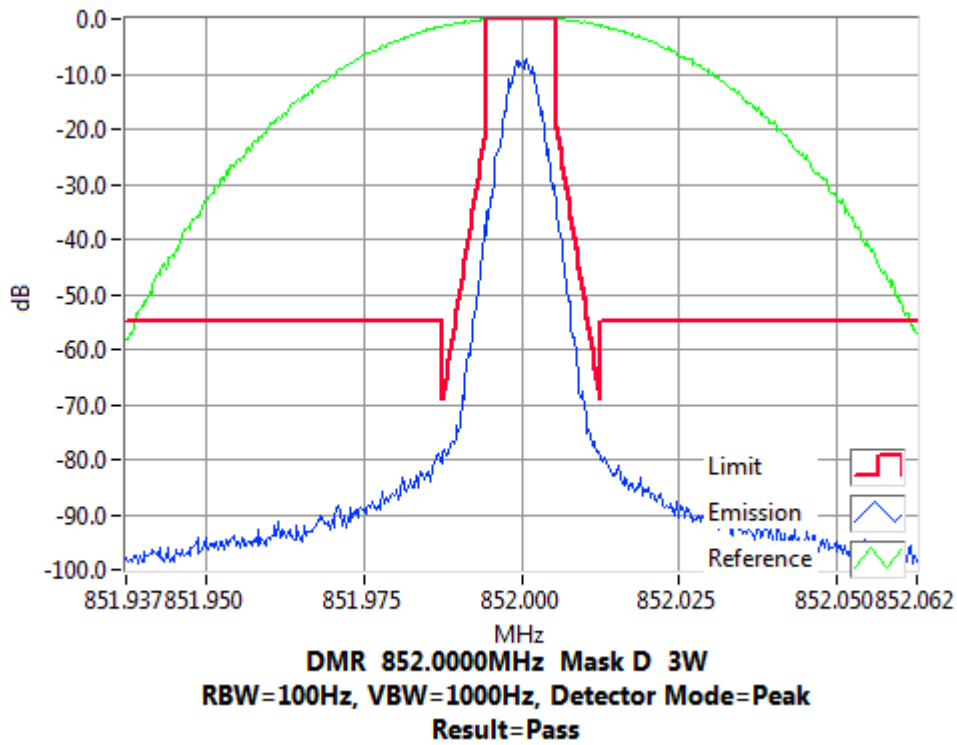
Tx FREQUENCY: 816.0 MHz 1 W 12.5 kHz Channel Spacing



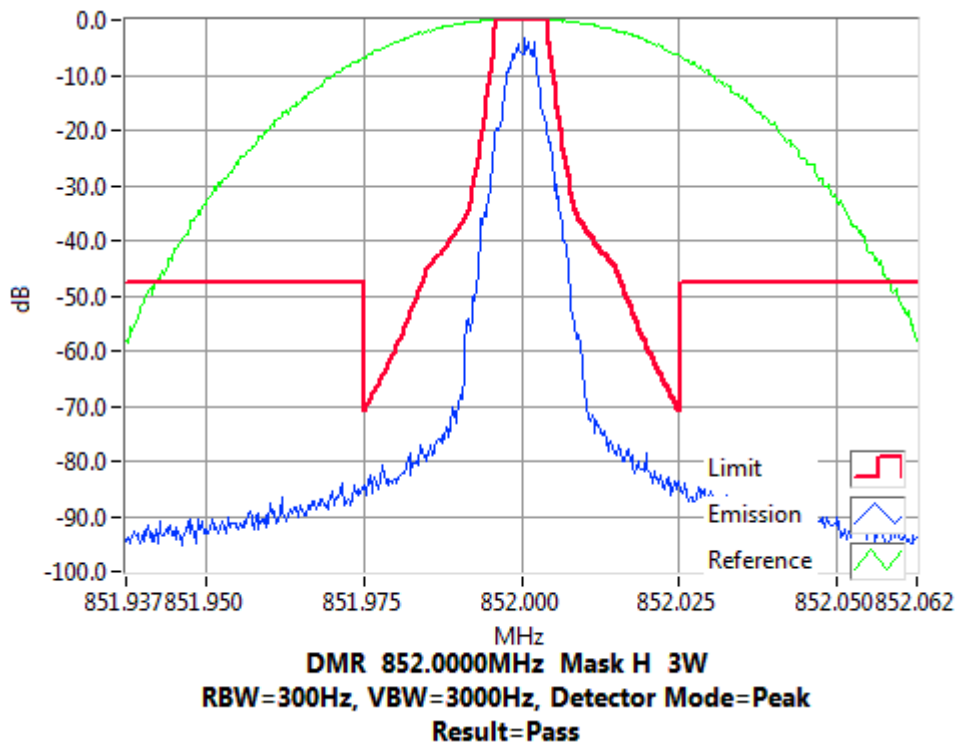
Occupied Bandwidth and Spectrum Masks

DMR

Tx FREQUENCY: 852.0 MHz 3 W 12.5 kHz Channel Spacing



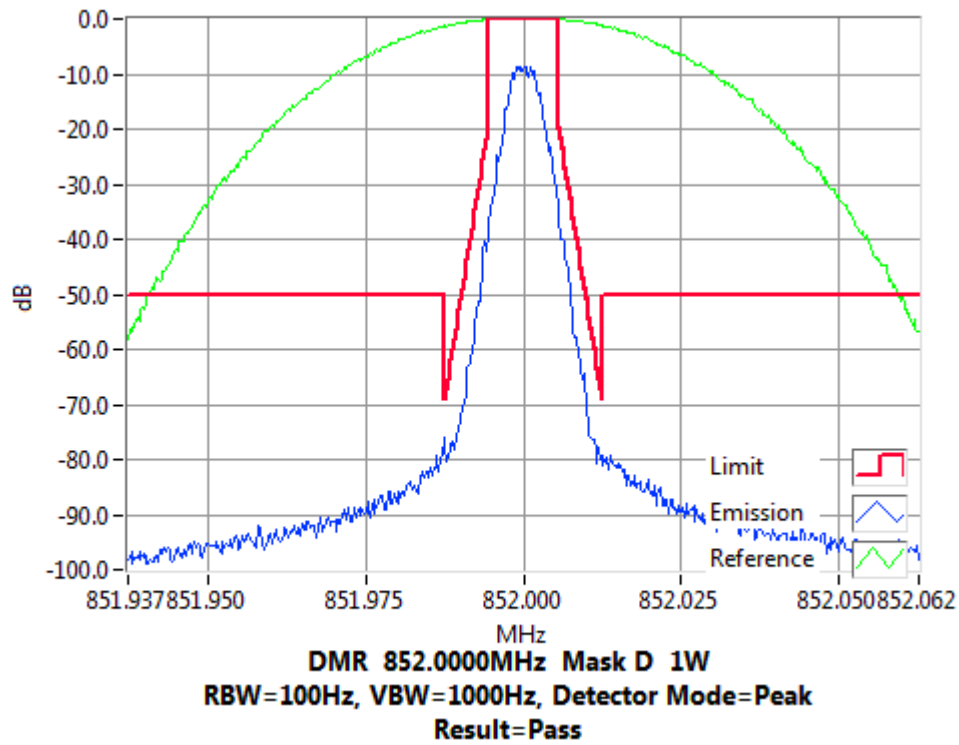
Tx FREQUENCY: 852.0 MHz 3 W 12.5 kHz Channel Spacing



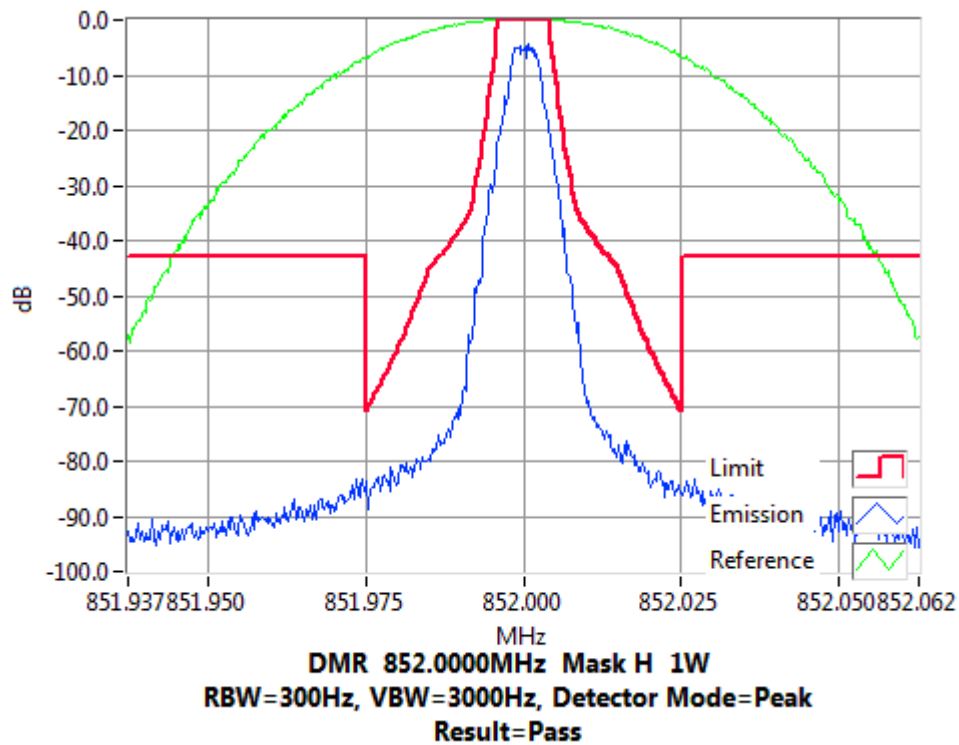
Occupied Bandwidth and Spectrum Masks

DMR

Tx FREQUENCY: 852.0 MHz 1 W 12.5 kHz Channel Spacing



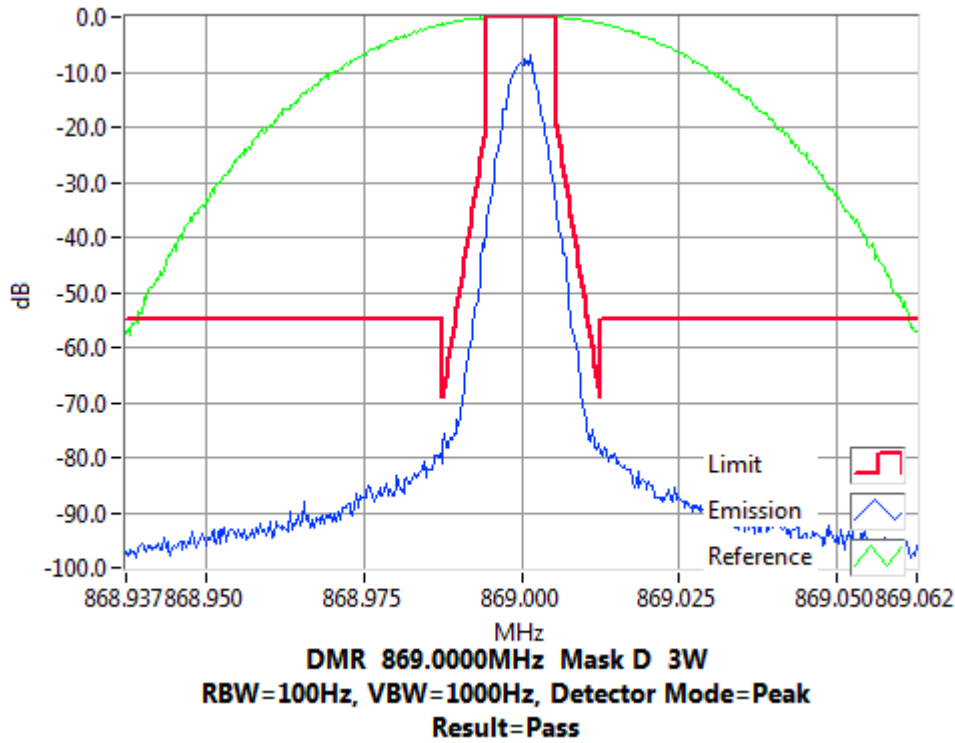
Tx FREQUENCY: 852.0 MHz 1 W 12.5 kHz Channel Spacing



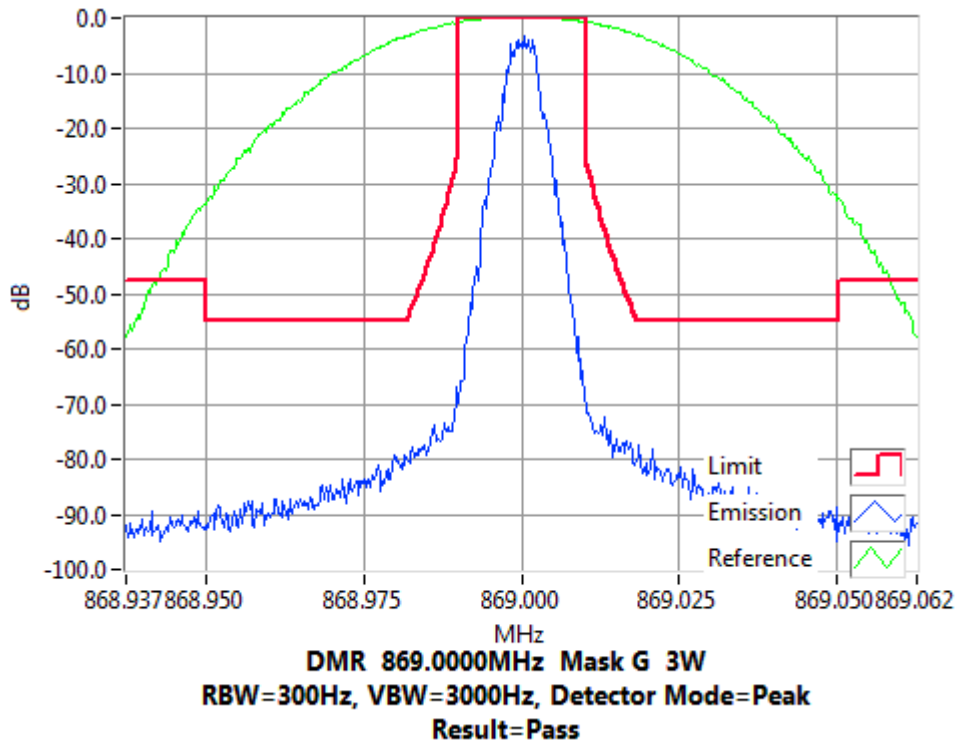
Occupied Bandwidth and Spectrum Masks

DMR

Tx FREQUENCY: 869.0 MHz 3 W 12.5 kHz Channel Spacing



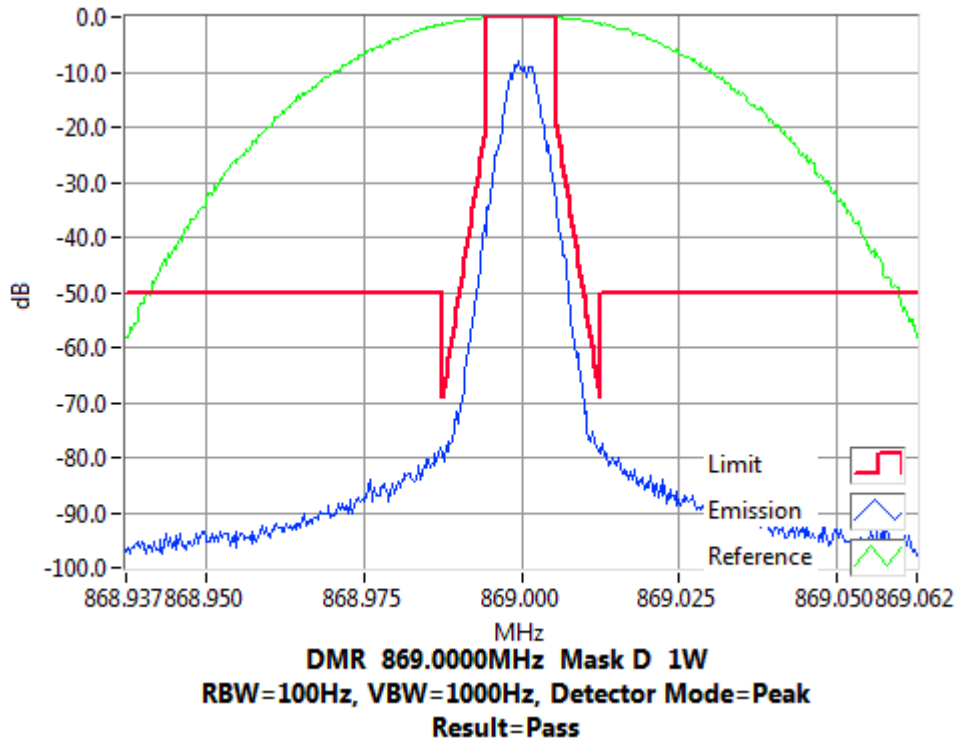
Tx FREQUENCY: 869.0 MHz 3 W 12.5 kHz Channel Spacing



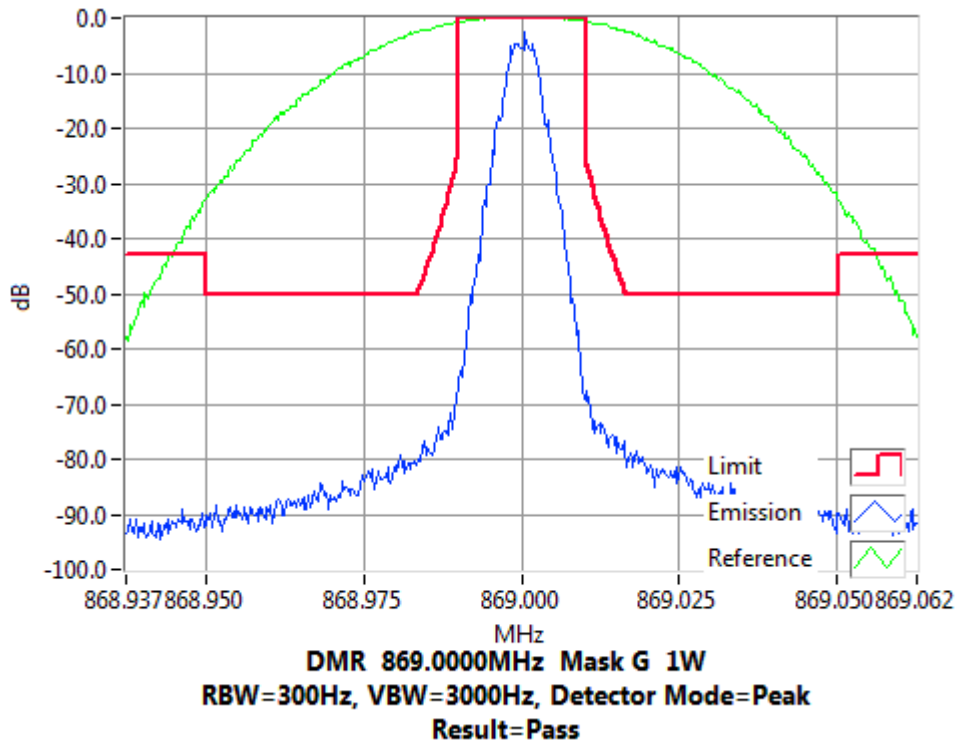
Occupied Bandwidth and Spectrum Masks

DMR

Tx FREQUENCY: 869.0 MHz 1 W 12.5 kHz Channel Spacing



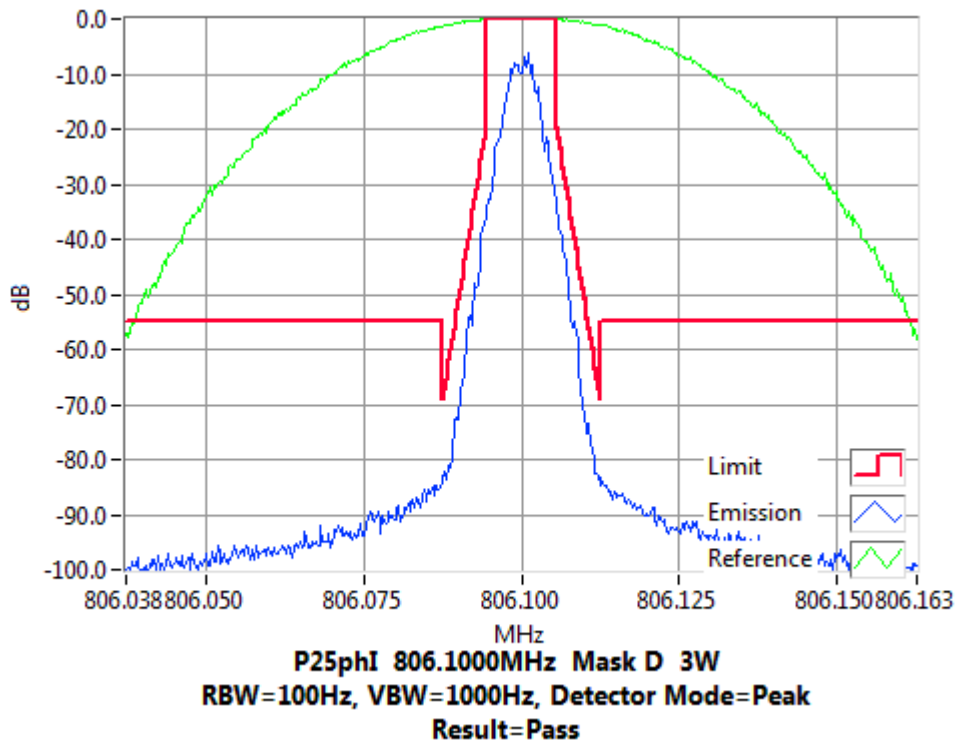
Tx FREQUENCY: 869.0 MHz 1 W 12.5 kHz Channel Spacing



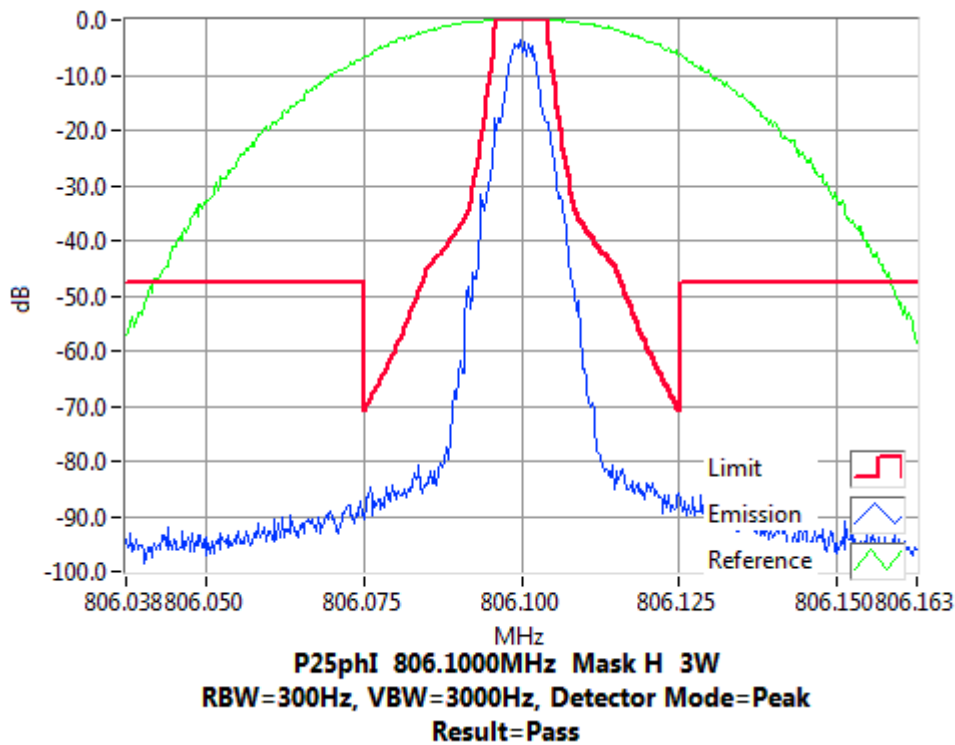
Occupied Bandwidth and Spectrum Masks

APCO P25 phase-1

Tx FREQUENCY: 806.1 MHz 3 W 12.5 kHz Channel Spacing



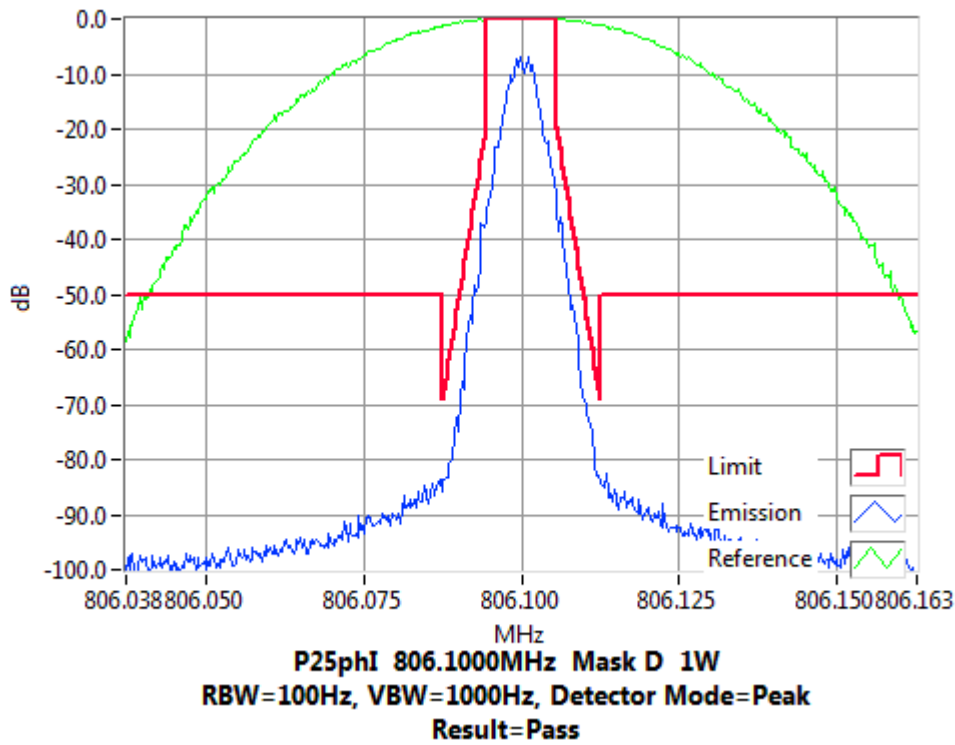
Tx FREQUENCY: 806.1 MHz 3 W 12.5 kHz Channel Spacing



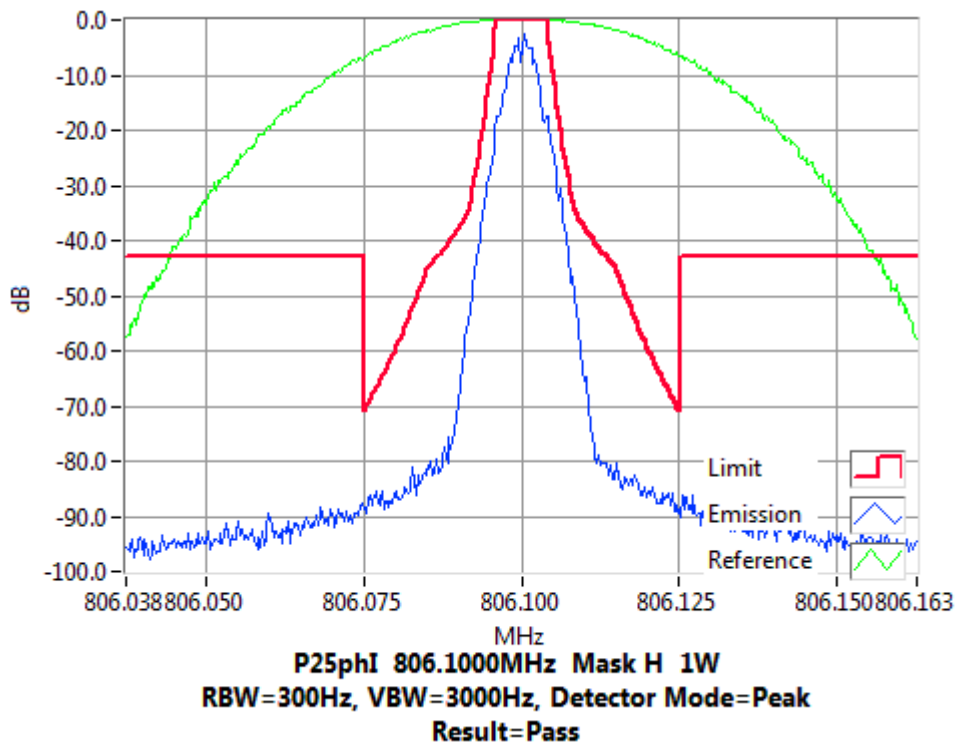
Occupied Bandwidth and Spectrum Masks

APCO P25 phase-1

Tx FREQUENCY: 806.1 MHz 1 W 12.5 kHz Channel Spacing



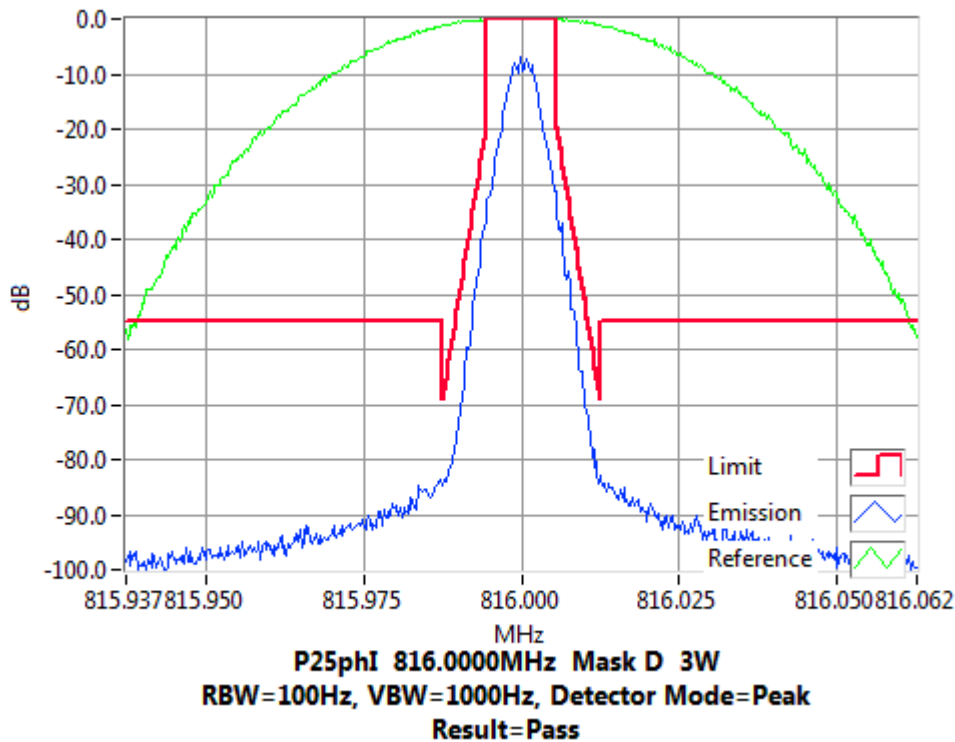
Tx FREQUENCY: 806.1 MHz 1 W 12.5 kHz Channel Spacing



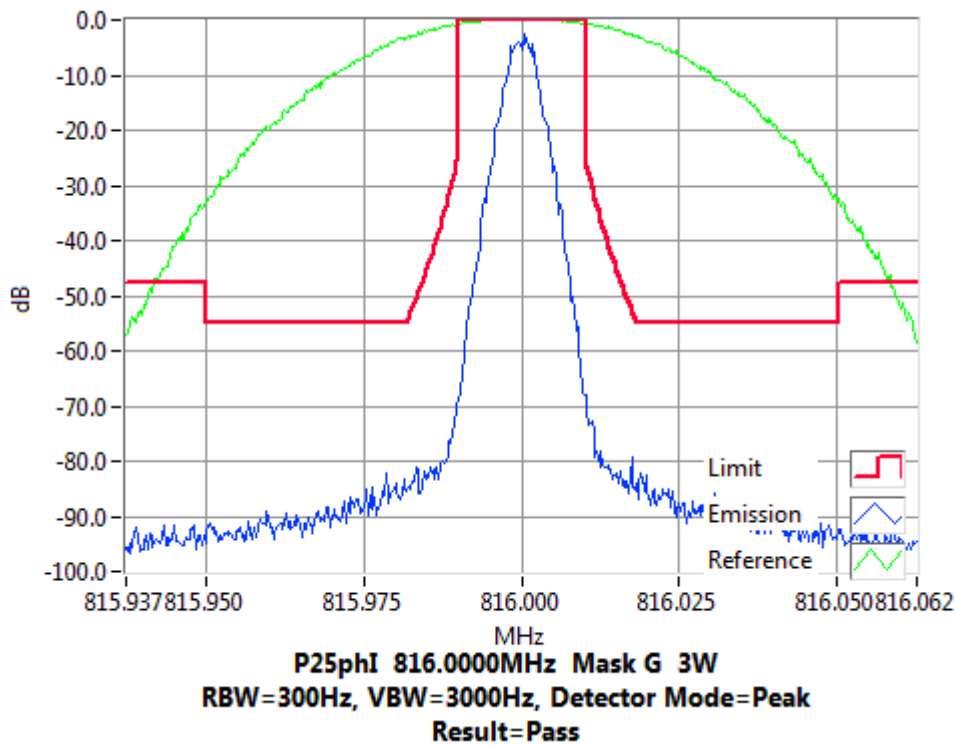
Occupied Bandwidth and Spectrum Masks

APCO P25 phase-1

Tx FREQUENCY: 816.0 MHz 3 W 12.5 kHz Channel Spacing



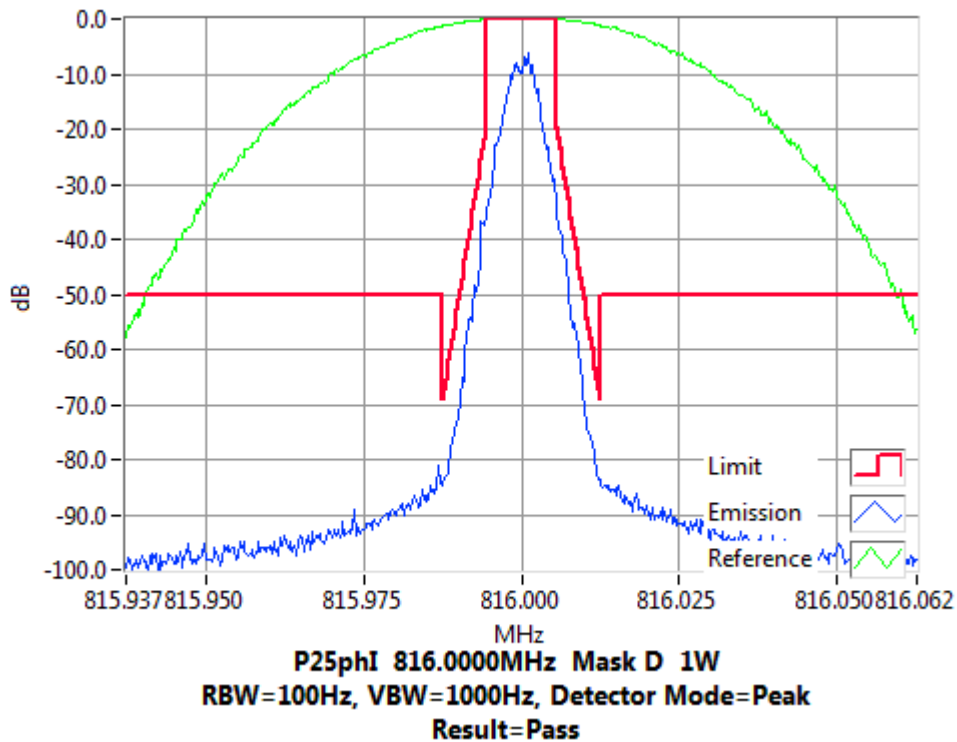
Tx FREQUENCY: 816.0 MHz 3 W 12.5 kHz Channel Spacing



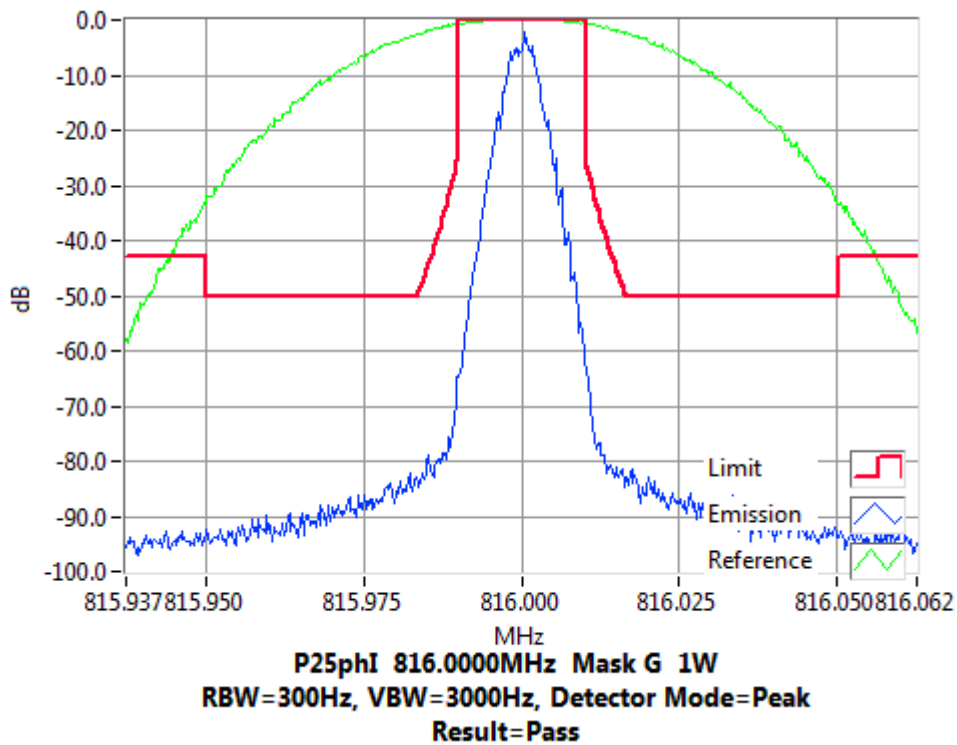
Occupied Bandwidth and Spectrum Masks

APCO P25 phase-1

Tx FREQUENCY: 816.0 MHz 1 W 12.5 kHz Channel Spacing



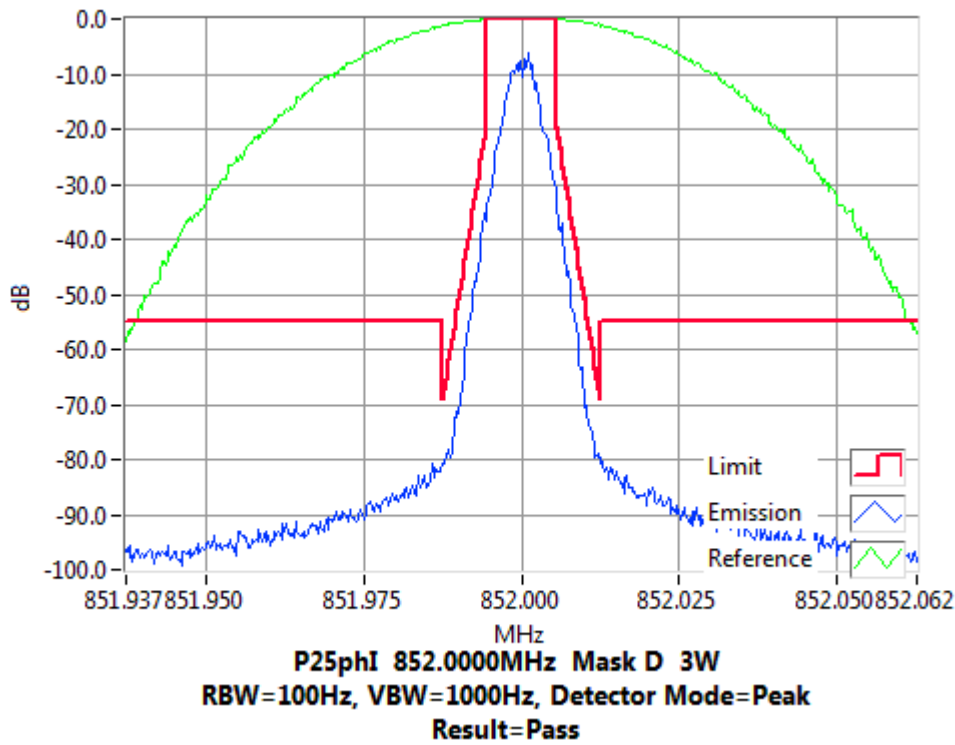
Tx FREQUENCY: 816.0 MHz 1 W 12.5 kHz Channel Spacing



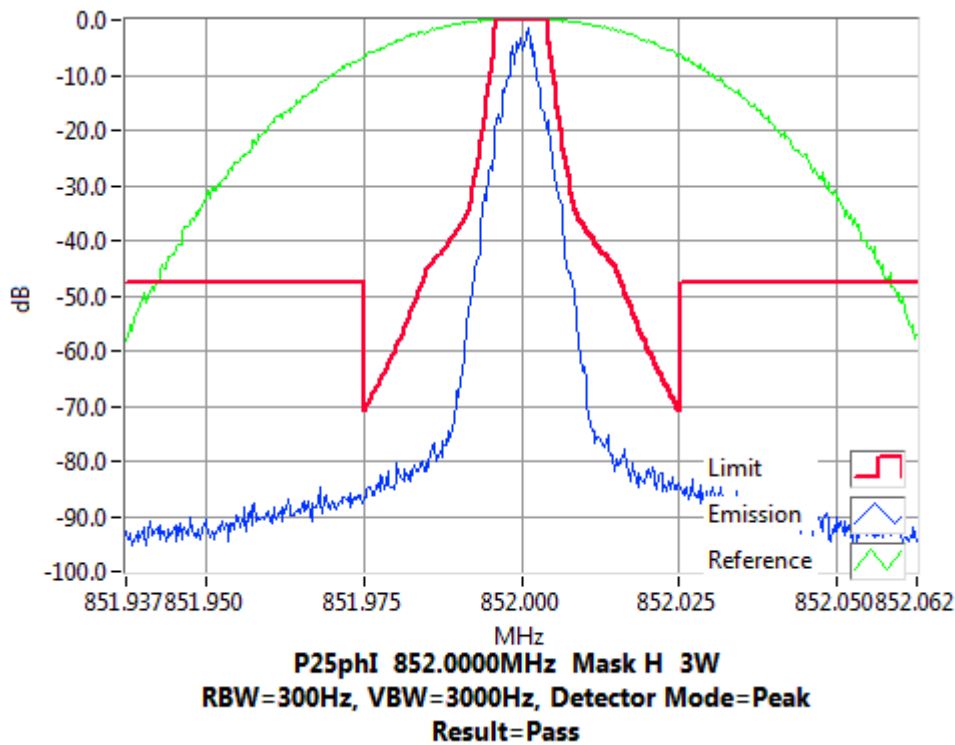
Occupied Bandwidth and Spectrum Masks

APCO P25 phase-1

Tx FREQUENCY: 852.0 MHz 3 W 12.5 kHz Channel Spacing



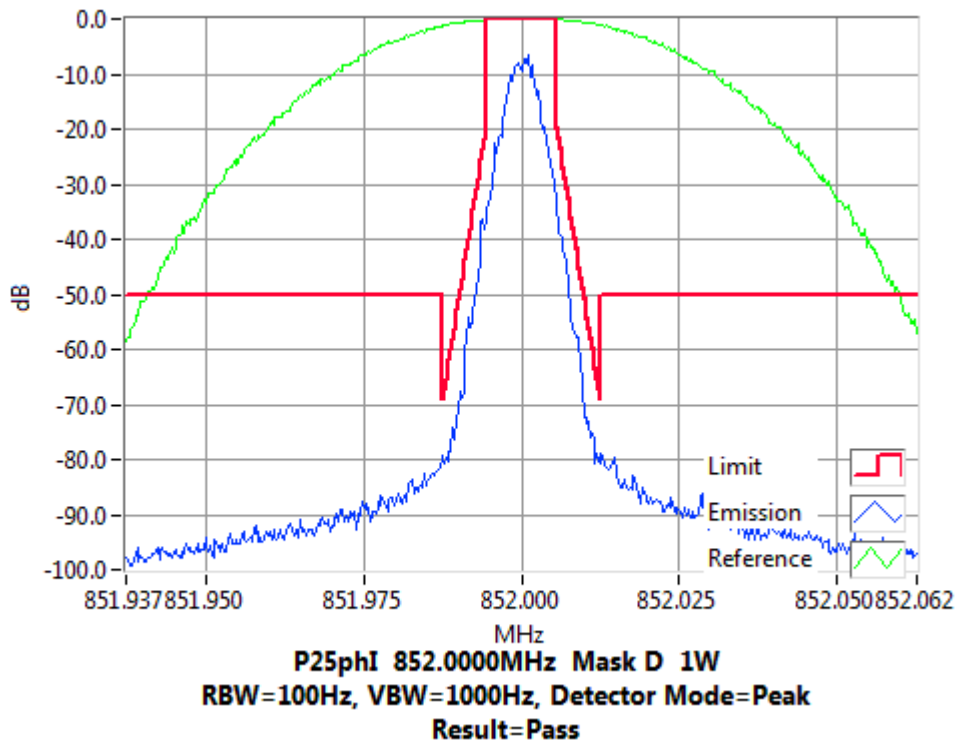
Tx FREQUENCY: 852.0 MHz 3 W 12.5 kHz Channel Spacing



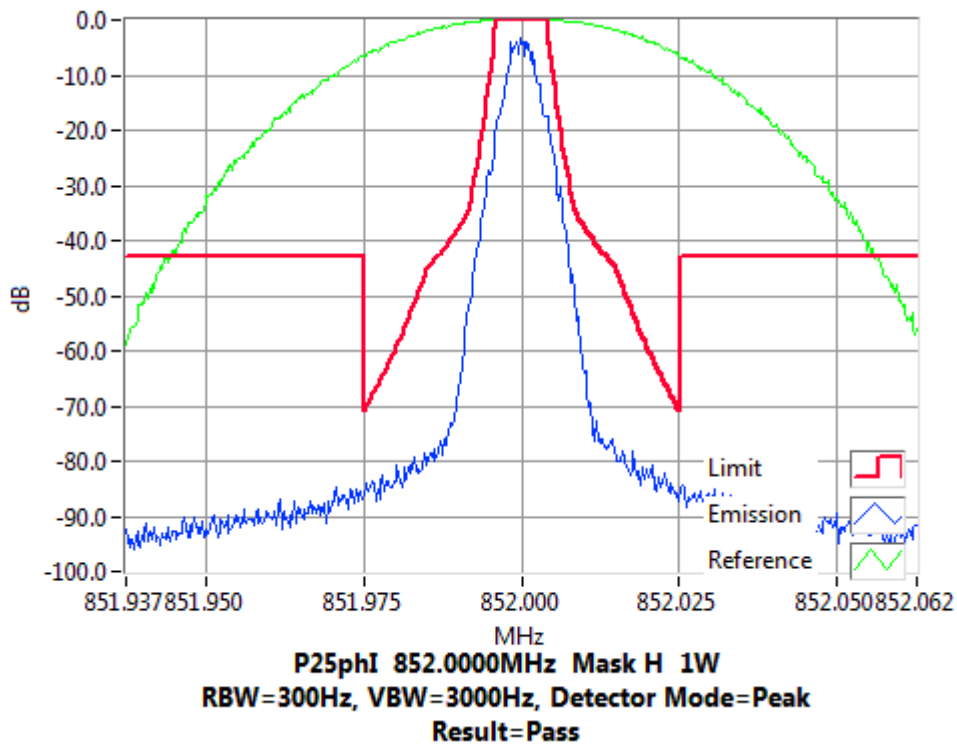
Occupied Bandwidth and Spectrum Masks

APCO P25 phase-1

Tx FREQUENCY: 852.0 MHz 1 W 12.5 kHz Channel Spacing



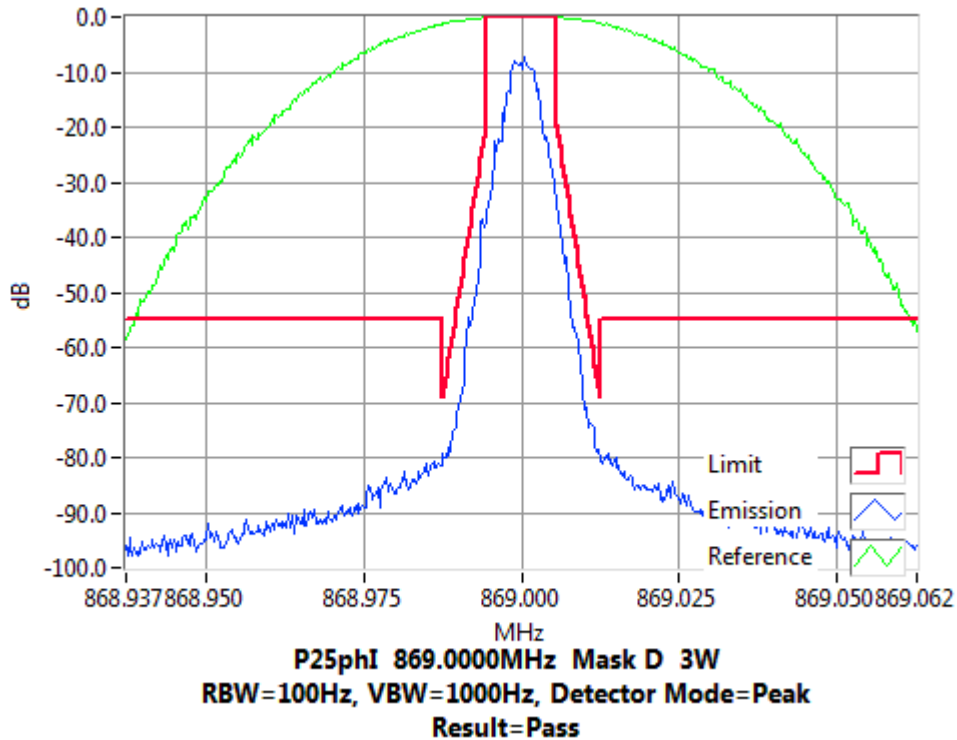
Tx FREQUENCY: 852.0 MHz 1 W 12.5 kHz Channel Spacing



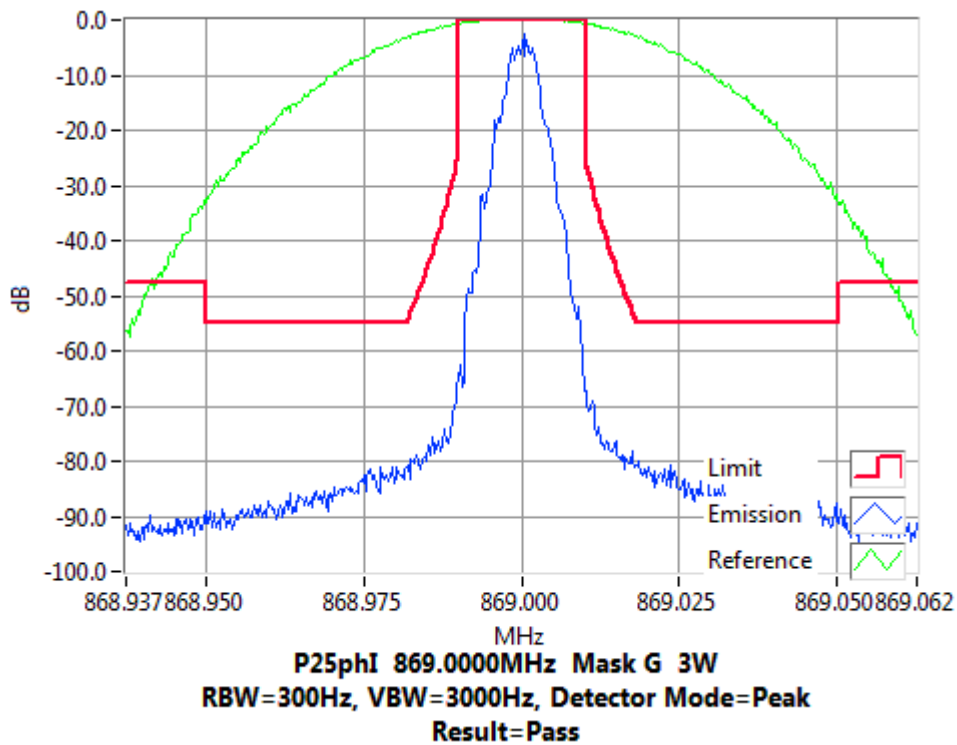
Occupied Bandwidth and Spectrum Masks

APCO P25 phase-1

Tx FREQUENCY: 869.0 MHz 3 W 12.5 kHz Channel Spacing



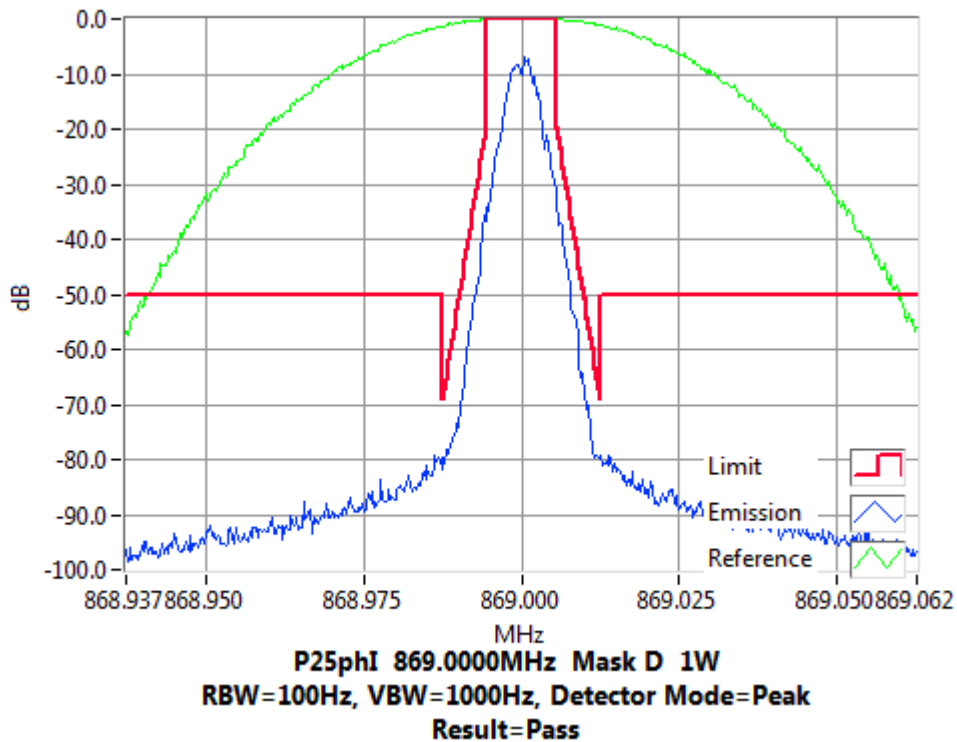
Tx FREQUENCY: 869.0 MHz 3 W 12.5 kHz Channel Spacing



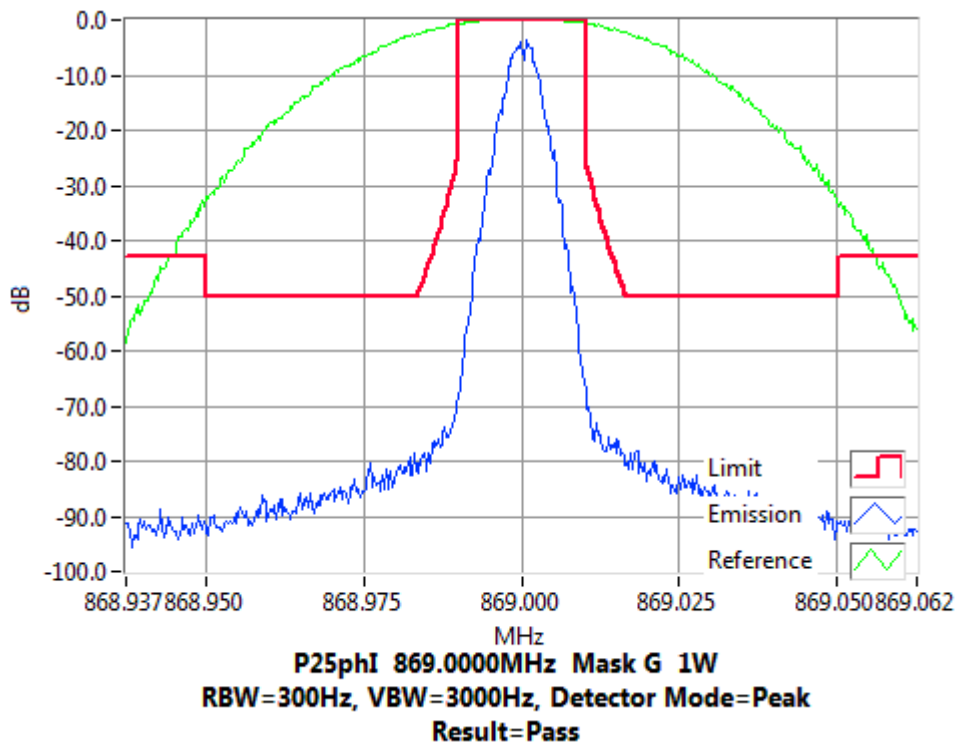
Occupied Bandwidth and Spectrum Masks

APCO P25 phase-1

Tx FREQUENCY: 869.0 MHz 1 W 12.5 kHz Channel Spacing



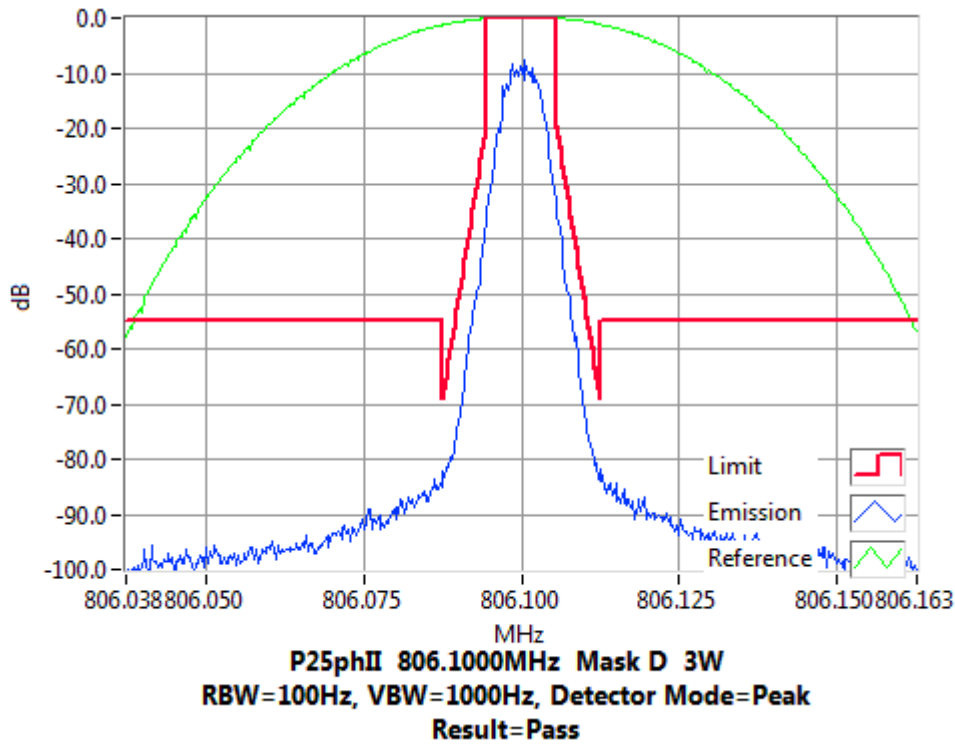
Tx FREQUENCY: 869.0 MHz 1 W 12.5 kHz Channel Spacing



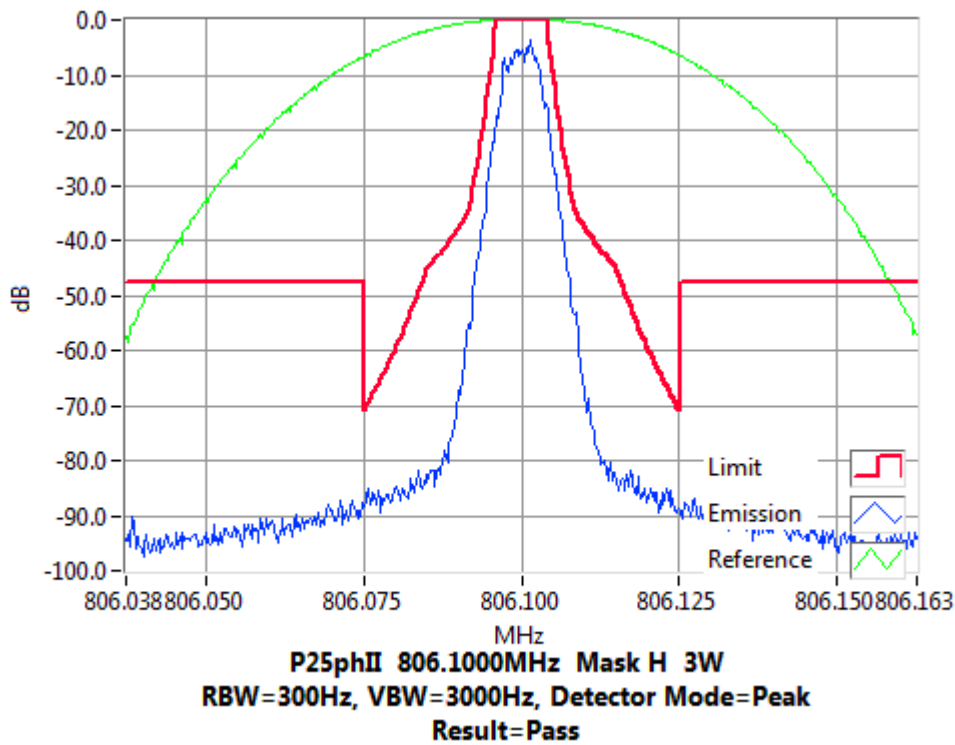
Occupied Bandwidth and Spectrum Masks

APCO P25 phase-2

Tx FREQUENCY: 806.1 MHz 3 W 12.5 kHz Channel Spacing



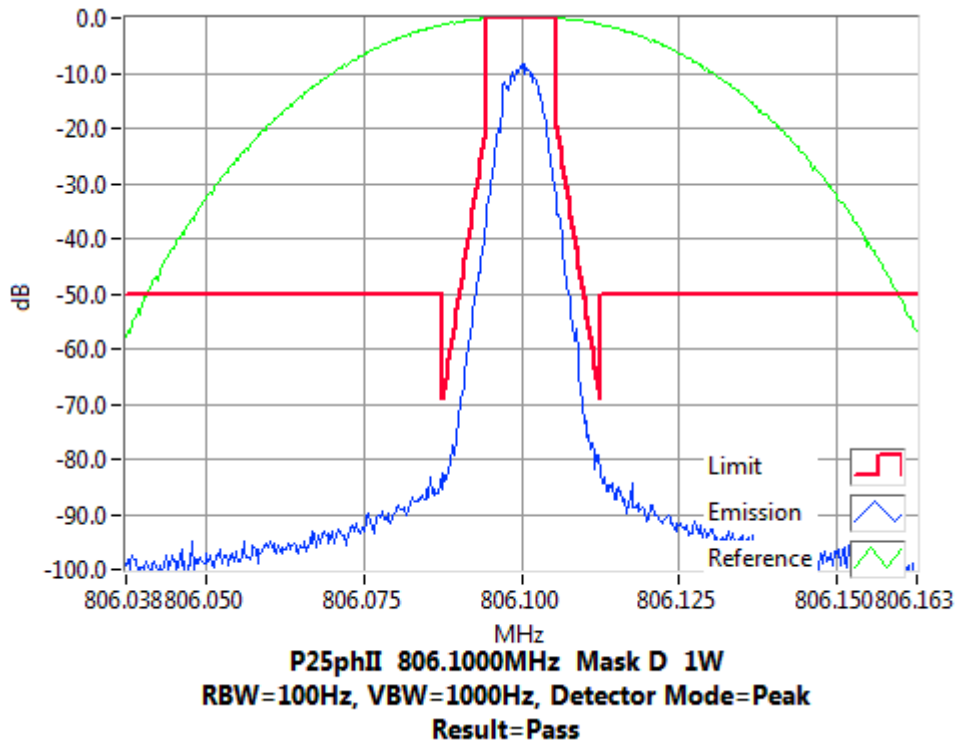
Tx FREQUENCY: 806.1 MHz 3 W 12.5 kHz Channel Spacing



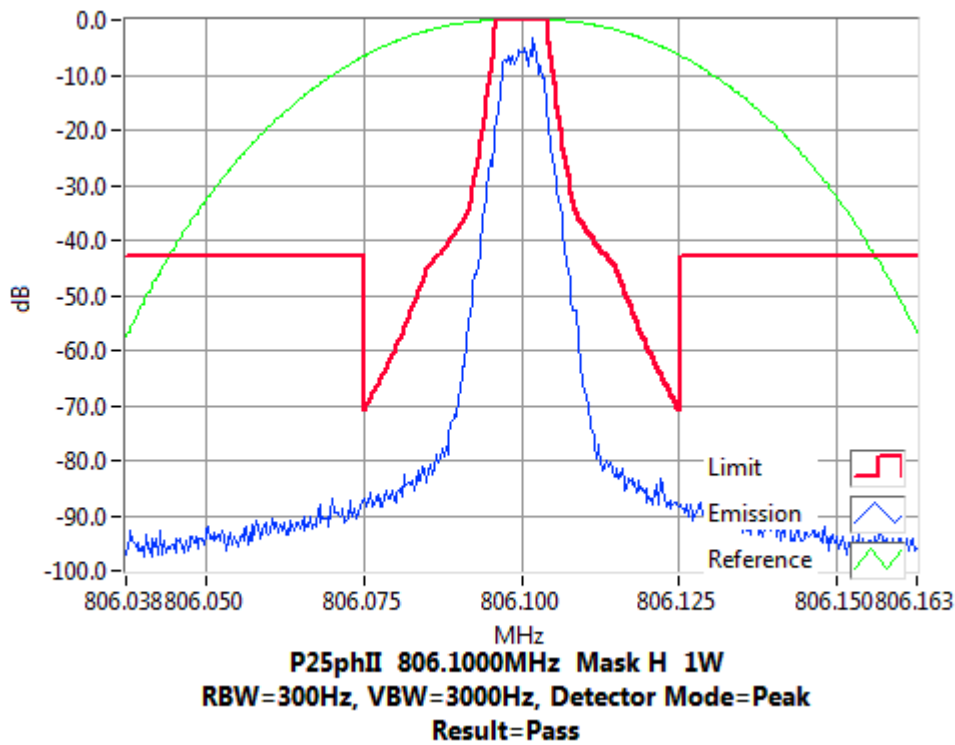
Occupied Bandwidth and Spectrum Masks

APCO P25 phase-2

Tx FREQUENCY: 806.1 MHz 1 W 12.5 kHz Channel Spacing



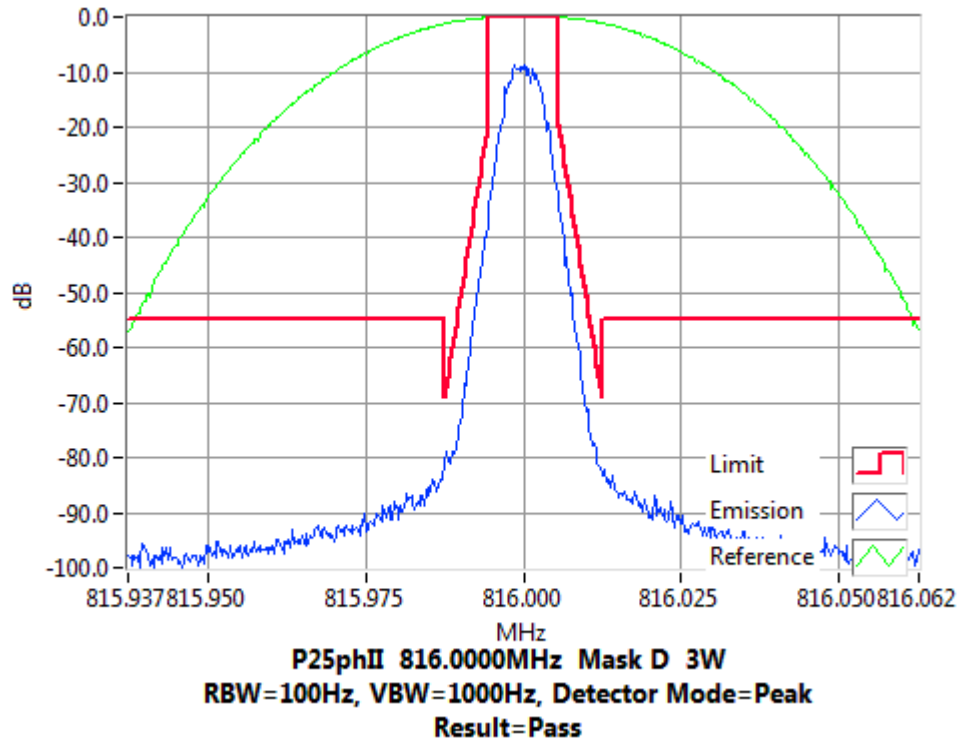
Tx FREQUENCY: 806.1 MHz 1 W 12.5 kHz Channel Spacing



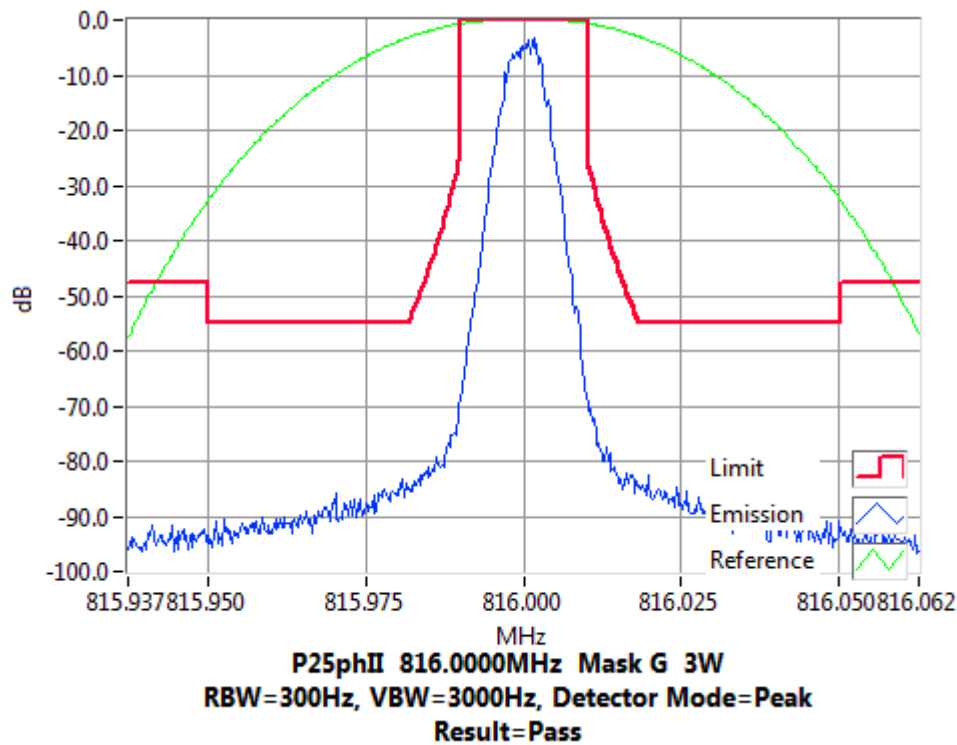
Occupied Bandwidth and Spectrum Masks

APCO P25 phase-2

Tx FREQUENCY: 816.0 MHz 3 W 12.5 kHz Channel Spacing



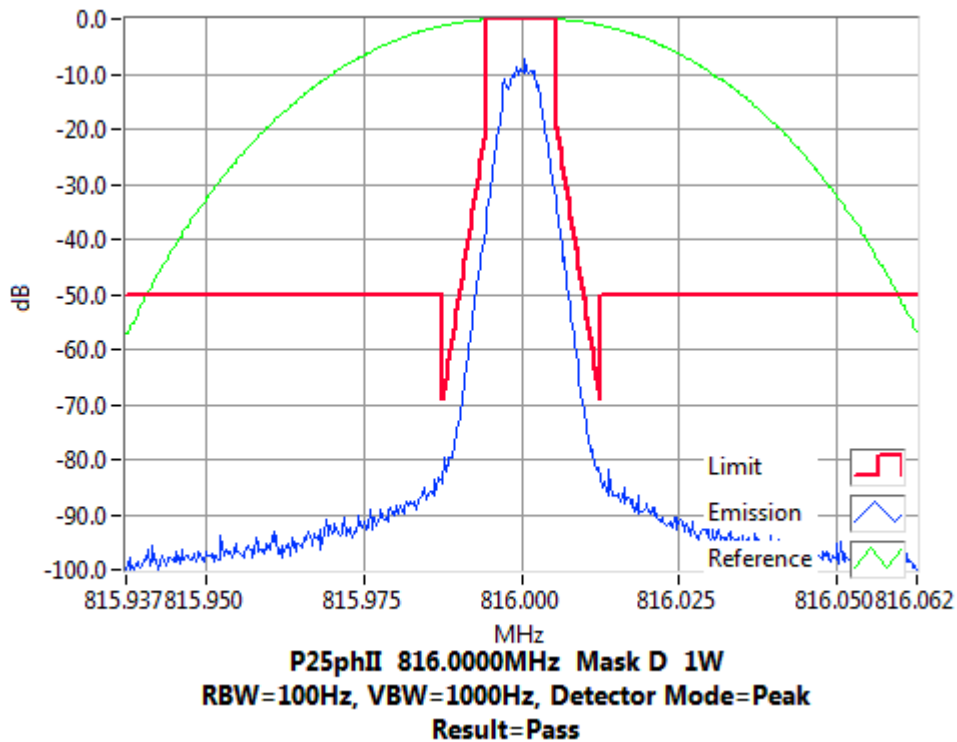
Tx FREQUENCY: 816.0 MHz 3 W 12.5 kHz Channel Spacing



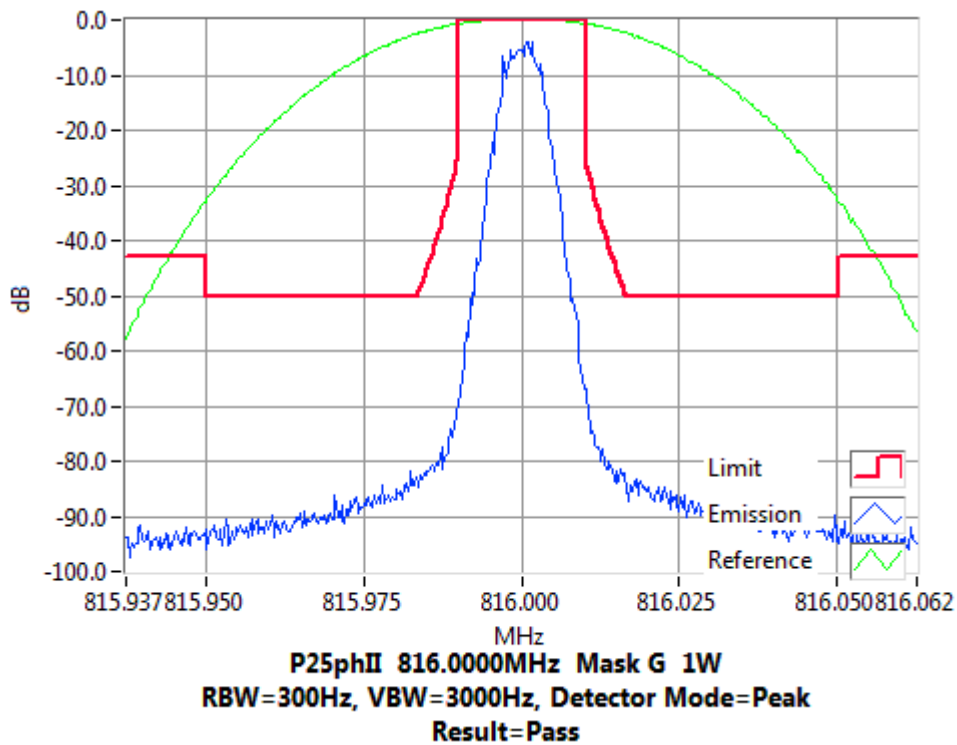
Occupied Bandwidth and Spectrum Masks

APCO P25 phase-2

Tx FREQUENCY: 816.0 MHz 1 W 12.5 kHz Channel Spacing



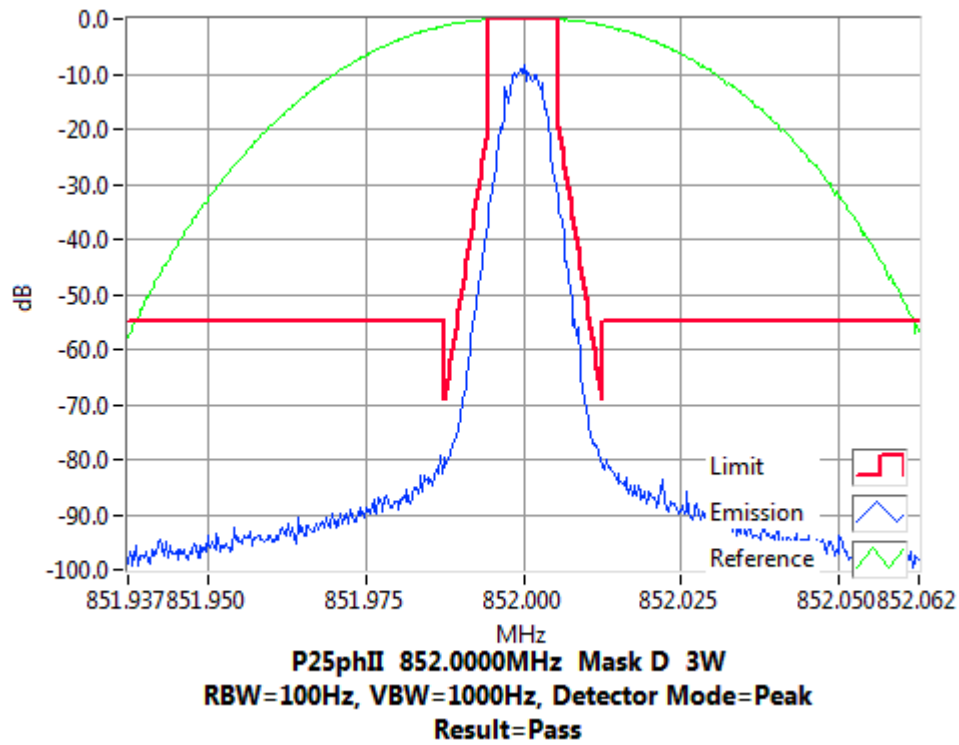
Tx FREQUENCY: 816.0 MHz 1 W 12.5 kHz Channel Spacing



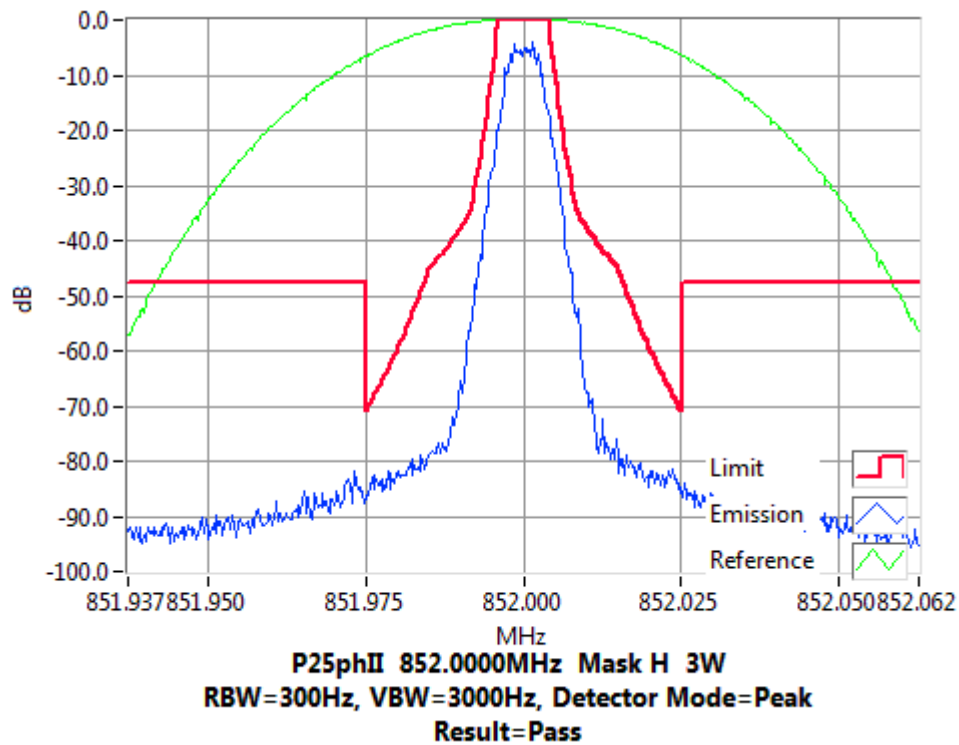
Occupied Bandwidth and Spectrum Masks

APCO P25 phase-2

Tx FREQUENCY: 852.0 MHz 3 W 12.5 kHz Channel Spacing



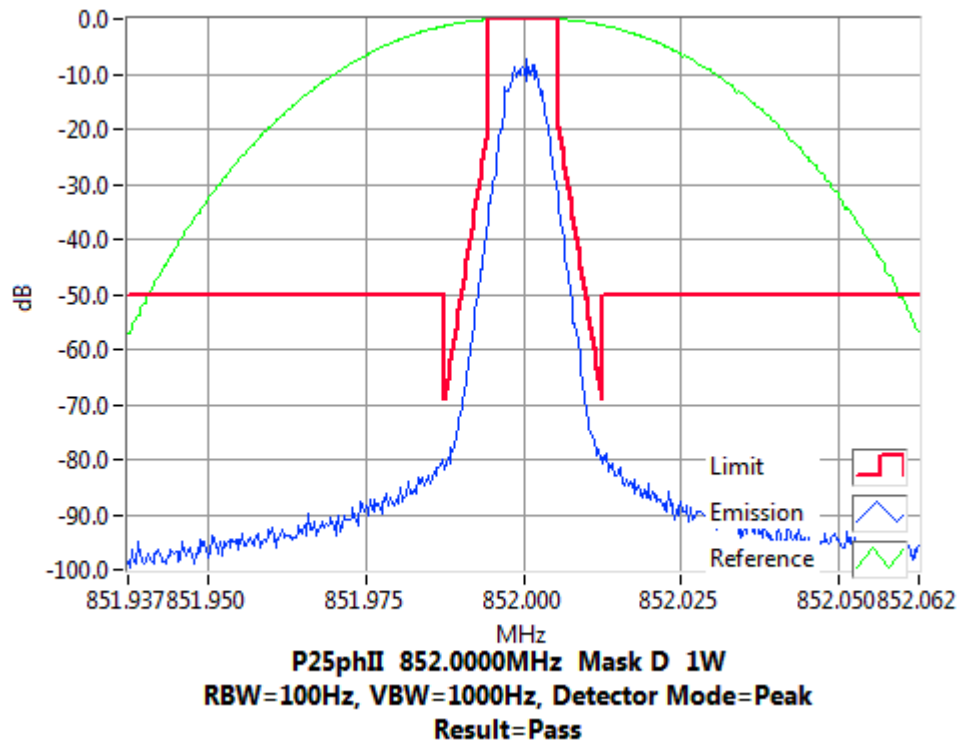
Tx FREQUENCY: 852.0 MHz 3 W 12.5 kHz Channel Spacing



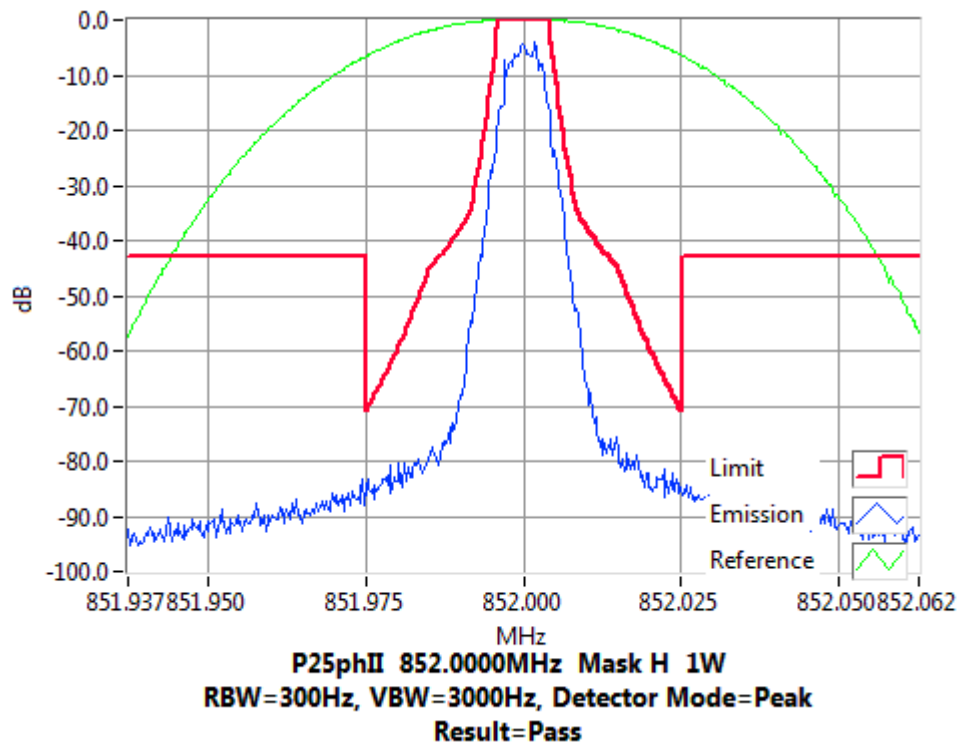
Occupied Bandwidth and Spectrum Masks

APCO P25 phase-2

Tx FREQUENCY: 852.0 MHz 1 W 12.5 kHz Channel Spacing



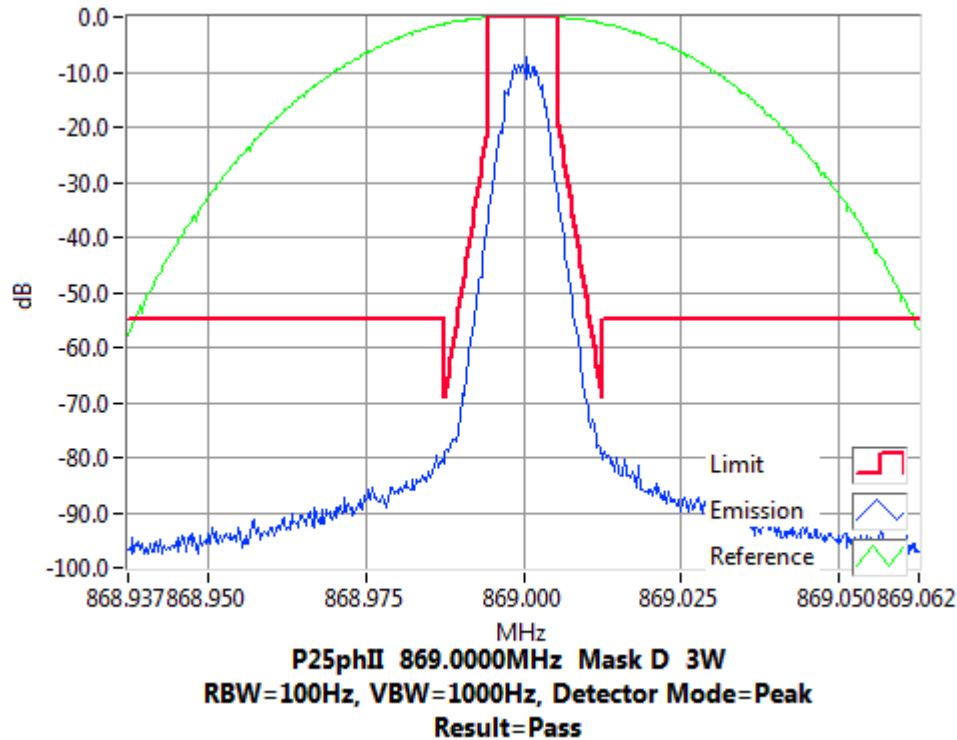
Tx FREQUENCY: 852.0 MHz 1 W 12.5 kHz Channel Spacing



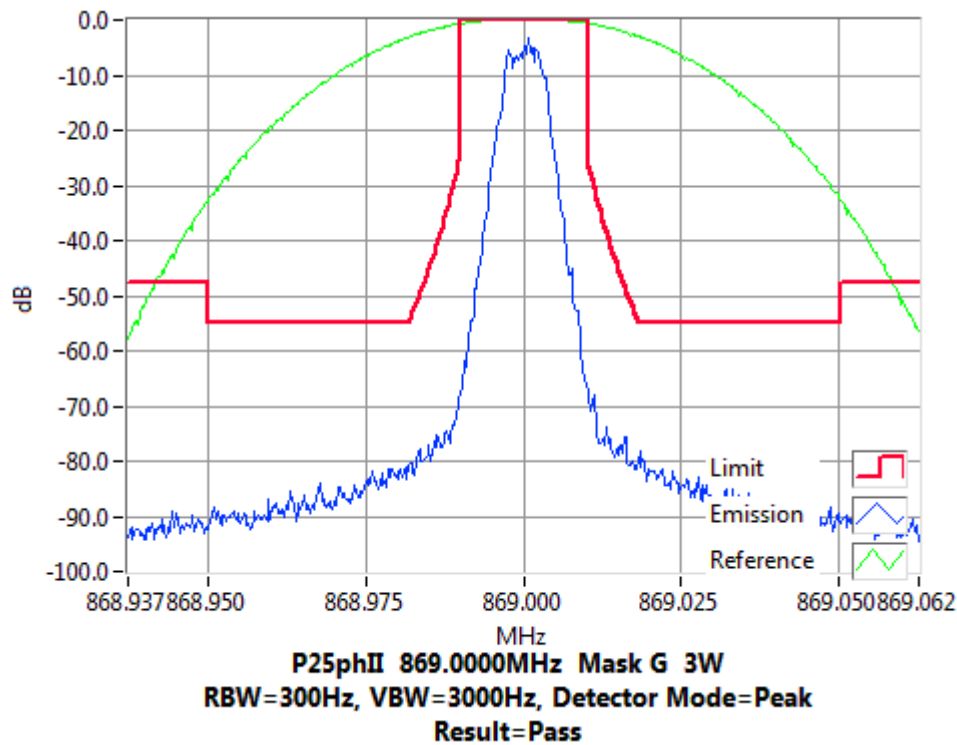
Occupied Bandwidth and Spectrum Masks

APCO P25 phase-2

Tx FREQUENCY: 869.0 MHz 3 W 12.5 kHz Channel Spacing



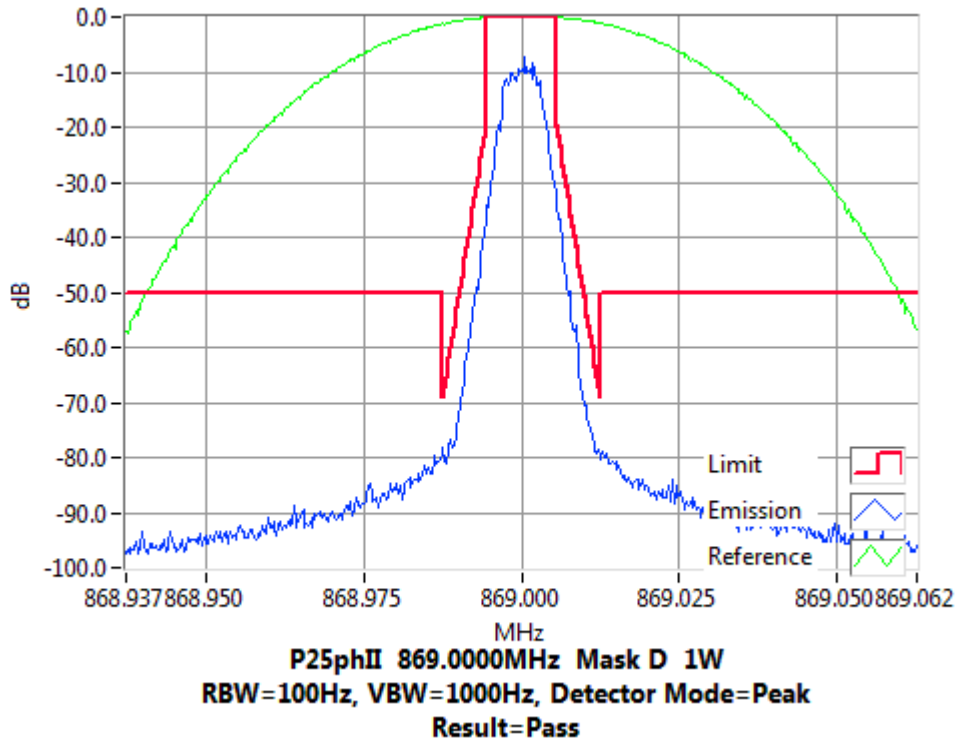
Tx FREQUENCY: 869.0 MHz 3 W 12.5 kHz Channel Spacing



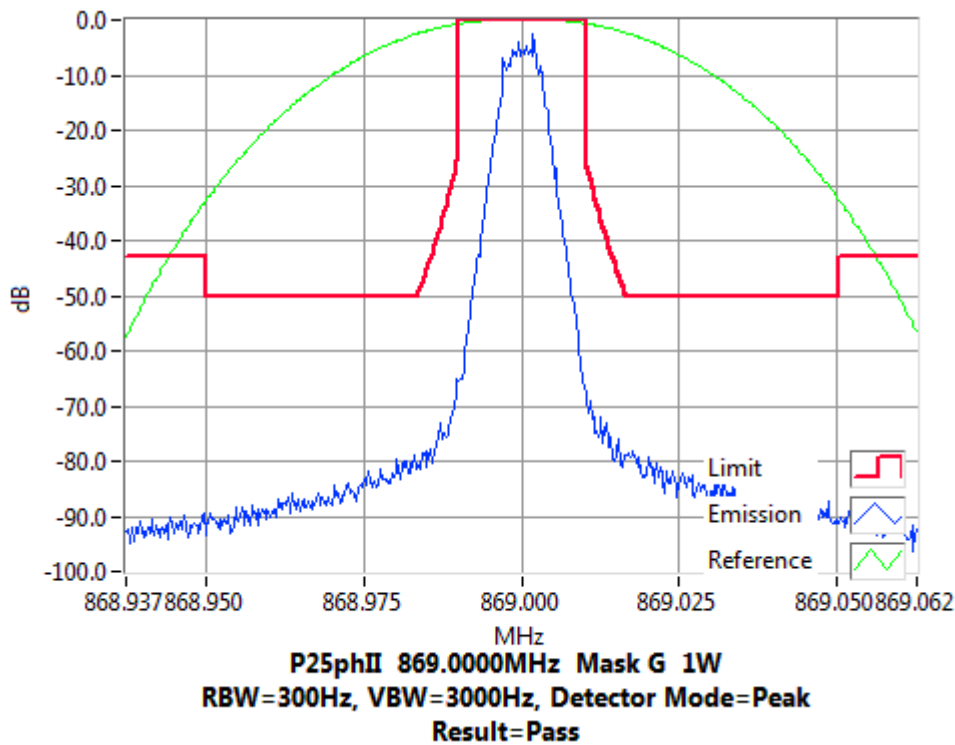
Occupied Bandwidth and Spectrum Masks

APCO P25 phase-2

Tx FREQUENCY: 869.0 MHz 1 W 12.5 kHz Channel Spacing



Tx FREQUENCY: 869.0 MHz 1 W 12.5 kHz Channel Spacing



ADJACENT CHANNEL POWER RATIO

SPECIFICATION: FCC 47 CFR 90.543

MEASUREMENT PROCEDURE:

1. Refer Annex A for equipment set up.
2. The transmitter is modulated with the standard test pattern for digital modulation.
3. The test is performed in accordance with 47 CFR 90.543

LIMIT CLAUSE: FCC 47 CFR 90.543

MEASUREMENT UNCERTAINTY: ≤ 12.75 GHz ± 3.0 dB

MEASUREMENT RESULTS:

Analogue

Tx FREQUENCY: 769.1 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP(dBc)
9.375 kHz	6.25 kHz	-52.57	-47.72	-40
15.625 kHz	6.25 kHz	-76.85	-76.44	-60
21.875 kHz	6.25 kHz	-80.92	-80.76	-60
37.5 kHz	25 kHz	-79.71	-79.54	-60
62.5 kHz	25 kHz	-83.65	-83.63	-65
87.5 kHz	25 kHz	-85.15	-85.16	-65
150 kHz	100 kHz	-78.45	-78.41	-65
250 kHz	100 kHz	-82.01	-81.97	-65
350 kHz	100 kHz	-85.11	-85.11	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.7		-75
12 MHz to paired receive band	30 kHz (swept)	-107.6		-75
In the paired receive band	30 kHz (swept)	-111.6		-100

Analogue

Tx FREQUENCY: 774.9 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP (dBc)
9.375 kHz	6.25 kHz	-52.24	-47.60	-40
15.625 kHz	6.25 kHz	-77.09	-76.73	-60
21.875 kHz	6.25 kHz	-81.13	-80.97	-60
37.5 kHz	25 kHz	-79.85	-79.70	-60
62.5 kHz	25 kHz	-83.13	-83.13	-65
87.5 kHz	25 kHz	-84.13	-84.16	-65
150 kHz	100 kHz	-78.30	-78.29	-65
250 kHz	100 kHz	-81.86	-81.87	-65
350 kHz	100 kHz	-84.82	-84.85	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.5		-75
12 MHz to paired receive band	30 kHz (swept)	-107.2		-75
In the paired receive band	30 kHz (swept)	-110.4		-100

Analogue
Tx FREQUENCY: 799.1 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP(dBc)
9.375 kHz	6.25 kHz	-52.14	-47.45	-40
15.625 kHz	6.25 kHz	-76.98	-76.56	-60
21.875 kHz	6.25 kHz	-81.01	-80.81	-60
37.5 kHz	25 kHz	-79.80	-79.60	-60
62.5 kHz	25 kHz	-83.66	-83.61	-65
87.5 kHz	25 kHz	-85.05	-85.05	-65
150 kHz	100 kHz	-78.43	-78.36	-65
250 kHz	100 kHz	-82.08	-82.04	-65
350 kHz	100 kHz	-85.22	-85.18	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.5		-75
12 MHz to paired receive band	30 kHz (swept)	-108.9		-75
In the paired receive band	30 kHz (swept)	-110.9		-100

Analogue
Tx FREQUENCY: 804.9 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP (dBc)
9.375 kHz	6.25 kHz	-52.18	-47.46	-40
15.625 kHz	6.25 kHz	-76.77	-76.35	-60
21.875 kHz	6.25 kHz	-80.77	-80.57	-60
37.5 kHz	25 kHz	-79.55	-79.35	-60
62.5 kHz	25 kHz	-83.47	-83.42	-65
87.5 kHz	25 kHz	-84.93	-84.92	-65
150 kHz	100 kHz	-78.38	-78.32	-65
250 kHz	100 kHz	-81.98	-81.98	-65
350 kHz	100 kHz	-85.19	-85.18	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.4		-75
12 MHz to paired receive band	30 kHz (swept)	-108.0		-75
In the paired receive band	30 kHz (swept)	-110.5		-100

Analogue
Tx FREQUENCY: 769.1 MHz 3 W 25 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP(dBc)
15.625 kHz	6.25 kHz	-72.32	-72.43	-60
21.875 kHz	6.25 kHz	-80.87	-80.78	-60
37.5 kHz	25 kHz	-80.06	-79.89	-60
62.5 kHz	25 kHz	-83.97	-83.94	-65
87.5 kHz	25 kHz	-85.37	-85.38	-65
150 kHz	100 kHz	-78.36	-78.32	-65
250 kHz	100 kHz	-81.94	-81.96	-65
350 kHz	100 kHz	-85.09	-85.03	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.7		-75
12 MHz to paired receive band	30 kHz (swept)	-106.5		-75
In the paired receive band	30 kHz (swept)	-111.6		-100

Analogue

Tx FREQUENCY: 774.9 MHz 3 W 25 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP (dBc)
15.625 kHz	6.25 kHz	-72.32	-72.30	-60
21.875 kHz	6.25 kHz	-80.74	-80.65	-60
37.5 kHz	25 kHz	-79.72	-79.56	-60
62.5 kHz	25 kHz	-83.10	-83.07	-65
87.5 kHz	25 kHz	-84.07	-84.11	-65
150 kHz	100 kHz	-78.26	-78.29	-65
250 kHz	100 kHz	-81.82	-81.85	-65
350 kHz	100 kHz	-84.86	-84.80	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.2		-75
12 MHz to paired receive band	30 kHz (swept)	-107.7		-75
In the paired receive band	30 kHz (swept)	-110.5		-100

Analogue

Tx FREQUENCY: 799.1 MHz 3 W 25 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP(dBc)
15.625 kHz	6.25 kHz	-72.17	-72.03	-60
21.875 kHz	6.25 kHz	-80.69	-80.48	-60
37.5 kHz	25 kHz	-79.66	-79.51	-60
62.5 kHz	25 kHz	-83.59	-83.53	-65
87.5 kHz	25 kHz	-85.02	-85.00	-65
150 kHz	100 kHz	-78.31	-78.28	-65
250 kHz	100 kHz	-82.05	-81.97	-65
350 kHz	100 kHz	-85.18	-85.13	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.7		-75
12 MHz to paired receive band	30 kHz (swept)	-107.7		-75
In the paired receive band	30 kHz (swept)	-110.1		-100

Analogue

Tx FREQUENCY: 804.9 MHz 3 W 25 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP (dBc)
15.625 kHz	6.25 kHz	-72.07	-71.83	-60
21.875 kHz	6.25 kHz	-80.32	-80.16	-60
37.5 kHz	25 kHz	-79.30	-79.13	-60
62.5 kHz	25 kHz	-83.34	-83.30	-65
87.5 kHz	25 kHz	-84.84	-84.81	-65
150 kHz	100 kHz	-78.29	-78.20	-65
250 kHz	100 kHz	-81.95	-81.87	-65
350 kHz	100 kHz	-85.06	-85.07	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.4		-75
12 MHz to paired receive band	30 kHz (swept)	-108.3		-75
In the paired receive band	30 kHz (swept)	-110.8		-100

FFSK 1200 bps

Tx FREQUENCY: 769.1 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP(dBc)
9.375 kHz	6.25 kHz	-60.64	-58.16	-40
15.625 kHz	6.25 kHz	-76.84	-76.47	-60
21.875 kHz	6.25 kHz	-81.15	-81.00	-60
37.5 kHz	25 kHz	-80.07	-79.91	-60
62.5 kHz	25 kHz	-83.99	-83.96	-65
87.5 kHz	25 kHz	-85.43	-85.45	-65
150 kHz	100 kHz	-78.42	-78.41	-65
250 kHz	100 kHz	-82.06	-81.99	-65
350 kHz	100 kHz	-85.13	-85.09	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.9		-75
12 MHz to paired receive band	30 kHz (swept)	-107.7		-75
In the paired receive band	30 kHz (swept)	-110.7		-100

FFSK 1200 bps

Tx FREQUENCY: 774.9 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP (dBc)
9.375 kHz	6.25 kHz	-60.50	-58.04	-40
15.625 kHz	6.25 kHz	-76.93	-76.57	-60
21.875 kHz	6.25 kHz	-81.02	-80.89	-60
37.5 kHz	25 kHz	-79.77	-79.62	-60
62.5 kHz	25 kHz	-83.12	-83.10	-65
87.5 kHz	25 kHz	-84.13	-84.15	-65
150 kHz	100 kHz	-78.37	-78.32	-65
250 kHz	100 kHz	-81.84	-81.75	-65
350 kHz	100 kHz	-84.78	-84.84	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.0		-75
12 MHz to paired receive band	30 kHz (swept)	-107.3		-75
In the paired receive band	30 kHz (swept)	-110.2		-100

FFSK 1200 bps

Tx FREQUENCY: 799.1 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP(dBc)
9.375 kHz	6.25 kHz	-60.53	-57.98	-40
15.625 kHz	6.25 kHz	-76.89	-76.50	-60
21.875 kHz	6.25 kHz	-81.11	-80.93	-60
37.5 kHz	25 kHz	-79.79	-79.62	-60
62.5 kHz	25 kHz	-83.69	-83.63	-65
87.5 kHz	25 kHz	-85.08	-85.08	-65
150 kHz	100 kHz	-78.41	-78.42	-65
250 kHz	100 kHz	-82.11	-82.09	-65
350 kHz	100 kHz	-85.20	-85.18	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.8		-75
12 MHz to paired receive band	30 kHz (swept)	-108.2		-75
In the paired receive band	30 kHz (swept)	-110.5		-100

FFSK 1200 bps
Tx FREQUENCY: 804.9 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP (dBc)
9.375 kHz	6.25 kHz	-60.26	-57.78	-40
15.625 kHz	6.25 kHz	-76.72	-76.33	-60
21.875 kHz	6.25 kHz	-80.81	-80.59	-60
37.5 kHz	25 kHz	-79.53	-79.37	-60
62.5 kHz	25 kHz	-83.49	-83.42	-65
87.5 kHz	25 kHz	-84.98	-84.97	-65
150 kHz	100 kHz	-78.40	-78.36	-65
250 kHz	100 kHz	-82.01	-82.01	-65
350 kHz	100 kHz	-85.21	-85.11	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.4		-75
12 MHz to paired receive band	30 kHz (swept)	-108.1		-75
In the paired receive band	30 kHz (swept)	-109.8		-100

FFSK 1200 bps
Tx FREQUENCY: 769.1 MHz 3 W 25 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP(dBc)
15.625 kHz	6.25 kHz	-76.08	-75.80	-60
21.875 kHz	6.25 kHz	-80.69	-80.47	-60
37.5 kHz	25 kHz	-80.02	-79.88	-60
62.5 kHz	25 kHz	-83.98	-83.94	-65
87.5 kHz	25 kHz	-85.40	-85.41	-65
150 kHz	100 kHz	-78.36	-78.36	-65
250 kHz	100 kHz	-81.92	-81.91	-65
350 kHz	100 kHz	-85.09	-85.10	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.3		-75
12 MHz to paired receive band	30 kHz (swept)	-106.5		-75
In the paired receive band	30 kHz (swept)	-110.3		-100

FFSK 1200 bps
Tx FREQUENCY: 774.9 MHz 3 W 25 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP (dBc)
15.625 kHz	6.25 kHz	-76.10	-75.89	-60
21.875 kHz	6.25 kHz	-80.55	-80.33	-60
37.5 kHz	25 kHz	-79.73	-79.59	-60
62.5 kHz	25 kHz	-83.11	-83.10	-65
87.5 kHz	25 kHz	-84.10	-84.12	-65
150 kHz	100 kHz	-78.35	-78.31	-65
250 kHz	100 kHz	-81.86	-81.85	-65
350 kHz	100 kHz	-84.81	-84.74	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.6		-75
12 MHz to paired receive band	30 kHz (swept)	-106.6		-75
In the paired receive band	30 kHz (swept)	-110.2		-100

FFSK 1200 bps

Tx FREQUENCY: 799.1 MHz 3 W 25 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP(dBc)
15.625 kHz	6.25 kHz	-76.15	-75.85	-60
21.875 kHz	6.25 kHz	-80.50	-80.25	-60
37.5 kHz	25 kHz	-79.68	-79.51	-60
62.5 kHz	25 kHz	-83.62	-83.58	-65
87.5 kHz	25 kHz	-85.03	-85.02	-65
150 kHz	100 kHz	-78.35	-78.36	-65
250 kHz	100 kHz	-81.99	-81.96	-65
350 kHz	100 kHz	-85.17	-85.13	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.8		-75
12 MHz to paired receive band	30 kHz (swept)	-108.2		-75
In the paired receive band	30 kHz (swept)	-109.8		-100

FFSK 1200 bps

Tx FREQUENCY: 804.9 MHz 3 W 25 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP (dBc)
15.625 kHz	6.25 kHz	-75.88	-75.63	-60
21.875 kHz	6.25 kHz	-80.26	-79.97	-60
37.5 kHz	25 kHz	-79.44	-79.28	-60
62.5 kHz	25 kHz	-83.43	-83.36	-65
87.5 kHz	25 kHz	-84.92	-84.92	-65
150 kHz	100 kHz	-78.33	-78.30	-65
250 kHz	100 kHz	-81.99	-81.99	-65
350 kHz	100 kHz	-85.21	-85.11	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.7		-75
12 MHz to paired receive band	30 kHz (swept)	-107.7		-75
In the paired receive band	30 kHz (swept)	-109.5		-100

FFSK 2400 bps

Tx FREQUENCY: 769.1 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP(dBc)
9.375 kHz	6.25 kHz	-48.99	-48.93	-40
15.625 kHz	6.25 kHz	-76.96	-76.65	-60
21.875 kHz	6.25 kHz	-81.19	-81.09	-60
37.5 kHz	25 kHz	-80.08	-79.95	-60
62.5 kHz	25 kHz	-83.98	-83.95	-65
87.5 kHz	25 kHz	-85.38	-85.40	-65
150 kHz	100 kHz	-78.40	-78.45	-65
250 kHz	100 kHz	-82.05	-82.01	-65
350 kHz	100 kHz	-85.10	-85.08	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.6		-75
12 MHz to paired receive band	30 kHz (swept)	-106.4		-75
In the paired receive band	30 kHz (swept)	-110.2		-100

FFSK 2400 bps
Tx FREQUENCY: 774.9 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP (dBc)
9.375 kHz	6.25 kHz	-48.84	-48.69	-40
15.625 kHz	6.25 kHz	-77.03	-76.67	-60
21.875 kHz	6.25 kHz	-81.07	-80.92	-60
37.5 kHz	25 kHz	-79.81	-79.68	-60
62.5 kHz	25 kHz	-83.13	-83.11	-65
87.5 kHz	25 kHz	-84.12	-84.15	-65
150 kHz	100 kHz	-78.26	-78.30	-65
250 kHz	100 kHz	-81.86	-81.83	-65
350 kHz	100 kHz	-84.82	-84.77	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.4		-75
12 MHz to paired receive band	30 kHz (swept)	-106.4		-75
In the paired receive band	30 kHz (swept)	-109.3		-100

FFSK 2400 bps
Tx FREQUENCY: 799.1 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP(dBc)
9.375 kHz	6.25 kHz	-48.71	-48.54	-40
15.625 kHz	6.25 kHz	-76.99	-76.48	-60
21.875 kHz	6.25 kHz	-81.07	-80.87	-60
37.5 kHz	25 kHz	-79.81	-79.66	-60
62.5 kHz	25 kHz	-83.65	-83.61	-65
87.5 kHz	25 kHz	-85.05	-85.03	-65
150 kHz	100 kHz	-78.42	-78.37	-65
250 kHz	100 kHz	-82.02	-81.96	-65
350 kHz	100 kHz	-85.15	-85.07	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.5		-75
12 MHz to paired receive band	30 kHz (swept)	-107.9		-75
In the paired receive band	30 kHz (swept)	-109.4		-100

FFSK 2400 bps
Tx FREQUENCY: 804.9 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP (dBc)
9.375 kHz	6.25 kHz	-48.61	-48.42	-40
15.625 kHz	6.25 kHz	-76.78	-76.25	-60
21.875 kHz	6.25 kHz	-80.85	-80.66	-60
37.5 kHz	25 kHz	-79.55	-79.40	-60
62.5 kHz	25 kHz	-83.48	-83.42	-65
87.5 kHz	25 kHz	-84.94	-84.93	-65
150 kHz	100 kHz	-78.38	-78.32	-65
250 kHz	100 kHz	-81.96	-81.93	-65
350 kHz	100 kHz	-85.17	-85.10	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.4		-75
12 MHz to paired receive band	30 kHz (swept)	-107.1		-75
In the paired receive band	30 kHz (swept)	-110.4		-100

FFSK 2400 bps
Tx FREQUENCY: 769.1 MHz 3 W 25 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP(dBc)
15.625 kHz	6.25 kHz	-75.03	-73.78	-60
21.875 kHz	6.25 kHz	-80.71	-80.45	-60
37.5 kHz	25 kHz	-79.90	-79.76	-60
62.5 kHz	25 kHz	-83.84	-83.82	-65
87.5 kHz	25 kHz	-85.28	-85.30	-65
150 kHz	100 kHz	-78.35	-78.47	-65
250 kHz	100 kHz	-81.99	-81.98	-65
350 kHz	100 kHz	-85.08	-85.02	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.2		-75
12 MHz to paired receive band	30 kHz (swept)	-106.7		-75
In the paired receive band	30 kHz (swept)	-110.8		-100

FFSK 2400 bps
Tx FREQUENCY: 774.9 MHz 3 W 25 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP (dBc)
15.625 kHz	6.25 kHz	-74.92	-73.58	-60
21.875 kHz	6.25 kHz	-80.53	-80.29	-60
37.5 kHz	25 kHz	-79.60	-79.48	-60
62.5 kHz	25 kHz	-83.01	-83.00	-65
87.5 kHz	25 kHz	-84.05	-84.08	-65
150 kHz	100 kHz	-78.22	-78.23	-65
250 kHz	100 kHz	-81.80	-81.77	-65
350 kHz	100 kHz	-84.77	-84.69	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.7		-75
12 MHz to paired receive band	30 kHz (swept)	-106.2		-75
In the paired receive band	30 kHz (swept)	-110.3		-100

FFSK 2400 bps
Tx FREQUENCY: 799.1 MHz 3 W 25 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP(dBc)
15.625 kHz	6.25 kHz	-74.85	-73.35	-60
21.875 kHz	6.25 kHz	-80.53	-80.24	-60
37.5 kHz	25 kHz	-79.59	-79.43	-60
62.5 kHz	25 kHz	-83.54	-83.49	-65
87.5 kHz	25 kHz	-84.96	-84.97	-65
150 kHz	100 kHz	-78.33	-78.39	-65
250 kHz	100 kHz	-82.03	-81.98	-65
350 kHz	100 kHz	-85.18	-85.10	-65
>400 kHz to 12 MHz	30 kHz (swept)	-91.5		-75
12 MHz to paired receive band	30 kHz (swept)	-107.7		-75
In the paired receive band	30 kHz (swept)	-109.6		-100

FFSK 2400 bps

Tx FREQUENCY: 804.9 MHz 3 W 25 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP (dBc)
15.625 kHz	6.25 kHz	-74.52	-73.02	-60
21.875 kHz	6.25 kHz	-80.32	-80.00	-60
37.5 kHz	25 kHz	-79.36	-79.21	-60
62.5 kHz	25 kHz	-83.37	-83.32	-65
87.5 kHz	25 kHz	-84.87	-84.87	-65
150 kHz	100 kHz	-78.31	-78.31	-65
250 kHz	100 kHz	-81.96	-81.98	-65
350 kHz	100 kHz	-85.13	-85.13	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.8		-75
12 MHz to paired receive band	30 kHz (swept)	-107.9		-75
In the paired receive band	30 kHz (swept)	-109.5		-100

DMR

Tx FREQUENCY: 769.1 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP(dBc)
9.375 kHz	6.25 kHz	-45.01	-41.79	-40
15.625 kHz	6.25 kHz	-75.00	-74.55	-60
21.875 kHz	6.25 kHz	-80.29	-80.07	-60
37.5 kHz	25 kHz	-79.94	-79.75	-60
62.5 kHz	25 kHz	-83.96	-83.93	-65
87.5 kHz	25 kHz	-85.39	-85.39	-65
150 kHz	100 kHz	-78.67	-78.61	-65
250 kHz	100 kHz	-82.21	-82.15	-65
350 kHz	100 kHz	-85.31	-85.24	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.6		-75
12 MHz to paired receive band	30 kHz (swept)	-106.1		-75
In the paired receive band	30 kHz (swept)	-110.6		-100

DMR

Tx FREQUENCY: 774.9 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP (dBc)
9.375 kHz	6.25 kHz	-44.94	-41.56	-40
15.625 kHz	6.25 kHz	-74.92	-74.45	-60
21.875 kHz	6.25 kHz	-80.06	-79.83	-60
37.5 kHz	25 kHz	-79.56	-79.38	-60
62.5 kHz	25 kHz	-83.04	-83.01	-65
87.5 kHz	25 kHz	-84.07	-84.09	-65
150 kHz	100 kHz	-78.38	-78.36	-65
250 kHz	100 kHz	-81.90	-81.79	-65
350 kHz	100 kHz	-84.88	-84.79	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.4		-75
12 MHz to paired receive band	30 kHz (swept)	-106.2		-75
In the paired receive band	30 kHz (swept)	-109.8		-100

DMR

Tx FREQUENCY: 799.1 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP(dBc)
9.375 kHz	6.25 kHz	-45.06	-41.42	-40
15.625 kHz	6.25 kHz	-74.83	-74.41	-60
21.875 kHz	6.25 kHz	-80.06	-79.78	-60
37.5 kHz	25 kHz	-79.51	-79.34	-60
62.5 kHz	25 kHz	-83.55	-83.50	-65
87.5 kHz	25 kHz	-84.97	-84.97	-65
150 kHz	100 kHz	-78.48	-78.42	-65
250 kHz	100 kHz	-82.07	-82.07	-65
350 kHz	100 kHz	-85.27	-85.18	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.5		-75
12 MHz to paired receive band	30 kHz (swept)	-107.8		-75
In the paired receive band	30 kHz (swept)	-109.4		-100

DMR

Tx FREQUENCY: 804.9 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP (dBc)
9.375 kHz	6.25 kHz	-44.97	-41.48	-40
15.625 kHz	6.25 kHz	-74.80	-74.35	-60
21.875 kHz	6.25 kHz	-79.99	-79.72	-60
37.5 kHz	25 kHz	-79.49	-79.29	-60
62.5 kHz	25 kHz	-83.55	-83.49	-65
87.5 kHz	25 kHz	-84.99	-84.97	-65
150 kHz	100 kHz	-78.64	-78.55	-65
250 kHz	100 kHz	-82.36	-82.29	-65
350 kHz	100 kHz	-85.46	-85.52	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.5		-75
12 MHz to paired receive band	30 kHz (swept)	-107.7		-75
In the paired receive band	30 kHz (swept)	-110.3		-100

P25 Phase I

Tx FREQUENCY: 769.1 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP(dBc)
9.375 kHz	6.25 kHz	-41.44	-40.85	-40
15.625 kHz	6.25 kHz	-76.94	-76.81	-60
21.875 kHz	6.25 kHz	-80.85	-80.89	-60
37.5 kHz	25 kHz	-79.71	-79.62	-60
62.5 kHz	25 kHz	-83.68	-83.70	-65
87.5 kHz	25 kHz	-85.21	-85.25	-65
150 kHz	100 kHz	-78.45	-78.38	-65
250 kHz	100 kHz	-82.01	-81.96	-65
350 kHz	100 kHz	-85.12	-85.04	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.3		-75
12 MHz to paired receive band	30 kHz (swept)	-105.7		-75
In the paired receive band	30 kHz (swept)	-110.2		-100

P25 Phase I

Tx FREQUENCY: 774.9 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP (dBc)
9.375 kHz	6.25 kHz	-41.33	-40.81	-40
15.625 kHz	6.25 kHz	-77.06	-76.97	-60
21.875 kHz	6.25 kHz	-80.77	-80.78	-60
37.5 kHz	25 kHz	-79.44	-79.37	-60
62.5 kHz	25 kHz	-82.89	-82.92	-65
87.5 kHz	25 kHz	-83.96	-84.00	-65
150 kHz	100 kHz	-78.37	-78.31	-65
250 kHz	100 kHz	-81.92	-81.80	-65
350 kHz	100 kHz	-84.87	-84.84	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.3		-75
12 MHz to paired receive band	30 kHz (swept)	-106.2		-75
In the paired receive band	30 kHz (swept)	-109.8		-100

P25 Phase I

Tx FREQUENCY: 799.1 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP(dBc)
9.375 kHz	6.25 kHz	-41.15	-40.62	-40
15.625 kHz	6.25 kHz	-76.89	-76.82	-60
21.875 kHz	6.25 kHz	-80.72	-80.75	-60
37.5 kHz	25 kHz	-79.41	-79.34	-60
62.5 kHz	25 kHz	-83.38	-83.38	-65
87.5 kHz	25 kHz	-84.87	-84.90	-65
150 kHz	100 kHz	-78.52	-78.51	-65
250 kHz	100 kHz	-82.20	-82.19	-65
350 kHz	100 kHz	-85.29	-85.24	-65
>400 kHz to 12 MHz	30 kHz (swept)	-91.2		-75
12 MHz to paired receive band	30 kHz (swept)	-107.9		-75
In the paired receive band	30 kHz (swept)	-109.8		-100

P25 Phase I

Tx FREQUENCY: 804.9 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP (dBc)
9.375 kHz	6.25 kHz	-41.04	-40.73	-40
15.625 kHz	6.25 kHz	-76.61	-76.49	-60
21.875 kHz	6.25 kHz	-80.46	-80.48	-60
37.5 kHz	25 kHz	-79.18	-79.09	-60
62.5 kHz	25 kHz	-83.20	-83.19	-65
87.5 kHz	25 kHz	-84.77	-84.78	-65
150 kHz	100 kHz	-78.10	-78.05	-65
250 kHz	100 kHz	-81.70	-81.75	-65
350 kHz	100 kHz	-84.94	-84.87	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.5		-75
12 MHz to paired receive band	30 kHz (swept)	-107.8		-75
In the paired receive band	30 kHz (swept)	-109.8		-100

P25 Phase II

Tx FREQUENCY: 769.1 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP(dBc)
9.375 kHz	6.25 kHz	-43.38	-40.98	-40
15.625 kHz	6.25 kHz	-76.99	-76.57	-60
21.875 kHz	6.25 kHz	-81.10	-80.97	-60
37.5 kHz	25 kHz	-79.90	-79.77	-60
62.5 kHz	25 kHz	-83.84	-83.83	-65
87.5 kHz	25 kHz	-85.31	-85.33	-65
150 kHz	100 kHz	-78.29	-78.30	-65
250 kHz	100 kHz	-81.92	-81.82	-65
350 kHz	100 kHz	-85.03	-84.89	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.5		-75
12 MHz to paired receive band	30 kHz (swept)	-106.7		-75
In the paired receive band	30 kHz (swept)	-110.3		-100

P25 Phase II

Tx FREQUENCY: 774.9 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP (dBc)
9.375 kHz	6.25 kHz	-43.32	-40.87	-40
15.625 kHz	6.25 kHz	-77.10	-76.68	-60
21.875 kHz	6.25 kHz	-80.92	-80.81	-60
37.5 kHz	25 kHz	-79.57	-79.46	-60
62.5 kHz	25 kHz	-82.98	-82.96	-65
87.5 kHz	25 kHz	-84.03	-84.07	-65
150 kHz	100 kHz	-78.31	-78.27	-65
250 kHz	100 kHz	-81.83	-81.85	-65
350 kHz	100 kHz	-84.83	-84.81	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.3		-75
12 MHz to paired receive band	30 kHz (swept)	-106.9		-75
In the paired receive band	30 kHz (swept)	-110.2		-100

P25 Phase II

Tx FREQUENCY: 799.1 MHz 3 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP(dBc)
9.375 kHz	6.25 kHz	-43.25	-40.80	-40
15.625 kHz	6.25 kHz	-76.88	-76.47	-60
21.875 kHz	6.25 kHz	-80.68	-80.64	-60
37.5 kHz	25 kHz	-79.50	-79.39	-60
62.5 kHz	25 kHz	-83.49	-83.46	-65
87.5 kHz	25 kHz	-84.98	-84.98	-65
150 kHz	100 kHz	-78.45	-78.39	-65
250 kHz	100 kHz	-82.02	-81.98	-65
350 kHz	100 kHz	-85.17	-85.17	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.7		-75
12 MHz to paired receive band	30 kHz (swept)	-108.1		-75
In the paired receive band	30 kHz (swept)	-109.5		-100

P25 Phase II

Tx FREQUENCY:

804.9 MHz

3 W

12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP (dBc)
9.375 kHz	6.25 kHz	-43.14	-40.64	-40
15.625 kHz	6.25 kHz	-76.69	-76.34	-60
21.875 kHz	6.25 kHz	-80.60	-80.47	-60
37.5 kHz	25 kHz	-79.24	-79.11	-60
62.5 kHz	25 kHz	-83.31	-83.28	-65
87.5 kHz	25 kHz	-84.87	-84.87	-65
150 kHz	100 kHz	-78.41	-78.32	-65
250 kHz	100 kHz	-82.07	-82.01	-65
350 kHz	100 kHz	-85.11	-85.09	-65
>400 kHz to 12 MHz	30 kHz (swept)	-90.8		-75
12 MHz to paired receive band	30 kHz (swept)	-107.7		-75
In the paired receive band	30 kHz (swept)	-110.4		-100

TRANSMITTER SPURIOUS EMISSIONS (CONDUCTED)

SPECIFICATIONS: FCC 47 CFR 2.1051

GUIDE: TIA/EIA-603D 2.2.13

MEASUREMENT PROCEDURE:

1. Refer Annex A for equipment set up.
2. The frequency range examined was from the lowest frequency generated within the EUT, to a frequency higher than the 10th Harmonic: 100 kHz to Fc-BW
Fc+ BW to 10Fc (9 GHz)
3. The EUT was set to transmit high or low power, modulated with P25 Phase 1 (C4FM). A scan is performed with a resolution bandwidth of 10 kHz and a video bandwidth of 30 kHz for frequencies up to 1 GHz, and a resolution bandwidth of 1 MHz and a video bandwidth of 3 MHz for frequencies above 1 GHz. A filter was used for frequencies just below the second harmonic to 3 GHz.
4. For each frequency range the spectrum analyser was loaded with the appropriate calibration figures to compensate for the cables, attenuator and filter losses, allowing the emission levels to be read directly with no further calculation.
The calibrations are loaded as an overall reference level offset plus a set of correction factors for the required frequency band.

Spurious emissions which were attenuated by more than 20 dB below the limit were not recorded.

Example of attenuation correction:

30dB 350W CK9178	32.12	
3m Blue 503429	0.55	
2m5 Blue 33449	0.6	
Total Attenuation @ 762.1 MHz	33.65	Sum of component attenuation (a)
Amplitude offset	33.27	(b)
Correction @ 762.1 MHz	0.37	(a-b)

A photograph of the test set-up is included below.

MEASUREMENT RESULTS:

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

LIMIT CLAUSES: FCC 47 CFR 90.210

Photo: Conducted Emissions Test Setup



Spurious Emissions (Tx Conducted)

SPECIFICATION: FCC 47 CFR 2.1051

12.5 kHz Channel Spacing

762.1 MHz @ 3 W

Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~

12.5 kHz Channel Spacing

762.1 MHz @ 1 W

Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
Measurement Uncertainty:	≤12.75 GHz ± 3.0 dB	
No emissions were detected at a level greater than 20 dB below the limit.		

Spurious Emissions (Tx Conducted)



Spurious Emissions (Tx Conducted)

SPECIFICATION: FCC 47 CFR 2.1051

12.5 kHz Channel Spacing 774.9 MHz @ 3 W Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~

12.5 kHz Channel Spacing 774.9 MHz @ 1 W Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
Measurement Uncertainty:	≤12.75 GHz ± 3.0 dB	
No emissions were detected at a level greater than 20 dB below the limit.		

Spurious Emissions (Tx Conducted)



Spurious Emissions (Tx Conducted)

SPECIFICATION: FCC 47 CFR 2.1051

12.5 kHz Channel Spacing

788.1 MHz @ 3 W

Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~

12.5 kHz Channel Spacing

788.1 MHz @ 1 W

Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
Measurement Uncertainty:	≤12.75 GHz ± 3.0 dB	
No emissions were detected at a level greater than 20 dB below the limit.		

Spurious Emissions (Tx Conducted)



Spurious Emissions (Tx Conducted)

SPECIFICATION: FCC 47 CFR 2.1051

12.5 kHz Channel Spacing

804.9 MHz @ 3 W

Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~

12.5 kHz Channel Spacing

804.9 MHz @ 1 W

Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
Measurement Uncertainty:	≤12.75 GHz ± 3.0 dB	
No emissions were detected at a level greater than 20 dB below the limit.		

Spurious Emissions (Tx Conducted)



Spurious Emissions (Tx Conducted)

SPECIFICATION: FCC 47 CFR 2.1051

12.5 kHz Channel Spacing

806.1 MHz @ 3 W

Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~

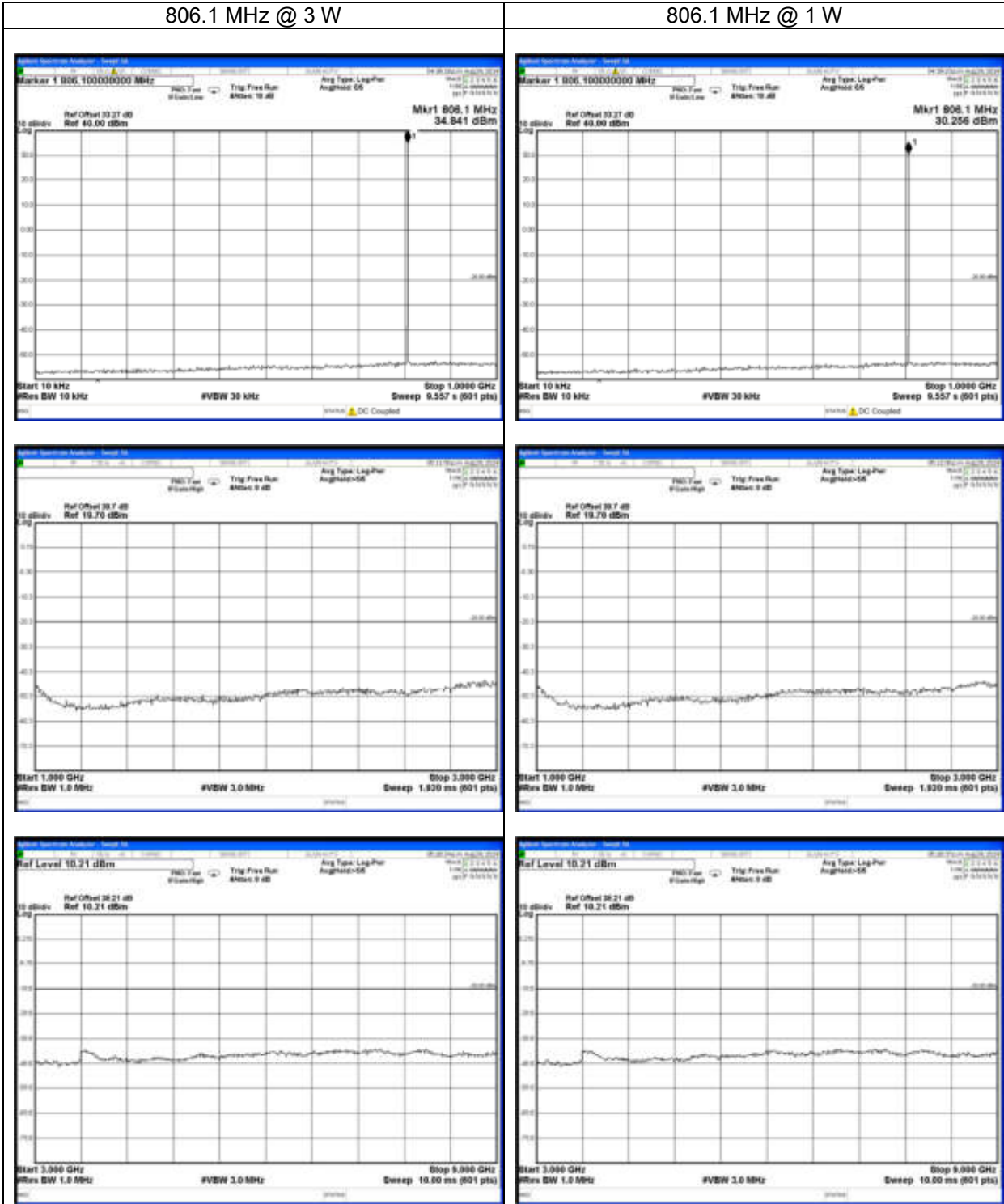
12.5 kHz Channel Spacing

806.1 MHz @ 1 W

Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
Measurement Uncertainty:	≤12.75 GHz ± 3.0 dB	
No emissions were detected at a level greater than 20 dB below the limit.		

Spurious Emissions (Tx Conducted)



Spurious Emissions (Tx Conducted)

SPECIFICATION: FCC 47 CFR 2.1051

12.5 kHz Channel Spacing

816.0 MHz @ 3 W

Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~

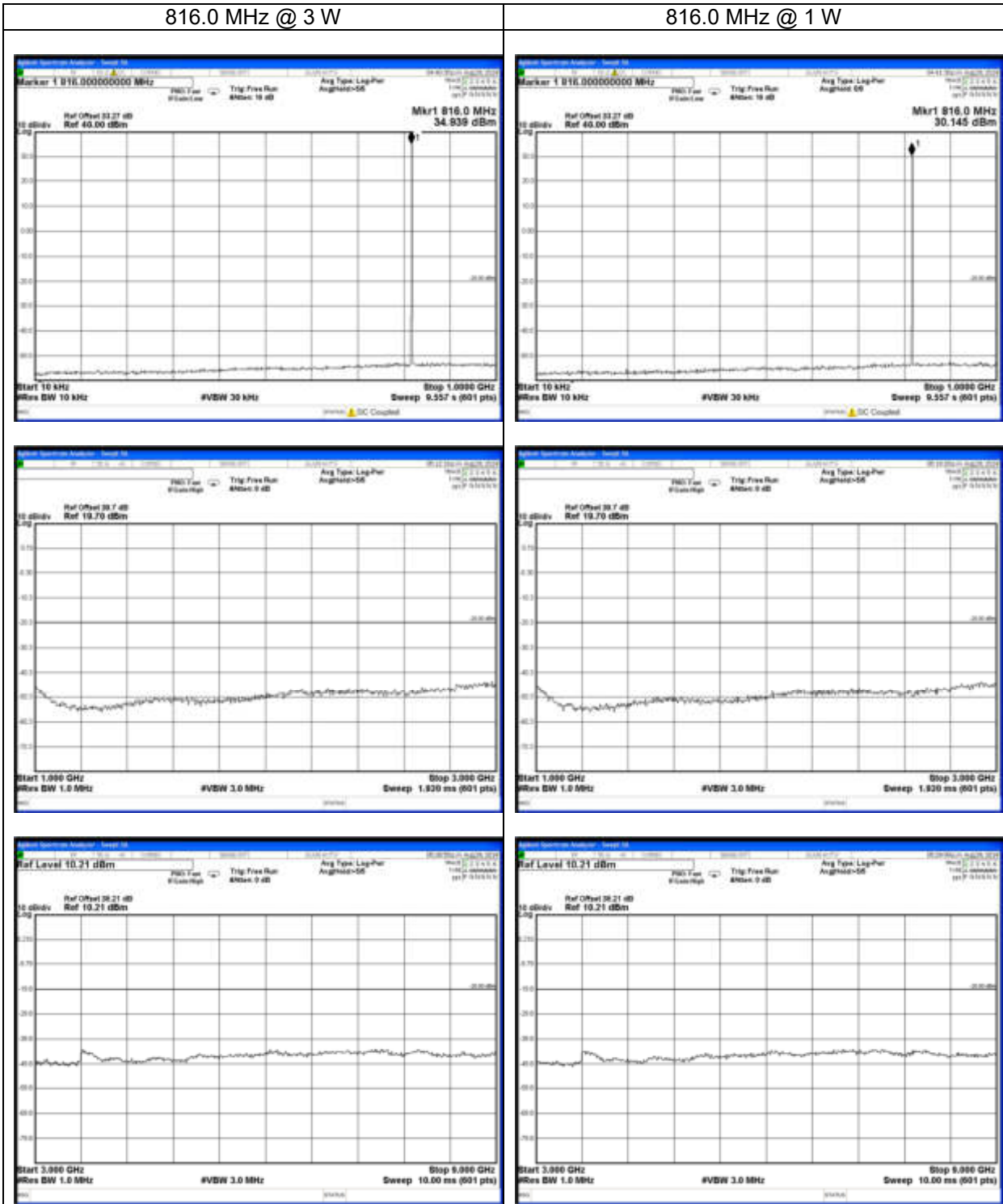
12.5 kHz Channel Spacing

816.0 MHz @ 1 W

Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
Measurement Uncertainty:	≤12.75 GHz ± 3.0 dB	
No emissions were detected at a level greater than 20 dB below the limit.		

Spurious Emissions (Tx Conducted)



Spurious Emissions (Tx Conducted)

SPECIFICATION: FCC 47 CFR 2.1051

12.5 kHz Channel Spacing

852.0 MHz @ 3 W

Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~

12.5 kHz Channel Spacing

852.0 MHz @ 1 W

Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
Measurement Uncertainty:	≤12.75 GHz ± 3.0 dB	
No emissions were detected at a level greater than 20 dB below the limit.		

Spurious Emissions (Tx Conducted)



Spurious Emissions (Tx Conducted)

SPECIFICATION: FCC 47 CFR 2.1051

12.5 kHz Channel Spacing

869.0 MHz @ 3 W

Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~

12.5 kHz Channel Spacing

869.0 MHz @ 1 W

Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
Measurement Uncertainty:	≤12.75 GHz ± 3.0 dB	
No emissions were detected at a level greater than 20 dB below the limit.		

Spurious Emissions (Tx Conducted)



Spurious Emissions (Tx Conducted)

SPECIFICATION: FCC 47 CFR 2.1051

LIMITS: FCC 47 CFR 90.210

Carrier Output Power	Emission Mask D 12.5 kHz Channel Spacing $50 + 10 \log_{10} (P_{\text{Watts}})$	
	-20 dBm	-55 dBc
3 W	-20 dBm	-55 dBc
1 W	-20 dBm	-50 dBc

TRANSMITTER SPURIOUS EMISSIONS (RADIATED)

SPECIFICATION: FCC 47 CFR 2.1053

GUIDE: TIA/EIA-603D 2.2.12

MEASUREMENT PROCEDURE:

Initial Scan:

1. The EUT is placed in the S-Line TEM cell and emissions are measured from 30 MHz to 800 MHz. Any emission within 20 dB of the limit is then re-tested on the OATS.
2. The EUT is placed in the reverberation chamber and emissions are measured from 800 MHz to the upper frequency required. Any emission within 20 dB of the limit is then re-tested on the OATS.
3. The harmonics emissions up to the 6th harmonic of the fundamental frequency are measured 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 1 m to 4 m 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 (Tx Radiated) - Continued

SPECIFICATION: FCC 47 CFR 2.1053

12.5 kHz Channel Spacing 762.1 MHz @ 3 W Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~

12.5 kHz Channel Spacing 762.1 MHz @ 1 W Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
Measurement Uncertainty	± 4.6 dB	
No emissions were detected at a level greater than 20 dB below the limit.		

12.5 kHz Channel Spacing 774.9 MHz @ 3 W Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~

12.5 kHz Channel Spacing 774.9 MHz @ 1 W Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
Measurement Uncertainty	± 4.6 dB	
No emissions were detected at a level greater than 20 dB below the limit.		

12.5 kHz Channel Spacing 788.1 MHz @ 3 W Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~

12.5 kHz Channel Spacing 788.1 MHz @ 1 W Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
Measurement Uncertainty	± 4.6 dB	
No emissions were detected at a level greater than 20 dB below the limit.		

Spurious Emissions (Tx Radiated) - Continued

12.5 kHz Channel Spacing

804.9 MHz @ 3 W

Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~

12.5 kHz Channel Spacing

804.9 MHz @ 1 W

Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
Measurement Uncertainty	± 4.6 dB	
No emissions were detected at a level greater than 20 dB below the limit.		

12.5 kHz Channel Spacing

806.1 MHz @ 3 W

Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~

12.5 kHz Channel Spacing

806.1 MHz @ 1 W

Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
Measurement Uncertainty	± 4.6 dB	
No emissions were detected at a level greater than 20 dB below the limit.		

12.5 kHz Channel Spacing

816.0 MHz @ 3 W

Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~

12.5 kHz Channel Spacing

816.0 MHz @ 1 W

Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
Measurement Uncertainty	± 4.6 dB	
No emissions were detected at a level greater than 20 dB below the limit.		

Spurious Emissions (Tx Radiated) - Continued

12.5 kHz Channel Spacing 852.0 MHz @ 3 W Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~

12.5 kHz Channel Spacing 852.0 MHz @ 1 W Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
Measurement Uncertainty	± 4.6 dB	
No emissions were detected at a level greater than 20 dB below the limit.		

12.5 kHz Channel Spacing 869.0 MHz @ 3 W Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~

12.5 kHz Channel Spacing 869.0 MHz @ 1 W Emission Mask D

Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
Measurement Uncertainty	± 4.6 dB	
No emissions were detected at a level greater than 20 dB below the limit.		

LIMITS: FCC 47 CFR 2.1053

Carrier Output Power	Emission Mask D 12.5 kHz Channel Spacing $50 + 10 \log_{10} (P_{\text{Watts}})$	
3 W	-20 dBm	-55 dBc
1 W	-20 dBm	-50 dBc

Spurious Emissions (Tx Radiated) - Continued

Open Area Test Site Results:

12.5 kHz Channel Spacing

806.1 MHz @ 3 W

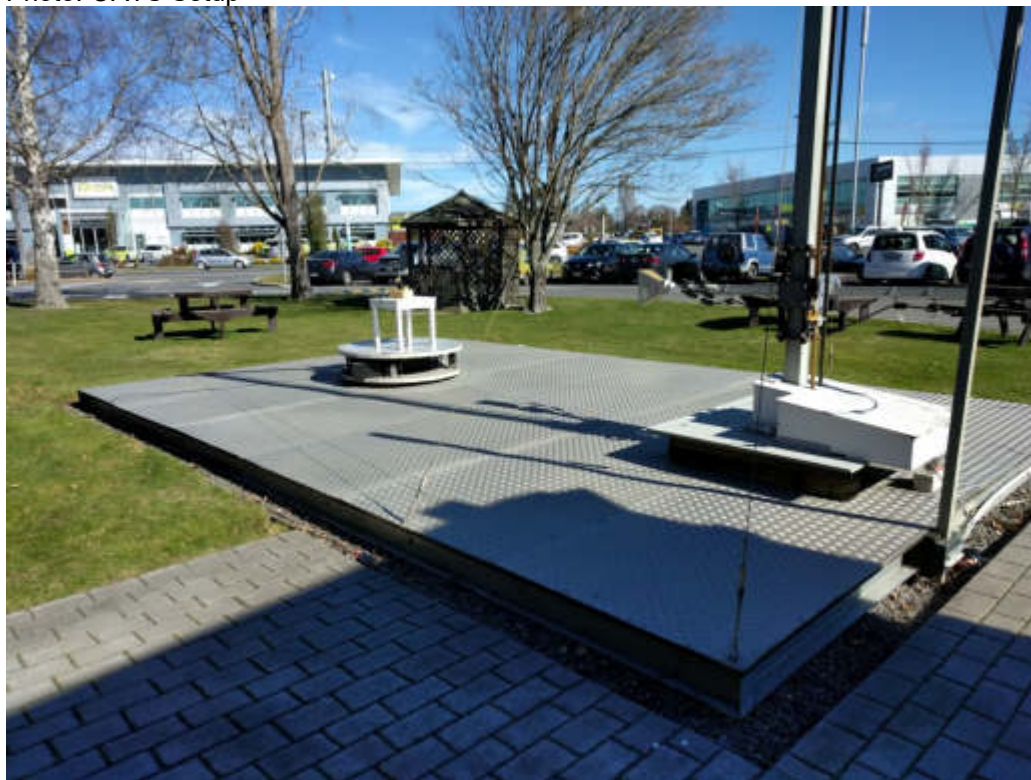
Emission Mask D

Harmonics Emission Frequency (MHz)	Level (dBm)	Level (dBc)
1612.2	-56.51	-91.51
2418.3	-56.90	-91.90
3224.4	-64.50	-99.50
4030.5	-65.25	-100.25
4836.6	-63.46	-98.46
5642.7	-58.77	-93.77
Measurement Uncertainty	± 4.6 dB	

Sample Calculation	Measurement					Result
	Reference	Substitution				
Emission Frequency (MHz)	Reference Level (dBm)	Sig-gen Level	Cable and Attenuator Gain	Antenna Gain (dBd)	Path and Boresight corrections	dBm
1612.2	-94.81	-42.44	-20.10	6.13	-0.10	-56.51
		A	B	C	D	E

Result (E) = A+B+C+D Result

Photo: OATS Setup



TRANSMITTER RADIATED EMISSIONS IN THE GNSS BAND

SPECIFICATION: FCC 47 CFR 90.543

GUIDE: TIA/EIA-603D 2.2.12

MEASUREMENT PROCEDURE:

1. Refer Annex A for equipment set up.
2. Spurious emissions were measured in the GNSS band. (1559 – 1610 MHz)
3. The EUT was placed on a wooden turntable at a distance of three metres from the test antenna.
4. The test antenna was raised from 1m to 4m to obtain a maximum reading; the turntable was then rotated through 360° to obtain the maximum response of each spurious emission.
5. Valid emissions were determined by switching the EUT on and off.
6. The EUT was replaced by a signal generator and substitution antenna to make measurements by the substitution method.
7. The test was performed with two different representative antennae connected to the EUT, at low and high output power settings.

788.1 MHz 3 W

Frequency	Antenna fitted	Antenna Polarity	Level dBW / MHz EIRP
1576.2 MHz	$\frac{1}{2}$ wave	Vertical	-84.01
		Horizontal	-89.11
1576.2 MHz	$\frac{1}{4}$ wave	Vertical	-90.01
		Horizontal	-89.61

788.1 MHz 1 W

Frequency	Antenna fitted	Antenna Polarity	Level dBW / MHz EIRP
1576.2 MHz	$\frac{1}{2}$ wave	Vertical	-85.51
		Horizontal	-93.31
1576.2 MHz	$\frac{1}{4}$ wave	Vertical	-94.51
		Horizontal	-94.41

Transmitter Radiated Emissions in the GNSS Band - Continued

804.9 MHz 3 W

Frequency	Antenna fitted	Antenna Polarity	Level dBW / MHz EIRP
1609.8 MHz	$\frac{1}{2}$ wave	Vertical	-83.05
		Horizontal	-88.15
1609.8 MHz	$\frac{1}{4}$ wave	Vertical	-87.65
		Horizontal	-86.75

804.9 MHz 1 W

Frequency	Antenna fitted	Antenna Polarity	Level dBW / MHz EIRP
1609.8 MHz	$\frac{1}{2}$ wave	Vertical	-86.55
		Horizontal	-91.35
1609.8 MHz	$\frac{1}{4}$ wave	Vertical	-91.25
		Horizontal	-93.65

LIMIT CLAUSE FCC 47 CFR 90.543 (f)	-70 dBW / MHz EIRP
---------------------------------------	--------------------

(f) For operations in the 763-775 MHz and 793-805 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.

TRANSMITTER FREQUENCY STABILITY - TEMPERATURE

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

GUIDE: TIA/EIA-603D 2.2.2

MEASUREMENT PROCEDURE:

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

MEASUREMENT RESULTS:

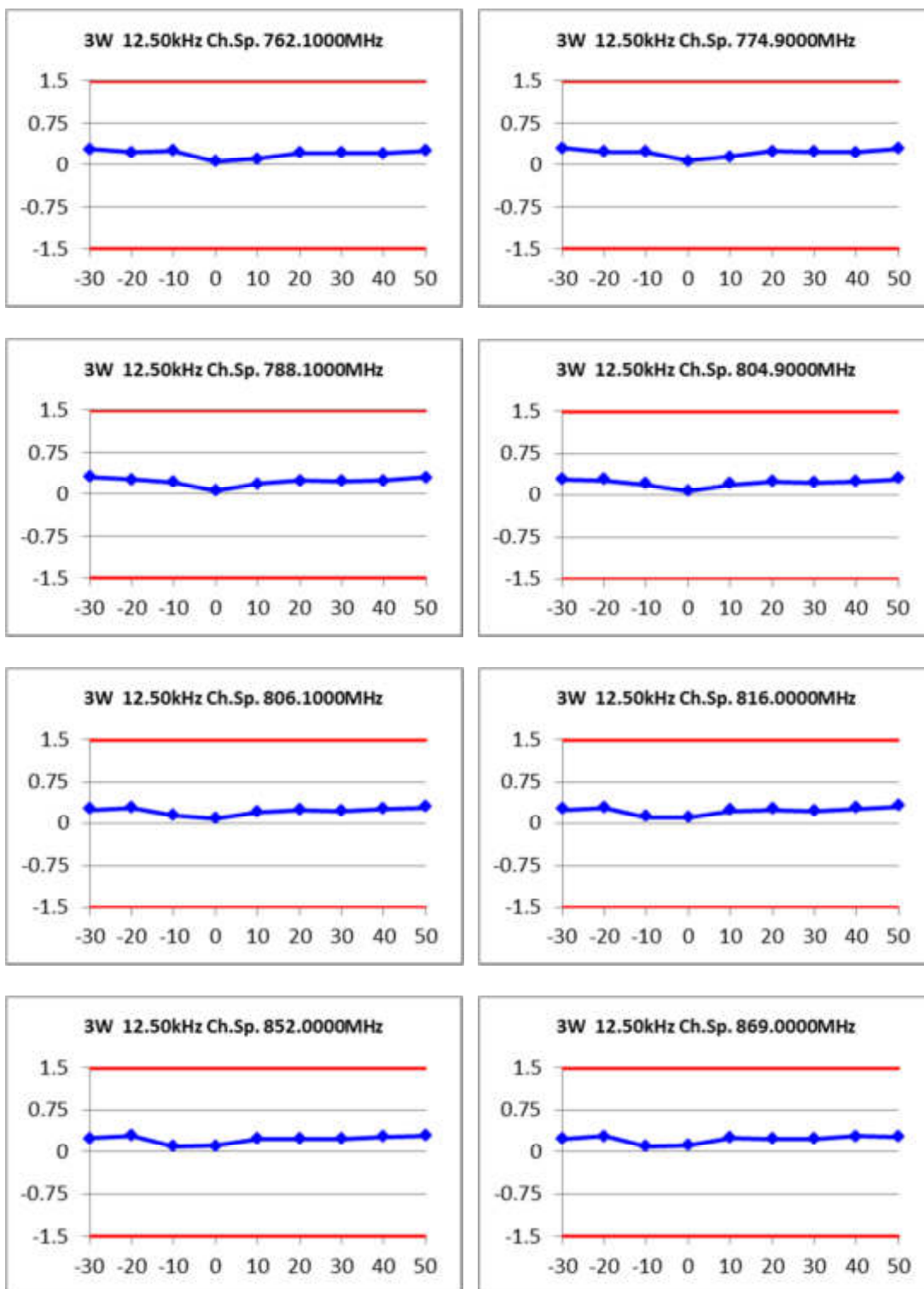
See the plots on the following pages for 12.5 kHz channel spacing.

Temperature ($^{\circ}\text{C}$)	Error (ppm)							
	762.1 MHz	774.9 MHz	788.1 MHz	804.9 MHz	806.1 MHz	816.0 MHz	852.0 MHz	869.0 MHz
-30	0.28	0.3	0.31	0.28	0.25	0.25	0.24	0.23
-20	0.22	0.23	0.26	0.27	0.28	0.28	0.29	0.28
-10	0.25	0.23	0.21	0.19	0.15	0.12	0.1	0.1
0	0.06	0.07	0.06	0.07	0.09	0.11	0.11	0.12
10	0.11	0.15	0.18	0.19	0.2	0.23	0.23	0.25
20	0.21	0.24	0.24	0.24	0.24	0.25	0.23	0.23
30	0.21	0.23	0.23	0.22	0.22	0.22	0.23	0.23
40	0.2	0.22	0.24	0.24	0.26	0.27	0.27	0.28
50	0.25	0.29	0.3	0.29	0.29	0.31	0.29	0.27
Measurement Uncertainty				$\pm 7 \times 10^{-8}$				

LIMIT: FCC 47 CFR 90.213

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

Transmitter Frequency Stability - Temperature



TRANSMITTER FREQUENCY STABILITY - VOLTAGE

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

GUIDE: TIA/EIA-603D 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 nominal battery voltage and battery end point .
3. The frequency error was recorded in parts per million (ppm).

MEASUREMENT RESULTS:

	FREQUENCY ERROR (ppm) for 12.5 kHz		
	7.5 V _{DC}	6.375 V _{DC}	7.5 V _{DC}
762.1 MHz	0.16	0.18	0.18
774.9 MHz	0.18	0.19	0.19
788.1 MHz	0.19	0.20	0.21
804.9 MHz	0.19	0.20	0.20
806.1 MHz	0.19	0.20	0.21
816.0 MHz	0.20	0.23	0.23
852.0 MHz	0.23	0.23	0.24
869.0 MHz	0.23	0.23	0.25
Measurement Uncertainty		$\pm 7 \times 10^{-8}$	

LIMIT CLAUSES: FCC 47 CFR 90.213

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

TEST EQUIPMENT LIST

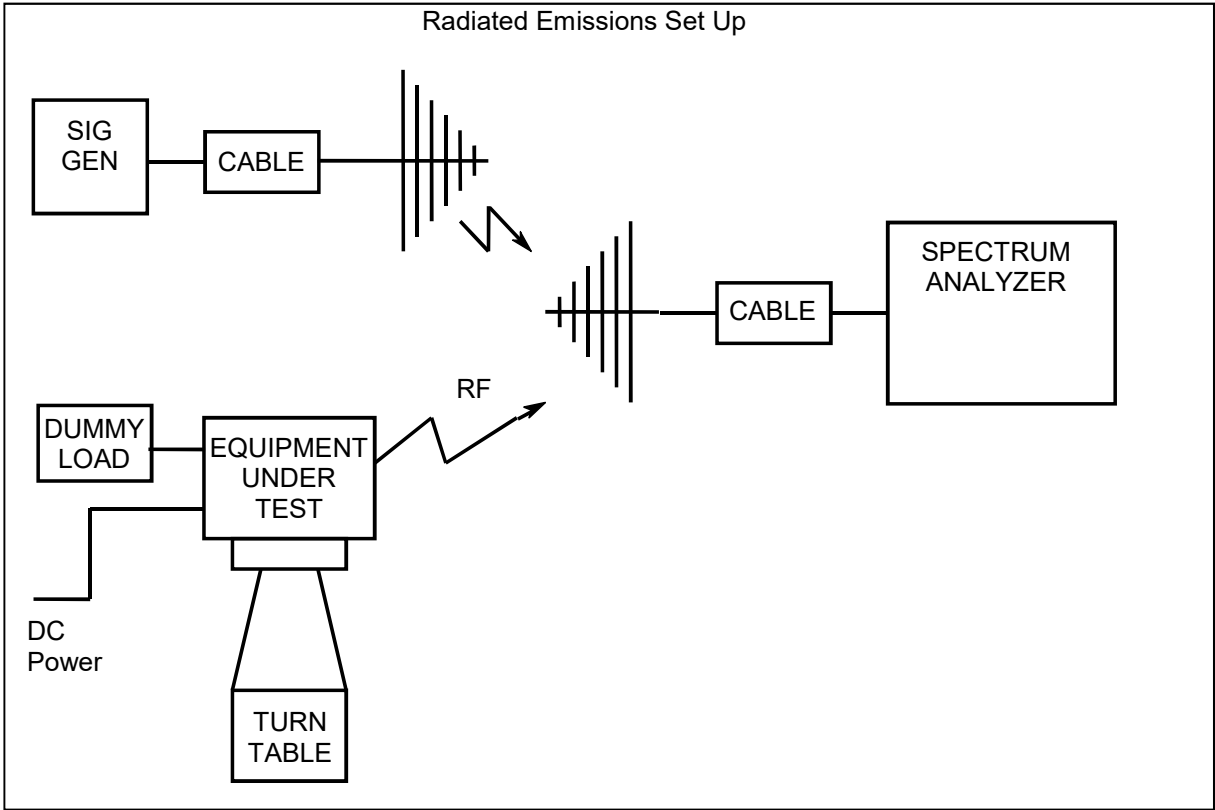
Equipment Type	Information	Manufacturer	Model No	Serial No#	Tait ID	Cal Due
Antenna	18GHz DRG	Emco	DRG3115	2084	E3076	
Antenna	Reference Dipoles	Emco	3121C DB1	9510-1164	E3559	14-May-22
Antenna	18GHz DRG	Emco	DRG3115	9512-4638	E3560	15-May-20
Antenna	Reverb - 1-18GHz DRG	Schwarzbeck	BBHA 9120 D	9120D-884	E4858	
Audio Analyser	TREVA1	Hewlett Packard	HP8903A	2437A04625	E4986	4-Oct-19
Coax Cable	OATS Turntable Cable 1	Intelcom	RG214	OATS1	E4621	15-Nov-19
Coax Cable	OATS Tower Cable	Intelcom	RG214	OATS2	E4622	14-Nov-19
Coax Cable	2m Black	Suhner	RG214HF/Nm/Nm/2000	TeltestBlack2	E4623	17-Oct-19
Coax Cable	2m Black	Suhner	RG214HF/Nm/Nm/2000	TeltestBlack3	E4624	17-Oct-19
Coax Cable	Reverb - 4.5m Multiflex 141	TeltestBlue6	MF 141	TeltestBlue6	E4843	18-Oct-19
Coax Cable	Reverb - 2m Multiflex 141	TeltestBlue5	MF 141	TeltestBlue5	E4844	18-Oct-19
Coax Cable	Reverb - 2m Multiflex 141	TeltestBlue4	MF 141	TeltestBlue4	E4845	18-Oct-19
Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue3	MF 141	TeltestBlue3	E4846	18-Oct-19
Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue2	MF 141	TeltestBlue2	E4847	18-Oct-19
Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue1	MF 141	TeltestBlue1	E4848	18-Oct-19
Coax Cable	2m Black	Suhner	RG214HF/Nm/Nm/2000	TeltestBlack5	E4850	17-Oct-19
Coax Cable	OATS Turntable Cable 2	Intelcom	RG215	OATS3	E4995	14-Nov-19
Coax Cable	2.5m Blue	Suhner	Sucoflex 104A	33449/4PEA	E4997	19-Oct-19
Coax Cable	2m Black	Suhner	RG214HF/Nm/Nm/2000	TeltestBlack7	E5004	17-Oct-19
Coax Cable	3m Blue	Suhner	Sucoflex 126EA	503429/126EA	E5015	19-Oct-19
Environ. Chamber	Upright	Contherm	5400 RHSLT.M	1416	E4051	7-Aug-23
Environ. Chamber	Upright	Contherm	5400 RHSLT.M	1416	E4051	15-May-20
Filter High Pass/Notch	550 to 885MHz	Tait		N/A	E3785	25-Sep-19
Modulation Analyser	TREVA1	Hewlett Packard	HP8901B (Opt 002)	2441A00393	E3073	4-Oct-19
Modulation Analyser	Includes Audio Analyser	Rohde & Schwarz	FMA0852.8500.5 2	842541/001	E3554	25-Mar-21
Multimeter		Fluke	77	35069359	E3237	25-Oct-19
OATS	Controller	Electrometrics	EM-4700	119	E4445	
OATS	Turntable	Electrometrics	EM-4704A	105	E4446	
OATS	Antenna Tower	Electrometrics	EM-4720-2	112	E4447	
OATS	NSA	Tait				18-Jun-20
Oscilloscope	100MHz Digital	Tektronics	TDS340	B013611	E3585	28-Sep-19
Power Meter	TREVA1 Power Head for HP8901	Hewlett Packard	HP11722A	3111A05573	E7054	28-Sep-19
Power Supply		Rohde & Schwarz	NGS M32/10 192.0810.31	Fnr 434	E3556	6-May-20
Power Supply	60V/50A/1000W	Hewlett Packard	HP6012B	2524A00616	E3712	30-Sep-19
Power Supply	TREVA1	Agilent	HP6032A	MY41000319	E4045	24-Sep-20
Power Supply	60V/25A	Agilent	N5767A	3111A05573	E4979	2-Oct-20
Equipment Type	Information	Manufacturer	Model No	Serial No#	Tait ID	Cal Due

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RF Amplifier	+21.7 dB 1GHz	Tait	ZFL-1000LN	E3660	E3360	30-Apr-20
RF Amplifier	Pre-amplifier	Agilent	87405C	MY47010688	E4941	2-Oct-19
RF Attenuator	10dB 50W	Weinschel	24-10-34	AZ0401	E3388	17-Oct-19
RF Attenuator	33dB 350W	Weinschel	67-30-33 & BW-N3W5+	CK9178	E5023	15-Jul-20
RF Attenuator	10dB 50W	Weinschel	24-10-34	BC3293	E4364	17-Oct-19
RF Attenuator	TREVA1 3dB	Weinschel	Model 1	BL9958	E4081	17-Oct-19
RF Attenuator	TREVA 1 20dB 150W	Weinschel	40-20-23	MF817	E4082	17-Oct-19
RF Attenuator	3dB 0.5W	Weinschel	Model 2	CH6857	E5012	17-Oct-19
RF Chamber	S-LINE TEM CELL	Rohde & Schwarz	1089.9296.02	338232/003	E3636	12-Sep-20
RF Chamber	Reverb - Stirrer controller for reverb chamber	Teseq	Stirrer Controller	29765.1	E4854	
RF Chamber	Reverb - 0.5 - 18GHz Reverberation Chamber	Teseq	RVC XS	29765	E4855	
RF Combiner	TREVA1	Minicircuits	ZFSC-4-1	-	E4083	
RF Load	50W	Weinschel	F1426	AE2490	E3624	18-Oct-19
Signal Generator	Analog 4GHz	Agilent	E4422B	GB40050320	E3788	27-Sep-19
Signal Generator	Digital 4GHz	Agilent	E4437B	US39260389	E4764	30-Sep-19
Signal Generator	TREVA1 Analog 3.2GHz	Agilent	E8663D	MY50420224	E4908	2-Oct-20
Spectrum Analyser	13.2GHz	Agilent	E4445A	MY42510072	E4139	19-Jul-20
Spectrum Analyser	26.5GHz	Agilent	PXA N9030A	MY49432161	E4907	27-Oct-20
Temp & Humidity datalogger		Hobo	U21-011	10134275	E4980	5-May-20
TREVA 1		Teltest	-	1	-	5-Nov-19
Testware	Frequency Vs Temperature		April 2018	-	-	
Testware	Occupied Bandwidth		July 2019	-	-	
Testware	Radiated Emissions		April 2018	-	-	
Testware	Reverb Emissions		May 2019	-	-	
Testware	Sideband Spectrum		February 2017	-	-	
Testware	S-Line Radiated Emissions		April 2018	-	-	
Testware	TREVA		7 February 2019	-	-	
Testware	Spec An Correction Loader		June 2019	-	-	

* NOTE: Items without calibration dates are calibrated immediately before use, or set using calibrated instruments.

ANNEX A – TEST SETUP DETAILS



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.

