

LIST OF EXHIBITS (added as supplemental to the information currently on record)

EXHIBIT	DESCRIPTION	REFERENCE
E	Report on Test Measurements	2.1033-(c)(14)
E1-24	Occupied Bandwidth Description – LSM, C4FM, H-DQPSK Digital Modulations – D-Mask Occupied Bandwidth Description – LSM, C4FM, H-DQPSK Digital Modulations – H-Mask	
E1-2.24a	Occupied Bandwidth Plot – Linear Simulcast Modulation (LSM) – D-Mask	
E1-2.24b	Occupied Bandwidth Plot – Linear Simulcast Modulation (LSM) – H-Mask	
E1-2.24c	Occupied Bandwidth Plot – Compatible 4-Level Frequency Modulation (C4FM) – D-Mask	
E1-2.24d	Occupied Bandwidth Plot – Compatible 4-Level Frequency Modulation (C4FM) – H-Mask	
E1-2.24e	Occupied Bandwidth Plot – H-DQPSK, P25 Two Slot TDMA Digital Modulation – D-Mask	
E1-2.24f	Occupied Bandwidth Plot – H-DQPSK, P25 Two Slot TDMA Digital Modulation – H-Mask	

Report on Test Measurements

Occupied Bandwidth – P25 Digital Modulations, 12.5 kHz Channel Spacing – D-Mask Compliance

Three digital modulations are shown. They can be used in a system configuration based upon channel usage as described in Exhibit B. The occupied bandwidth charts reference the following setup and specification requirements.

Modulation Type:	LSM	C4FM	H-DQPSK
Emission Designator:	8K70D1W, 8K70D1E, 8K70D1D	8K10F1W, 8K10F1E, 8K10F1D	9K80D7W, 9K80D7E, 9K80D7D
Channelization:	12.5 kHz	12.5 kHz	12.5 kHz
Power Setting:	100 Watts, Avg	100 Watts	100 Watts, Avg

Specification Requirement § 90.210(d) Emission Limits – “D-Mask”:

Emission Mask D. For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

- (1) On any frequency from the center of the authorized bandwidth (f_0) to 5.625 kHz removed from f_0 : *Zero dB*
- (2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.625 kHz but no more than 12.5 kHz: *At least $7.27 * (f_d - 2.88 \text{ kHz})$ dB*
- (3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz: *At least 50 plus $10 \log_{10}(P)$ dB or 70 dB, whichever is the lesser attenuation.*

(4) The reference level for showing compliance with the emission mask shall be established using a resolution bandwidth sufficiently wide to capture the true peak emission of the equipment under test. In order to show compliance with the emissions mask up to and including 50 kHz removed from the edge of the authorized bandwidth, adjust the resolution bandwidth to 100 Hz with the measuring instrument in a peak hold mode. A sufficient number of sweeps must be measured to ensure that the emission profile is developed.

Necessary Bandwidth Calculation: Refer to information provided in the associated full filing package or change packages for necessary bandwidth information for these modulations.

Measurement Procedure and Instrument Settings:

Emission Measurement Analyzer Settings:

Horizontal:	12.5 kHz per Division	Resolution Bandwidth:	100 Hz
Vertical:	10 dB per Division	Video Bandwidth:	10 kHz
Sweep Time:	72 Seconds (<2000 Hz / Second)	Span:	125 kHz
Detector Mode:	Peak		

Test Procedure:

- 1) Adjust the spectrum analyzer per the values specified in the Emission Measurement Analyzer Settings.
- 2) Modulate the transmitter with the appropriate signaling pattern, (pseudorandom data) and key the transmitter at the full power rating. Use the analyzer controls to set this signal to the full-scale reference line. Allow the analyzer to sweep fully and store the sweep.
- 3) Use the band power marker function of the spectrum analyzer to measure the power of the carrier in a 12.5 kHz bandwidth.
- 4) Use the carrier power value from the previous step to generate the emission mask limit.
- 5) Plot the resulting analyzer trace and the emission mask limit; add text and labeling as appropriate.

EXHIBIT	DESCRIPTION
E1-2.24a	Occupied Bandwidth Plot – Linear Simulcast Modulation (LSM) – D-Mask
E1-2.24b	Occupied Bandwidth Plot – Linear Simulcast Modulation (LSM) – H-Mask
E1-2.24c	Occupied Bandwidth Plot – Compatible 4-Level Frequency Modulation (C4FM) – D-Mask
E1-2.24d	Occupied Bandwidth Plot – Compatible 4-Level Frequency Modulation (C4FM) – H-Mask
E1-2.24e	Occupied Bandwidth Plot – H-DQPSK, P25 Two Slot TDMA Digital Modulation – D-Mask
E1-2.24f	Occupied Bandwidth Plot – H-DQPSK, P25 Two Slot TDMA Digital Modulation – H-Mask

Report on Test Measurements

Occupied Bandwidth – P25 Digital Modulations, NPSPAC Channels – H-Mask Compliance

Three digital modulations are shown. They can be used in a system configuration based upon channel usage as described in Exhibit B. The occupied bandwidth charts reference the following setup and specification requirements.

Modulation Type:	LSM	C4FM	H-DQPSK
Emission Designator:	8K70D1W, 8K70D1E, 8K70D1D	8K10F1W, 8K10F1E, 8K10F1D	9K80D7W, 9K80D7E, 9K80D7D
Channelization:	12.5 kHz	12.5 kHz	12.5 kHz
Power Setting:	100 Watts, Avg	100 Watts	100 Watts, Avg

Specification Requirement § 90.210(h) Emission Limits – “H-Mask”:

Emission Mask H. For transmitters that are not equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier output power (P) as follows:

- (1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of 4 kHz or less: Zero dB
- (2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 4 kHz but no more than 8.5 kHz: $At least 107 * \log_{10}(f_d / 4) \text{ dB}$
- (3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 8.5 kHz, but no more than 15 kHz: $At least 40.5 \log_{10}(f_d / 1.16) \text{ dB};$
- (4) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 15 kHz, but no more than 25 kHz: $At least 116 \log_{10}(f_d / 6.1) \text{ dB};$
- (5) On any frequency removed from the center of the authorized bandwidth by more than 25 kHz: $At least 43 \text{ plus } 10 \log_{10}(P) \text{ dB}$

Necessary Bandwidth Calculation: Refer to information provided in the associated full filing package or change packages for necessary bandwidth information for these modulations.

Measurement Procedure and Instrument Settings:

Emission Measurement Analyzer Settings:

Horizontal:	12.5 kHz per Division	Resolution Bandwidth:	300 Hz
Vertical:	10 dB per Division	Video Bandwidth:	10 kHz
Sweep Time:	72 Seconds (<2000 Hz / Second)	Span:	125 kHz
Detector Mode:	Peak		

Test Procedure:

- 1) Adjust the spectrum analyzer per the values specified in the Emission Measurement Analyzer Settings.
- 2) Modulate the transmitter with the appropriate signaling pattern, (pseudorandom data) and key the transmitter at the full power rating. Use the analyzer controls to set this signal to the full-scale reference line. Allow the analyzer to sweep fully and store the sweep.
- 3) Use the band power marker function of the spectrum analyzer to measure the power of the carrier in a 12.5 kHz bandwidth.
- 4) Use the carrier power value from the previous step to generate the emission mask limit.
- 5) Plot the resulting analyzer trace and the emission mask limit, add text and labeling as appropriate.

EXHIBIT	DESCRIPTION
E1-2.24a	Occupied Bandwidth Plot – Linear Simulcast Modulation (LSM) – D-Mask
E1-2.24b	Occupied Bandwidth Plot – Linear Simulcast Modulation (LSM) – H-Mask
E1-2.24c	Occupied Bandwidth Plot – Compatible 4-Level Frequency Modulation (C4FM) – D-Mask
E1-2.24d	Occupied Bandwidth Plot – Compatible 4-Level Frequency Modulation (C4FM) – H-Mask
E1-2.24e	Occupied Bandwidth Plot – H-DQPSK, P25 Two Slot TDMA Digital Modulation – D-Mask
E1-2.24f	Occupied Bandwidth Plot – H-DQPSK, P25 Two Slot TDMA Digital Modulation – H-Mask

Occupied Bandwidth – Linear Simulcast Modulation – D-Mask

ATTEN 20 dB

**10 dB/
Peak**

— Transmit Signal - 100 W

— 90.210 D-Mask - 100 W

CENTER 851.0250 MHz

RES BW 100 Hz

VID BW 10 kHz

SPAN 125 kHz

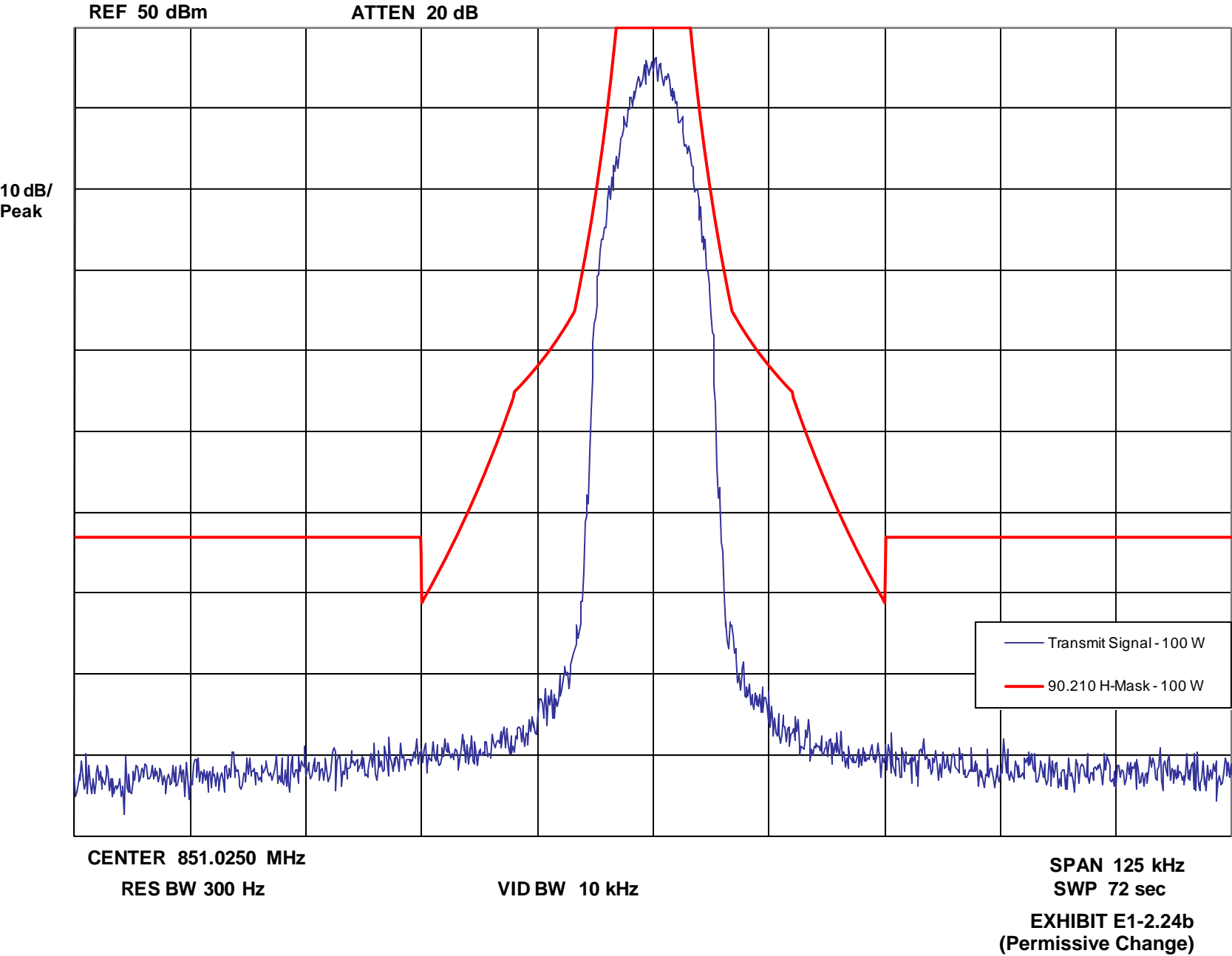
SWP 72 sec

EXHIBIT E1-2.24a
(Permissive Change)

Report on Test Measurements

Occupied Bandwidth – Linear Simulcast Modulation – H-Mask

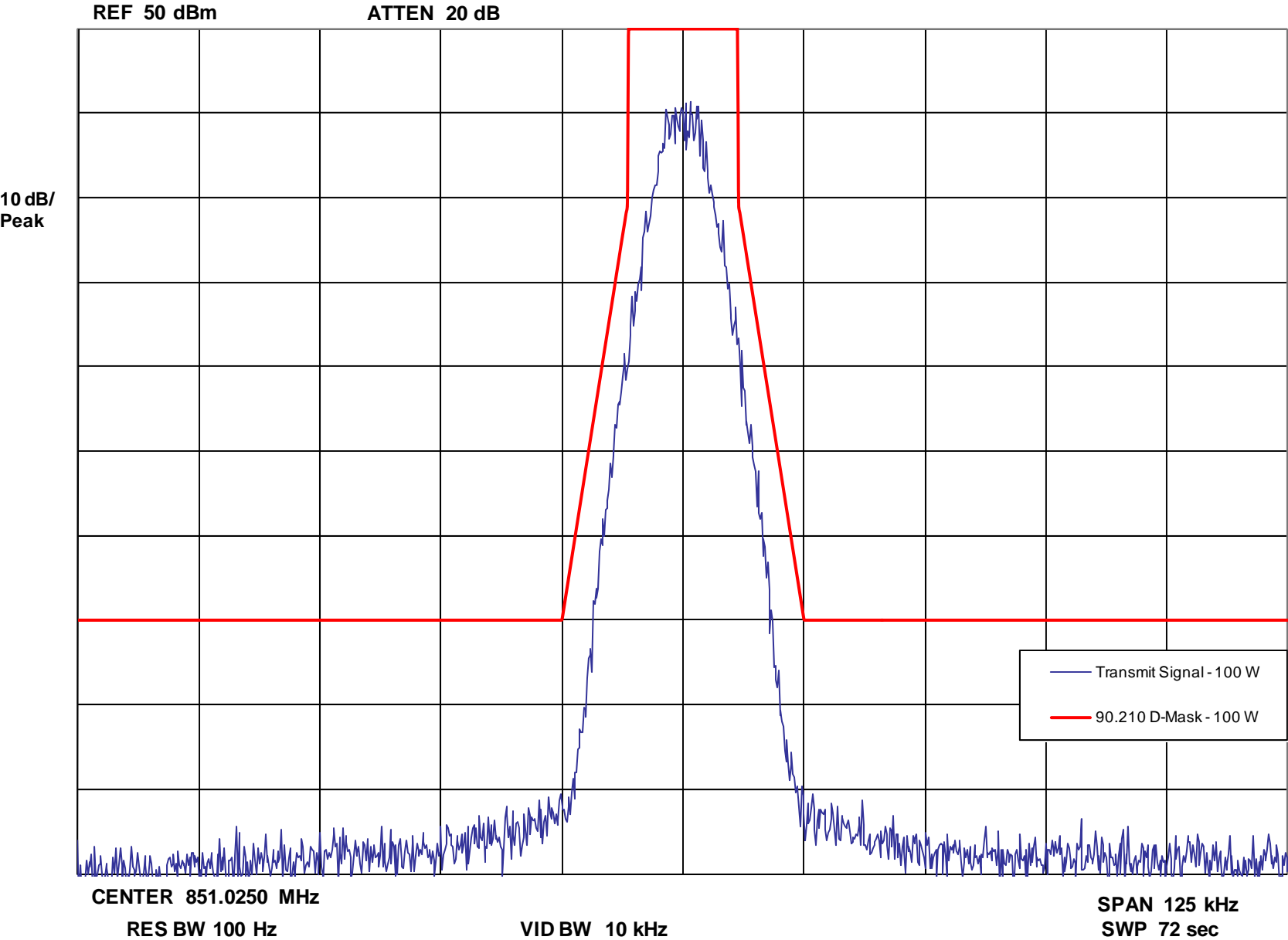
Occupied Bandwidth -- Linear Simulcast Modulation - 100 Watts (Average)



Report on Test Measurements

Occupied Bandwidth – Compatible 4-Level Frequency Modulation – D-Mask

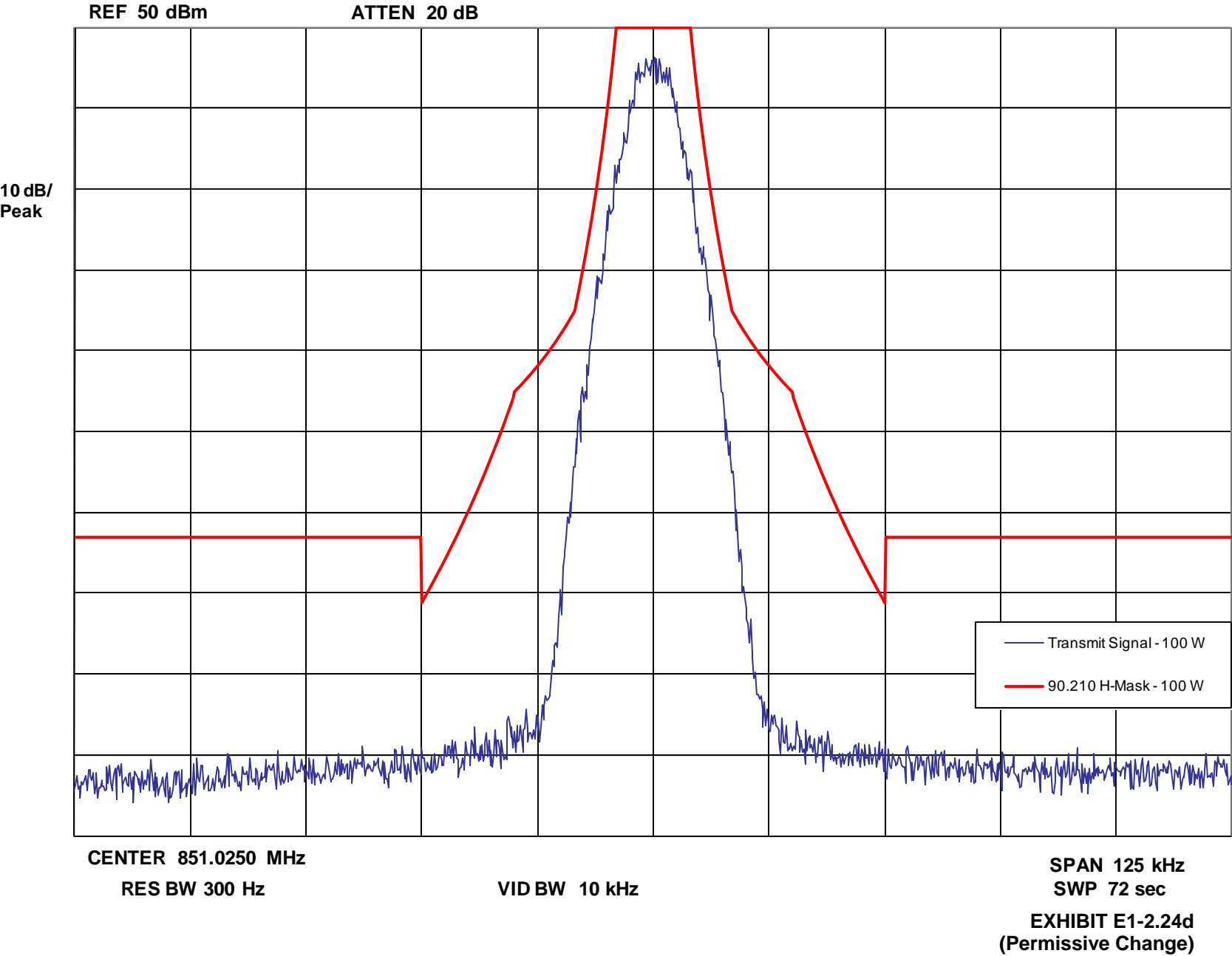
Occupied Bandwidth -- Compatible 4-Level Frequency Modulation - 100 Watts



Report on Test Measurements

Occupied Bandwidth – Compatible 4-Level Frequency Modulation – H-Mask

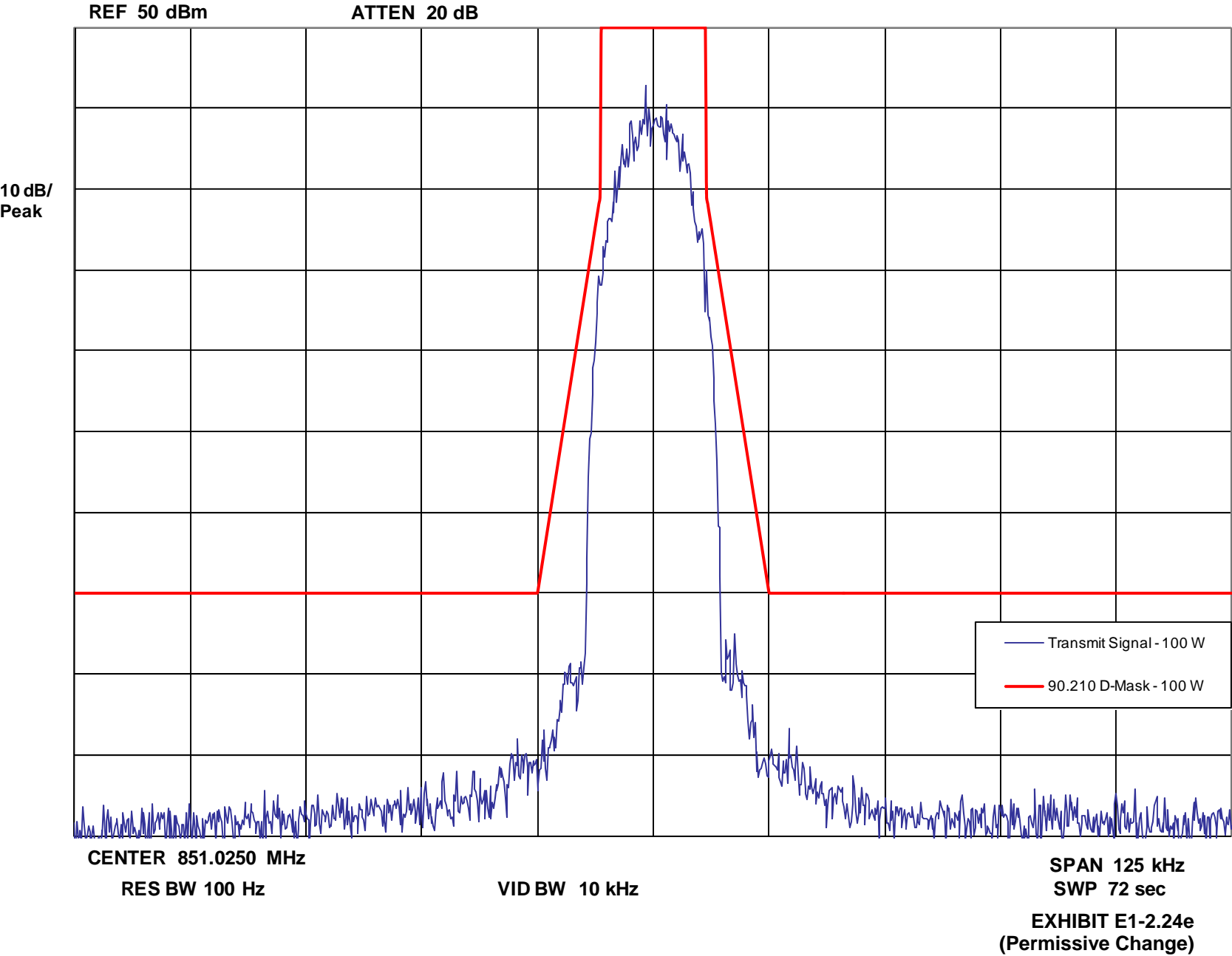
Occupied Bandwidth -- Compatible 4-Level Frequency Modulation - 100 Watts



Report on Test Measurements

Occupied Bandwidth – H-DQPSK P25 Two Slot TDMA Digital Modulation – D-Mask

Occupied Bandwidth -- H-DQPSK P25 Two Slot TDMA Digital Modulation - 100 Watts (Average)



Report on Test Measurements

Occupied Bandwidth – H-DQPSK P25 Two Slot TDMA Digital Modulation – H-Mask

Occupied Bandwidth -- H-DQPSK P25 Two Slot TDMA Digital Modulation - 100 Watts (Average)

