

Report on Test Measurements*Measurements Report*

The measurement report shows compliance information against the pertinent technical standards. Each section of the report contains either verbiage or graphs which show compliance to applicable standards as required. Each section also explains testing method and indicates what the applicable specification is.

A list of test equipment for all sections, and certification signoff page are included at the end of the measurement report.

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Report on Test Measurements

Measurements Report

SUBMITTED MEASURED DATA – INDEX (Continued)

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Report on Test Measurements

RF Power Output Data

The RF power output was measured with the indicated voltage applied to and current into the final RF amplifying device. The DC current indicated is the total for the final RF amplifier stage, consisting of four parallel power transistors.

High Performance Data Mode:

Measured RF output	<u>50</u>	Watts, Average
DC Voltage	<u>28.5</u>	Volts
DC Current	<u>8.0</u>	Amperes
Input power for final RF amplifying device(s)	<u>228</u>	Watts
Primary Radio Input Supply Voltage	<u>120</u>	Volts AC
Minimum Measured RF output	<u>2</u>	Watts, Average
Normal DC Voltage	<u>21.0</u>	Volts
Normal DC Current	<u>3.0</u>	Amperes
Input power for final RF amplifying device(s)	<u>63</u>	Watts
Primary Radio Input Supply Voltage	<u>120</u>	Volts AC

Linear Simulcast Modulation Mode:

Measured RF output	<u>100</u>	Watts, Average
DC Voltage	<u>27.5</u>	Volts
DC Current	<u>12.0</u>	Amperes
Input power for final RF amplifying device(s)	<u>330</u>	Watts
Primary Radio Input Supply Voltage	<u>120</u>	Volts AC
Minimum Measured RF output	<u>2</u>	Watts, Average
Normal DC Voltage	<u>21.0</u>	Volts
Normal DC Current	<u>3.0</u>	Amperes
Input power for final RF amplifying device(s)	<u>63</u>	Watts
Primary Radio Input Supply Voltage	<u>120</u>	Volts AC

Compatible 4-Level Frequency Modulation Mode:

Measured RF output	<u>100</u>	Watts
DC Voltage	<u>21.0</u>	Volts
DC Current	<u>13.0</u>	Amperes
Input power for final RF amplifying device(s)	<u>273</u>	Watts
Primary Radio Input Supply Voltage	<u>120</u>	Volts AC
Minimum Measured RF output	<u>2</u>	Watts
Normal DC Voltage	<u>21.0</u>	Volts
Normal DC Current	<u>3.0</u>	Amperes
Input power for final RF amplifying device(s)	<u>63</u>	Watts
Primary Radio Input Supply Voltage	<u>120</u>	Volts AC

Report on Test Measurements*Occupied Bandwidth – High Performance Data (HPD), 25 kHz Channel Spacing*

There are four exhibits shown for high performance data. All can be used in a system configuration based upon channel usage as described in Exhibit B. All four of the following charts reference the following setup and specification requirements.

Modulation Type: High Performance Data, MQAM
 Emission Designator: 17K7D7D
 Channelization: 25 kHz
 Power Setting: 50 Watts, Average

Specification Requirement § 90.210(g) Emission Limits: (Biennial Regulatory Review Report and Order, Adopted July 22, 2005, FCC 05-144, http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-05-144A1.doc):

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

- (1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 10 kHz, but no more than 250 percent of the authorized bandwidth:

$$\text{At least } 116 \log (fd/6.1) \text{ dB, or } 50 + 10 \log (P) \text{ dB, or } 70 \text{ dB}$$

(whichever is the lesser attenuation);
- (2) On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth:

$$\text{At least } 43 + 10 \log (P) \text{ dB.}$$

Necessary Bandwidth Calculation:

The necessary bandwidth of the modulation signal is not calculable per the formulas defined in 47 CFR 2.202 (b). Specifically, although the modulation for this emission is a composite modulation, the equations given in the composite tables in 2.202 are not applicable since none of them adequately approximate the form of digital modulation used. The necessary bandwidth of 17.7 kHz is based upon a 99% power measurement of the transmitter spectrum, per 2.202 (a).

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:	Average		

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 25 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

E1-2.1	High Performance Data – 64 QAM
E1-2.2	High Performance Data – 16 QAM
E1-2.3	High Performance Data – QPSK
E1-2.4	High Performance Data – Mixed Mode (64 / 16 / QPSK)

Report on Test Measurements

Occupied Bandwidth – Linear Simulcast Modulation (LSM), 12.5 kHz Channel Spacing

There is one exhibit shown for Linear Simulcast Modulation. It can be used in a system configuration based upon channel usage as described in Exhibit B. The occupied bandwidth chart references the following setup and specification requirements.

Modulation Type: Linear Simulcast Modulation, LSM
 Emission Designator: 8K70D1W
 Channelization: 12.5 kHz
 Power Setting: 100 Watts, Average

Specification Requirement § 90.210(d) Emission Limits:

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: The necessary bandwidth of the modulation signal is not calculable per the formulas defined in 47 CFR 2.202 (b). Specifically, although the modulation for this emission is a composite modulation, the equations given in the composite tables in 2.202 are not applicable since none of them adequately approximate the form of digital modulation used. The necessary bandwidth of 8.70 kHz is based upon a 99% power measurement of the transmitter spectrum, per 2.202 (a).

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
E1-2.5	Linear Simulcast Modulation

Report on Test Measurements

Occupied Bandwidth – Compatible 4-Level Frequency Modulation (C4FM), 12.5 kHz Channel Spacing

There is one exhibit shown for C4FM. It can be used in a system configuration based upon channel usage as described in Exhibit B. The occupied bandwidth chart references the following setup and specification requirements.

Modulation Type: Compatible 4-Level Frequency Modulation, C4FM
 Emission Designator: 8K10F1E
 Channelization: 12.5 kHz
 Power Setting: 100 Watts

Specification Requirement § 90.210(d) Emission Limits:

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: An occupied bandwidth of 8.10 kHz was measured for this emission, per 2.202 paragraph (a) of the Rules and Regulations, as that bandwidth which contains 99% of the power in the transmitted signal. For this system, the necessary bandwidth has been chosen to be the same as the occupied bandwidth, thereby per paragraph (b) (2), the necessary bandwidth is 8K10.

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

E1-2.6 Compatible 4-Level Frequency Modulation

APPLICANT: MOTOROLA

EQUIPMENT TYPE: ABZ89FC5810

Report on Test Measurements

Occupied Bandwidth – HPD 64 QAM

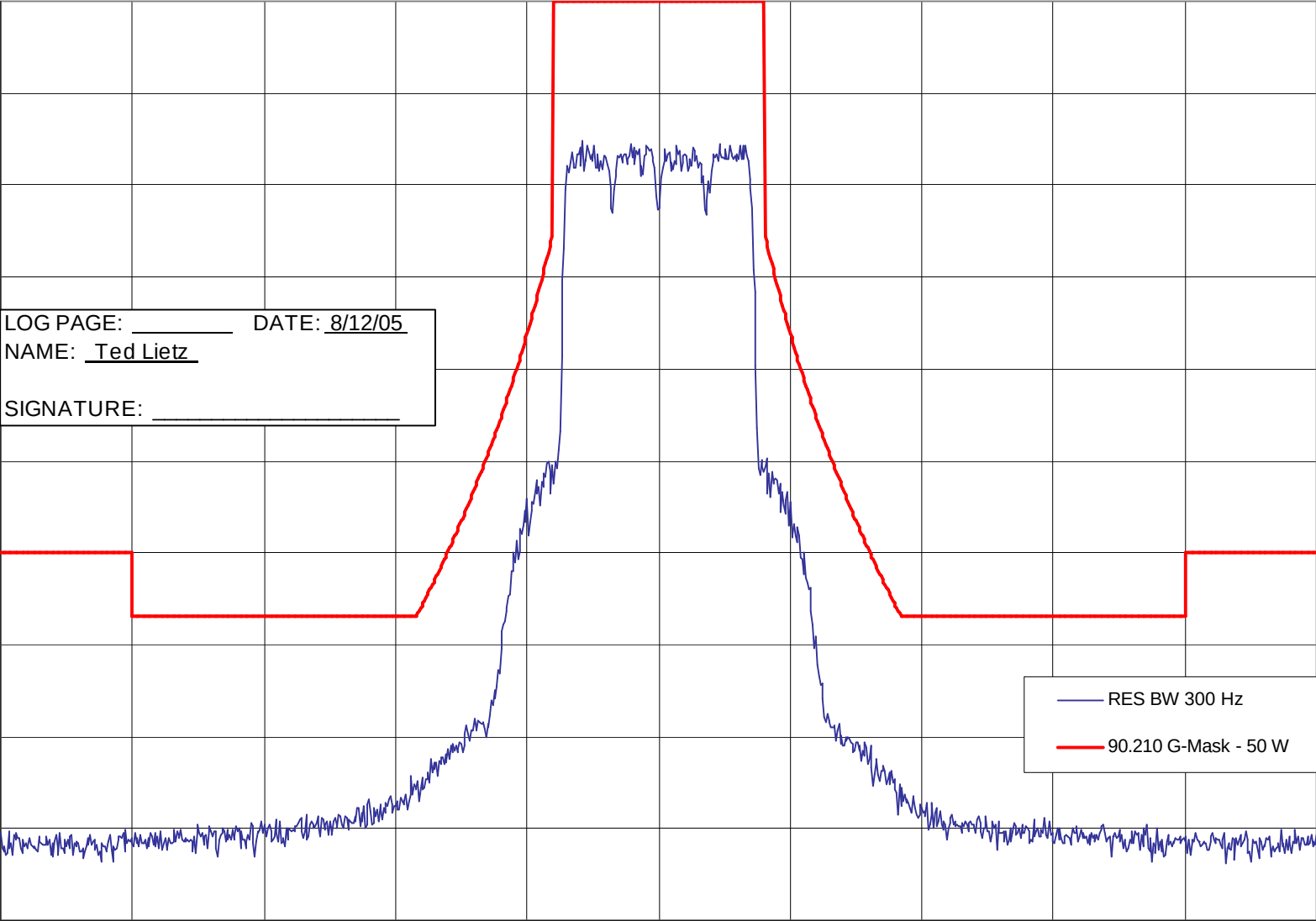
Occupied Bandwidth -- High Performance Data - 64 QAM - 17K7D7D - 50 Watts

REF 47 dBm

ATTEN 20 dB

10 dB/
Avg

LOG PAGE: _____ DATE: 8/12/05
NAME: Ted Lietz
SIGNATURE: _____



Report on Test Measurements

Occupied Bandwidth – HPD 16 QAM

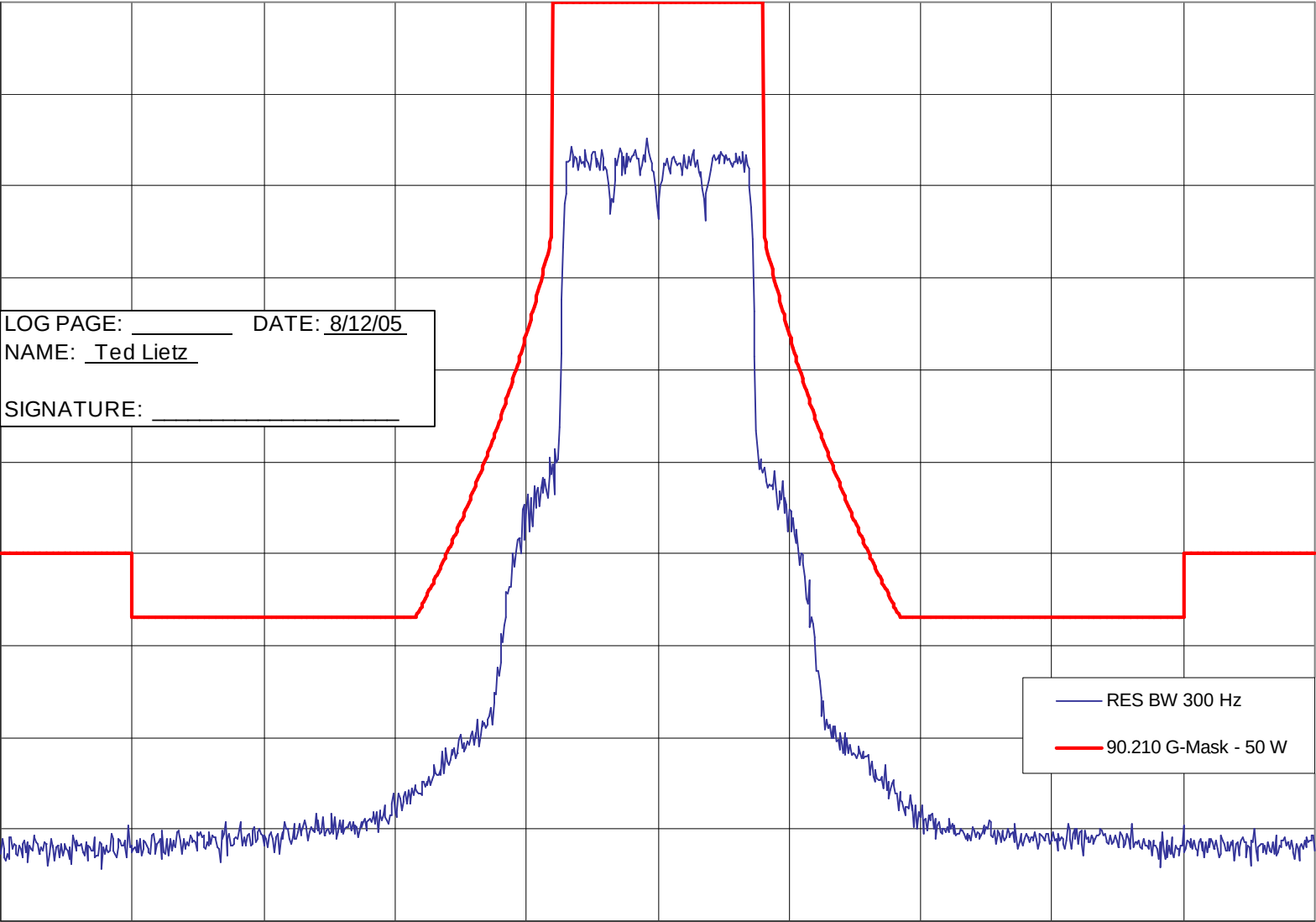
Occupied Bandwidth -- High Performance Data - 16 QAM - 17K7D7D - 50 Watts

REF 47 dBm

ATTEN 20 dB

10 dB/
Avg

LOG PAGE: _____ DATE: 8/12/05
 NAME: Ted Lietz
 SIGNATURE: _____



CENTER 860.01250 MHz
 RES BW 300 Hz

VID BW 10 kHz

SPAN 125 kHz
 SWP 72 sec

APPLICANT: MOTOROLA

EQUIPMENT TYPE: ABZ89FC5810

Report on Test Measurements

Occupied Bandwidth – HPD QPSK

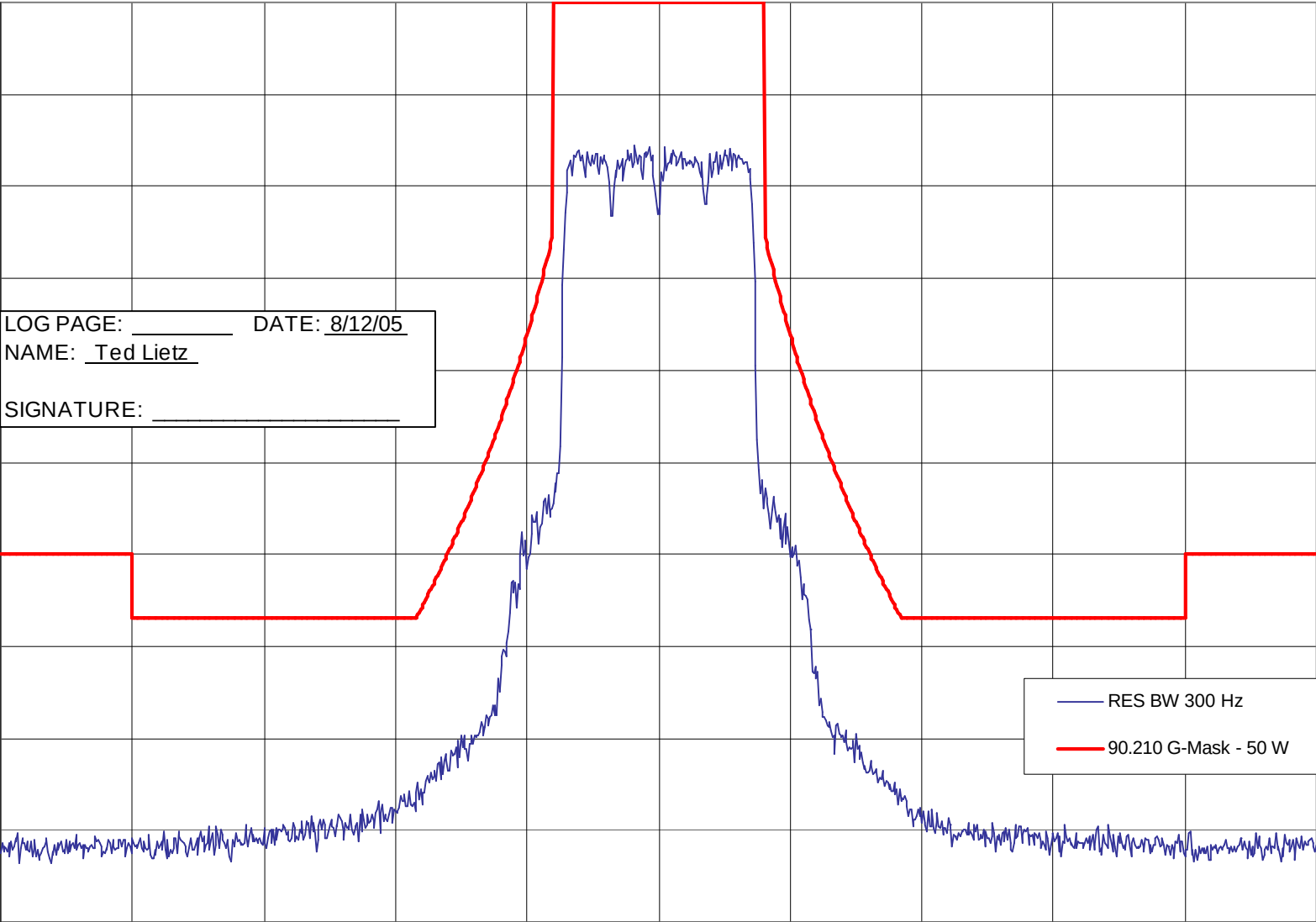
Occupied Bandwidth -- High Performance Data - QPSK (4 QAM) - 17K7D7D - 50 Watts

REF 47 dBm

ATTEN 20 dB

10 dB/
Avg

LOG PAGE: _____ DATE: 8/12/05
NAME: Ted Lietz
SIGNATURE: _____



CENTER 860.01250 MHz

RES BW 300 Hz

VID BW 10 kHz

SPAN 125 kHz

SWP 72 sec

Report on Test Measurements

Occupied Bandwidth – HPD 64 / 16 / QPSK QAM Mixed Mode

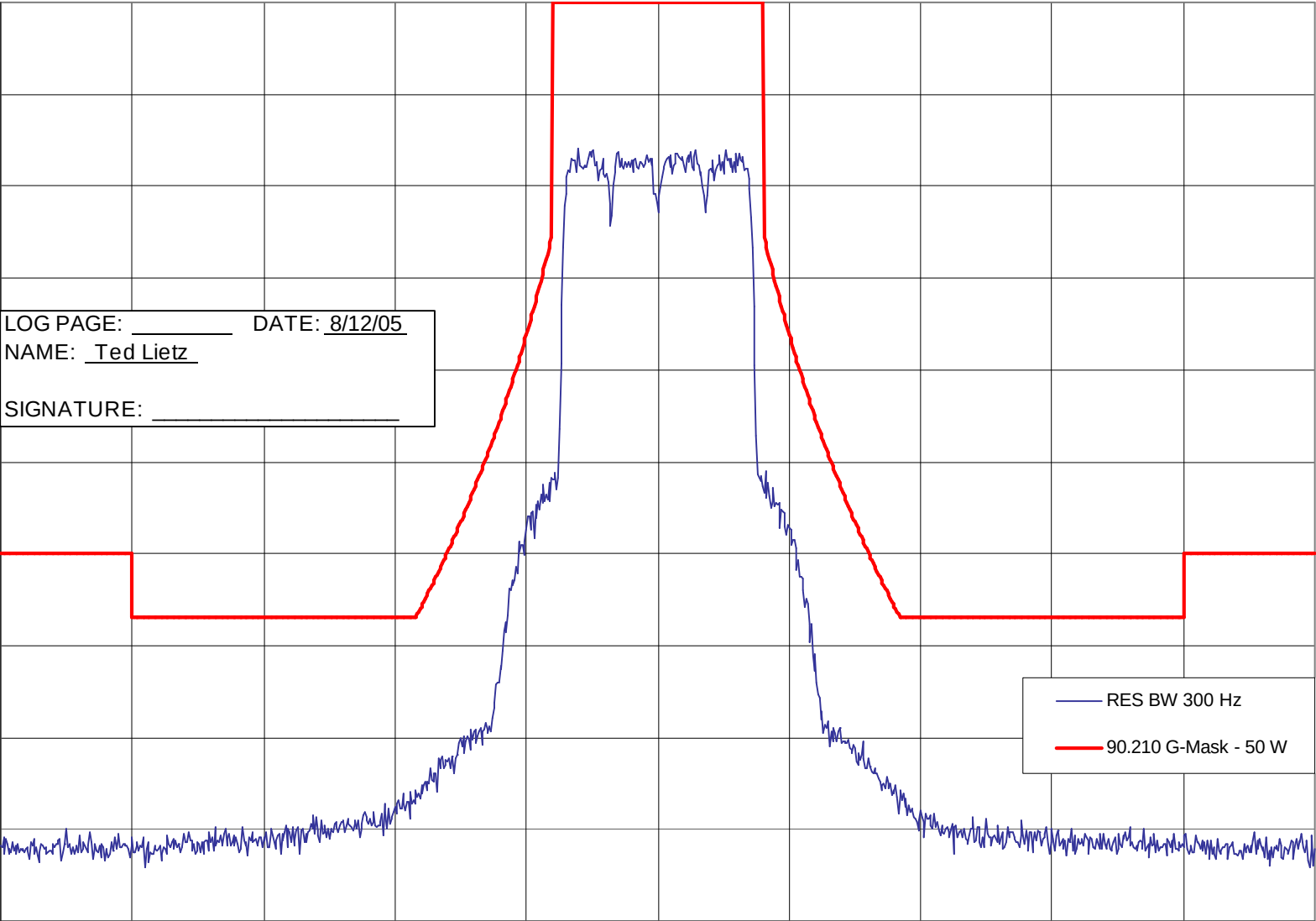
Occupied Bandwidth -- High Performance Data - Mixed QPSK - 17K7D7D - 50 Watts

REF 47 dBm

ATTEN 20 dB

10 dB/
Avg

LOG PAGE: _____ DATE: 8/12/05
 NAME: Ted Lietz
 SIGNATURE: _____



CENTER 860.01250 MHz
 RES BW 300 Hz

VID BW 10 kHz

SPAN 125 kHz
 SWP 72 sec

Report on Test Measurements

Occupied Bandwidth – LSM

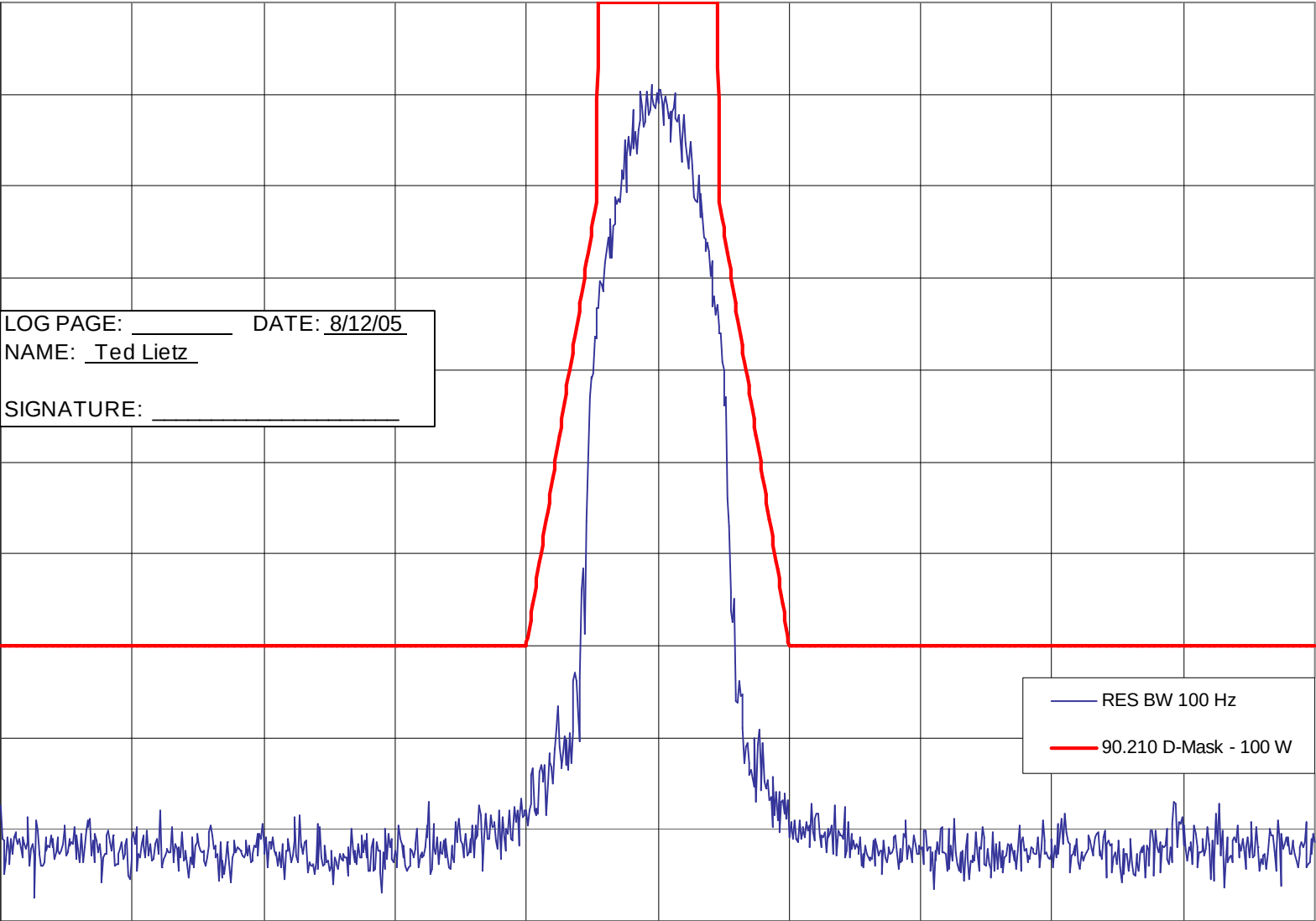
Occupied Bandwidth -- Linear Simulcast Modulation - 8K70D1W - 100 Watts

REF 50 dBm

ATTEN 20 dB

10 dB/
Peak

LOG PAGE: _____ DATE: 8/12/05
NAME: Ted Lietz
SIGNATURE: _____



CENTER 860.01250 MHz
RES BW 100 Hz

VID BW 10 kHz

SPAN 125 kHz
SWP 72 sec

APPLICANT: MOTOROLA

EQUIPMENT TYPE: ABZ89FC5810

Report on Test Measurements

Occupied Bandwidth – C4FM

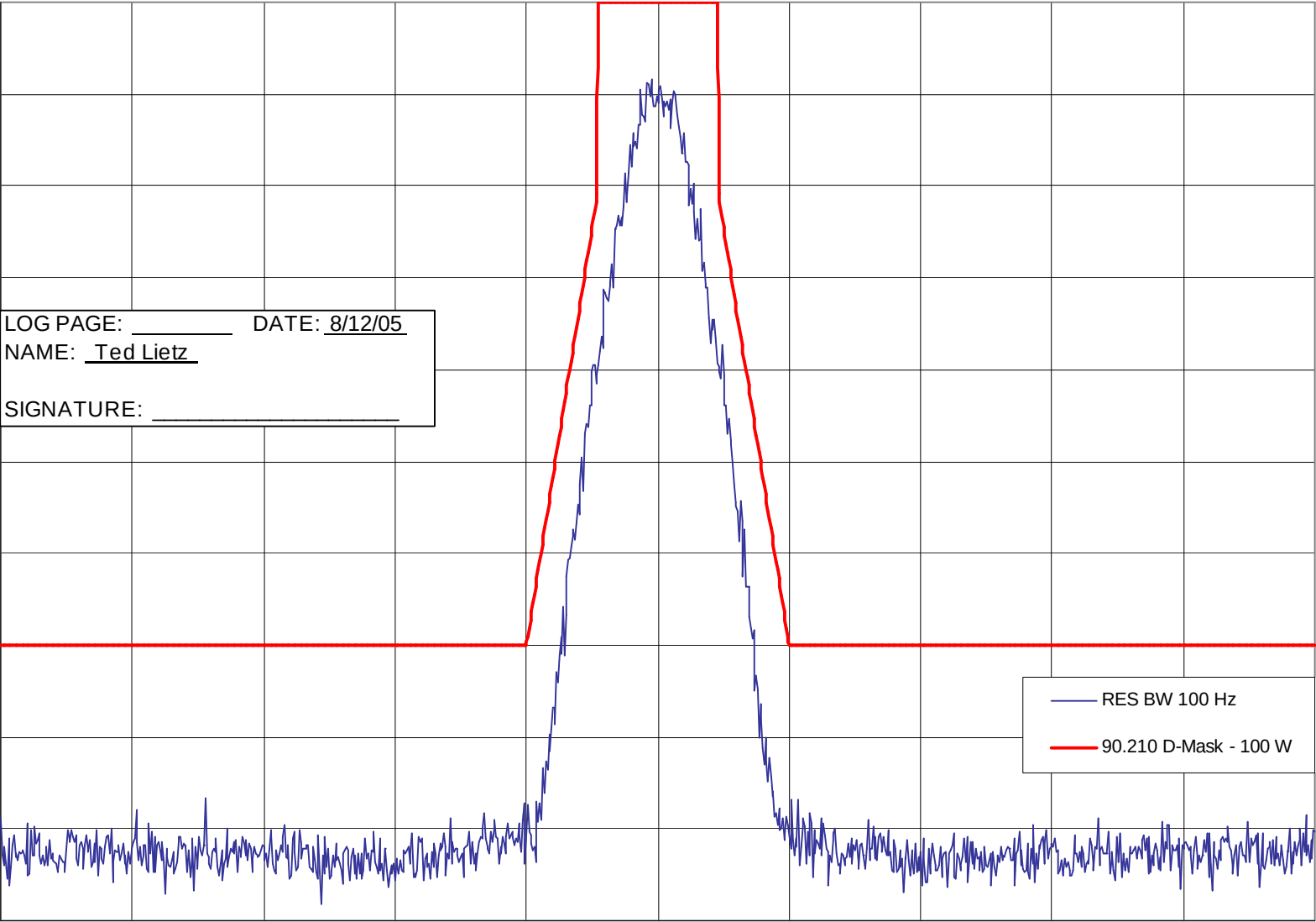
Occupied Bandwidth -- Compatible 4-Level Frequency Modulation - 8K10F1E - 100 Watts

REF 50 dBm

ATTEN 20 dB

10 dB/
Peak

LOG PAGE: _____ DATE: 8/12/05
NAME: Ted Lietz
SIGNATURE: _____



— RES BW 100 Hz
— 90.210 D-Mask - 100 W

CENTER 860.01250 MHz

RES BW 100 Hz

VID BW 10 kHz

SPAN 125 kHz

SWP 72 sec

EXHIBIT E1-2.6

Report on Test Measurements*Conducted Spurious Emissions, Harmonics and Close-In*Specification Requirement § 90.210(g) Emission Limits:

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

(3) On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: *At least $43 + 10 \log (P)$ dB.*

Modulation: High Performance Data – 64 QAM – Pseudorandom data

Carrier Frequency: A carrier frequency of 860.0000 MHz was measured. This frequency is near the center of the operating band 851-870 MHz

EXHIBIT DESCRIPTION

- | | |
|--------|---|
| E1-3.1 | Conducted Spurious Emissions, Harmonics, Power Output 50 Watts, High Performance Data (HPD)
The specification limit is -60.0 dBc |
| E1-3.2 | Conducted Spurious Emissions, Harmonics, Power Output 2 Watts, High Performance Data (HPD)
The specification limit is -46.0 dBc |
| E1-3.3 | Conducted Spurious Emissions, Close-In, 500 kHz Span, Power Output at 50 Watts, HPD
The specification limit is -60.0 dBc |
| E1-3.4 | Conducted Spurious Emissions, Close-In, 5 MHz Span, Power Output at 50 Watts, HPD
The specification limit is -60.0 dBc |
| E1-3.5 | Conducted Spurious Emissions, Close-In, 100 MHz Span, Power Output at 50 Watts, HPD
The specification limit is -60.0 dBc |

Report on Test Measurements*Conducted Spurious Emissions, Harmonics and Close-In*Specification Requirement § 90.210(d) Emission Limits:

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:

(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.

Modulation: Linear Simulcast Modulation (LSM) or Compatible 4-Level Frequency Modulation (C4FM) as indicated – Pseudorandom data
 Carrier Frequency: A carrier frequency of 860.0000 MHz was measured. This frequency is near the center of the operating band 851-870 MHz

EXHIBIT DESCRIPTION

E1-3.6	Conducted Spurious Emissions, Harmonics, Power Output 100 Watts, LSM The specification limit is -70.0 dBc
E1-3.7	Conducted Spurious Emissions, Close-In, 500 kHz Span, Power Output at 100 Watts, LSM The specification limit is -70.0 dBc
E1-3.8	Conducted Spurious Emissions, Close-In, 5 MHz Span, Power Output at 100 Watts, LSM The specification limit is -70.0 dBc
E1-3.9	Conducted Spurious Emissions, Close-In, 100 MHz Span, Power Output at 100 Watts, LSM The specification limit is -70.0 dBc
E1-3.10	Conducted Spurious Emissions, Harmonics, Power Output 100 Watts, C4FM The specification limit is -70.0 dBc

Note 1: Conducted emissions at 2 Watts for LSM and C4FM modes are virtually identical to that shown in E1-3.2 for HPD at 2 Watts. Thus, separate exhibits for LSM and C4FM conducted emissions at 2 Watts and are not included in this package.

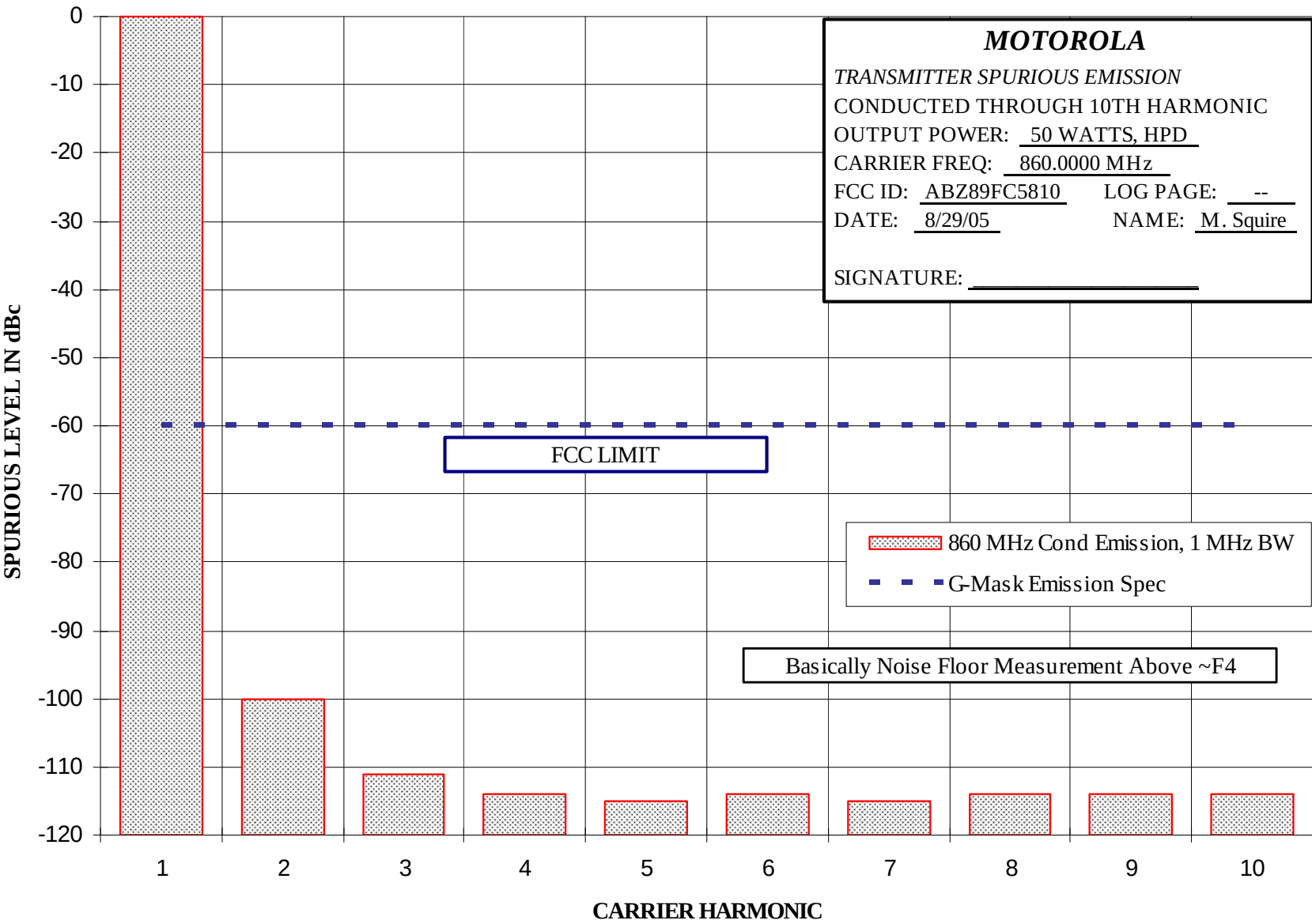
Note 2: LSM and C4FM close-in conducted performance are identical. Thus close-in performance for C4FM is covered in Exhibits E1-3.7, E1-3.8, and E1-3.9.

APPLICANT: MOTOROLA

EQUIPMENT TYPE: ABZ89FC5810

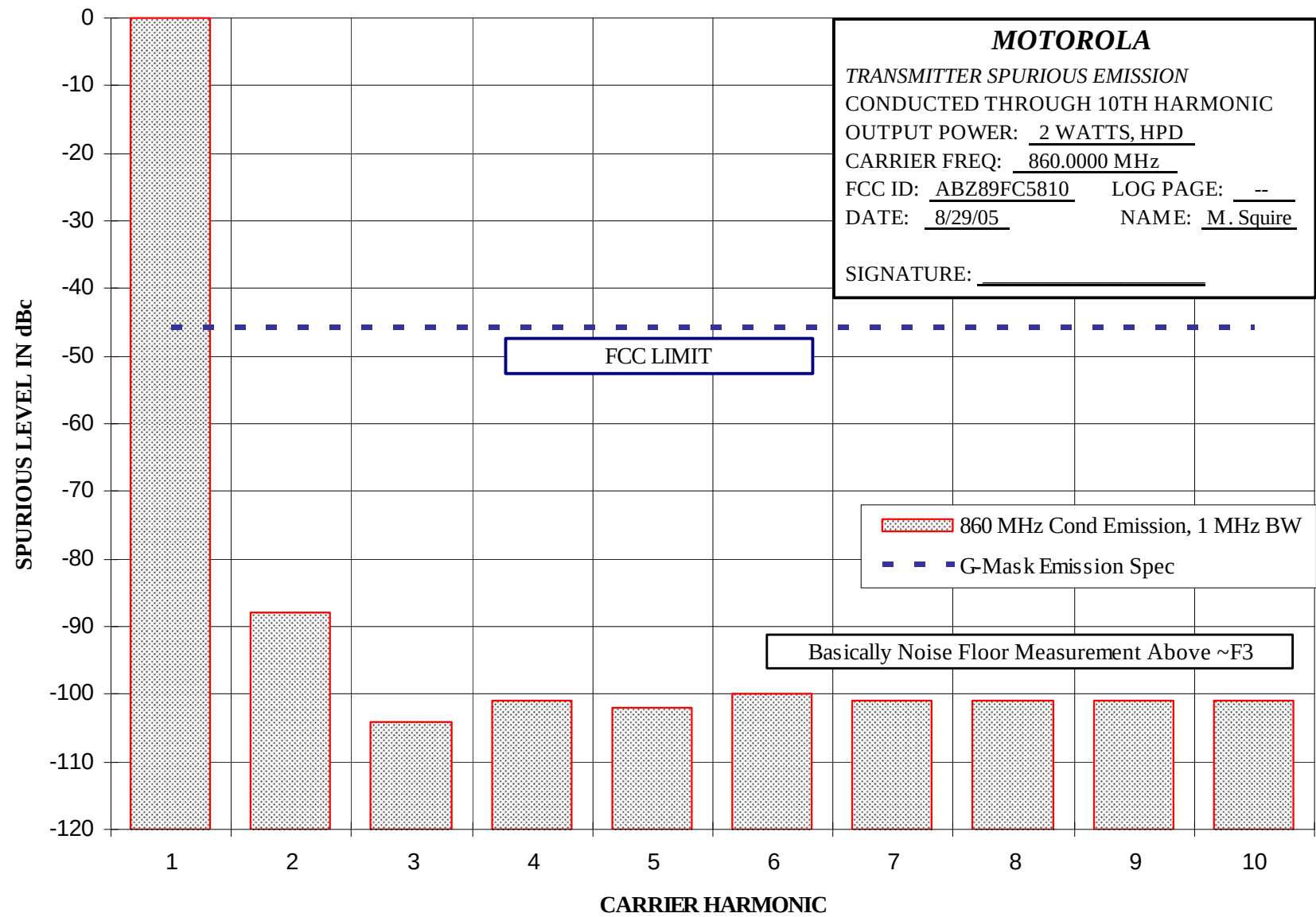
Report on Test Measurements

Conducted Emission – Harmonics – 50 Watts HPD



Report on Test Measurements

Conducted Emission – Harmonics – 2 Watts HPD

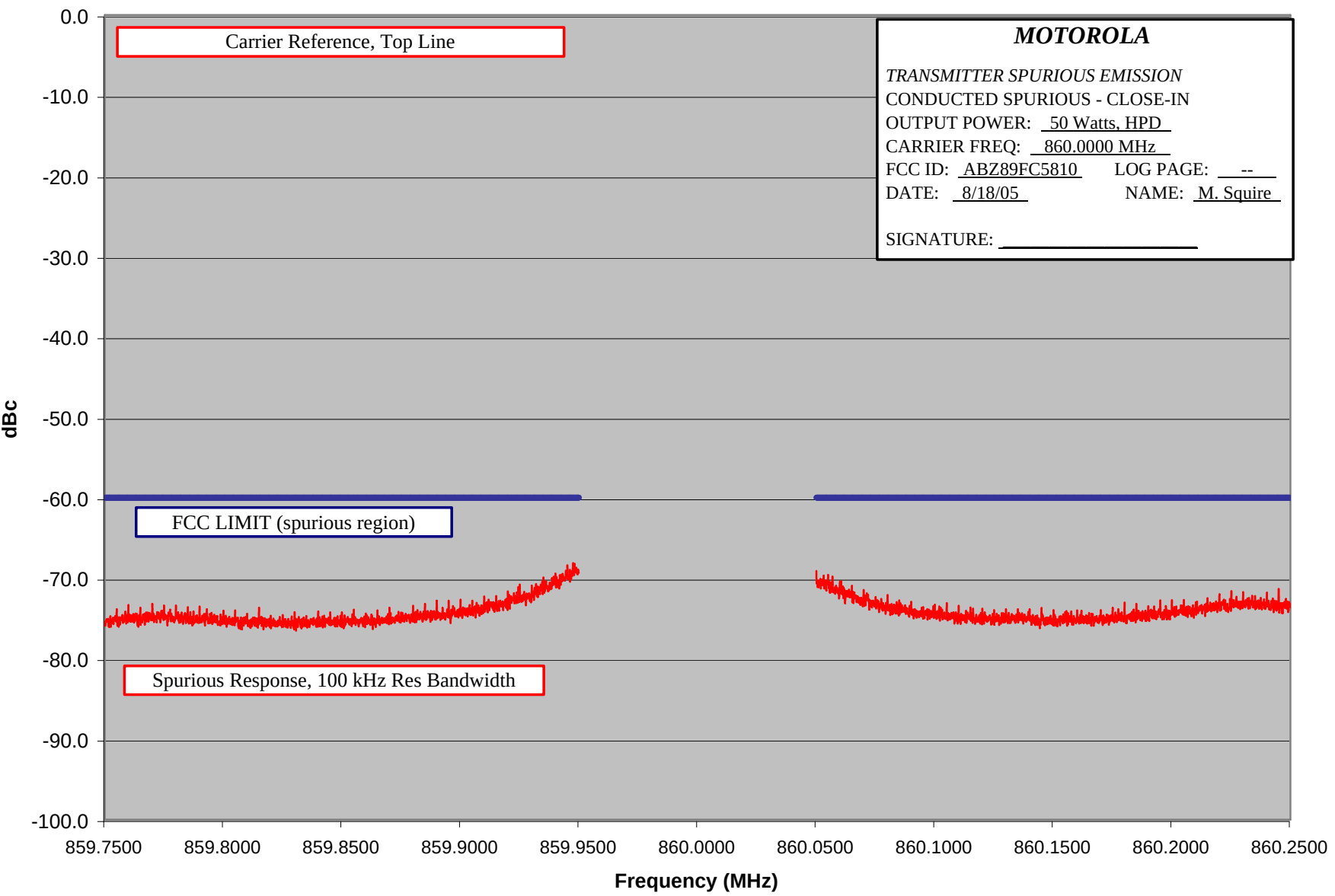


APPLICANT: MOTOROLA

EQUIPMENT TYPE: ABZ89FC5810

Report on Test Measurements

Conducted Emission – Close-In – 50 Watts HPD – 500 kHz Span

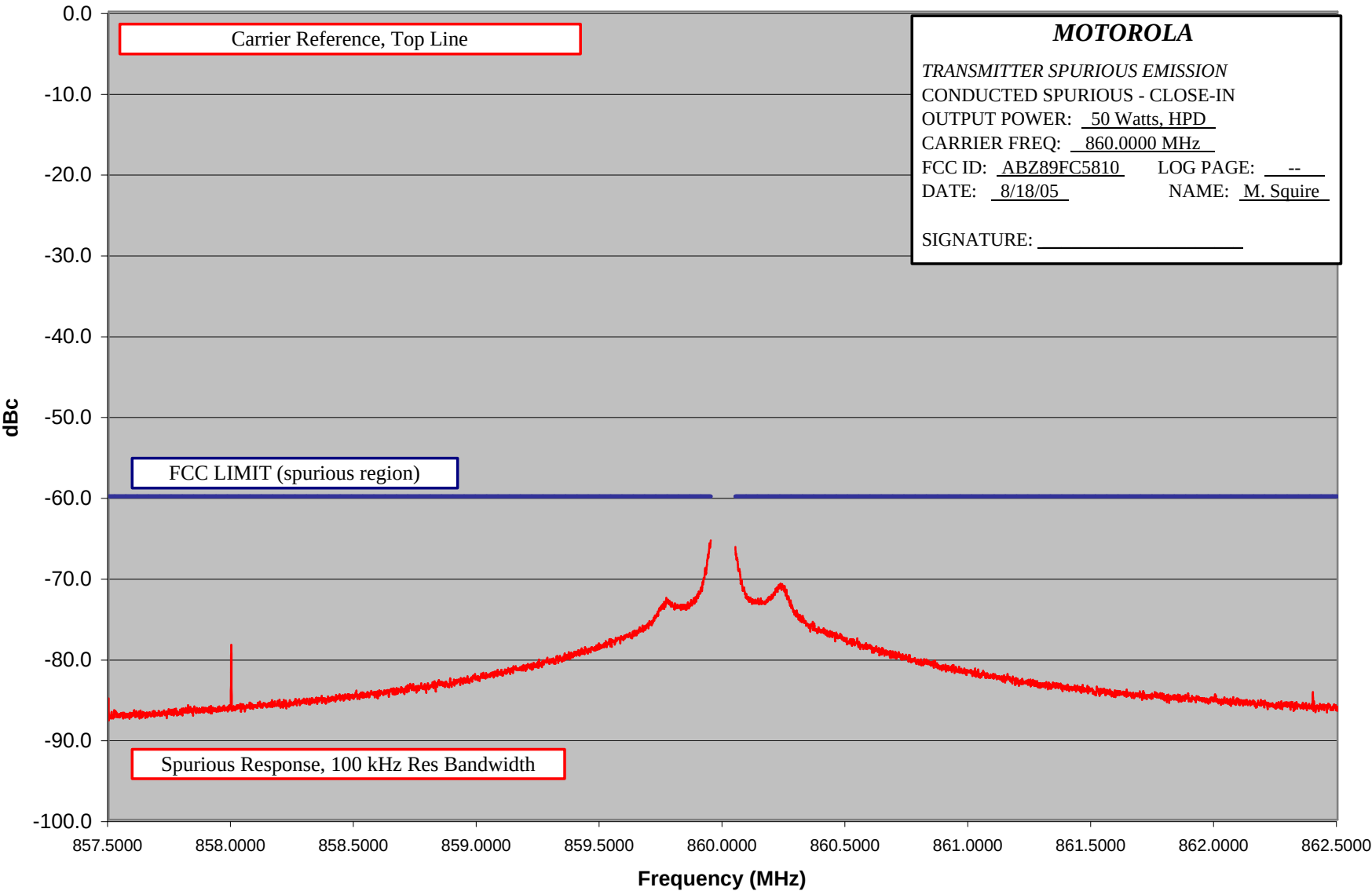


APPLICANT: MOTOROLA

EQUIPMENT TYPE: ABZ89FC5810

Report on Test Measurements

Conducted Emission – Close-In – 50 Watts HPD – 5 MHz Span

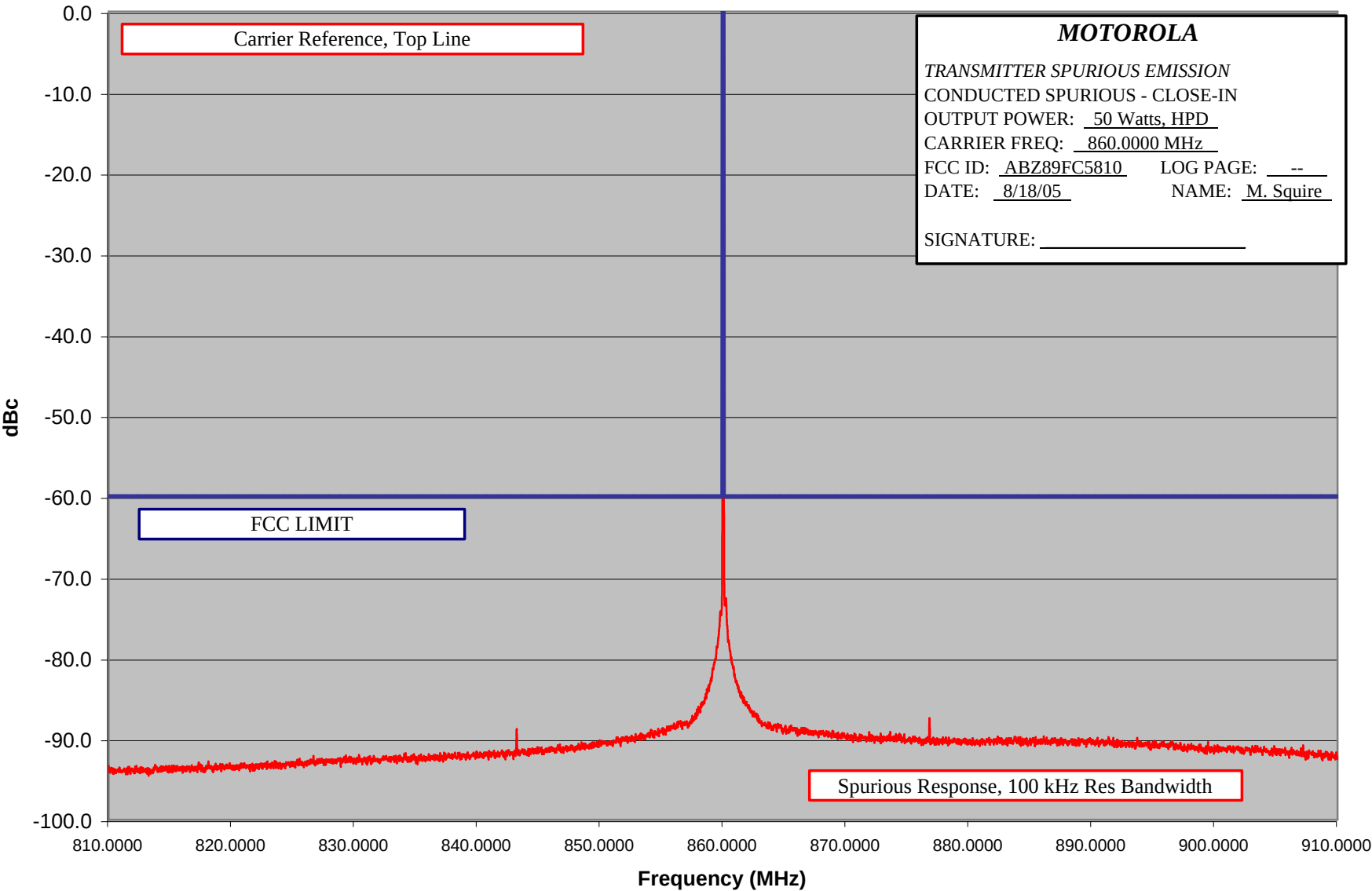


APPLICANT: MOTOROLA

EQUIPMENT TYPE: ABZ89FC5810

Report on Test Measurements

Conducted Emission – Close-In – 50 Watts HPD – 100 MHz Span

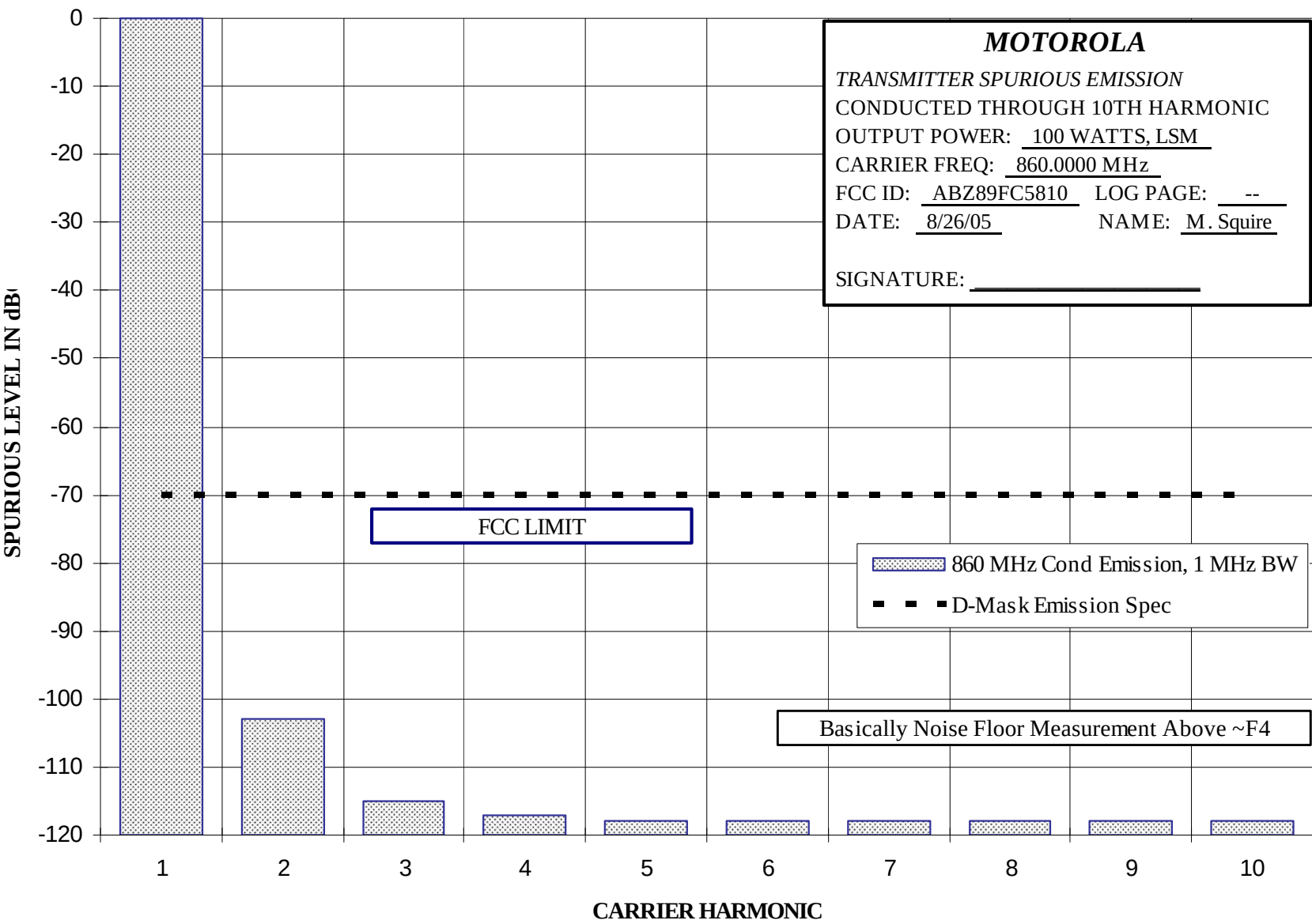


APPLICANT: MOTOROLA

EQUIPMENT TYPE: ABZ89FC5810

Report on Test Measurements

Conducted Emission – Harmonics – 100 Watts LSM

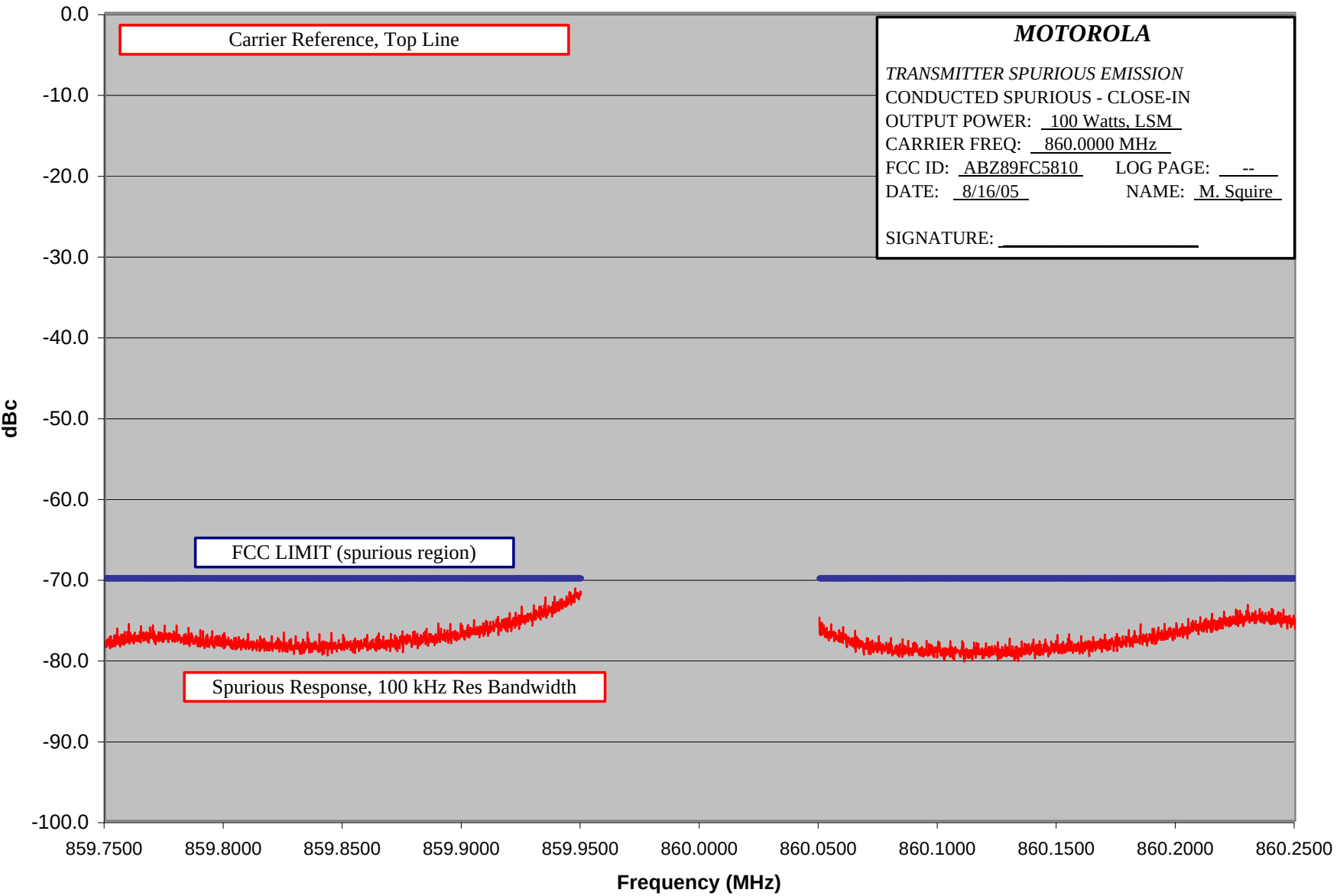


APPLICANT: MOTOROLA

EQUIPMENT TYPE: ABZ89FC5810

Report on Test Measurements

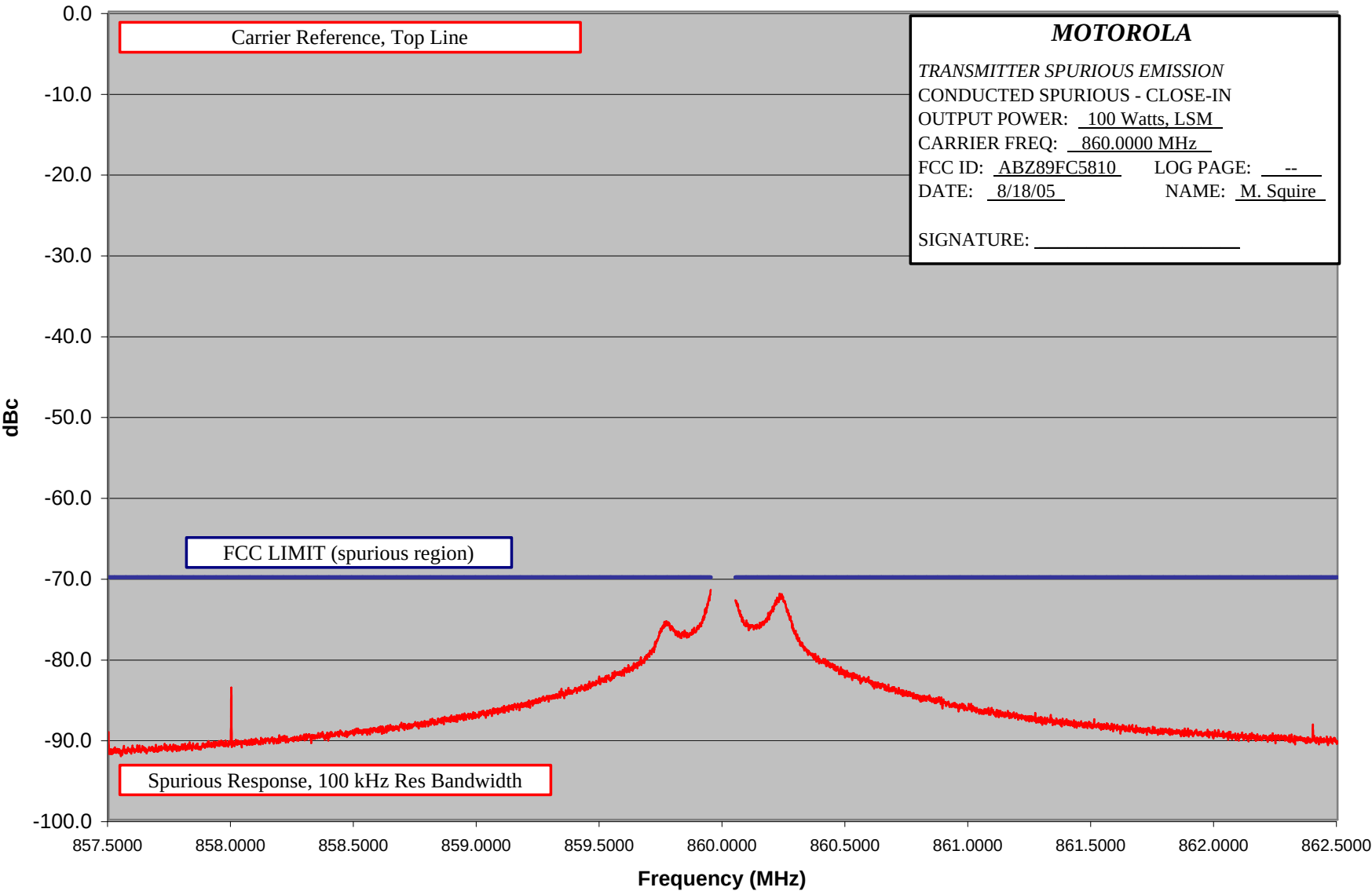
Conducted Emission – Close-In – 100 Watts LSM – 500 kHz Span



APPLICANT: MOTOROLA

EQUIPMENT TYPE: ABZ89FC5810

Report on Test Measurements
Conducted Emission – Close-In – 100 Watts LSM – 5 MHz Span

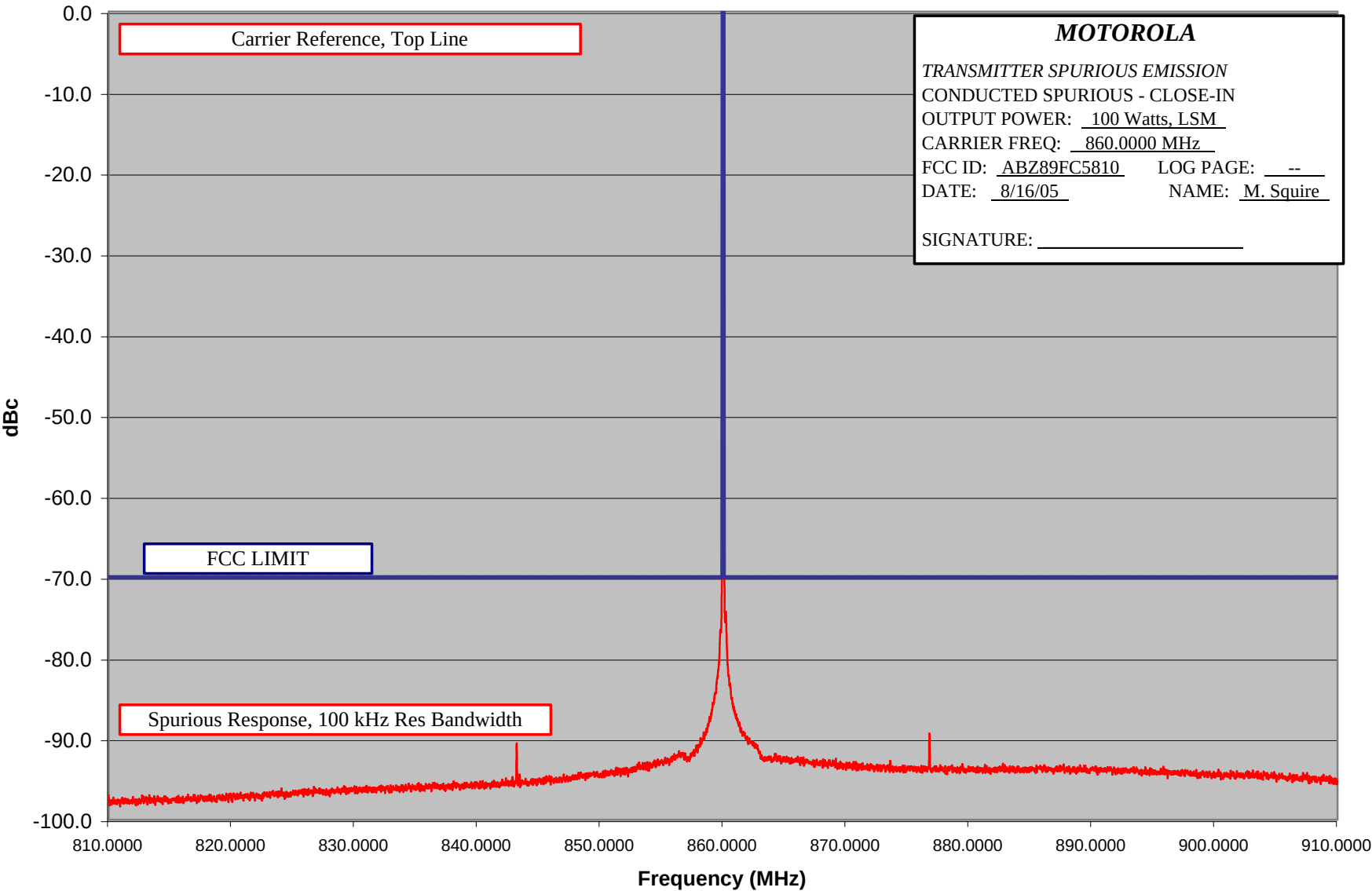


APPLICANT: MOTOROLA

EQUIPMENT TYPE: ABZ89FC5810

Report on Test Measurements

Conducted Emission – Close-In – 100 Watts LSM – 100 MHz Span

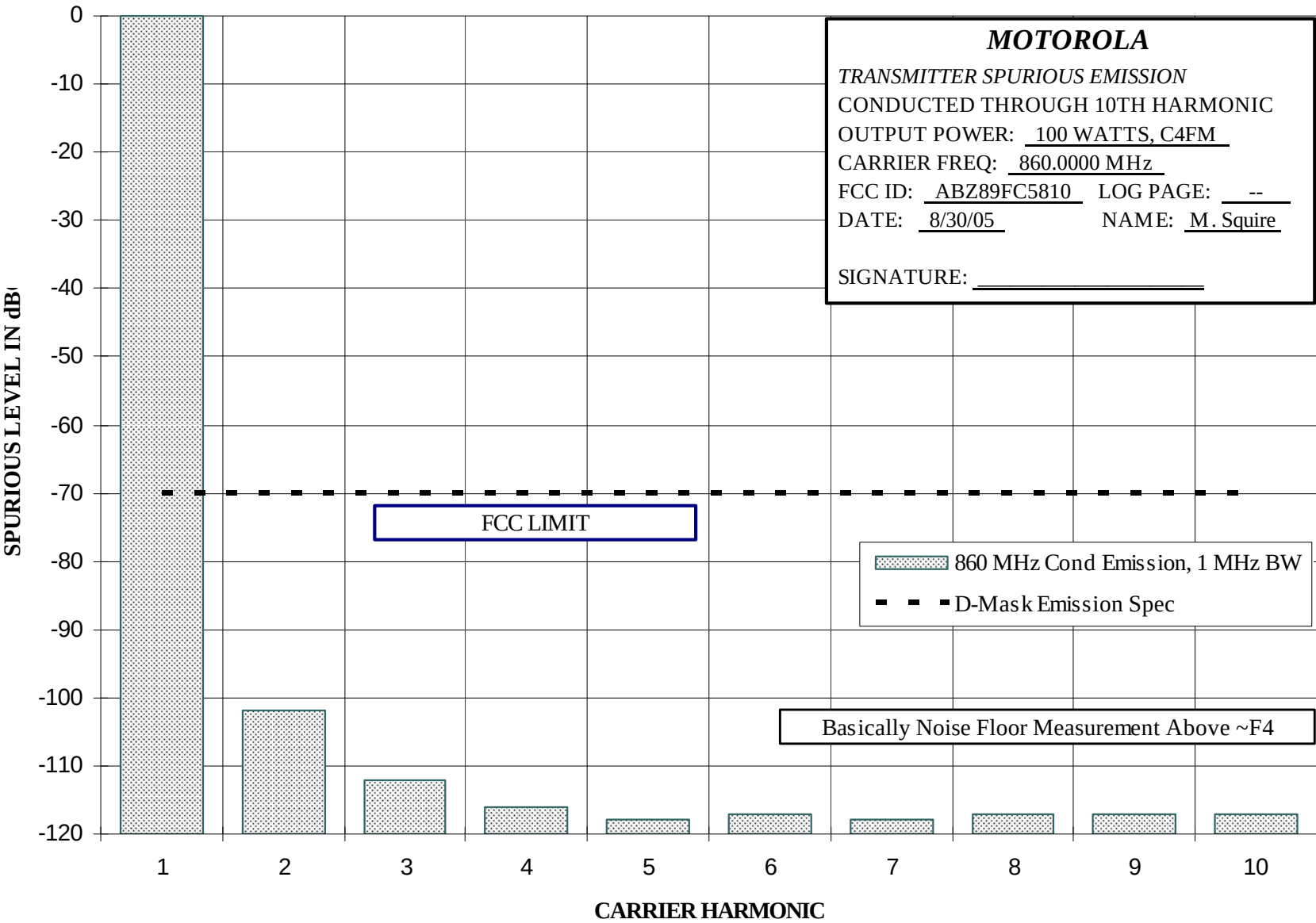


APPLICANT: MOTOROLA

EQUIPMENT TYPE: ABZ89FC5810

Report on Test Measurements

Conducted Emission – Harmonics – 100 Watts C4FM



Report on Test Measurements

Radiated Spurious Emissions, Harmonics

Specification Requirement § 90.210(g) Emission Limits:

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

(2) On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least $43 + 10 \log (P)$ dB.

Modulation: High Performance Data – 64 QAM – Pseudorandom data

Carrier Frequency: A carrier frequency of 860.0125 MHz was measured. This frequency is near the center of the operating band 851-870 MHz

EXHIBIT DESCRIPTION

E1-4.1 Radiated Spurious Emissions, Harmonics, Power Output 50 Watts, High Performance Data (HPD)
The specification limit is -60.0 dBc

E1-4.2 Radiated Spurious Emissions, Harmonics, Power Output 2 Watts, High Performance Data (HPD)
The specification limit is -46.0 dBc

Specification Requirement § 90.210(d) Emission Limits for 12.5 kHz Channel Bandwidth Equipment:

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:

(3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 12.5 kHz: At least $50 + 10 \log (P)$ dB or 70 dB
(whichever is the lesser attenuation).

Modulation: Linear Simulcast Modulation (LSM) or Compatible 4-Level Frequency Modulation (C4FM) as indicated – Pseudorandom data

Carrier Frequency: A carrier frequency of 860.0125 MHz was measured. This frequency is near the center of the operating band 851-870 MHz

EXHIBIT DESCRIPTION

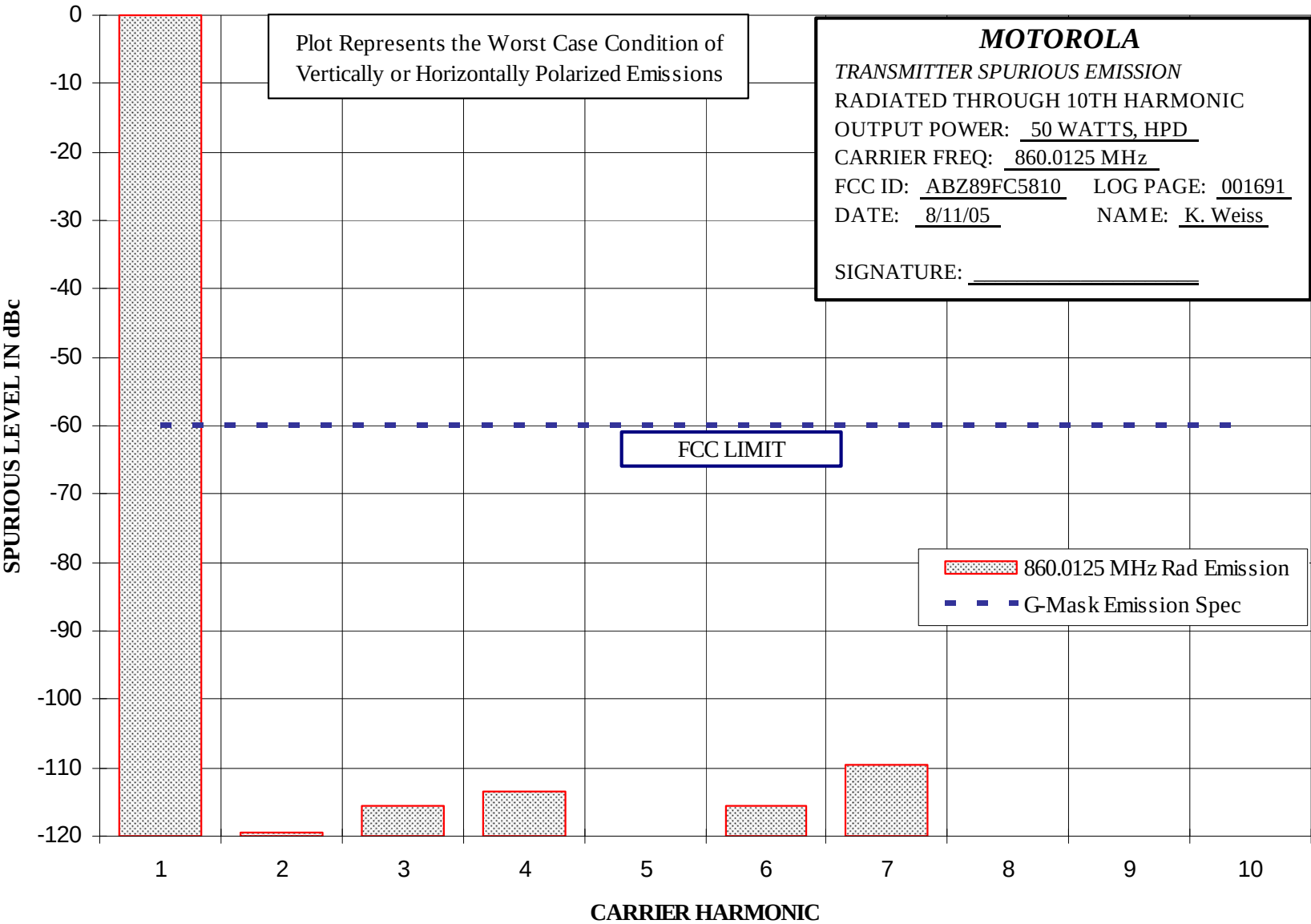
E1-4.3 Radiated Spurious Emissions, Harmonics, Power Output 100 Watts, LSM
The specification limit is -70.0 dBc

E1-4.4 Radiated Spurious Emissions, Harmonics, Power Output 2 Watts, LSM
The specification limit is -53.0 dBc

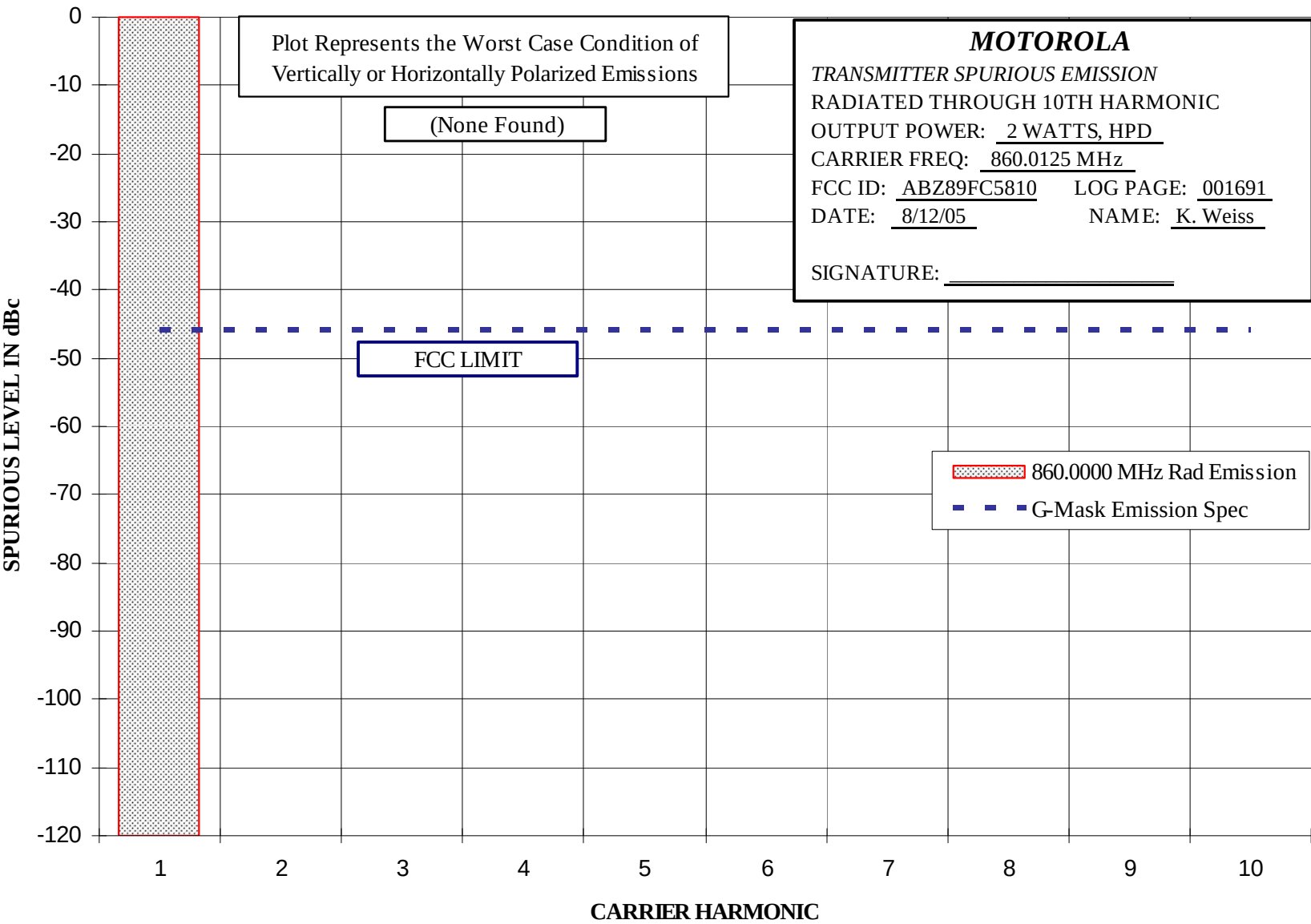
E1-4.5 Radiated Spurious Emissions, Harmonics, Power Output 100 Watts, C4FM
The specification limit is -70.0 dBc

E1-4.6 Radiated Spurious Emissions, Harmonics, Power Output 2 Watts, C4FM
The specification limit is -53.0 dBc

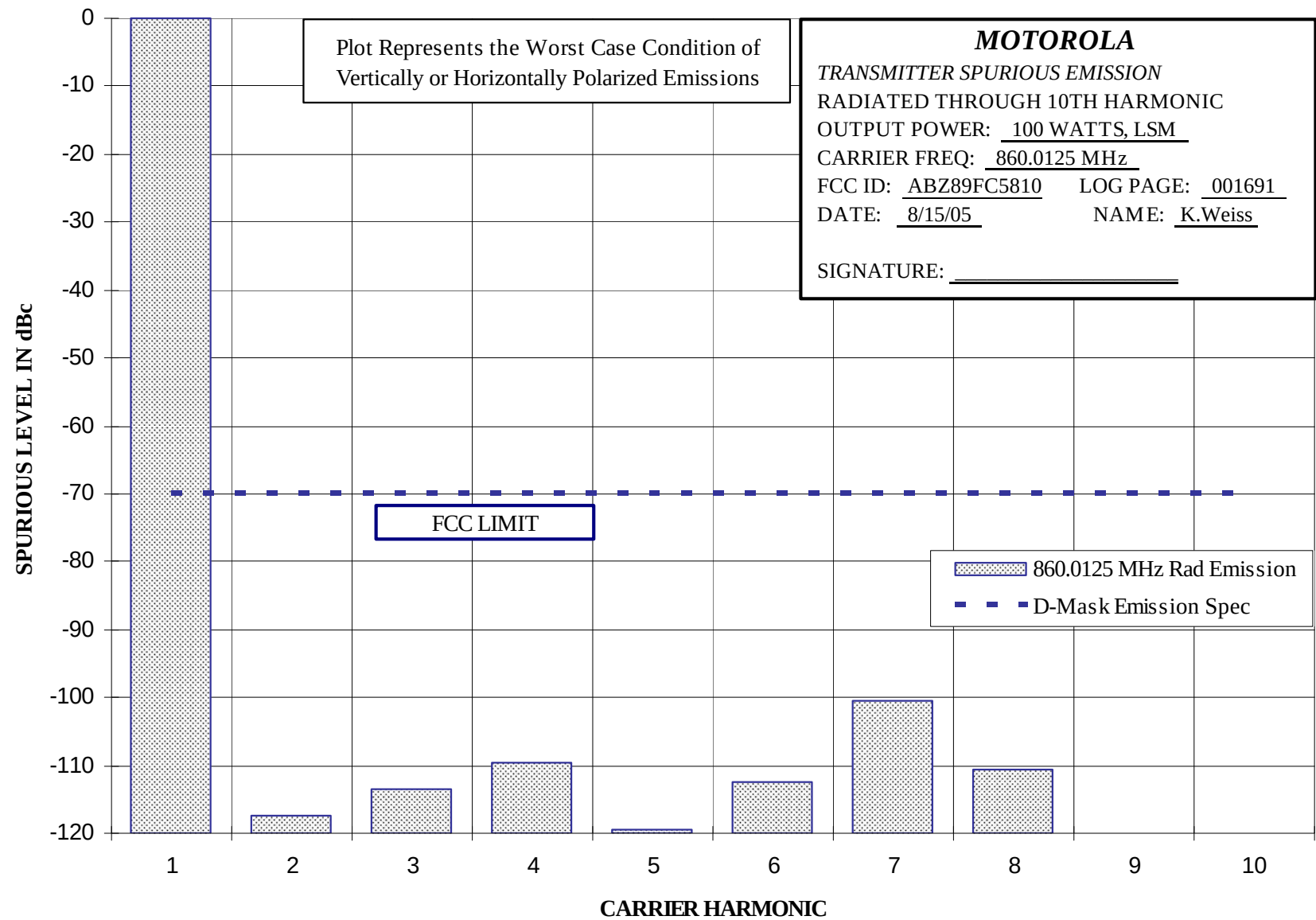
Report on Test Measurements
 Radiated Emission – Harmonics – 50 Watts – High Performance Data (HPD)



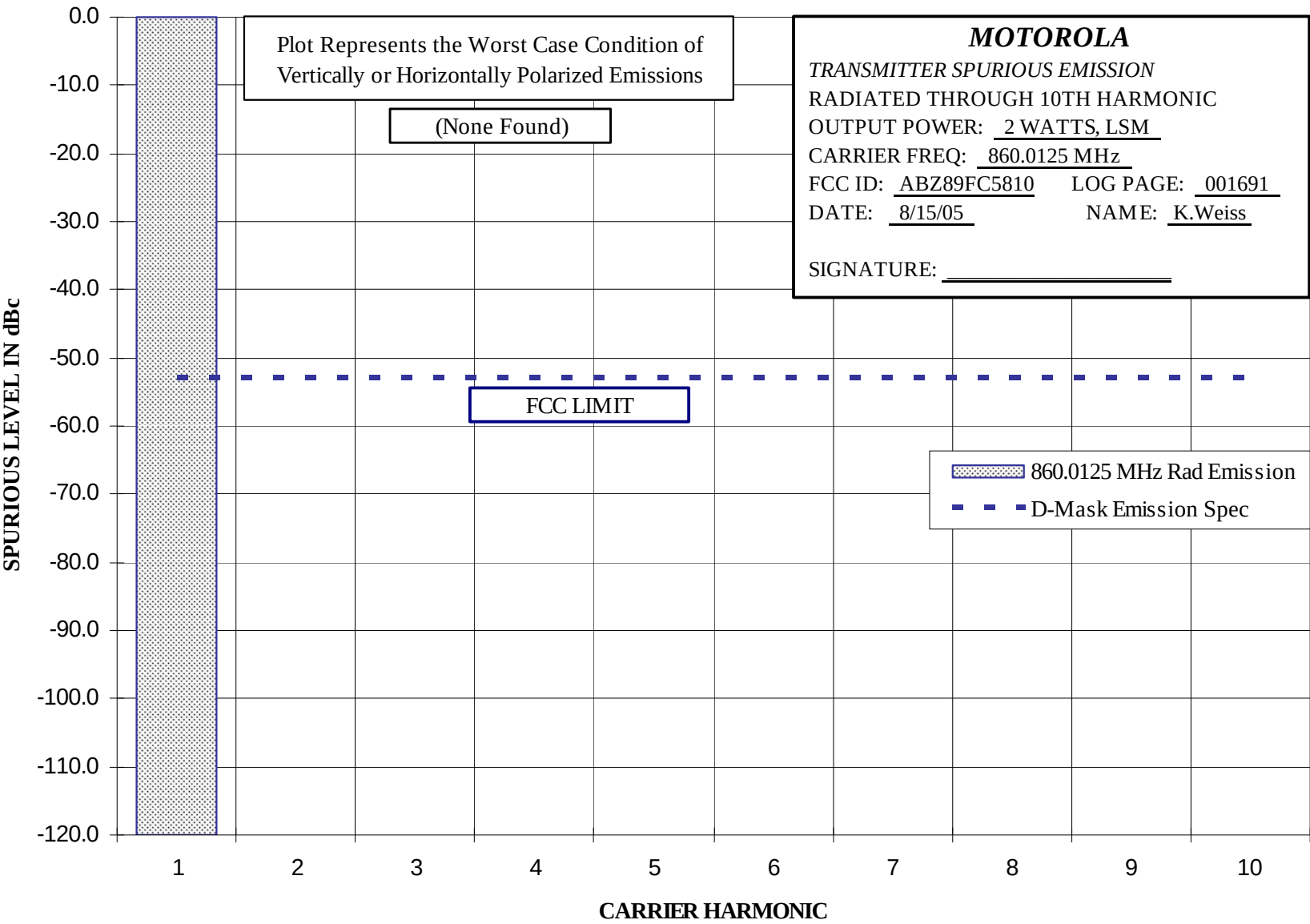
Report on Test Measurements
Radiated Emission – Harmonics – 2 Watts – High Performance Data (HPD)



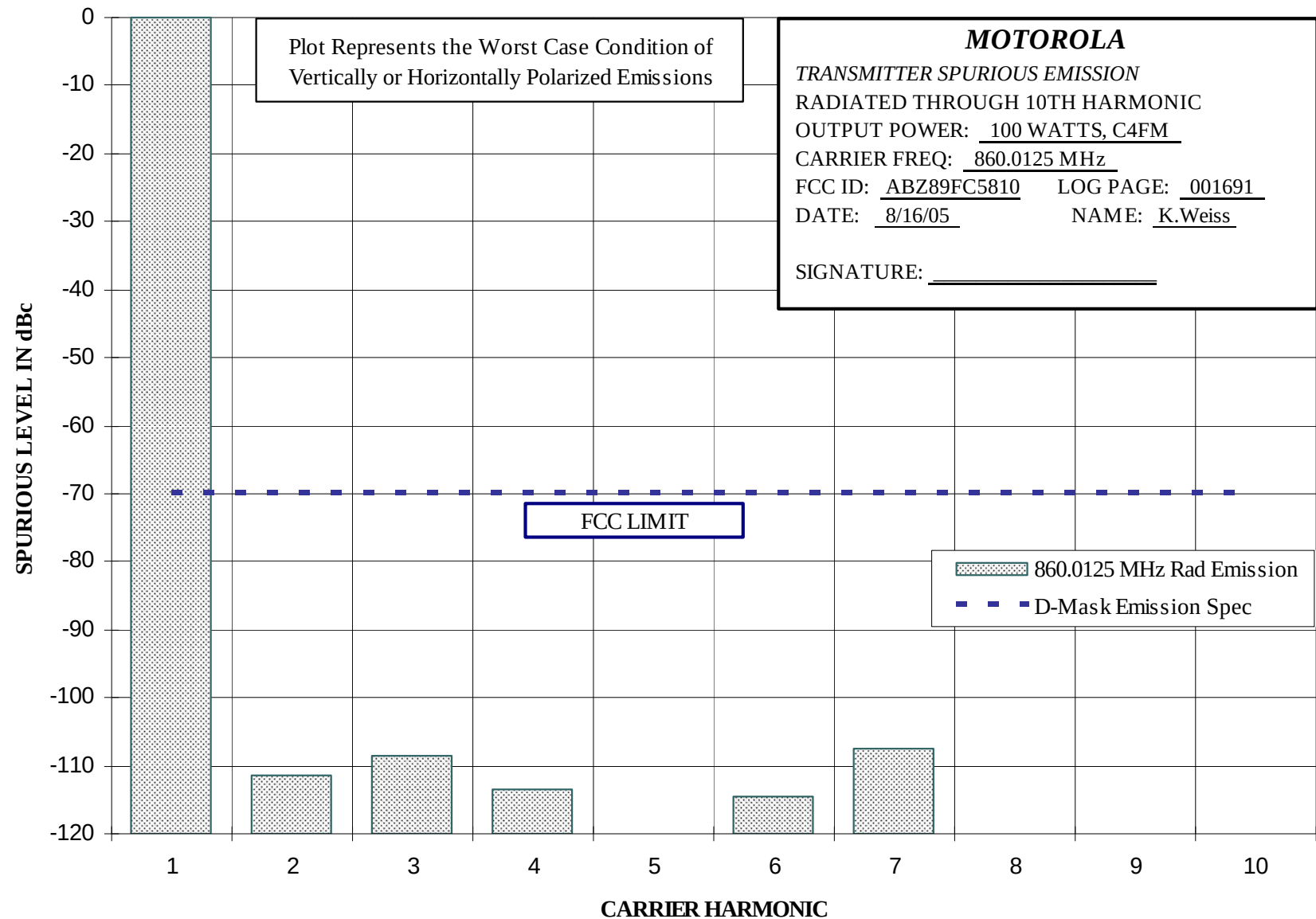
Report on Test Measurements
 Radiated Emission – Harmonics – 100 Watts – Linear Simulcast Modulation (LSM)



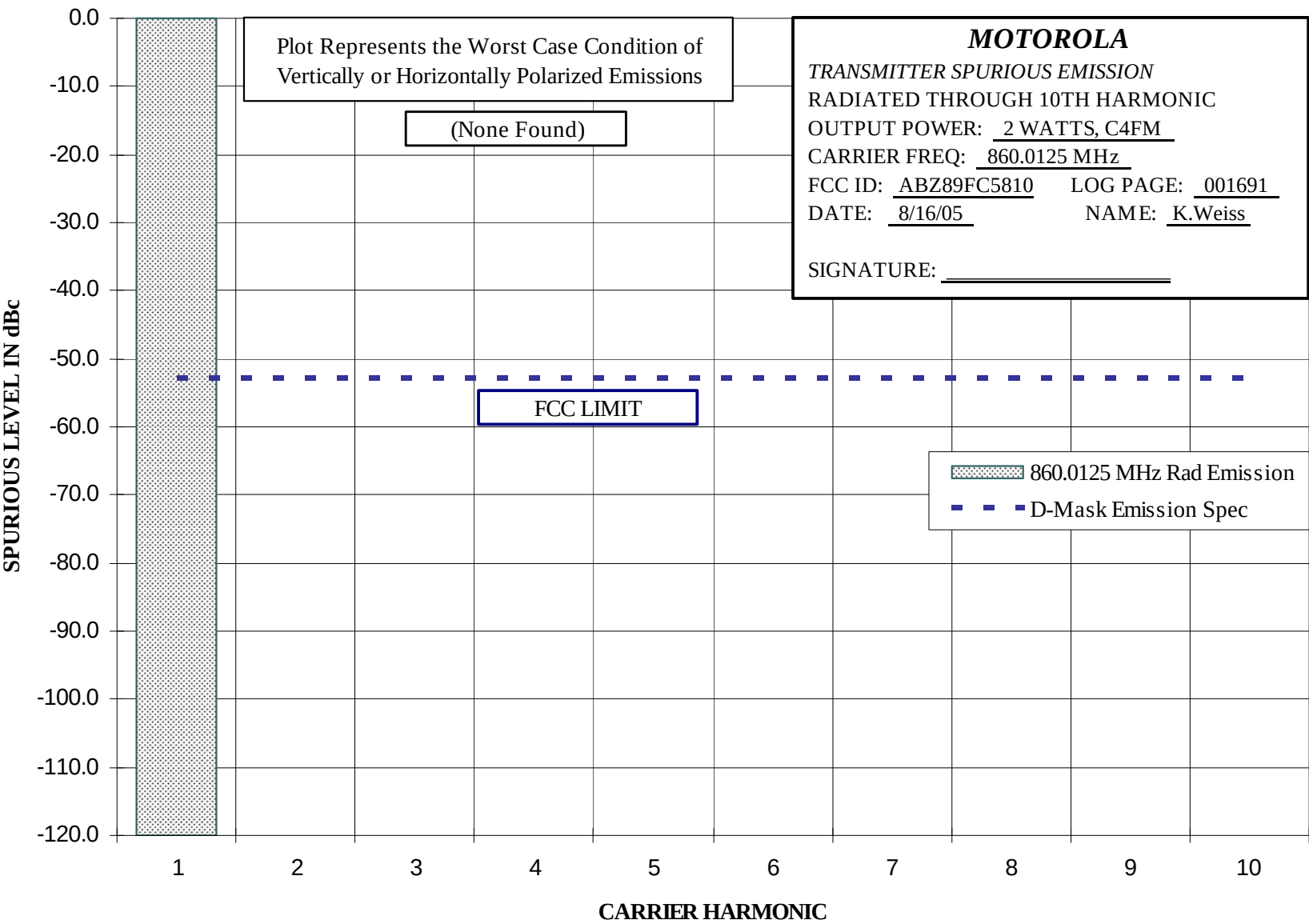
Report on Test Measurements
Radiated Emission – Harmonics – 2 Watts – Linear Simulcast Modulation (LSM)



Report on Test Measurements
 Radiated Emission – Harmonics – 100 Watts – Compatible 4-Level Frequency Modulation (C4FM)



Report on Test Measurements
 Radiated Emission – Harmonics – 2 Watts – Compatible 4-Level Frequency Modulation (C4FM)



Report on Test Measurements*Oscillator Frequency Stability*

Manufacturer data for the system site frequency standard was used in generation of the following frequency stability exhibits.

Specification Requirement:**Reference: Part 90.213**

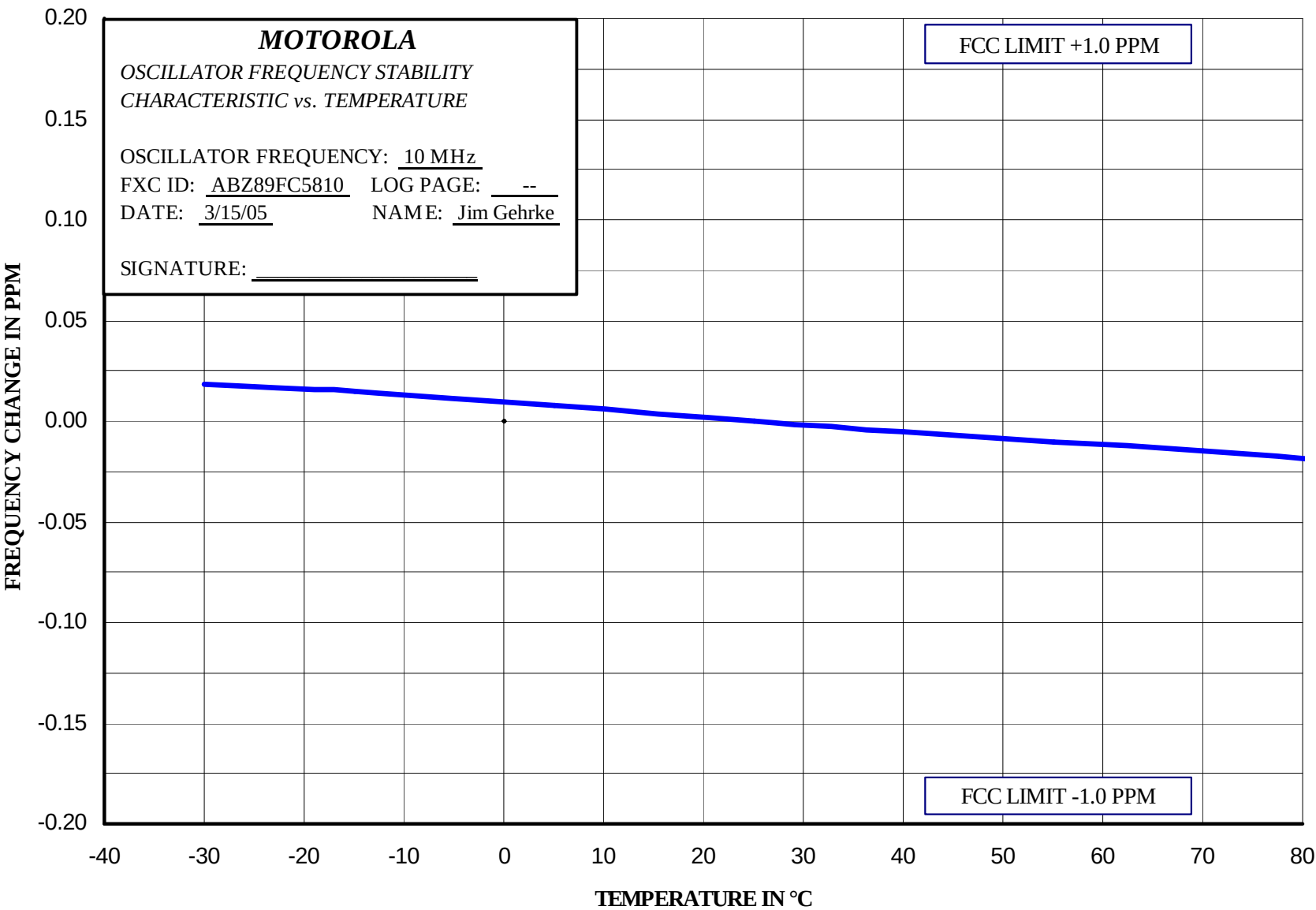
Fixed and Base stations, operating at 851-866 MHz, must have a frequency stability of better than +/- 1.5 PPM.

Fixed and Base stations, operating at 866-869 MHz, must have a frequency stability of better than +/- 1.0 PPM.

<u>EXHIBIT</u>	<u>DESCRIPTION</u>
E1-5.1	Frequency Stability Vs Temperature
E1-5.2	Frequency Stability Vs Voltage

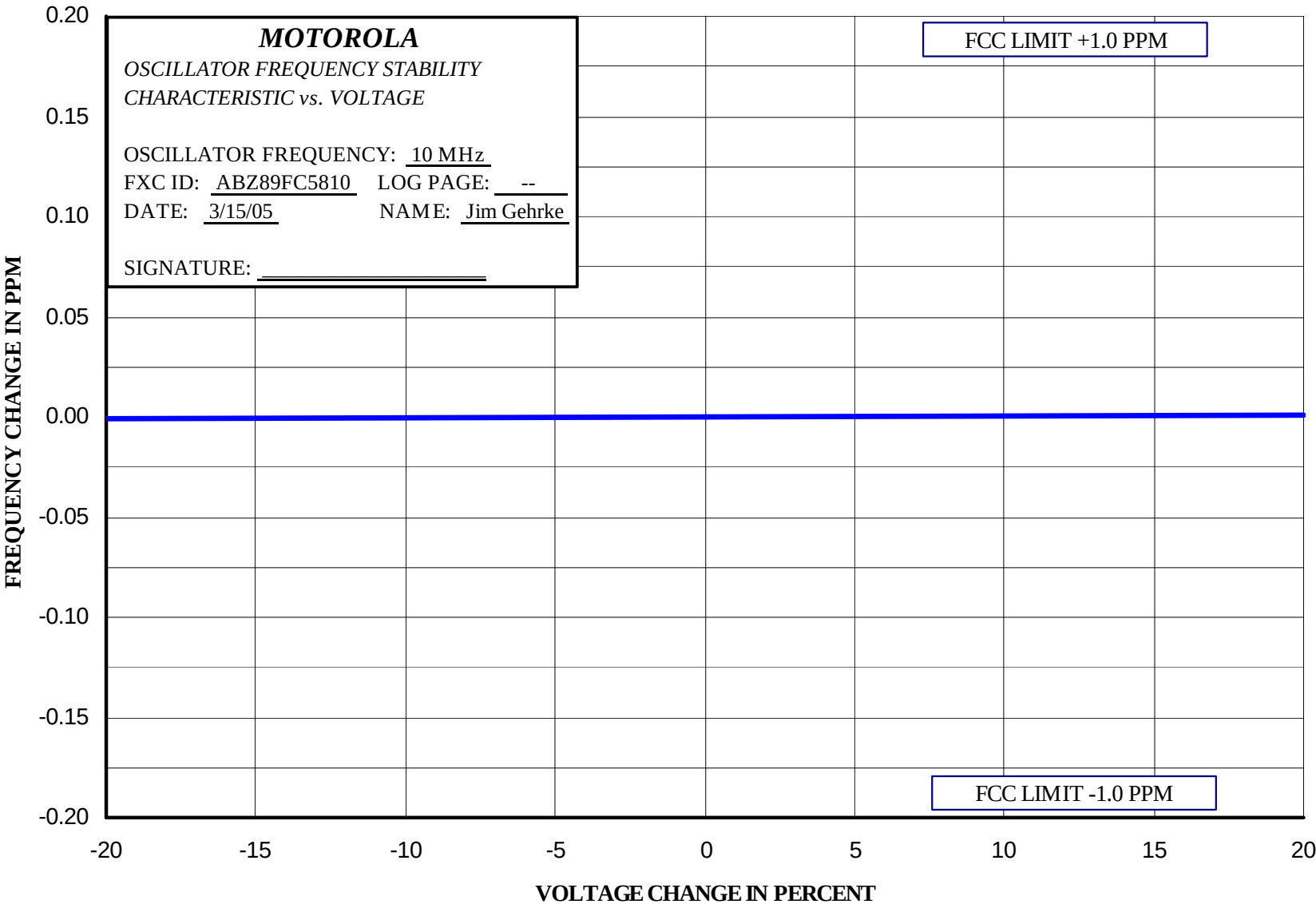
Report on Test Measurements

Frequency Stability Vs Temperature



Report on Test Measurements

Frequency Stability Vs Voltage



Report on Test Measurements

Test Equipment List

MODEL	MANUFACTURER	DESCRIPTION	Serial No.	Last Cal	Next Cal
438A	Hewlett Packard	RF Power Meter	3008A07428	11/05/04	11/05/07
8481A	Hewlett Packard	RF Power Sensor	2702A76706	11/17/04	11/17/07
E4443A	Agilent	Spectrum Analyzer	MY43360090	12/27/03	12/27/06
ESG-D2000A	Agilent	RF Signal Generator	US307040105	06/04/03	06/04/06
83712A	Hewlett Packard	Signal Generator	3429A00455	no calibration required	
8671B	Hewlett Packard	Signal Generator	2611A00159	11/08/04	11/08/07
85460A	Hewlett Packard	EMI Analyzer, Filter	3704A00467	11/17/03	11/17/06
85462A	Hewlett Packard	EMI Analyzer, RF/Display	3906A00500	11/17/03	11/17/06
8593E	Hewlett Packard	EMI Analyzer	3513A01649	05/19/04	05/19/07
(Various)	Weinschel, Kathrein, Bird	RF Loads	Various	no calibration required	
3020A, etc.	Narda	Directional Coupler	Various	no calibration required	

Report on Test Measurements

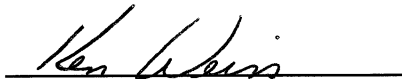
Statement of Certification

The technical data supplied with this application, having been taken under my supervision is hereby duly certified. The following is a statement of my qualifications:

College Degree: BSEE, Valparaiso University, Valparaiso, Indiana, USA
MSEE, Illinois Institute of Technology, Chicago, Illinois, USA

23 years of Design and Development experience in the field of two-way radio communication.

NAME: Ken Weiss

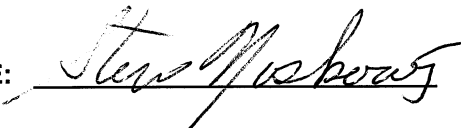
SIGNATURE: 

DATE: September 28, 2005

POSITION: Senior Staff Engineer

I hereby certify that the above application was prepared under my direction and that to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct:

NAME: Steve Noskowicz

SIGNATURE: 

DATE: September 28, 2005

POSITION: Engineering Manager