

APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

Measurements Report

The measurement report shows compliance information against applicable standards. Each parameter is measured generally at the low end, middle, and at the high end of the applicable frequency band.

Each section of the report contains either verbiage or graphs which show compliance to applicable standards as required, explains testing method used, and indicates what the applicable specification is.

Test setup details and certification signoff page are included at the end of the measurement report.

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E1-1 Tested Unit Details

Model Under Test	SLR 8000
Serial Number	433IAU0048
Firmware Version	D20.24.02.19
Codeplug Version	24.62.01
Bootloader Version	R01.11.02
Manufacturer	Motorola Solutions 2540 Galvin Drive, Elgin, IL 60124

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E1-2: Measurement Uncertainty

Measurement	Frequency	Expanded Uncertainty
RF Power Output	50MHz-10GHz	+/-0.132dB
Carrier Frequency Stability	9kHz-13GHz	+/-0.368Hz
Occupied Bandwidth	9kHz-13GHz	+/-0.52dB
Transmitter Conducted Spurious Emissions	9kHz-13GHz	+/-0.64dB
Transient Frequency Behavior	9kHz-13GHz	+/-2.04dB
Modulation Characteristics	100-5000Hz	+/-0.40dB
Radiated Emissions	30MHz-1000MHz	4.3dB
Radiated Emissions	1GHz-6GHz	3.1dB

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E1.3: Test Results Summary

Test	47 CFR Reference	RSS-119 Reference	Results
RF Output Power	2.1046	4.1,5.4	Pass
Occupied Bandwidth	2.1049	5.5	Pass
Conducted Spurious Emissions	2.1051	4.2,5.8	Pass
Radiated Spurious Emissions	2.1053	4.2,5.8	Pass
Frequency Stability	2.1055	5.3	Pass
Frequency Transient Behavior	90.214	5.9	Pass
Modulation Characteristics	2.1047		Pass

Test Standards:

Title 47 Part 2 of Code of Federal Regulations

Title 47 Part 90 of Code of Federal Regulations

RSS-119 Land Mobile and Fixed Equipment Operating in the Frequency Range 27.41-960 MHz

ANSI C63.26-2015 American National Standard for Compliance Testing of Transmitters

Used in Licensed Radio Services

ANSI C63.4-2014 American National Standard for Methods of Measurement of Radio-Noise

Emissions from Low-Voltage Electrical and Electronic Equipment in the Range 9 kHz to 40 Ghz

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E1-4 RF Power Output Data per CFR 47 2.1046 and RSS-119 5.4

The RF power output was measured with the indicated voltage applied to and current into the final RF amplifying device(s). The DC current indicated is the total for the final RF amplifier stage.

Analog Voice (FM) and Digital MOTOTRBO™ 4-Level Frequency Modulation (4FSK)

	851MHz	860MHz	870MHz	
Measured RF output	110	110	110	Watts
DC Voltage, final RF amplifier stage/stages	15.2	15.8	15.9	Volts
DC Current, final RF amplifier stage/stages	17	18	20	Amps
Input power for final RF amplifying device(s)	258.4	284.4	318	Watts
Primary Radio Input Supply Voltage	120	120	120	VAC
Minimum Measured RF output	1	1	1	Watts
DC Voltage, final RF amplifier stage/stages	11	11	11	Volts
Normal DC Current	3.2	3.2	3.2	Amps
Input power for final RF amplifying device(s)	35.2	35.2	35.2	Watts
Primary Radio Input Supply Voltage	120	120	120	VAC

Analog Voice (FM) and Digital MOTOTRBO™ 4-Level Frequency Modulation (4FSK):

	935 MHz	940MHz	941MHz	
Measured RF output	110	110	110	Watts
DC Voltage, final RF amplifier stage/stages	15.9	15.9	15.9	Volts
DC Current, final RF amplifier stage/stages	22	21	22	Amps
Input power for final RF amplifying device(s)	349.8	333.9	349.8	Watts
Primary Radio Input Supply Voltage	120	120	120	VAC
Minimum Measured RF output	1	1	1	Watts
DC Voltage, final RF amplifier stage/stages	11	11	11	Volts
Normal DC Current	3.3	3.4	3.3	Amps
Input power for final RF amplifying device(s)	36.3	37.4	36.3	Watts
Primary Radio Input Supply Voltage	120	120	120	VAC

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E1-5 Occupied bandwidth per CFR 47 2.1051 and RSS-119 5.5

Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 12.5 kHz Channel Spacing

MOTOTRBO™ Digital Modulation can be used in a system configuration based upon channel usage as described in Exhibit B. The 'F7E' and 'FXE' emission designators provide usage for telephony, the 'F7D' and 'FXD' designators provide usage for data / telecommand, and the 'F7W' designator provides for usage as a combination of telephony and telecommand. All are spectrally identical. The occupied bandwidth chart references the following setup and specification requirements.

Modulation Type: MOTOTRBO™ Digital Modulation

Emission Designator: 7K60F7W, 7K60F7D, 7K60F7E, 7K60FXD, 7K60FXE

Channelization: 12.5 kHz

Power Setting: 110 Watts

Necessary Bandwidth Calculation:

The necessary bandwidth of the modulation per the formulas defined in 47 CFR §2.202(g) / TRC-43 section 8 is as follows:

Four Level Frequency Modulation is used to modulate a carrier with a digital bit stream: Data Rate: $R = 9600$ bps; Bits per Symbol: $S=2$; Modulation rate in baud = $B = 9600 / 2 = 4800$; Max Modulation Frequency = $M = \frac{1}{2} * B = 2400$ Hz; Deviation at the outer symbols is 1.944 kHz; A square root raised cosine filter is implemented for the modulation low pass filter with the following magnitude response, $|F(f)|$:

$|F(f)|: 1$ for $|f| \leq 1920$ Hz

$|F(f)|: |\cos(\pi f / 1920)|$ for 1920 Hz $\leq f \leq 2880$ Hz

$|F(f)|: 0$ for $|f| > 2880$ Hz

where f = frequency in hertz.

Max Mod Freq, $M = \frac{1}{2}B$	Max Deviation, D	$2M + 2DK$ ($K = .72$)	Nec BW
2.4 kHz	1.944 kHz	7.60 kHz	7K60

Measurement Procedure and Instrument Settings:

Emission Measurement Analyzer Settings	Measured Occupied Bandwidth
Horizontal: 12.5 kHz per Division	Resolution BW: 100 Hz
Vertical: 20 dB per Division	Video BW: 10 kHz
Sweep Time: 72 Seconds (<2 kHz/Sec)	Span: 125 kHz
Detector: Peak	Number of Points: 1001

**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

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.
- 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.
- 6) Adjust the signal analyzer resolution BW and span as indicated above, use the Occupied Bandwidth function to record the value.

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FCC 47 CFR 90 and IC RSS-119.**

Specification Requirement 47 CFR §90.210(d) and IC RSS-119 section 5.8.3 - 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 (f0) to 5.625 kHz removed from f0: *Zero dB*
- (2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 5.625 kHz but no more than 12.5 kHz:
*At least 7.27 * (fd - 2.88 kHz) dB*
- (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 plus 10 log10(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.

EXHIBIT	DESCRIPTION	Meas Occ BW
E1-5.1	Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 851.0125 MHz	7.49 kHz
E1-5.2	Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 860.0125 MHz	7.48 kHz
E1-5.3	Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 868.8875 MHz	7.54 kHz

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Specification Requirement 47 CFR §90.210(l) and IC RSS-119 section 5.8.7 - Emission Limits – “I-Mask”:

Emission Mask I. For transmitters that are equipped with an audio low pass filter, the power of any emission must be attenuated below the unmodulated carrier power of the transmitter (P) as follows:

- (1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency of more than 6.8 kHz, but no more than 9.0 kHz: At least 25 dB;
- (2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency of more than 9.0 kHz, but no more than 15 kHz: At least 35 dB;
- (3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency of more than 15 kHz: At least $43 + 10 \log (P)$ dB, or 70 dB, whichever is the lesser attenuation.

EXHIBIT	DESCRIPTION	Meas Occ BW
E1-5.4	Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 935.0125 MHz	7.49 kHz
E1-5.5	Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 939.9875 MHz	7.55 kHz

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Specification Requirement 47 CFR §24.133 and IC RSS-134 section 4.4.2 - Emission Limits – “24.133-Mask”:

(a) The power of any emission shall be attenuated below the transmitter power (P), as measured in accordance with § 24.132(f), in accordance with the following schedule:

(1) For transmitters authorized a bandwidth greater than 10 kHz:

- (i) On any frequency outside the authorized bandwidth and removed from the edge of the authorized bandwidth by a displacement frequency (fd in kHz) of up to and including 40 kHz: at least $116 \text{ Log10} ((fd + 10)/6.1)$ decibels or 50 plus 10 Log10 (P) decibels or 70 decibels, whichever is the lesser attenuation;
- (ii) On any frequency outside the authorized bandwidth and removed from the edge of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 40 kHz: at least $43 + 10 \text{ Log10} (P)$ decibels or 80 decibels, whichever is the lesser attenuation.

(2) For transmitters authorized a bandwidth of 10 kHz:

- (i) On any frequency outside the authorized bandwidth and removed from the edge of the authorized bandwidth by a displacement frequency (fd in kHz) of up to and including 20 kHz: at least $116 \times \text{Log10} ((fd + 5)/3.05)$ decibels or $50 + 10 \times \text{Log10} (P)$ decibels or 70 decibels, whichever is the lesser attenuation;
- (ii) On any frequency outside the authorized bandwidth and removed from the edge of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 20 kHz: at least $43 + 10 \text{ Log10} (P)$ decibels or 80 decibels, whichever is the lesser attenuation.

(b) The measurements of emission power can be expressed in peak or average values provided they are expressed in the same parameters as the transmitter power.

(c) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

(d) The following minimum spectrum analyzer resolution bandwidth settings will be used: 300 Hz when showing compliance with paragraphs (a)(1)(i) and (a)(2)(i) of this section; and 30 kHz when showing compliance with paragraphs (a)(1)(ii) and (a)(2)(ii) of this section.

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<u>EXHIBIT</u>	<u>DESCRIPTION</u>	<u>Meas Occ BW</u>
E1-5.6	Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 940.5 MHz	7.51 kHz

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Specification Requirement 47 CFR §90.691 - Emission Limits – “90.691-Mask”:

Emission Mask 90.691, Emission mask requirements for EA-based systems.

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \text{ Log10}(f/6.1)$ decibels or $50 + 10 \text{ Log10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \text{ Log10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

EXHIBIT	DESCRIPTION	Meas Occ BW
E1-5.7	Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 860.0125 MHz	kHz

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Occupied Bandwidth – MOTOTRBO™ Digital Modulation, Dual Carrier

MOTOTRBO™ Digital Modulation can be used in a system configuration based upon channel usage as described in Exhibit B. The 'D7E' emission designator provides usage for telephony, the 'D7D' designator provides usage for data / telecommand, and the 'D7W' designator provides for usage as a combination of telephony and telecommand. All are spectrally identical. The occupied bandwidth chart references the following setup and specification requirements.

Modulation Type: MOTOTRBO™ Digital Modulation

Emission Designator: 21K7D7E, 21K7D7D, 21K7D7W

Channelization: 25 kHz

Power Setting: 110 Watts

Necessary Bandwidth Calculation:

The necessary bandwidth of the modulation per the formulas defined in 47 CFR §2.202(g) / TRC-43 section 8 is as follows:

Four Level Frequency Modulation is used to modulate a carrier with a digital bit stream: Data Rate: $R = 9600$ bps; Bits per Symbol: $S=2$; Modulation rate in baud = $B = 9600 / 2 = 4800$; Max Modulation Frequency = $M = \frac{1}{2} * B = 2400$ Hz; Deviation at the outer symbols is 1.944 kHz; A square root raised cosine filter is implemented for the modulation low pass filter with the following magnitude response, $|F(f)|$:

$|F(f)|: 1$ for $|f| \leq 1920$ Hz

$|F(f)|: |\cos(\pi f / 1920)|$ for 1920 Hz $\leq f \leq 2880$ Hz

$|F(f)|: 0$ for $|f| > 2880$ Hz

where f = frequency in hertz.

Max Mod Freq, $M = \frac{1}{2}B$	Max Deviation, D	$2M+2DK$ ($K=1.0$)	Necessary BW
2.4 kHz	1.944 kHz	8.69 kHz	21.2 kHz

Measurement Procedure and Instrument Settings:

Emission Measurement Analyzer Settings	Measured Occupied Bandwidth
Horizontal: 12.5 kHz per Division	Resolution BW: 100 Hz
Vertical: 20 dB per Division	Video BW: 1 kHz
Sweep Time: 60 Seconds (<4 kHz/Sec)	Span: 225 kHz
Detector: Peak	Number of Points: 2001

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Test Procedure:

- 1) Adjust the spectrum analyzer per the values specified in the Emission Measurement Analyzer Settings.
- 2) Modulate the transmitters 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.
- 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.
- 6) Adjust the signal analyzer resolution BW and span as indicated above, use the Occupied Bandwidth function to record the value.

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Specification Requirement 47 CFR §90.221 - Emission Limits / Adjacent Channel Power Limits – 90.221-Mask:

(a) For the frequency bands indicated below, operations using equipment designed to operate with a 25 kHz channel bandwidth may be authorized up to a 22 kHz bandwidth if the equipment meets the adjacent channel power (ACP) limits below. The table specifies a value for the ACP as a function of the displacement from the channel center frequency and a measurement bandwidth of 18 kHz.

(c)

(1) Maximum adjacent power levels for frequencies in the 809-824/854-869 MHz band:

Frequency offset	Maximum ACP (dBc) for devices less than 15 watts	Maximum ACP (dBc) for devices 15 watts and above
25 kHz	-55 dBc	-55 dBc
50 kHz	-65 dBc	-65 dBc
75 kHz	-65 dBc	-70 dBc

(2) In any case, no requirement in excess of -36 dBm shall apply.

(d) On any frequency removed from the assigned frequency by more than 75 kHz, the attenuation of any emission must be at least $43 + 10 \log (P_{\text{watts}})$ dB.

Frequency offset	Maximum ACP (dBc) for devices 15 watts and above	Measured ACP (dBc) at 110W, 860.00625MHz
25 kHz	-55 dBc	-72.86 dBc
50 kHz	-65 dBc	-86.22 dBc
75 kHz	-70 dBc	-86.85 dBc

EXHIBIT	DESCRIPTION	Meas Occ BW
E1-5.8	Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 860.00625 MHz	19.26 kHz

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Occupied Bandwidth – Analog Voice Frequency Modulation, 25 kHz Channel Spacing

The exhibits in this section show occupied bandwidth plots for analog voice modulation. Data is shown with the modulating audio tone itself, the tone plus Private Line (PL) sub-audible tone signaling, and tone plus Digital Private Line (DPL) sub-audible signaling. PL is a Continuous Tone Coded Squelch System (CTCSS), a method of using low frequency sub audible tones to share a single radio channel among multiple users. DPL is a digital version of Private Line.

The occupied bandwidth charts reference the following setup and specification requirements.

Modulation Type: Analog Voice

Emission Designator: 16K0F3E

Channelization: 25 kHz

Deviation Limit: ± 5.0 kHz Max

Power Setting: 110 Watts

Necessary Bandwidth Calculation:

The necessary bandwidth of the modulation per the formulas defined in 47 CFR §2.202(g) / TRC-43 section 8 is as follows:

Max Mod Freq, M	Max Deviation, D	$2*(M+D)$	Nec BW
3 kHz	5 kHz	16 kHz	16K0

Measurement Procedure and Instrument Settings:

Emission Measurement Analyzer Settings	Measured Occupied Bandwidth
Horizontal: 2.5 kHz per Division	Resolution BW: 300 Hz
Vertical: 20 dB per Division	Video BW: 10 kHz
Sweep Time: 72 Seconds (<2 kHz/Sec)	Number of Points: 1001
Detector: Peak	Integration Time: 7.4 ms

Test Procedure:

- 1) Key the station with no modulation to obtain the unmodulated carrier reference level on the analyzer. Use the analyzer controls to set this reference to a full-scale reference line. Store this analyzer trace in trace A.
- 2) Modulate the transmitter with a 2500 Hz sine wave at an input level 16 dB greater than that necessary to produce 50% of rated system deviation.
- 3) Allow the analyzer to sweep, and record the resultant emission levels in trace B.
- 4) Plot the resulting analyzer trace. The occupied bandwidth mask is then added along with additional labeling as appropriate.
- 5) Adjust the signal analyzer resolution BW and span as indicated above, use the Occupied Bandwidth function to record the value.

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Specification Requirement 47 CFR §90.210(b) and IC RSS-119 section 5.8.1 - Emission Limits – “B-Mask”:

For transmitters equipped with an audio low pass filter and designed to operate with a 25 kHz channel spacing (authorized bandwidth 20 kHz), the power of any emission must be below the unmodulated carrier power (P) as follows:

On any frequency removed from the assigned frequency by a displacement frequency (Fd in Hz) of:

- a) >10 kHz up to and including 20 kHz At least 25 dB;
- b) >20 kHz up to and including 50 kHz At least 35 dB;
- c) >50 kHz at least $43+10 * \text{Log10}(P)$ dB.

EXHIBIT	DESCRIPTION	Meas Occ BW: No PL	PL	DPL
E1-5.9,10,11	Occupied Bandwidth, Analog, 25 kHz Channels, 851.0125 MHz			15.01, 11.74, 11.52 kHz
E12.12,13,14	Occupied Bandwidth, Analog, 25 kHz Channels, 860.0125 MHz			15.01, 11.63, 11.49 kHz
E1-5.15,16,17	Occupied Bandwidth, Analog, 25 kHz Channels, 868.8875 MHz			15.01, 11.67, 11.50 kHz

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Specification Requirement 47 CFR §90.691 - Emission Limits – “90.691-Mask”:

Emission Mask 90.691, Emission mask requirements for EA-based systems.

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \text{ Log10}(f/6.1)$ decibels or $50 + 10 \text{ Log10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \text{ Log10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

<u>EXHIBIT</u>	<u>DESCRIPTION</u>	<u>Meas Occ BW: No PL</u>	<u>PL</u>	<u>DPL</u>
E1-5.18,19,20	Occupied Bandwidth, Analog, 25 kHz Channels, 860.0125MHz			15.03, 11.78, 11.81 kHz

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Occupied Bandwidth – Analog Voice Frequency Modulation, 12.5 kHz Channel Spacing

The exhibits in this section show occupied bandwidth plots for analog voice modulation. Data is shown with the modulating audio tone itself, the tone plus Private Line (PL) sub-audible tone signaling, and tone plus Digital Private Line (DPL) sub-audible signaling. PL is a Continuous Tone Coded Squelch System (CTCSS), a method of using low frequency sub audible tones to share a single radio channel among multiple users. DPL is a digital version of Private Line.

The occupied bandwidth charts reference the following setup and specification requirements.

Modulation Type: Analog Voice

Emission Designator: 11K0F3E

Channelization: 12.5 kHz

Deviation Limit: ± 2.5 kHz Max

Power Setting: 110 Watts

Necessary Bandwidth Calculation (Analog Emission):

The necessary bandwidth of the modulation signal per the formulas defined in 47 CFR 2.202 (b) is as follows:

Max Mod Freq, M	Max Deviation, D	$2*(M+D)$	Nec BW
3 kHz	2.5 kHz	11 kHz	11K0

Measurement Procedure and Instrument Settings:

Emission Measurement Analyzer Settings	Measured Occupied Bandwidth
Horizontal: 12.5 kHz per Division	Resolution BW: 100 Hz
Vertical: 20 dB per Division	Video BW: 10 kHz
Sweep Time: 72 Seconds (<2 kHz/Sec)	Number of Points: 1601
Detector: Peak	Integration Time: 14.8 ms

Test Procedure (Analog Voice):

- 1) Key the station with no modulation to obtain the unmodulated carrier reference level on the analyzer. Use the analyzer controls to set this reference to a full-scale reference line. Store this analyzer trace in trace A.
- 2) Modulate the transmitter with a 2500 Hz sine wave at an input level 16 dB greater than that necessary to produce 50% of rated system deviation.
- 3) Allow the analyzer to sweep, and record the resultant emission levels in trace B.
- 4) Plot the resulting analyzer trace. The occupied bandwidth mask is then added along with additional labeling as appropriate.
- 5) Adjust the signal analyzer resolution BW and span as indicated above, use the Occupied Bandwidth function to record the value.

APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

Specification Requirement 47 CFR §90.210(d) and IC RSS-119 section 5.8.3 - 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 (f0) to 5.625 kHz removed from f0: Zero dB
- (2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least $7.27 * (fd - 2.88 \text{ kHz})$ dB
- (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 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.

EXHIBIT	DESCRIPTION	Meas Occ BW: No PL PL DPL
E1-5.21,22,23	Occupied Bandwidth, Analog, 12.5 kHz Channels, 851.0125 MHz	10.00, 9.23, 9.14 kHz
E1-5.24,25,26	Occupied Bandwidth, Analog, 12.5 kHz Channels, 860.0125 MHz	9.99, 9.18, 9.12 kHz
E1-5.27,28,29	Occupied Bandwidth, Analog, 12.5 kHz Channels, 868.8875 MHz	10.00, 9.20, 9.13 kHz

APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

Specification Requirement 47 CFR §90.210(l) and IC RSS-119 section 5.8.7 - Emission Limits – “I-Mask”:

Emission Mask I. For transmitters that are equipped with an audio low pass filter, the power of any emission must be attenuated below the unmodulated carrier power of the transmitter (P) as follows:

- (1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency of more than 6.8 kHz, but no more than 9.0 kHz: At least 25 dB;
- (2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency of more than 9.0 kHz, but no more than 15 kHz: At least 35 dB;
- (3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency of more than 15 kHz: At least $43 + 10 \log (P)$ dB, or 70 dB, whichever is the lesser attenuation.

<u>EXHIBIT</u>	<u>DESCRIPTION</u>	<u>Meas Occ BW: No PL</u>	<u>PL</u>	<u>DPL</u>
E1-5.30,31,32	Occupied Bandwidth, Analog, 12.5 kHz Channels, 935.0125 MHz			9.90, 9.11, 9.00 kHz
E1-5.33,34,35	Occupied Bandwidth, Analog, 12.5 kHz Channels, 939.9875 MHz			9.99, 9.12, 8.98 kHz

APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

Specification Requirement 47 CFR §90.691 - Emission Limits – “90.691-Mask”:

Emission Mask 90.691, Emission mask requirements for EA-based systems.

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \text{ Log10}(f/6.1)$ decibels or $50 + 10 \text{ Log10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10\text{Log10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

EXHIBIT	DESCRIPTION	Meas Occ BW
E1-5.36	Occupied Bandwidth, Analog, 12.5 kHz Channels, 860.0125 MHz	9.98, 9.03, 8.92 kHz

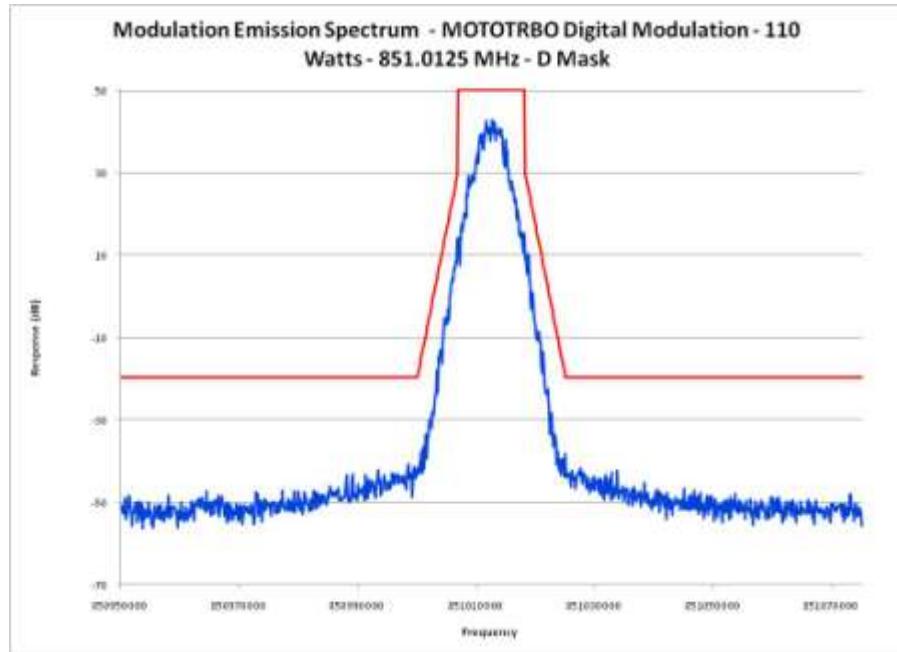
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

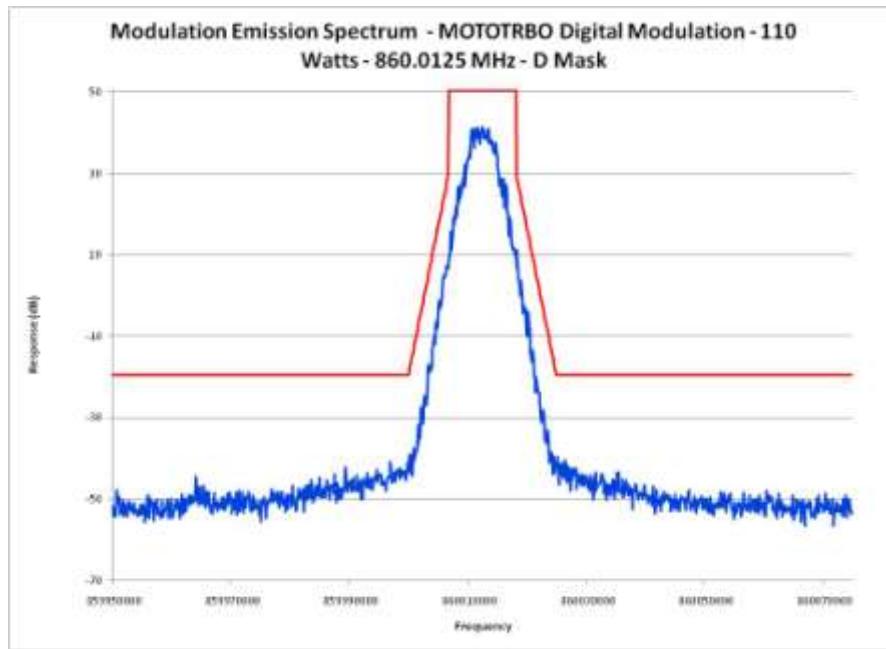
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-5.1 Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 851.0125 MHz, D-Mask



E1-5.2 Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 860.0125 MHz, D-Mask



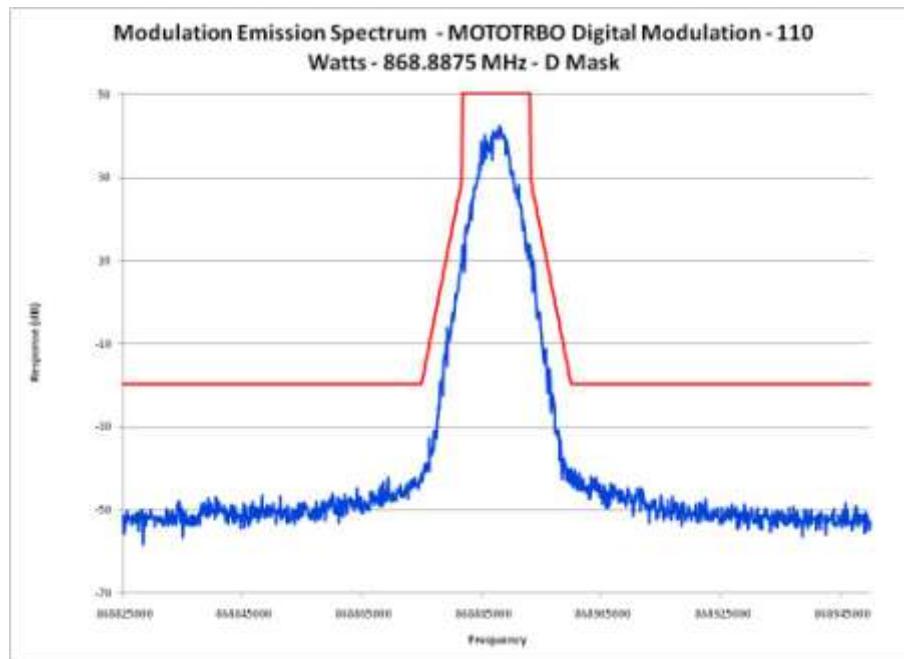
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

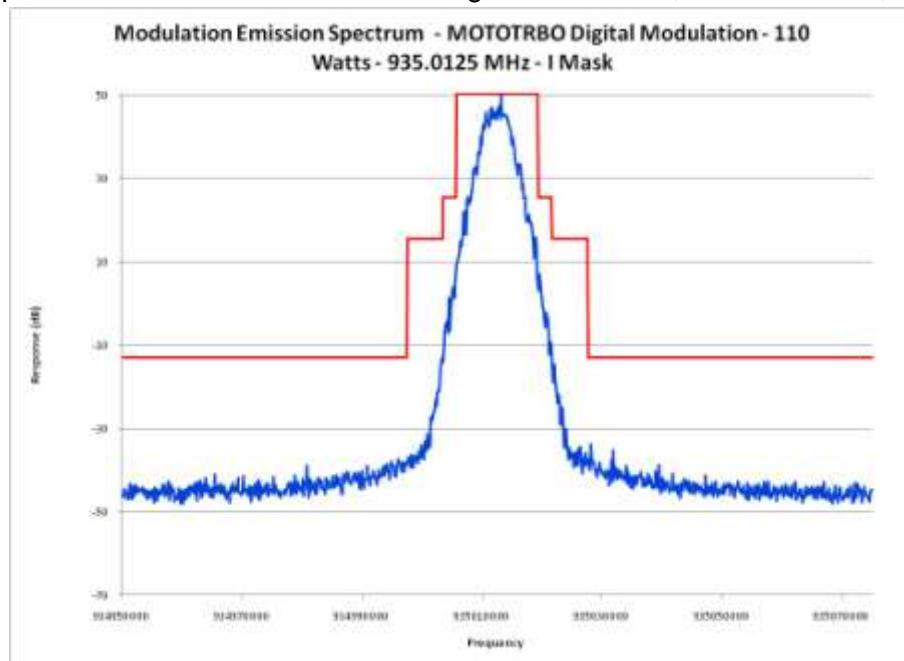
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-5.3 Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 868.8875 MHz, D-Mask



E1-5.4 Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 935.0125 MHz, I-Mask



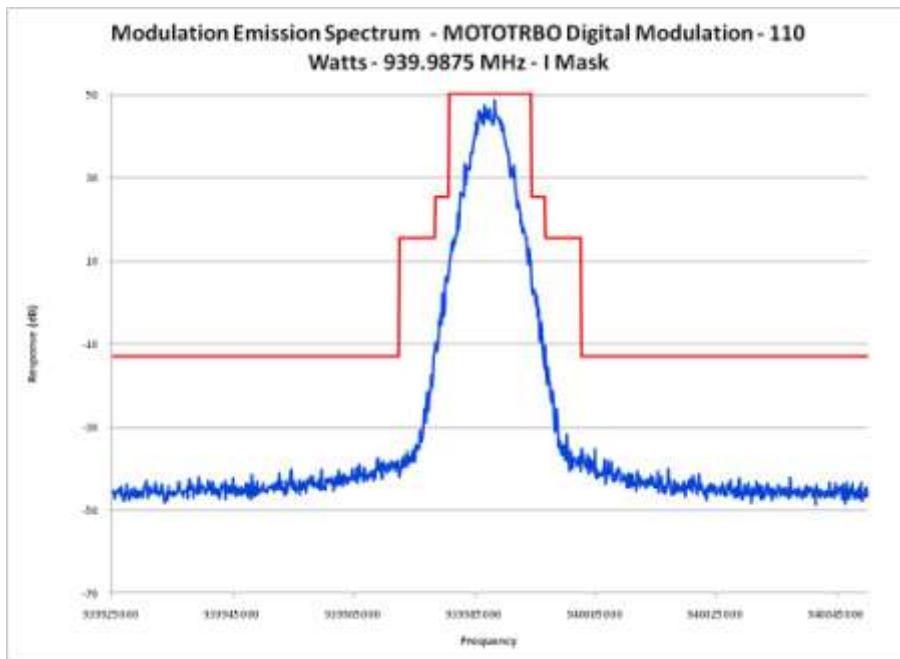
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

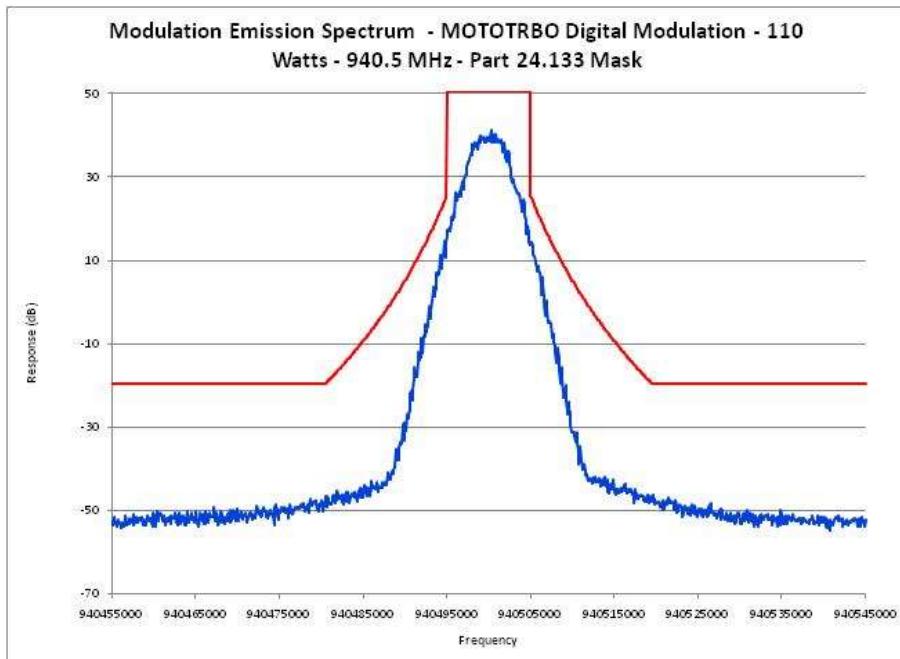
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-5.5 Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 939.9875 MHz, I-Mask



E1-5.6 Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 940.5 MHz, 24.133-Mask



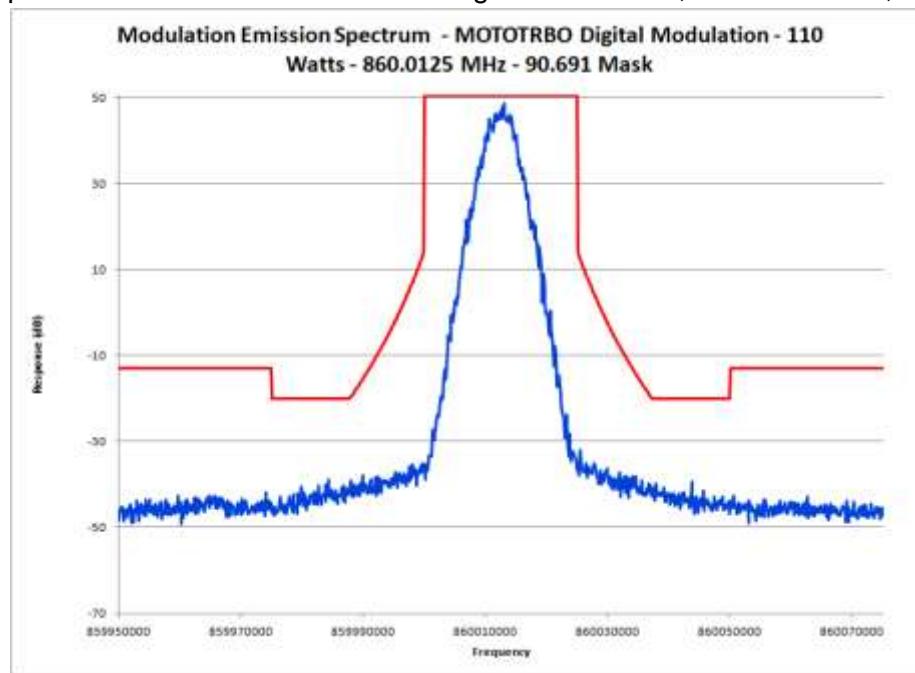
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

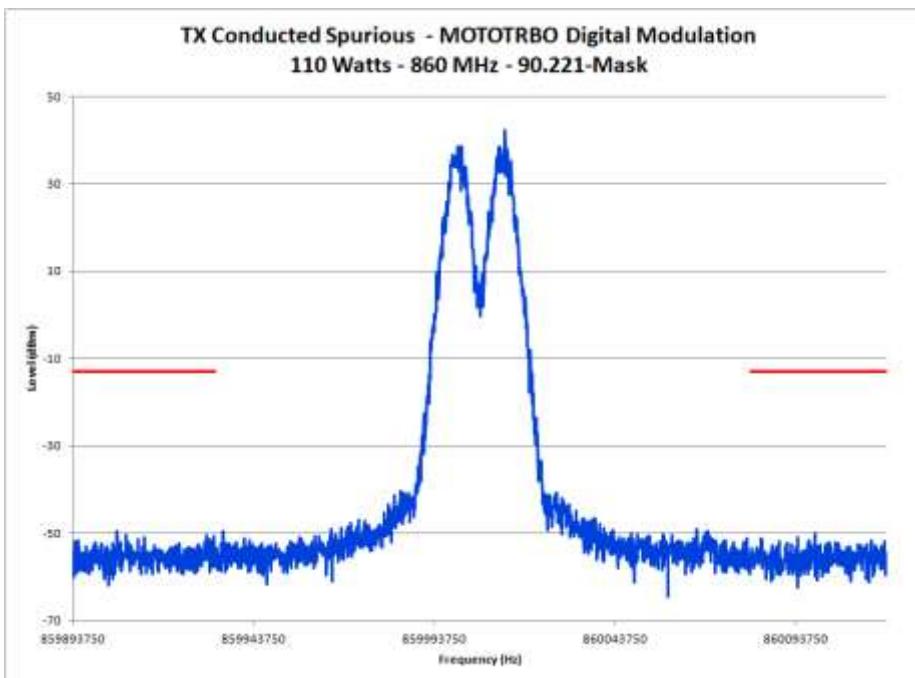
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-5.7 Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 860.0125 MHz, 90.691-Mask



E1-5.8 Occupied Bandwidth – MOTOTRBO™ Digital Modulation Dual Carrier, 860.00625 MHz, 90.221-Mask



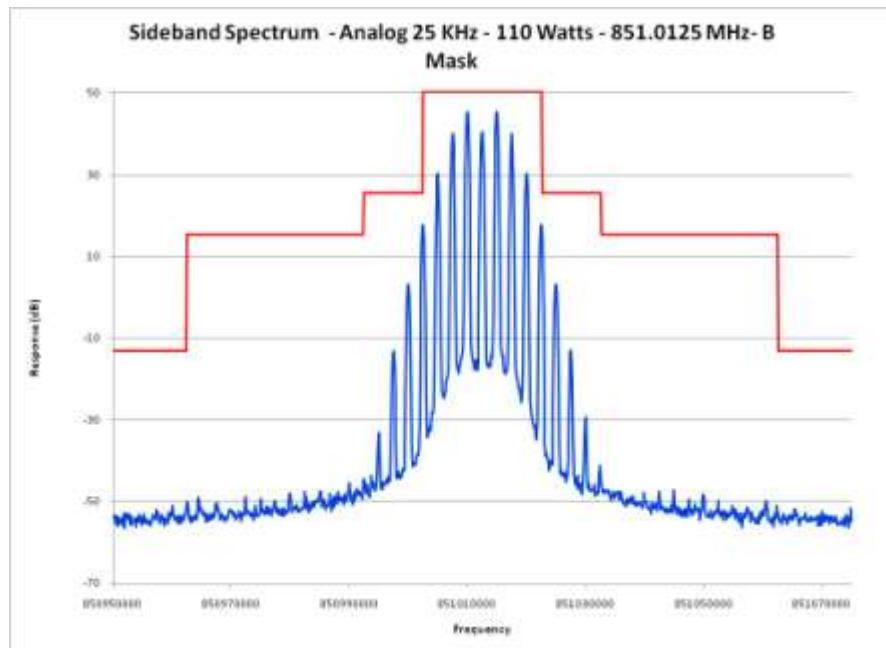
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

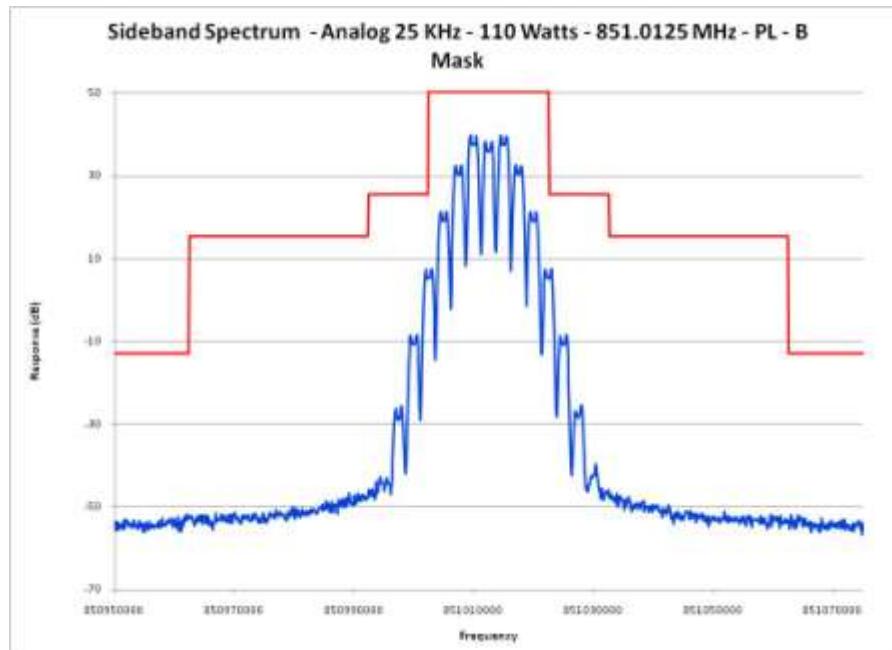
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-5.9 Occupied Bandwidth, Analog, 25 kHz Channels, 851.0125 MHz, B-Mask



E1-5.10 Occupied Bandwidth, Analog, 25 kHz Channels, 851.0125 MHz PL, B-Mask



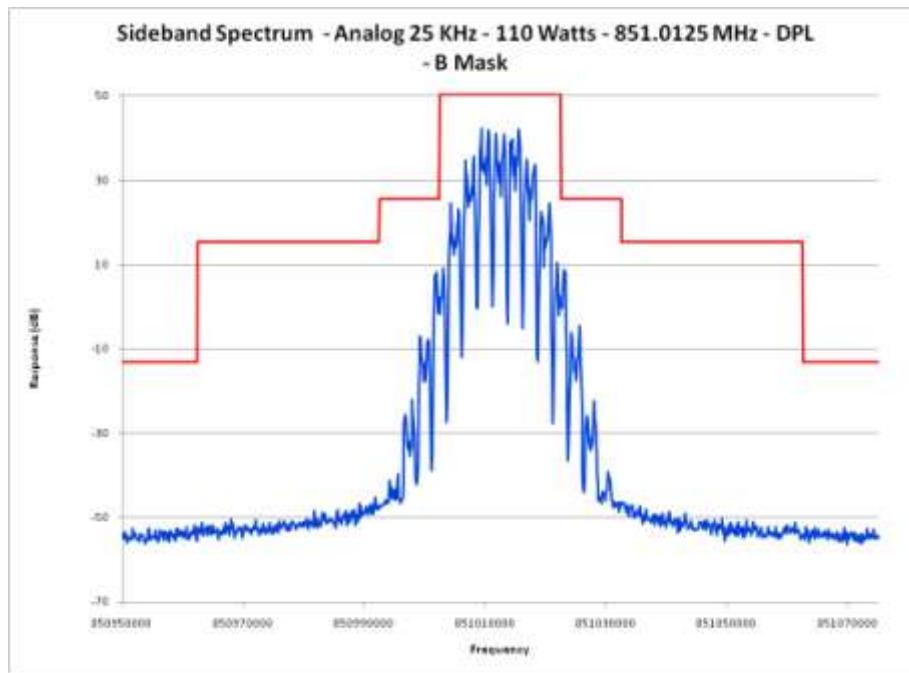
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

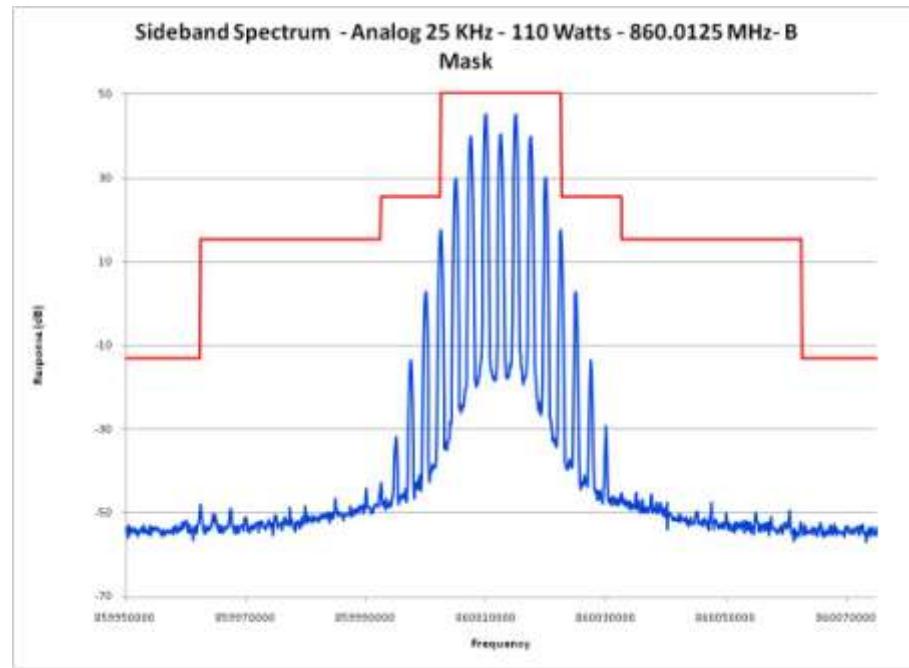
109AB-99FT5101B

**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

E1-5.11 Occupied Bandwidth, Analog, 25 kHz Channels, 851.0125 MHz DPL, B-Mask



E1-5.12 Occupied Bandwidth, Analog, 25 kHz Channels, 860.0125 MHz, B-Mask



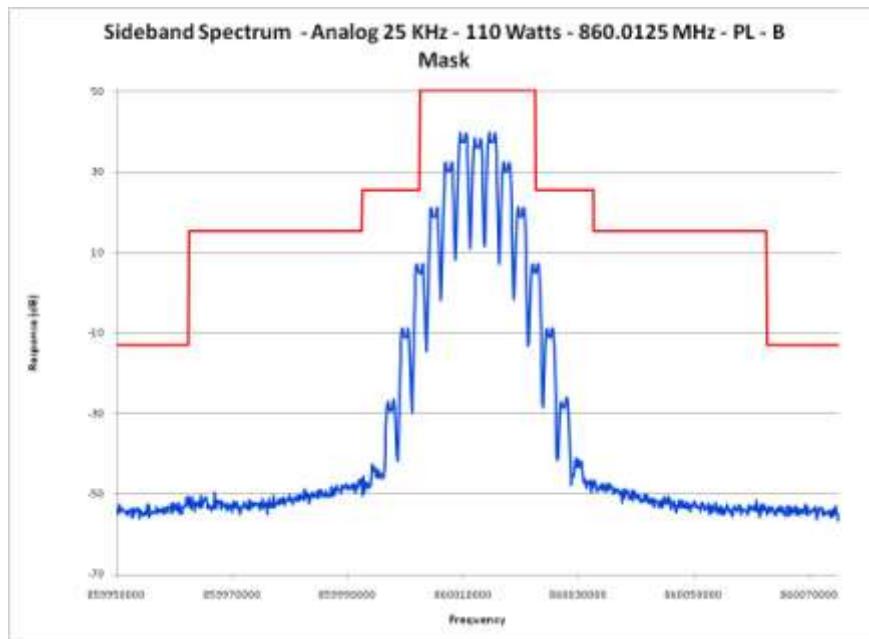
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

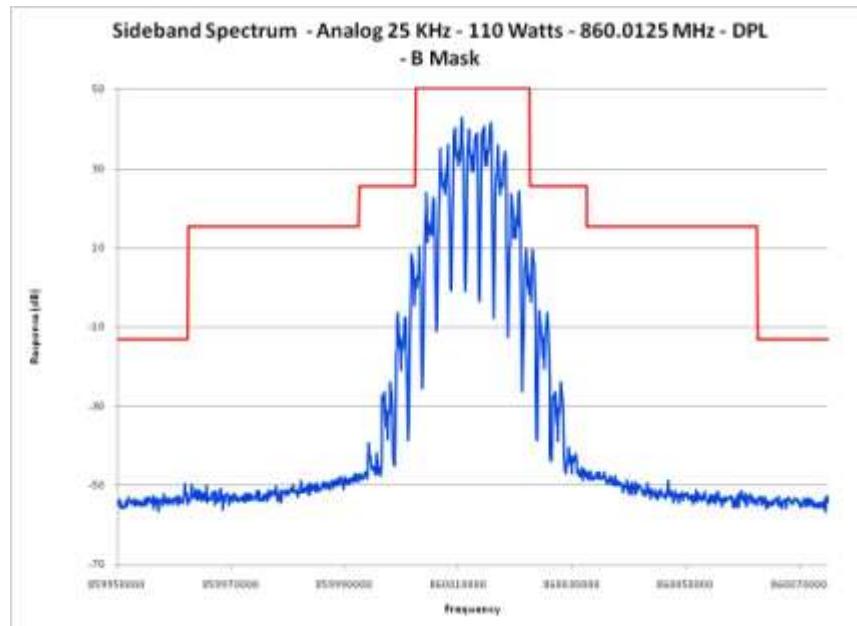
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-5.13 Occupied Bandwidth, Analog, 25 kHz Channels, 860.0125 MHz PL, B-Mask



E1-5.14 Occupied Bandwidth, Analog, 25 kHz Channels, 860.0125 MHz DPL, B-Mask



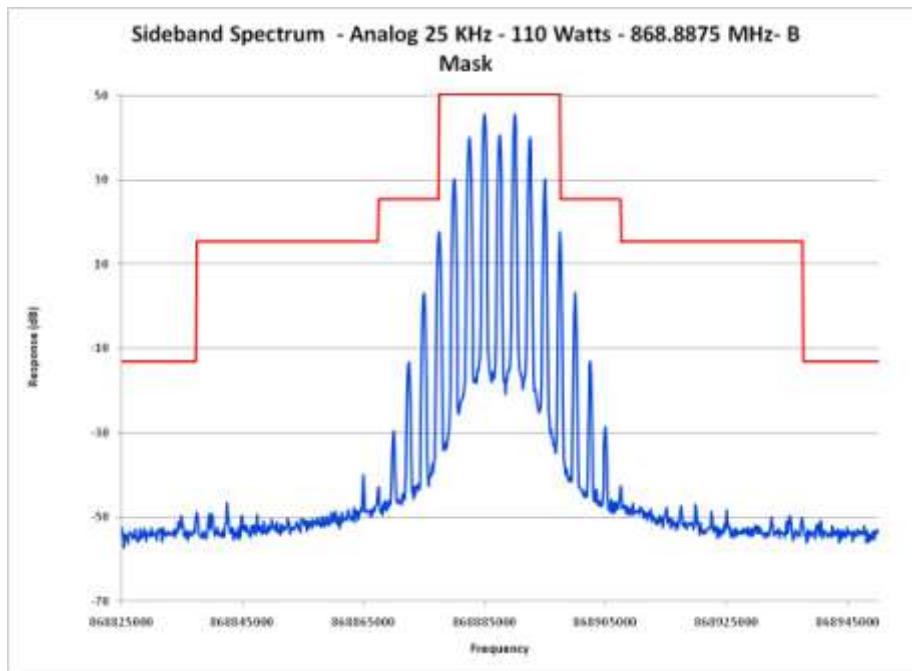
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

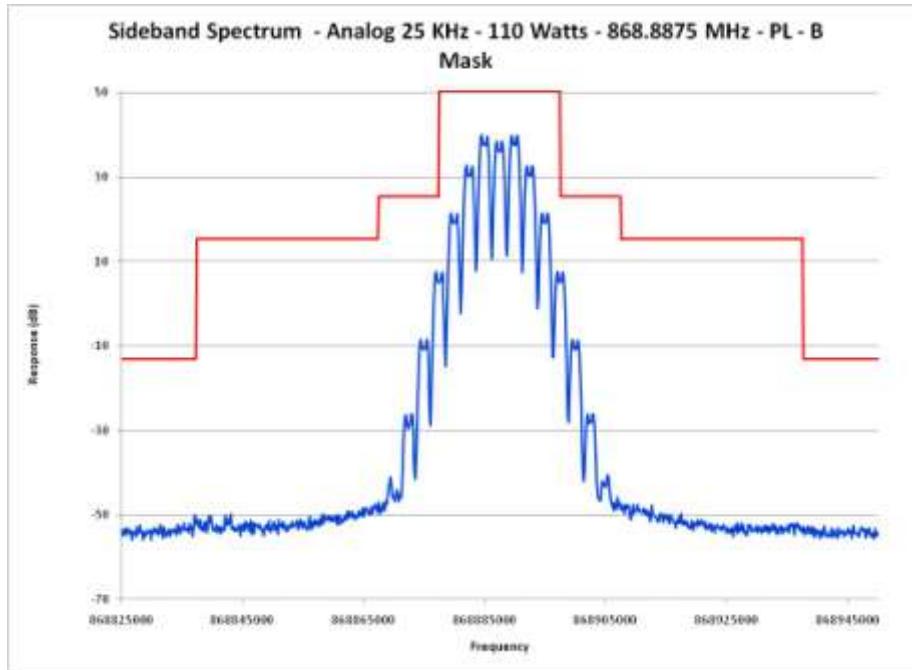
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-5.15 Occupied Bandwidth, Analog, 25 kHz Channels, 868.8875 MHz, B-Mask



E1-5.16 Occupied Bandwidth, Analog, 25 kHz Channels, 868.8875 MHz PL, B-Mask



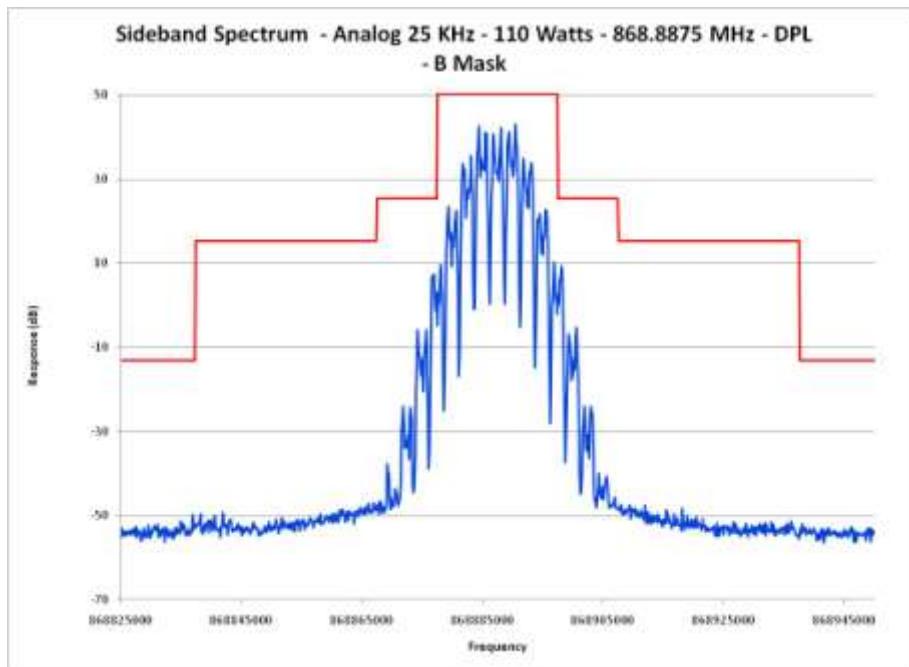
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

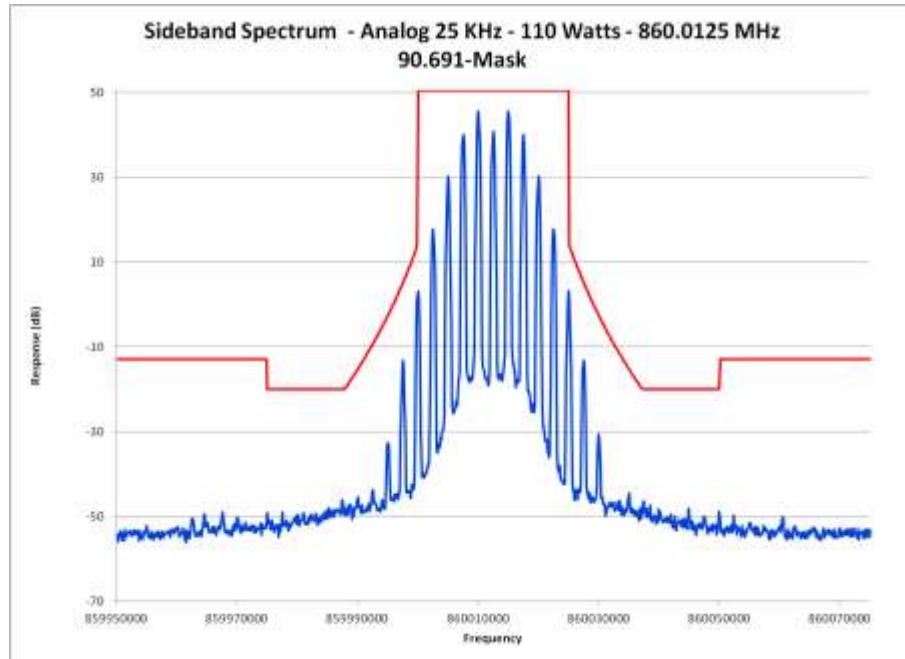
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-5.17 Occupied Bandwidth, Analog, 25 kHz Channels, 868.8875 MHz DPL, B-Mask



E1-5.18 Occupied Bandwidth, Analog, 25 kHz Channels, 860.0125 MHz, 90.691-Mask



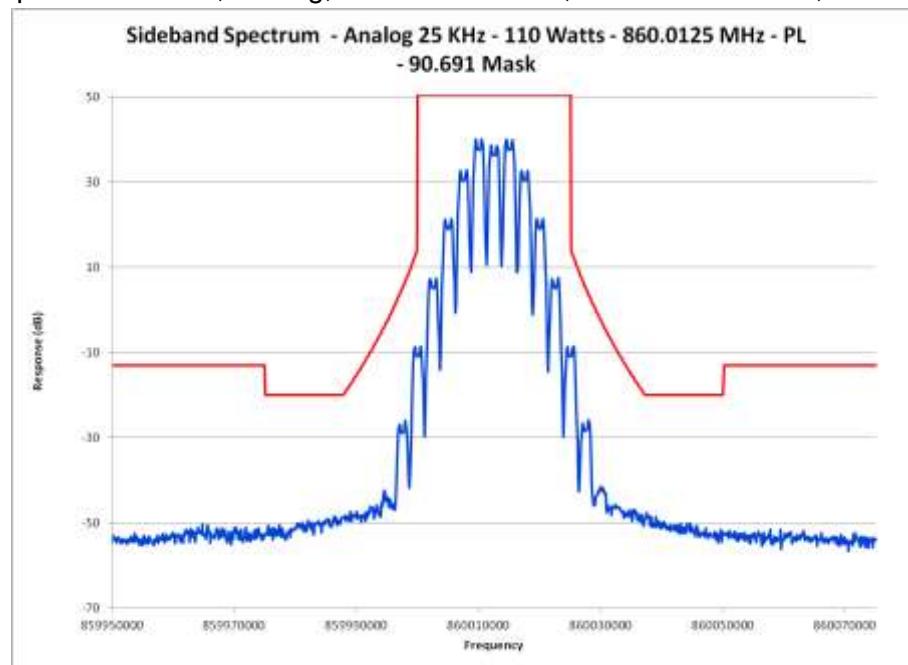
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

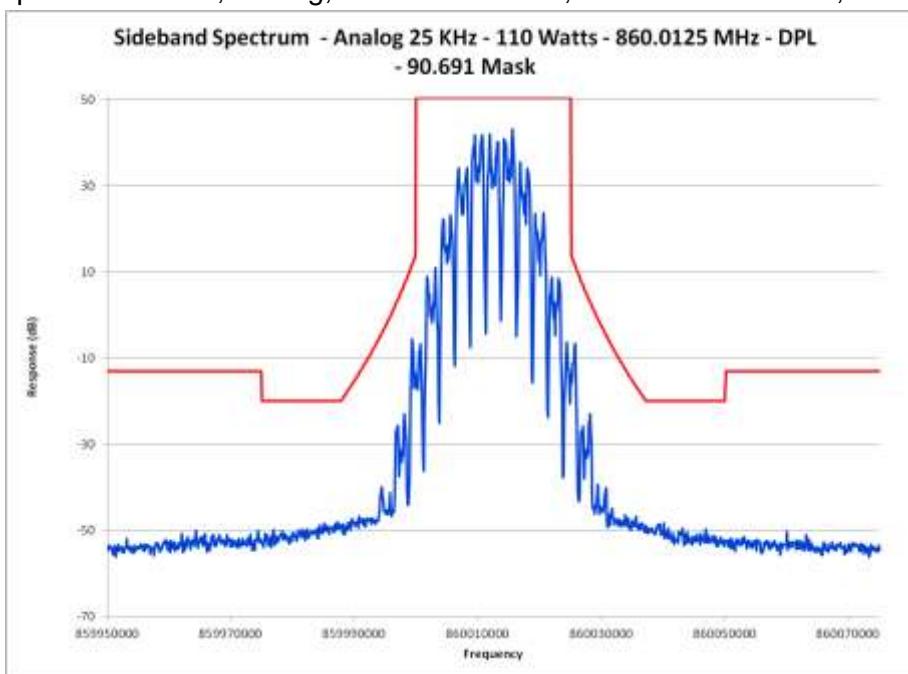
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-5.19 Occupied Bandwidth, Analog, 25 kHz Channels, 860.0125 MHz PL, 90.691-Mask



E1-5.20 Occupied Bandwidth, Analog, 25 kHz Channels, 860.0125 MHz DPL, 90.691-Mask



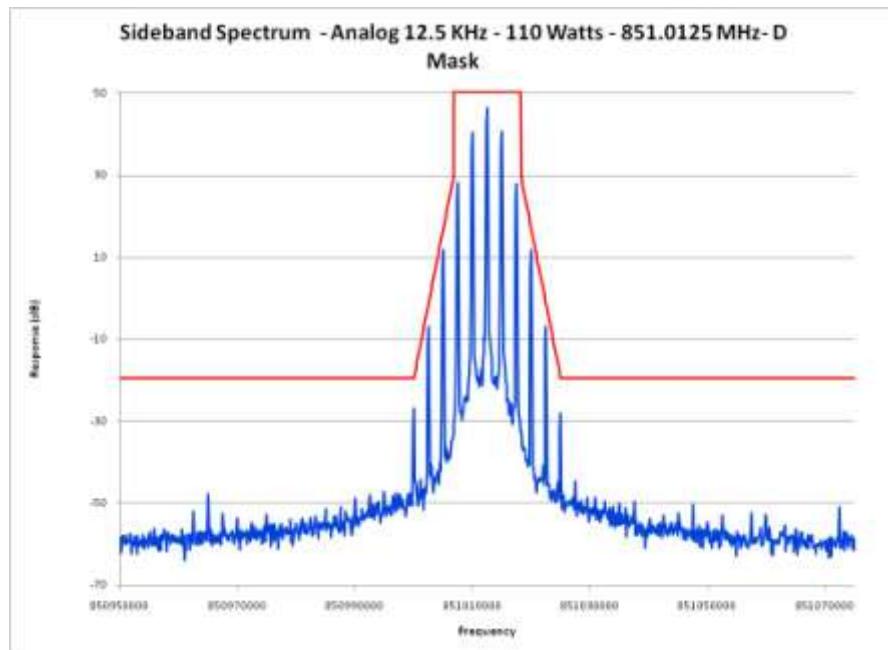
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

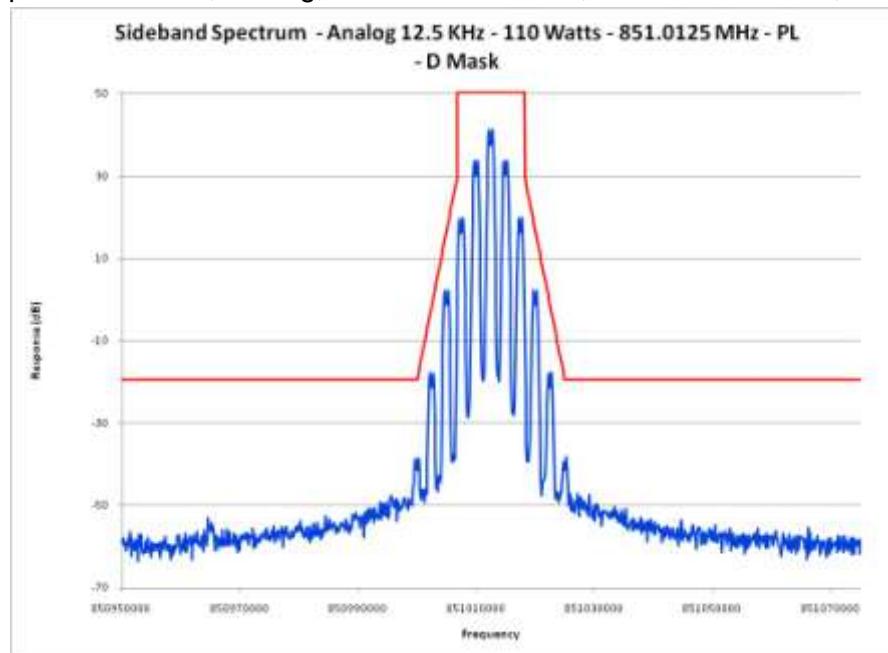
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-5.21 Occupied Bandwidth, Analog, 12.5 kHz Channels, 851.0125 MHz, D-Mask



E1-5.22 Occupied Bandwidth, Analog, 12.5 kHz Channels, 851.0125 MHz PL, D-Mask



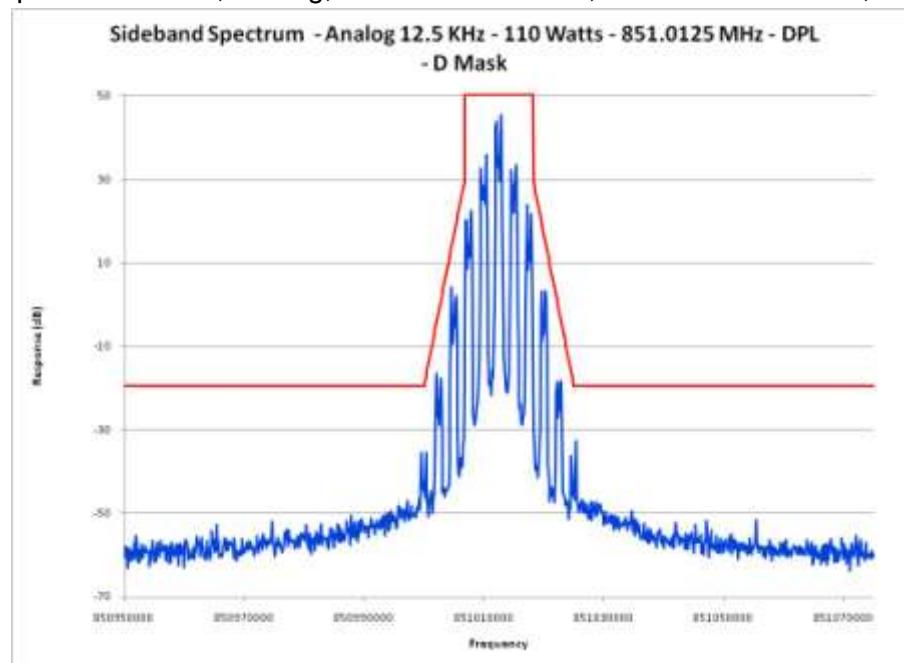
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

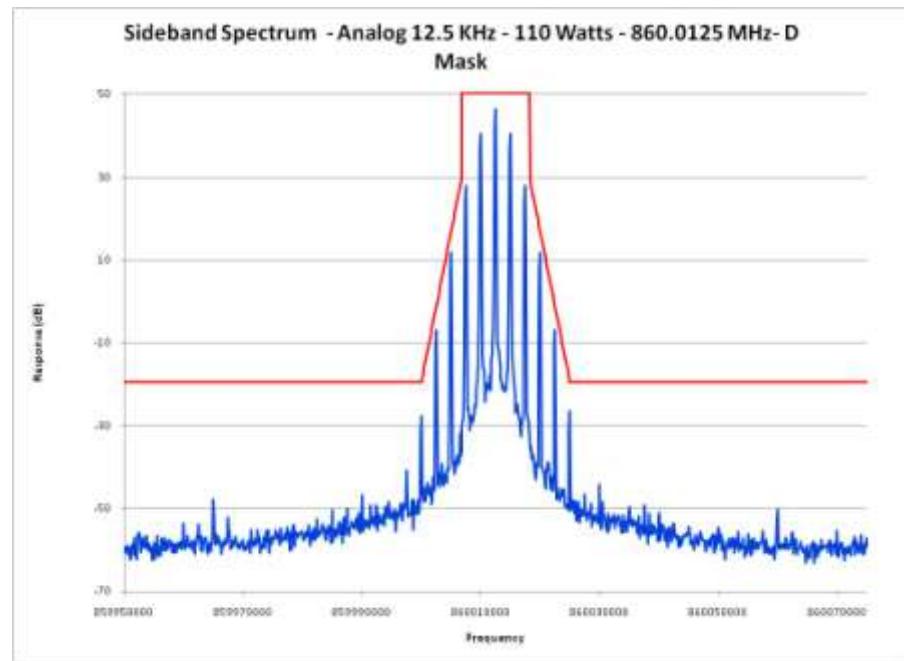
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-5.23 Occupied Bandwidth, Analog, 12.5 kHz Channels, 851.0125 MHz DPL, D-Mask



E1-5.24 Occupied Bandwidth, Analog, 12.5 kHz Channels, 860.0125 MHz, D-Mask



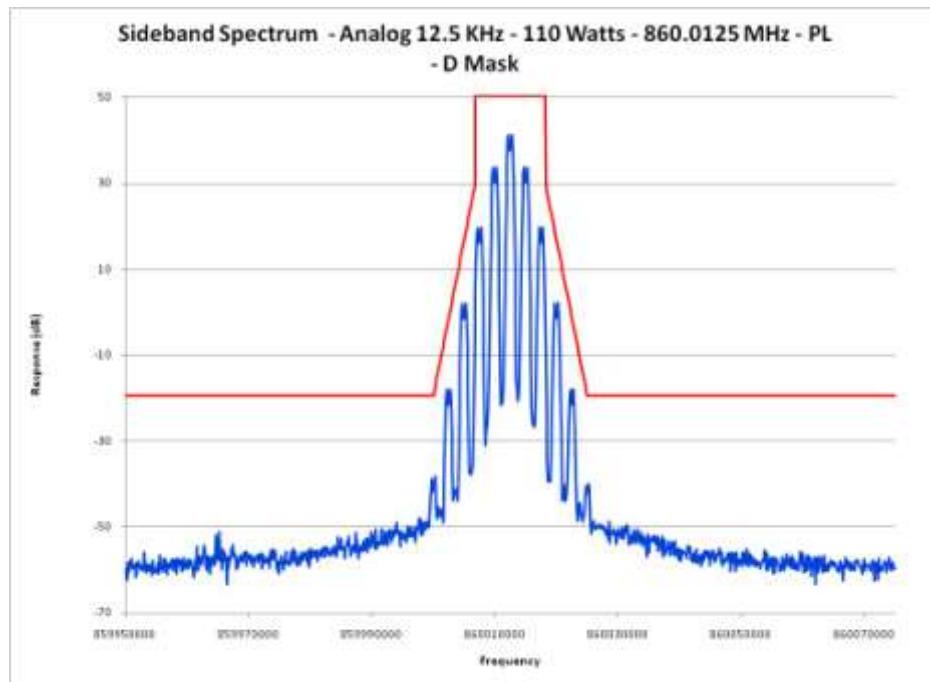
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

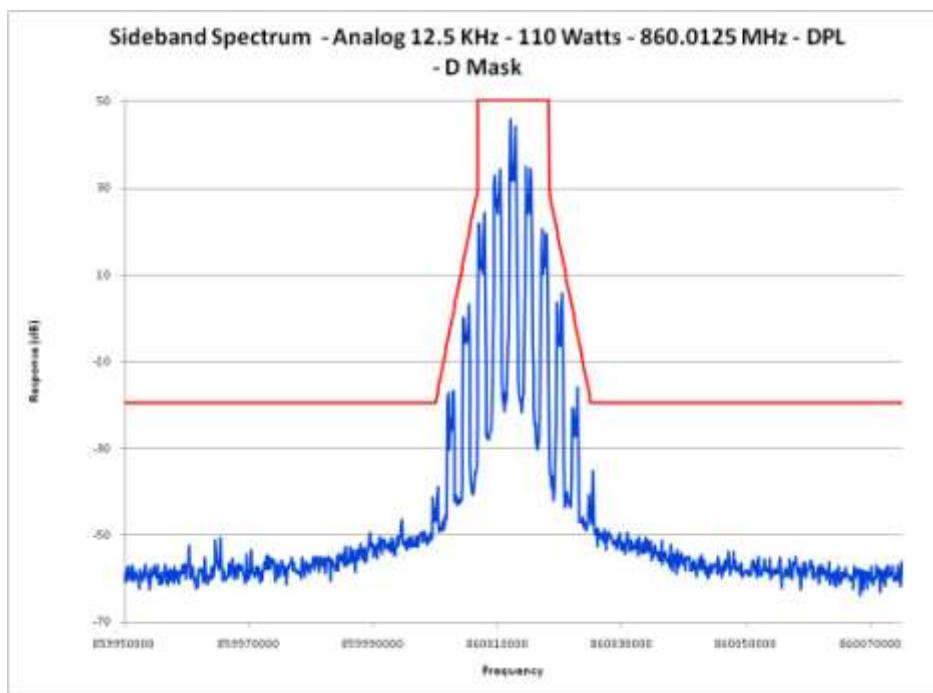
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-5.25 Occupied Bandwidth, Analog, 12.5 kHz Channels, 860.0125 MHz PL, D-Mask



E1-5.26 Occupied Bandwidth, Analog, 12.5 kHz Channels, 860.0125 MHz DPL, D-Mask



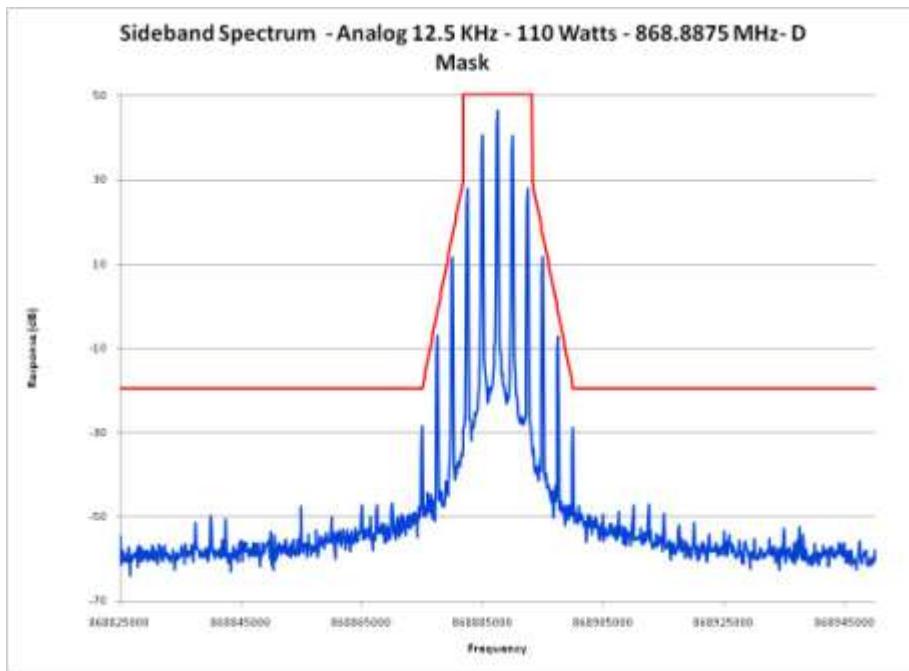
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

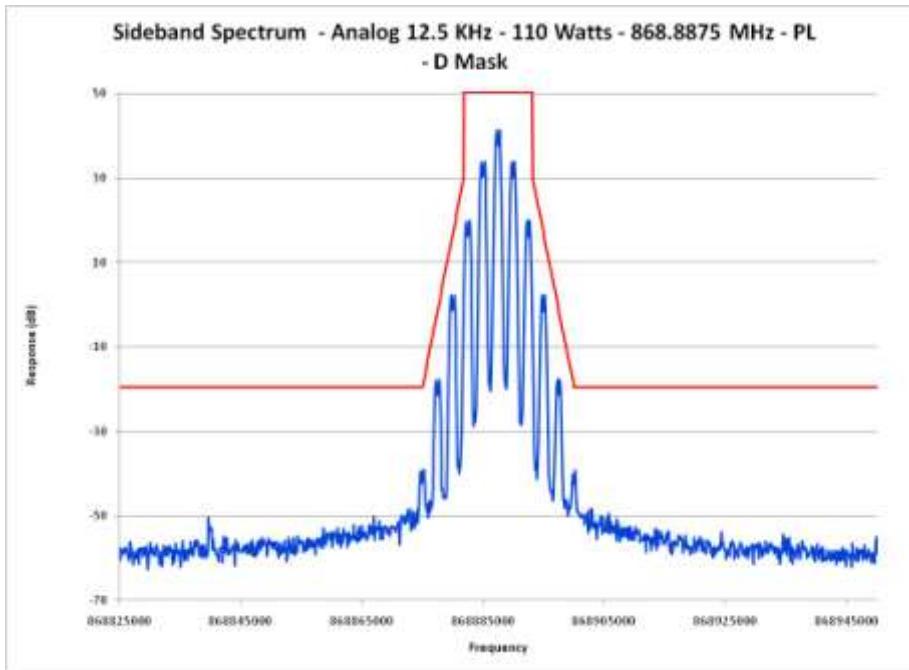
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-5.27 Occupied Bandwidth, Analog, 12.5 kHz Channels, 868.8875 MHz, D-Mask



E1-5.28 Occupied Bandwidth, Analog, 12.5 kHz Channels, 868.8875 MHz PL, D-Mask



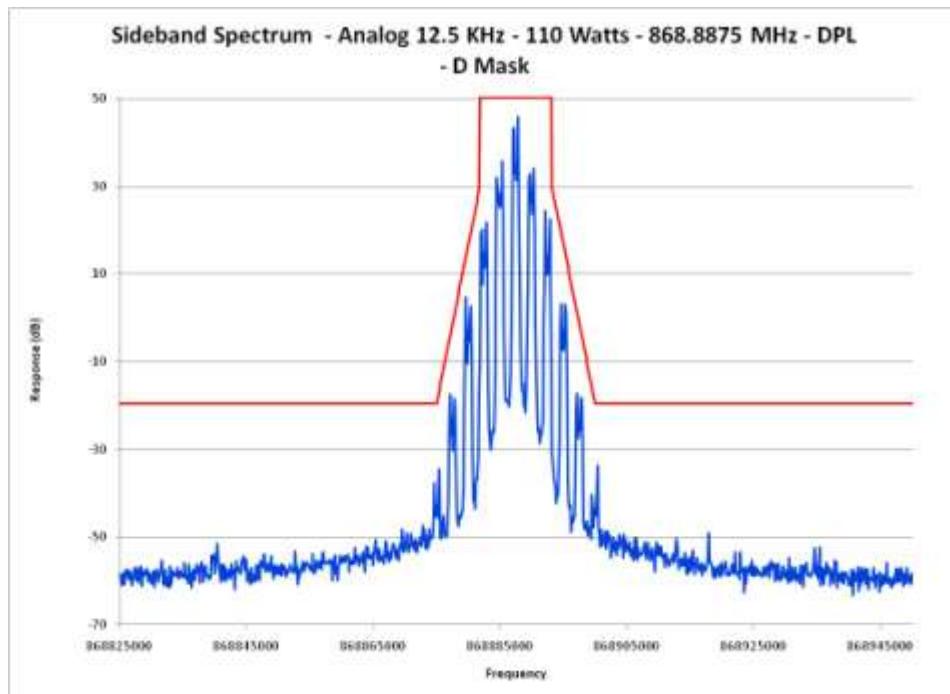
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

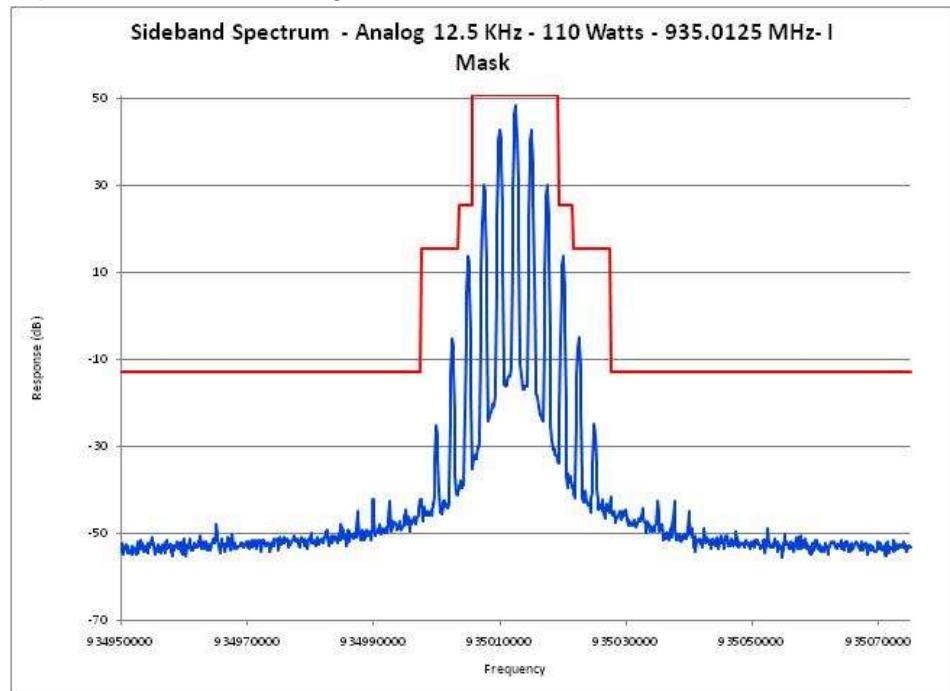
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-5.29 Occupied Bandwidth, Analog, 12.5 kHz Channels, 868.8875 MHz DPL, D-Mask



E1-5.30 Occupied Bandwidth, Analog, 12.5 kHz Channels, 935.0125 MHz, I-Mask



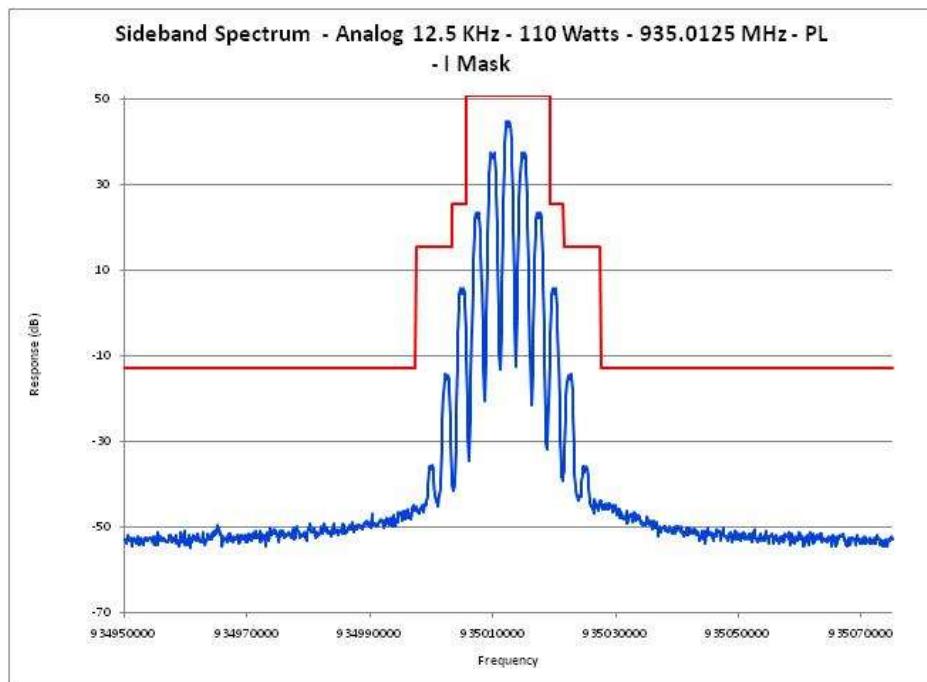
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

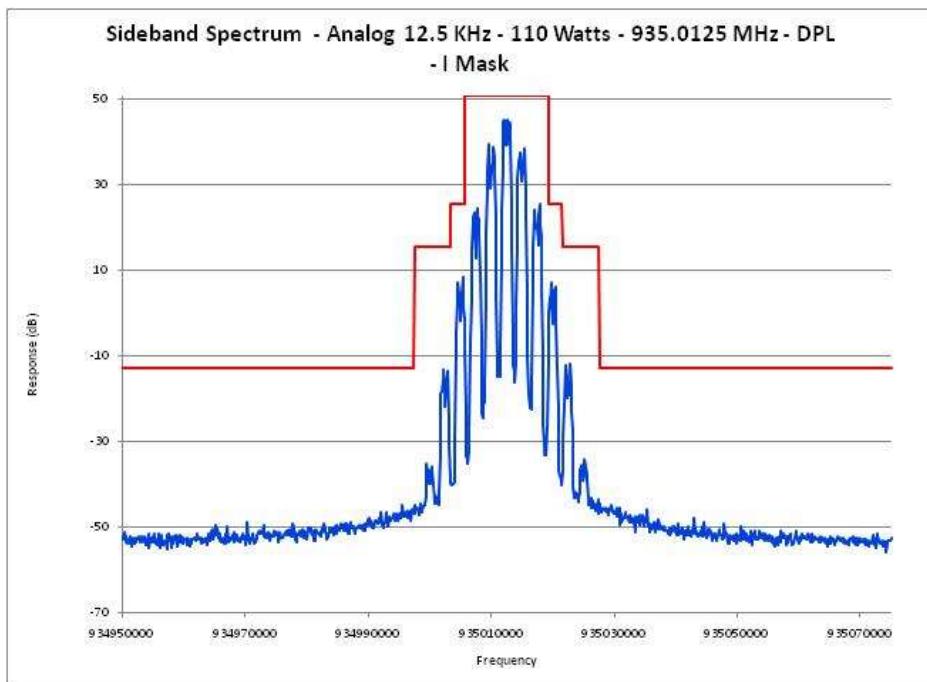
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-5.31 Occupied Bandwidth, Analog, 12.5 kHz Channels, 935.0125 MHz PL, I-Mask



E1-5.32 Occupied Bandwidth, Analog, 12.5 kHz Channels, 935.0125 MHz DPL, I-Mask



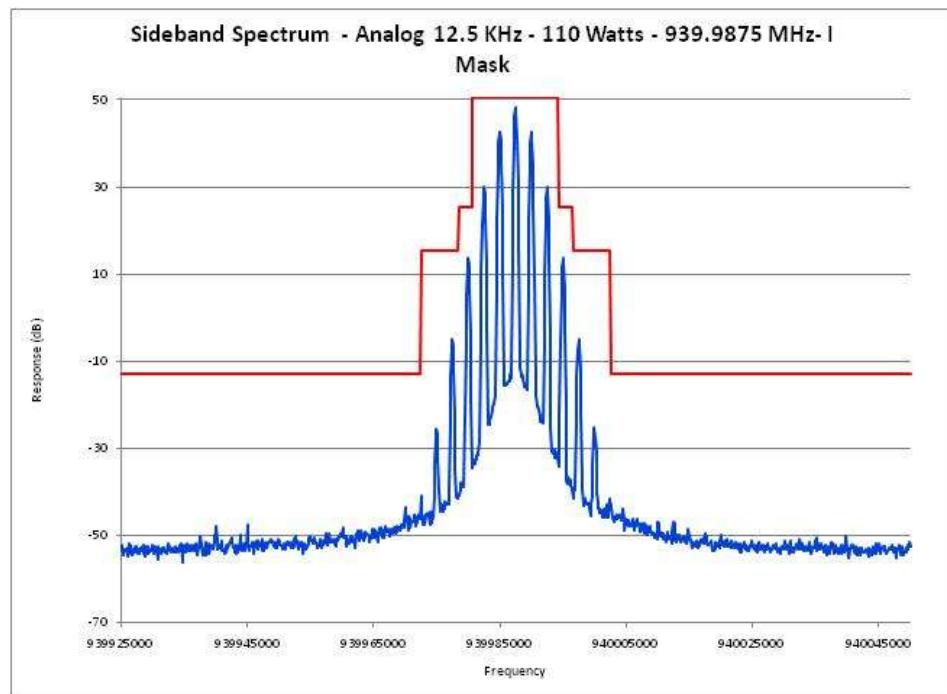
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

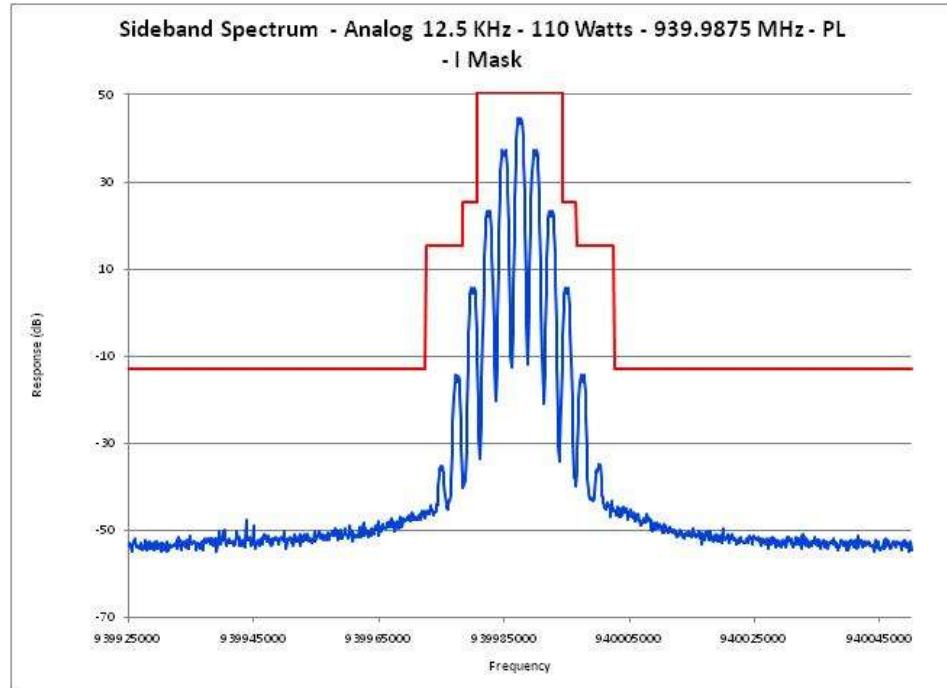
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-5.33 Occupied Bandwidth, Analog, 12.5 kHz Channels, 939.9875 MHz, I-Mask



E1-5.34 Occupied Bandwidth, Analog, 12.5 kHz Channels, 939.9875 MHz PL, I-Mask



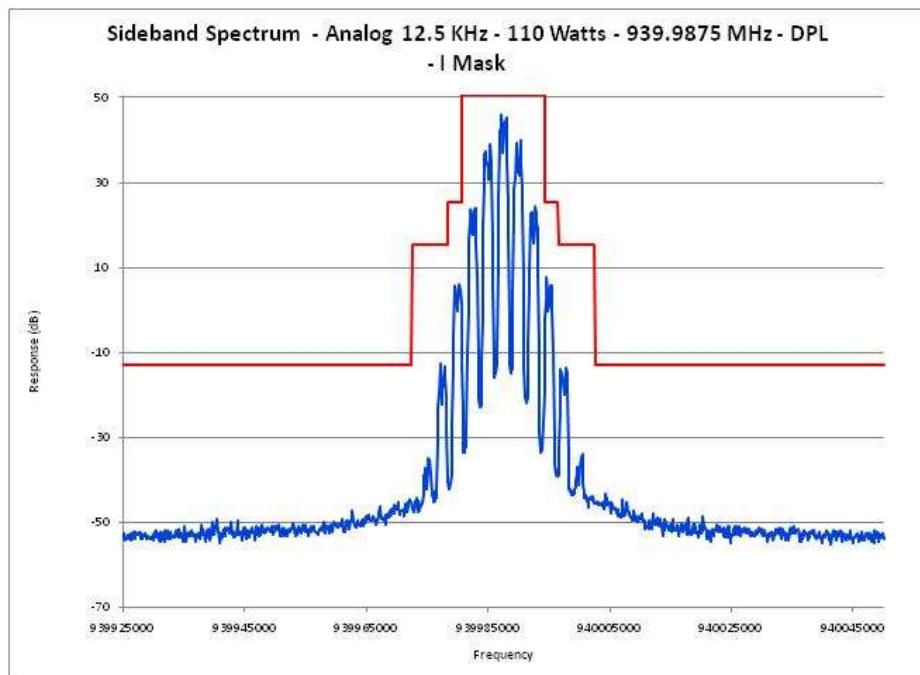
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

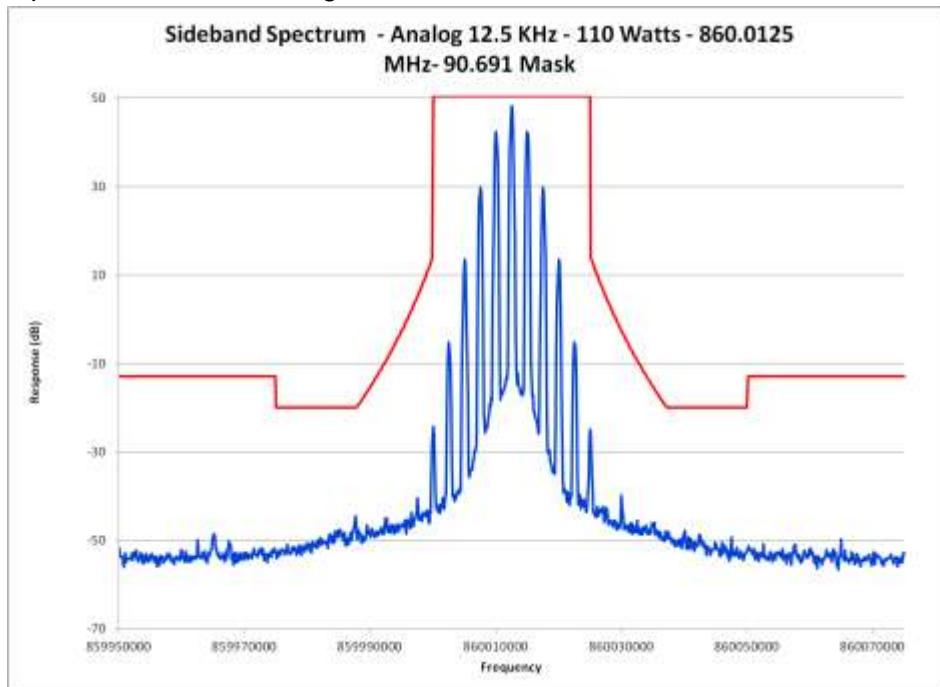
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-5.35 Occupied Bandwidth, Analog, 12.5 kHz Channels, 939.9875 MHz DPL, I-Mask



E1-5.36 Occupied Bandwidth, Analog, 12.5 kHz Channels, 860.0125 MHz, 90.691-Mask



APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-6 Conducted Spurious Emissions – Harmonics and Emission Spectrum

Specification Requirement 47 CFR §90.210(b) and IC RSS-119 section 5.8.1 - Emission Limits – “B-Mask”:

For transmitters equipped with an audio low pass filter and designed to operate with a 25 kHz channel spacing (authorized bandwidth 20 kHz), the power of any emission must be below the unmodulated carrier power (P) as follows:

On any frequency removed from the assigned frequency by a displacement frequency (F_d in kHz) of: c) > 50 kHz at least $43 + 10 \cdot \log_{10}(P)$ dB.

Specification Requirement 47 CFR §90.210(d) and IC RSS-119 section 5.8.3 - 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:

(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: Analog Frequency Modulation – this is also representative of the performance of MOTOTRBO™ Digital Modulation, which is 4-level frequency modulation of the carrier.

Carrier Frequencies: Carrier frequencies of 851.0125, 860.0125, 868.8875, 935.0125, 939.9875, 940.5 MHz were measured for conducted carrier harmonics and conducted spurious emission measurements.

851.0125, 860.0125 and 868.9875MHz represent the low end, center and high end of the 851-869MHz band.

935.0125 and 939.9875MHz represent the low end and high end of the 935-940MHz band.

940.5MHz represents the center of the 940-941MHz band.

APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

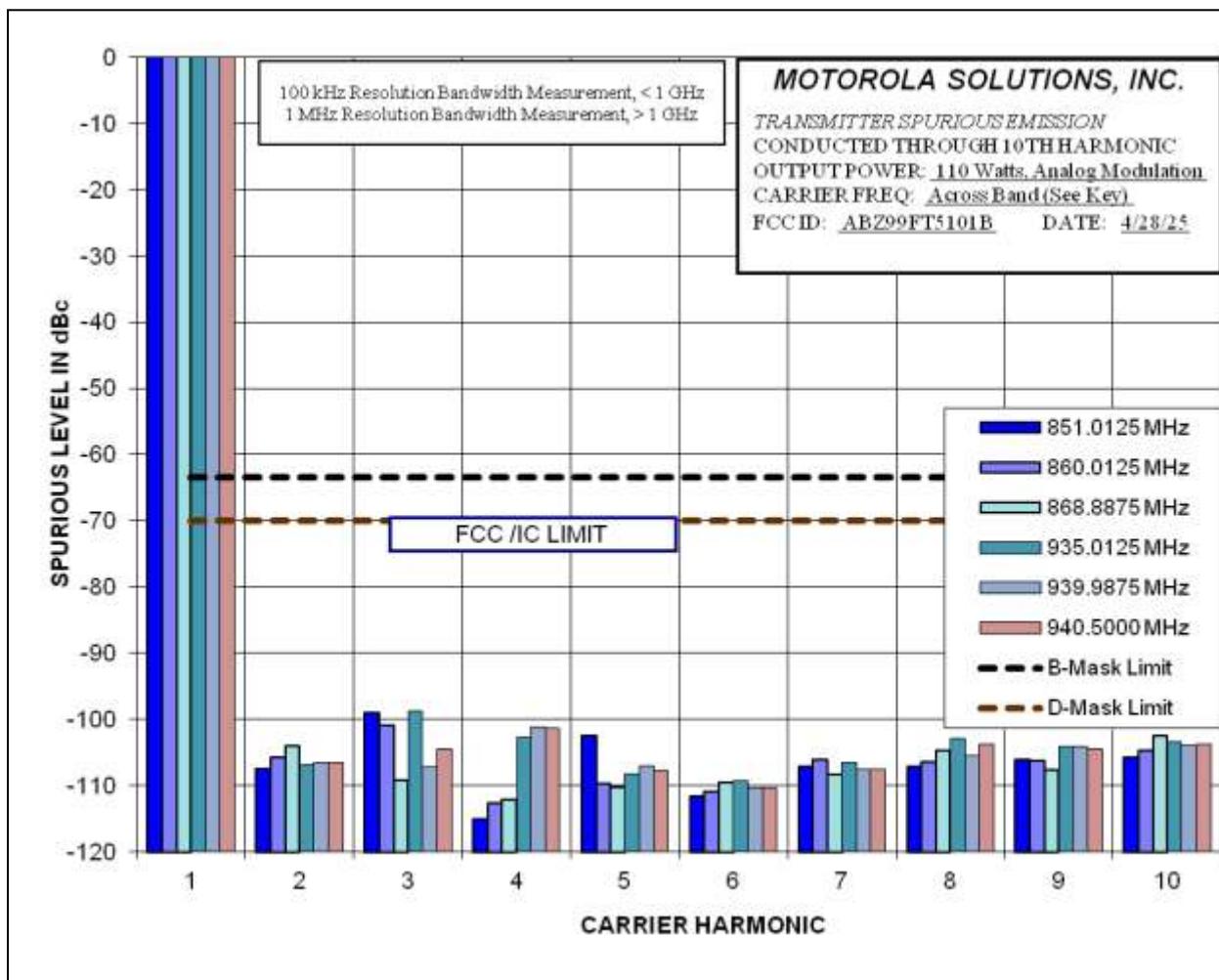
109AB-99FT5101B

**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

<u>EXHIBIT</u>	<u>DESCRIPTION</u>
E1-6.1	Conducted Spurious Harmonic Emissions, Power Output 110 Watts The specification limit is -70.0 dBc
E1-6.2	Conducted Spurious Harmonic Emissions, Power Output 1 Watt The specification limit is -50.0 dBc
E1-6.3	Conducted Spurious Emission Spectrum, 200 MHz Span, Power 110 Watts, 851.0125 MHz
E1-6.4	Conducted Spurious Emission Spectrum, 200 MHz Span, Power 110 Watts, 860.0125 MHz
E1-6.5	Conducted Spurious Emission Spectrum, 200 MHz Span, Power 110 Watts, 868.8875 MHz
E1-6.6	Conducted Spurious Emission Spectrum, 200 MHz Span, Power 110 Watts, 935.0125 MHz
E1-6.7	Conducted Spurious Emission Spectrum, 200 MHz Span, Power 110 Watts, 939.9875 MHz
E1-6.8	Conducted Spurious Emission Spectrum, 200 MHz Span, Power 110 Watts, 940.5 MHz

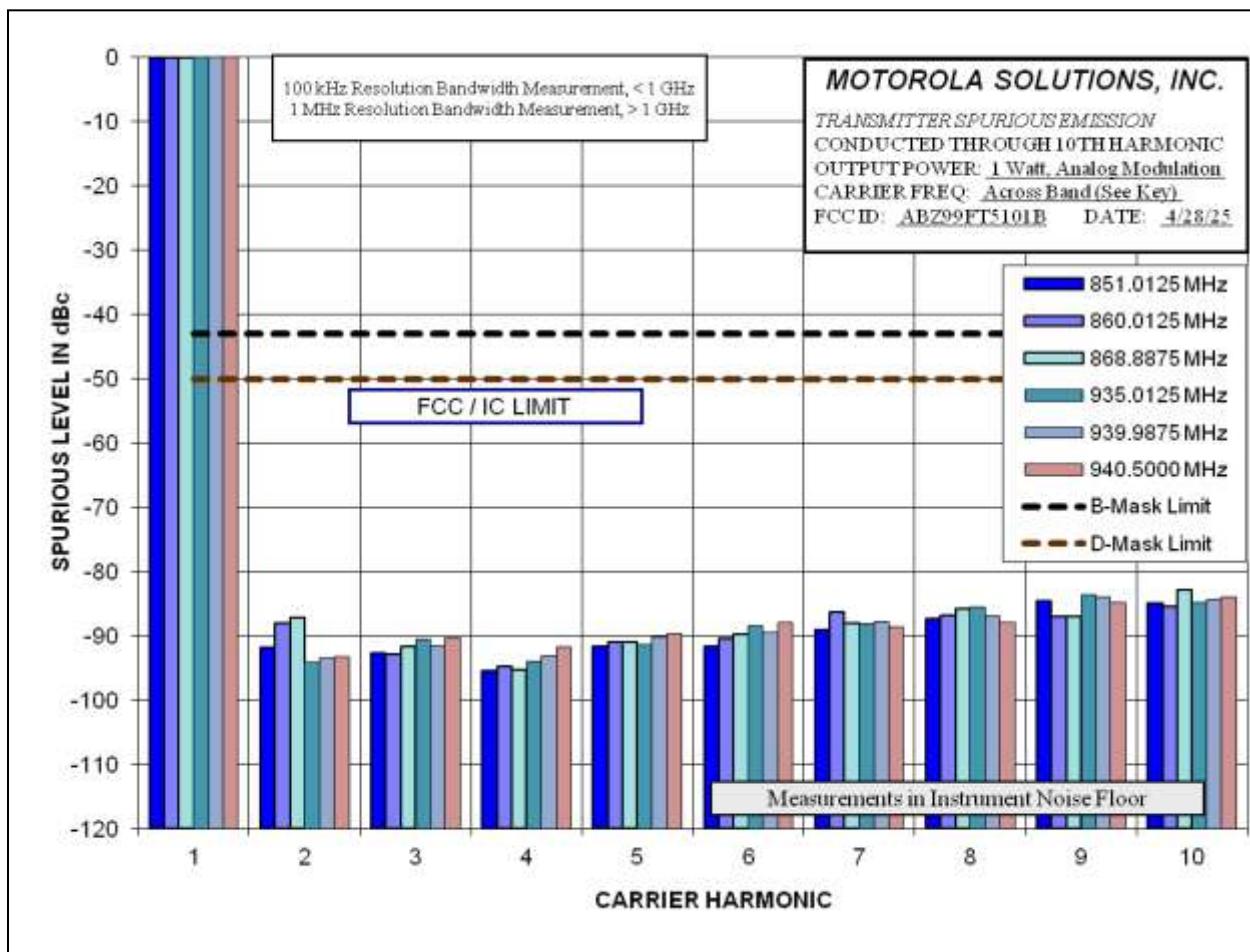
**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

E1-6.1 Conducted Spurious Harmonic Emissions, Power Output 110 Watts



**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

E1-6.2 Conducted Spurious Harmonic Emissions, Power Output 1 Watt



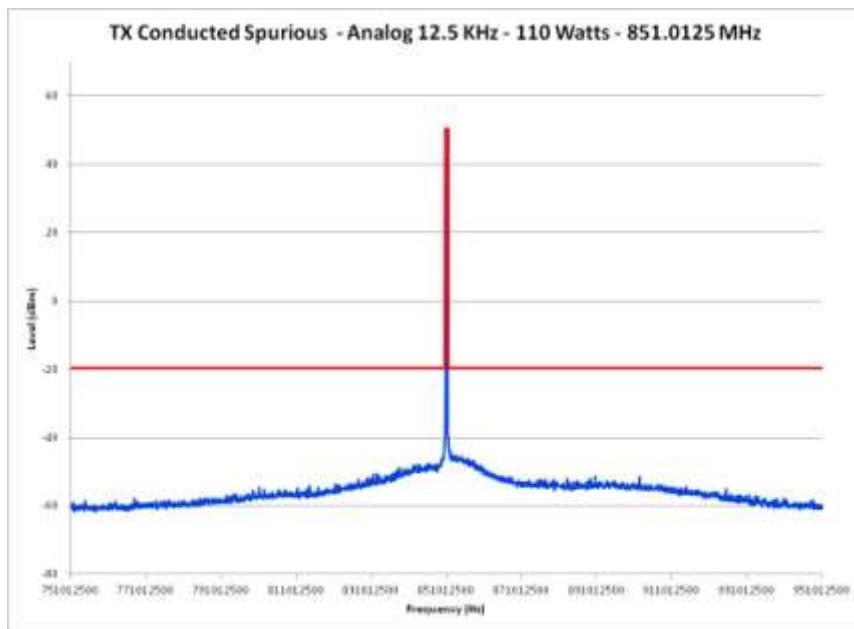
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

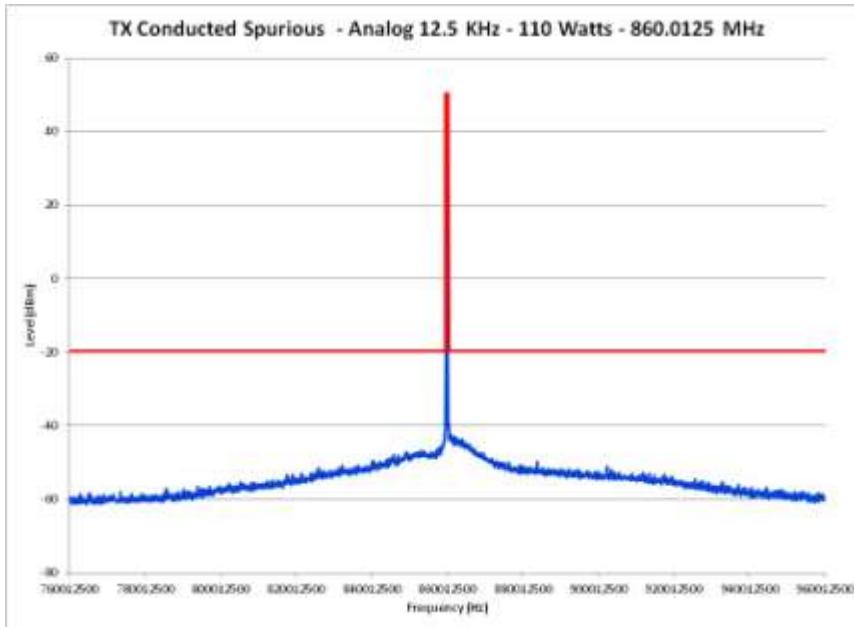
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-6.3 Conducted Spurious Emission Spectrum, 200 MHz Span, Power 110 Watts, 851.0125 MHz



E1-6.4 Conducted Spurious Emission Spectrum, 200 MHz Span, Power 110 Watts, 860.0125 MHz



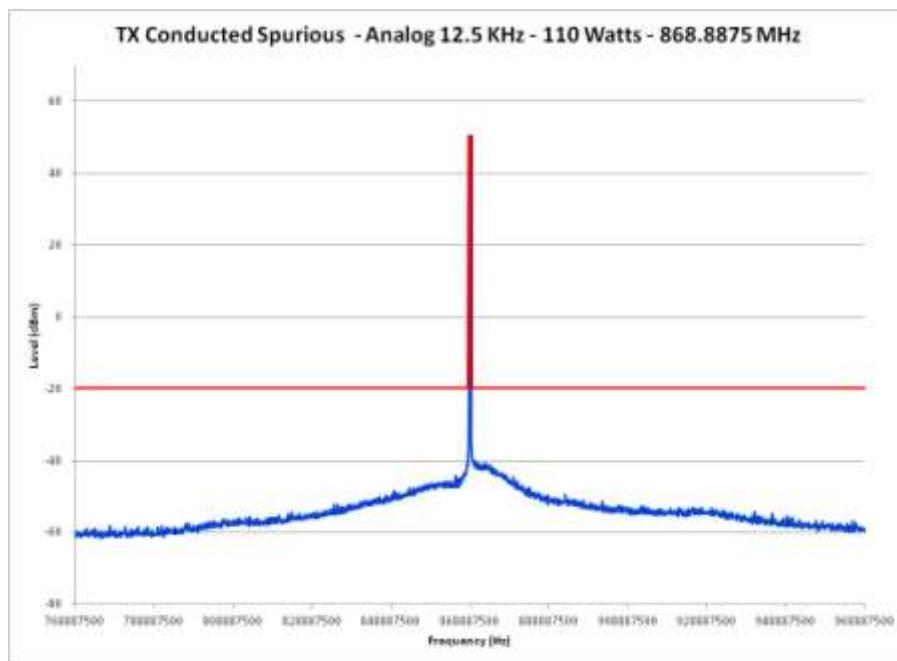
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

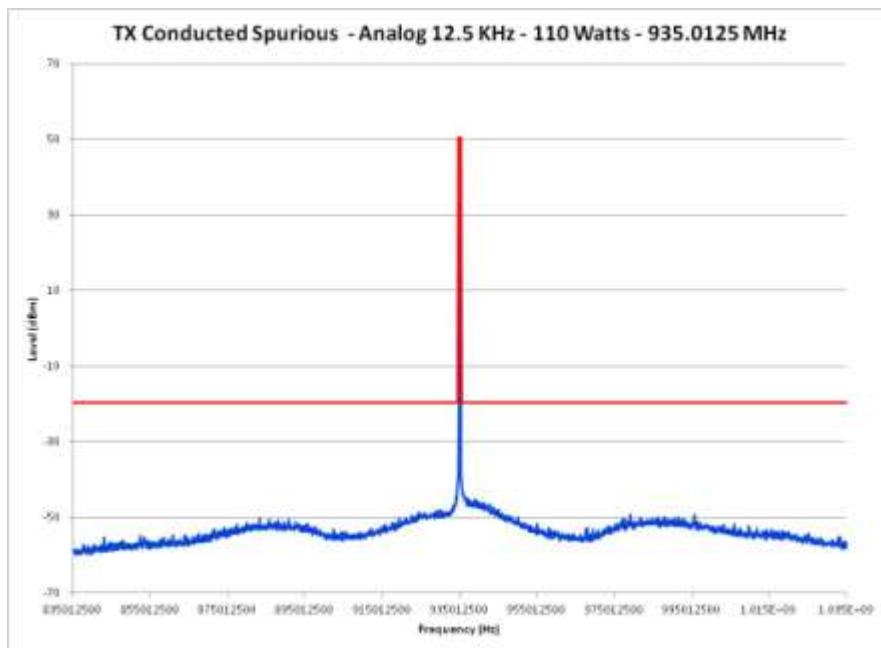
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-6.5 Conducted Spurious Emission Spectrum, 200 MHz Span, Power 110 Watts, 868.8875 MHz



E1-6.6 Conducted Spurious Emission Spectrum, 200 MHz Span, Power 110 Watts, 935.0125 MHz



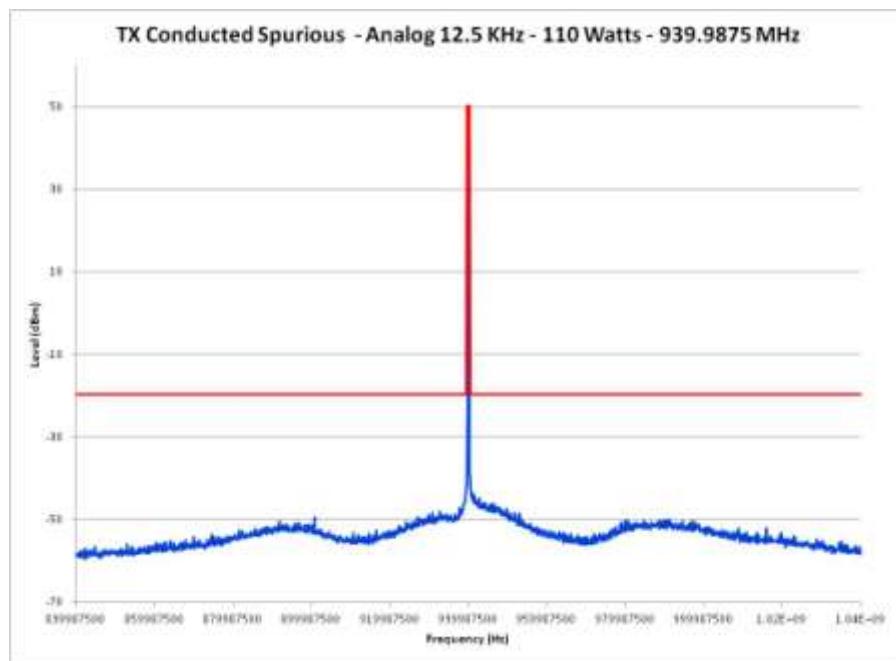
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

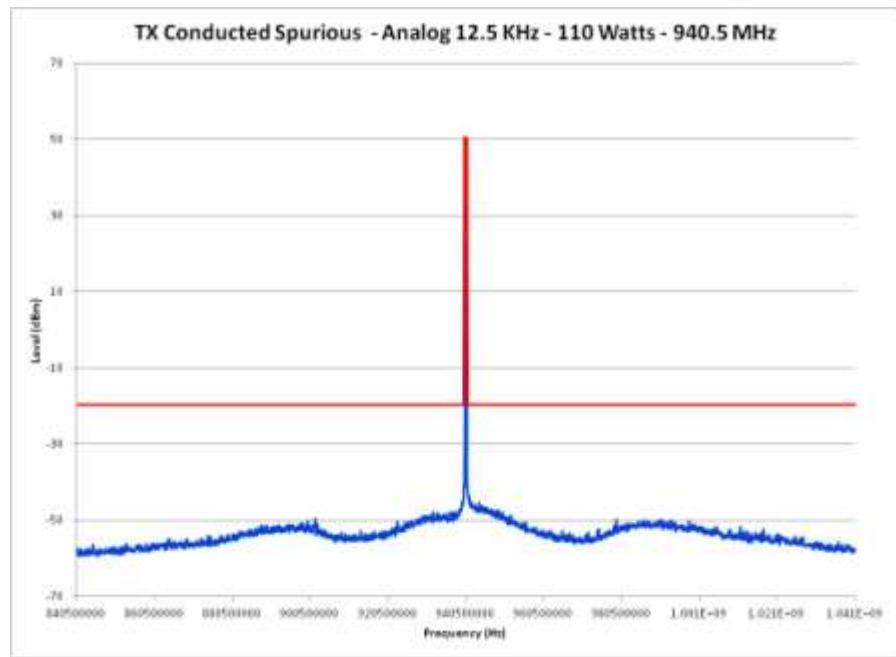
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-6.7 Conducted Spurious Emission Spectrum, 200 MHz Span, Power 110 Watts, 939.9875 MHz



E1-6.8 Conducted Spurious Emission Spectrum, 200 MHz Span, Power 110 Watts, 940.5 MHz



APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-7 Radiated Spurious Emissions, Harmonics

Specification Requirement 47 CFR §90.210(b) and IC RSS-119 section 5.8.1 - Emission Limits – “B-Mask”:

For transmitters equipped with an audio low pass filter and designed to operate with a 25 kHz channel spacing (authorized bandwidth 20 kHz), the power of any emission must be below the unmodulated carrier power (P) as follows:

On any frequency removed from the assigned frequency by a displacement frequency (F_d in kHz) of: c) >50 kHz *at least $43+10 * \log_{10}(P)$ dB.*

Specification Requirement 47 CFR §90.210(d) and IC RSS-119 section 5.8.3 - 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:

(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.

Carrier Frequencies: Carrier frequencies of 851.0125, 860.0125, 868.9875, 935.0125, 939.9875, 940.5 MHz were measured for radiated carrier harmonics at the high and low rated power.

851.0125, 860.0125 and 868.9875MHz represent the low end, center and high end of the 851-869MHz band.

935.0125 and 939.9875MHz represent the low end and high end of the 935-940MHz band.

940.5MHz represents the center of the 940-941MHz band.

Result: N/A

APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

E1-8 Oscillator Frequency Stability

Specification Requirement IC RSS-119 section 5.3:

Fixed and Base stations operating at 851-869 MHz and 12.5 kHz channel bandwidth must have a frequency stability of better than +/- 1 PPM, and those operating at 25 kHz channel bandwidth must have a frequency stability of better than +/- 1.5 PPM.

Fixed and Base stations operating at 935-940 MHz and 12.5 kHz channel bandwidth must have a frequency stability of better than +/- 0.1 PPM.

Specification Requirement: Reference Part 90.213

Fixed and Base stations operating at 851-854 MHz must have a frequency stability of better than +/- 1 PPM.

Fixed and Base stations operating at 854-869 MHz must have a frequency stability of better than +/- 1.5 PPM.

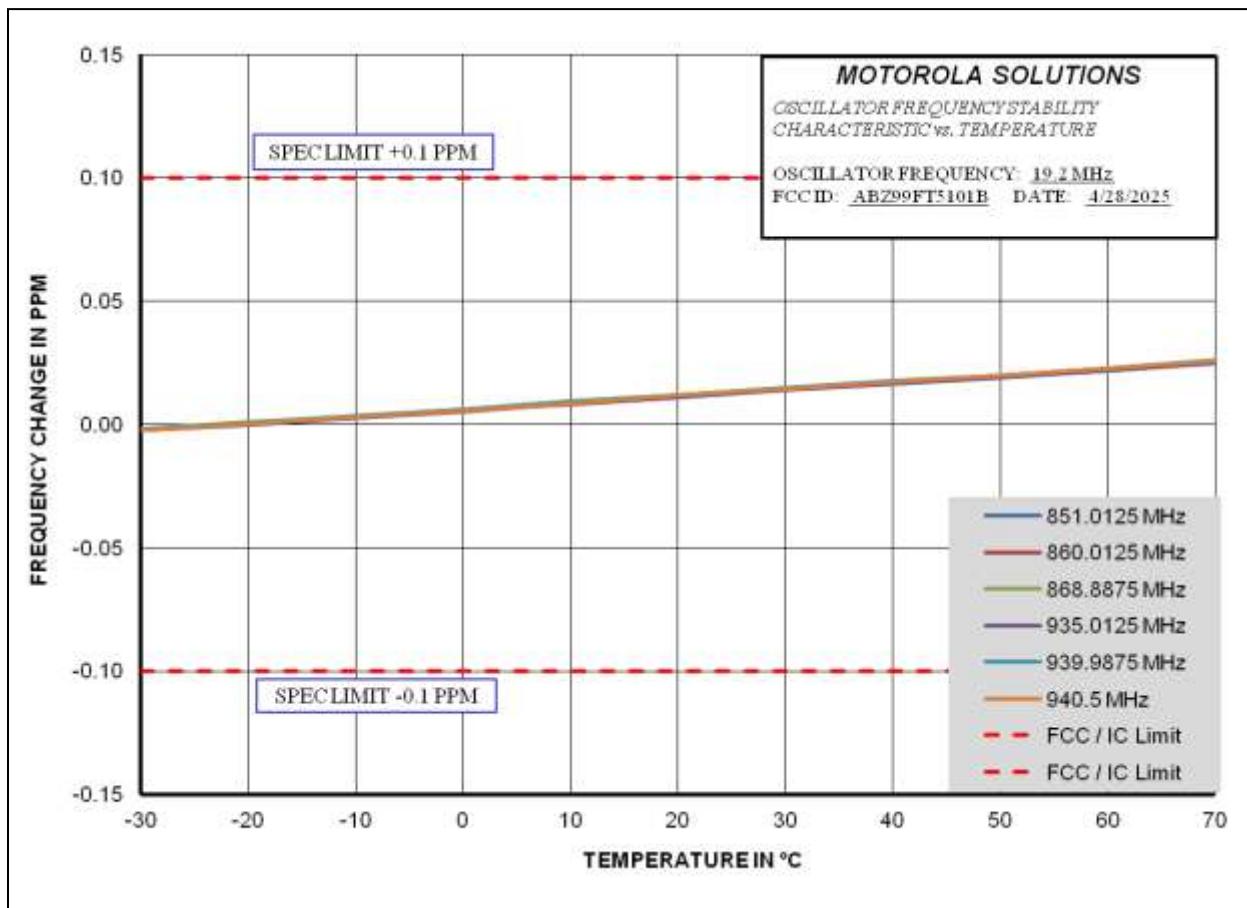
Fixed and Base stations operating at 935-940 MHz must have a frequency stability of better than +/- 0.1 PPM.

Only the more stringent specification limit is shown on the frequency stability exhibits.
Performance was measured at carrier frequencies across the operating band.

<u>EXHIBIT</u>	<u>DESCRIPTION</u>
E1-8.1	Frequency Stability Vs Temperature
E1-8.2	Frequency Stability Vs Voltage

**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

E1-8.1 Frequency Stability Vs Temperature



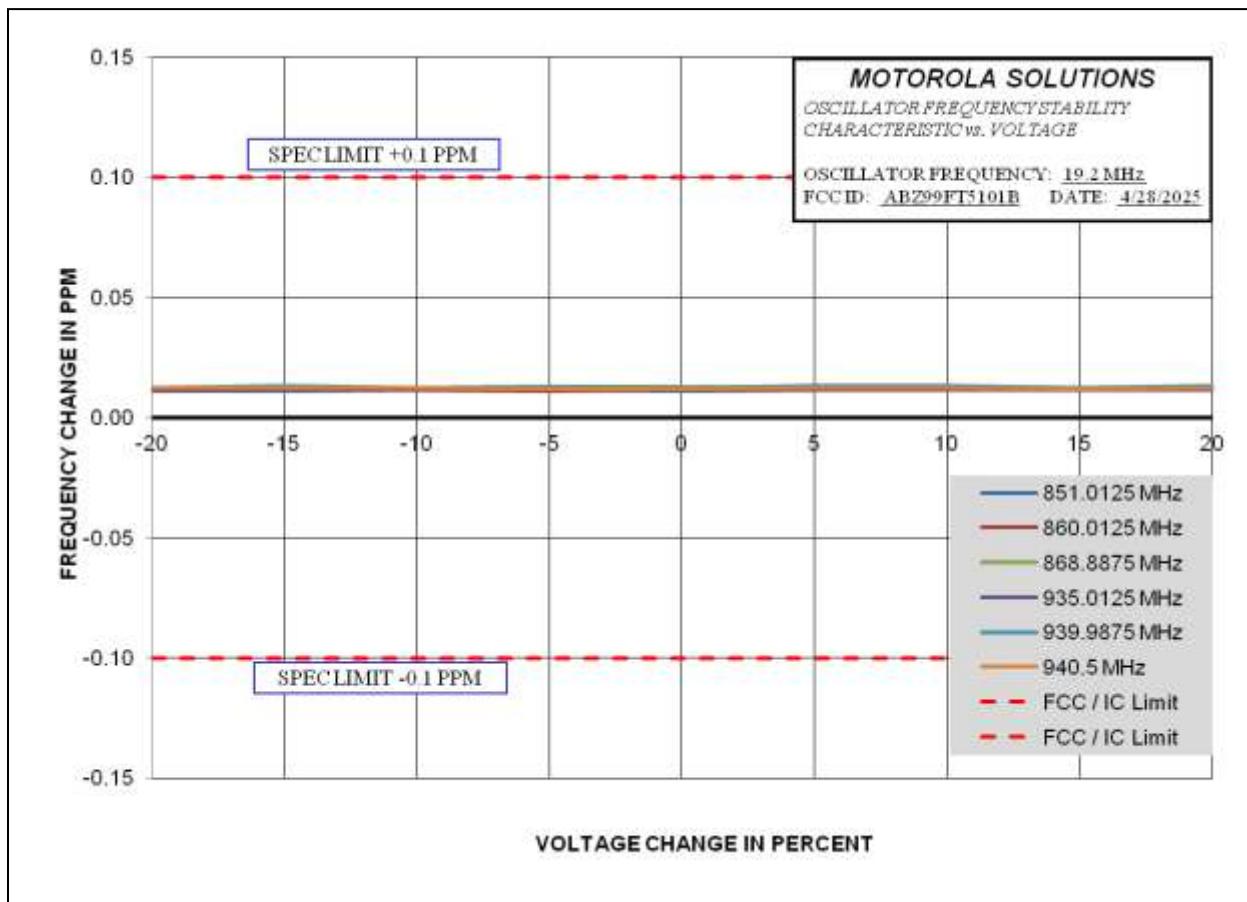
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

E1-8.2 Frequency Stability Vs Voltage



APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

E1-9 Audio Frequency Response

Specification Requirement per TIA 603:

Audio Frequency Response, 25 kHz Channels: The audio frequency response from 300 Hz to 3000 Hz shall not vary more than +1 dB or -3 dB from a true 6 dB per octave pre-emphasis characteristic as referenced to the 1000 Hz level, with an additional 6 dB per octave attenuation allowed from 500 Hz to 300 Hz, and an additional 6 dB per octave attenuation is allowed from 2500 Hz to 3000 Hz in equipment operating in the 25 MHz to 869 MHz range.

Audio Frequency Response, 12.5 kHz Channels: The audio frequency response from 300 Hz to 3000 Hz shall not vary more than +1 dB or -3 dB from a true 6 dB per octave pre-emphasis characteristic as referenced to the 1000 Hz level, with an additional 6 dB per octave attenuation allowed from 500 Hz to 300 Hz. An additional 6 dB per octave rolloff is allowed from 2300 Hz to 2700 Hz, and an additional 12 dB per octave is allowed from 2700 Hz to 3000 Hz in equipment operating in the 896 MHz to 940 MHz range or for 12.5 kHz channel operation.

Modulation: Audio Test Tone

Carrier Frequency: Carrier frequencies of 851.0125, 860.0125, 868.8875, 935.0125, 939.9875, 940.5 MHz were measured for conducted carrier harmonics and conducted spurious emission measurements.

851.0125, 860.0125 and 868.8875MHz represent the low end, center and high end of the 851-869MHz band.

935.0125 and 939.9875MHz represent the low end and high end of the 935-940MHz band.

940.5MHz represents the center of the 940-941MHz band.

Specification: The specification limit is shown on the response plots

<u>EXHIBIT</u>	<u>DESCRIPTION</u>
E1-9.1	Audio Frequency Response – Modulation Characteristics, 25 kHz Channels – 851.0125 MHz
E1-9.2	Audio Frequency Response – Modulation Characteristics, 25 kHz Channels – 860.0125 MHz
E1-9.3	Audio Frequency Response – Modulation Characteristics, 25 kHz Channels – 868.8875 MHz

APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

- E1-9.4 Audio Frequency Response – Modulation Characteristics, 25 kHz
Channels – 935.0125 MHz
- E1-9.5 Audio Frequency Response – Modulation Characteristics, 25 kHz
Channels – 939.9875 MHz
- E1-9.6 Audio Frequency Response – Modulation Characteristics, 25 kHz
Channels – 940.5 MHz

- E1-9.7 Audio Frequency Response – Modulation Characteristics, 12.5 kHz
Channels – 851.0125 MHz
- E1-9.8 Audio Frequency Response – Modulation Characteristics, 12.5 kHz
Channels – 860.0125 MHz
- E1-9.9 Audio Frequency Response – Modulation Characteristics, 12.5 kHz
Channels – 868.8875 MHz
- E1-9.10 Audio Frequency Response – Modulation Characteristics, 12.5 kHz
Channels – 935.0125 MHz
- E1-9.11 Audio Frequency Response – Modulation Characteristics, 12.5 kHz
Channels – 939.9875 MHz
- E1-9.12 Audio Frequency Response – Modulation Characteristics, 12.5 kHz
Channels – 940.5 MHz

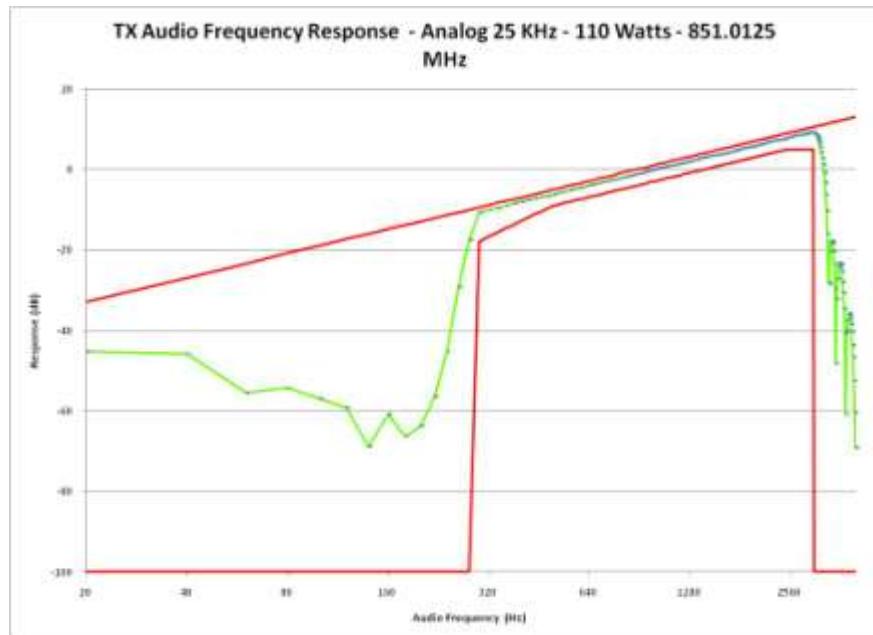
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

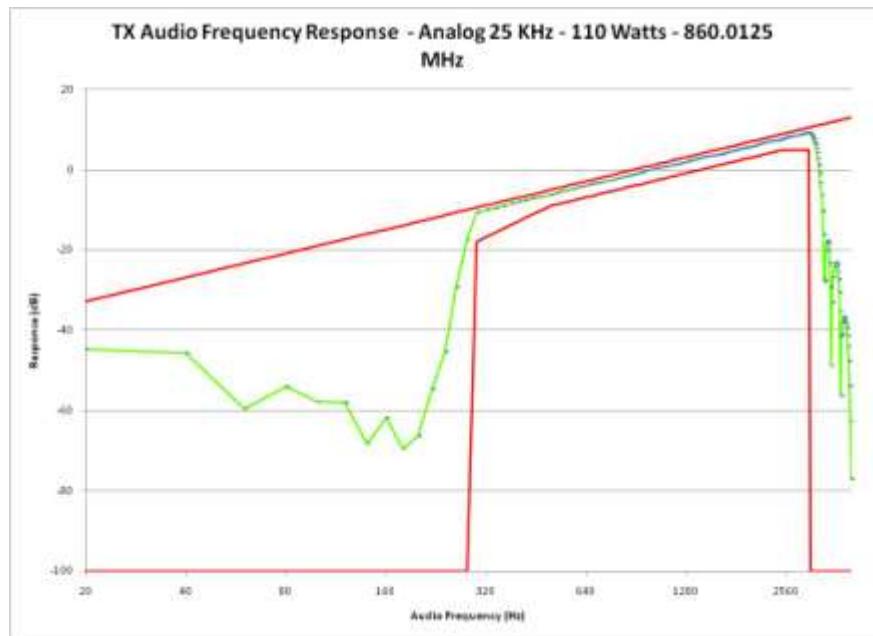
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-9.1 Audio Frequency Response – Modulation Characteristics, 25 kHz Channels – 851.0125 MHz



E1-9.2 Audio Frequency Response – Modulation Characteristics, 25 kHz Channels – 860.0125 MHz



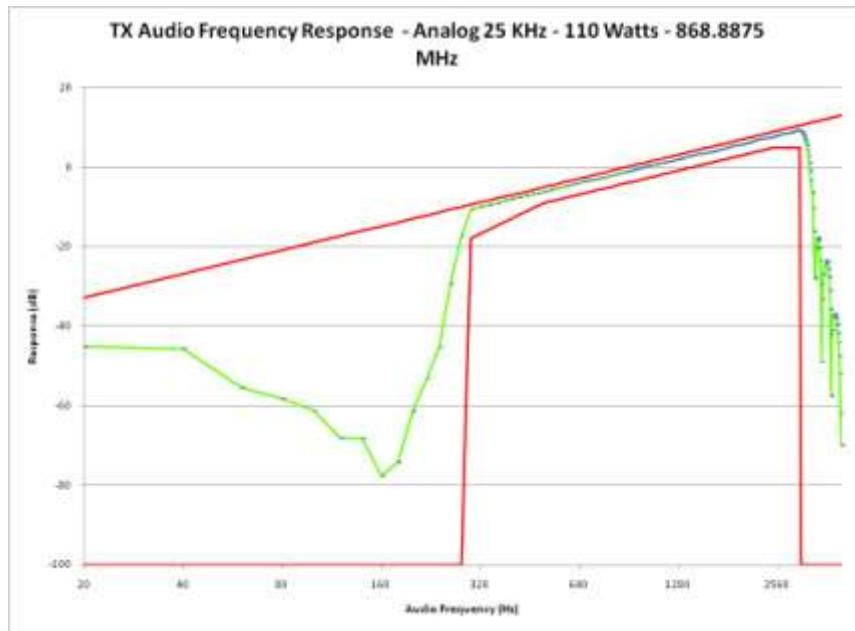
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

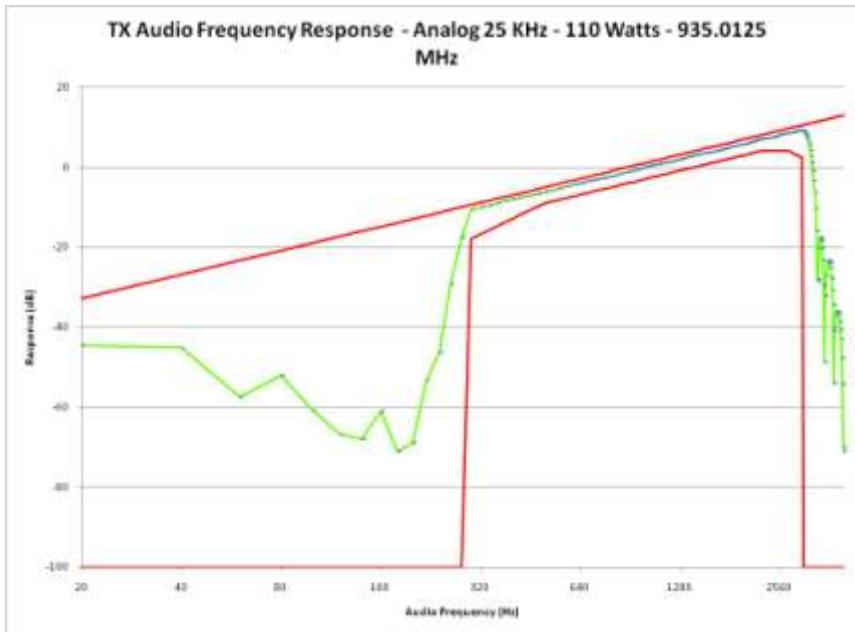
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-9.3 Audio Frequency Response – Modulation Characteristics, 25 kHz Channels – 868.8875 MHz



E1-9.4 Audio Frequency Response – Modulation Characteristics, 25 kHz Channels – 935.0125 MHz



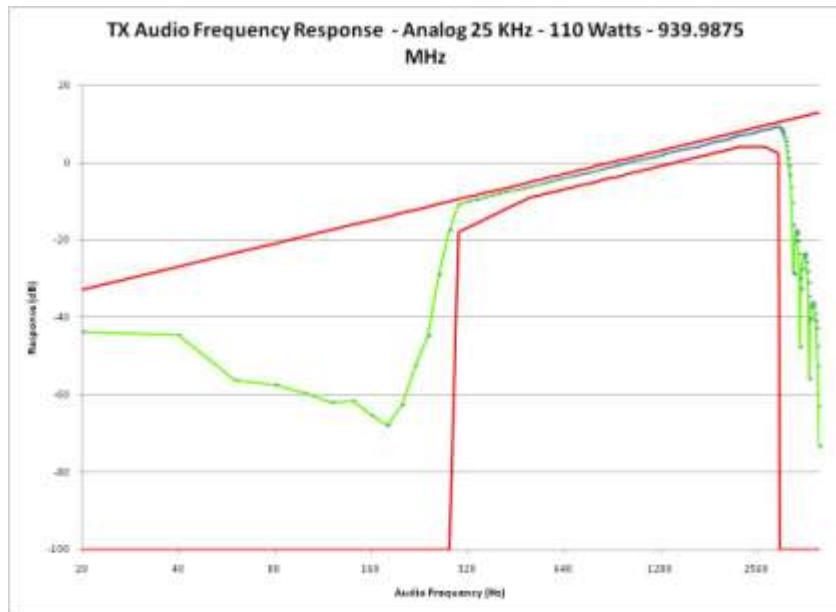
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

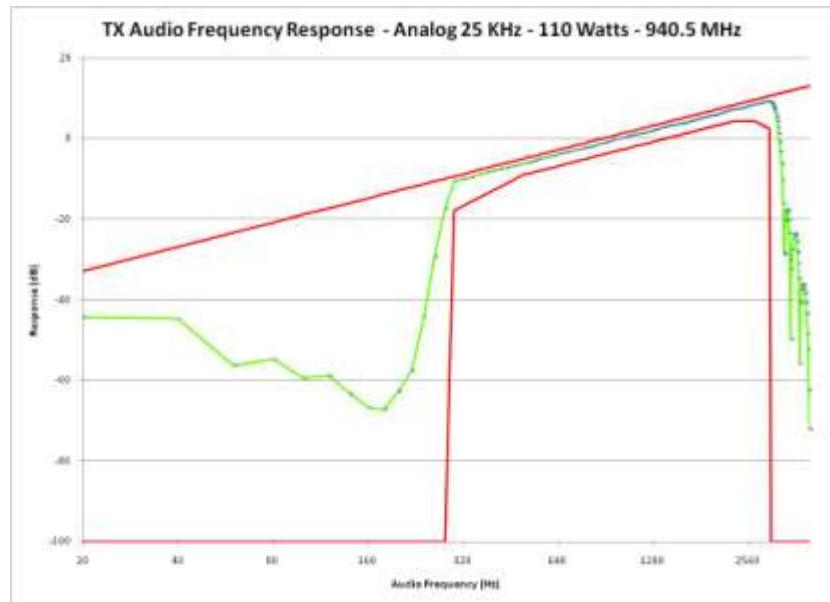
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-9.5 Audio Frequency Response – Modulation Characteristics, 25 kHz Channels – 939.9875 MHz



E1-9.6 Audio Frequency Response – Modulation Characteristics, 25 kHz Channels – 940.5 MHz



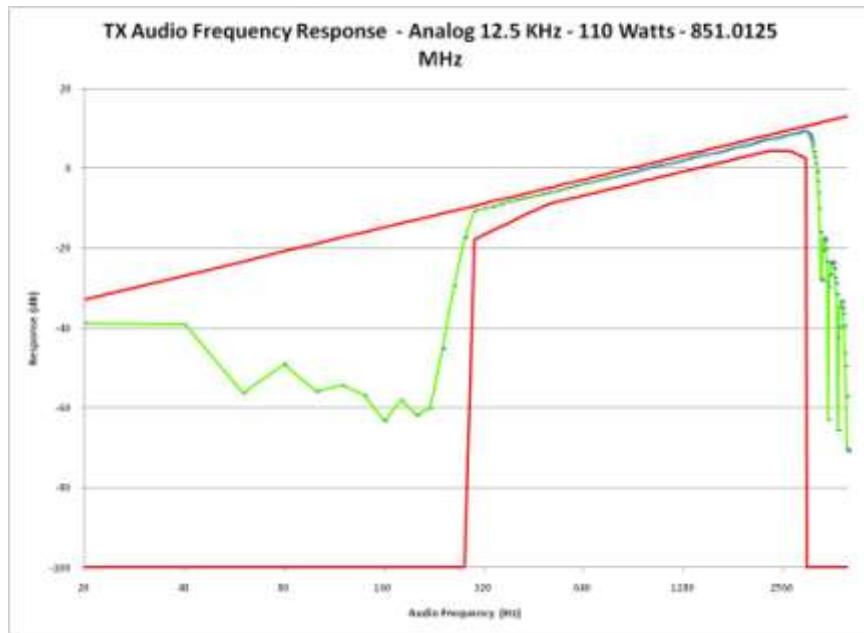
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

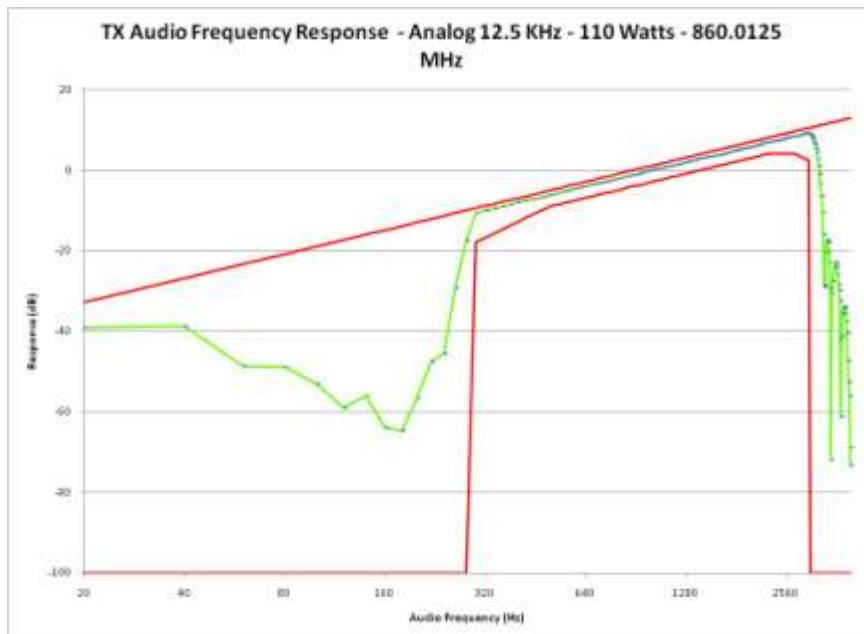
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-9.7 Audio Frequency Response – Modulation Characteristics, 12.5 kHz Channels – 851.0125 MHz



E1-9.8 Audio Frequency Response – Modulation Characteristics, 12.5 kHz Channels – 860.0125 MHz



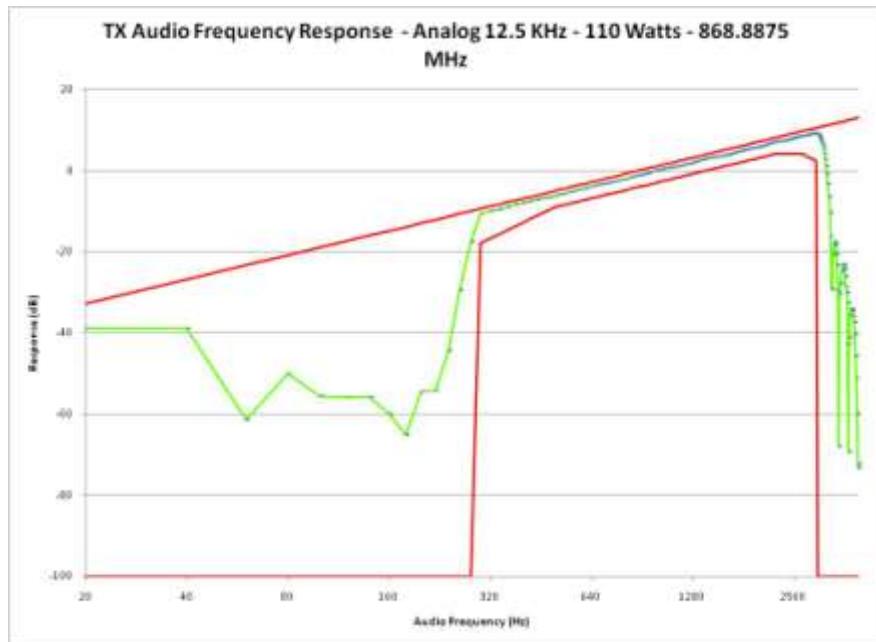
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

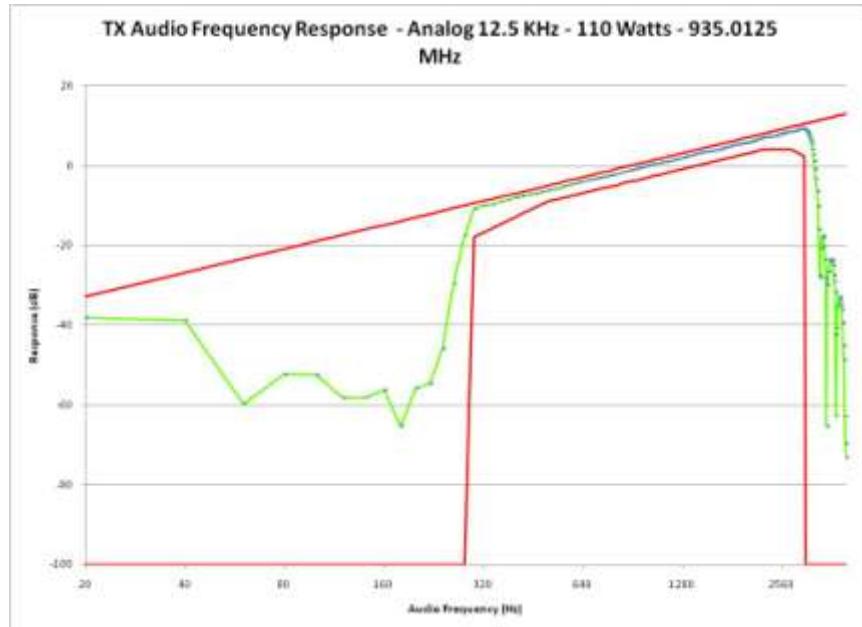
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-9.9 Audio Frequency Response – Modulation Characteristics, 12.5 kHz Channels – 868.8875 MHz



E1-9.10 Audio Frequency Response – Modulation Characteristics, 12.5 kHz Channels – 935.0125 MHz



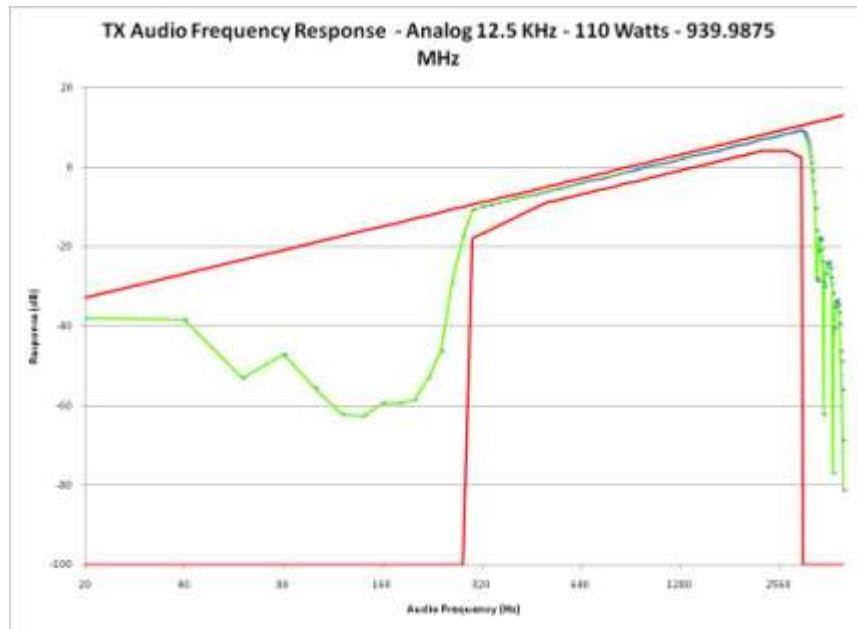
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

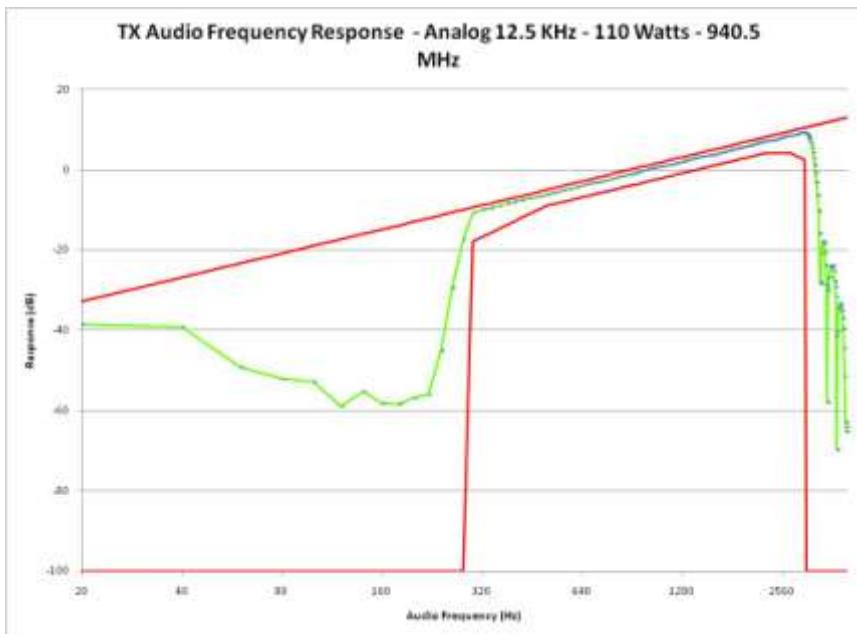
109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-9.11 Audio Frequency Response – Modulation Characteristics, 12.5 kHz Channels – 939.9875 MHz



E1-9.12 Audio Frequency Response – Modulation Characteristics, 12.5 kHz Channels – 940.5 MHz



APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

E1-10 Modulation Limiting

Specification Requirement per TIA 603:

Modulation Limiting, 25 kHz Channels: The maximum instantaneous peak and steady state deviations shall not exceed the rated system deviation of +/- 5 kHz at any audio frequency or change in level as specified in the method of measurement.

The minimum value of modulation limiting shall be at least 60% of the rated system deviation, or 3 kHz.

Modulation Limiting, 12.5 kHz Channels: The maximum instantaneous peak and steady state deviations shall not exceed the rated system deviation of +/- 2.5 kHz at any audio frequency or change in level as specified in the method of measurement.

The minimum value of modulation limiting shall be at least 60% of the rated system deviation, or 1.5 kHz.

Modulation: Audio Test Tone, Varying Frequency between 300 Hz and 3000 Hz

Carrier Frequency: Carrier frequencies of 851.0125, 860.0125, 868.8875, 935.0125, 939.9875, 940.5 MHz were measured for conducted carrier harmonics and conducted spurious emission measurements.

851.0125, 860.0125 and 868.8875MHz represent the low end, center and high end of the 851-869MHz band.

935.0125 and 939.9875MHz represent the low end and high end of the 935-940MHz band.

940.5MHz represents the center of the 940-941MHz band.

Modulation Limiting Response Plots:

<u>EXHIBIT</u>	<u>DESCRIPTION</u>
E1-10.1	Audio Modulation Limiting – Modulation Characteristics, 25 kHz Channels – 851.0125 MHz
E1-10.2	Audio Modulation Limiting – Modulation Characteristics, 25 kHz Channels – 860.0125 MHz
E1-10.3	Audio Modulation Limiting – Modulation Characteristics, 25 kHz Channels – 868.8875 MHz

APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

- E1-10.4 Audio Modulation Limiting – Modulation Characteristics, 25 kHz Channels – 935.0125 MHz
- E1-10.5 Audio Modulation Limiting – Modulation Characteristics, 25 kHz Channels – 939.9875 MHz
- E1-10.6 Audio Modulation Limiting – Modulation Characteristics, 25 kHz Channels – 940.5 MHz
- E1-10.7 Audio Modulation Limiting – Modulation Characteristics, 12.5 kHz Channels – 851.0125 MHz
- E1-10.8 Audio Modulation Limiting – Modulation Characteristics, 12.5 kHz Channels – 860.0125 MHz
- E1-10.9 Audio Modulation Limiting – Modulation Characteristics, 12.5 kHz Channels – 868.8875 MHz
- E1-10.10 Audio Modulation Limiting – Modulation Characteristics, 12.5 kHz Channels – 935.0125 MHz
- E1-10.11 Audio Modulation Limiting – Modulation Characteristics, 12.5 kHz Channels – 939.9875 MHz
- E1-10.12 Audio Modulation Limiting – Modulation Characteristics, 12.5 kHz Channels – 940.5 MHz

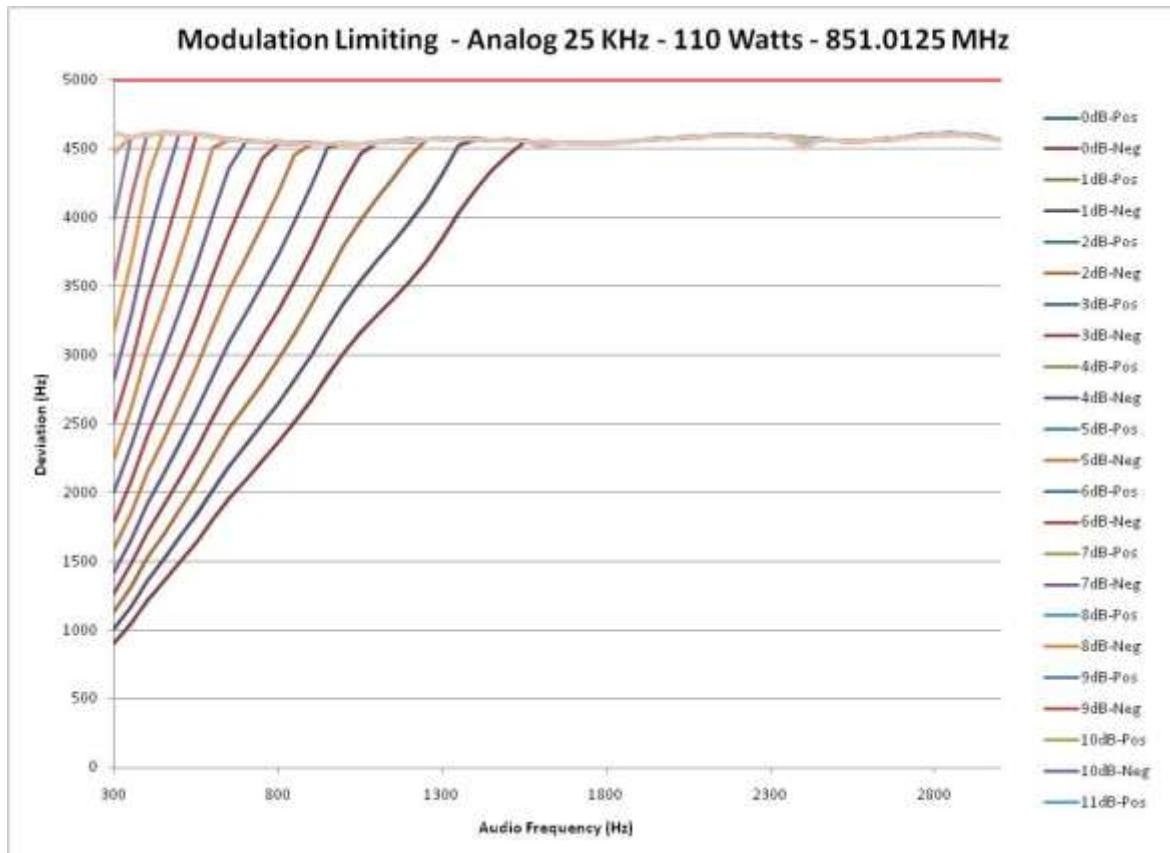
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-10.1 Audio Modulation Limiting – Modulation Characteristics, 25 kHz Channels – 851.0125 MHz



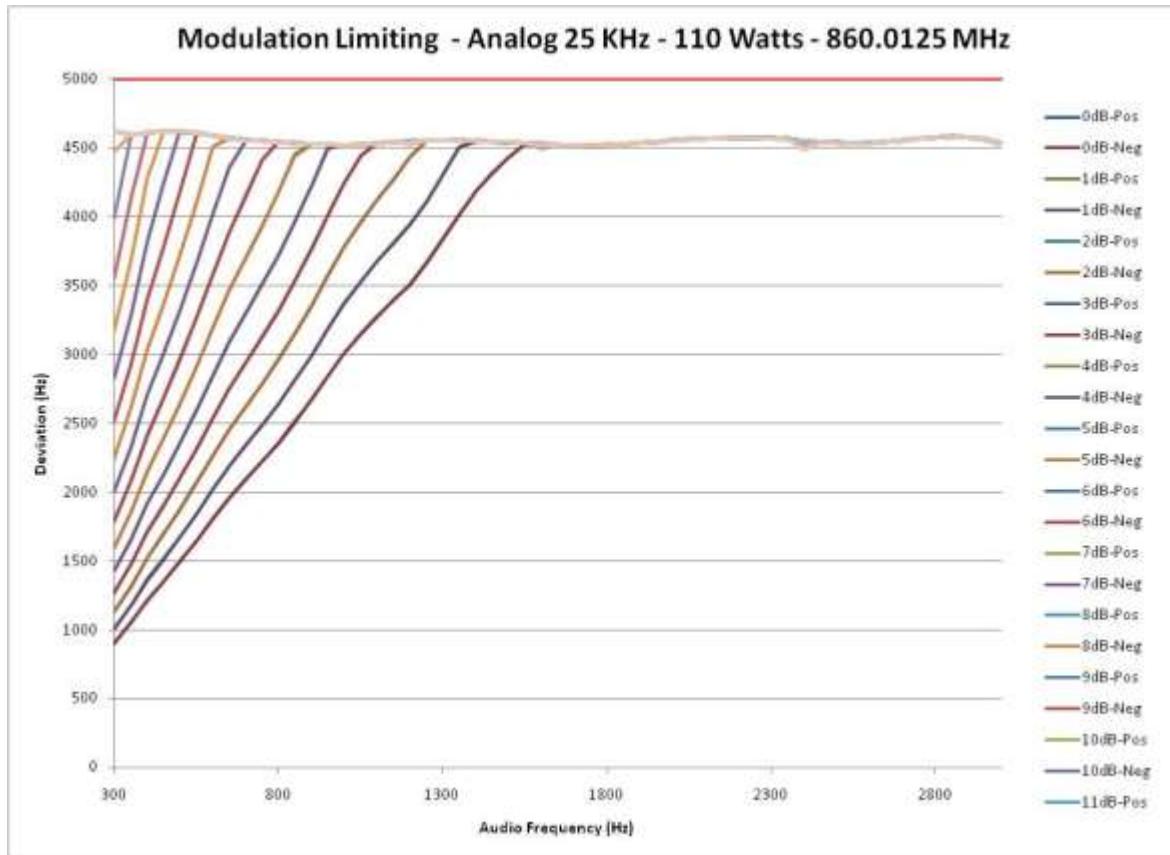
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-10.2 Audio Modulation Limiting – Modulation Characteristics, 25 kHz Channels – 860.0125 MHz



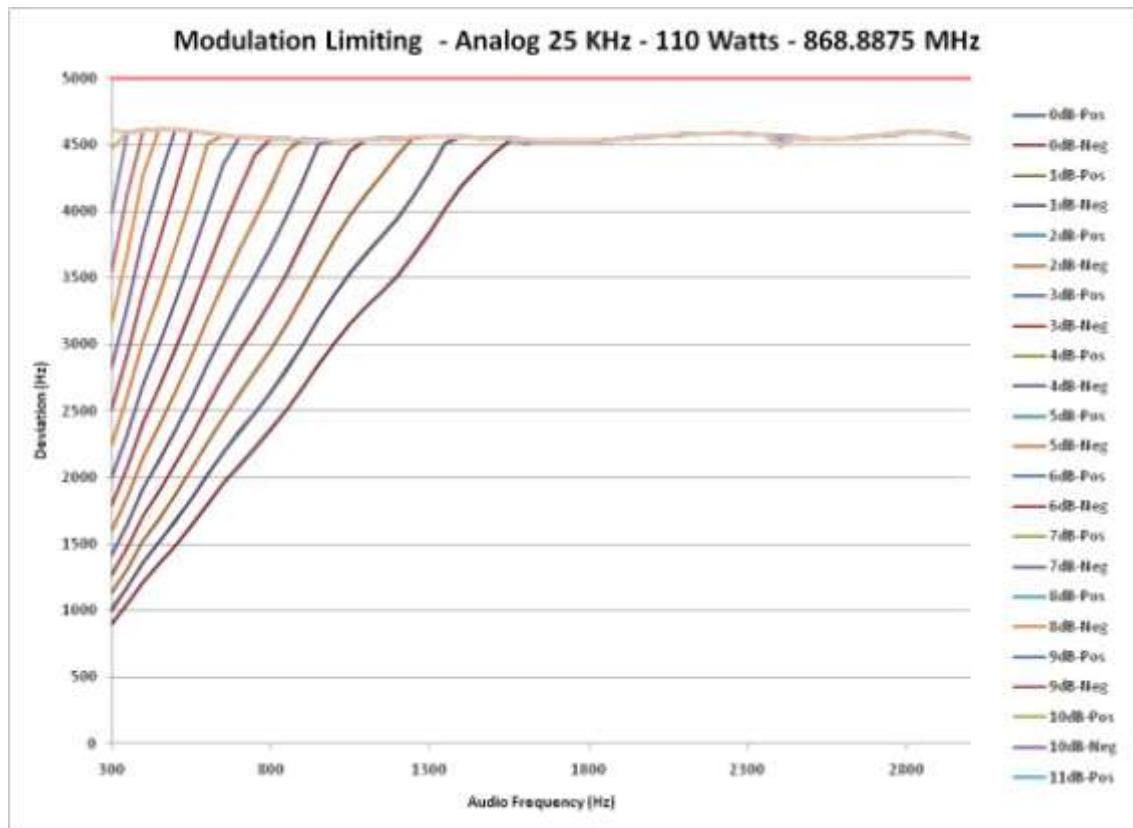
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-10.3 Audio Modulation Limiting – Modulation Characteristics, 25 kHz Channels – 868.8875 MHz



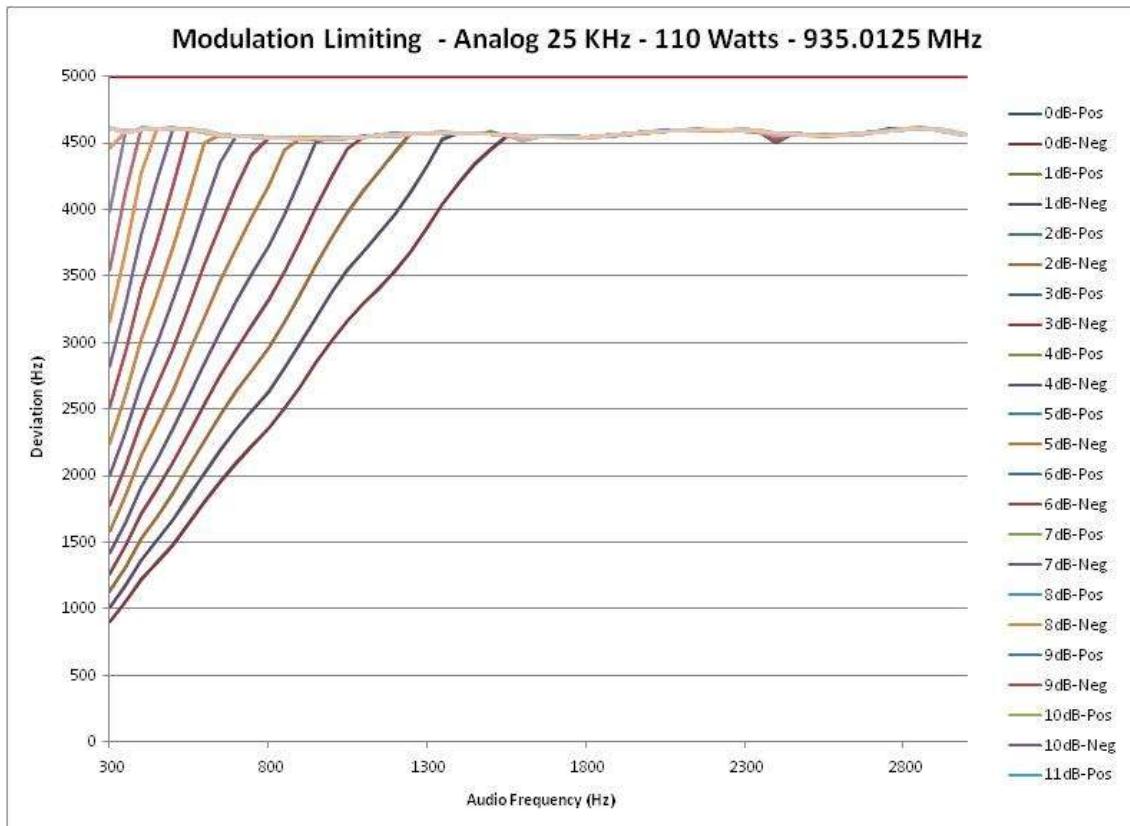
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-10.4 Audio Modulation Limiting – Modulation Characteristics, 25 kHz Channels – 935.0125 MHz



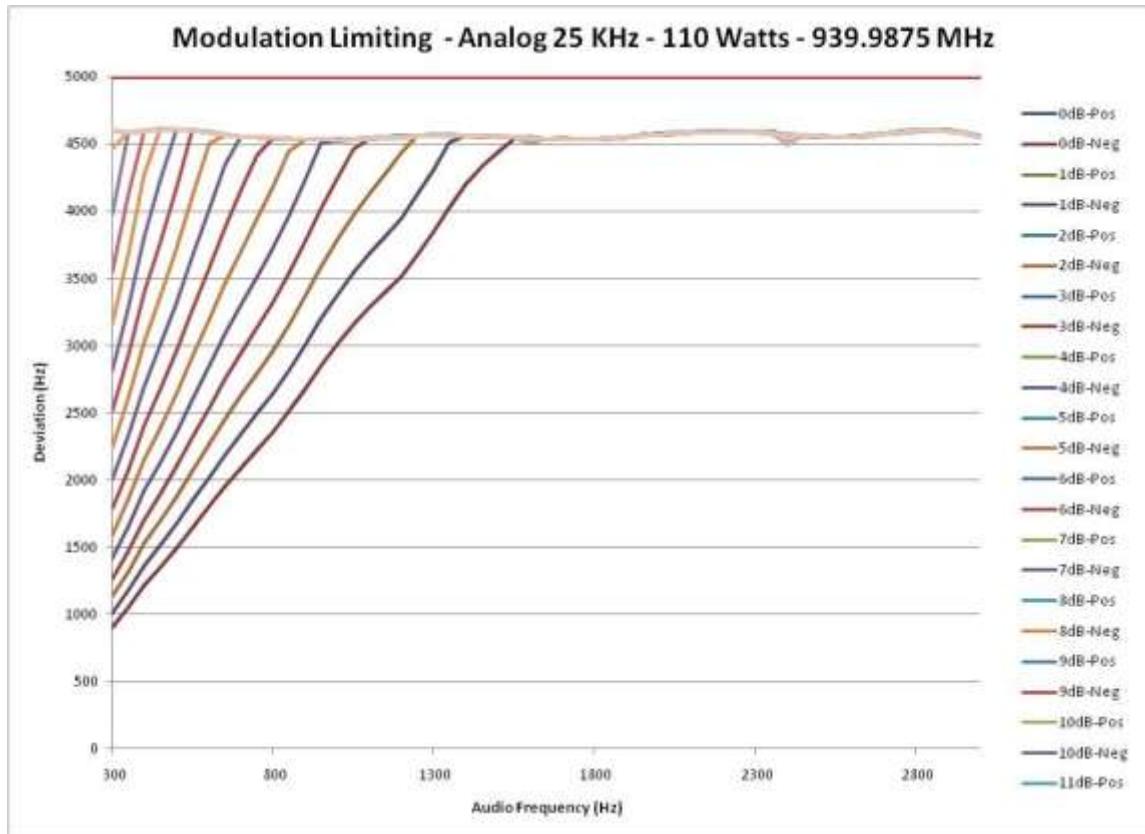
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-10.5 Audio Modulation Limiting – Modulation Characteristics, 25 kHz Channels – 939.9875 MHz



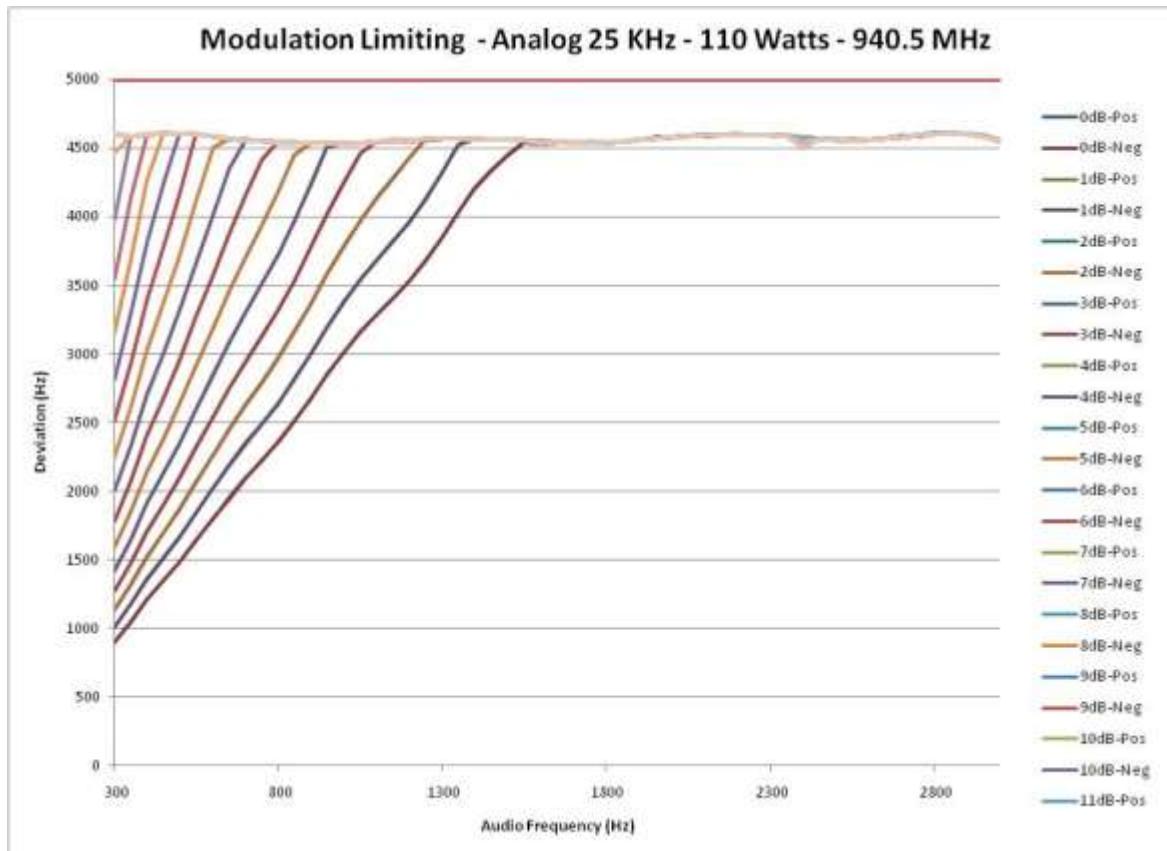
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

E1-10.6 Audio Modulation Limiting – Modulation Characteristics, 25 kHz Channels – 940.5 MHz



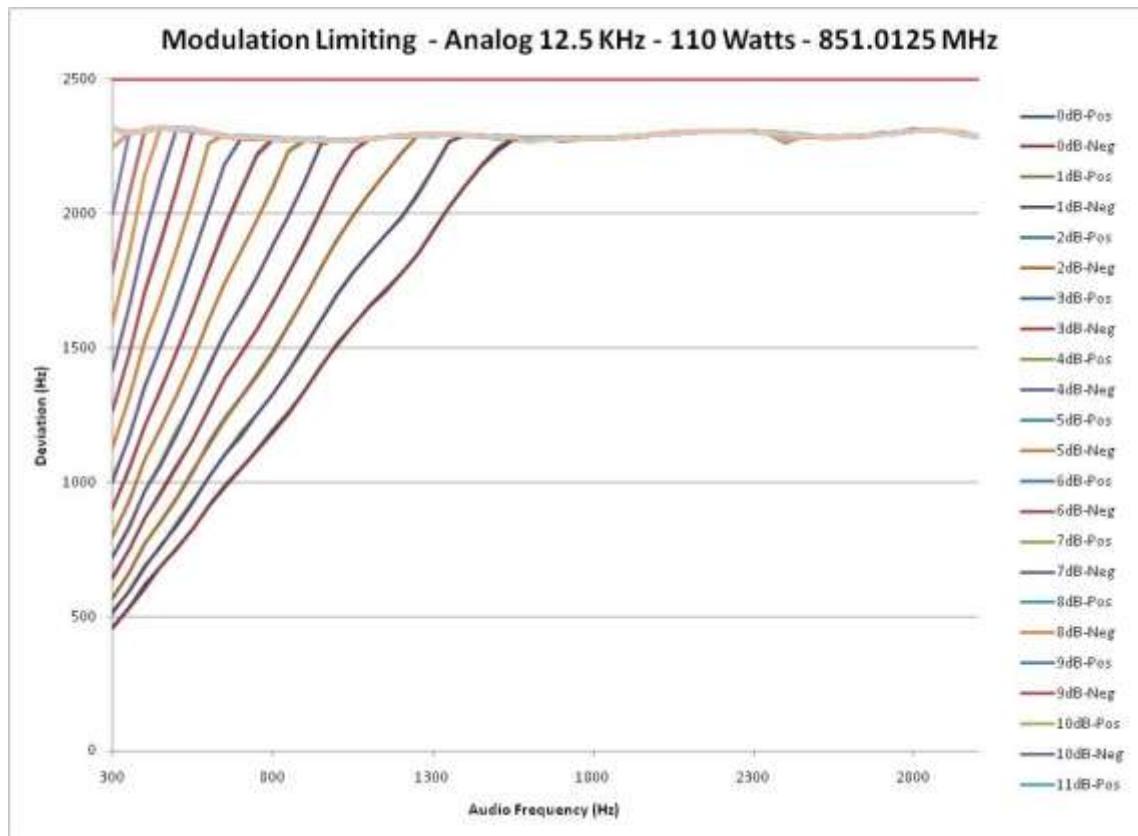
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-10.7 Audio Modulation Limiting – Modulation Characteristics, 12.5 kHz Channels – 851.0125 MHz



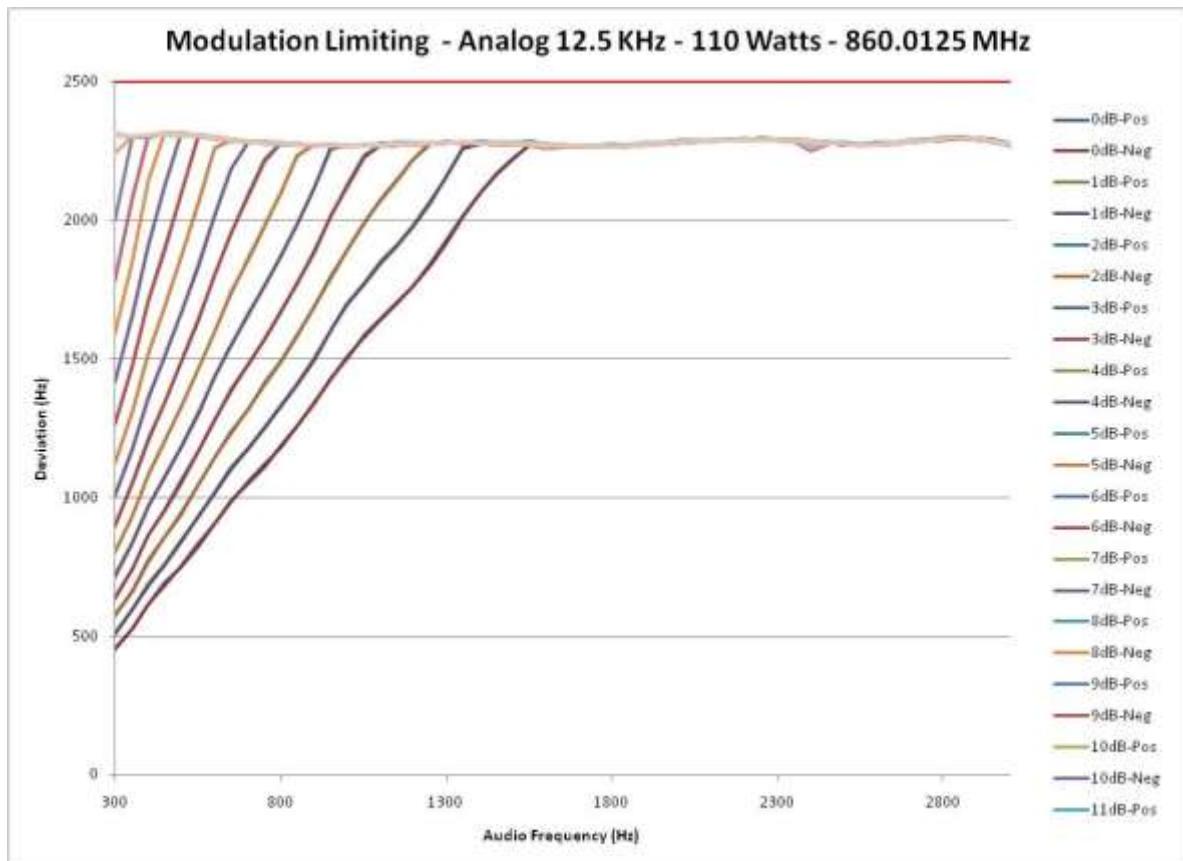
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-10.8 Audio Modulation Limiting – Modulation Characteristics, 12.5 kHz Channels – 860.0125 MHz



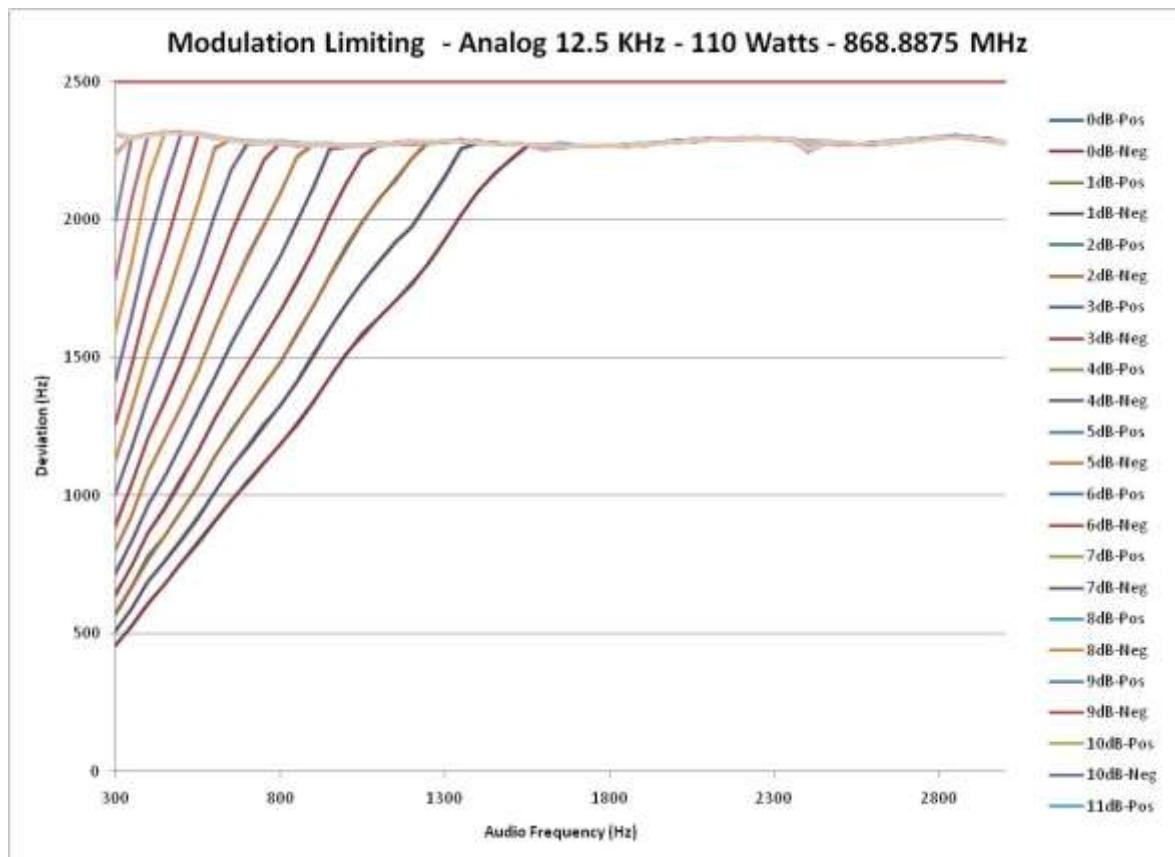
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-10.9 Audio Modulation Limiting – Modulation Characteristics, 12.5 kHz Channels – 868.9875 MHz



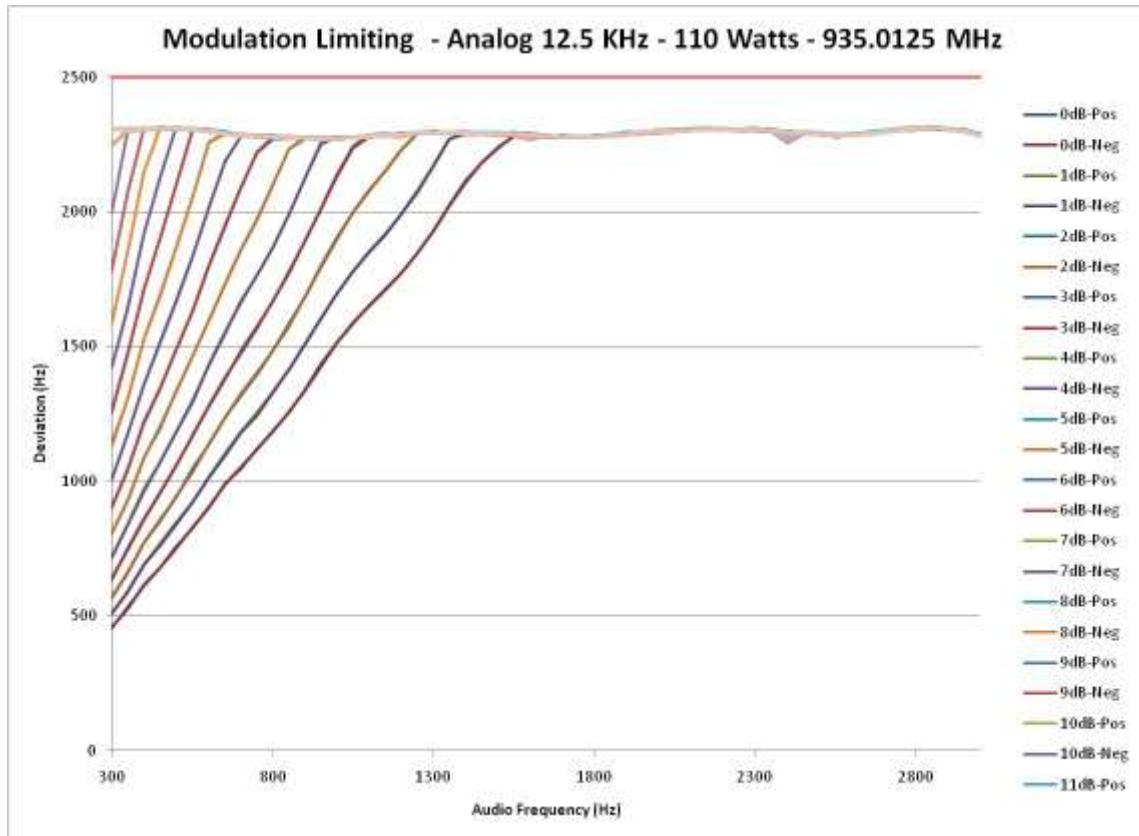
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-10.10 Audio Modulation Limiting – Modulation Characteristics, 12.5 kHz Channels – 935.0125 MHz



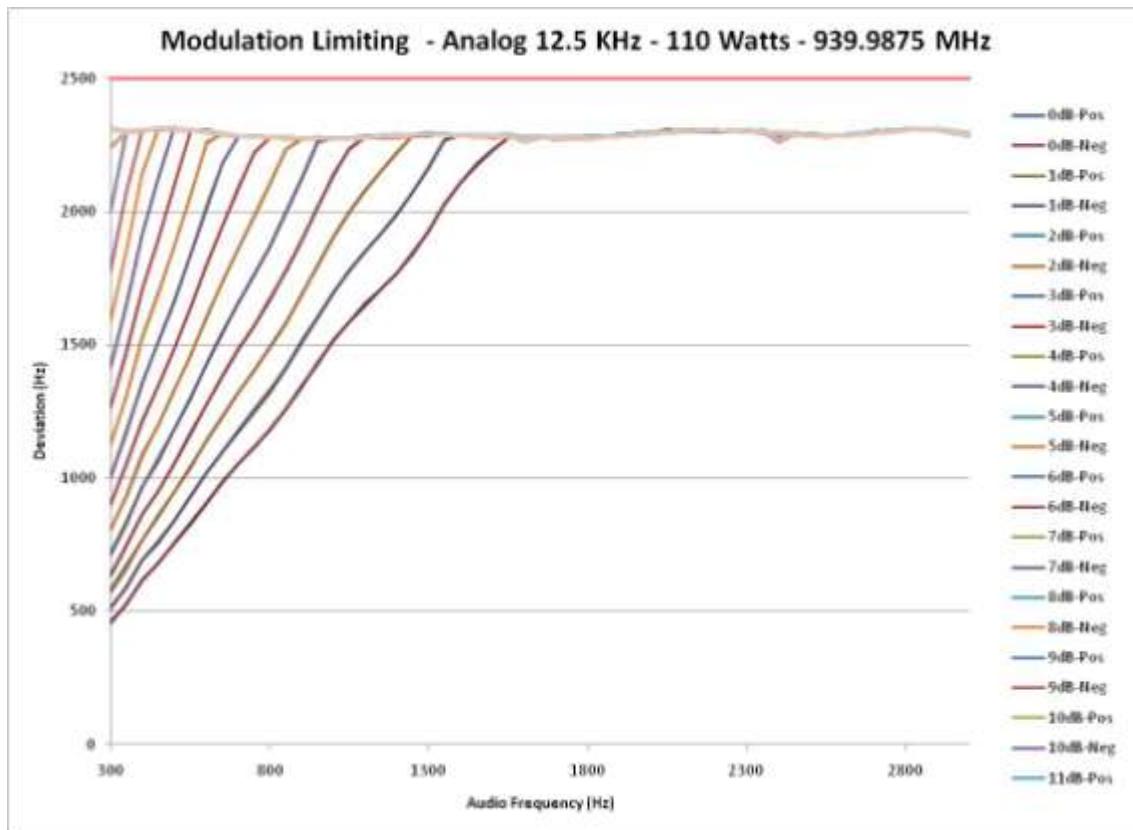
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-10.11 Audio Modulation Limiting – Modulation Characteristics, 12.5 kHz Channels – 939.9875 MHz



APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per FCC 47 CFR 90 and IC RSS-119.

E1-10.12 Audio Modulation Limiting – Modulation Characteristics, 12.5 kHz Channels – 940.5 MHz



APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

E1-11 Test Setup Details

Test Location:

(for all tests except radiated emissions)

Motorola Solutions, Inc., Schaumburg Lab

2000 Progress Parkway, Schaumburg, IL 60196

FCC Registration Number 786245

IC CAB Identifier US0220

Test Engineer Sanford Yue

(for radiated emissions)

N/A

APPLICANT: MOTOROLA SOLUTIONS

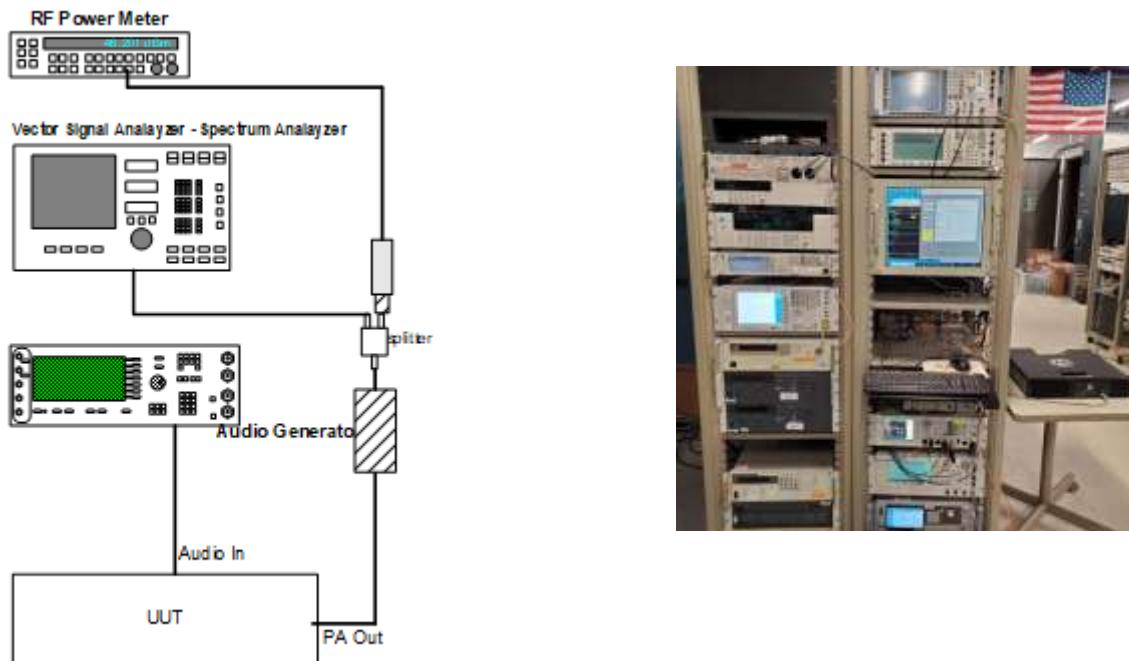
EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

Test Setup: Motorola Solutions

RF Output Power, Occupied Bandwidth, Frequency Stability, Frequency Transient Behavior,
Modulation Characteristics



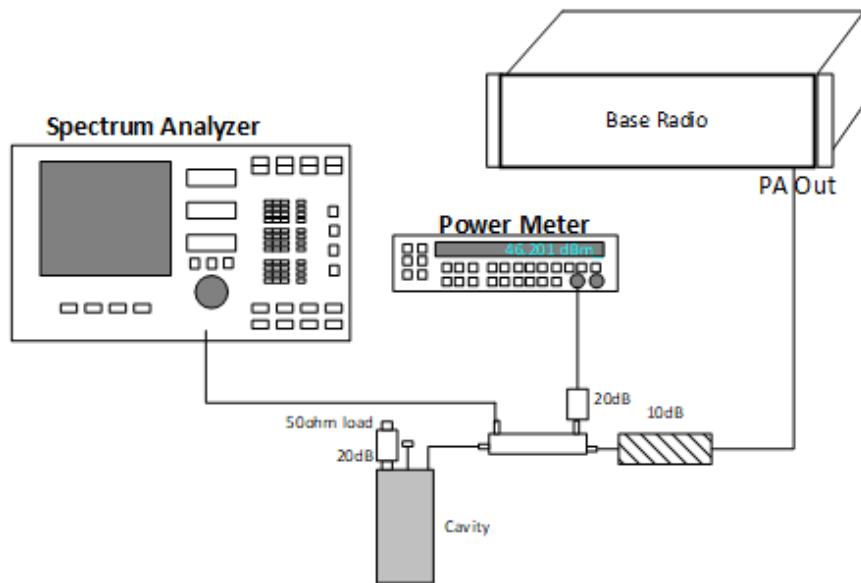
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

Conducted Spurious Emissions Close-in



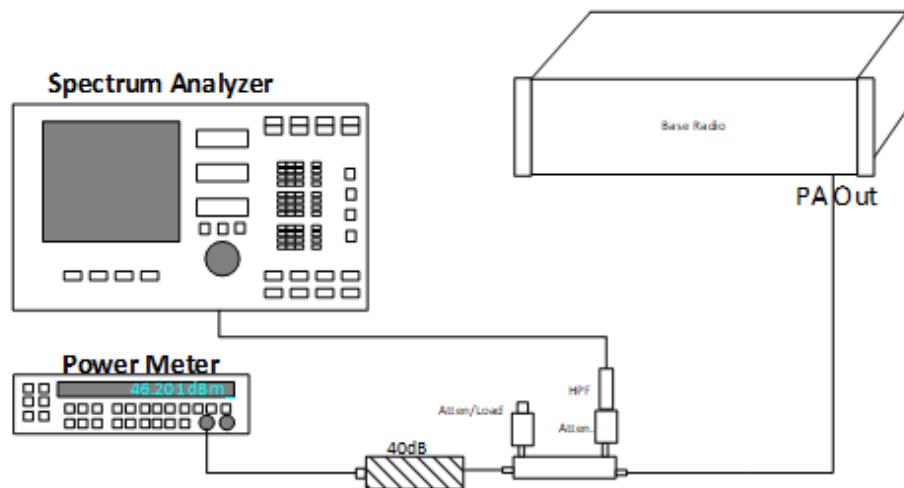
APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

Conducted Harmonic Emissions



APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

Test Equipment List – Motorola Solutions

Manufacturer	Model	Serial Number	Description	Last Cal	Next Cal
Keysight/Agilent/HP	N9030A	MY53310751	PXA Signal Analyzer, 3 Hz to 50 GHz	08-21-2024	08-21-2025
Keysight/Agilent/HP	U8903A	MY50500002	Audio Analyzer, 10 Hz to 100 kHz	10-14-2024	10-14-2025
Rohde & Schwarz	NRP-Z11	101590	Power Sensor	08-21-2024	8-21-2026
Rohde & Schwarz	SMU200A	101350	Signal Generator / Power Meter	08-20-2024	08-20-2027
Keysight/Agilent/HP	34401A	3146A59752	Digital Multimeter	08-29-2022	08-29-2026
Keysight/Agilent/HP	8482a	2652A15873	Power Sensor	08-22-2024	08-22-2025
Keysight/Agilent/HP	E5071C	MY46316134	ENA Series Network analyzer	08-20-2024	08-20-2025
Thermotron	WS-120-CHM-15-15	52516	Temperature Chamber	11-28-2023	11-28-2025
Keysight/Agilent/HP	E4440A	MY46185813	PSA Spectrum Analyzer 3 Hz - 26.5 GHz	08-22-2024	08-22-2026
Keysight/Agilent/HP	8753es	US39175306	S-parameter Network Analyzer	08-21-2024	08-21-2025

APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT5101B

109AB-99FT5101B

**Report on Test Measurements for FCC ID ABZ99FT5101B, HVIN SLR 8000-800900B per
FCC 47 CFR 90 and IC RSS-119.**

E1-12 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, Purdue University, West Lafayette, Indiana, USA

24 years of Development and Test experience in the field of two-way radio communication.

NAME: Sanford Yue



SIGNATURE: _____

DATE: 4/28/2025

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: Matt Nawrocki



SIGNATURE: _____

DATE: 4/28/2025

POSITION: Engineering Manager

REPORT END