

Report on Test Measurements for FCC ID ABZ99FT3094, HVIN SLR 5700-VHF 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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APPLICANT: MOTOROLA SOLUTIONS

EQUIPMENT TYPE: ABZ99FT3094

109AB-99FT3094

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E1-1 Tested Unit Details

Model Under Test	SLR 5700
Serial Number	478IYA1351
Firmware Version	D20.21.04.10
Codeplug Version	216102
Bootloader Version	R01.11.01
Manufacturer	Motorola Solutions 2540 Galvin Drive, Elgin, IL 60124

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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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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 (C4FM)

	<u>136MHz</u>	<u>138MHz</u>	<u>155MHz</u>	<u>174MHz</u>	
Measured RF output	60	60	60	60	Watts
DC Voltage, final RF amplifier stage/stages	13.6	13.6	13.6	13.6	Volts
DC Current, final RF amplifier stage/stages	7.9	7.9	7.7	7.9	Amps
Input power for final RF amplifying device(s)	107	107	105	107	Watts
Primary Radio Input Supply Voltage	120	120	120	120	VAC
Minimum Measured RF output	1	1	1	1	Watts
DC Voltage, final RF amplifier stage/stages	13.6	13.6	13.6	13.6	Volts
Normal DC Current	1.5	1.5	1.51.5	1.5	Amps
Input power for final RF amplifying device(s)	20	20	20	20	Watts
Primary Radio Input Supply Voltage	120	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: 60 Watts

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 (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 $7.27 * (f_d - 2.88 \text{ kHz}) \text{ dB}$*

(3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz:

At least 50 plus $10 \log_{10}(P) \text{ dB}$ 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

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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 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 $|f| \leq 1920\text{Hz}$

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

$|F(f)|$: 0 for $|f| > 2880\text{Hz}$

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	Resolution BW: 100 Hz
Vertical: 10 dB per Division	Video BW: 10 kHz	Span: 125 kHz
Sweep Time: 72 Seconds (<2 kHz/Sec)	Span: 125 kHz	Number of Points: 6401
Detector: Peak		Integration Time: 34.16 ms

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.

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- 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.

EXHIBIT	DESCRIPTION	Meas Occ BW
E1-5.1	Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 136.0125 MHz	7.38 kHz
E1-5.2	Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 138.0125 MHz	7.41 kHz
E1-5.3	Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 155.0125 MHz	7.53 kHz
E1-5.4	Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 173.9875 MHz	7.49 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: 60 Watts

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:

- 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 $43 + 10 * \log_{10}(P)$ dB.

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	Resolution BW: 300 Hz
Vertical: 0 dB per Division	Video BW: 10 kHz	Span: 30 kHz
Sweep Time: 72 Seconds (<2 kHz/Sec)	Span: 125 kHz	Number of Points: 1001

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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.

EXHIBIT	DESCRIPTION	Meas Occ BW:	No PL	PL	DPL
E1-5.5,6,7	Occupied Bandwidth, Analog, 25 kHz Channels, 136.0125 MHz				
			15.04,	11.81,	11.82 kHz
E1-5.8,9,10	Occupied Bandwidth, Analog, 25 kHz Channels, 138.0125 MHz				
			15.04,	11.82,	11.84 kHz
E1-5.11,12,13	Occupied Bandwidth, Analog, 25 kHz Channels, 155.0125 MHz				
			15.04,	11.85,	11.84 kHz
E1-5.14,15,16	Occupied Bandwidth, Analog, 25 kHz Channels, 173.9875 MHz				
			15.05,	11.95,	11.90 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: 60 Watts

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 (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.

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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	Resolution BW:150 Hz
Vertical:10 dB per Division	Video BW:10 kHz	Span: 15 kHz
Sweep Time:72 Seconds (<2 kHz/Sec)	Span:125 kHz	Number of Points: 1601
Detector:Peak		Integration Time:14.8 ms

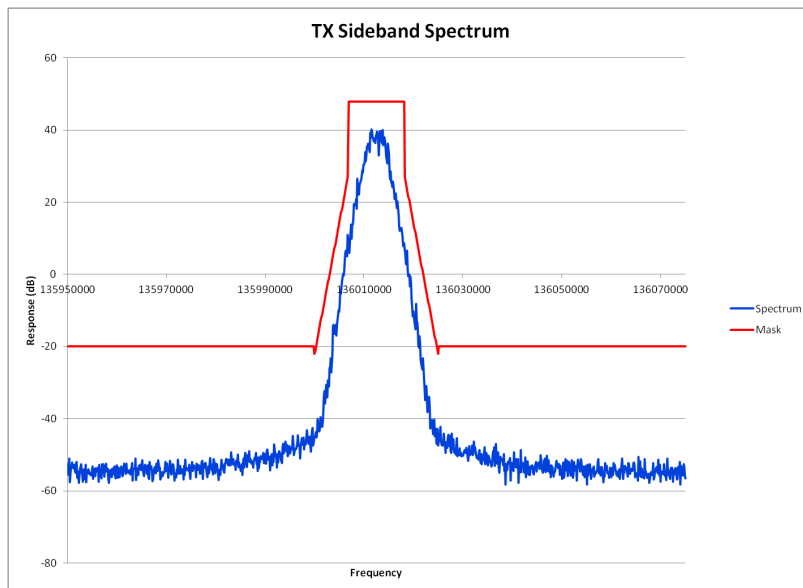
Test Procedure (Analog Voice):

- 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.

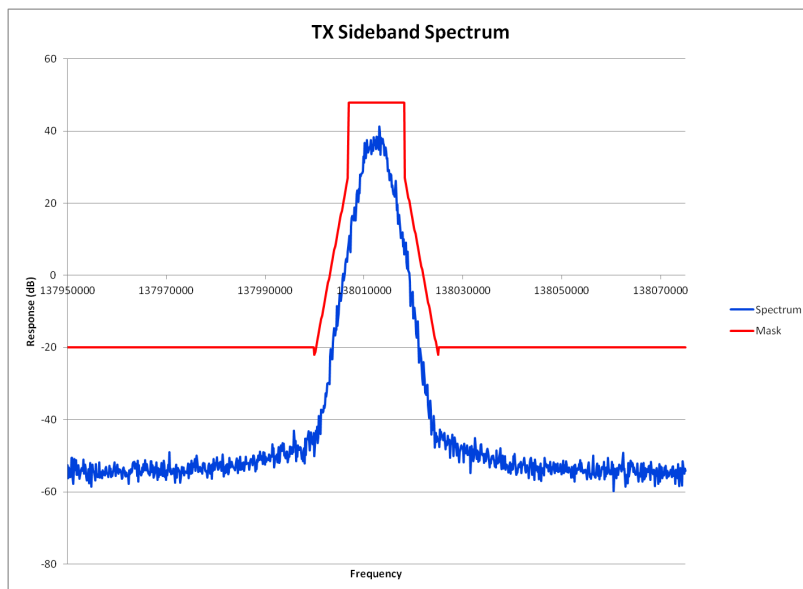
EXHIBIT	DESCRIPTION	Meas Occ BW: No PL	PL	DPL
E1-5.17,18,19	Occupied Bandwidth, Analog, 12.5 kHz Channels, 136.0125 MHz		10.0, 9.21, 9.14 kHz	
E1-5.20,21,22	Occupied Bandwidth, Analog, 12.5 kHz Channels, 138.0125 MHz		10.0, 9.21, 9.14 kHz	
E1-5.23,24,25	Occupied Bandwidth, Analog, 12.5 kHz Channels, 155.0125 MHz		10.0, 9.22, 9.14 kHz	
E1-5.26,27,28	Occupied Bandwidth, Analog, 12.5 kHz Channels, 173.9875 MHz		10.0, 9.25, 9.16 kHz	

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E1-5.1 Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 136.0125 MHz

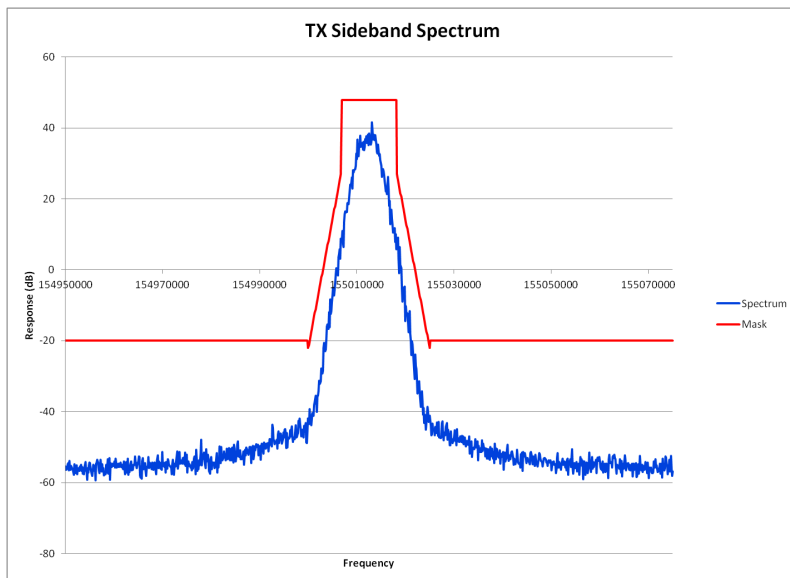


E1-5.2 Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 138.0125 MHz

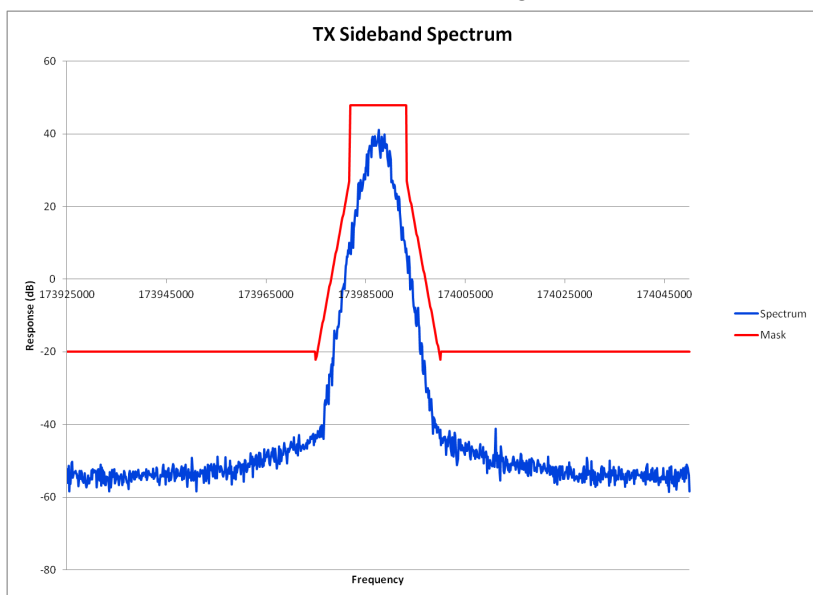


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E1-5.3 Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 155.0125 MHz

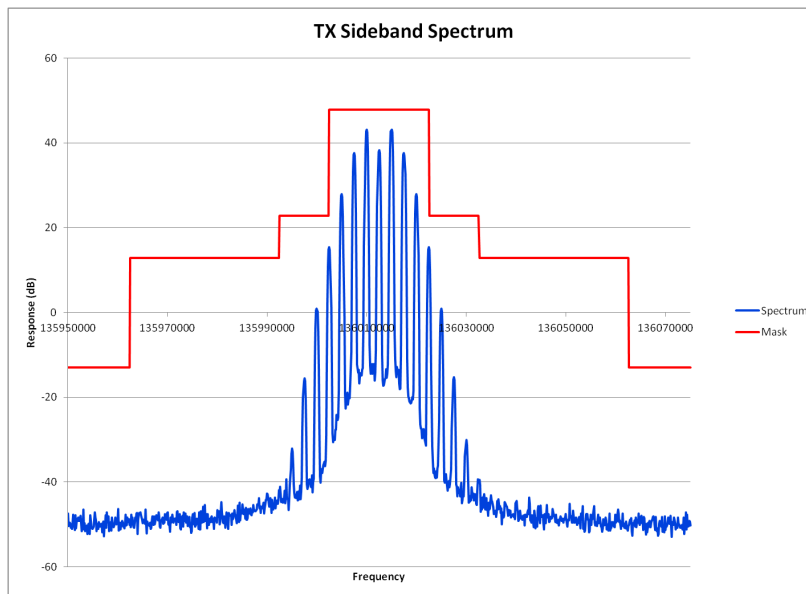


E1-5.4 Occupied Bandwidth – MOTOTRBO™ Digital Modulation, 173.9875 MHz

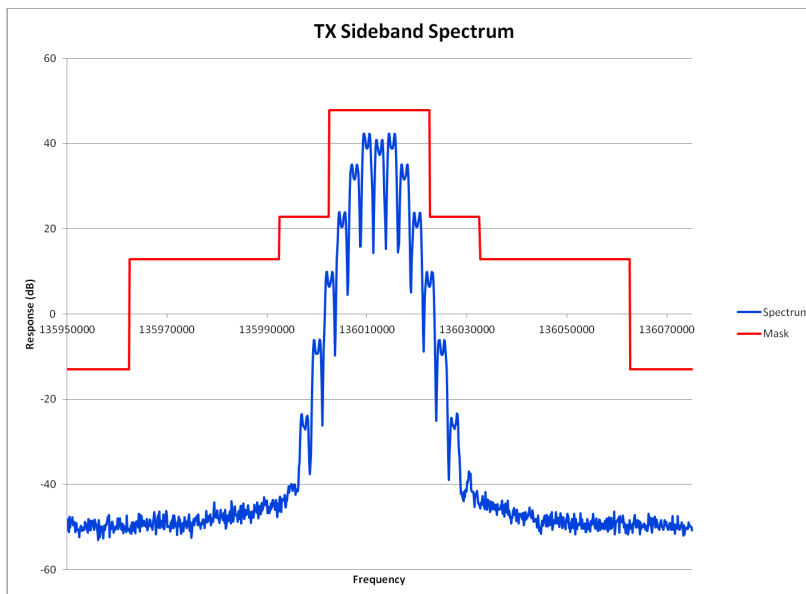


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E1-5.5 Occupied Bandwidth, Analog, 25 kHz Channels, 136.0125 MHz

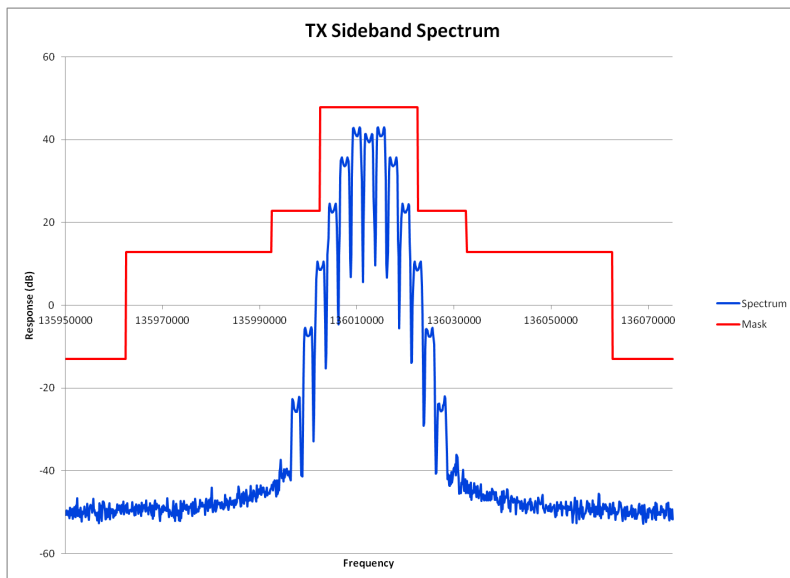


E1-5.6 Occupied Bandwidth, Analog, 25 kHz Channels, 136.0125 MHz PL

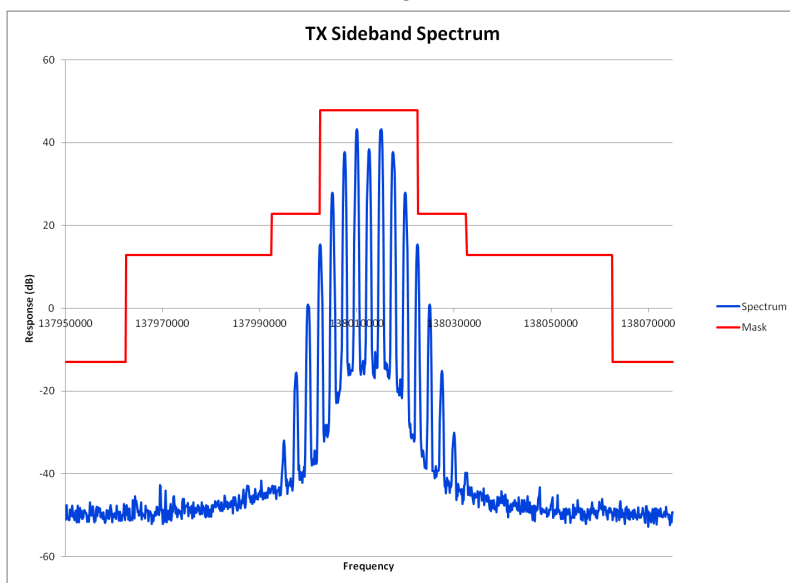


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E1-5.7 Occupied Bandwidth, Analog, 25 kHz Channels, 136.0125 MHz DPL

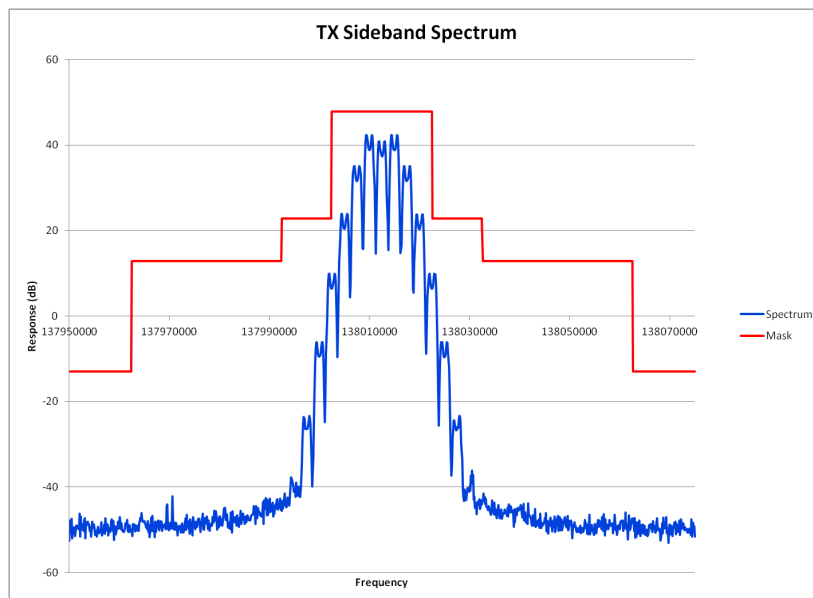


E1-5.8 Occupied Bandwidth, Analog, 25 kHz Channels, 138.0125 MHz

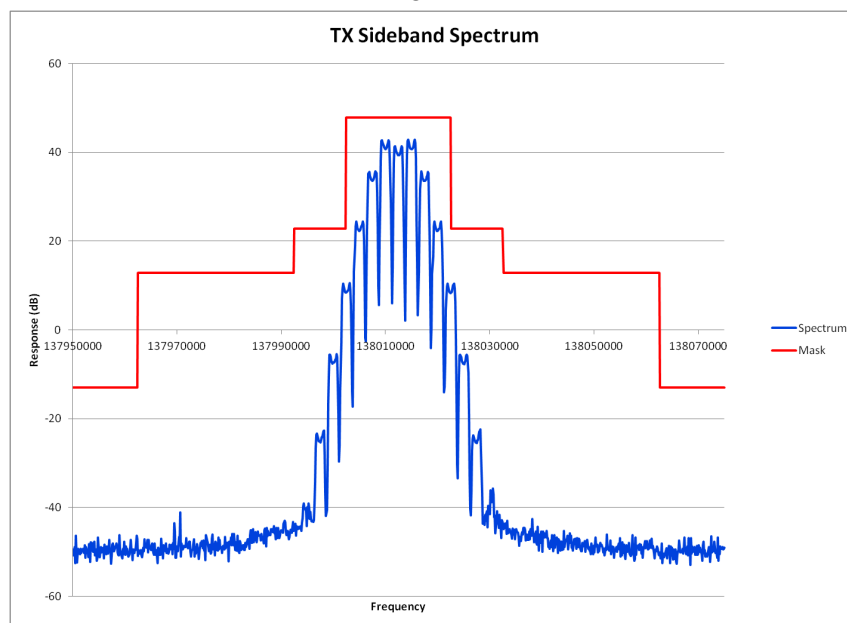


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E1-5.9 Occupied Bandwidth, Analog, 25 kHz Channels, 138.0125 MHz PL

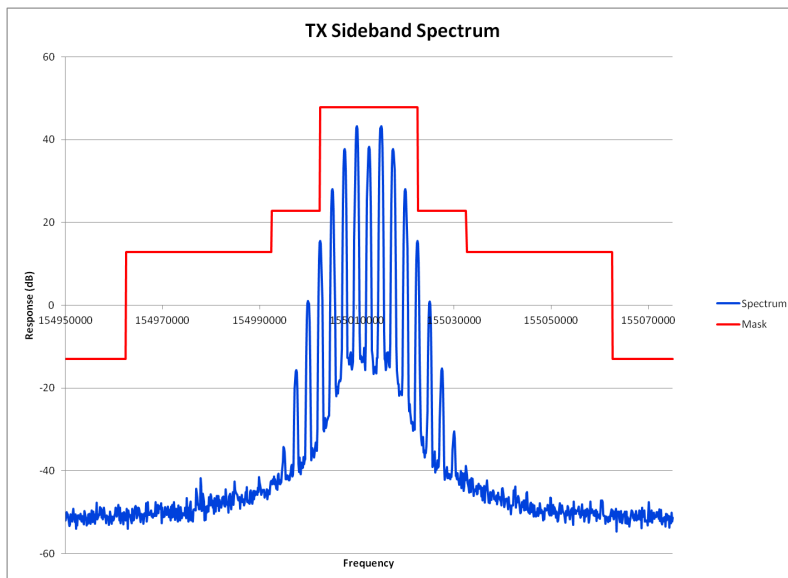


E1-5.10 Occupied Bandwidth, Analog, 25 kHz Channels, 138.0125 MHz DPL

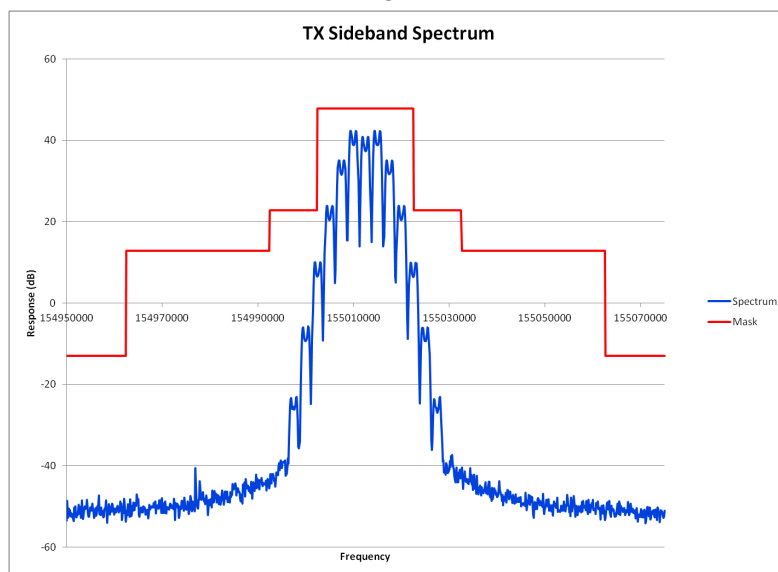


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E1-5.11 Occupied Bandwidth, Analog, 25 kHz Channels, 155.0125 MHz

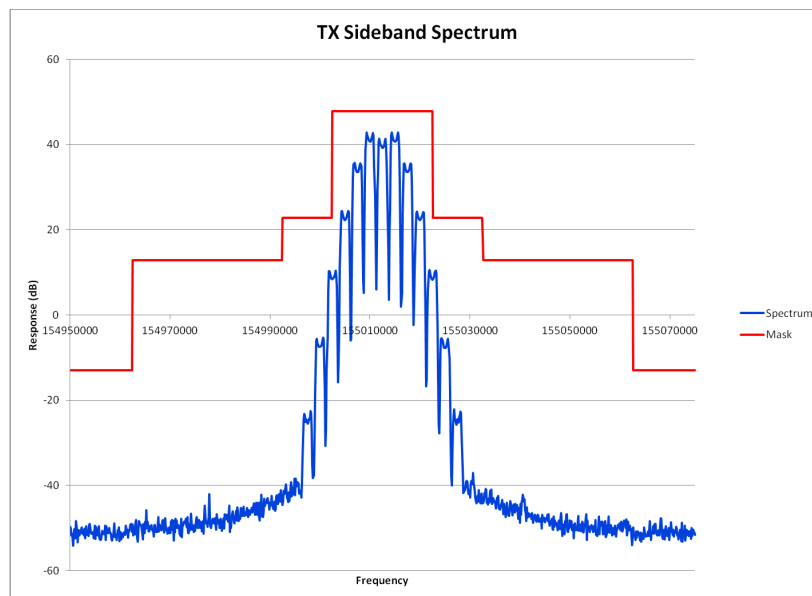


E1-5.12 Occupied Bandwidth, Analog, 25 kHz Channels, 155.0125 MHz PL

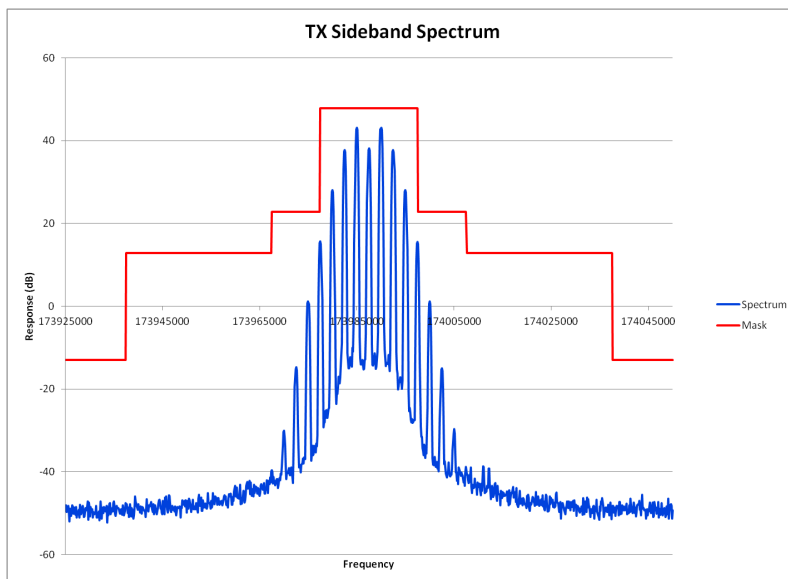


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E1-5.13 Occupied Bandwidth, Analog, 25 kHz Channels, 155.0125 MHz DPL

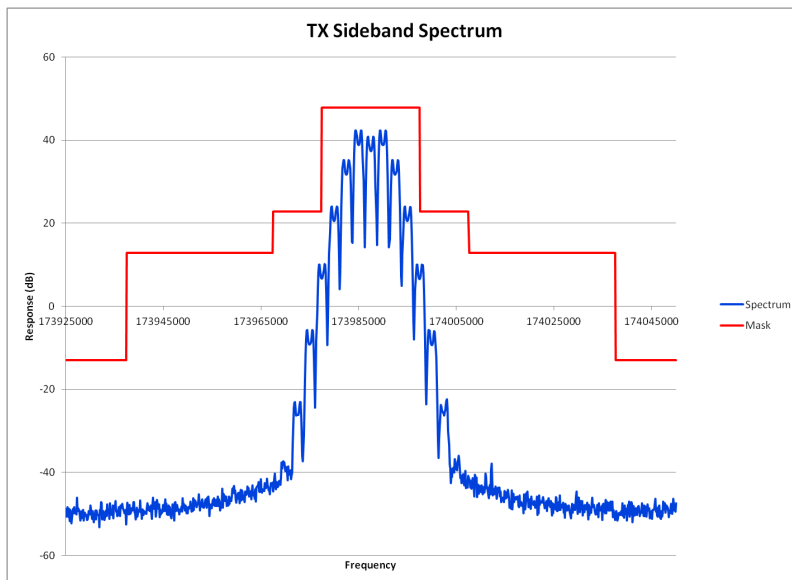


E1-5.14 Occupied Bandwidth, Analog, 25 kHz Channels, 173.9875 MHz

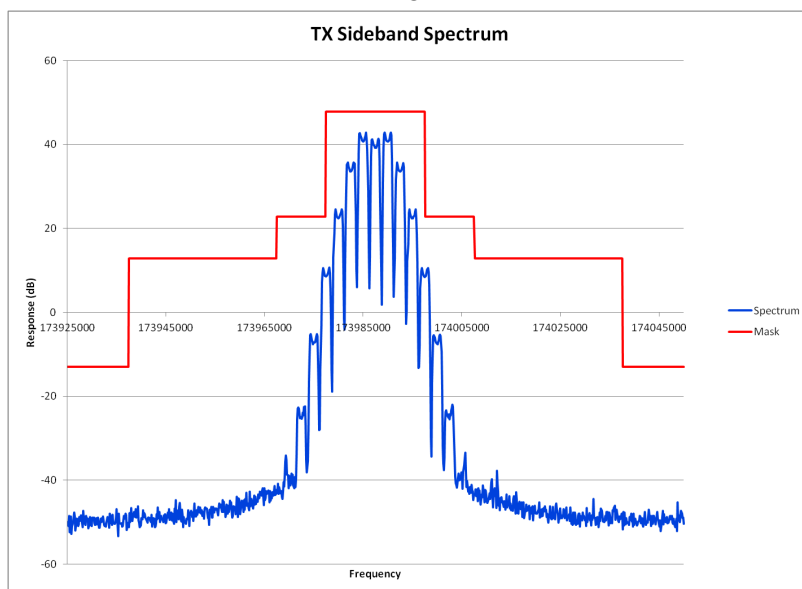


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E1-5.15 Occupied Bandwidth, Analog, 25 kHz Channels, 173.9875 MHz PL

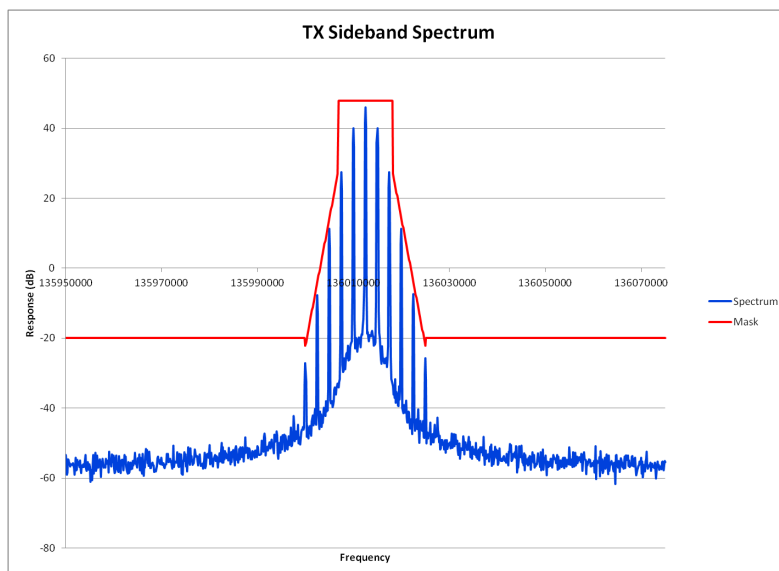


E1-5.16 Occupied Bandwidth, Analog, 25 kHz Channels, 173.9875 MHz DPL

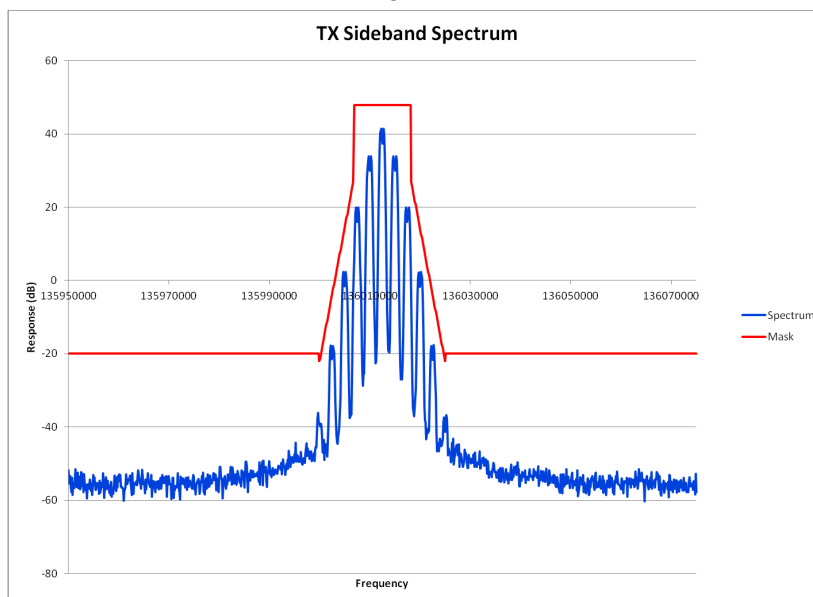


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E1-5.17 Occupied Bandwidth, Analog, 12.5 kHz Channels, 136.0125 MHz

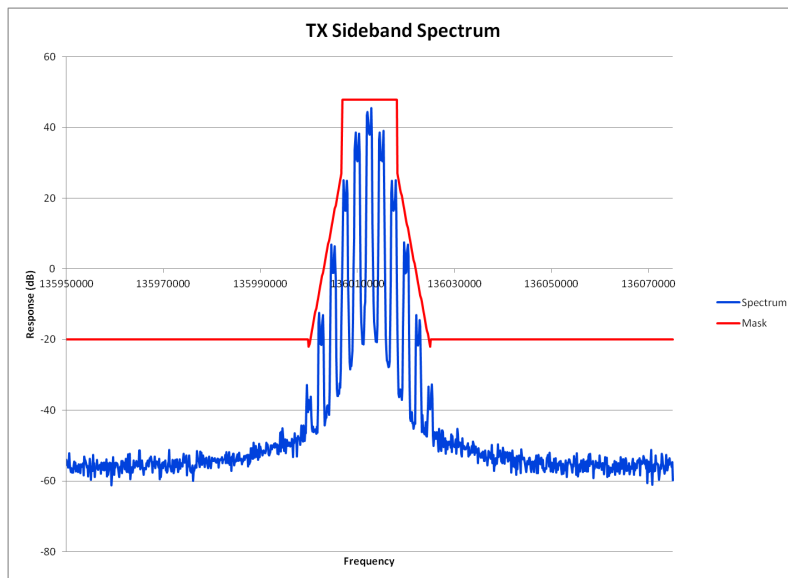


E1-5.18 Occupied Bandwidth, Analog, 12.5 kHz Channels, 136.0125 MHz PL

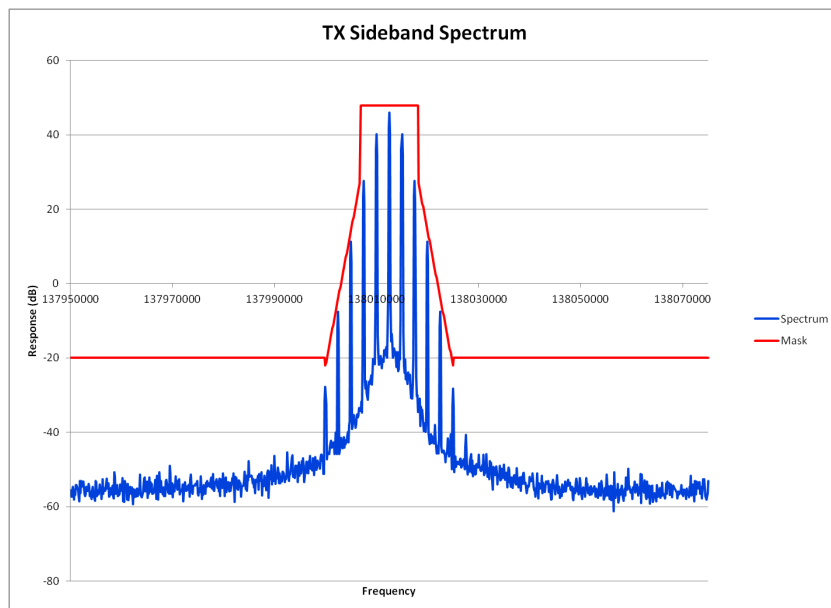


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E1-5.19 Occupied Bandwidth, Analog, 12.5 kHz Channels, 136.0125 MHz DPL

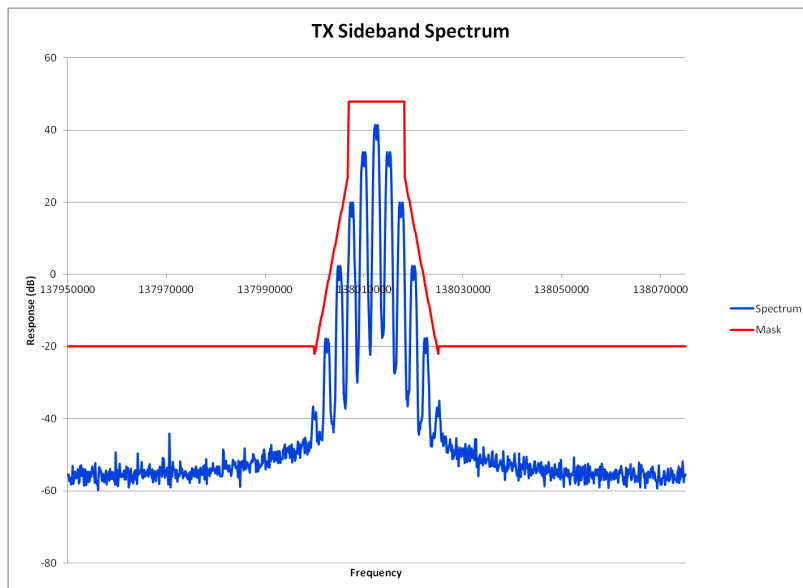


E1-5.20 Occupied Bandwidth, Analog, 12.5 kHz Channels, 138.0125 MHz

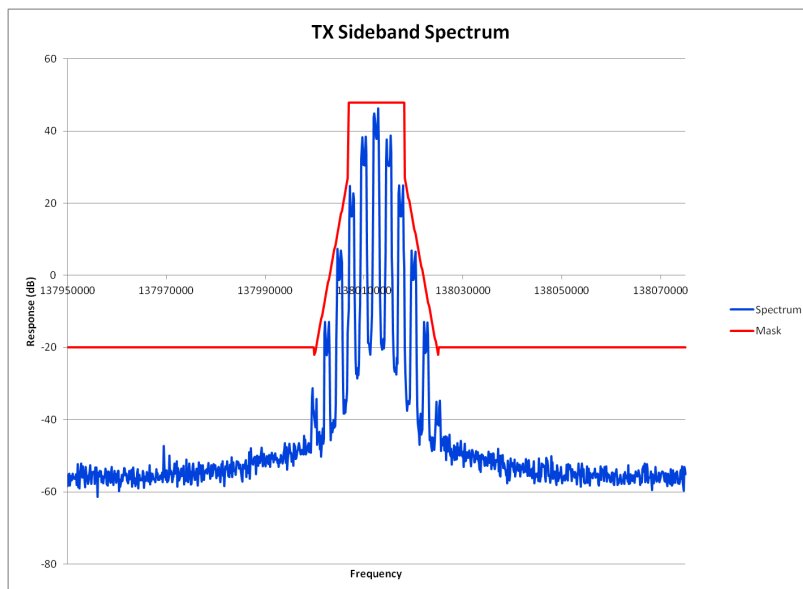


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E1-5.21 Occupied Bandwidth, Analog, 12.5 kHz Channels, 138.0125 MHz PL

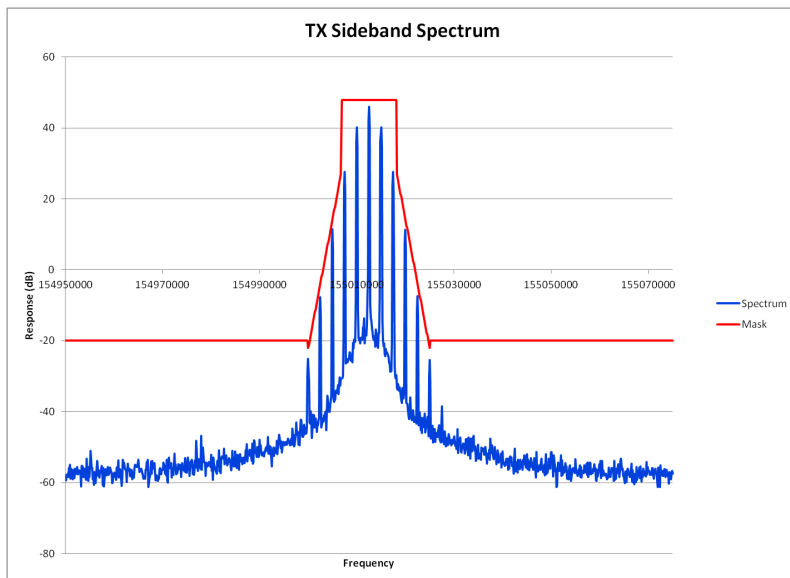


E1-5.22 Occupied Bandwidth, Analog, 12.5 kHz Channels, 138.0125 MHz DPL

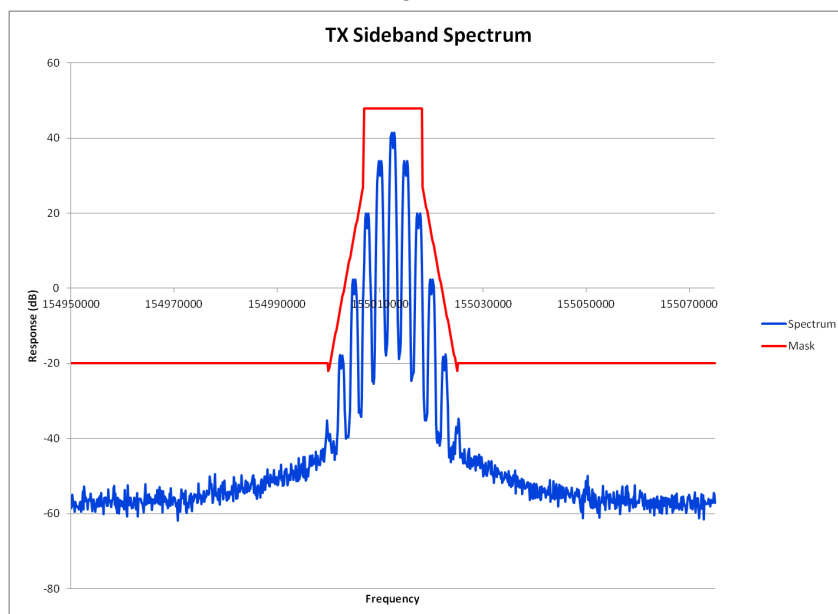


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E1-5.23 Occupied Bandwidth, Analog, 12.5 kHz Channels, 155.0125 MHz

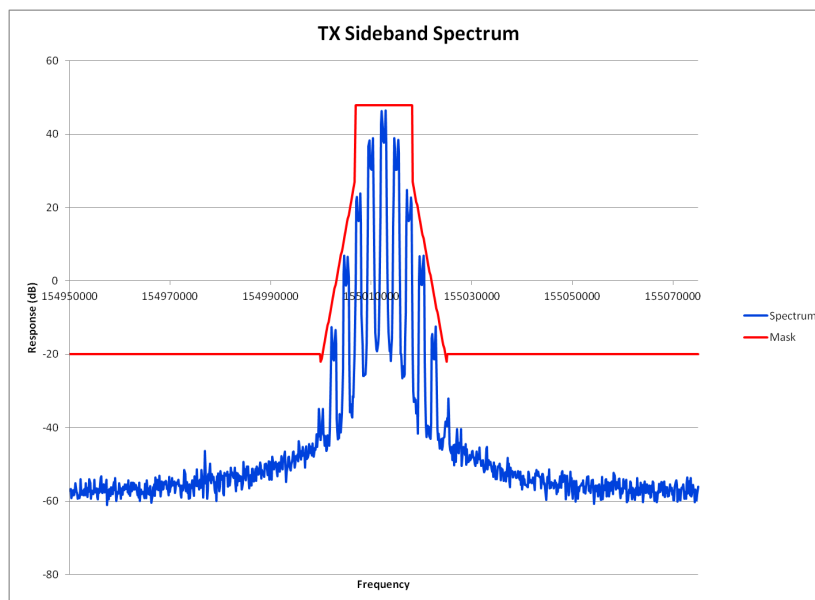


E1-5.24 Occupied Bandwidth, Analog, 12.5 kHz Channels, 155.0125 MHz PL

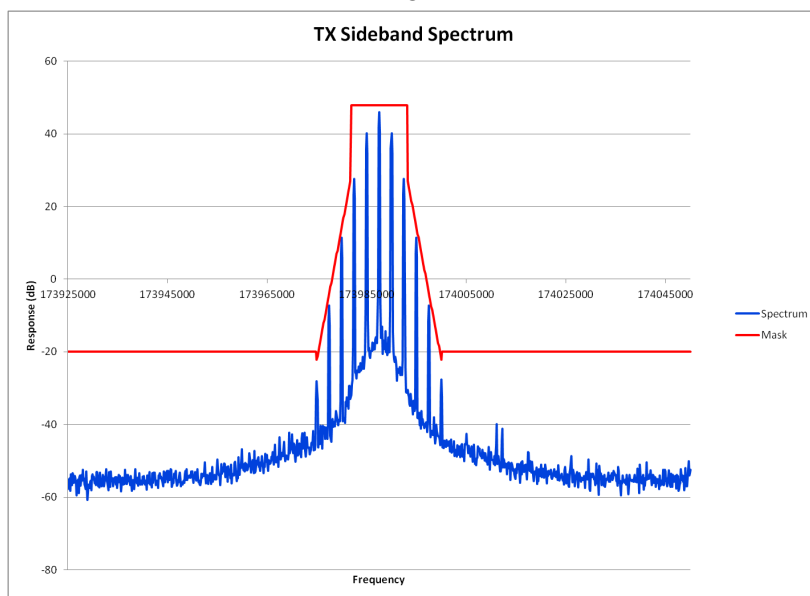


Report on Test Measurements for FCC ID ABZ99FT3094, HVIN SLR 5700-VHF per FCC 47 CFR 90 and IC RSS-119.

E1-5.25 Occupied Bandwidth, Analog, 12.5 kHz Channels, 155.0125 MHz DPL

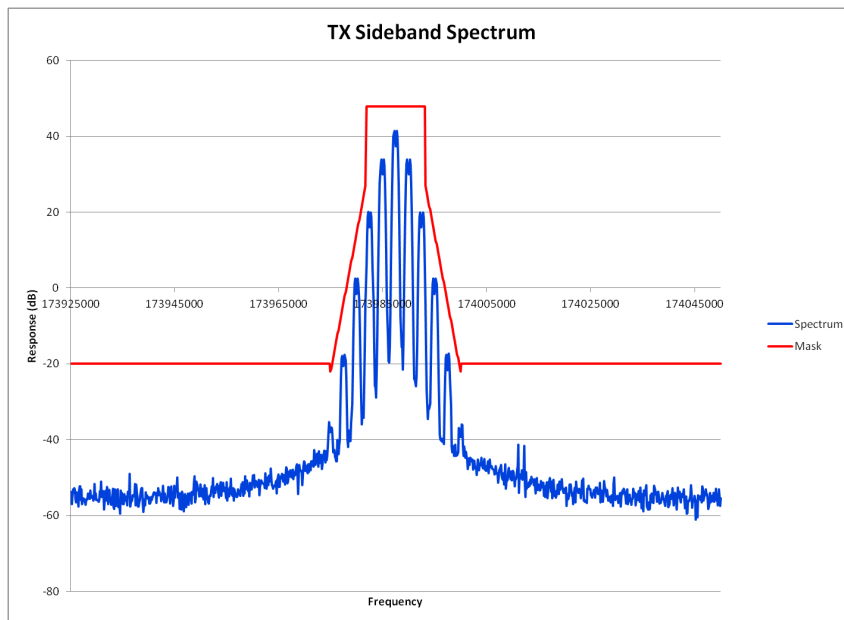


E1-5.26 Occupied Bandwidth, Analog, 12.5 kHz Channels, 173.9875 MHz

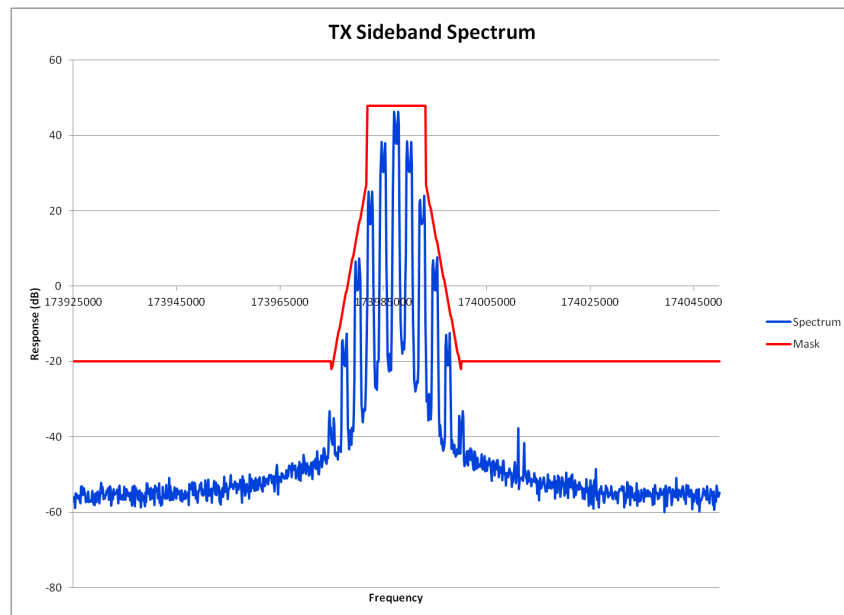


Report on Test Measurements for FCC ID ABZ99FT3094, HVIN SLR 5700-VHF per FCC 47 CFR 90 and IC RSS-119.

E1-5.27 Occupied Bandwidth, Analog, 12.5 kHz Channels, 173.9875 MHz PL



E1-5.28 Occupied Bandwidth, Analog, 12.5 kHz Channels, 173.9875 MHz DPL



Report on Test Measurements for FCC ID ABZ99FT3094, HVIN SLR 5700-VHF 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 (Fd 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 (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.

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 136.0125, 138.0125, 155.0125, 173.9875 MHz were measured for conducted carrier harmonics.

Carrier frequencies of 136.0125, 138.0125, 155.0125, 173.9875 MHz were measured for conducted spurious emission measurements

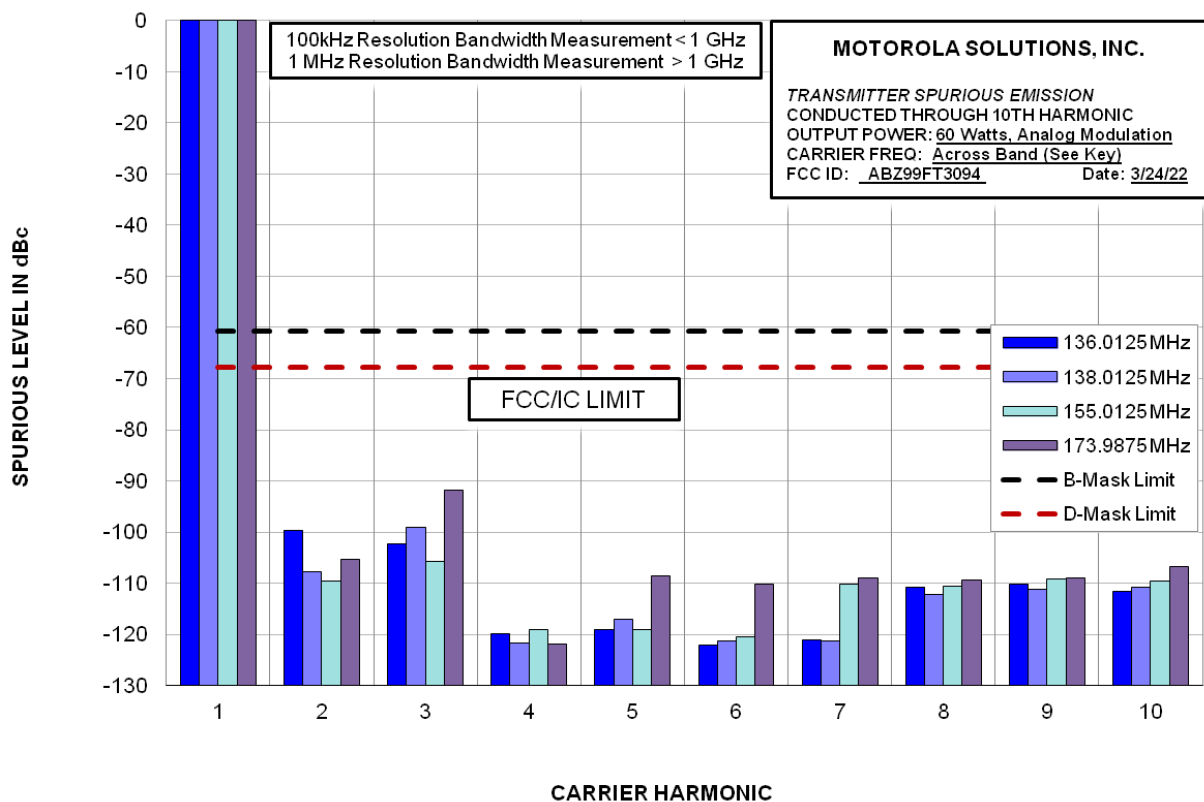
These frequencies represent the low end, center, and high end of the band, and are representative of the full 136-174 operating band.

Report on Test Measurements for FCC ID ABZ99FT3094, HVIN SLR 5700-VHF per FCC 47 CFR 90 and IC RSS-119.

<u>EXHIBIT</u>	<u>DESCRIPTION</u>
E1-6.1	Conducted Spurious Harmonic Emissions, Power Output 60 Watts The specification limit is -67.8 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 60 Watts, 136.0125 MHz
E1-6.4	Conducted Spurious Emission Spectrum, 200 MHz Span, Power 60 Watts, 138.0125 MHz
E1-6.5	Conducted Spurious Emission Spectrum, 200 MHz Span, Power 60 Watts, 155.0125 MHz
E1-6.6	Conducted Spurious Emission Spectrum, 200 MHz Span, Power 60 Watts, 173.9875 MHz

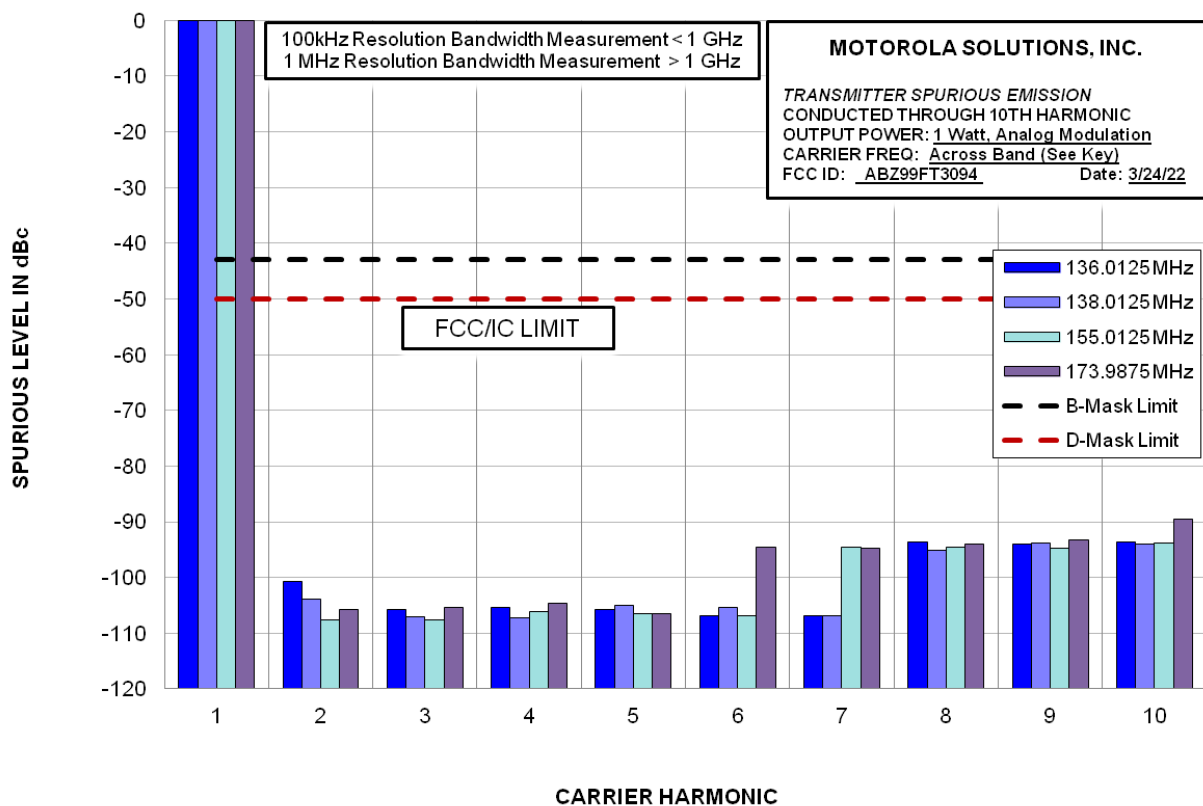
Report on Test Measurements for FCC ID ABZ99FT3094, HVIN SLR 5700-VHF per FCC 47 CFR 90 and IC RSS-119.

E1-6.1 Conducted Spurious Harmonic Emissions, Power Output 60 Watts



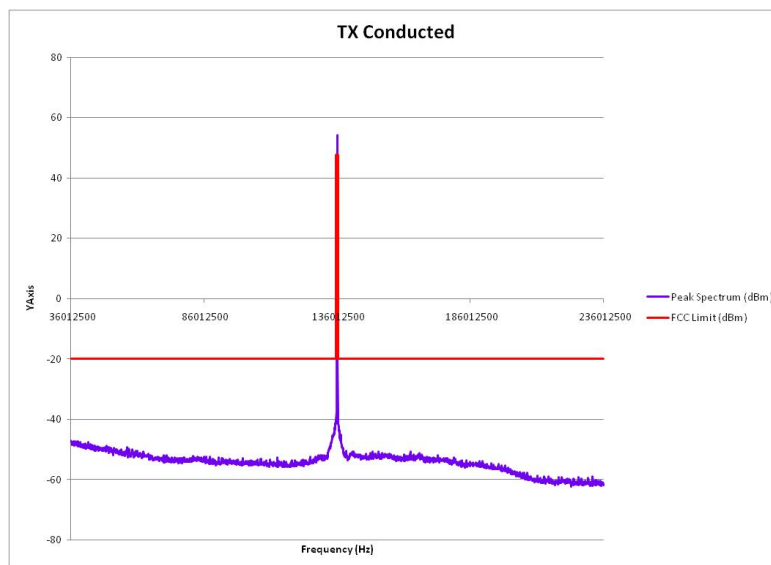
Report on Test Measurements for FCC ID ABZ99FT3094, HVIN SLR 5700-VHF per FCC 47 CFR 90 and IC RSS-119.

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

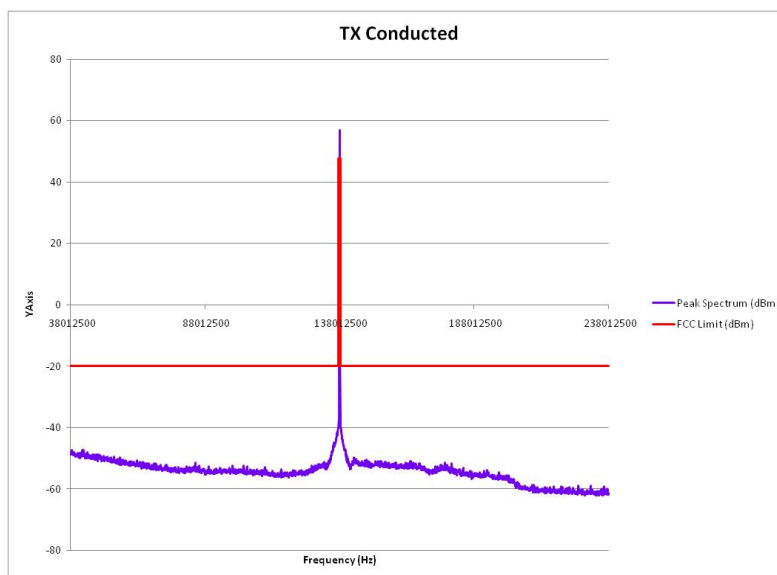


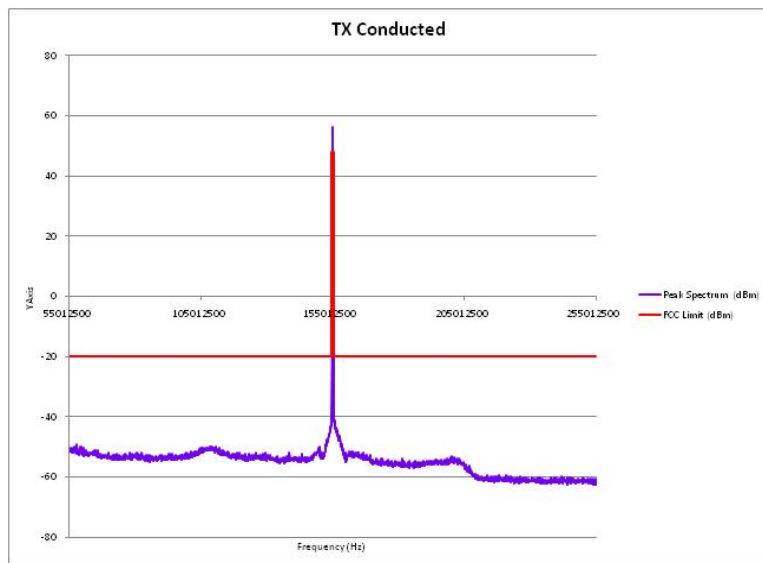
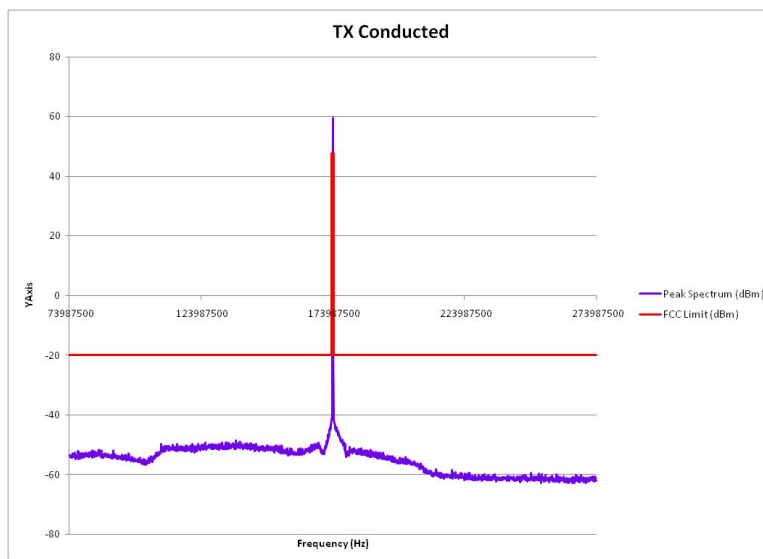
Report on Test Measurements for FCC ID ABZ99FT3094, HVIN SLR 5700-VHF per FCC 47 CFR 90 and IC RSS-119.

E1-6.3 Conducted Spurious Emission Spectrum, 200 MHz Span, Power 60 Watts, 136.0125MHz



E1-6.4 Conducted Spurious Emission Spectrum, 200 MHz Span, Power 60 Watts, 138.0125MHz



Report on Test Measurements for FCC ID ABZ99FT3094, HVIN SLR 5700-VHF per FCC 47 CFR 90 and IC RSS-119.**E1-6.5 Conducted Spurious Emission Spectrum, 200 MHz Span, Power 60 Watts, 155.0125MHz****E1-6.6 Conducted Spurious Emission Spectrum, 200 MHz Span, Power 60 Watts, 173.9875MHz**

Report on Test Measurements for FCC ID ABZ99FT3094, HVIN SLR 5700-VHF 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 136.0125, 138.0125, 155.0125, 173.9875 MHz were measured for radiated carrier harmonics at the high and low rated power. These frequencies represent the low end, center, and high end of the 136-174 MHz band and the low end, center, and high end of the 138-174 MHz band, and are representative of the full 136-174 MHz operating band.

:

EXHIBIT	DESCRIPTION
E1-7.1	Radiated Spurious Harmonic Emissions, Power Output 1 Watt, 136.0125 MHz
E1-7.2	Radiated Spurious Harmonic Emissions, Power Output 60 Watts, 136.0125 MHz
E1-7.3	Radiated Spurious Harmonic Emissions, Power Output 1 Watt, 138.0125 MHz
E1-7.4	Radiated Spurious Harmonic Emissions, Power Output 60 Watts, 138.0125 MHz

Report on Test Measurements for FCC ID ABZ99FT3094, HVIN SLR 5700-VHF per FCC 47 CFR 90 and IC RSS-119.

E1-7.5	Radiated Spurious Harmonic Emissions, Power Output 1 Watt, 155.0125 MHz
E1-7.6	Radiated Spurious Harmonic Emissions, Power Output 60 Watts, 155.0125 MHz
E1-7.7	Radiated Spurious Harmonic Emissions, Power Output 1 Watt, 173.9875 MHz
E1-7.8	Radiated Spurious Harmonic Emissions, Power Output 60 Watts, 173.9875 MHz

Report on Test Measurements for FCC ID ABZ99FT3094, HVIN SLR 5700-VHF per FCC 47 CFR 90 and IC RSS-119.

Test Details	
Manufacturer	Motorola Solutions
EUT	VHF 60W Repeater
Model No.	SLR 5700 VHF
Serial No.	478IYA1351
Mode	Tx
Frequency Tested	136.0125MHz
Notes	1W Power

Freq (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	Matched Sig Gen Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	ERP (dBm)	Attenuation Below Output Power (dB)	Minimum Attenuation (dBm)
272.0250	H	12.82	Ambient	-76.00	0.00	0.90	-76.90	106.90	50.00
	V	12.02	Ambient	-77.70	0.00	0.90	-78.60	108.60	50.00
408.0375	H	13.09	Ambient	-69.00	0.00	1.10	-70.10	100.10	50.00
	V	12.91	Ambient	-69.20	0.00	1.10	-70.30	100.30	50.00
544.0500	H	10.92	Ambient	-75.60	0.00	1.27	-76.87	106.87	50.00
	V	10.80	Ambient	-72.50	0.00	1.27	-73.77	103.77	50.00
680.0625	H	10.90	Ambient	-72.60	0.00	1.42	-74.02	104.02	50.00
	V	11.09	Ambient	-72.00	0.00	1.42	-73.42	103.42	50.00
816.0750	H	10.16	Ambient	-68.90	0.00	1.55	-70.45	100.45	50.00
	V	10.32	Ambient	-71.80	0.00	1.55	-73.35	103.35	50.00
952.0875	H	10.98	Ambient	-72.20	0.00	1.68	-73.88	103.88	50.00
	V	11.00	Ambient	-71.40	0.00	1.68	-73.08	103.08	50.00
1088.1000	H	21.21	Ambient	-45.26	0.97	1.81	-46.10	76.10	50.00
	V	21.29	Ambient	-44.57	0.97	1.81	-45.41	75.41	50.00
1224.1125	H	21.17	Ambient	-44.22	1.13	1.93	-45.01	75.01	50.00
	V	21.03	Ambient	-43.44	1.13	1.93	-44.23	74.23	50.00
1360.1250	H	21.26	Ambient	-44.06	2.05	2.04	-44.05	74.05	50.00
	V	22.22	Ambient	-43.14	2.05	2.04	-43.12	73.12	50.00

E1-7.1 Radiated Spurious Harmonic Emissions, Power Output 1 Watt, 136.0125 MHz

Report on Test Measurements for FCC ID ABZ99FT3094, HVIN SLR 5700-VHF per FCC 47 CFR 90 and IC RSS-119.

Test Details	
Manufacturer	Motorola Solutions
EUT	VHF 60W Repeater
Model No.	SLR 5700 VHF
Serial No.	478IYA1351
Mode	Tx
Frequency Tested	136.0125MHz
Notes	60W Power

Freq (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	Matched Sig Gen Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	ERP (dBm)	Attenuation Below Output Power (dB)	Minimum Attenuation (dBm)
272.0250	H	11.95	Ambient	-80.00	0.00	0.90	-80.90	128.68	67.78
	V	13.31	Ambient	-69.68	0.00	0.90	-70.58	118.36	67.78
408.0375	H	13.47	Ambient	-69.00	0.00	1.10	-70.10	117.88	67.78
	V	13.55	Ambient	-69.20	0.00	1.10	-70.30	118.08	67.78
544.0500	H	11.17	Ambient	-75.06	0.00	1.27	-76.33	124.11	67.78
	V	15.15	Ambient	-58.00	0.00	1.27	-59.27	107.05	67.78
680.0625	H	10.72	Ambient	-72.60	0.00	1.42	-74.02	121.80	67.78
	V	11.25	Ambient	-72.00	0.00	1.42	-73.42	121.20	67.78
816.0750	H	10.66	Ambient	-68.90	0.00	1.55	-70.45	118.23	67.78
	V	10.29	Ambient	-71.80	0.00	1.55	-73.35	121.13	67.78
952.0875	H	11.39	Ambient	-72.20	0.00	1.68	-73.88	121.66	67.78
	V	11.79	Ambient	-71.40	0.00	1.68	-73.08	120.86	67.78
1088.1000	H	20.39	Ambient	-46.08	0.97	1.81	-46.92	94.70	67.78
	V	21.51	Ambient	-44.35	0.97	1.81	-45.19	92.97	67.78
1224.1125	H	21.09	Ambient	-44.30	1.13	1.93	-45.09	92.87	67.78
	V	21.15	Ambient	-43.32	1.13	1.93	-44.11	91.89	67.78
1360.1250	H	21.10	Ambient	-44.22	2.05	2.04	-44.21	91.99	67.78
	V	21.08	Ambient	-44.28	2.05	2.04	-44.26	92.04	67.78

E1-7.2 Radiated Spurious Harmonic Emissions, Power Output 60 Watts, 136.0125 MHz

Report on Test Measurements for FCC ID ABZ99FT3094, HVIN SLR 5700-VHF per FCC 47 CFR 90 and IC RSS-119.

Test Details	
Manufacturer	Motorola Solutions
EUT	VHF 60W Repeater
Model No.	SLR 5700 VHF
Serial No.	478IYA1351
Mode	Tx
Frequency Tested	138.0125MHz
Notes	1W

Freq (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	Matched Sig Gen Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	ERP (dBm)	Attenuation Below Output Power (dB)	Minimum Attenuation (dBm)
276.0250	H	12.40	Ambient	-79.23	0.00	0.91	-80.14	110.14	50.00
	V	13.00	Ambient	-76.00	0.00	0.91	-76.91	106.91	50.00
414.0375	H	12.84	Ambient	-73.00	0.00	1.11	-74.11	104.11	50.00
	V	12.82	Ambient	-74.50	0.00	1.11	-75.61	105.61	50.00
552.0500	H	10.79	Ambient	-75.10	0.00	1.28	-76.38	106.38	50.00
	V	10.90	Ambient	-76.90	0.00	1.28	-78.18	108.18	50.00
690.0625	H	10.02	Ambient	-71.40	0.00	1.43	-72.83	102.83	50.00
	V	10.14	Ambient	-73.10	0.00	1.43	-74.53	104.53	50.00
828.0750	H	10.87	Ambient	-73.00	0.00	1.56	-74.56	104.56	50.00
	V	10.33	Ambient	-72.30	0.00	1.56	-73.86	103.86	50.00
966.0875	H	11.07	Ambient	-74.00	0.00	1.69	-75.69	105.69	50.00
	V	11.13	Ambient	-74.70	0.00	1.69	-76.39	106.39	50.00
1104.1000	H	21.68	Ambient	-44.63	1.14	1.82	-45.32	75.32	50.00
	V	21.44	Ambient	-44.18	1.14	1.82	-44.87	74.87	50.00
1242.1125	H	21.12	Ambient	-44.26	1.03	1.95	-45.17	75.17	50.00
	V	22.47	Ambient	-42.12	1.03	1.95	-43.04	73.04	50.00
1380.1250	H	21.64	Ambient	-43.67	2.35	2.06	-43.38	73.38	50.00
	V	21.34	Ambient	-44.14	2.35	2.06	-43.85	73.85	50.00

E1-7.3 Radiated Spurious Harmonic Emissions, Power Output 1 Watt, 138.0125 MHz

Report on Test Measurements for FCC ID ABZ99FT3094, HVIN SLR 5700-VHF per FCC 47 CFR 90 and IC RSS-119.

Test Details	
Manufacturer	Motorola Solutions
EUT	VHF 60W Repeater
Model No.	SLR 5700 VHF
Serial No.	478IYA1351
Mode	Tx
Frequency Tested	138.0125MHz
Notes	60W

Freq (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	Matched Sig Gen Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	ERP (dBm)	Attenuation Below Output Power (dB)	Minimum Attenuation (dBm)
276.0250	H	13.19		-73.62	0.00	0.91	-74.53	122.31	67.78
	V	13.46		-70.36	0.00	0.91	-71.27	119.05	67.78
414.0375	H	13.54	Ambient	-73.00	0.00	1.11	-74.11	121.89	67.78
	V	13.60	Ambient	-74.50	0.00	1.11	-75.61	123.39	67.78
552.0500	H	11.08		-70.42	0.00	1.28	-71.70	119.48	67.78
	V	13.63		-61.42	0.00	1.28	-62.70	110.48	67.78
690.0625	H	10.26	Ambient	-71.40	0.00	1.43	-72.83	120.61	67.78
	V	10.74	Ambient	-73.10	0.00	1.43	-74.53	122.31	67.78
828.0750	H	10.43	Ambient	-73.00	0.00	1.56	-74.56	122.34	67.78
	V	10.40	Ambient	-72.30	0.00	1.56	-73.86	121.64	67.78
966.0875	H	10.69	Ambient	-74.00	0.00	1.69	-75.69	123.47	67.78
	V	11.43	Ambient	-74.70	0.00	1.69	-76.39	124.17	67.78
1104.1000	H	21.28	Ambient	-45.03	1.14	1.82	-45.72	93.50	67.78
	V	22.13	Ambient	-43.49	1.14	1.82	-44.18	91.96	67.78
1242.1125	H	21.20	Ambient	-44.18	1.03	1.95	-45.09	92.87	67.78
	V	21.78	Ambient	-42.81	1.03	1.95	-43.73	91.51	67.78
1380.1250	H	20.97	Ambient	-44.34	2.35	2.06	-44.05	91.83	67.78
	V	21.00	Ambient	-44.48	2.35	2.06	-44.19	91.97	67.78

E1-7.4 Radiated Spurious Harmonic Emissions, Power Output 60 Watts, 138.0125 MHz

Report on Test Measurements for FCC ID ABZ99FT3094, HVIN SLR 5700-VHF per FCC 47 CFR 90 and IC RSS-119.

Test Details	
Manufacturer	Motorola Solutions
EUT	VHF 60W Repeater
Model No.	SLR 5700 VHF
Serial No.	478IYA1351
Mode	Tx
Frequency Tested	155.0125MHz
Notes	1W

Freq (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	Matched Sig Gen Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	ERP (dBm)	Attenuation Below Output Power (dB)	Minimum Attenuation (dBm)
310.0250	H	11.70	Ambient	-81.20	0.00	0.96	-82.16	112.16	50.00
	V	12.95		-72.18	0.00	0.96	-73.14	103.14	50.00
465.0375	H	11.83		-66.00	0.00	1.18	-67.18	97.18	50.00
	V	12.48		-59.68	0.00	1.18	-60.86	90.86	50.00
620.0500	H	10.30	Ambient	-75.02	0.00	1.35	-76.37	106.37	50.00
	V	9.86	Ambient	-76.90	0.00	1.35	-78.25	108.25	50.00
775.0625	H	10.11	Ambient	-72.20	0.00	1.51	-73.71	103.71	50.00
	V	9.94	Ambient	-71.90	0.00	1.51	-73.41	103.41	50.00
930.0750	H	11.58	Ambient	-70.70	0.00	1.66	-72.36	102.36	50.00
	V	11.45	Ambient	-73.80	0.00	1.66	-75.46	105.46	50.00
1085.0875	H	21.87	Ambient	-44.63	0.92	1.80	-45.52	75.52	50.00
	V	21.45	Ambient	-44.45	0.92	1.80	-45.34	75.34	50.00
1240.1000	H	21.63	Ambient	-43.75	1.04	1.94	-44.65	74.65	50.00
	V	21.74	Ambient	-42.84	1.04	1.94	-43.74	73.74	50.00
1395.1125	H	21.09	Ambient	-44.21	2.57	2.07	-43.71	73.71	50.00
	V	21.18	Ambient	-44.39	2.57	2.07	-43.89	73.89	50.00
1550.1250	H	20.39	Ambient	-46.89	3.84	2.18	-45.23	75.23	50.00
	V	20.93	Ambient	-45.97	3.84	2.18	-44.30	74.30	50.00

E1-7.5 Radiated Spurious Harmonic Emissions, Power Output 1 Watt, 155.0125 MHz

Report on Test Measurements for FCC ID ABZ99FT3094, HVIN SLR 5700-VHF per FCC 47 CFR 90 and IC RSS-119.

Test Details	
Manufacturer	Motorola Solutions
EUT	VHF 60W Repeater
Model No.	SLR 5700 VHF
Serial No.	478IYA1351
Mode	Tx
Frequency Tested	155.0125MHz
Notes	60W

Freq (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	Matched Sig Gen Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	ERP (dBm)	Attenuation Below Output Power (dB)	Minimum Attenuation (dBm)
310.0250	H	11.78	Ambient	-81.63	0.00	0.96	-82.59	130.37	67.78
	V	12.66		-72.72	0.00	0.96	-73.68	121.46	67.78
465.0375	H	10.73		-60.44	0.00	1.18	-61.62	109.40	67.78
	V	11.35		-62.26	0.00	1.18	-63.44	111.22	67.78
620.0500	H	10.17	Ambient	-75.02	0.00	1.35	-76.37	124.15	67.78
	V	10.44	Ambient	-76.90	0.00	1.35	-78.25	126.03	67.78
775.0625	H	9.95	Ambient	-72.20	0.00	1.51	-73.71	121.49	67.78
	V	9.47	Ambient	-71.90	0.00	1.51	-73.41	121.19	67.78
930.0750	H	11.12	Ambient	-70.70	0.00	1.66	-72.36	120.14	67.78
	V	11.13	Ambient	-73.80	0.00	1.66	-75.46	123.24	67.78
1085.0875	H	21.70	Ambient	-44.80	0.92	1.80	-45.69	93.47	67.78
	V	22.07	Ambient	-43.83	0.92	1.80	-44.72	92.50	67.78
1240.1000	H	21.32	Ambient	-44.06	1.04	1.94	-44.96	92.74	67.78
	V	20.47	Ambient	-44.11	1.04	1.94	-45.01	92.79	67.78
1395.1125	H	22.04	Ambient	-43.26	2.57	2.07	-42.76	90.54	67.78
	V	21.34	Ambient	-44.23	2.57	2.07	-43.73	91.51	67.78
1550.1250	H	21.22	Ambient	-46.06	3.84	2.18	-44.40	92.18	67.78
	V	21.28	Ambient	-45.62	3.84	2.18	-43.95	91.73	67.78

E1-7.6 Radiated Spurious Harmonic Emissions, Power Output 60 Watts, 155.0125 MHz

Report on Test Measurements for FCC ID ABZ99FT3094, HVIN SLR 5700-VHF per FCC 47 CFR 90 and IC RSS-119.

Test Details	
Manufacturer	Motorola Solutions
EUT	VHF 60W Repeater
Model No.	SLR 5700 VHF
Serial No.	478IYA1351
Mode	Tx
Frequency Tested	173.9875MHz
Notes	1W

Freq (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	Matched Sig Gen Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	ERP (dBm)	Attenuation Below Output Power (dB)	Minimum Attenuation (dBm)
347.9750	H	13.25	Ambient	-72.18	0.00	1.02	-73.20	103.20	50.00
	V	12.57	Ambient	-75.60	0.00	1.02	-76.62	106.62	50.00
521.9625	H	11.33	Ambient	-72.00	0.00	1.25	-73.25	103.25	50.00
	V	10.80	Ambient	-73.60	0.00	1.25	-74.85	104.85	50.00
695.9500	H	10.44	Ambient	-71.90	0.00	1.44	-73.34	103.34	50.00
	V	9.58	Ambient	-73.10	0.00	1.44	-74.54	104.54	50.00
869.9375	H	10.68	Ambient	-71.50	0.00	1.60	-73.10	103.10	50.00
	V	10.40	Ambient	-72.40	0.00	1.60	-74.00	104.00	50.00
1043.9250	H	21.59	Ambient	-45.34	0.21	1.76	-46.89	76.89	50.00
	V	21.40	Ambient	-45.12	0.21	1.76	-46.67	76.67	50.00
1217.9125	H	21.55	Ambient	-43.84	1.17	1.93	-44.60	74.60	50.00
	V	20.92	Ambient	-43.50	1.17	1.93	-44.26	74.26	50.00
1391.9000	H	21.78	Ambient	-43.52	2.52	2.07	-43.07	73.07	50.00
	V	21.98	Ambient	-43.57	2.52	2.07	-43.12	73.12	50.00
1565.8875	H	20.63	Ambient	-46.85	3.79	2.19	-45.26	75.26	50.00
	V	20.95	Ambient	-46.08	3.79	2.19	-44.48	74.48	50.00
1739.8750	H	21.00	Ambient	-44.62	2.94	2.30	-43.99	73.99	50.00
	V	21.97	Ambient	-41.99	2.94	2.30	-41.35	71.35	50.00

E1-7.7 Radiated Spurious Harmonic Emissions, Power Output 1 Watt, 173.9875 MHz

Report on Test Measurements for FCC ID ABZ99FT3094, HVIN SLR 5700-VHF per FCC 47 CFR 90 and IC RSS-119.

Test Details	
Manufacturer	Motorola Solutions
EUT	VHF 60W Repeater
Model No.	SLR 5700 VHF
Serial No.	478IYA1351
Mode	Tx
Frequency Tested	173.9875MHz
Notes	60W

Freq (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	Matched Sig Gen Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	ERP (dBm)	Attenuation Below Output Power (dB)	Minimum Attenuation (dBm)
347.9750	H	16.38		-68.24	0.00	1.02	-69.26	117.04	67.78
	V	17.68		-60.20	0.00	1.02	-61.22	109.00	67.78
521.9625	H	11.20		-75.18	0.00	1.25	-76.43	124.21	67.78
	V	12.94		-62.34	0.00	1.25	-63.59	111.37	67.78
695.9500	H	9.98	Ambient	-71.90	0.00	1.44	-73.34	121.12	67.78
	V	10.93		-74.90	0.00	1.44	-76.34	124.12	67.78
869.9375	H	9.76	Ambient	-71.50	0.00	1.60	-73.10	120.88	67.78
	V	10.50	Ambient	-72.40	0.00	1.60	-74.00	121.78	67.78
1043.9250	H	22.24	Ambient	-44.69	0.21	1.76	-46.24	94.02	67.78
	V	21.79	Ambient	-44.73	0.21	1.76	-46.28	94.06	67.78
1217.9125	H	21.16	Ambient	-44.23	1.17	1.93	-44.99	92.77	67.78
	V	21.02	Ambient	-43.40	1.17	1.93	-44.16	91.94	67.78
1391.9000	H	21.66	Ambient	-43.64	2.52	2.07	-43.19	90.97	67.78
	V	21.51	Ambient	-44.04	2.52	2.07	-43.59	91.37	67.78
1565.8875	H	20.55	Ambient	-46.93	3.79	2.19	-45.34	93.12	67.78
	V	21.31	Ambient	-45.72	3.79	2.19	-44.12	91.90	67.78
1739.8750	H	21.39	Ambient	-44.23	2.94	2.30	-43.60	91.38	67.78
	V	21.07	Ambient	-42.89	2.94	2.30	-42.25	90.03	67.78

E1-7.8 Radiated Spurious Harmonic Emissions, Power Output 60 Watts, 173.9875 MHz