BROADCAST COMMUNICATIONS ENGINEERING

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EQUIPMENT PERFORMANCE REPORT
& NRSC-1 MEASUREMENT

FOR
KRMS – AM
Osage Beach, MO

PERFORMED 7/23/2019

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PURPOSE OF THE TEST:

As outlined in the FCC's Code of Federal Regulations, as of June 30, 1994, all AM Broadcast stations must perform an annual equipment performance measurement to comply with the ANSI/EIA-549-1988, NRSC-1 AM Preemphasis/Deemphasis and Broadcast Transmissions Bandwidth Specifications (NRSC-1).

These rules are outlined in sections 73.44 and 73.1590 of the Code of Federal Regulations:

§73.44 Emission limitations.

(a) The emissions of stations in the AM service shall be attenuated in accordance with the requirements specified in paragraph (b) of this section. Emissions shall be measured using properly operated and suitable swept-frequency RF spectrum analyzer using a peak hold duration of 10 minutes, no video filtering, and a 300 Hz resolution bandwidth, except that a wider resolution bandwidth may be employed above 11.5 kHz to detect transient emissions. Alternatively, other specialized receivers or monitors with appropriate characteristics may be used to determine compliance with the provisions of this section, provided that any disputes over measurement accuracy are resolved in favor of measurements obtained by using a calibrated spectrum analyzer adjusted as set forth above.

(b) Emissions 10.2 kHz to 20 kHz removed from the carrier must be attenuated at least 25 dB below the unmodulated carrier level, emissions 20 kHz to 30 kHz removed from the carrier must be attenuated at least 35 dB below the unmodulated carrier level, emissions 30 kHz to 60 kHz removed from the carrier must be attenuated at least [5 + 1 dB/kHz] below the unmodulated carrier level, and emissions between 60 kHz and 75 kHz of the carrier frequency must be attenuated at least 65 dB below the unmodulated carrier level. Emissions removed by more than 75 kHz must be attenuated at least 43 + 10 Log (Power in watts) or 80 dB below the unmodulated carrier level, whichever is the lesser attenuation, except for transmitters having power less than 158 watts, where the attenuation must be at least 65 dB below carrier level.

§73.1590 Equipment performance measurements.

(a) The licensee of each AM, FM and TV station, except licensees of Class D noncommercial educational FM stations authorized to operate with 10 watts or less output power, must make equipment performance measurements for each main transmitter as follows:

(6) Annually, for AM stations, with not more than 14 months between measurements.

(b) Measurements for spurious and harmonic emissions must be made to show compliance with the transmission system requirements of §73.44 for AM stations, §73.317 for FM stations and §73.687 for TV stations. Measurements must be made under all conditions of modulation expected to be encountered by the station whether transmitting monophonic or stereophonic programs or providing subsidiary communications services.

(NOTE: Electronic CFR Data is current as of January 2019)

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On July 23, 2019 Broadcast Communications Engineering was contracted to perform the NRSC-1 AM transmission measurement and Equipment Performance Report for KRMS AM, Osage Beach, MO.

Broadcast Communications Engineering is owned and operated by Bobby J. Moore of Lebanon, Mo. FCC license #PG-17-27327.

Under the penalty of perjury, I certify that all findings in this document are true and accurate to the best of my knowledge and ability.

The following equipment was used in performing the measurement:

Anritsu MS2721B Spectrum Analyzer, Serial # 1018004
Chris Scott and Associates LP-3 Loop Antenna
Chris Scott and Associates AM Notch Filter

Testing Method:

The spectrum analyzer was set up in an automobile with the antenna attached to the input of the analyzer. The analyzer was set up near the AM tower. This allowed an accurate reading to be obtained and still maintain a good signal to noise ratio on the display. Normal program audio was sampled for 10 minutes then stored into the memory of the spectrum analyzer. Two measurements were made. One with a span of 5 khz per division to monitor the spectral mask. The second, with the span width set to 20 khz per division to monitor the spectrum out to 100 khz above and below the carrier. All other adjustments to the analyzer were set as outlined in section 73.44 of the FCC's Code of Federal Regulations. A line was superimposed on the plot indicating the NRSC mask limits that could not be exceeded to pass the measurement.

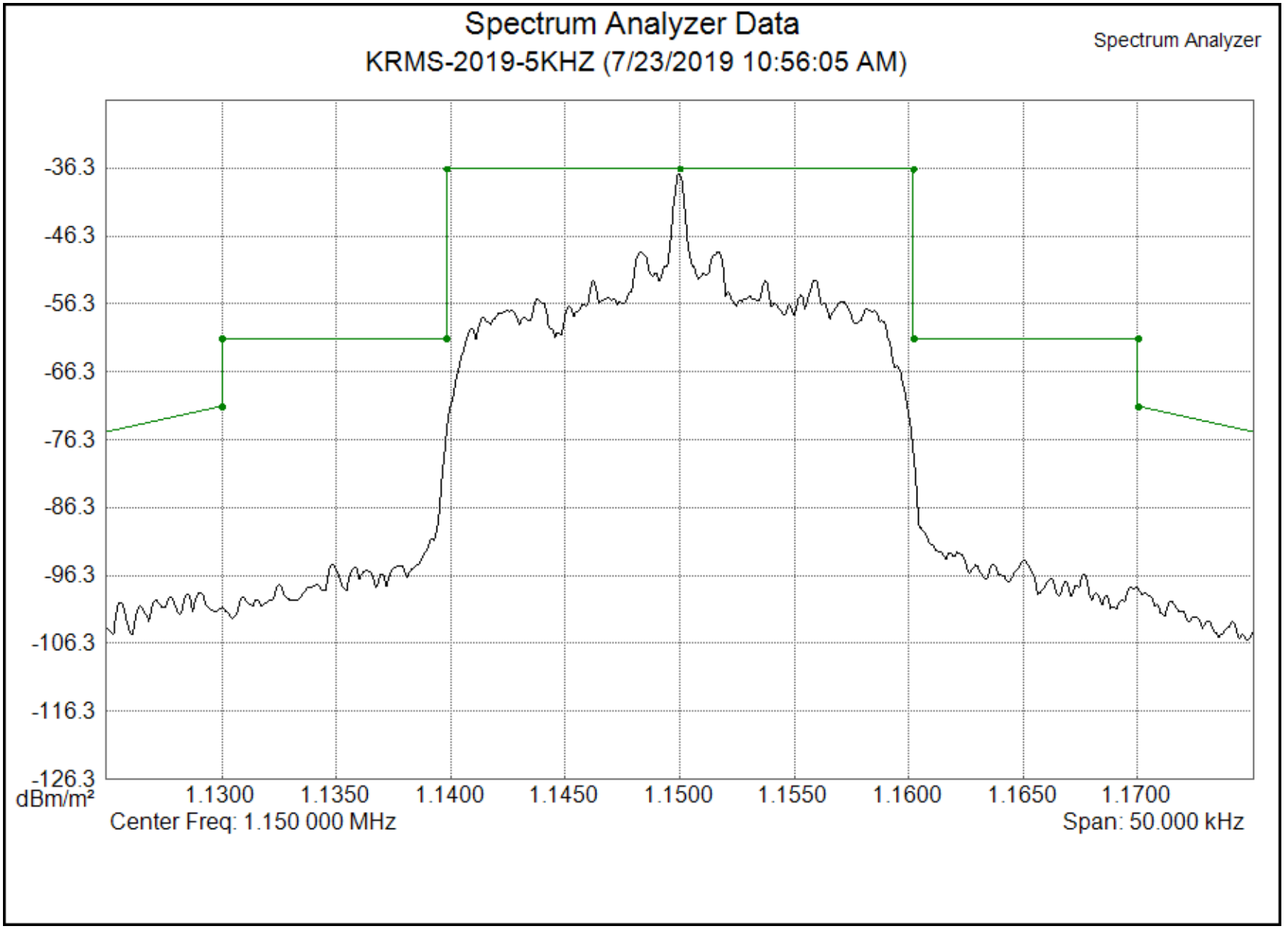
The harmonic measurements were taken as close as needed to obtain proper first, second, and third harmonic attenuation. First, the fundamental frequency was measured and recorded as the reference level. After the reference level was established, and to eliminate the fundamental frequency from overloading the analyzer, an AM notch filter was inserted between the antenna and the analyzer. Tuning the notch filter to the station's carrier frequency attenuated the fundamental carrier by 40 dB. First, Second, and Third harmonics were measured and plotted. The loop antenna's calibration record provided by Chris Scott and Associates has been programmed into the spectrum to compensate for the slope in efficiency of the LP-3 antenna. The total amount of harmonic attenuation was determined by using the formula **20 x ^{log} (fundamental/harmonic)** AFTER correction. The amount of attenuation required by the FCC to be legal was determined using the formula **43 + ^{10}log (power in watts)** as outlined in section 73.44 of the FCC's Code of Federal Regulations.

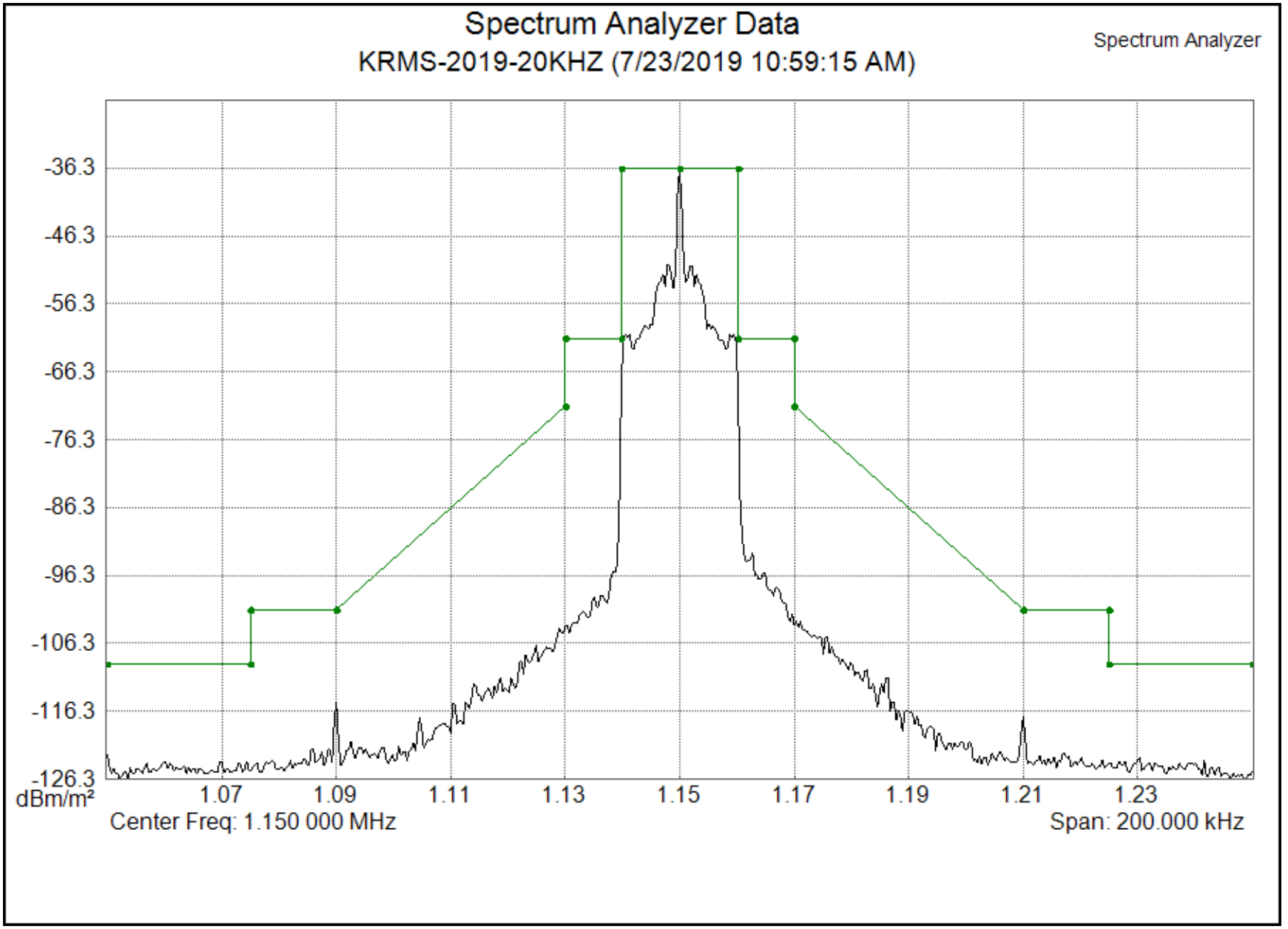
This station had to prove compliance by having all harmonic attenuations at **73 dB** or greater.

The findings of this study prove that KRMS AM **passed** the NRSC-1 emissions measurement.

The findings of this study prove that KRMS AM **passed** the harmonic emissions measurement.

Bob Moore,
BCE

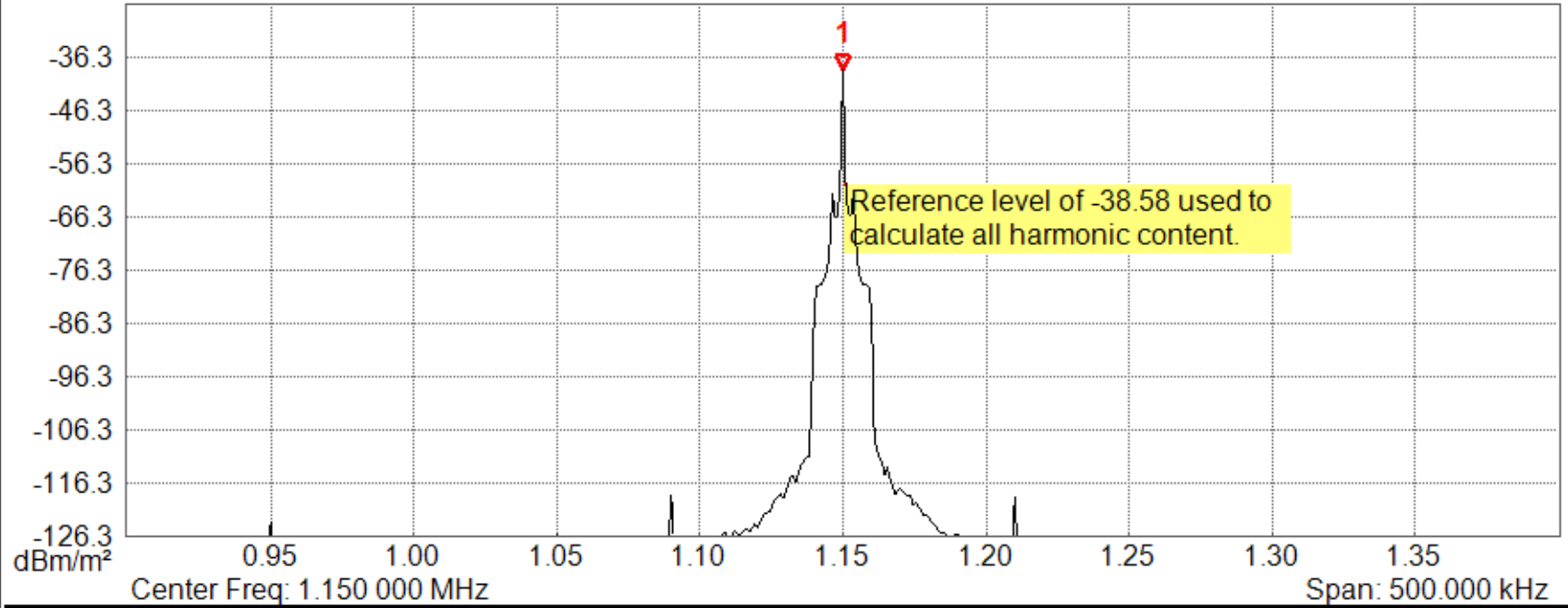

Spectrum Analyzer Data
KRMS-2019-5KHZ (7/23/2019 10:56:05 AM)
Spectrum Analyzer
-36.3
-46.3
-56.3
-66.3
-76.3
-86.3
-96.3
-106.3
-116.3
-126.3
dBm/m²
1.1300
1.1350
1.1400
1.1450
1.1500
1.1550
1.1600
1.1650
1.1700
Center Freq: 1.150 000 MHz
Span: 50.000 kHz


Spectrum Analyzer Data
KRMS-2019-20KHZ (7/23/2019 10:59:15 AM)
Spectrum Analyzer
-36.3
-46.3
-56.3
-66.3
-76.3
-86.3
-96.3
-106.3
-116.3
-126.3
dBm/m²
1.07
1.09
1.11
1.13
1.15
1.17
1.19
1.21
1.23
Center Freq: 1.150 000 MHz
Span: 200.000 kHz

Spectrum Analyzer Data

KRMS-2019-REFERENCE (7/23/2019 11:00:08 AM)

Spectrum Analyzer

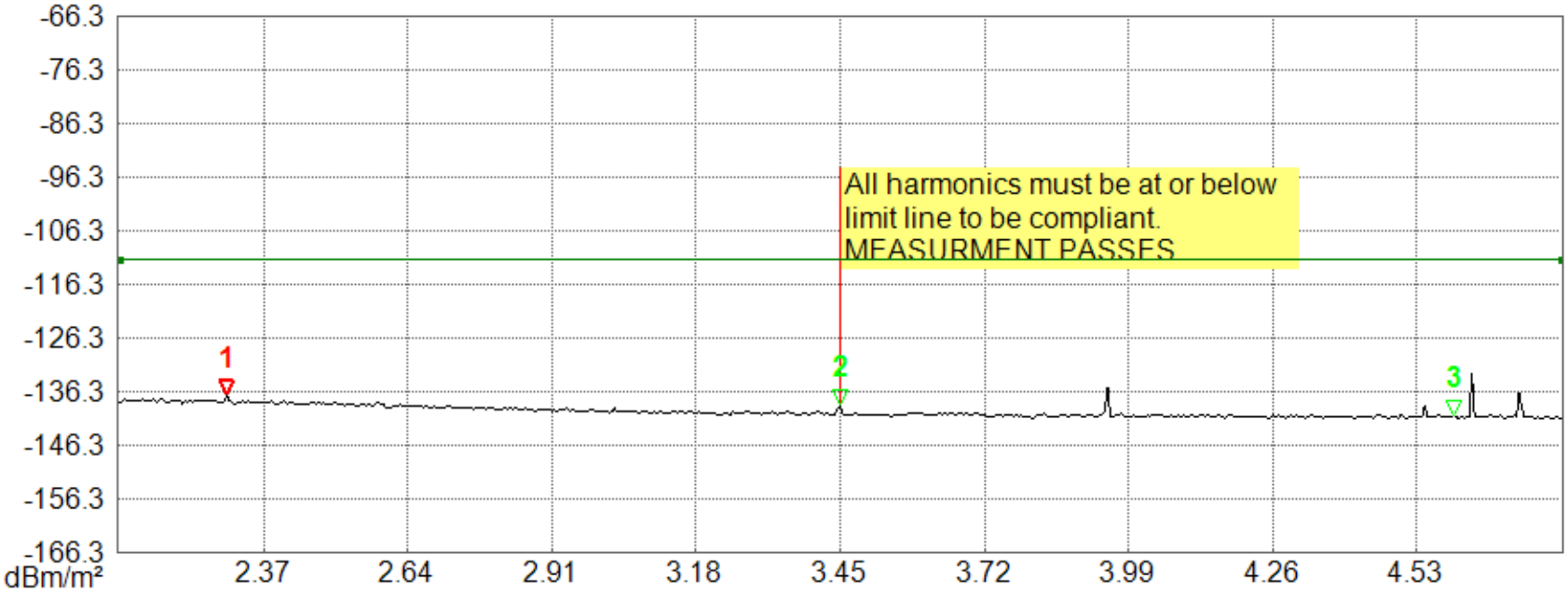


Mkr	Ref	Delta	Ref Freq	Ref Amp	Delta Freq	Delta Amp
1	■	☐	**1.150 0 MHz**	**-38.58dBm/m²**	--	--
2	☐	☐	--	--	--	--
3	☐	☐	--	--	--	--
4	☐	☐	--	--	--	--
5	☐	☐	--	--	--	--
6	☐	☐	--	--	--	--

Spectrum Analyzer Data

KRMS-2019-HARMONICS (7/23/2019 11:03:34 AM)

Spectrum Analyzer



Mkr	Ref	Delta	Ref Freq	Ref Amp	Delta Freq	Delta Amp
1	■	☐	**2.300 0 MHz**	**-136.79dBm/m²**	--	--
2	■	☐	3.450 0 MHz	-138.65dBm/m²	--	--
3	■	☐	4.600 0 MHz	-140.71dBm/m²	--	--
4	☐	☐	--	--	--	--
5	☐	☐	--	--	--	--
6	☐	☐	--	--	--	--