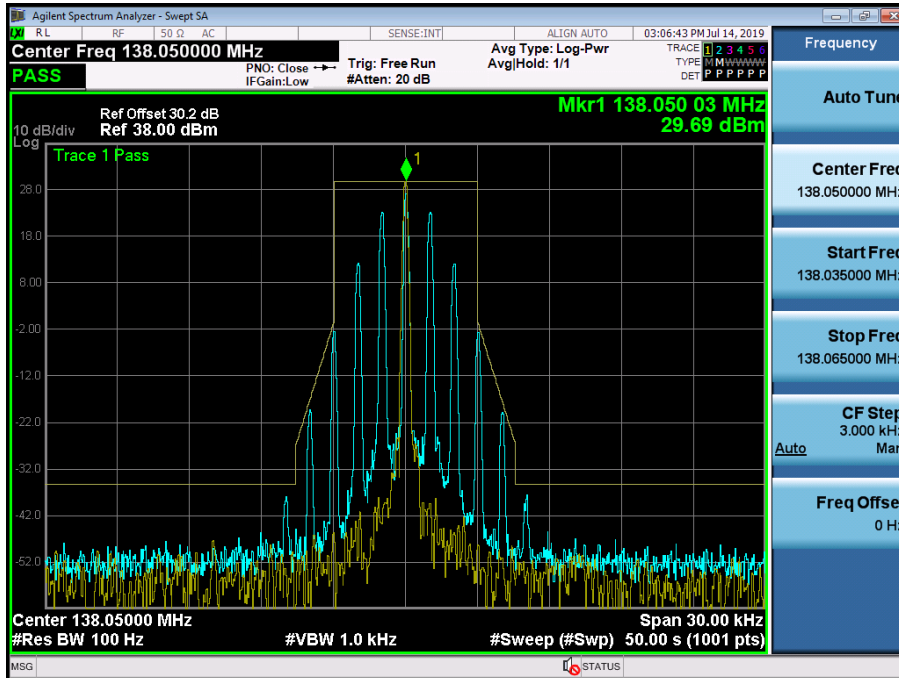
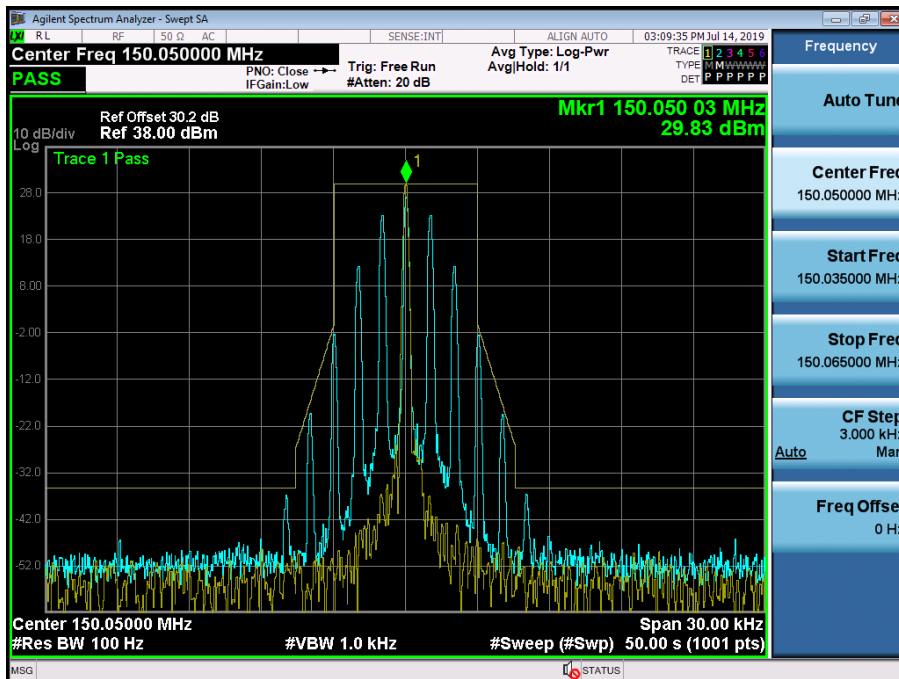


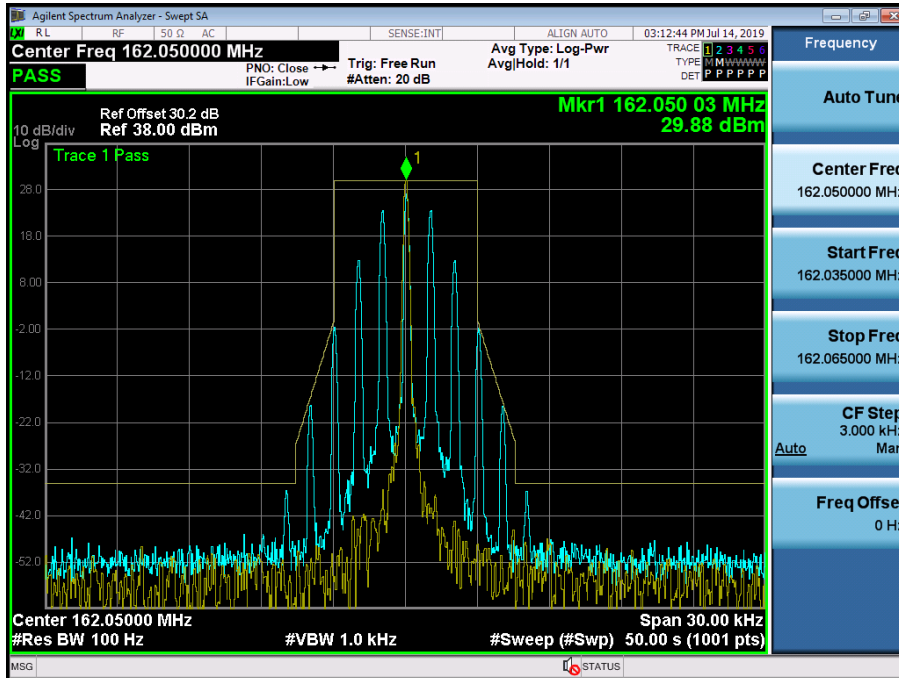
(138.05 MHz)_Low



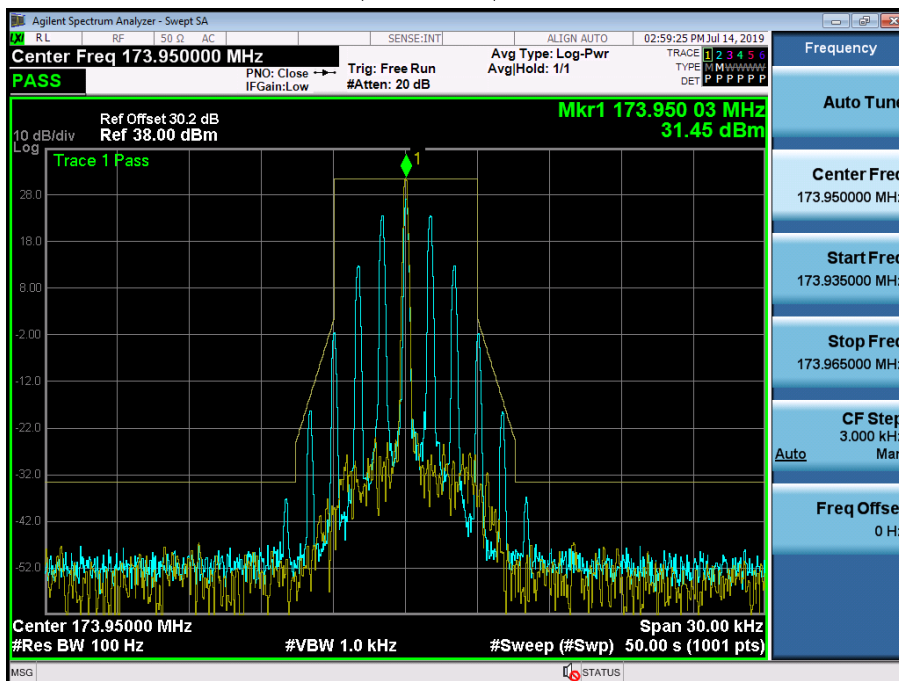
(150.05 MHz)_Low



(162.05 MHz)_Low



(173.95 MHz)_Low

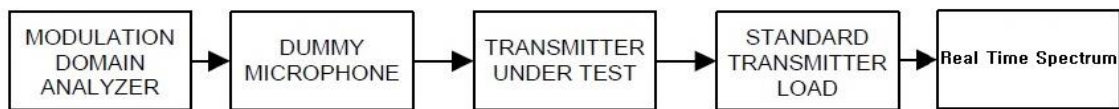


8.7 Transient Frequency Behavior

■ Definition

Transient frequency behavior is a measure of the difference, as a function in time, of the actual transmitter frequency to the assigned transmitter frequency when the transmitted RF output power is switched on or off.

■ TEST CONFIGURATION



■ TEST PROCEDURE

According to 2.2.19 in TIA-603-E Standard.

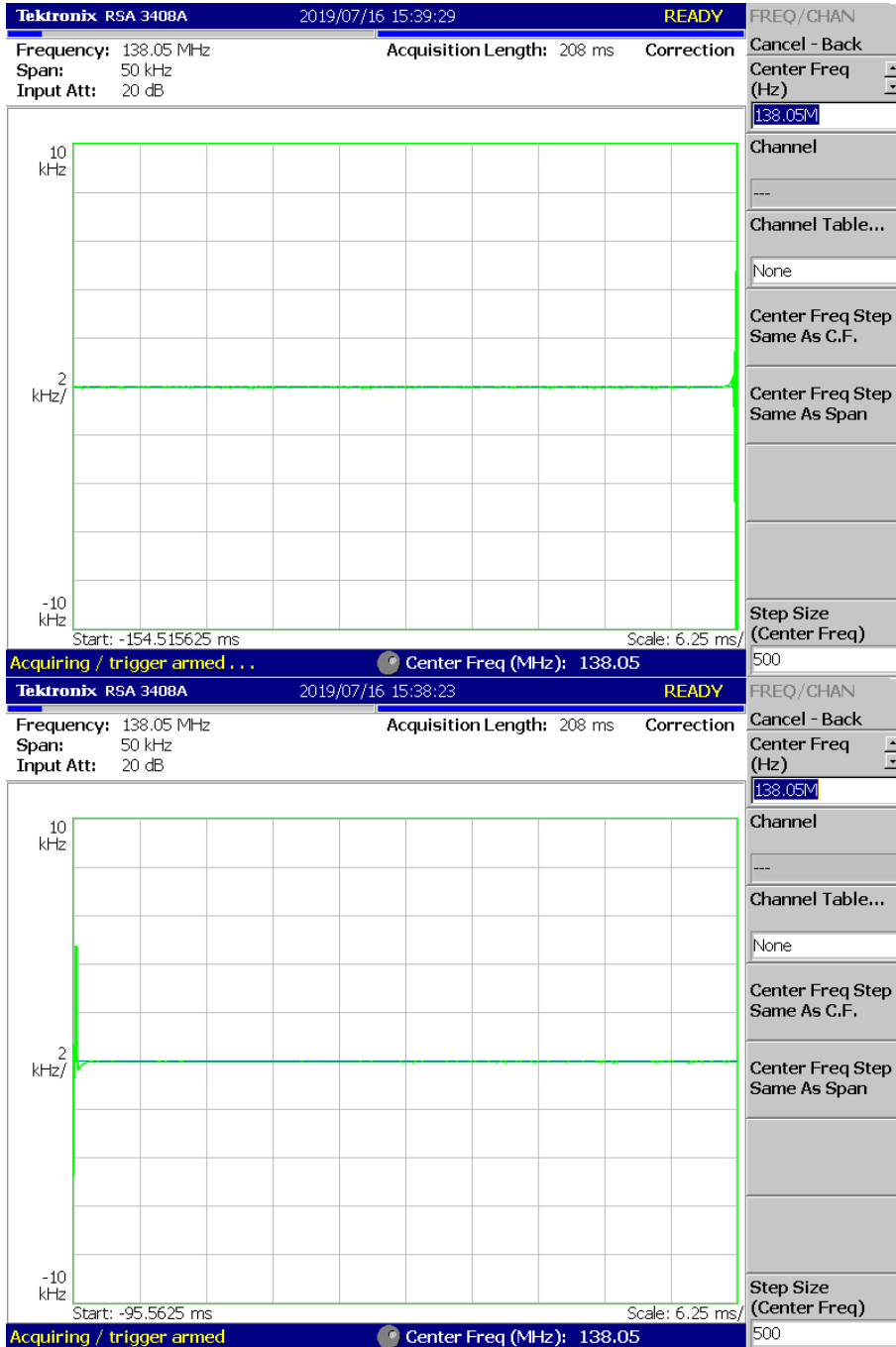
- a) Connect the equipment as illustrated.
- b) Connect the output of the standard transmitter load to the RF power meter.
Supply sufficient attenuation via the RF attenuator to provide a level that is approximately 40 dB below the maximum allowable input to the modulation domain analyzer.
- c) Unkey the transmitter.
- d) Disconnect the RF power meter and connect the modulation domain analyzer in its place.
Set the envelope trigger of the modulation domain analyzer to the minimum level that will trigger when the transmitter is keyed.
- e) Reduce the attenuation of the RF attenuator so that the input to the modulation domain analyzer is increased by 30 dB when the transmitter is keyed.
- f) Set the modulation domain analyzer to trigger on the rising edge of the waveform in order to capture a single-shot turn-on of the transmitter signal.
- g) Adjust the display of the modulation domain analyzer for proper viewing of the transmitter transient behavior. Set the time base reference to the left for observing the transmitter turn-on transient.
- h) Key the transmitter.
- i) Observe the stored display of the modulation domain analyzer.
The signal trace shall be maintained within the allowable limits during the periods t_1 and t_2 , and shall also remain within limits following t_2 .
- j) Adjust the modulation domain analyzer to trigger on the falling edge of the transmitter waveform in order to capture a single-shot turn-off transient of the transmitter signal.

- k) Adjust the display of the modulation domain analyzer for proper viewing of the transmitter transient behavior. Set the time base reference to the right for observing the transmitter turn-off transient.
- l) Unkey the transmitter.
- m) Observe the stored display of the modulation domain analyzer. The signal trace shall be maintained within the allowable limits during the period t_3 .

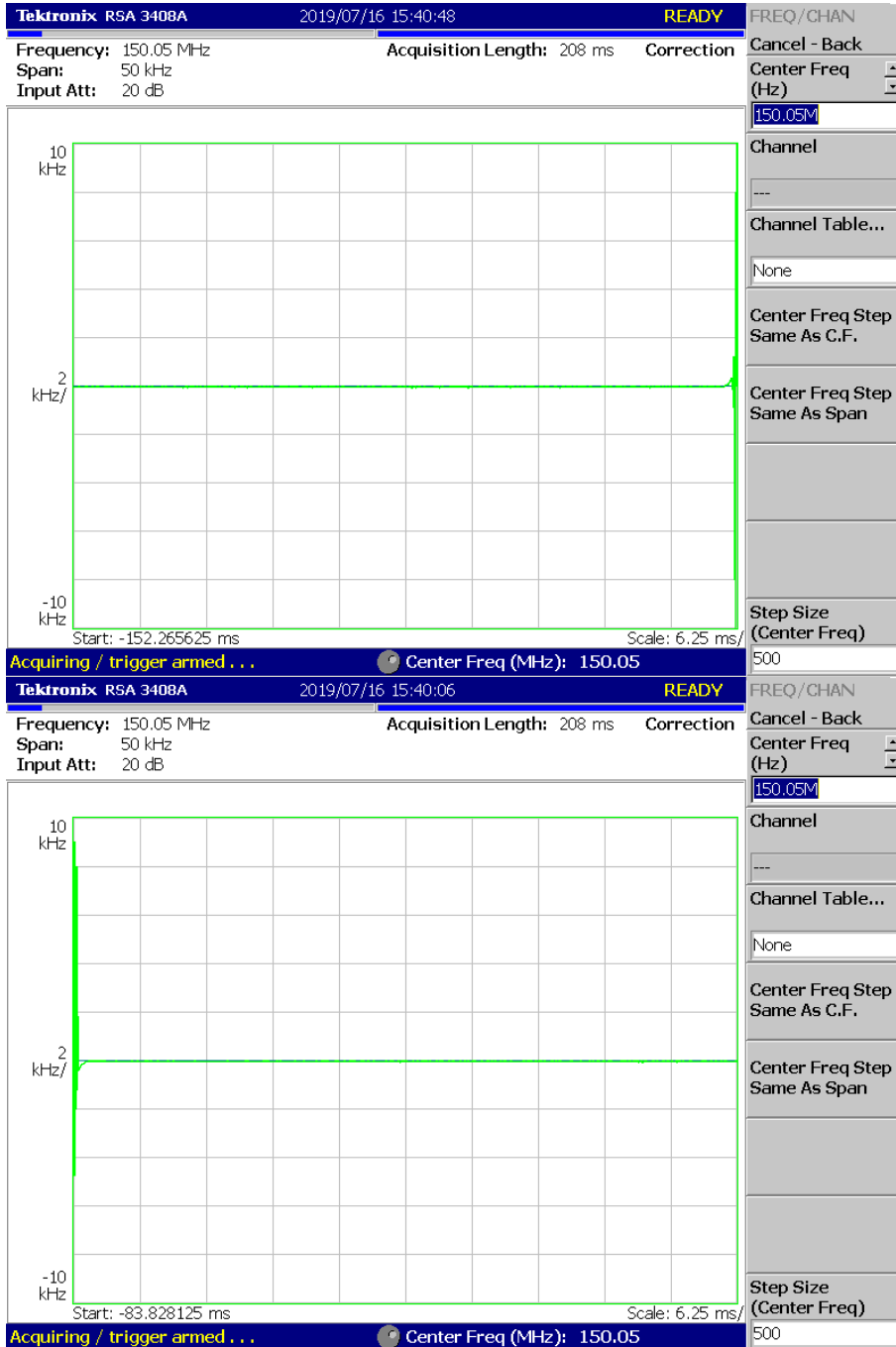
Plots of Transient Frequency Behavior

11K0F3E

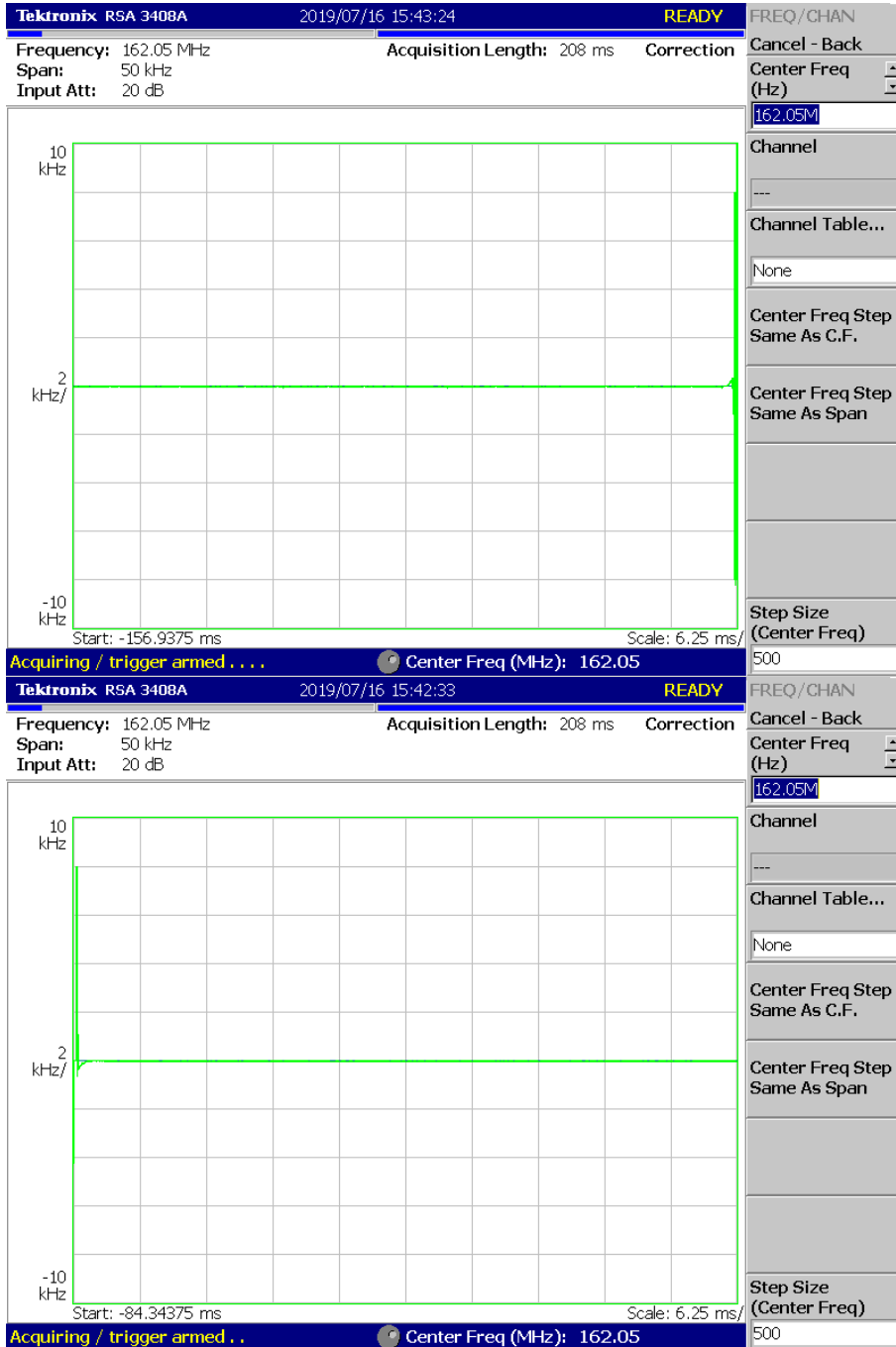
(138.05 MHz)_High



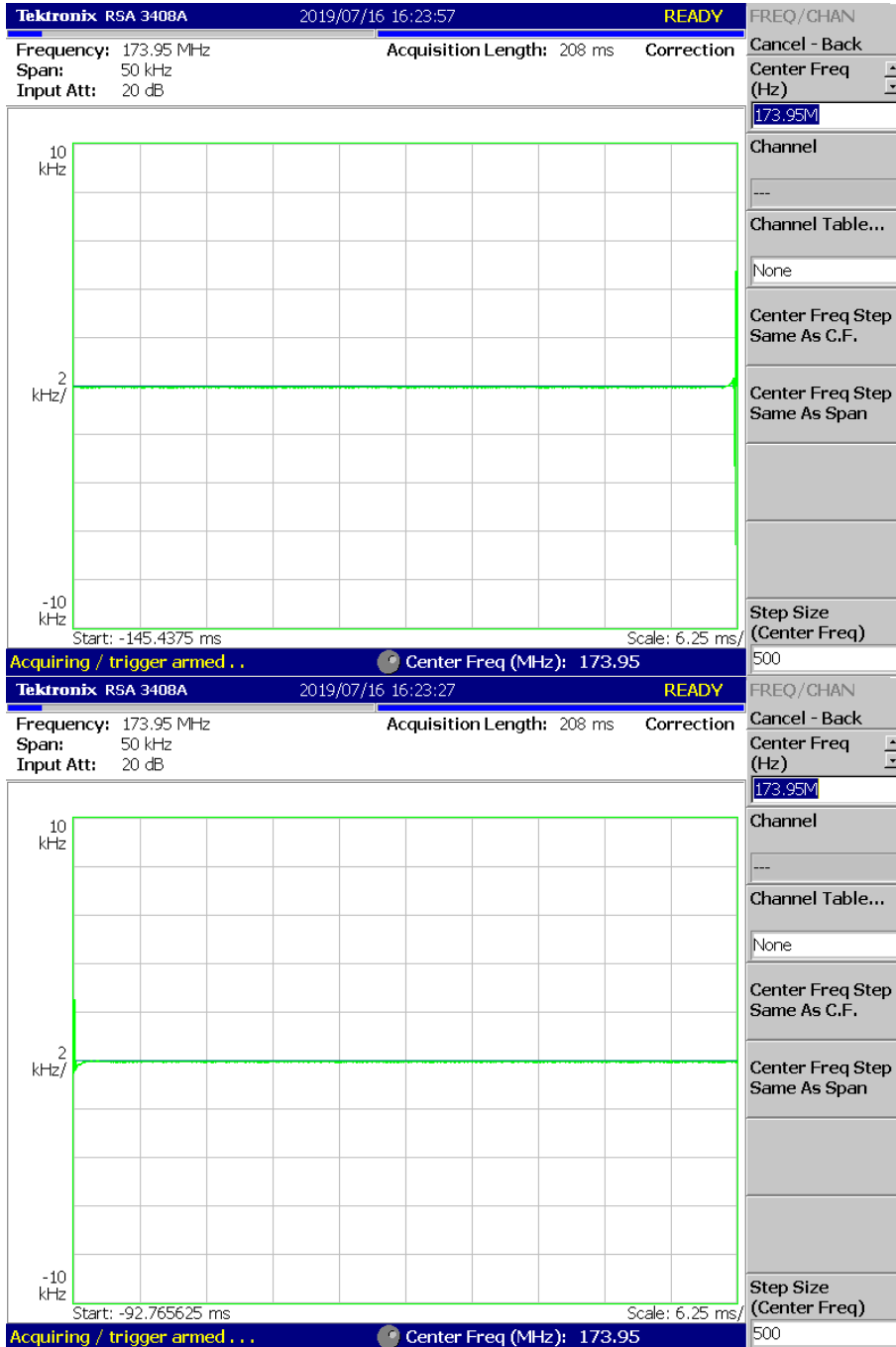
(150.05 MHz)_High



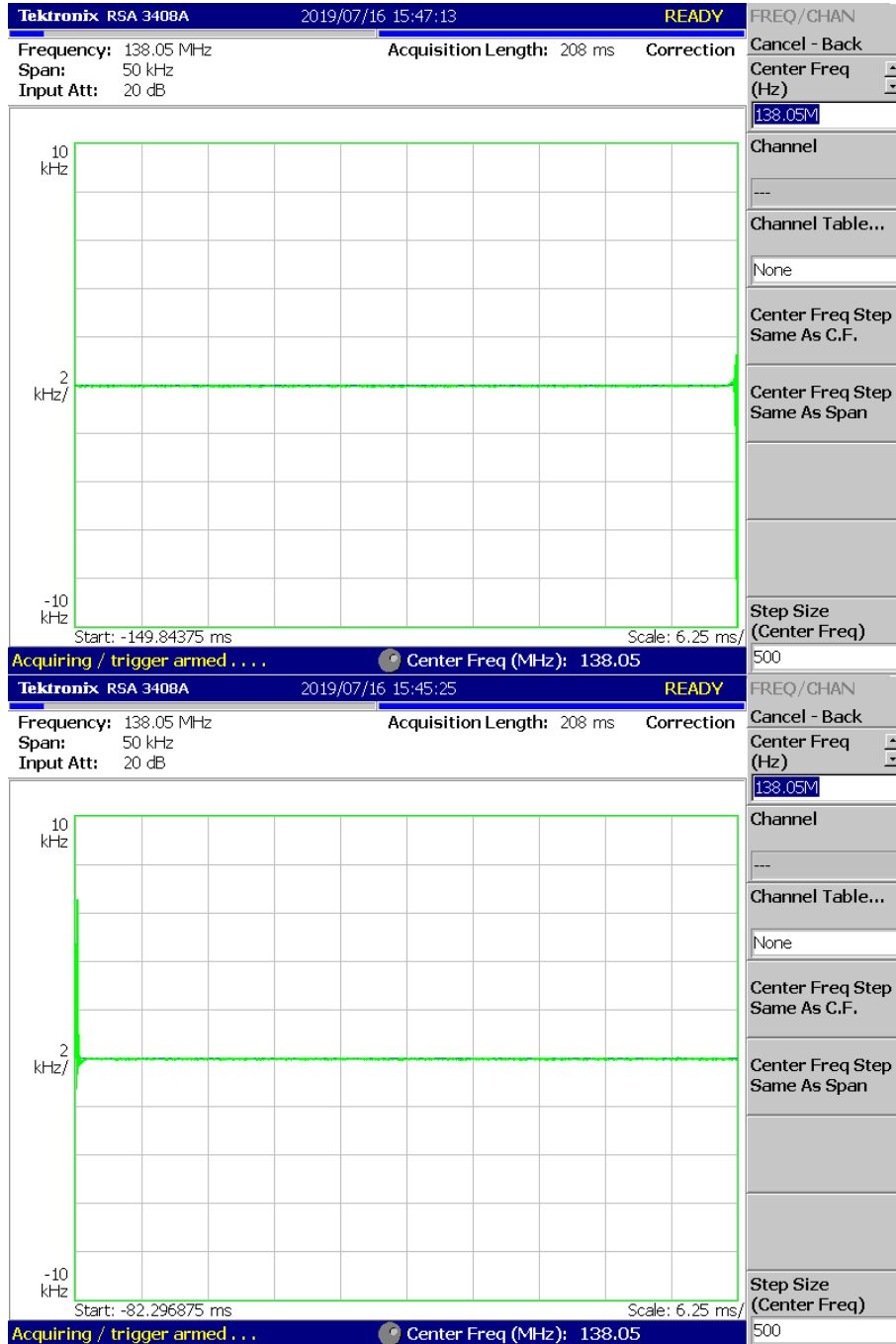
(162.05 MHz)_High



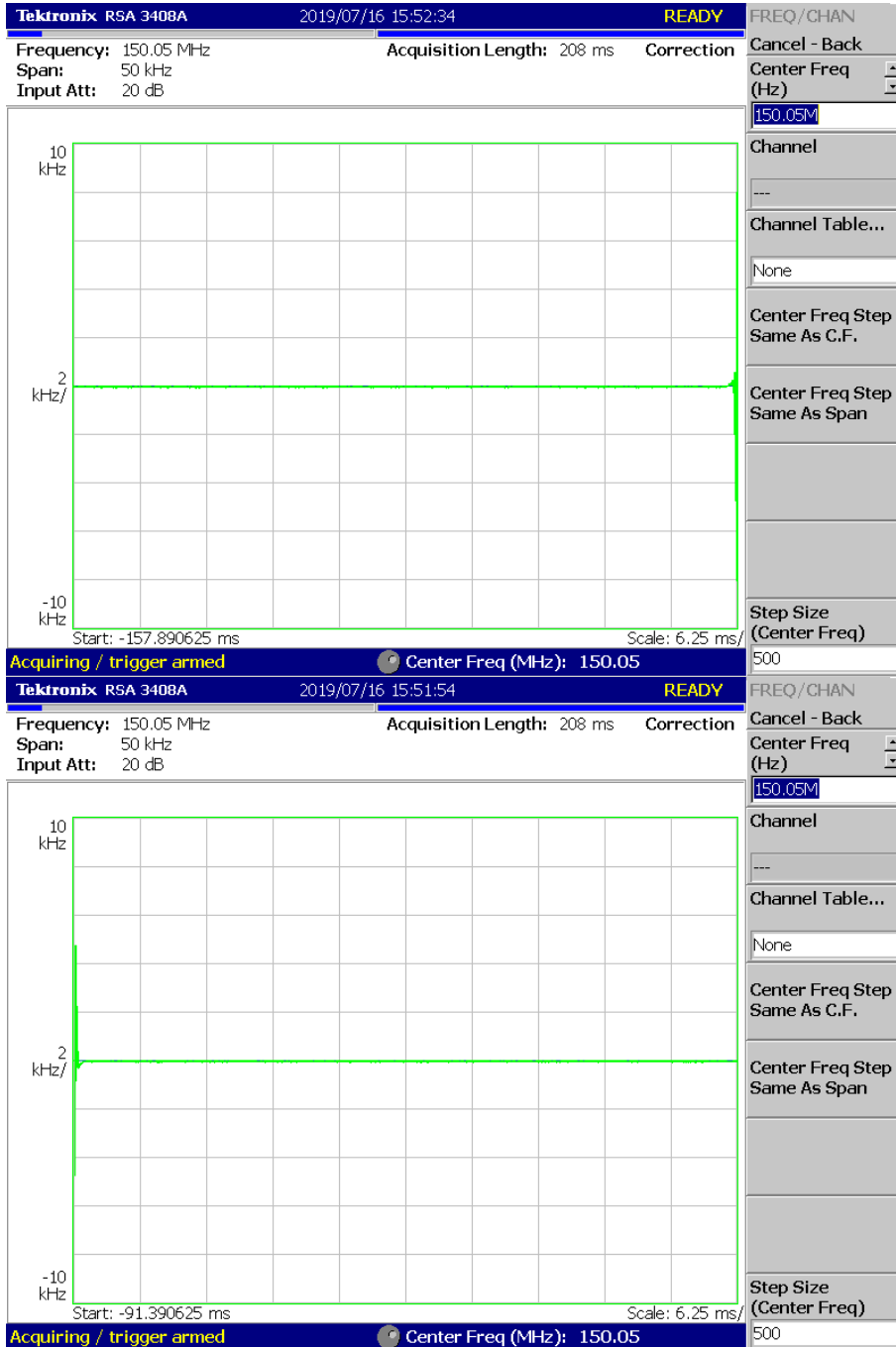
(173.95 MHz)_High



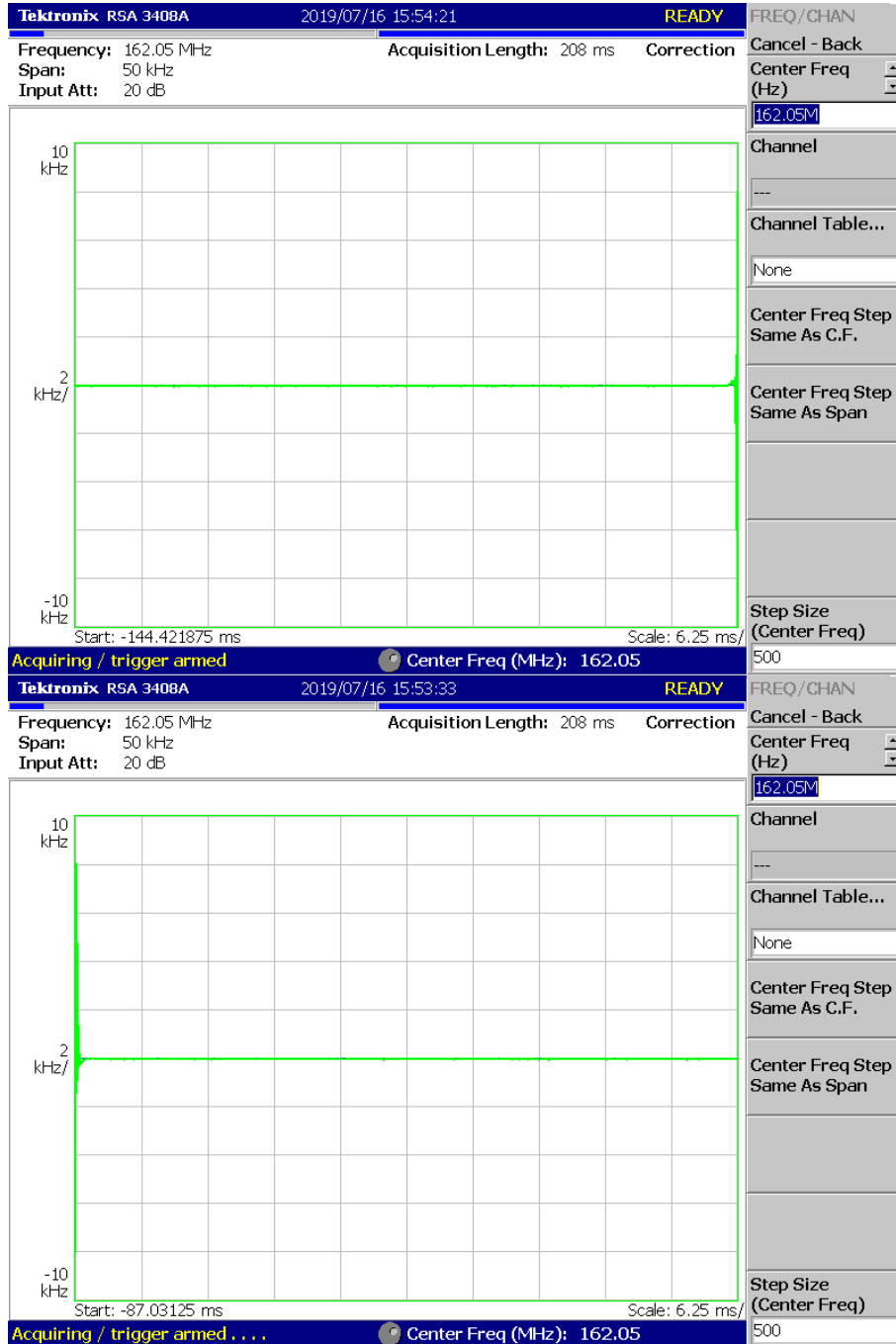
(138.05 MHz)_Low



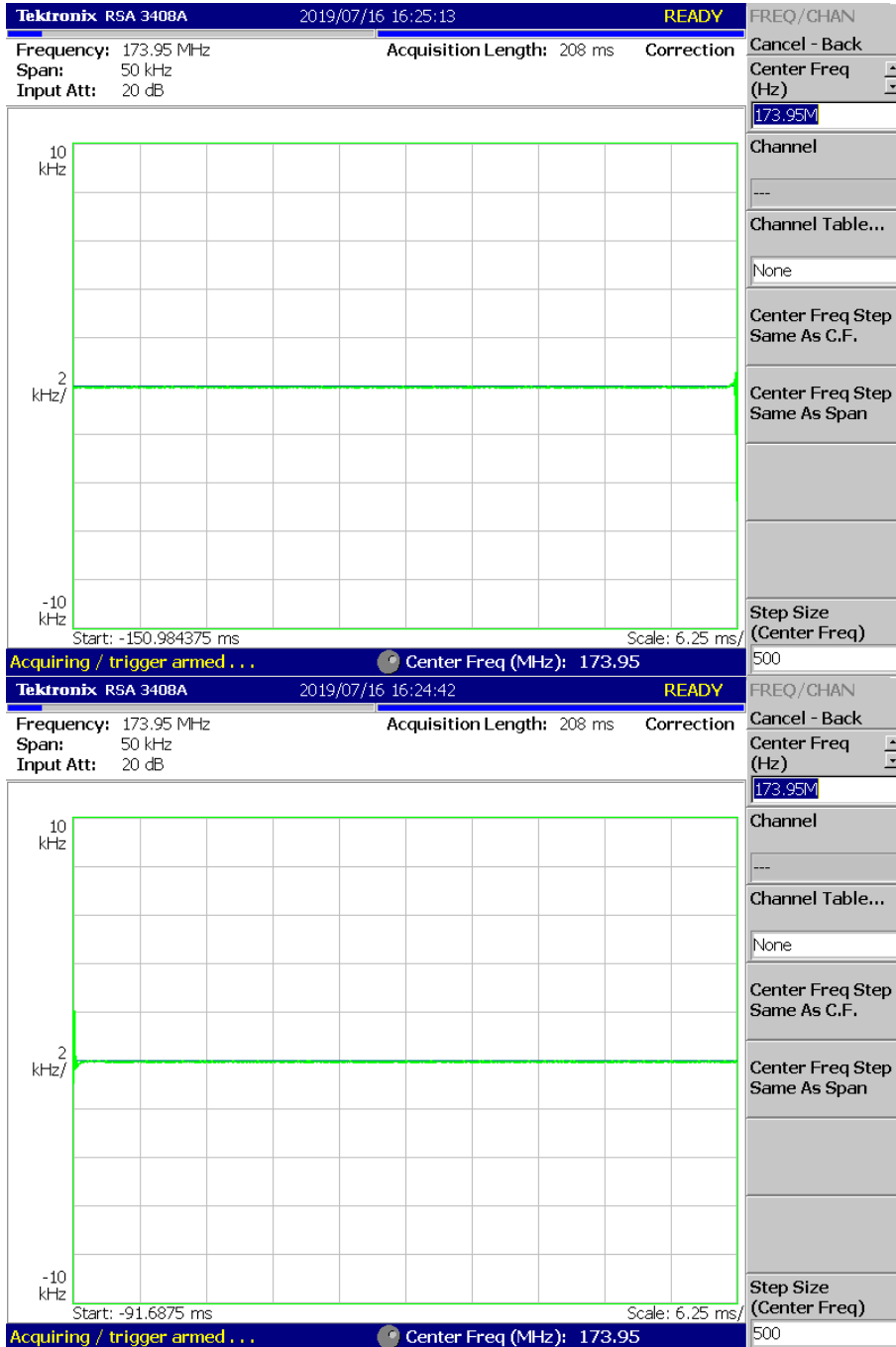
(150.05 MHz)_ Low



(162.05 MHz)_ Low

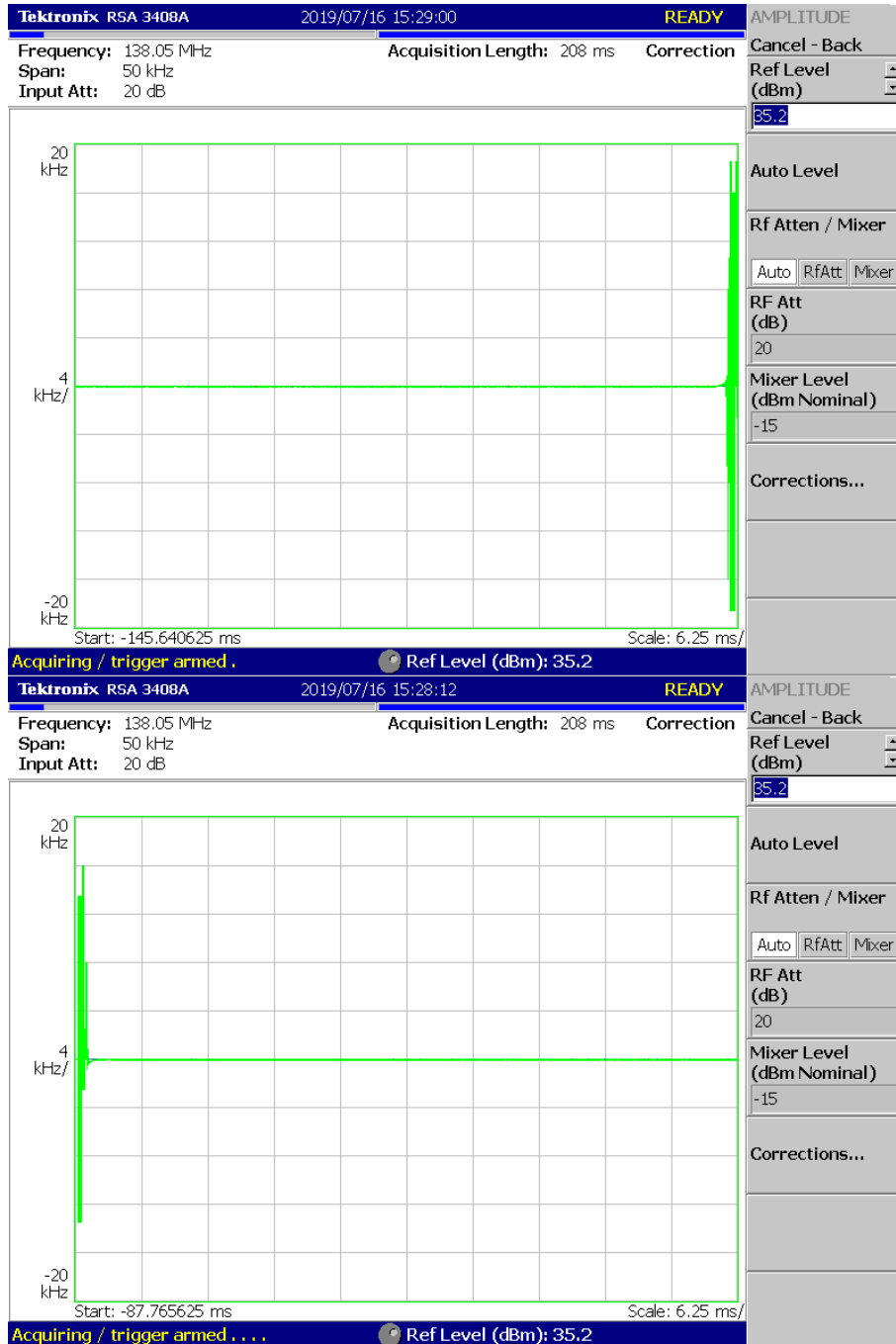


(173.95 MHz)_Low

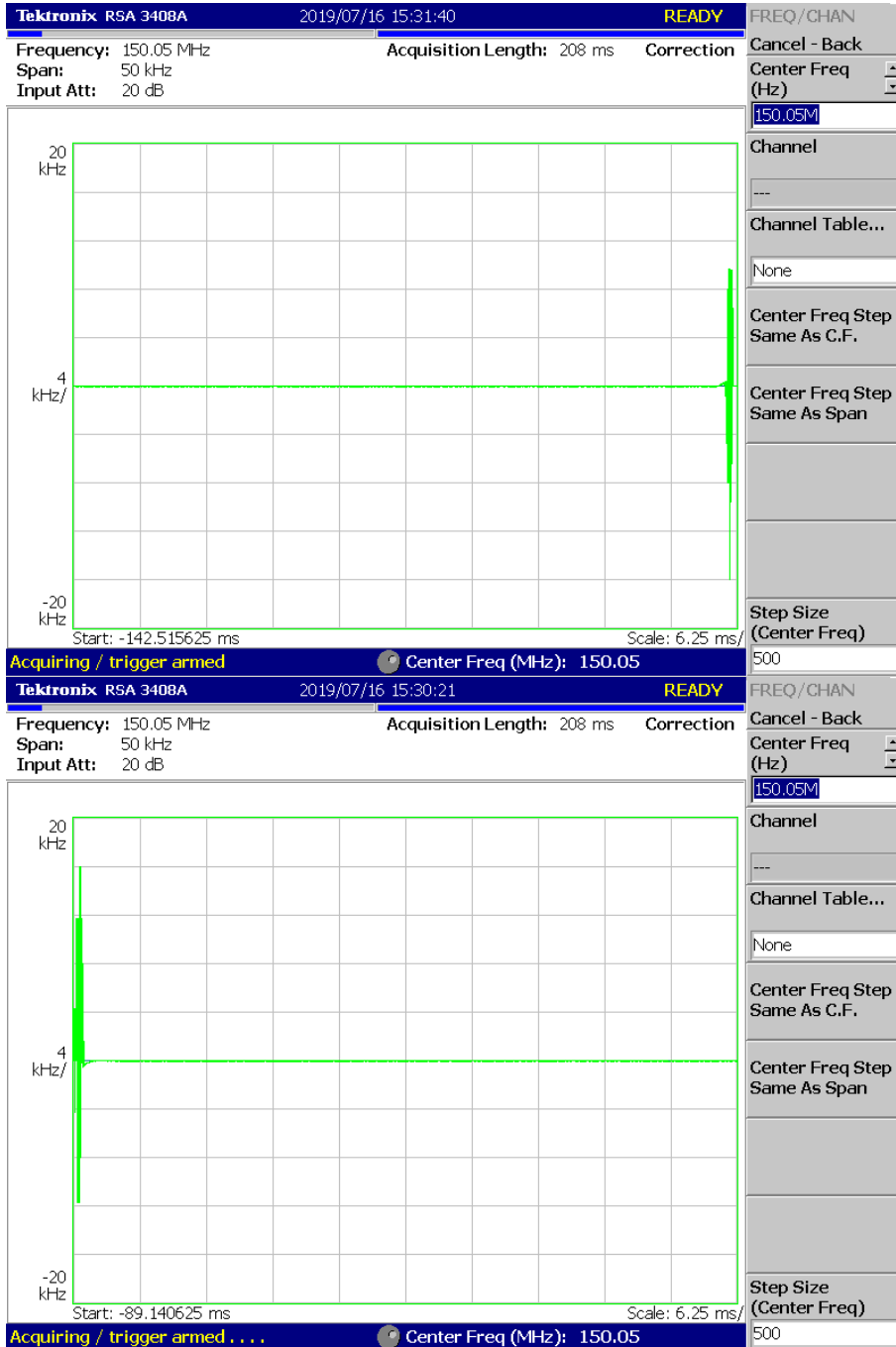


16K0F3E

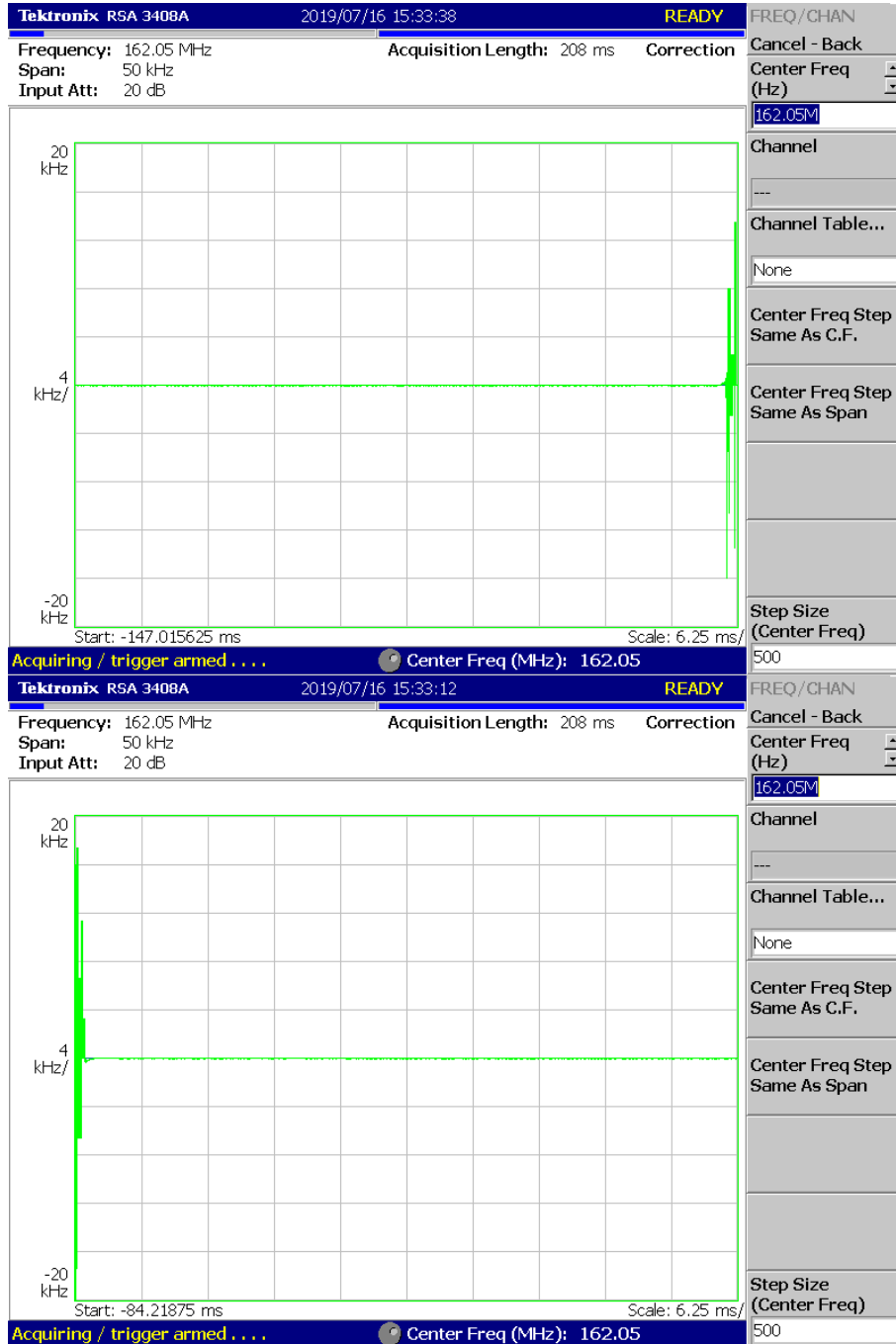
(138.05 MHz)_High



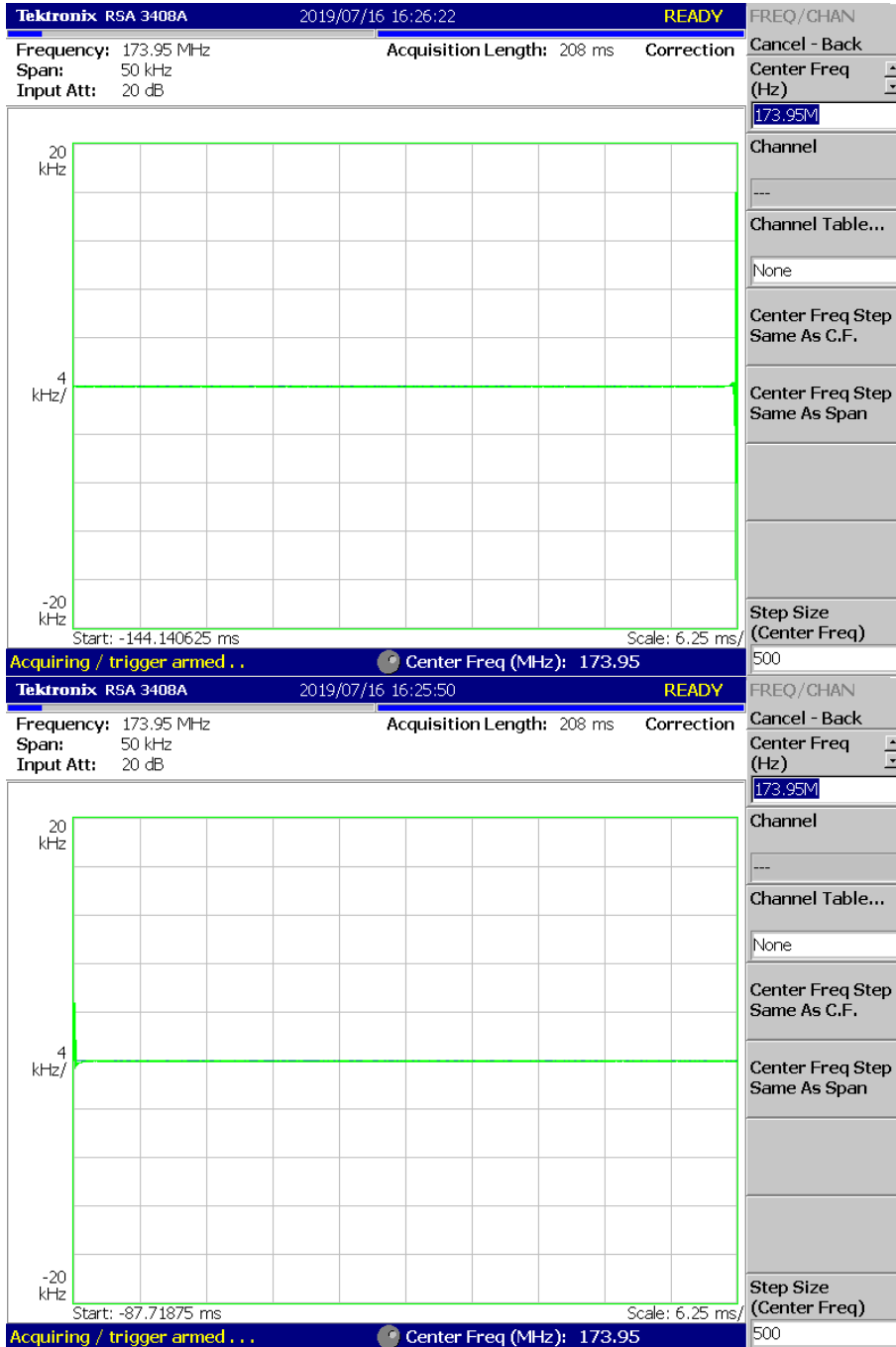
(150.05 MHz)_High



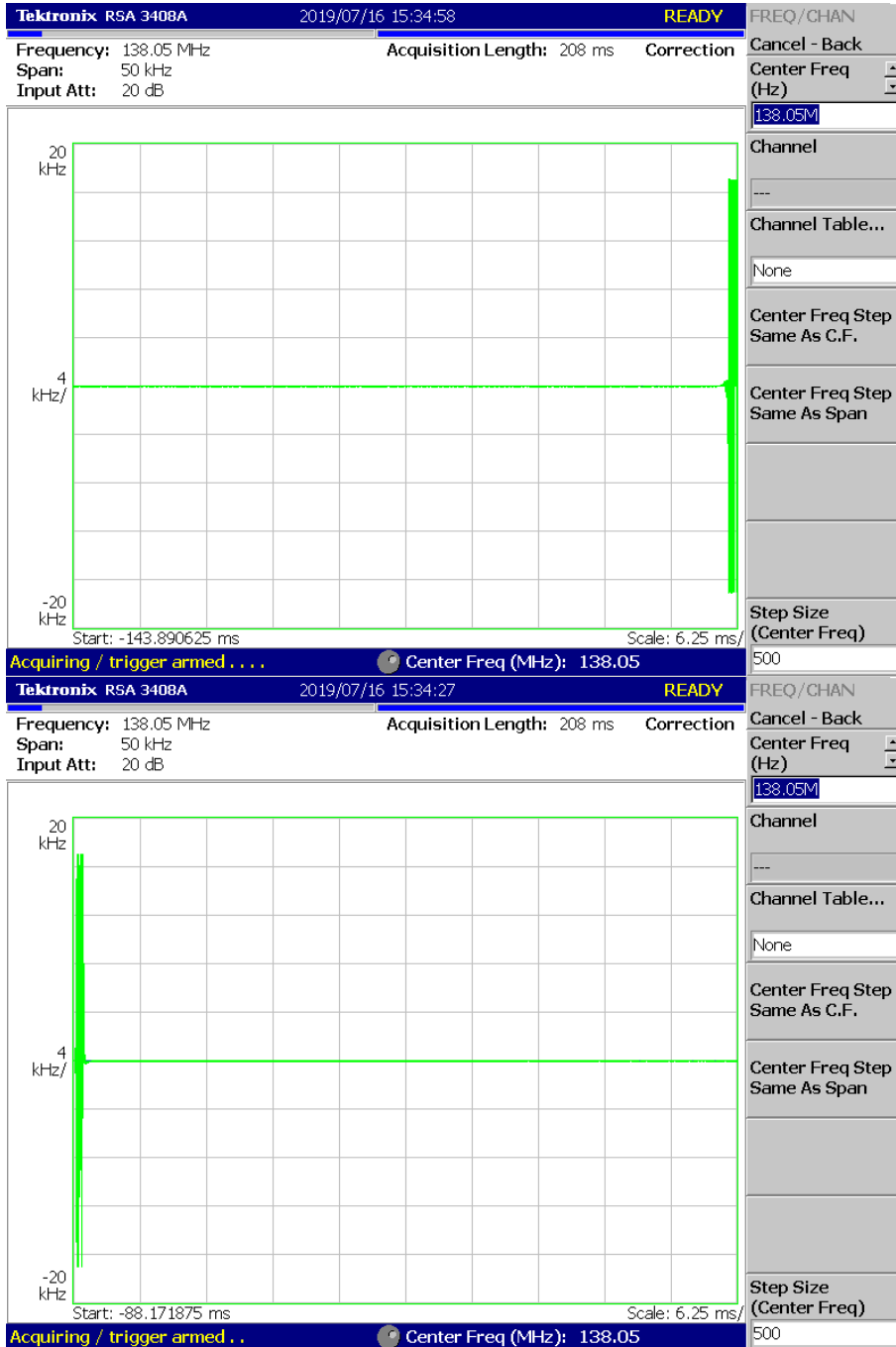
(162.05 MHz)_High



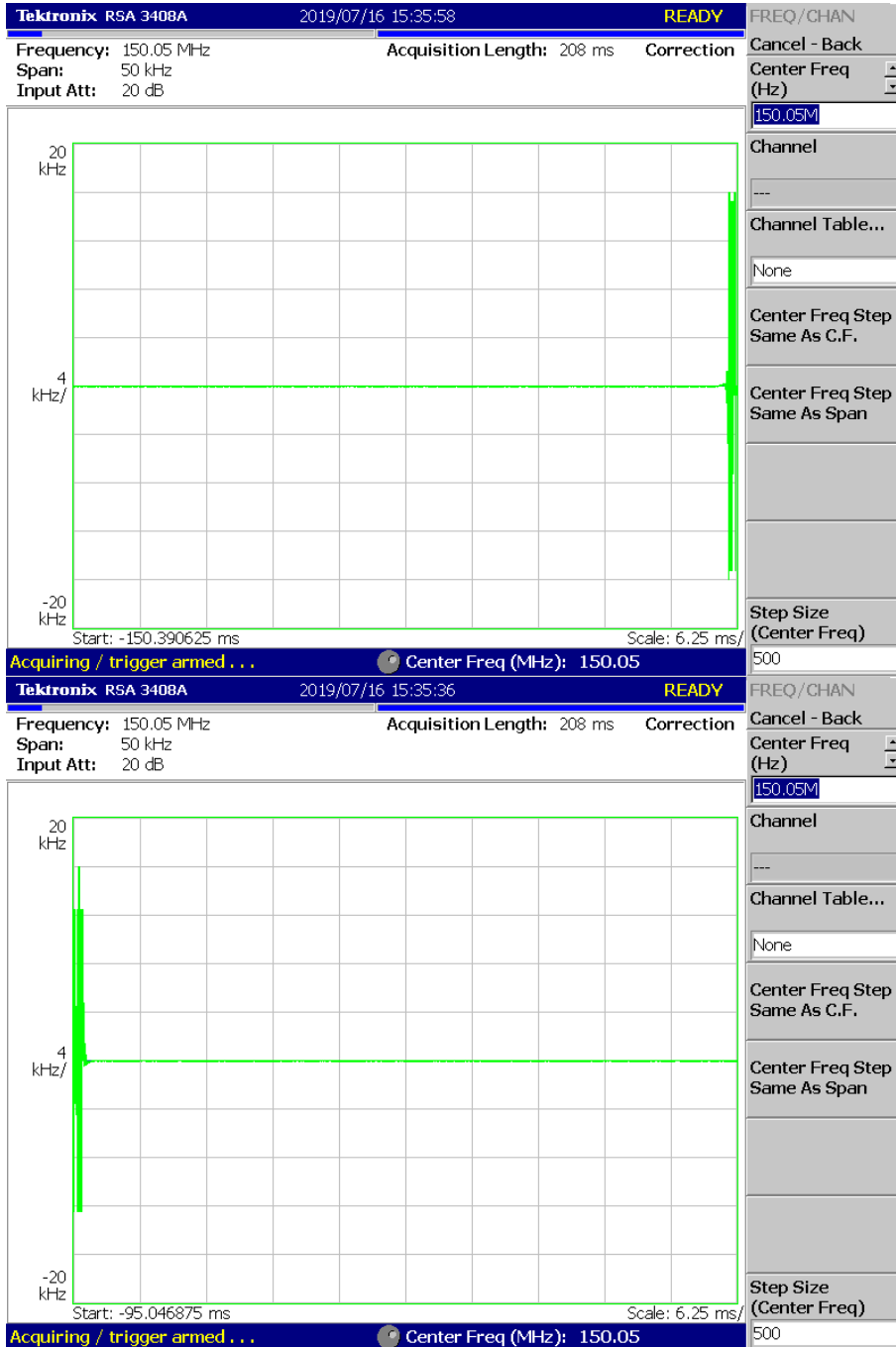
(173.95 MHz)_High



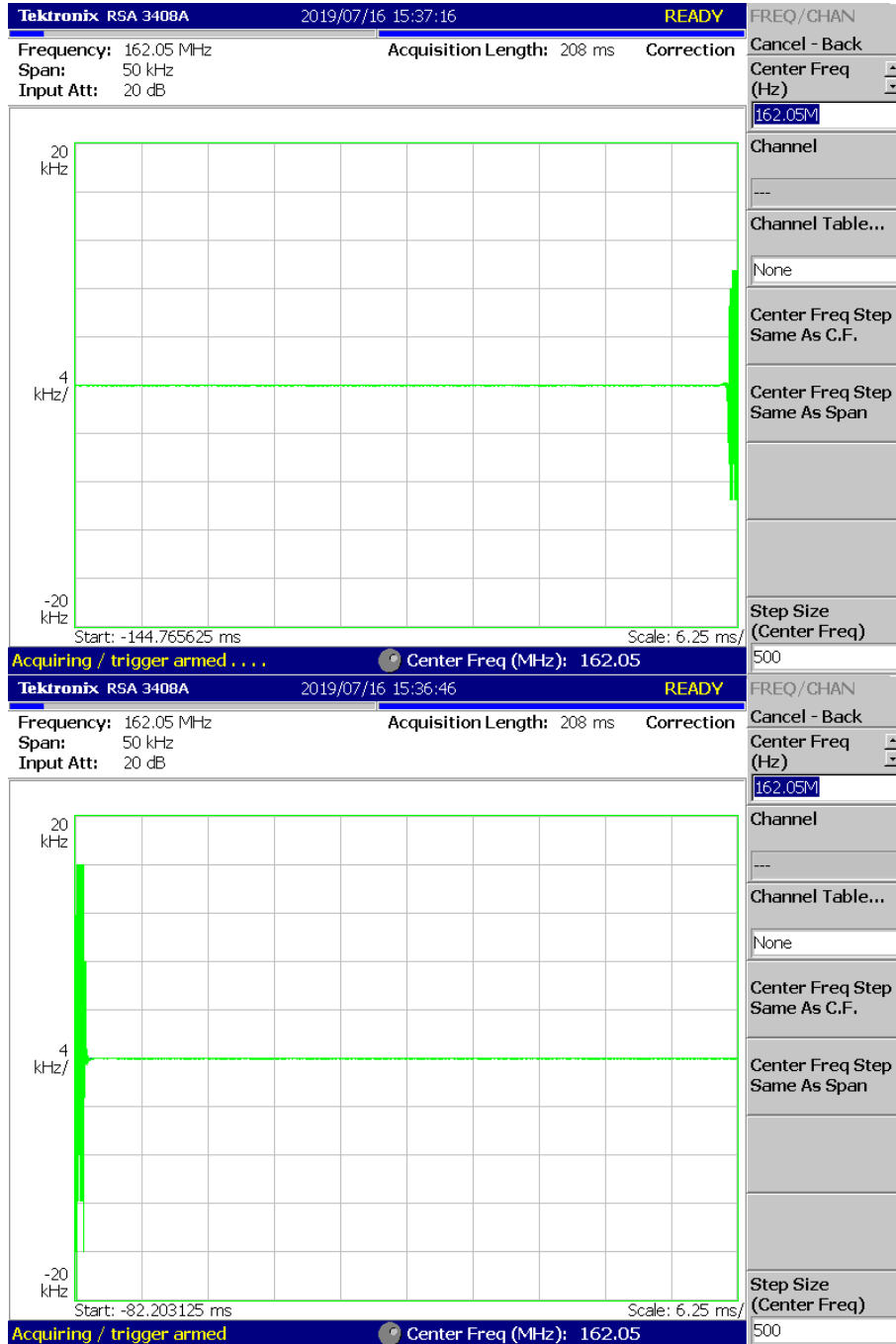
(138.05 MHz)_Low



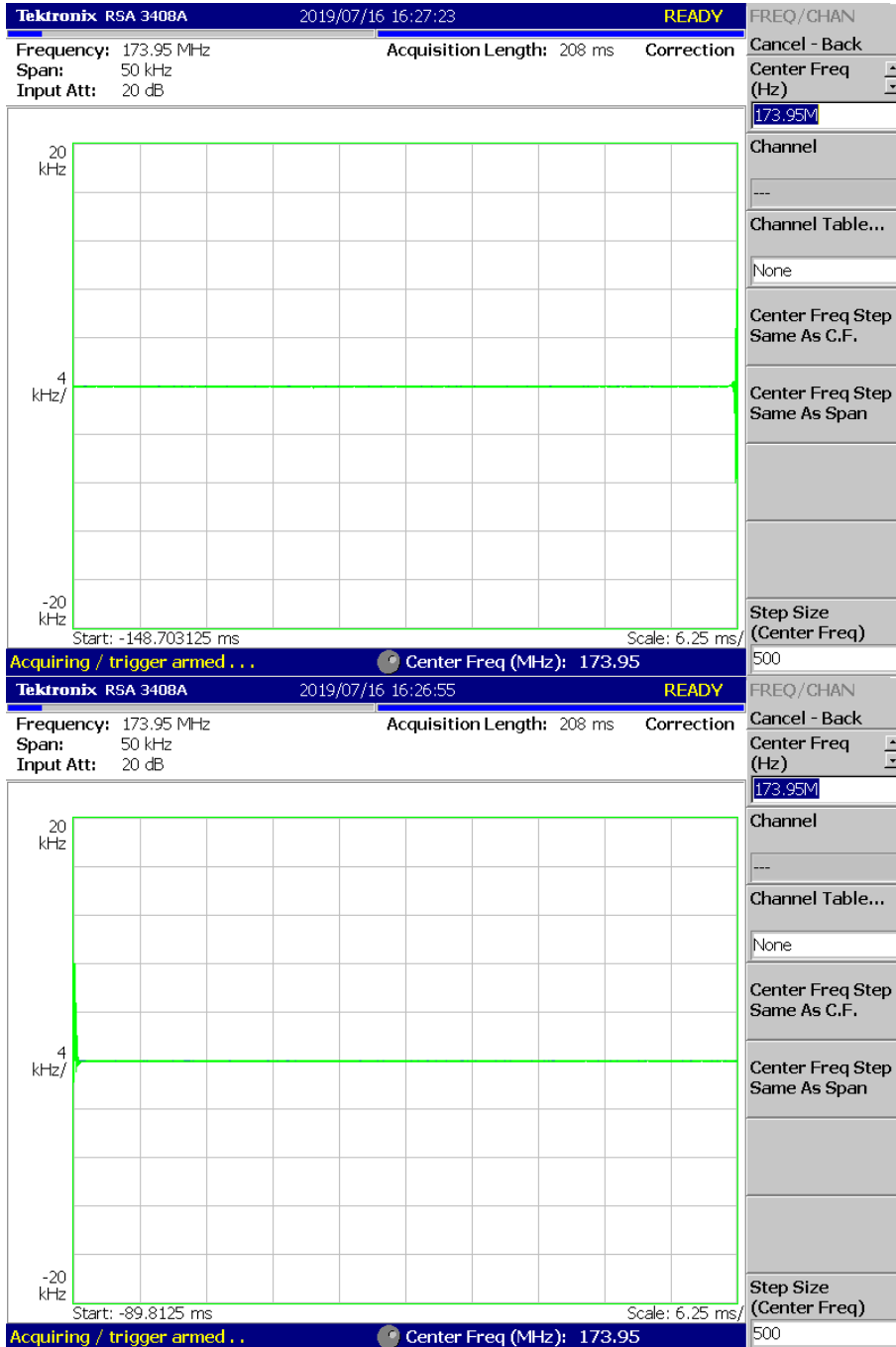
(150.05 MHz)_Low



(162.05 MHz)_Low



(173.95 MHz)_Low

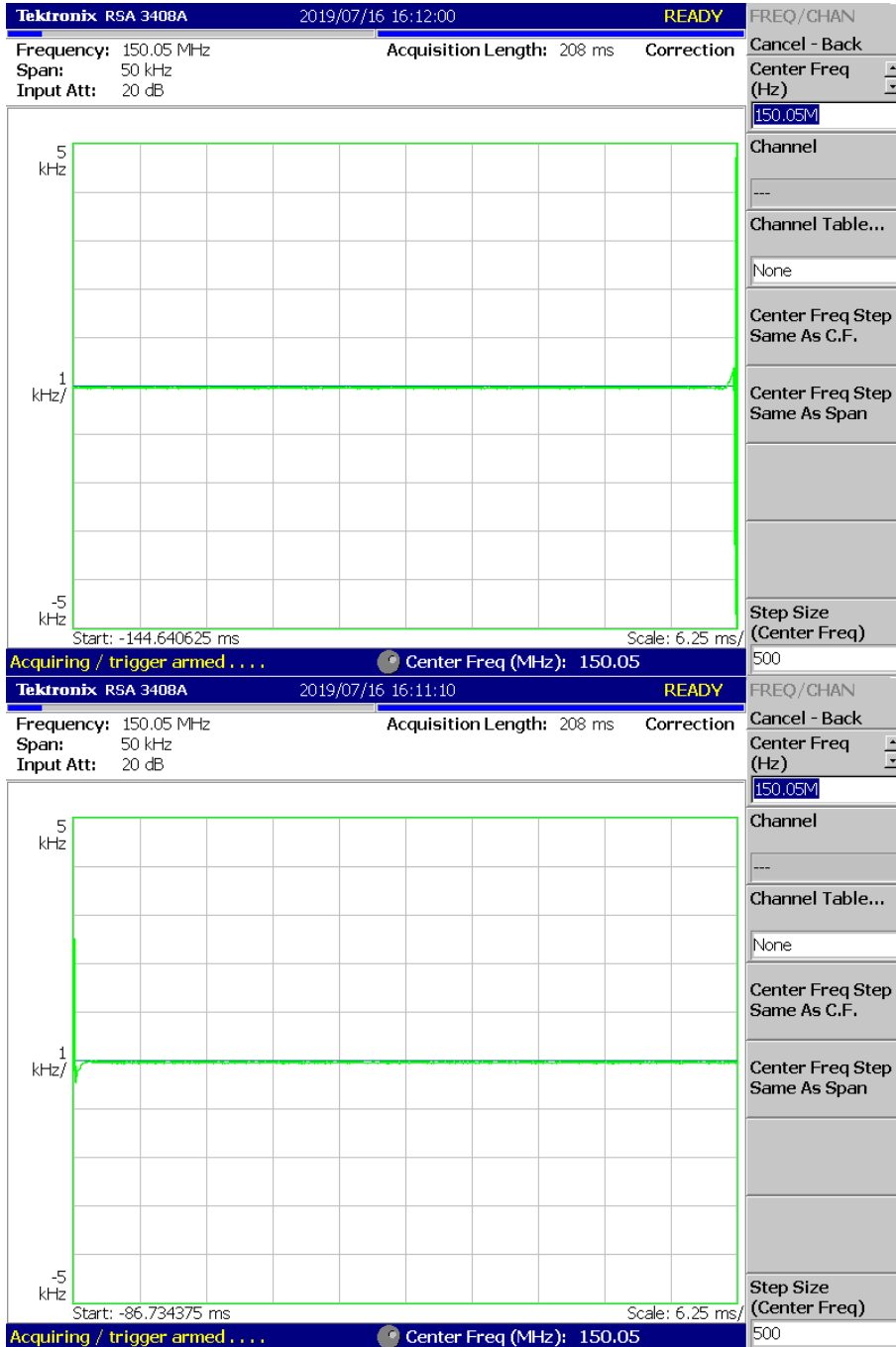


4K00F1E, 4K00F1D, 4K00F7W

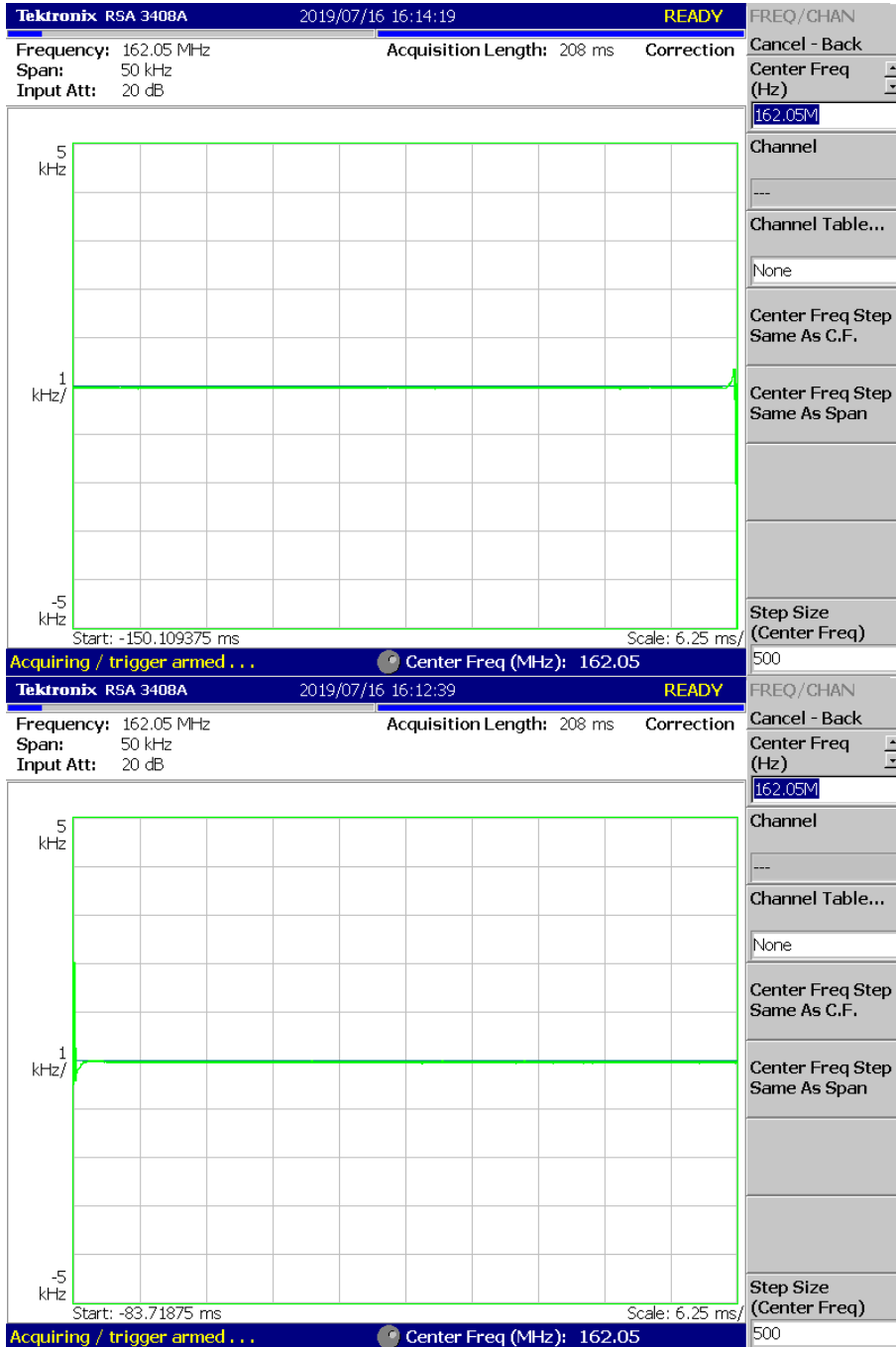
(138.05 MHz)_High



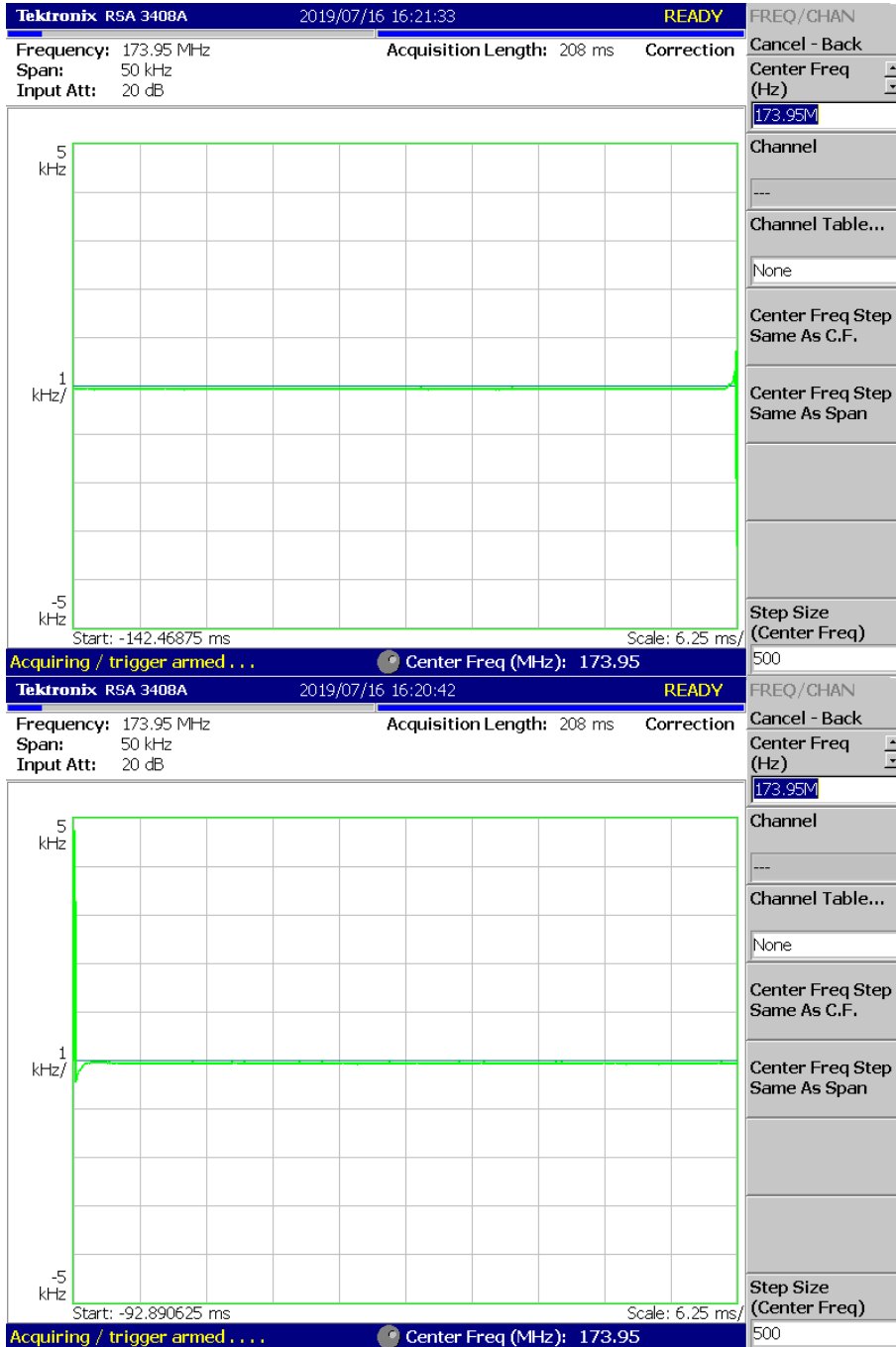
(150.05 MHz)_High



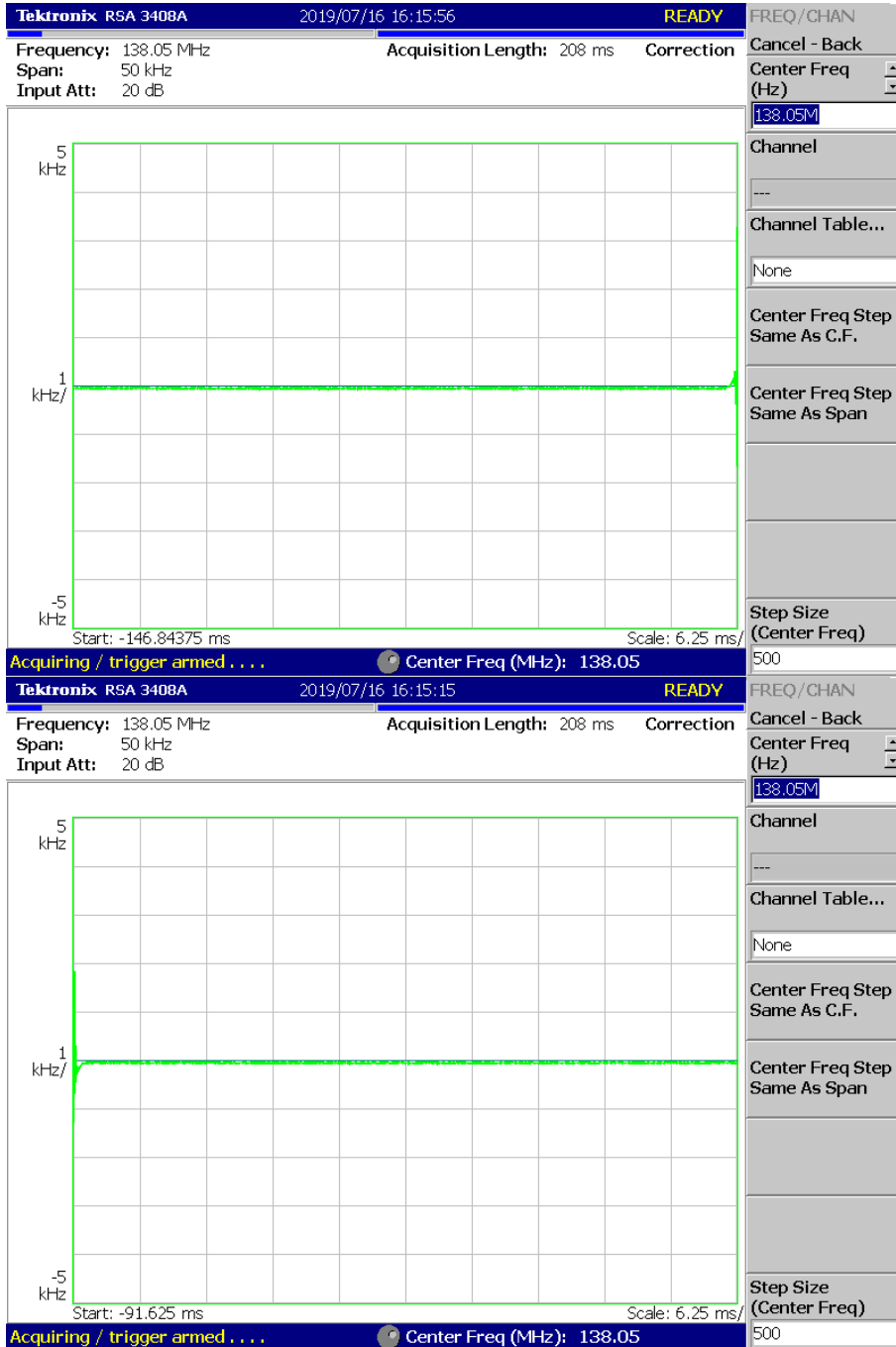
(162.05 MHz)_High



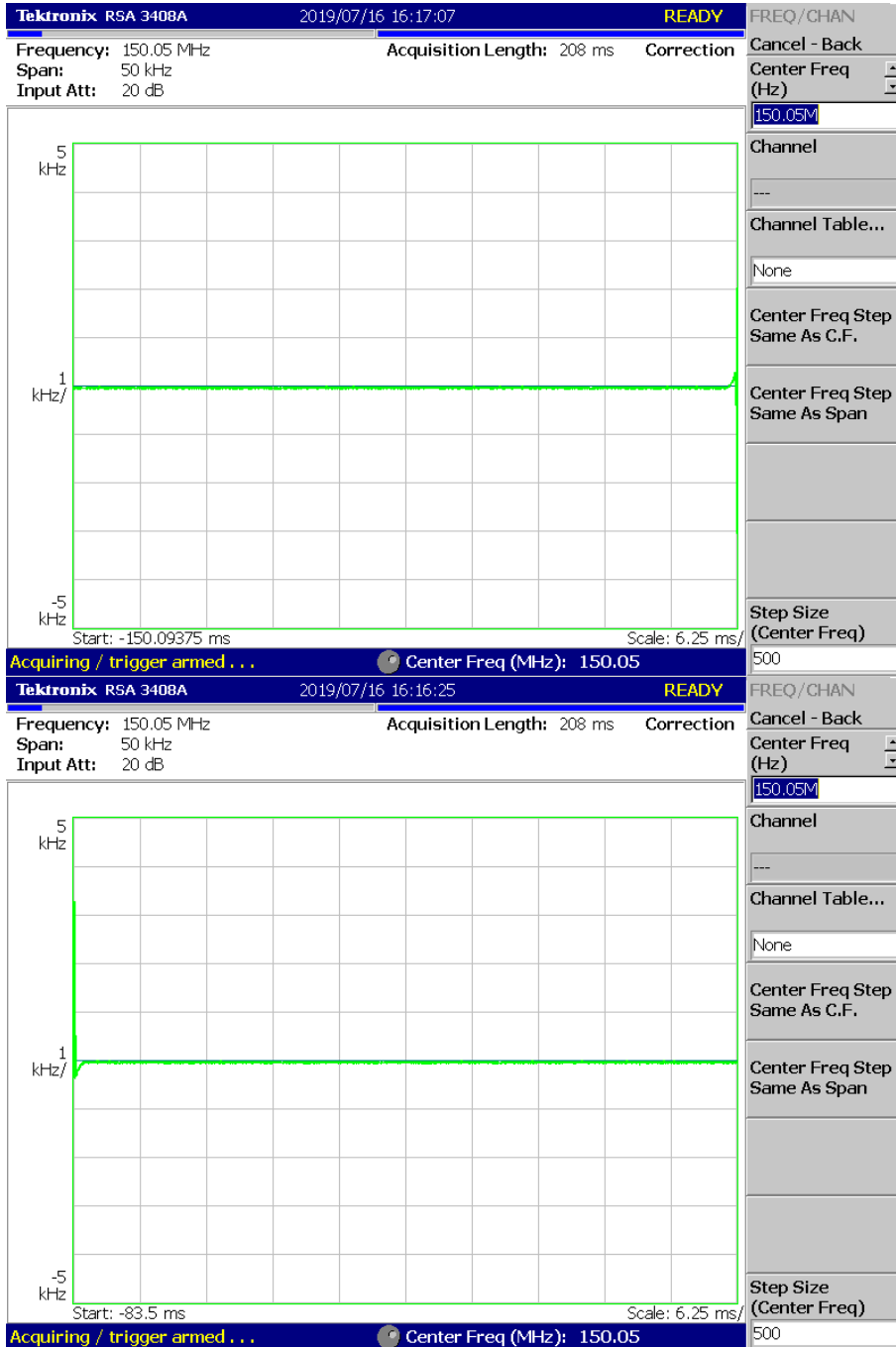
(173.95 MHz)_High



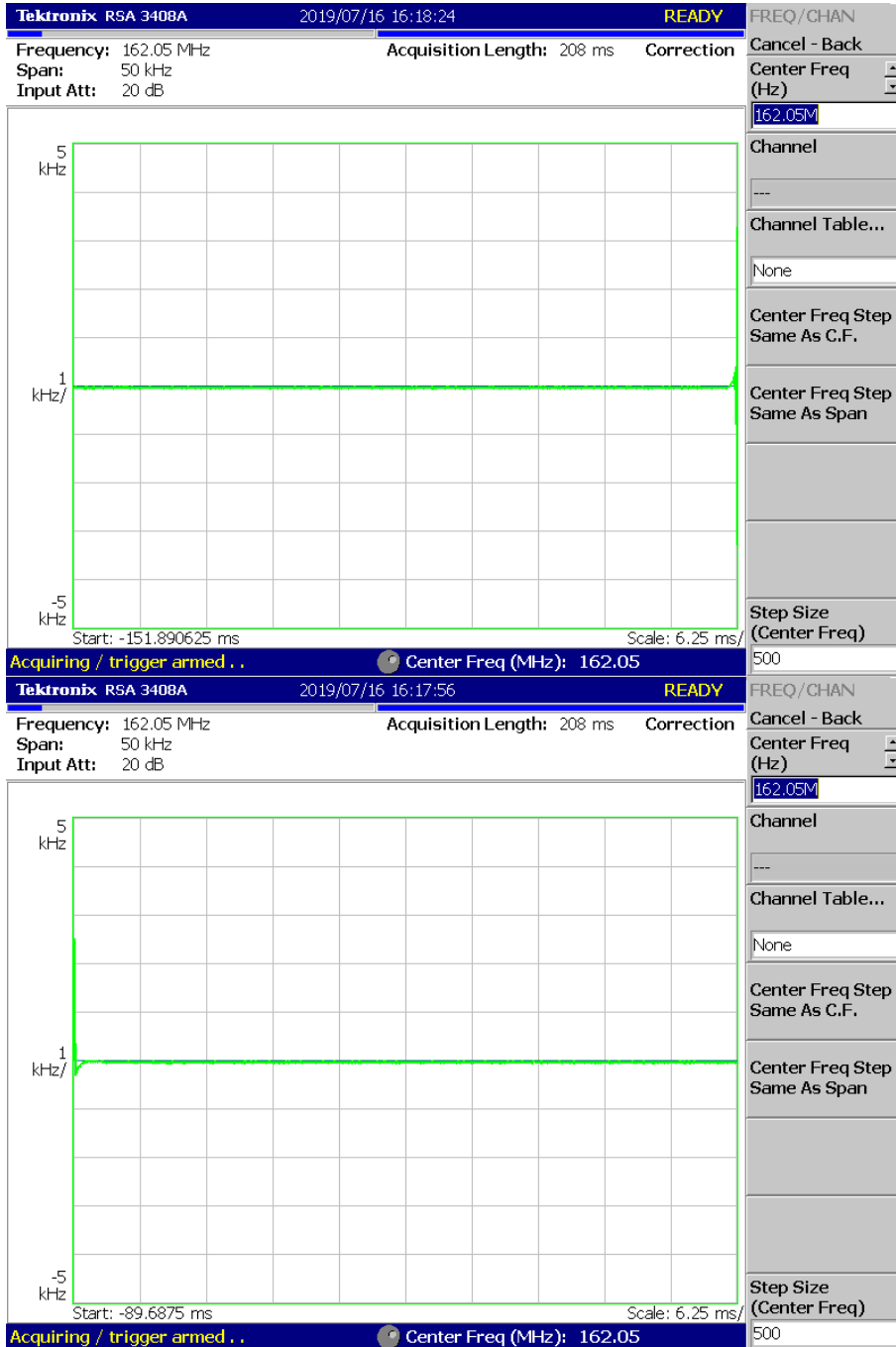
(138.05 MHz)_Low



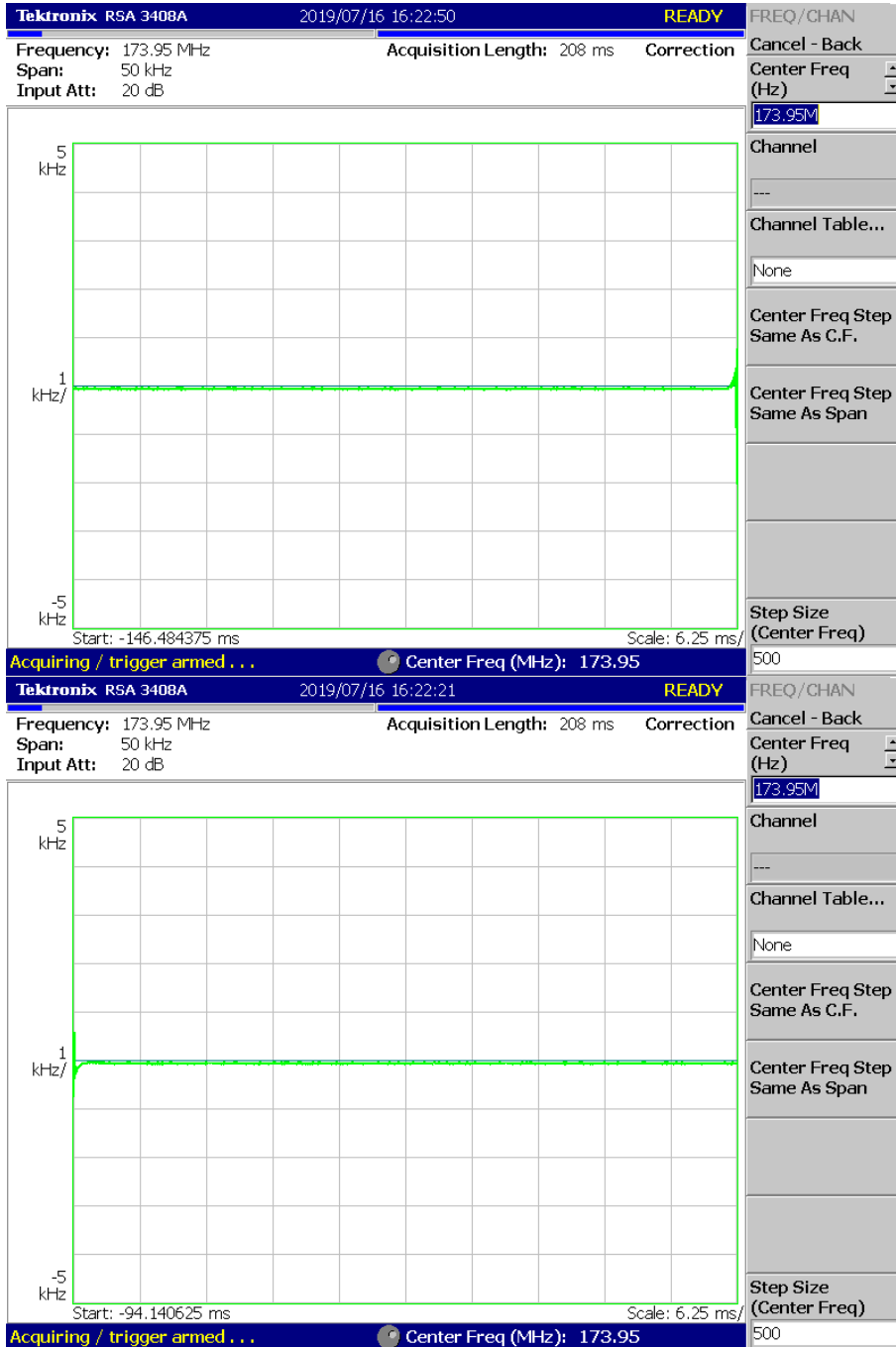
(150.05 MHz)_Low



(162.05 MHz)_Low



(173.95 MHz)_Low

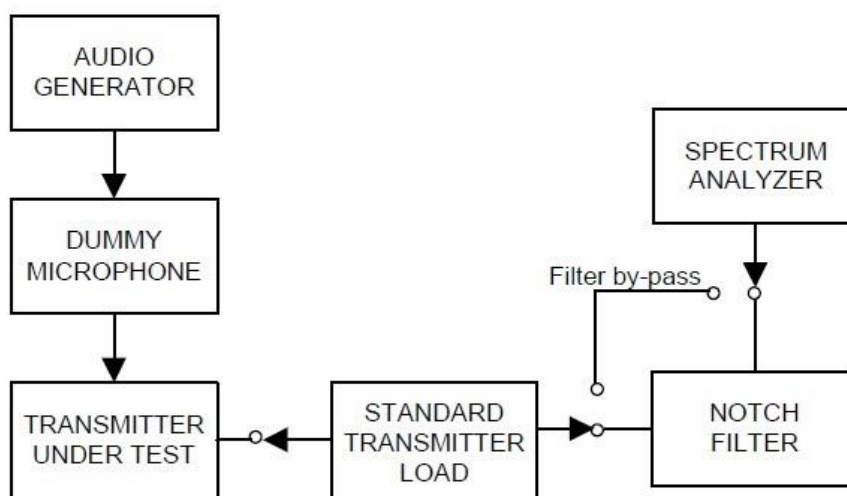


8.8 Unwanted Emissions : Conducted Spurious Emission

▣ Definition

Conducted spurious emissions are emissions at the antenna terminals on a frequency or frequencies that are outside a band sufficient to ensure transmission of information of required quality for the class of communication desired.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

According to 2.2.13 in TIA-603-E Standard.

- e) Connect the equipment as illustrated, with the notch filter by-passed.
- f) Set the center frequency of the spectrum analyzer to the assigned transmitter frequency, key the transmitter, and set the level of the carrier to the full scale reference line.
- g) 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. The input level shall be established at the frequency of maximum response of the audio modulation circuit.
- h) Adjust the spectrum analyzer for the following settings:
 - 1) Resolution Bandwidth = 10 kHz for spurious emissions below 1 GHz, and 1 MHz for spurious emissions above 1 GHz.
 - 2) Video Bandwidth ≥ 3 times the resolution bandwidth.
 - 3) Sweep Speed ≤ 2000 Hz per second.
 - 4) Detector Mode = mean or average power.
- e) Adjust the center frequency of the spectrum analyzer for incremental coverage of the range from:
 - 1) The lowest radio frequency generated in the equipment to the carrier frequency minus the test bandwidth (see 1.3.4.4).

- 2) The carrier frequency plus the test bandwidth to a frequency less than 2 times the carrier frequency.
- f) Record the frequencies and levels of spurious emissions from step e).
- g) Unkey the transmitter. Replace the transmitter under test with the signal generator and adjust the signal level to reproduce the frequencies and levels of every spurious emission recorded in step f). Record the signal generator levels in dBm.
- h) Insert the notch filter.
- i) Adjust the spectrum analyzer for the following settings:
 - 1) Resolution Bandwidth = 10 kHz for spurious emissions below 1 GHz, and 1 MHz for spurious emissions above 1 GHz.
 - 2) Video Bandwidth ≥ 3 times the resolution bandwidth.
 - 3) Sweep Speed ≤ 2000 Hz per second.
 - 4) Detector Mode = mean or average power.
- j) Key the transmitter. Adjust the center frequency of the spectrum analyzer for incremental coverage of the range from a frequency equal to 2 times the carrier frequency and to the tenth harmonic of the carrier frequency.

▣ TEST RESULTS

Type of Emission	Power	Test Frequency (MHz)	Measured Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)
16K0F3E (FCC)	High Power	138.05	0.01	-34.835	-13.000	21.835
			0.16	-37.131	-13.000	24.131
			939.27	-41.009	-13.000	28.009
			3673.58	-31.086	-13.000	18.086
		150.05	0.01	-33.819	-13.000	20.819
			0.15	-35.998	-13.000	22.998
			450.15	-40.512	-13.000	27.512
			3739.74	-31.797	-13.000	18.797
		162.05	0.01	-33.595	-13.000	20.595
			0.15	-36.081	-13.000	23.081
			85.39	-40.548	-13.000	27.548
			5642.43	-31.881	-13.000	18.881
		173.95	0.01	-33.280	-13.000	20.280
			0.15	-36.872	-13.000	23.872
			88.40	-40.101	-13.000	27.101
			3673.58	-31.163	-13.000	18.163

Type of Emission	Power	Test Frequency (MHz)	Measured Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)
16K0F3E (IC)	High Power	138.05	0.01	-34.985	-13.000	21.985
			0.17	-37.390	-13.000	24.390
			276.11	-39.896	-13.000	26.896
			3664.13	-31.201	-13.000	18.201
		150.05	0.01	-35.336	-13.000	22.336
			0.16	-35.911	-13.000	22.911
			300.08	-38.987	-13.000	25.987
			6298.56	-31.546	-13.000	18.546
		162.05	0.01	-32.284	-13.000	19.284
			0.15	-35.341	-13.000	22.341
			324.13	-38.618	-13.000	25.618
			3710.04	-31.514	-13.000	18.514
		173.95	0.01	-31.862	-13.000	18.862
			0.15	-36.791	-13.000	23.791
			347.90	-39.251	-13.000	26.251
			6957.40	-31.690	-13.000	18.690

Type of Emission	Power	Test Frequency (MHz)	Measured Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)
11K0F3E	High Power	138.05	0.01	-35.525	-20.000	15.525
			0.15	-38.222	-20.000	18.222
			276.11	-39.456	-20.000	19.456
			5594.73	-31.353	-20.000	11.353
		150.05	0.01	-33.953	-20.000	13.953
			0.15	-37.130	-20.000	17.130
			300.08	-39.239	-20.000	19.239
			5992.10	-31.651	-20.000	11.651
		162.05	0.01	-34.306	-20.000	14.306
			0.15	-34.152	-20.000	14.152
			324.13	-39.837	-20.000	19.837
			3666.38	-31.179	-20.000	11.179
		173.95	0.01	-36.166	-20.000	16.166
			0.16	-36.133	-20.000	16.133
			32.72	-40.275	-20.000	20.275
			3686.18	-31.867	-20.000	11.867

Type of Emission	Power	Test Frequency (MHz)	Measured Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)
8K30F1E, 8K30F1D, 8K30F7W	High Power	138.05	0.01	-34.303	-20.000	14.303
			0.16	-36.055	-20.000	16.055
			847.89	-39.990	-20.000	19.990
			3708.69	-31.590	-20.000	11.590
		150.05	0.01	-34.838	-20.000	14.838
			0.16	-36.022	-20.000	16.022
			300.08	-40.266	-20.000	20.266
			6501.08	-31.747	-20.000	11.747
		162.05	0.01	-32.847	-20.000	12.847
			0.16	-35.949	-20.000	15.949
			324.13	-39.429	-20.000	19.429
			7239.56	-31.497	-20.000	11.497
		173.95	0.01	-33.253	-20.000	13.253
			0.16	-34.873	-20.000	14.873
			347.90	-38.718	-20.000	18.718
			5585.73	-31.468	-20.000	11.468

Type of Emission	Power	Test Frequency (MHz)	Measured Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)
7K60FXD, 7K60FXE	High Power	138.05	0.01	-33.704	-20.000	13.704
			0.15	-35.035	-20.000	15.035
			60.75	-39.740	-20.000	19.740
			3725.34	-30.634	-20.000	10.634
		150.05	0.01	-33.139	-20.000	13.139
			0.15	-33.935	-20.000	13.935
			300.08	-39.142	-20.000	19.142
			3732.09	-30.845	-20.000	10.845
		162.05	0.01	-34.221	-20.000	14.221
			0.16	-36.714	-20.000	16.714
			324.13	-39.037	-20.000	19.037
			3725.34	-31.030	-20.000	11.030
		173.95	0.01	-34.187	-20.000	14.187
			0.15	-35.627	-20.000	15.627
			347.90	-39.563	-20.000	19.563
			6879.09	-31.155	-20.000	11.155

Type of Emission	Power	Test Frequency (MHz)	Measured Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)
4K00F1E, 4K00F1D, 4K00F7W	High Power	138.05	0.01	-34.319	-25.000	9.319
			0.16	-37.545	-25.000	12.545
			856.72	-40.545	-25.000	15.545
			6598.73	-31.258	-25.000	6.258
		150.05	0.01	-33.467	-25.000	8.467
			0.15	-35.077	-25.000	10.077
			300.08	-39.446	-25.000	14.446
			3733.44	-31.080	-25.000	6.080
		162.05	0.01	-33.847	-25.000	8.847
			0.15	-37.274	-25.000	12.274
			324.13	-39.784	-25.000	14.784
			6202.26	-31.804	-25.000	6.804
		173.95	0.01	-34.137	-25.000	9.137
			0.15	-35.135	-25.000	10.135
			52.51	-40.248	-25.000	15.248
			3692.93	-31.432	-25.000	6.432

Type of Emission	Power	Test Frequency (MHz)	Measured Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)
4K00F2D	High Power	138.05	0.01	-32.884	-25.000	7.884
			0.15	-35.207	-25.000	10.207
			276.11	-38.072	-25.000	13.072
			6552.38	-31.220	-25.000	6.220
		150.05	0.01	-36.163	-25.000	11.163
			0.16	-36.918	-25.000	11.918
			300.08	-39.463	-25.000	14.463
			5631.18	-31.040	-25.000	6.040
		162.05	0.01	-33.212	-25.000	8.212
			0.17	-37.295	-25.000	12.295
			324.13	-38.759	-25.000	13.759
			3452.17	-31.593	-25.000	6.593
		173.95	0.01	-34.093	-25.000	9.093
			0.16	-36.848	-25.000	11.848
			347.90	-39.589	-25.000	14.589
			2445.92	-31.494	-25.000	6.494

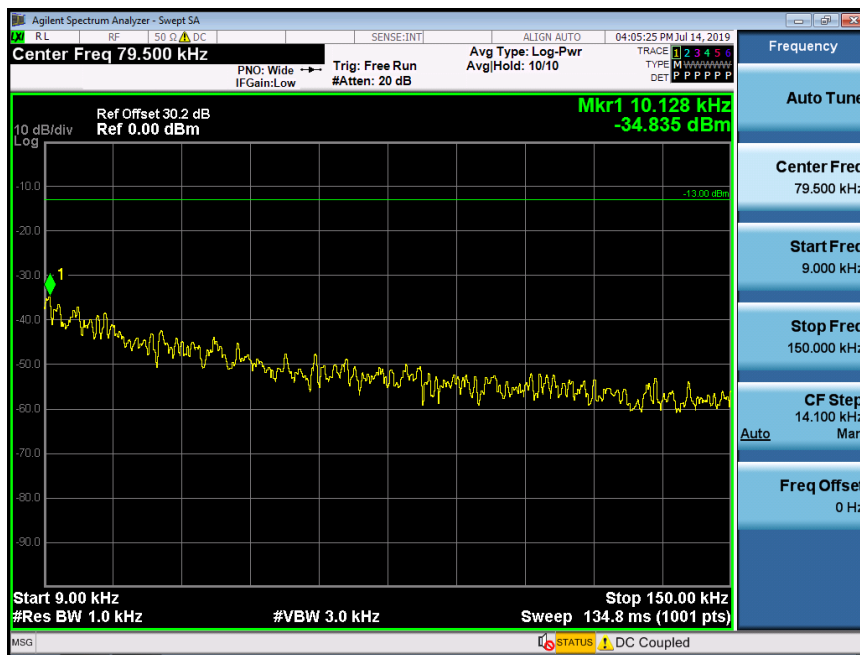
Plots of Unwanted Emissions : Conducted Spurious Emission

** In order to simplify the report, only 138.05MHz, 150.05MHz and 173.95MHz were attached.

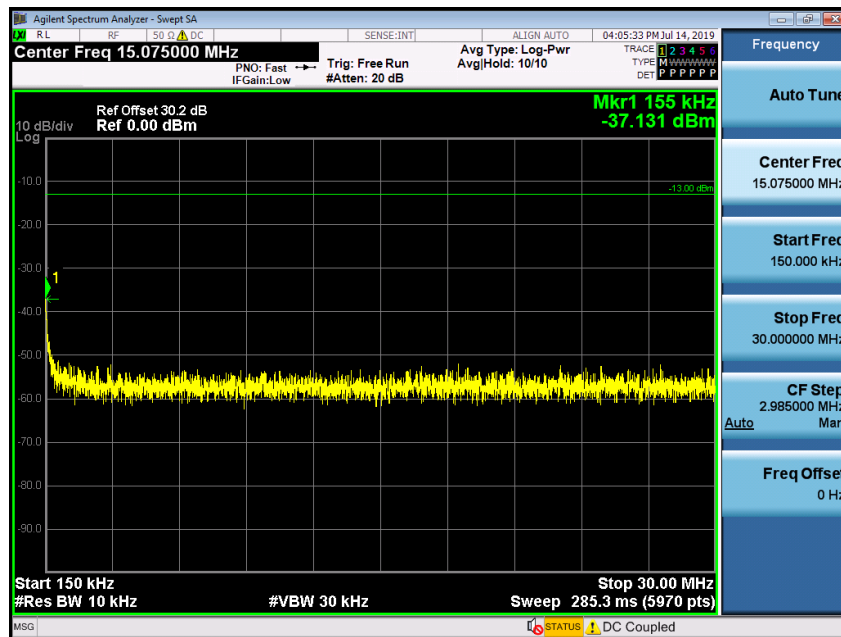
16K0F3E_FCC

(138.05 MHz)_High

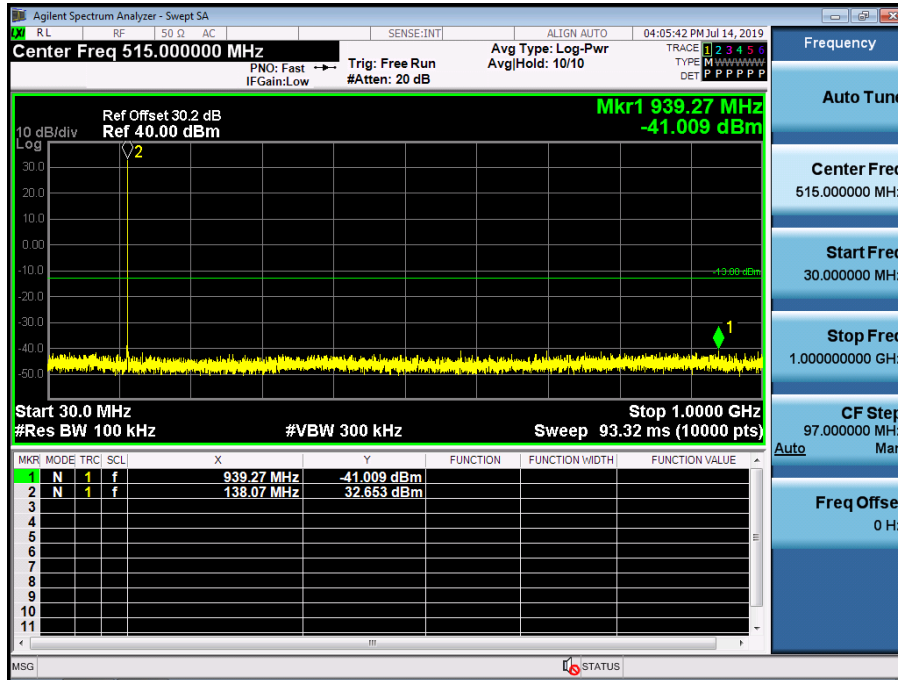
9 kHz~150 kHz



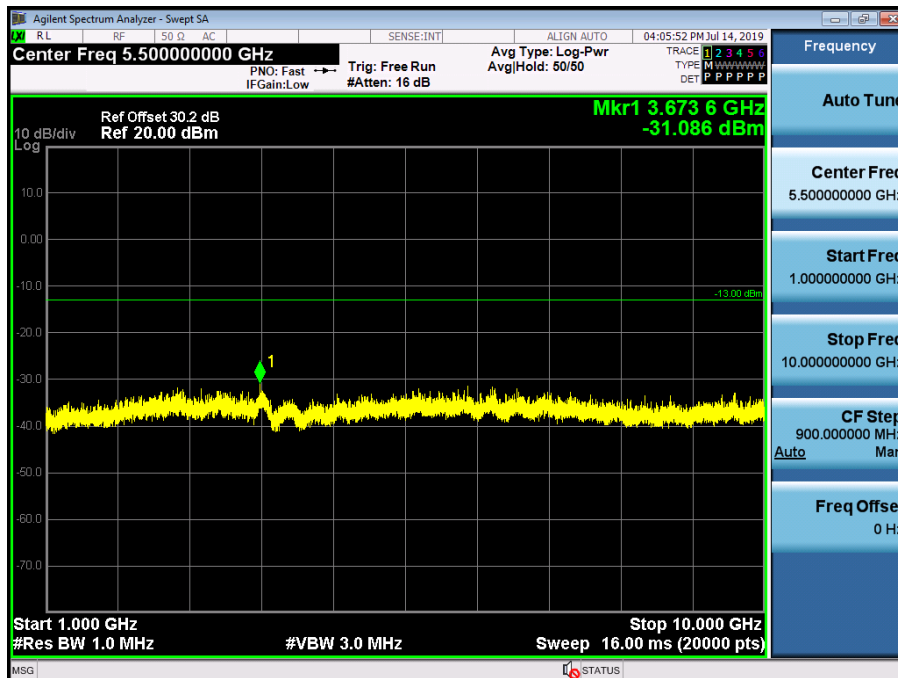
150 kHz~30 MHz



30 MHz~1 GHz



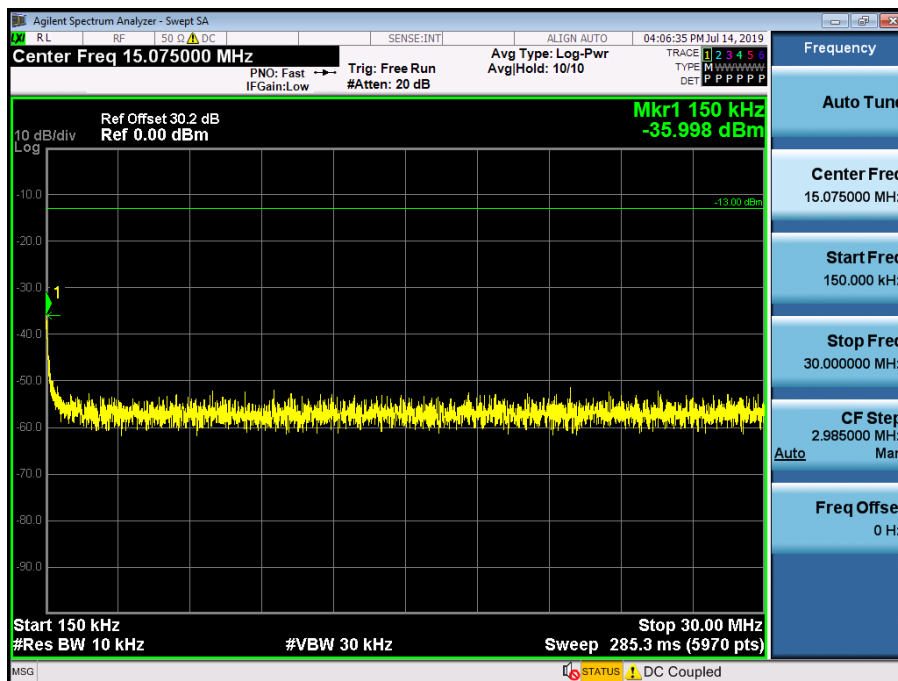
1 GHz~10 GHz



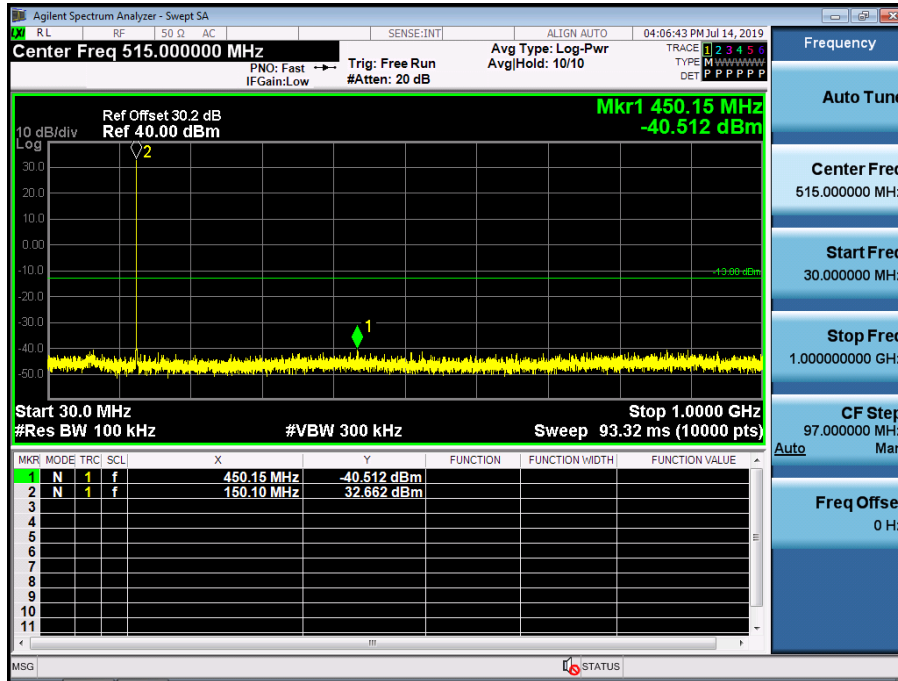
(150.05 MHz)_High
9 kHz~150 kHz



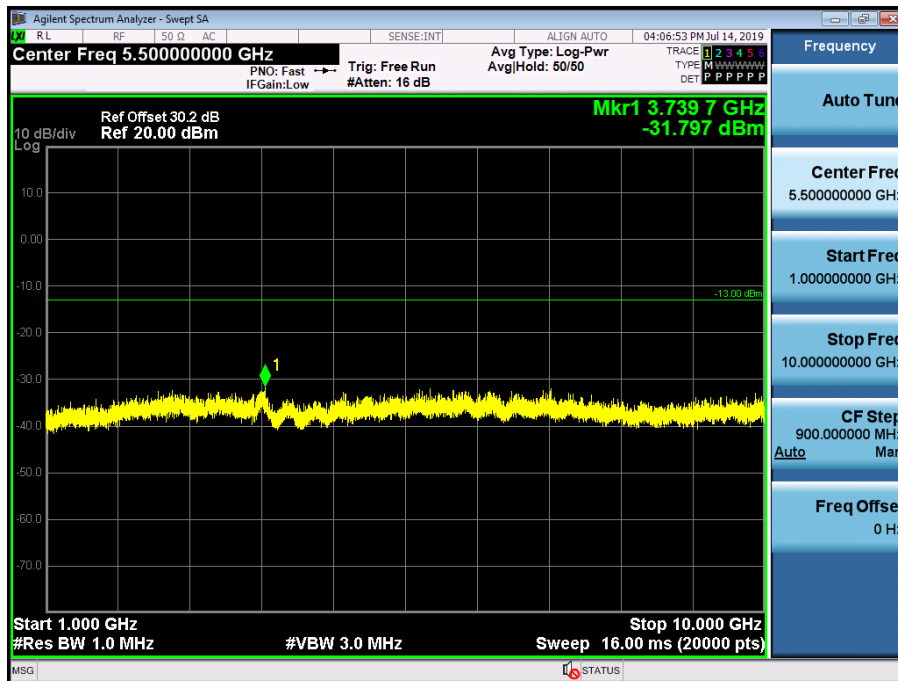
150 kHz~30 MHz



30 MHz~1 GHz

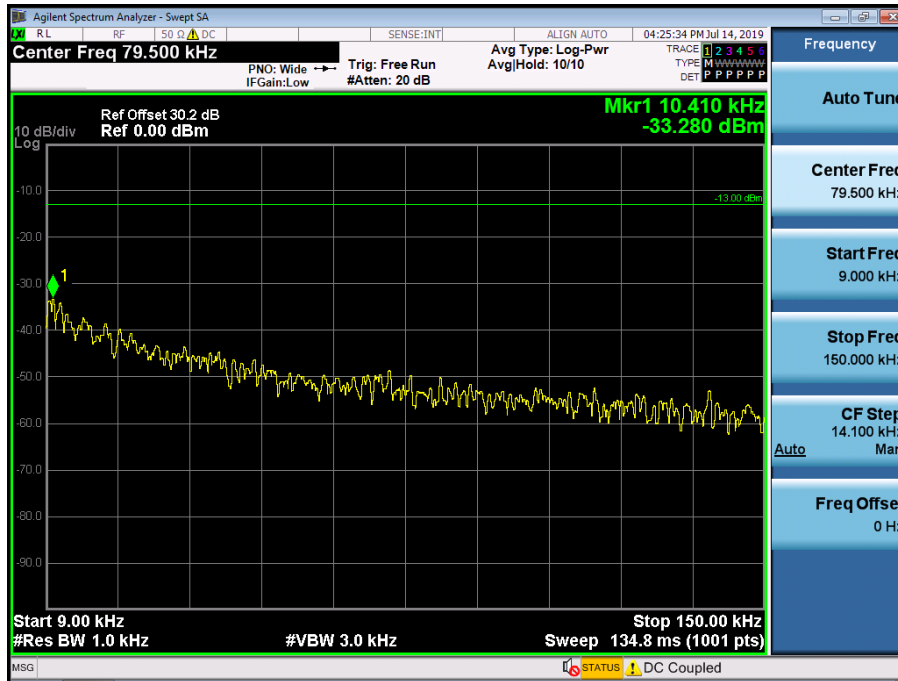


1 GHz~10 GHz

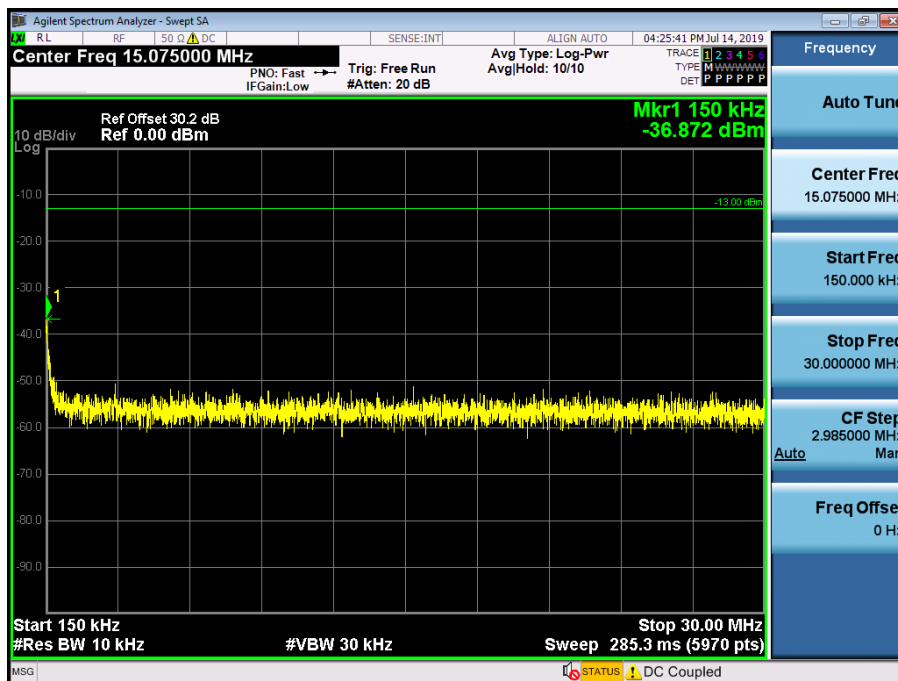


(173.95 MHz)_High

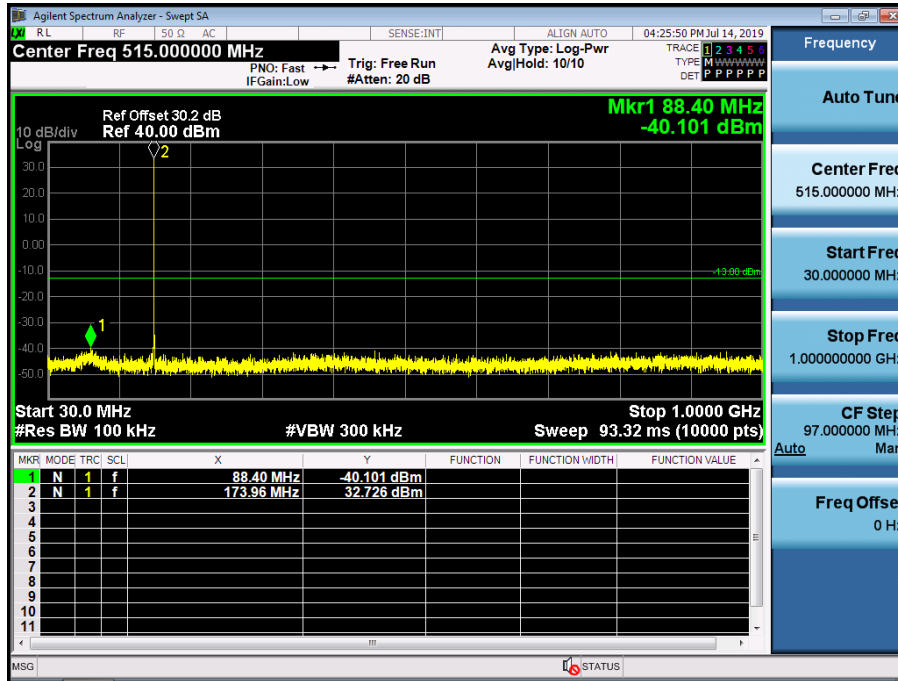
9 kHz~150 kHz



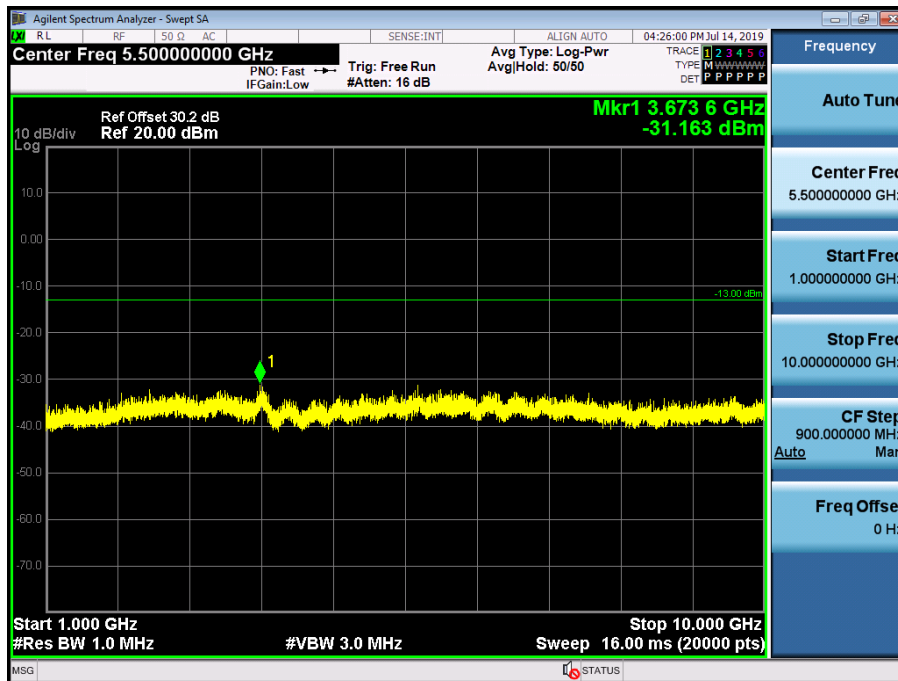
150 kHz~30 MHz



30 MHz~1 GHz

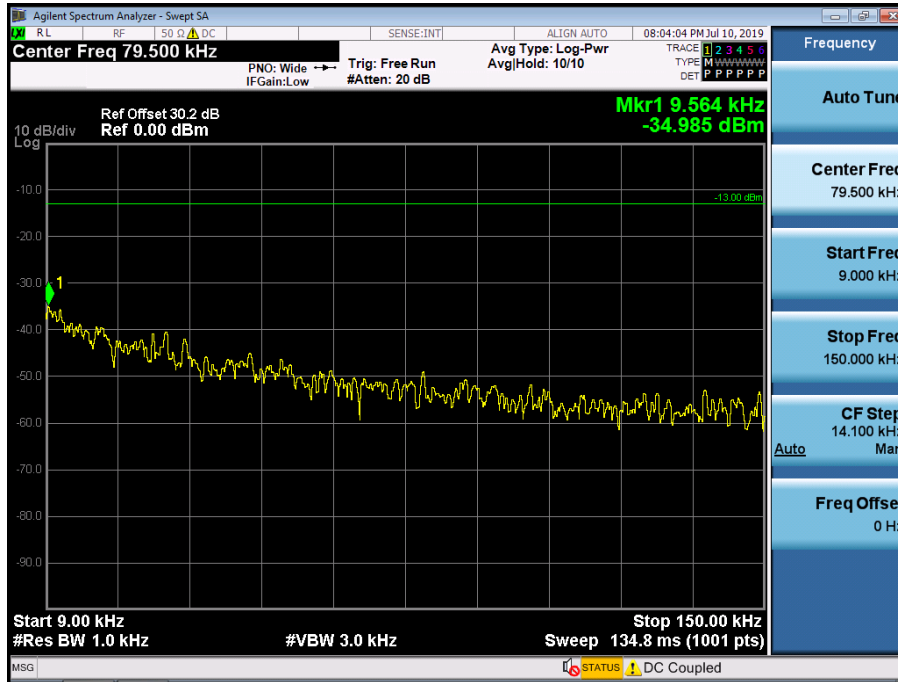


1 GHz~10 GHz

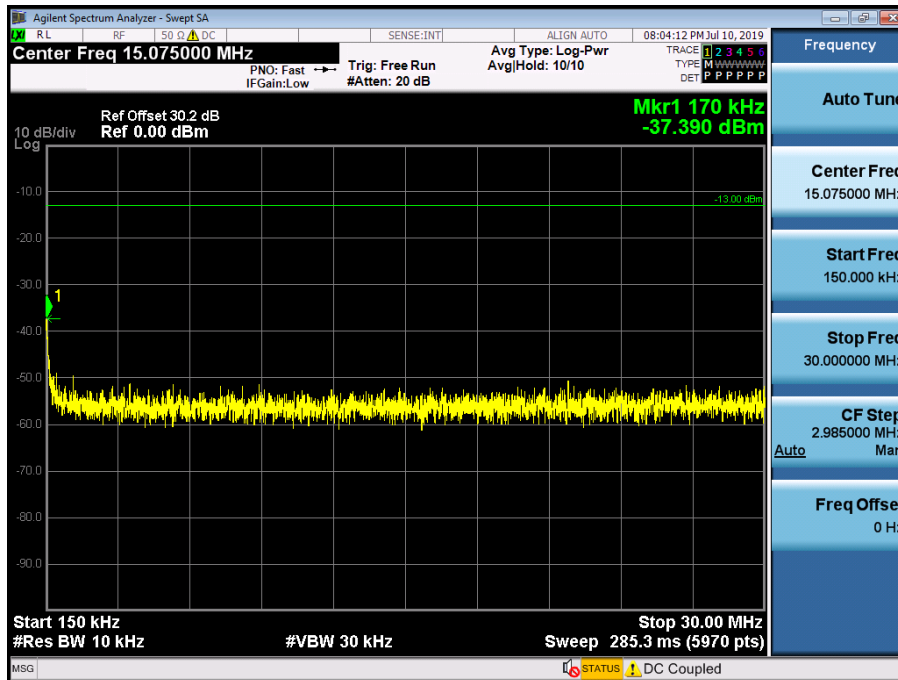


16K0F3E_IC

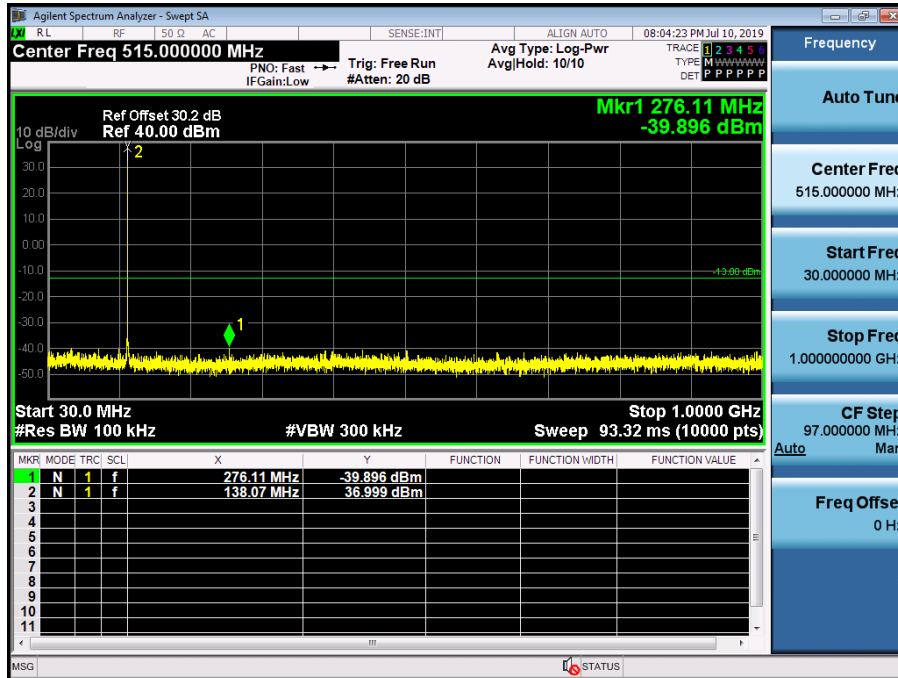
(138.05 MHz)_High
9 kHz~150 kHz



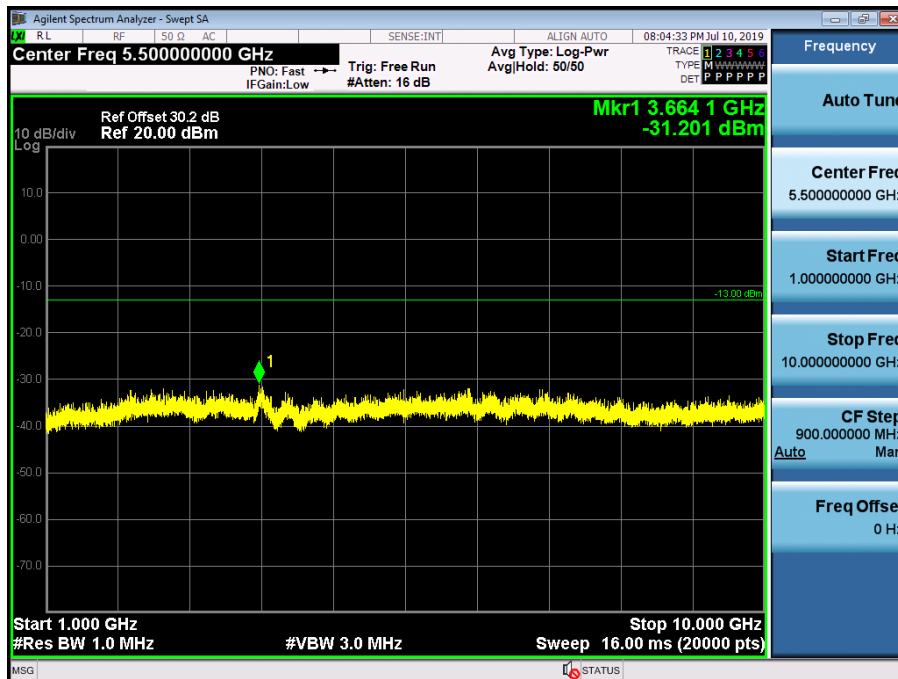
150 kHz~30 MHz



30 MHz~1 GHz



1 GHz~10 GHz

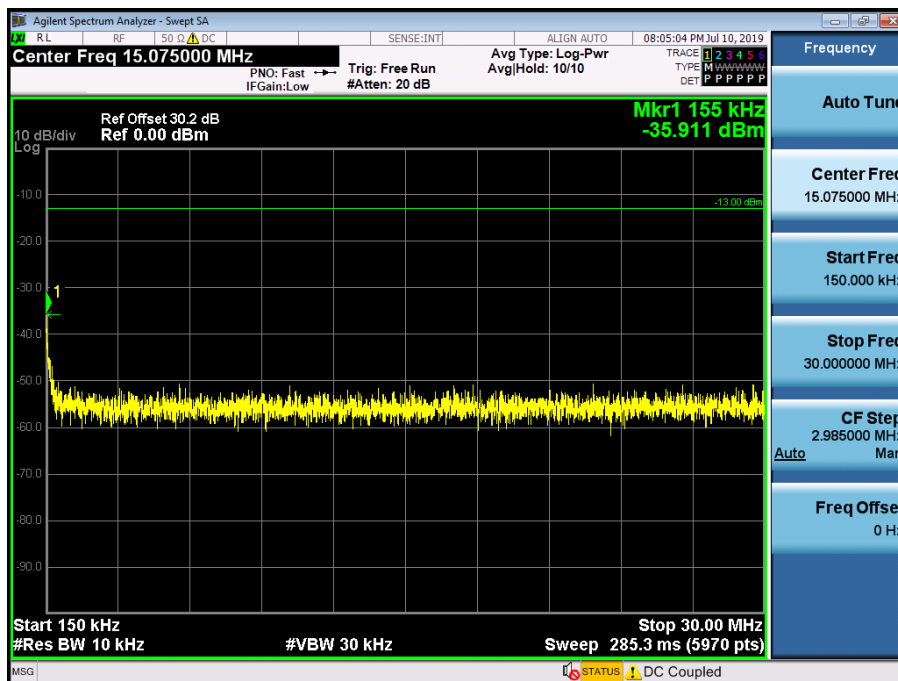


(150.05 MHz)_High

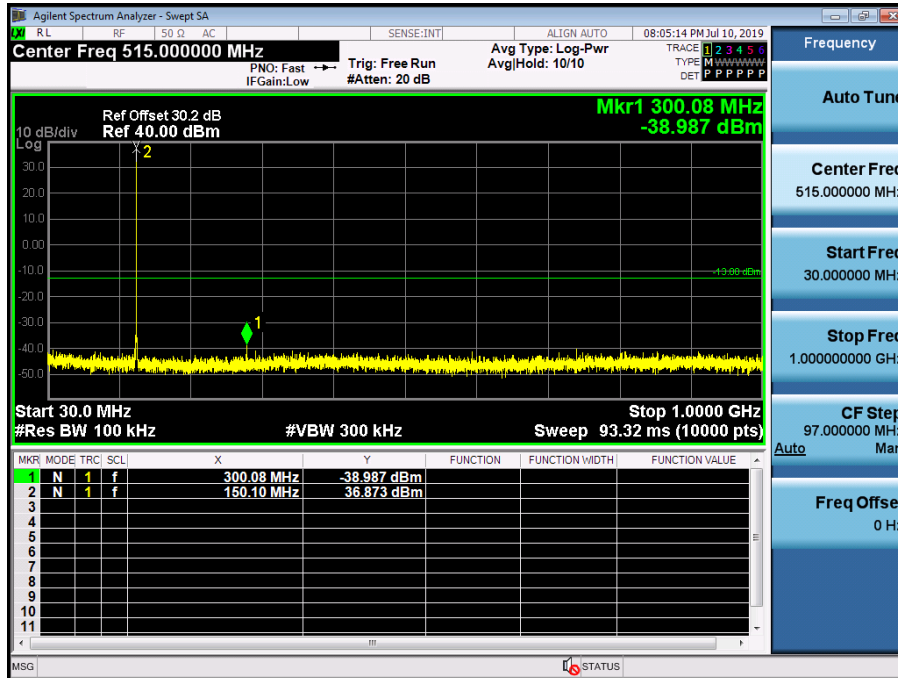
9 kHz~150 kHz



150 kHz~30 MHz



30 MHz~1 GHz



1 GHz~10 GHz

