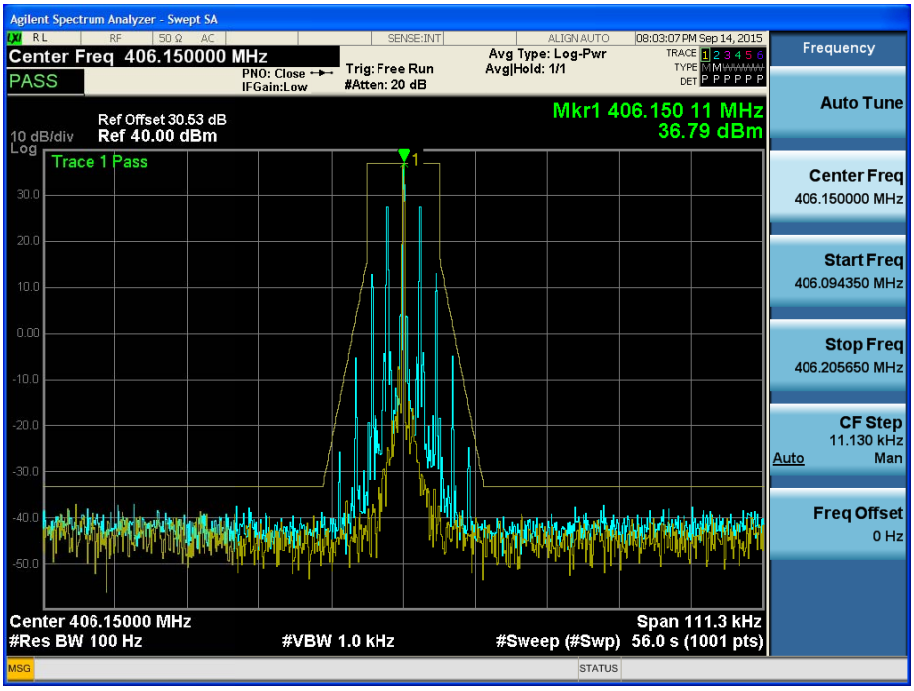
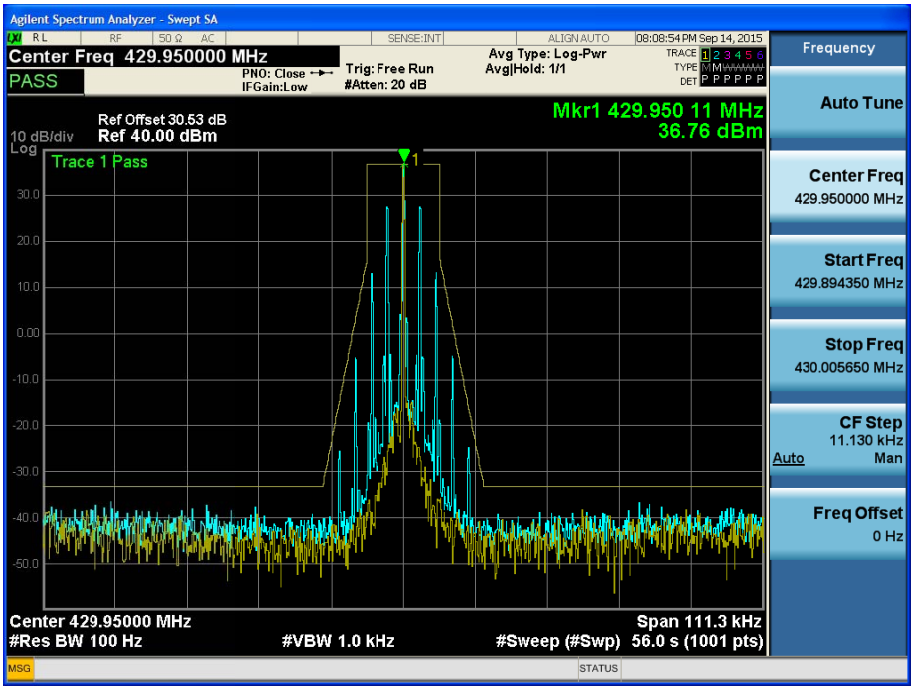
▣TEST RESULTS

11K0F3E For FCC AND IC

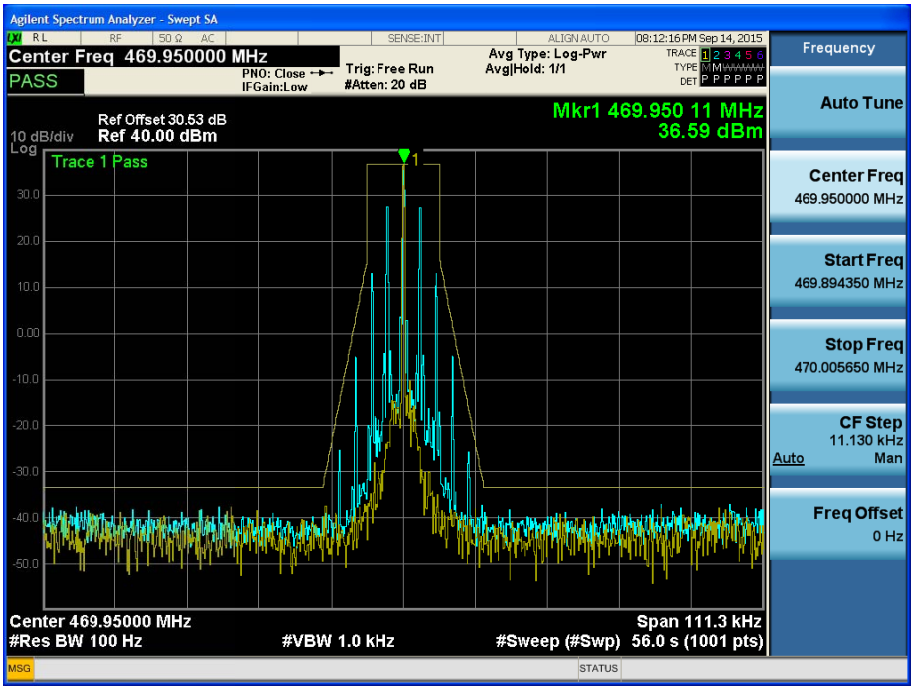
HIGH POWER_11K0F3E_406.15 MHz_Low



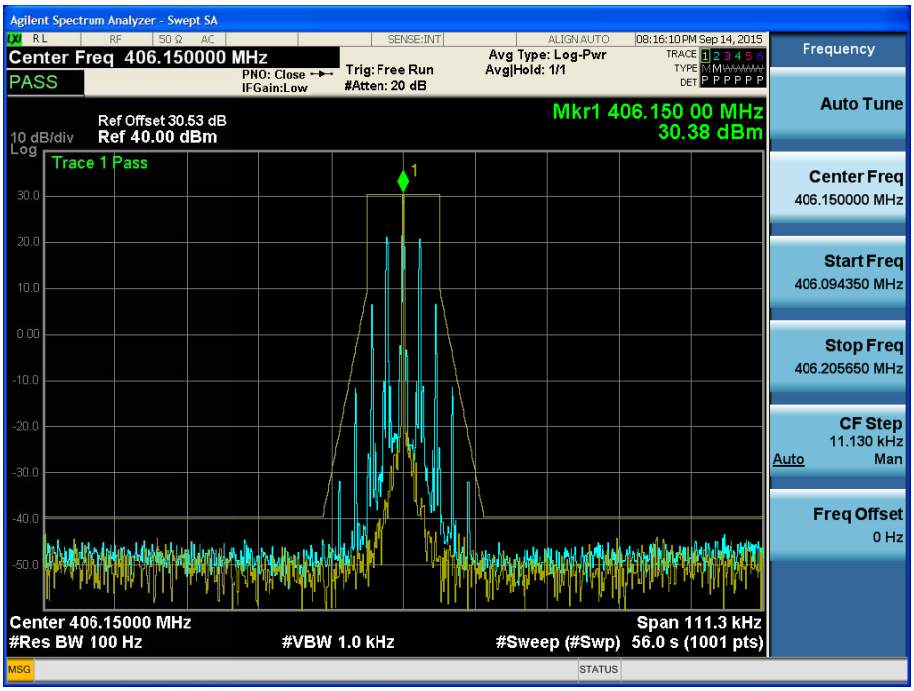
HIGH POWER_11K0F3E_429.95 MHz_Middle



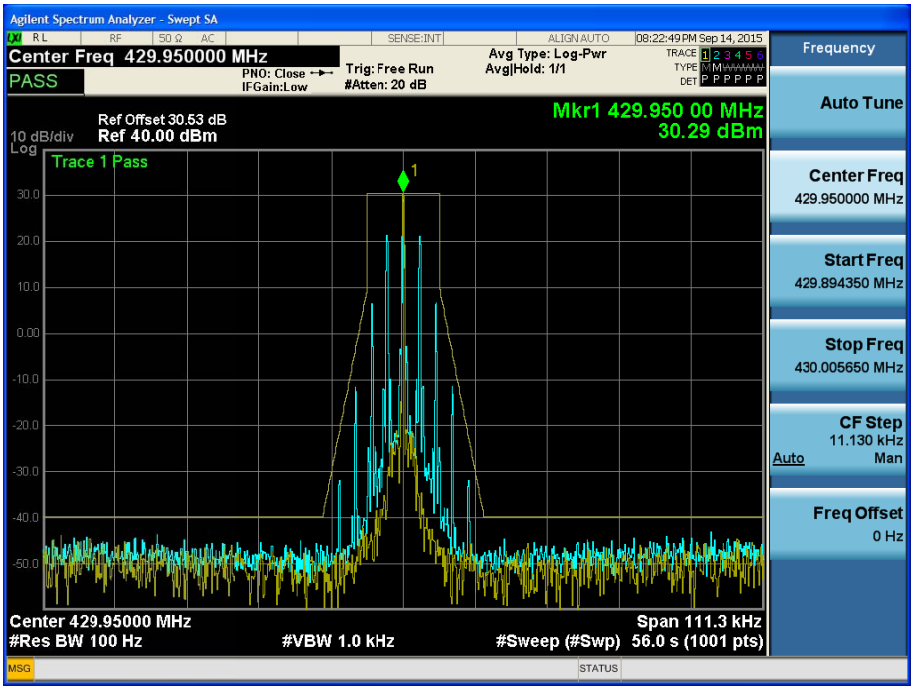
HIGH POWER_11K0F3E_469.95 MHz_High



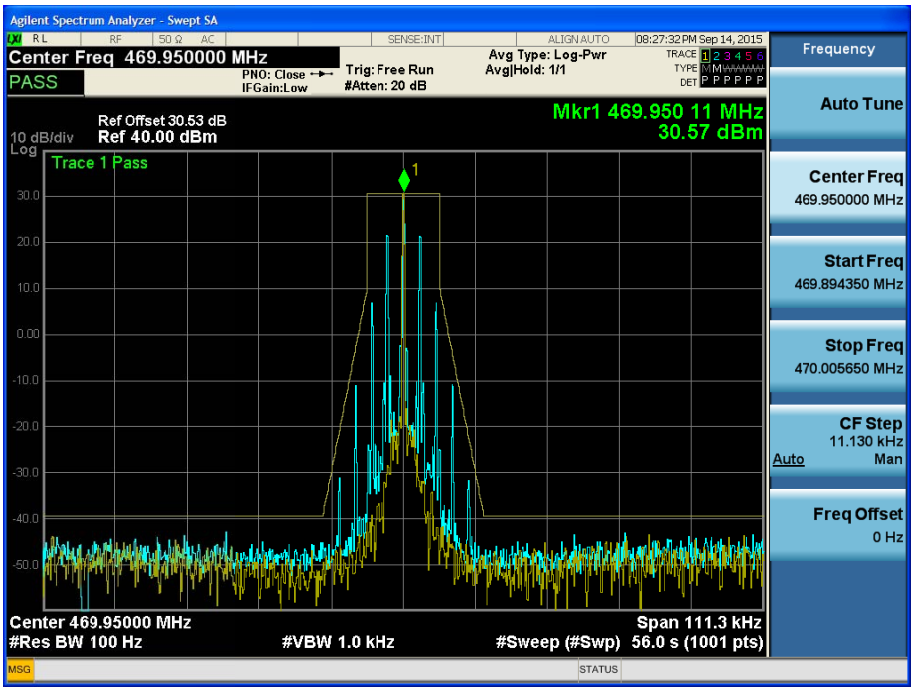
LOW POWER_11K0F3E _406.15 MHz_Low



LOW POWER_11K0F3E _429.95 MHz_Middle



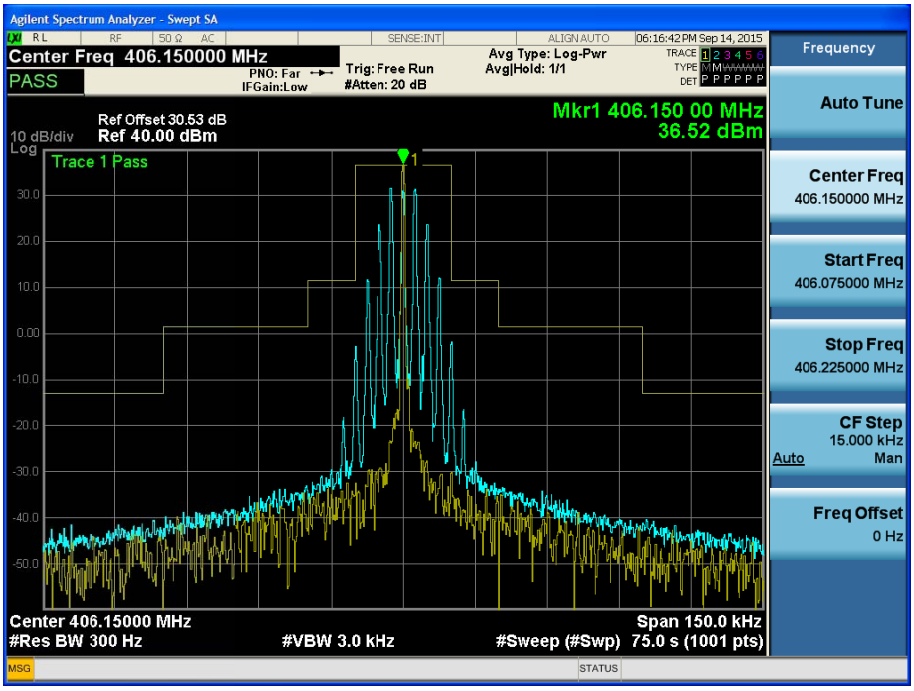
LOW POWER_11K0F3E _469.95 MHz_High



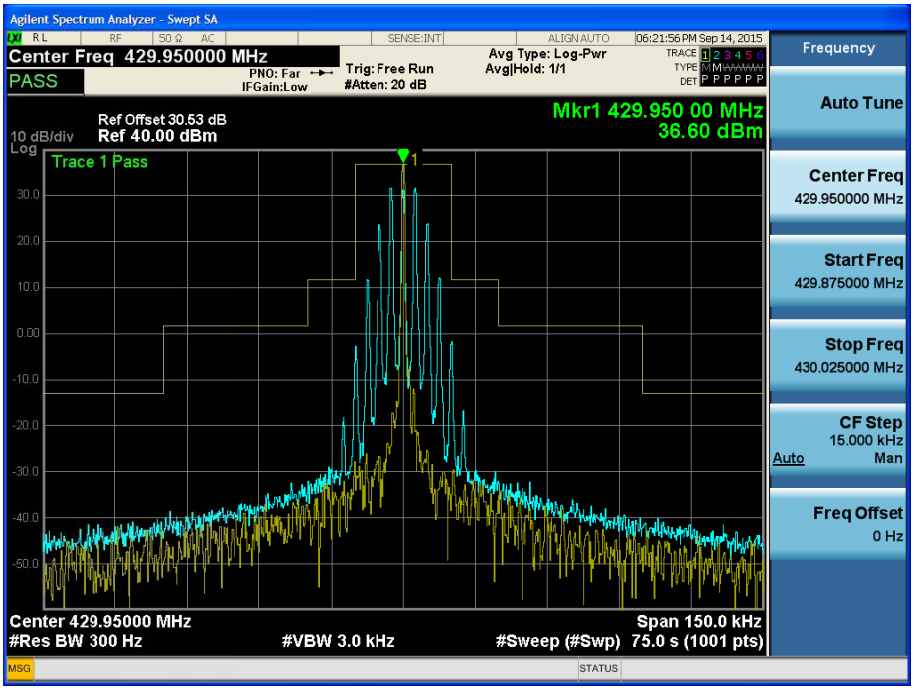
▣TEST RESULTS

16K0F3E For ONLY IC

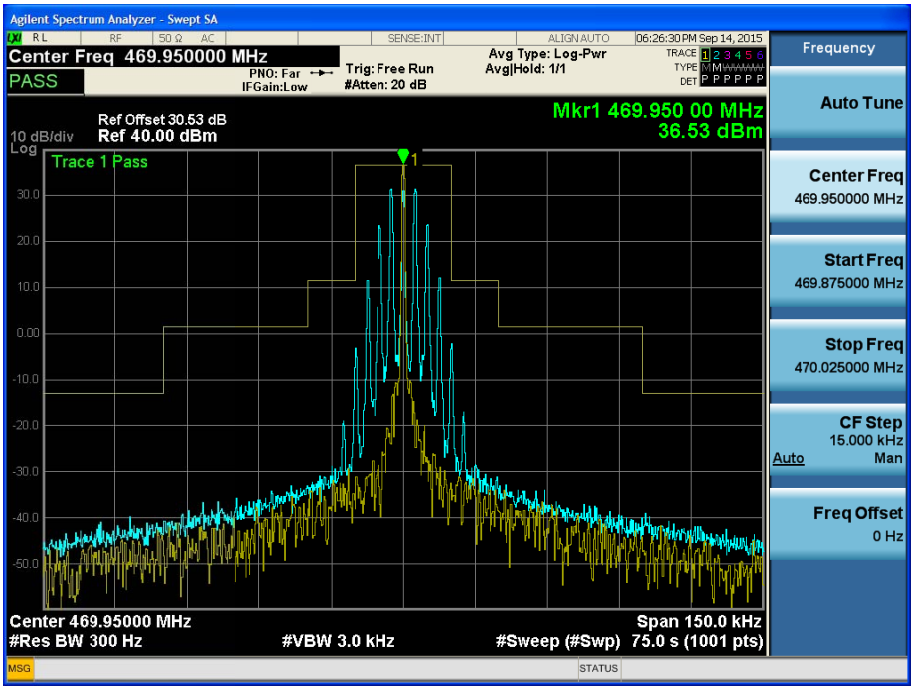
HIGH POWER_16K0F3E_406.15 MHz_Low



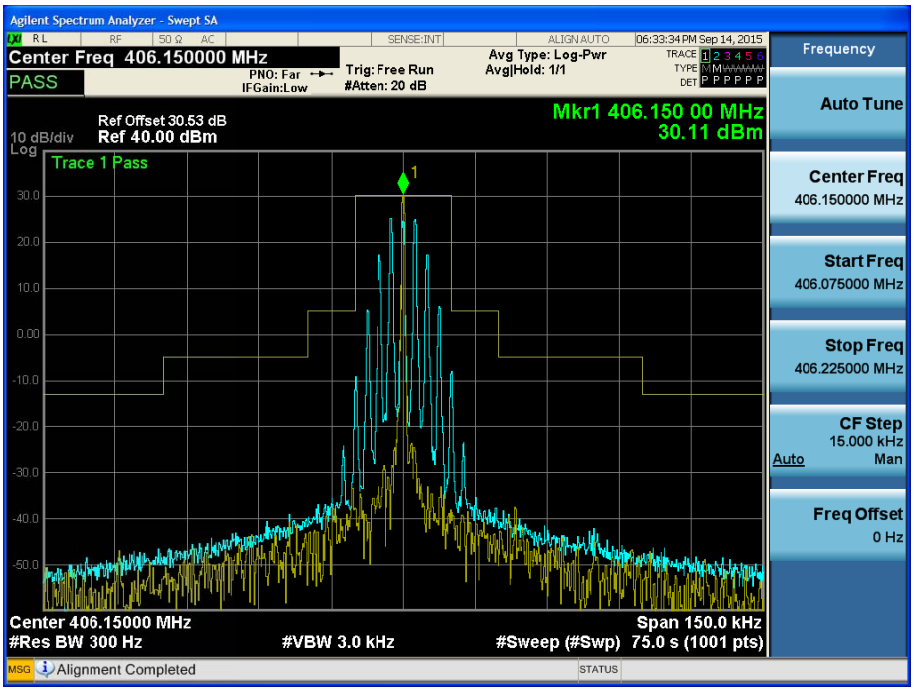
HIGH POWER_16K0F3E_429.95 MHz_Middle



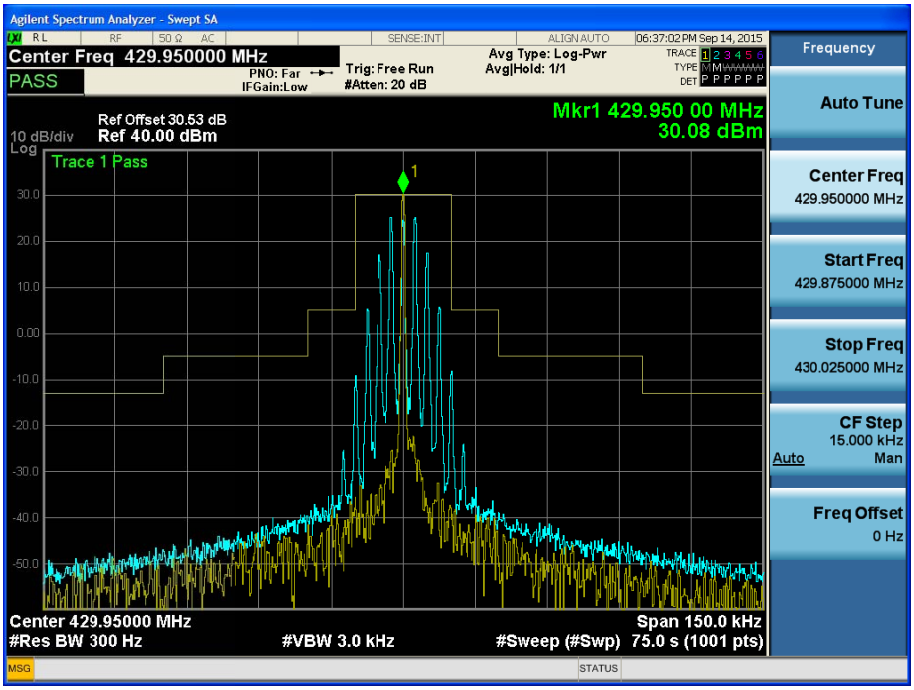
HIGH POWER_16K0F3E_469.95 MHz_High



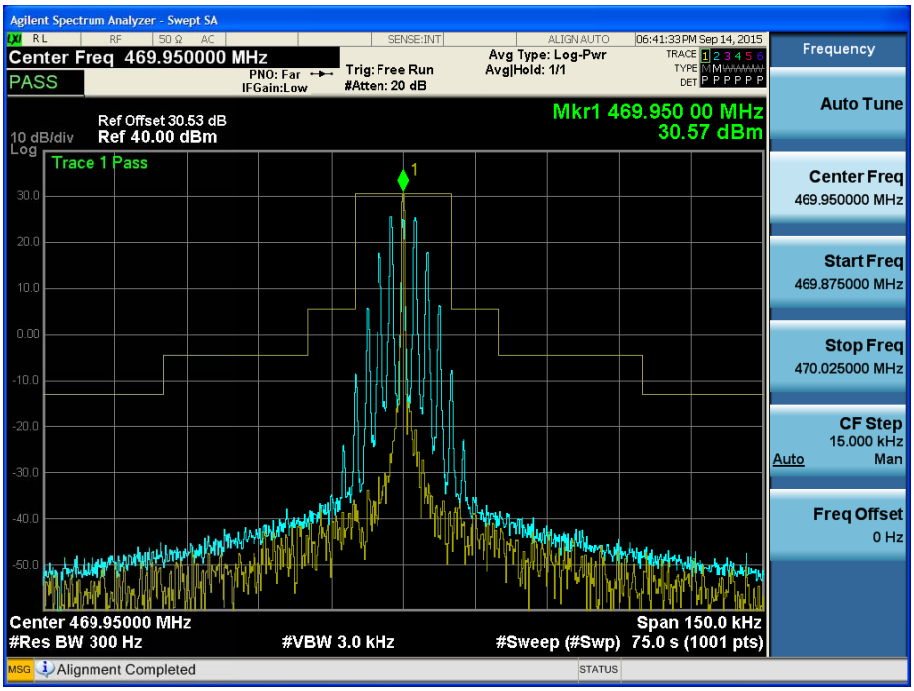
LOW POWER_16K0F3E _406.15 MHz_Low



LOW POWER_16K0F3E _429.95 MHz_Middle



LOW POWER_16K0F3E _469.95 MHz_High



7.7 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-D 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 timebase 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 timebase reference to the right for observing the transmitter turn-off transient.

l) Unkey the transmitter.

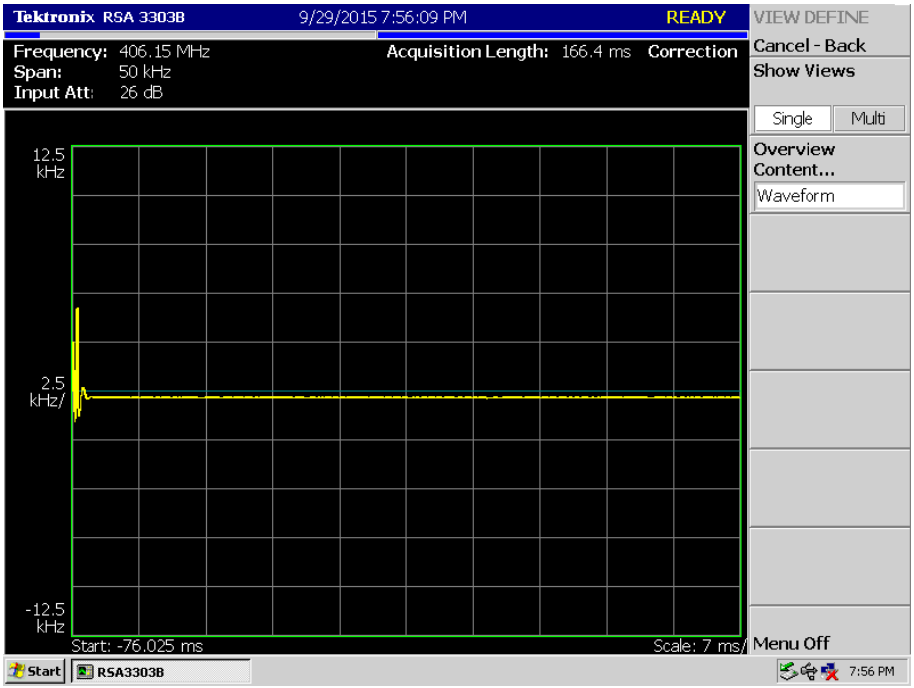
m) Observe the stored display of the modulation domain analyzer. The signal trace shall be maintained within the allowable limits during the period t_3.

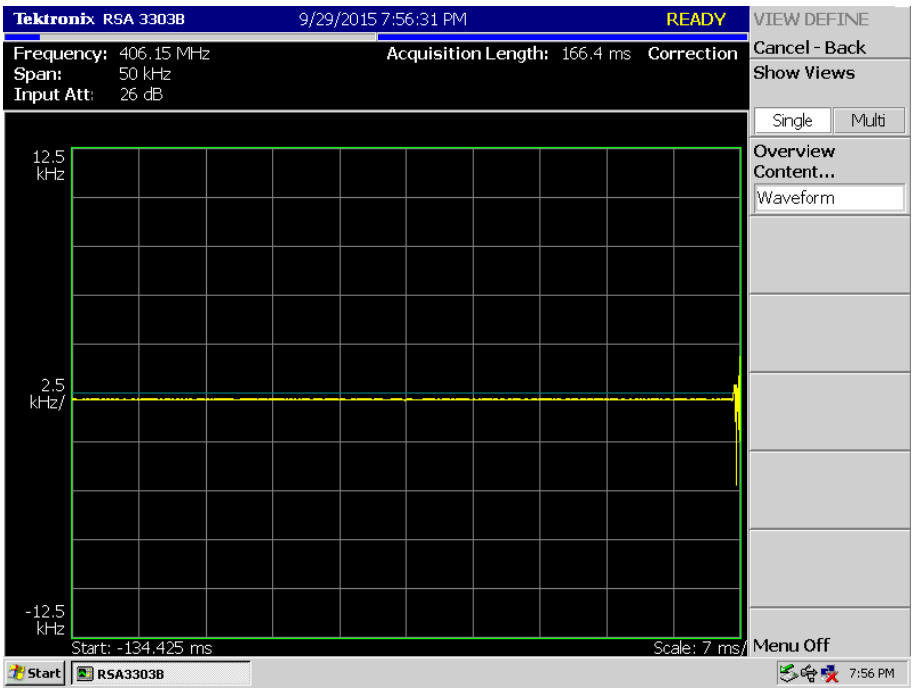
*Note :Digital test is no provision to configure the device with un-modulated carrier, hence test was performed with digital modulation on.

▣TEST RESULTS

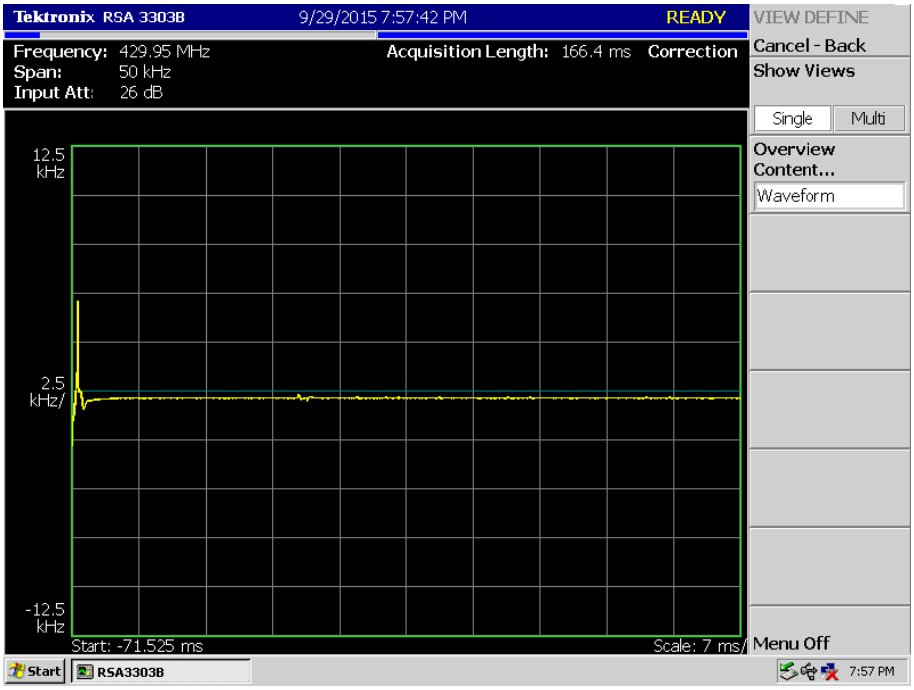
7K60FXD/7K60FXE For FCC AND IC

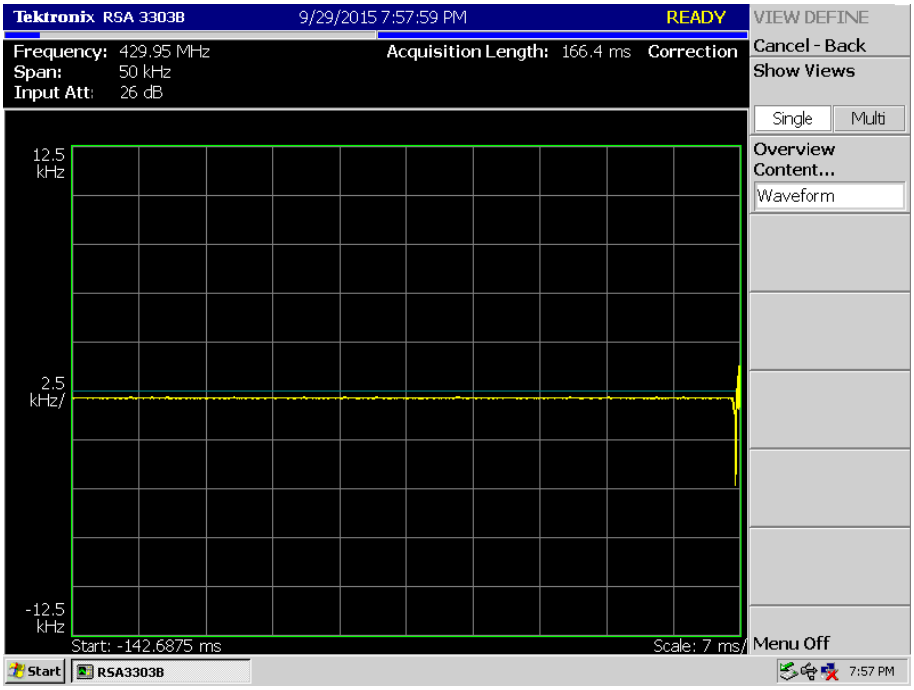
HIGH POWER_7K60FXD/7K60FXE _406.15 MHz_Low



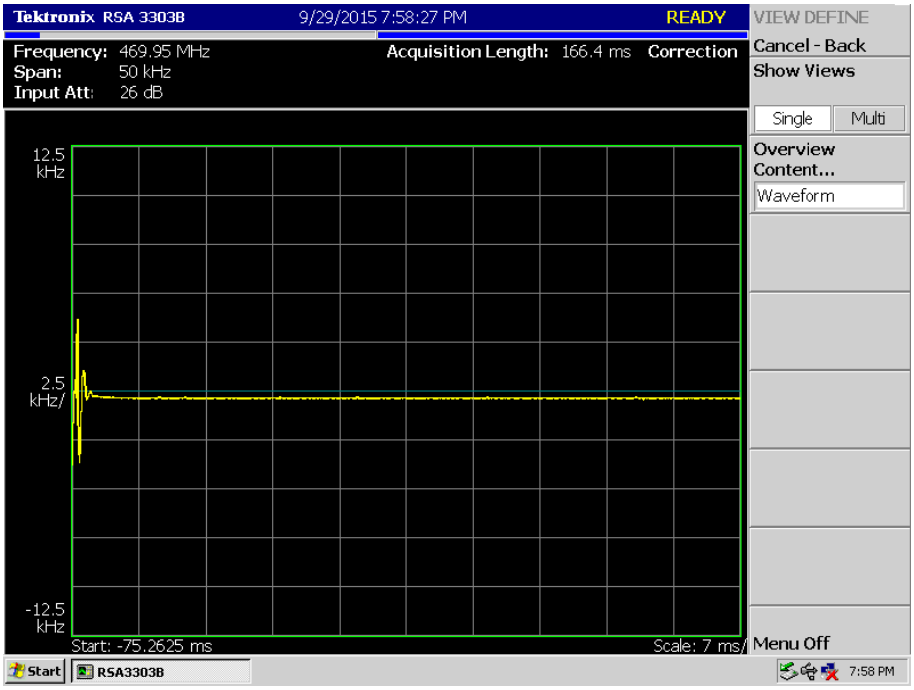


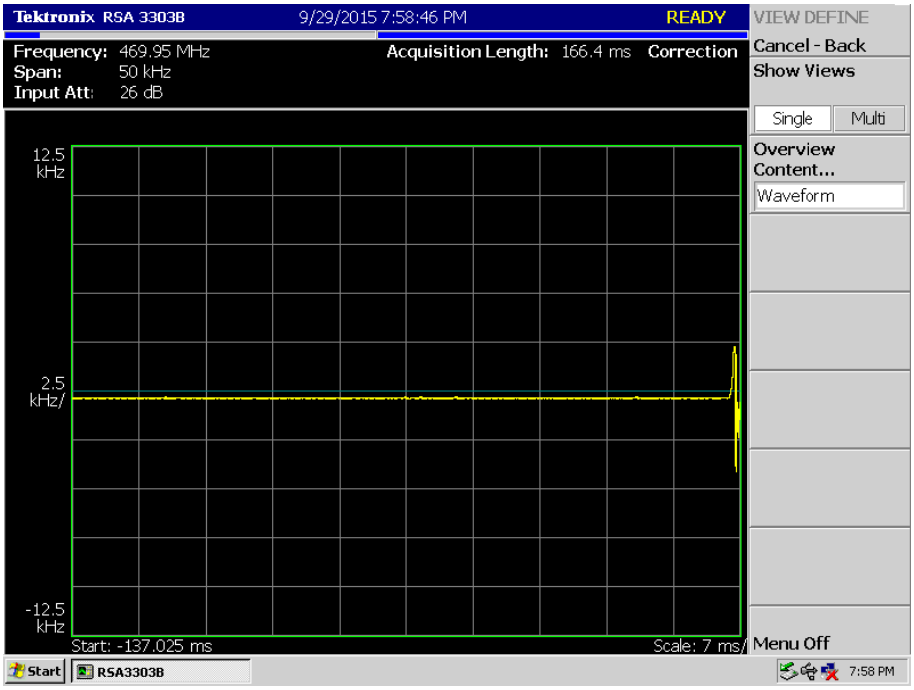
HIGH POWER_7K60FXD/7K60FXE _429.95 MHz_Middle



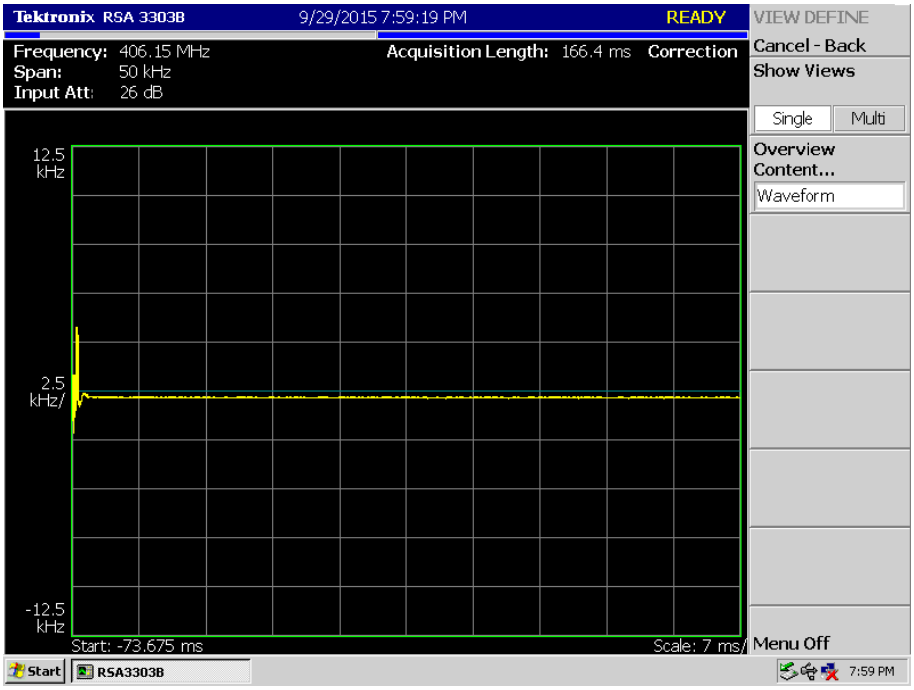


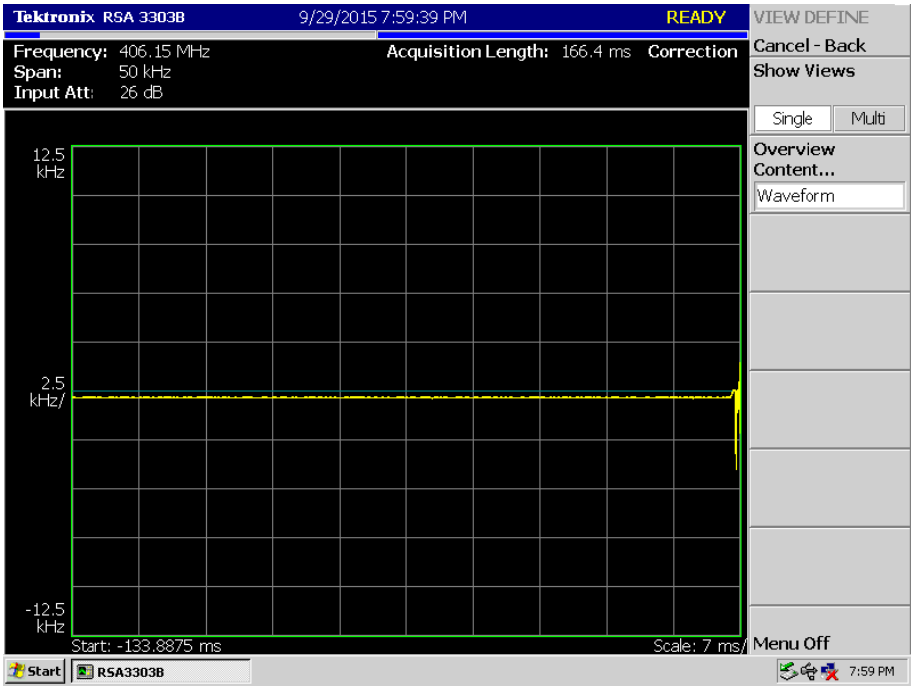
HIGH POWER_7K60FXD/7K60FXE _469.95 MHz_High



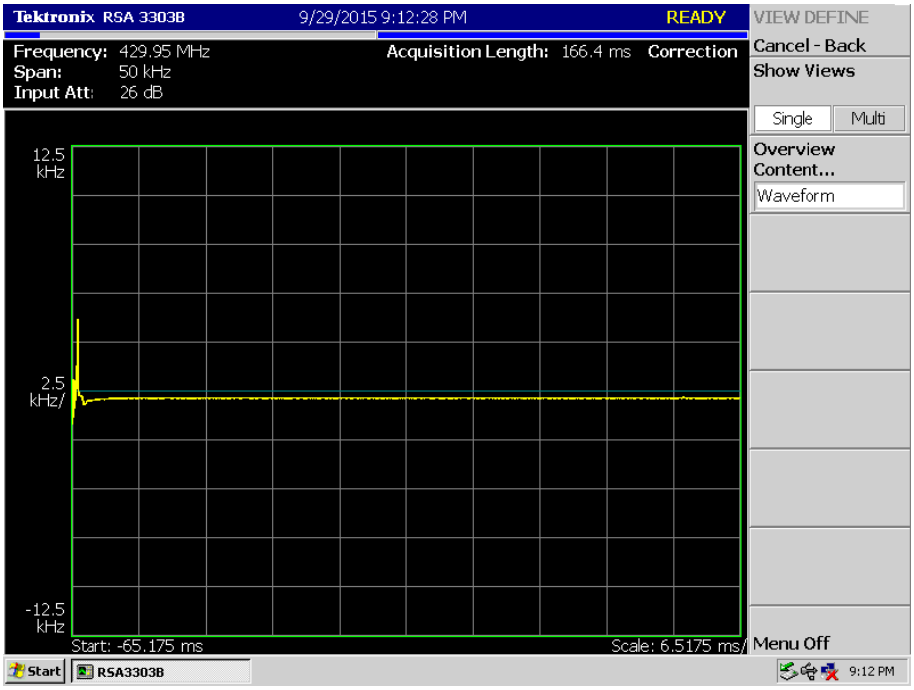


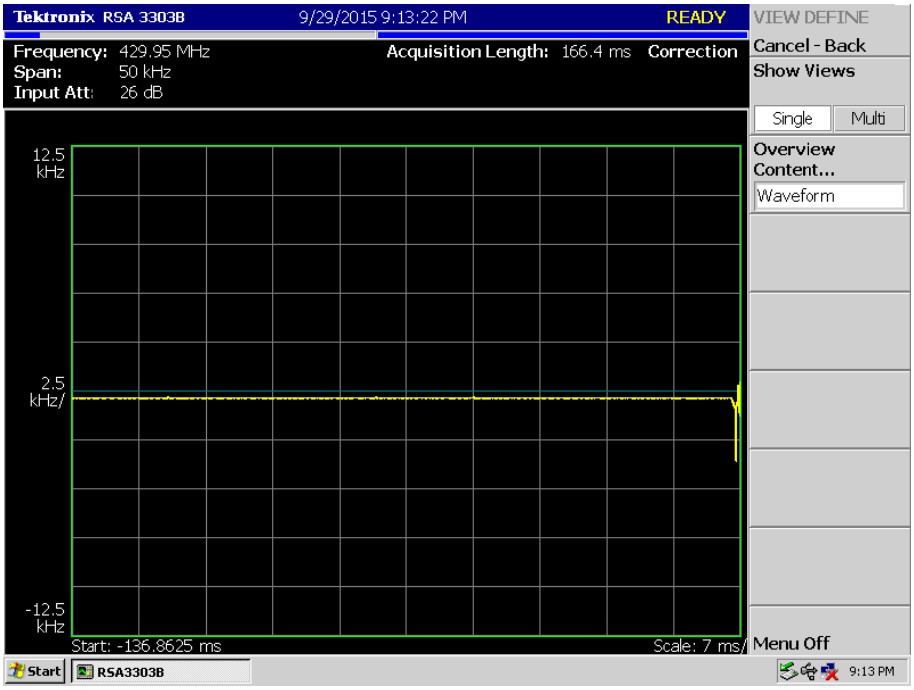
LOW POWER_7K60FXD/7K60FXE _406.15 MHz_Low



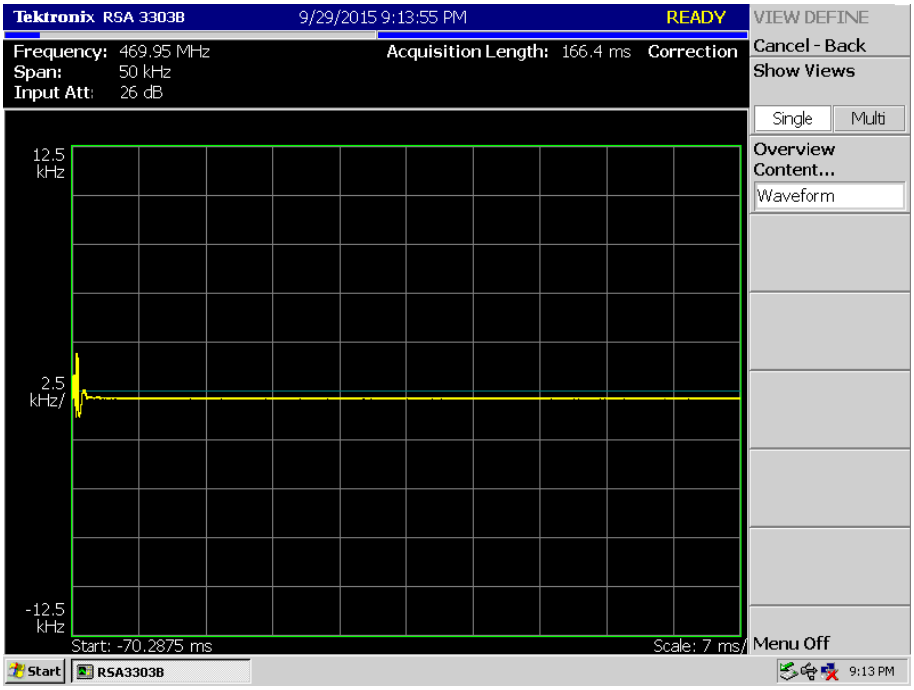


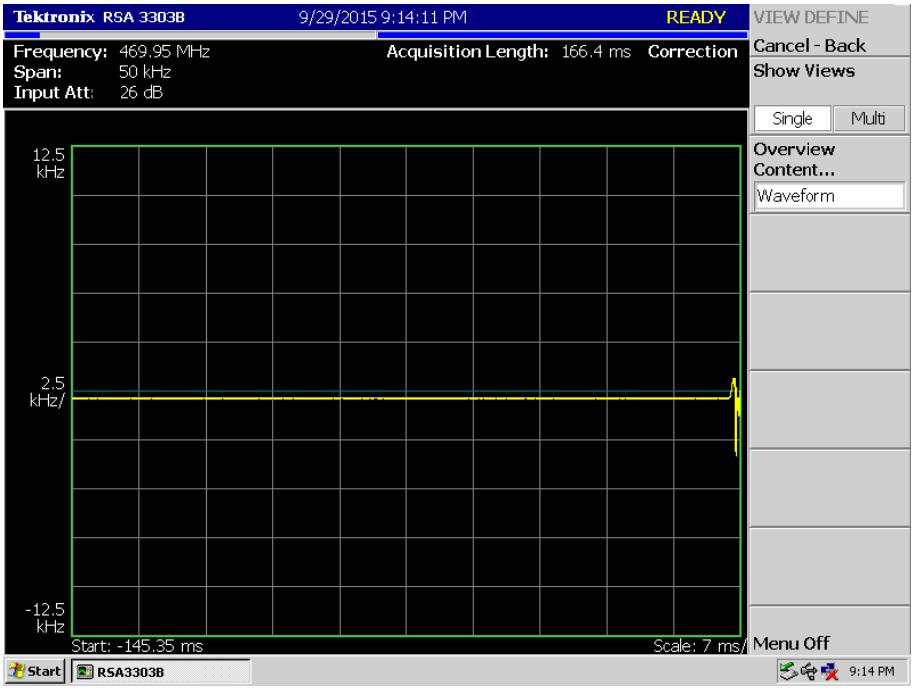
LOW POWER_7K60FXD/7K60FXE _429.95 MHz_Middle





LOW POWER_7K60FXD/7K60FXE _469.95 MHz_High

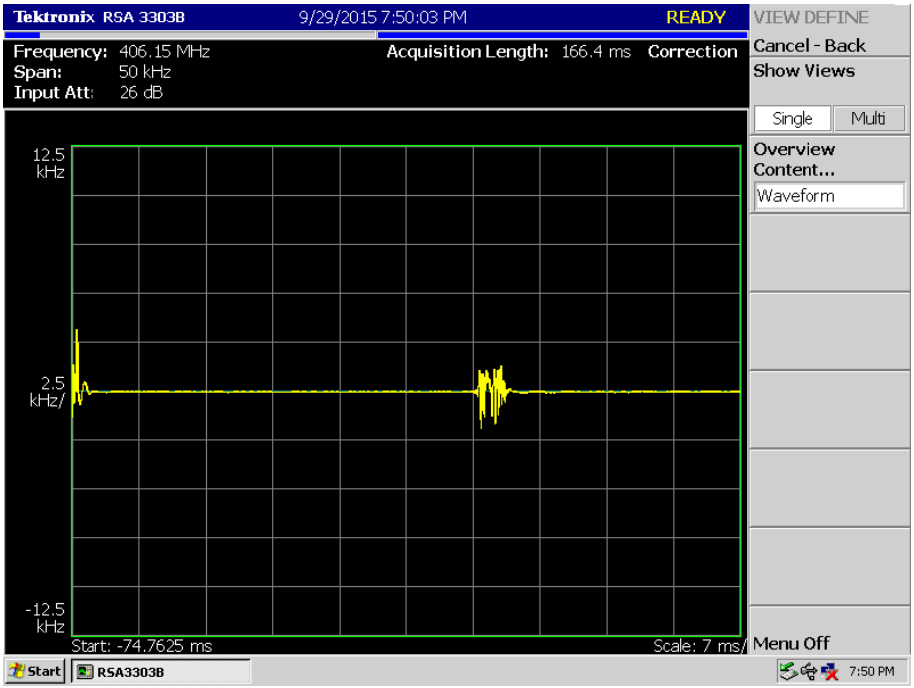


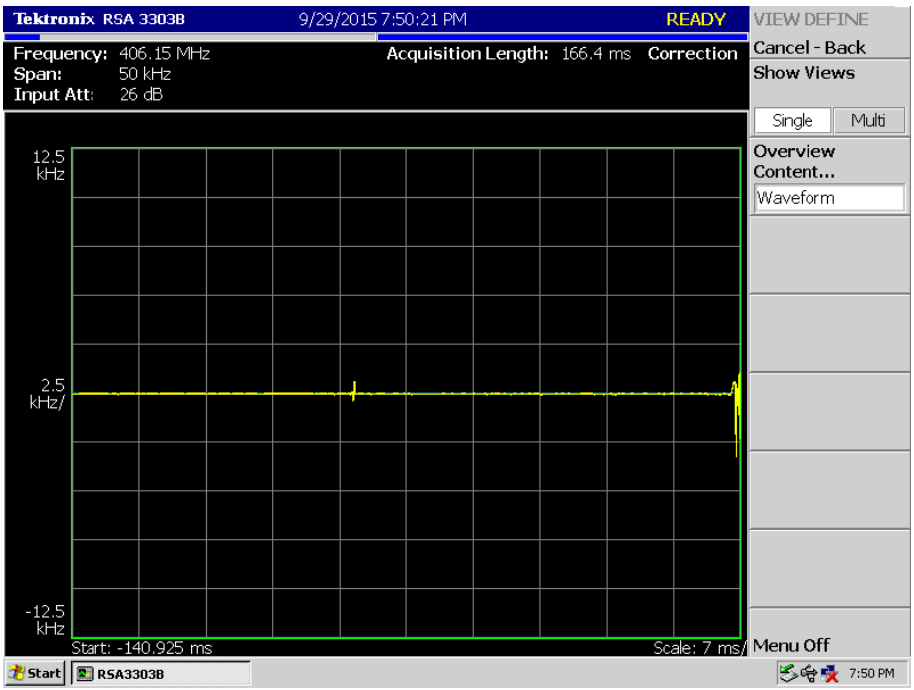


▣TEST RESULTS

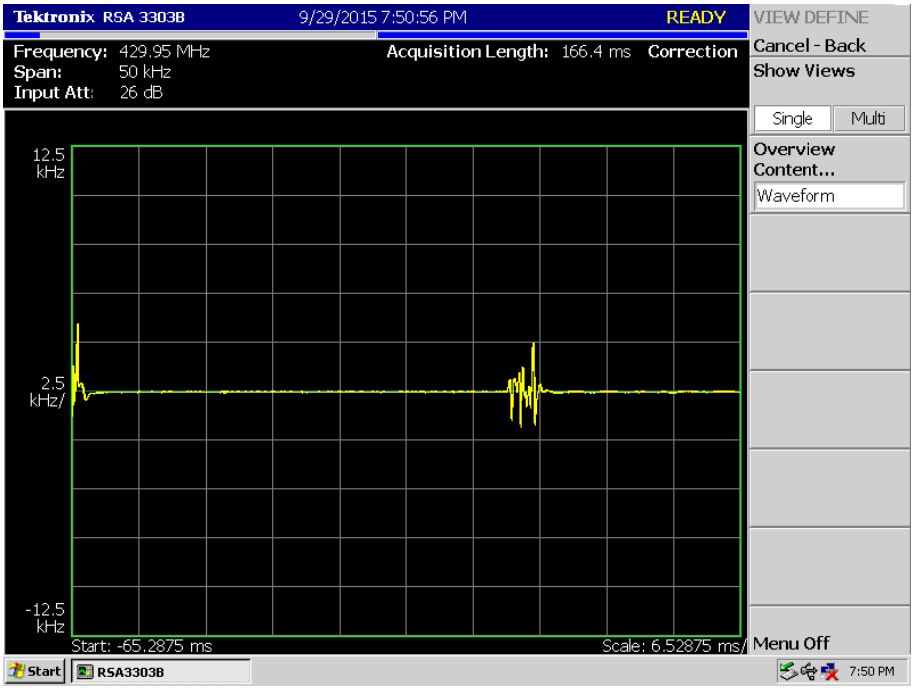
11K0F3E For FCC AND IC

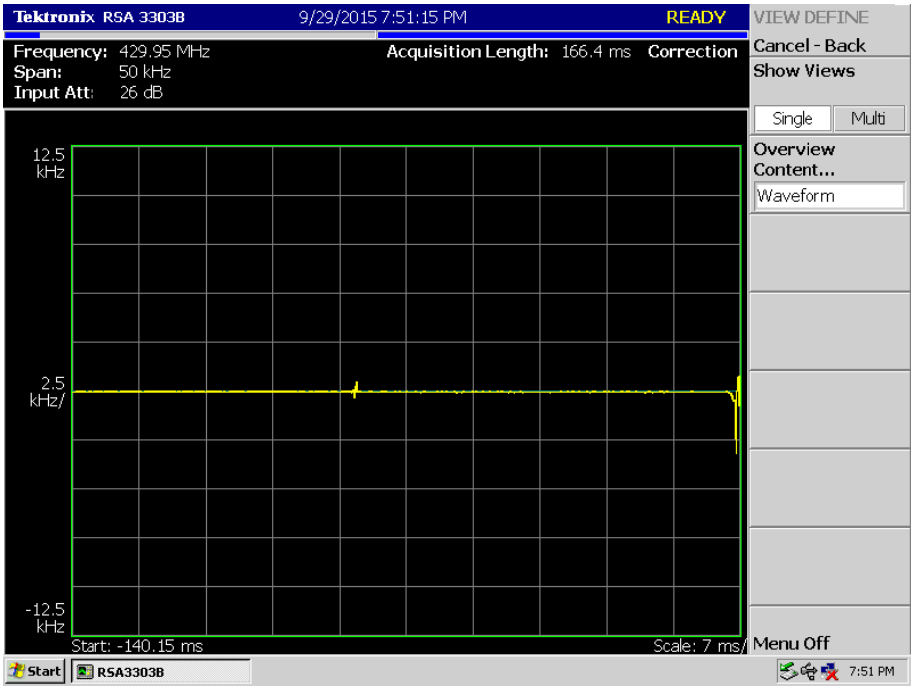
HIGH POWER_11K0F3E_406.15 MHz_Low



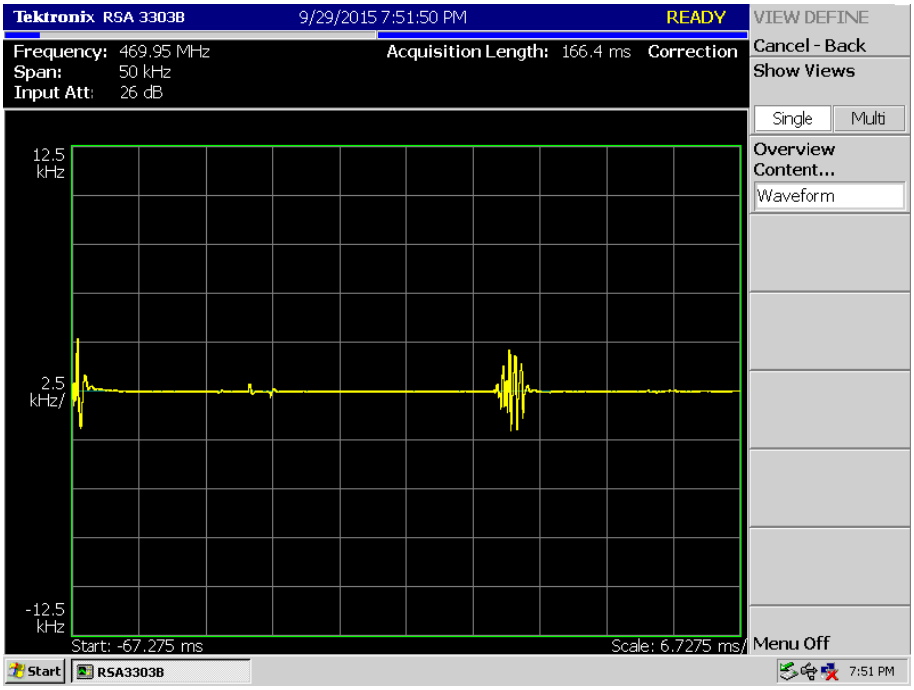


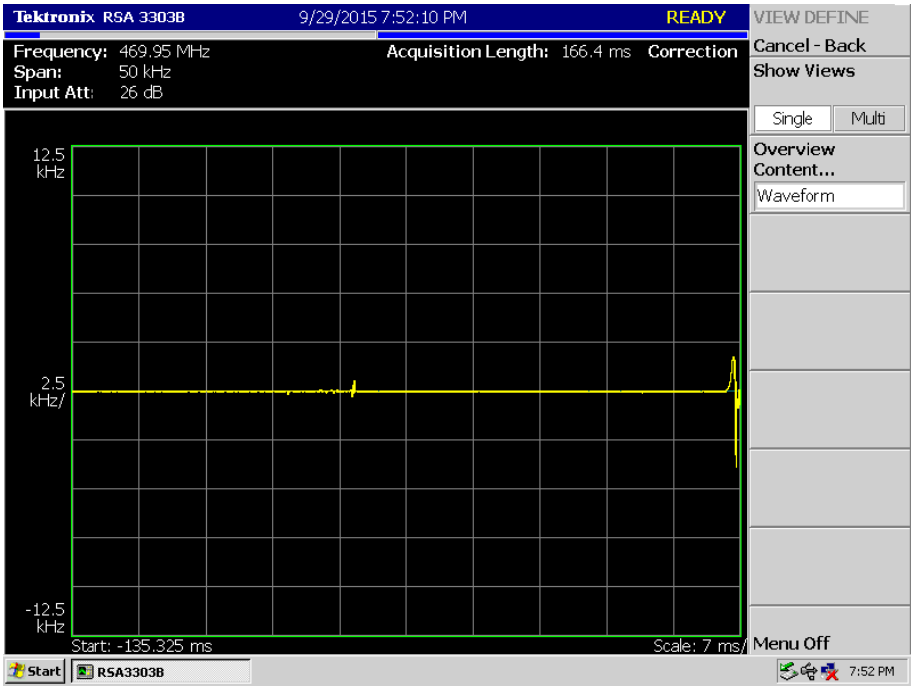
HIGH POWER_11K0F3E_429.95 MHz_Middle



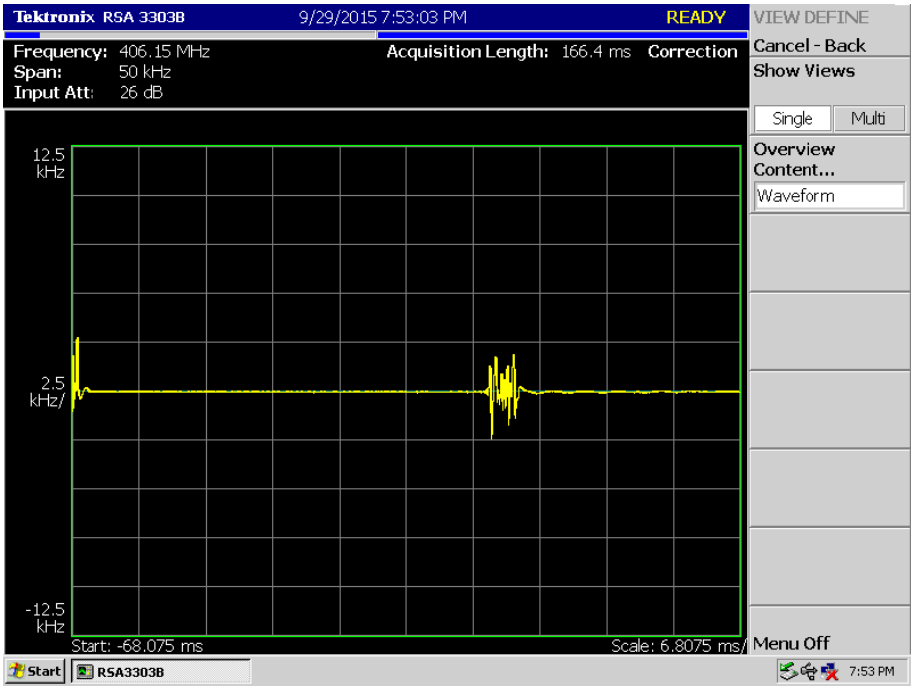


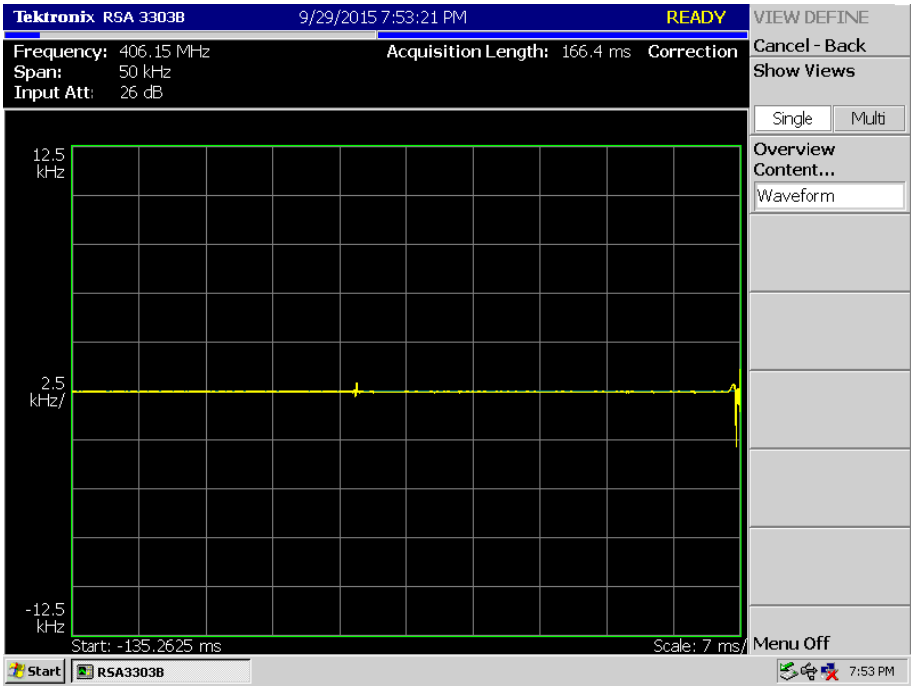
HIGH POWER_11K0F3E_469.95 MHz_High



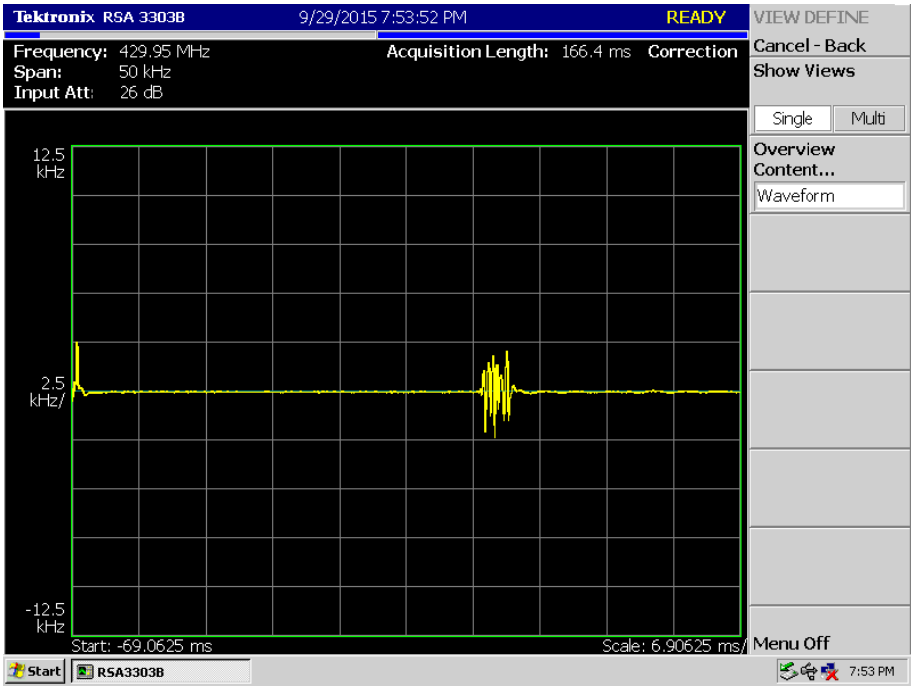


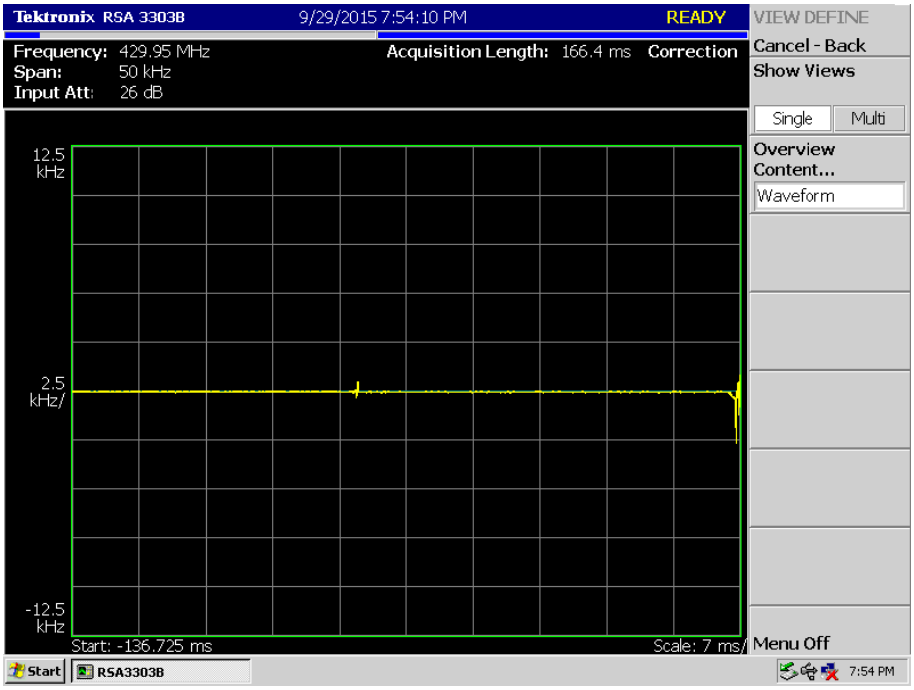
LOW POWER_11K0F3E _406.15 MHz_Low



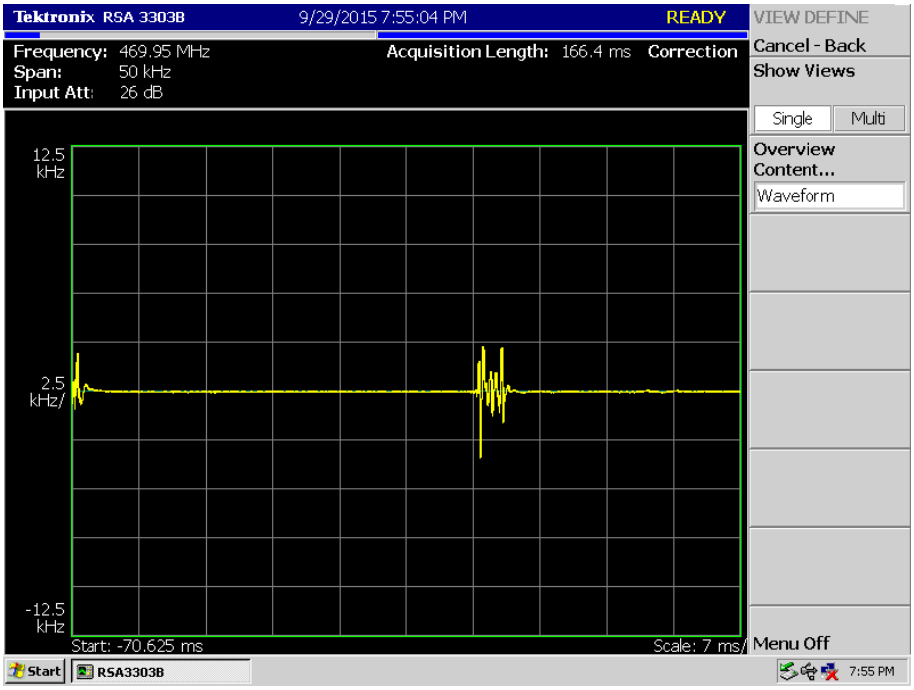


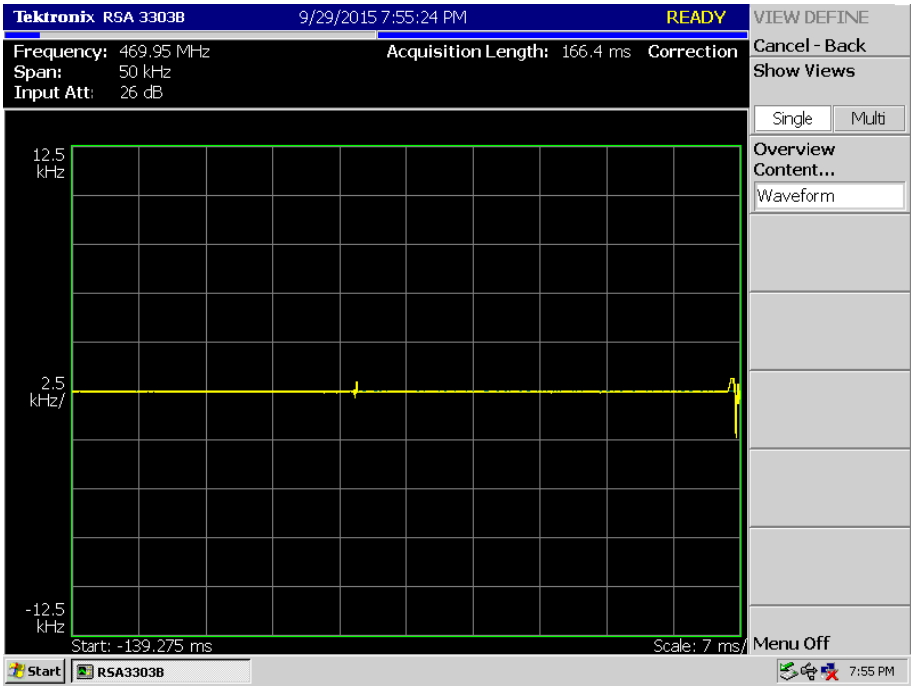
LOW POWER_11K0F3E _429.95 MHz_Middle





LOW POWER_11K0F3E _469.95 MHz_High

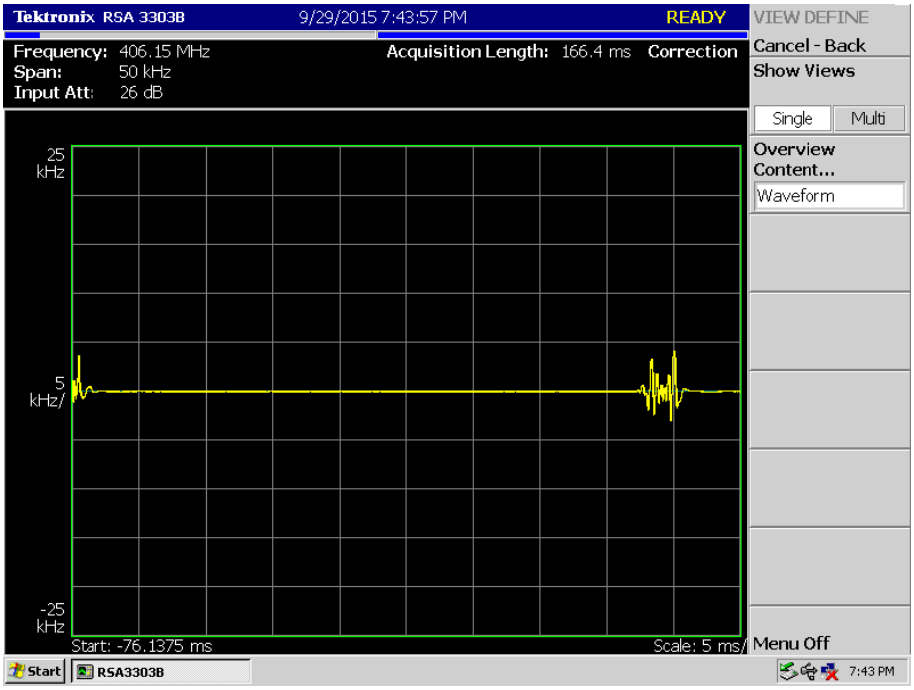


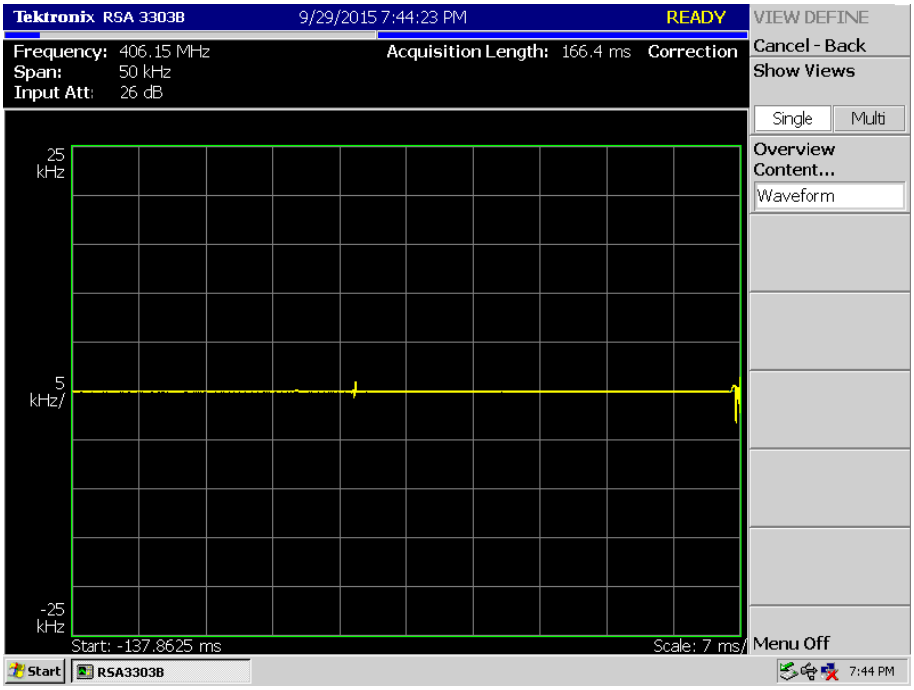


▣TEST RESULTS

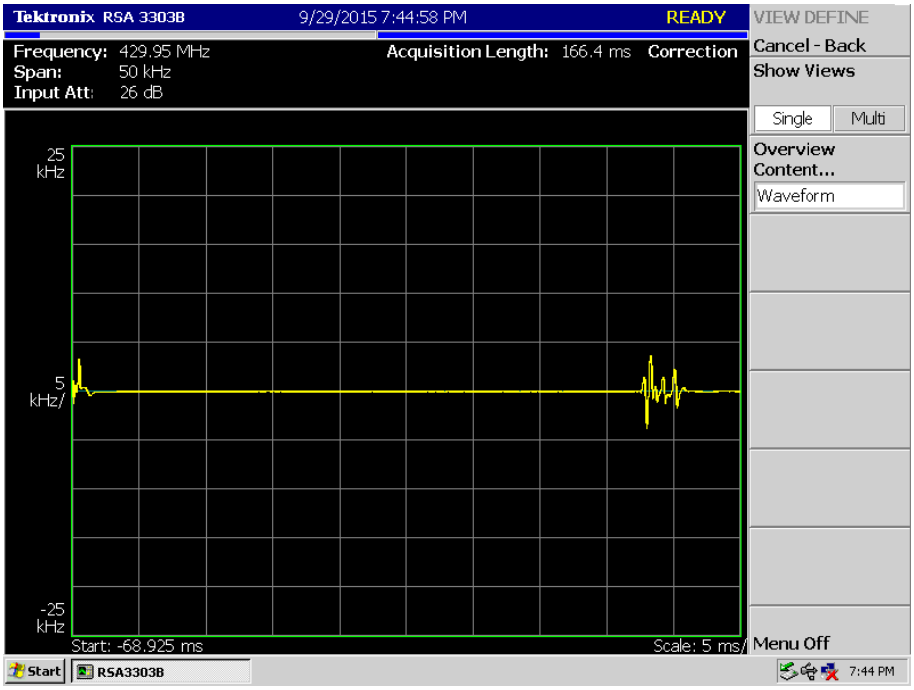
16K0F3E For ONLY IC

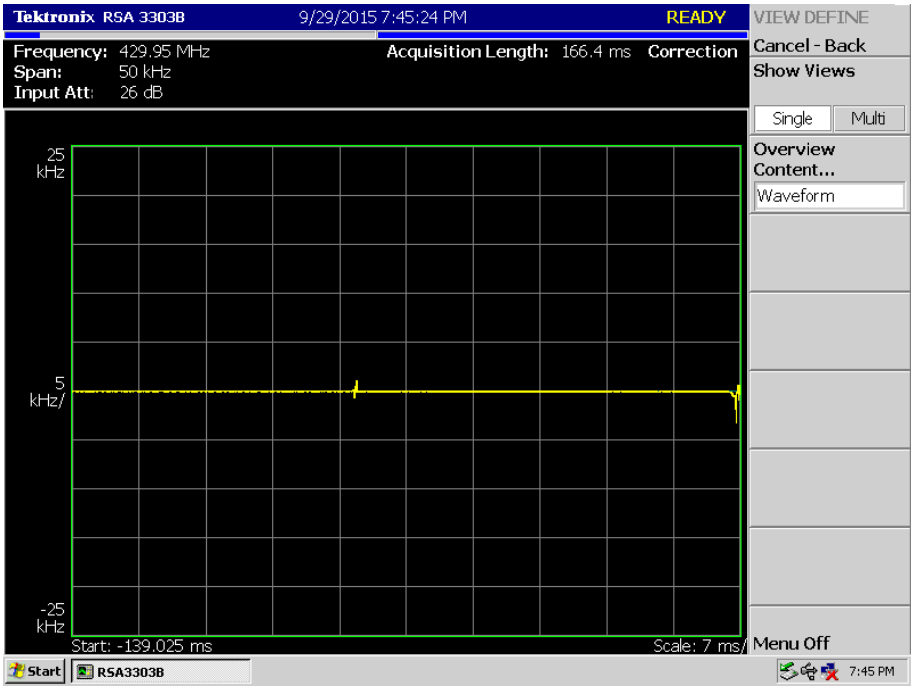
HIGH POWER_ 16K0F3E_406.15 MHz_Low



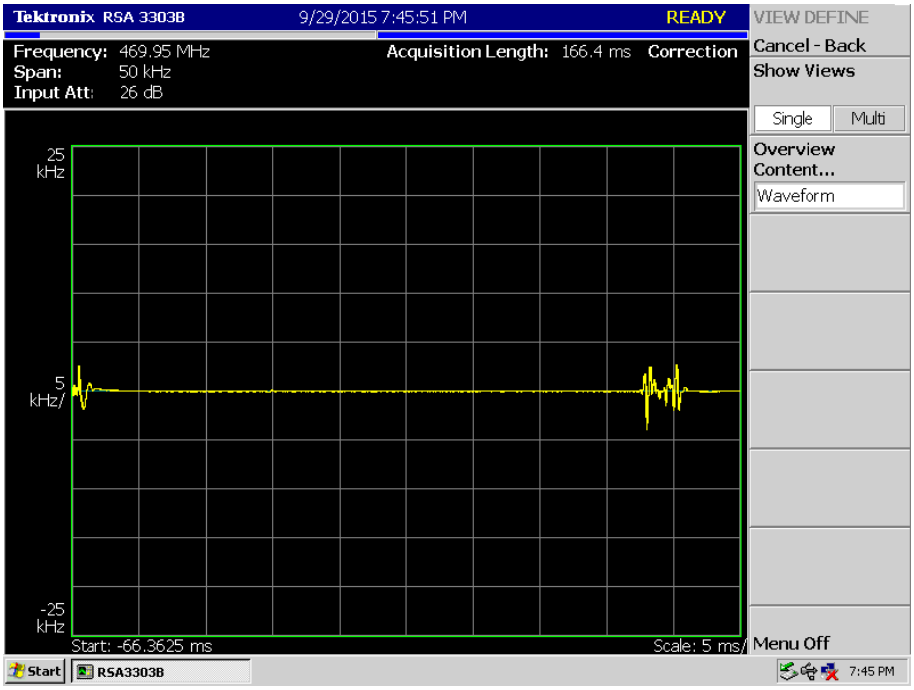


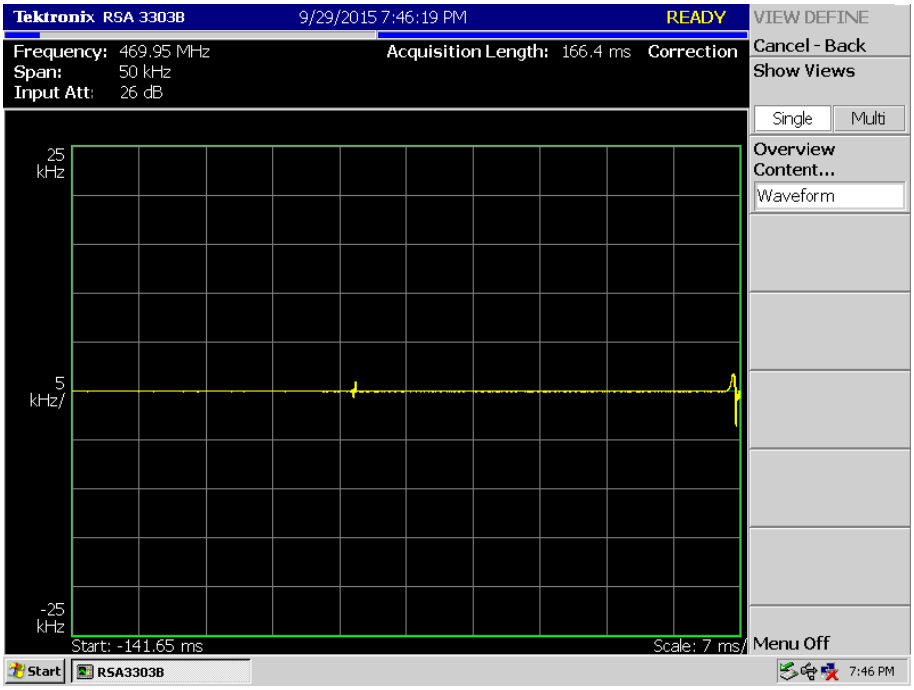
HIGH POWER_ 16K0F3E_429.95 MHz_Middle



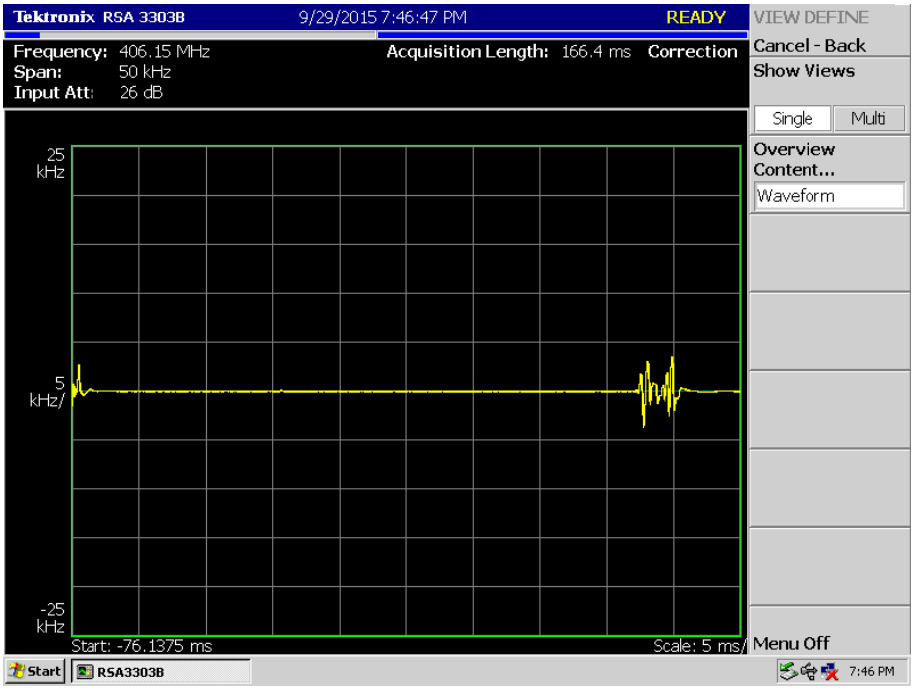


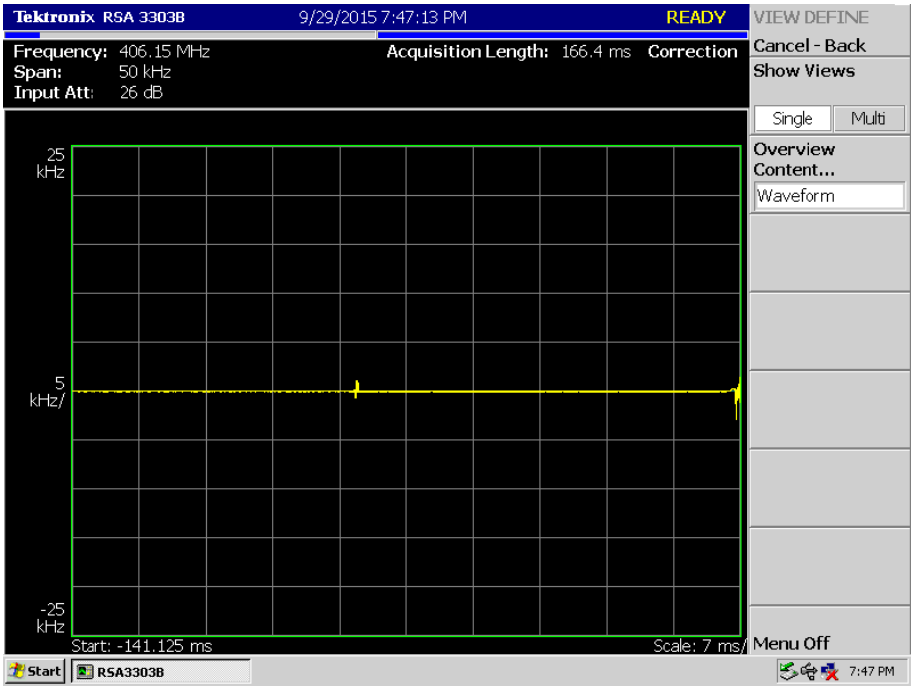
HIGH POWER_ 16K0F3E_469.95 MHz_High



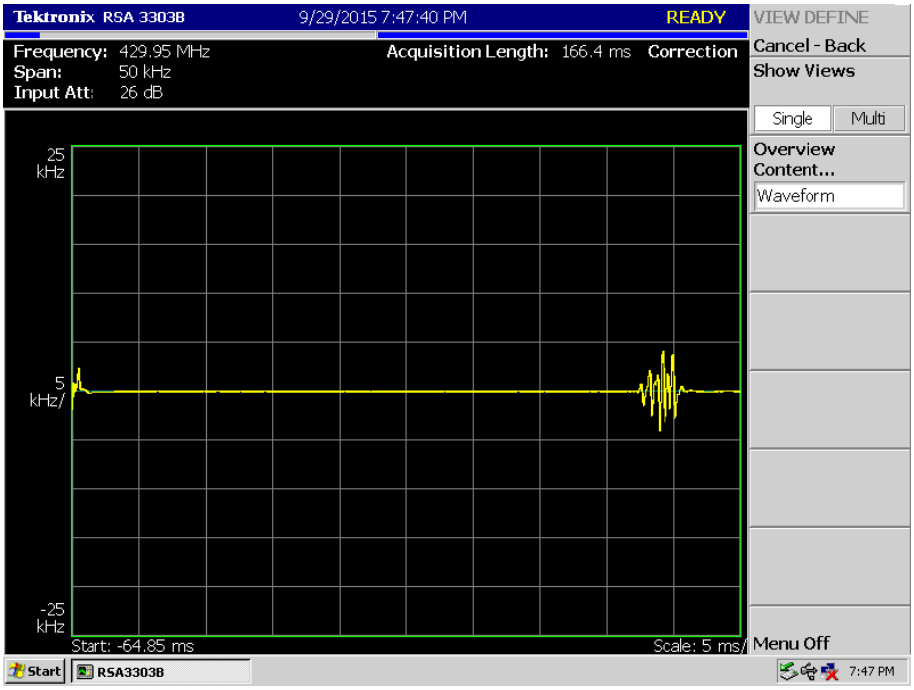


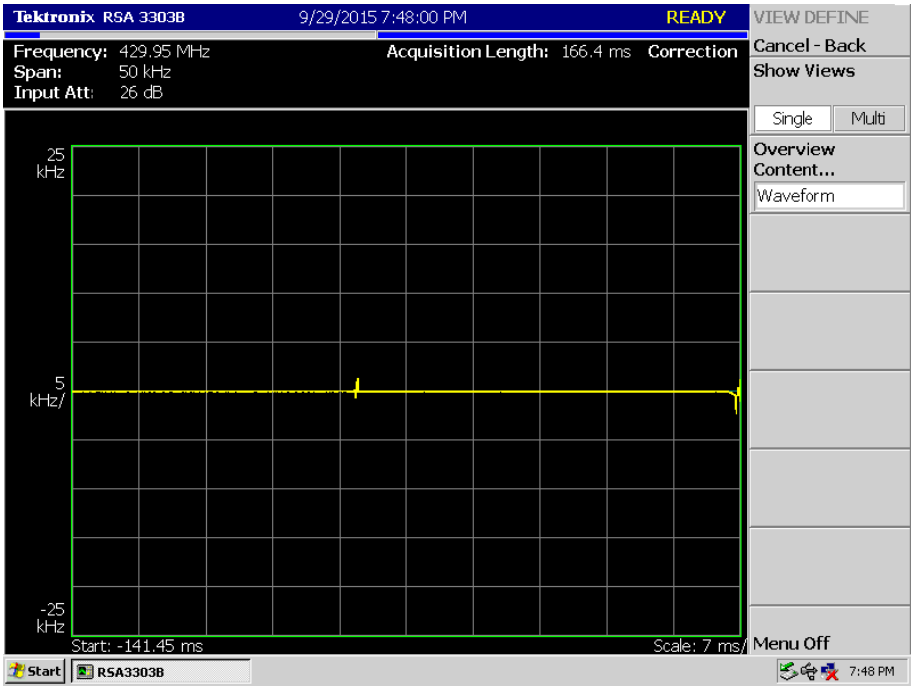
LOW POWER_ 16K0F3E _406.15 MHz_Low



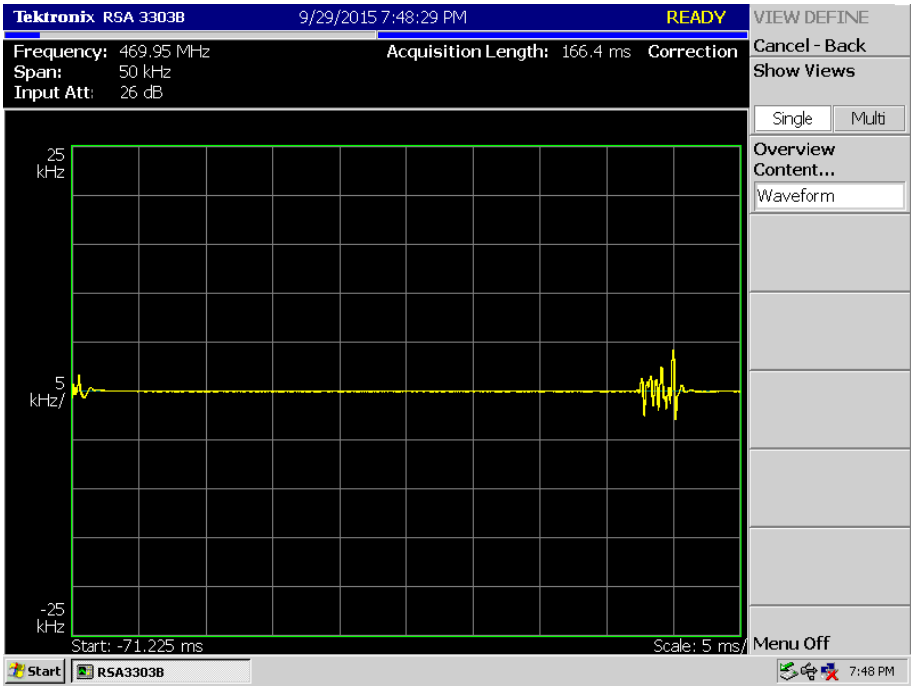


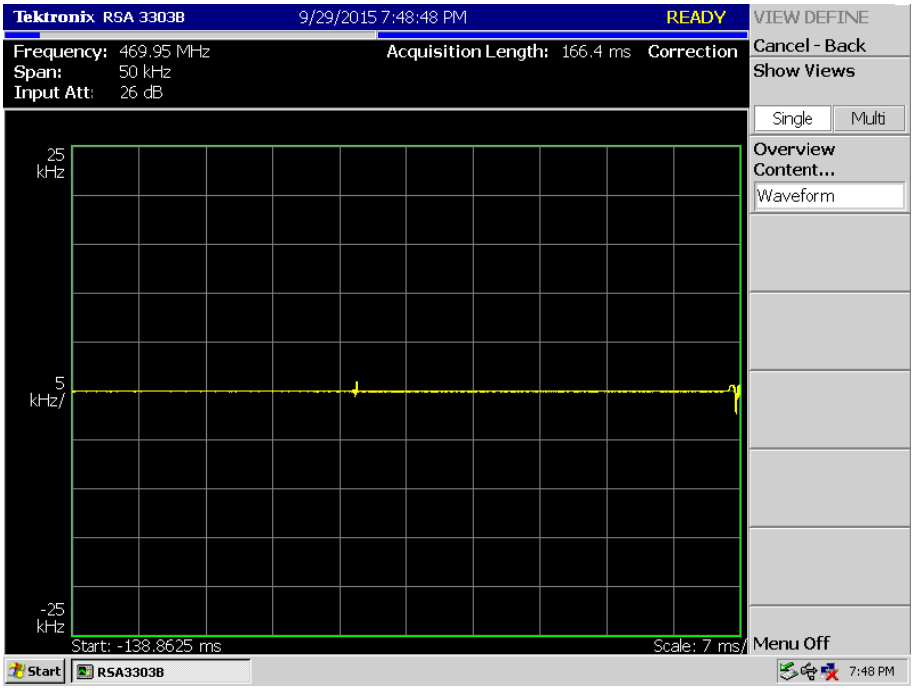
LOW POWER_ 16K0F3E _429.95 MHz_Middle





LOW POWER_ 16K0F3E _469.95 MHz_High



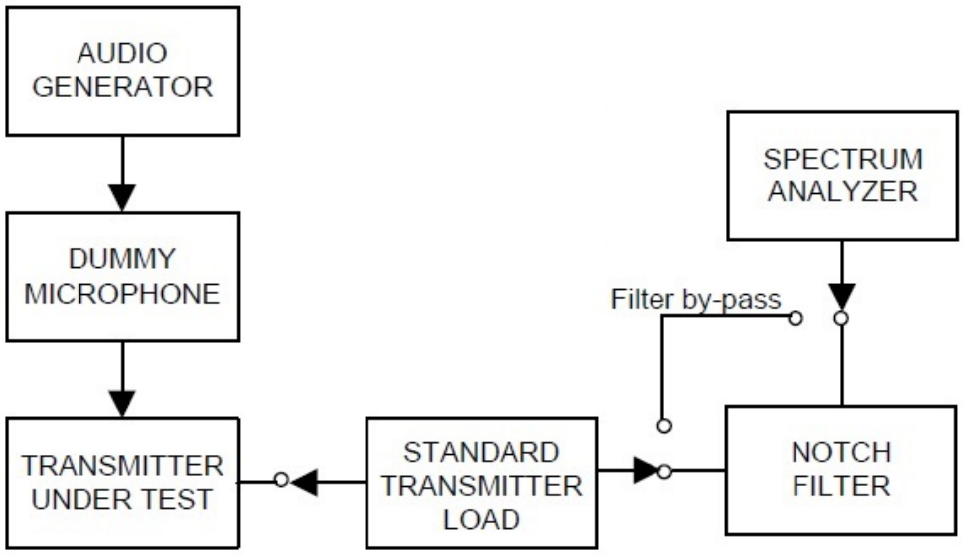


7.8 Unwanted Emissions : Conducted Spurious Emission

▣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-D 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 For FCC AND IC

7K60FXD/7K60FXE

Frequency (MHz)	Channel	Power Mode	Spurious Frequency (MHz)	Correct Level (dBm)	Emission Level (dBc)	Limit (dBc)	Margin (dB)
406.15	Low	High Power	0.010	-45.748	-82.383	-56.635	25.748
			0.170	-48.865	-85.500	-56.635	28.865
			474.260	-48.792	-85.427	-56.635	28.792
			5422.491	-34.235	-70.870	-56.635	14.235
429.95	Middle		0.012	-44.616	-81.371	-56.755	24.616
			0.160	-47.523	-84.278	-56.755	27.523
			872.930	-49.888	-86.643	-56.755	29.888
			5464.996	-35.160	-71.915	-56.755	15.160
469.95	High		0.011	-47.377	-83.850	-56.473	27.377
			0.160	-48.564	-85.037	-56.473	28.564
			848.680	-48.907	-85.380	-56.473	28.907
			5474.997	-35.404	-71.877	-56.473	15.404
406.15	Low	Low Power	0.010	-46.147	-76.459	-50.312	26.147
			0.160	-47.685	-77.997	-50.312	27.685
			502.390	-49.041	-79.353	-50.312	29.041
			5473.497	-35.563	-65.875	-50.312	15.563
429.95	Middle		0.009	-47.700	-78.036	-50.336	27.700
			0.150	-47.621	-77.957	-50.336	27.621
			794.360	-49.710	-80.046	-50.336	29.710
			5420.991	-34.890	-65.226	-50.336	14.890
469.95	High		0.009	-47.017	-77.767	-50.750	27.017
			0.160	-49.253	-80.003	-50.750	29.253
			881.660	-49.791	-80.541	-50.750	29.791
			5303.978	-35.416	-66.166	-50.750	15.416

▣TEST RESULTS For FCC AND IC

11K0F3E

Frequency (MHz)	Channel	Power Mode	Spurious Frequency (MHz)	Correct Level (dBm)	Emission Level (dBc)	Limit (dBc)	Margin (dB)
406.15	Low	High Power	0.010	-45.367	-82.185	-56.818	25.367
			0.150	-45.263	-82.081	-56.818	25.263
			474.260	-48.791	-85.609	-56.818	28.791
			5404.989	-35.298	-72.116	-56.818	15.298
429.95	Middle		0.011	-47.630	-84.450	-56.820	27.630
			0.165	-48.723	-85.543	-56.820	28.723
			856.440	-49.673	-86.493	-56.820	29.673
			5493.999	-35.065	-71.885	-56.820	15.065
469.95	High		0.009	-46.637	-83.297	-56.660	26.637
			0.185	-48.507	-85.167	-56.660	28.507
			80.440	-49.369	-86.029	-56.660	29.369
			5276.475	-32.981	-69.641	-56.660	12.981
406.15	Low	Low Power	0.009	-46.534	-76.944	-50.410	26.534
			0.155	-48.819	-79.229	-50.410	28.819
			501.420	-49.471	-79.881	-50.410	29.471
			5400.489	-34.748	-65.158	-50.410	14.748
429.95	Middle		0.011	-47.237	-77.740	-50.503	27.237
			0.150	-47.450	-77.953	-50.503	27.450
			866.140	-50.191	-80.694	-50.503	30.191
			5410.490	-35.031	-65.534	-50.503	15.031
469.95	High		0.009	-44.955	-75.802	-50.847	24.955
			0.175	-49.998	-80.845	-50.847	29.998
			841.890	-50.029	-80.876	-50.847	30.029
			5494.499	-34.986	-65.833	-50.847	14.986

▣TEST RESULTS For ONLY IC

16K0F3E

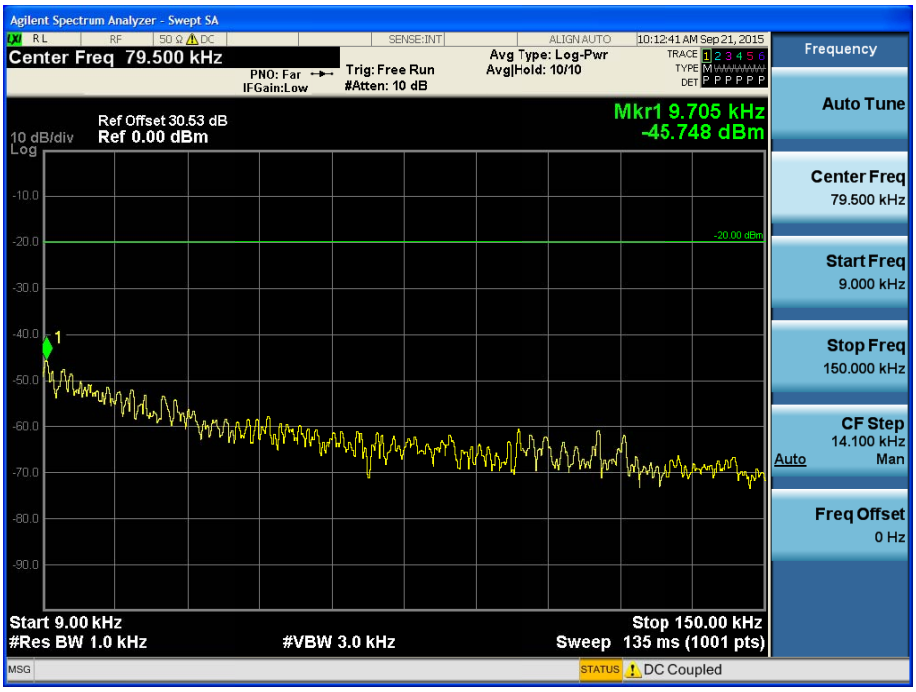
Frequency (MHz)	Channel	Power Mode	Spurious Frequency (MHz)	Correct Level (dBm)	Emission Level (dBc)	Limit (dBc)	Margin (dB)
406.15	Low	High Power	0.012	-46.566	-83.168	-56.602	26.566
			0.160	-48.394	-84.996	-56.602	28.394
			811.820	-49.307	-85.909	-56.602	29.307
			5472.997	-35.781	-72.383	-56.602	15.781
429.95	Middle		0.011	-46.125	-82.780	-56.655	26.125
			0.165	-50.611	-87.266	-56.655	30.611
			923.370	-48.329	-84.984	-56.655	28.329
			5430.992	-34.781	-71.436	-56.655	14.781
469.95	High		0.010	-47.581	-84.141	-56.560	27.581
			0.155	-48.974	-85.534	-56.560	28.974
			734.220	-49.891	-86.451	-56.560	29.891
			5430.492	-35.820	-72.380	-56.560	15.820
406.15	Low	Low Power	0.010	-45.196	-75.493	-50.297	25.196
			0.160	-49.441	-79.738	-50.297	29.441
			937.920	-49.787	-80.084	-50.297	29.787
			5387.988	-35.729	-66.026	-50.297	15.729
429.95	Middle		0.010	-45.722	-76.032	-50.310	25.722
			0.160	-47.371	-77.681	-50.310	27.371
			887.480	-49.659	-79.969	-50.310	29.659
			5401.489	-35.459	-65.769	-50.310	15.459
469.95	High		0.009	-47.196	-77.948	-50.752	27.196
			0.165	-48.504	-79.256	-50.752	28.504
			907.850	-49.123	-79.875	-50.752	29.123
			5453.995	-34.564	-65.316	-50.752	14.564

▣TEST PLOT

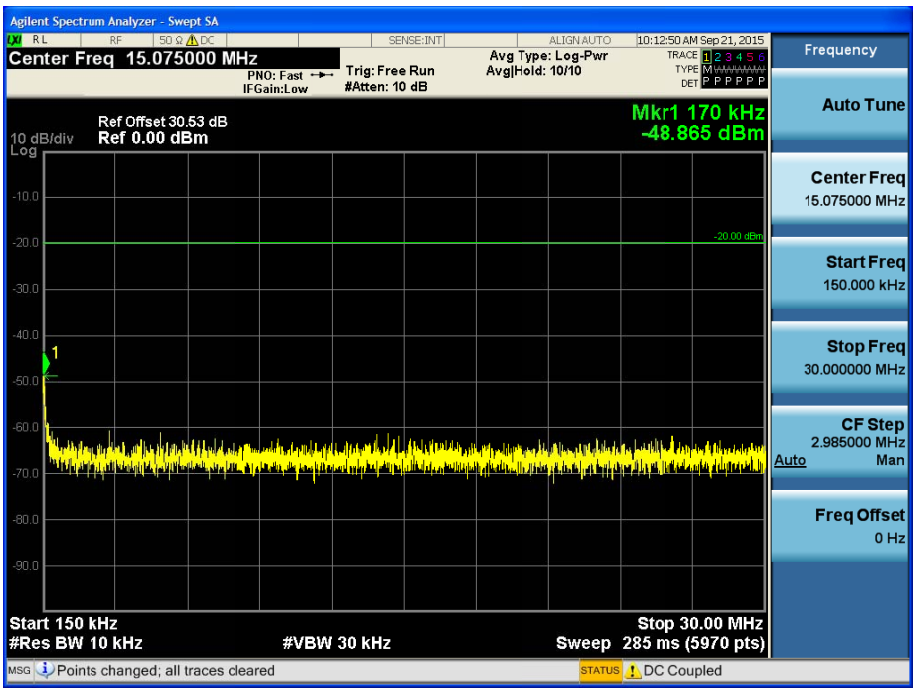
7K60FXD/7K60FXE For FCC AND IC

HIGH POWER_7K60FXD/7K60FXE _406.15 MHz_Low

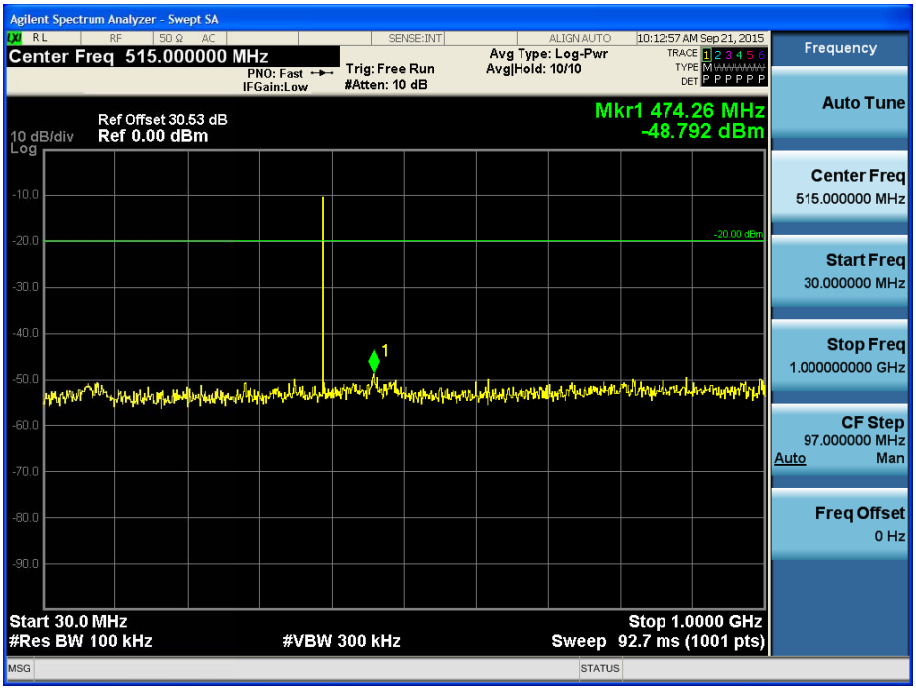
(9 kHz ~ 150 kHz)



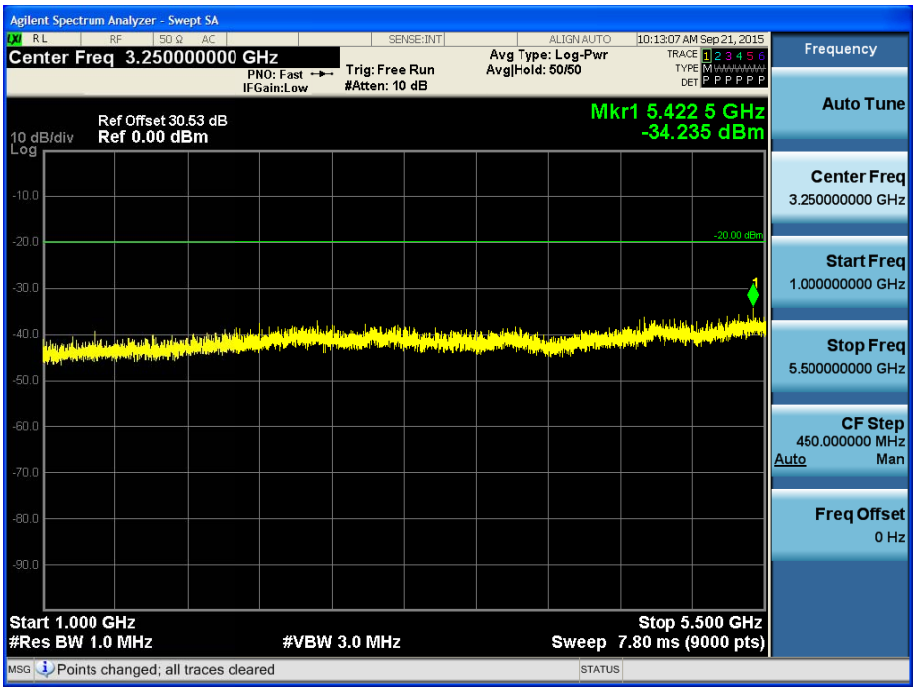
(150 kHz ~ 30 MHz)



(30 MHz ~ 1 GHz)



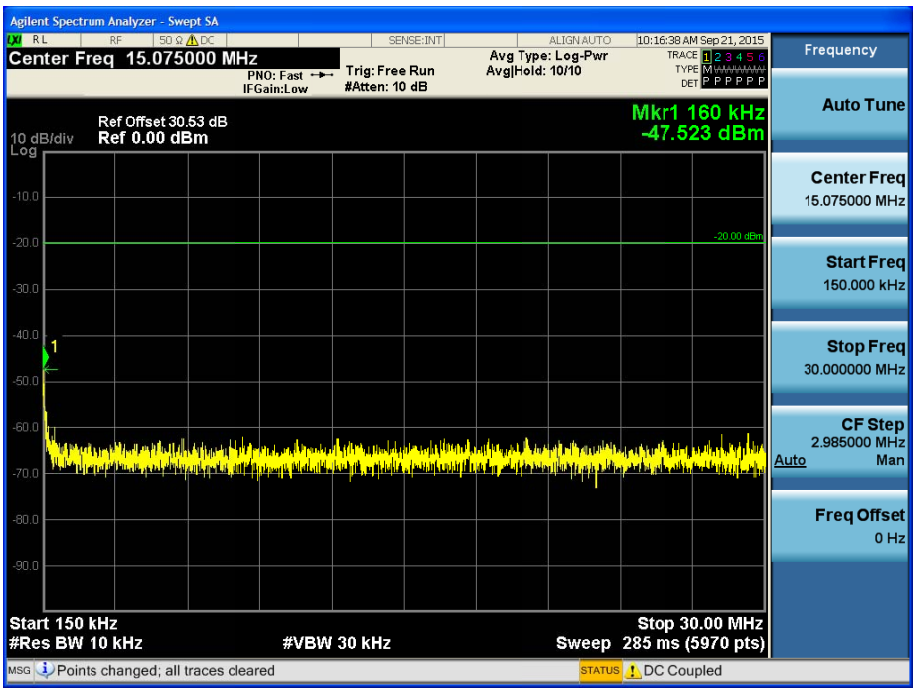
(1 GHz ~ 5.5 GHz)



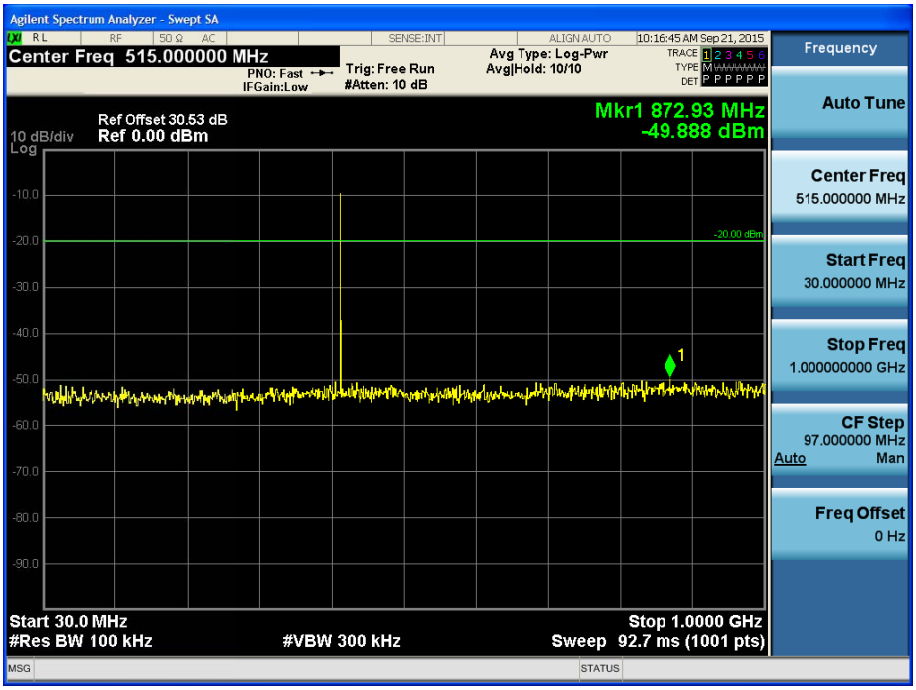
HIGH POWER_7K60FXD/7K60FXE _429.95 MHz_Middle

(9 kHz ~ 150 kHz)

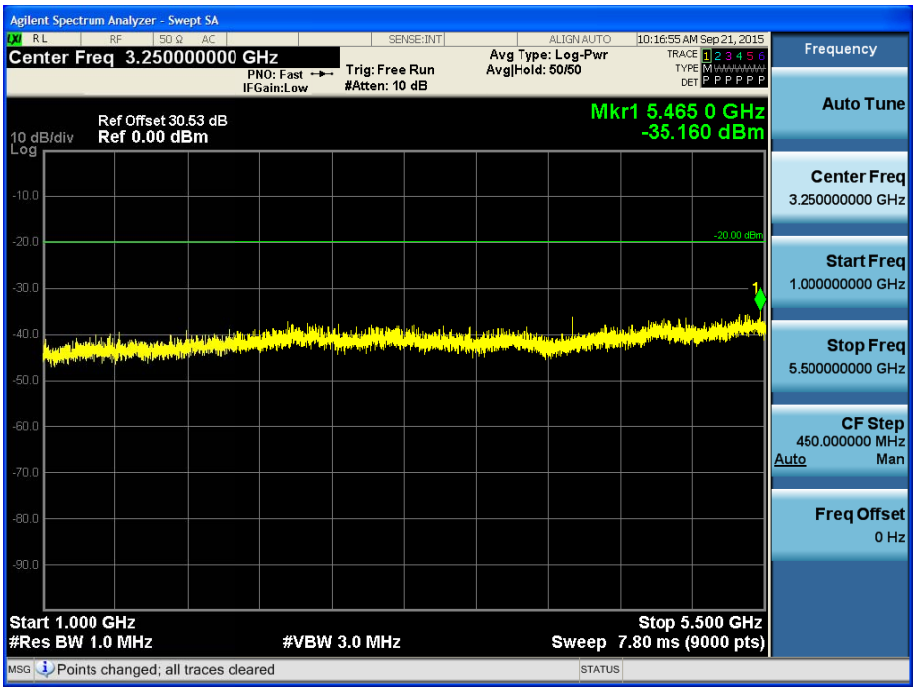
(150 kHz ~ 30 MHz)



(30 MHz ~ 1 GHz)

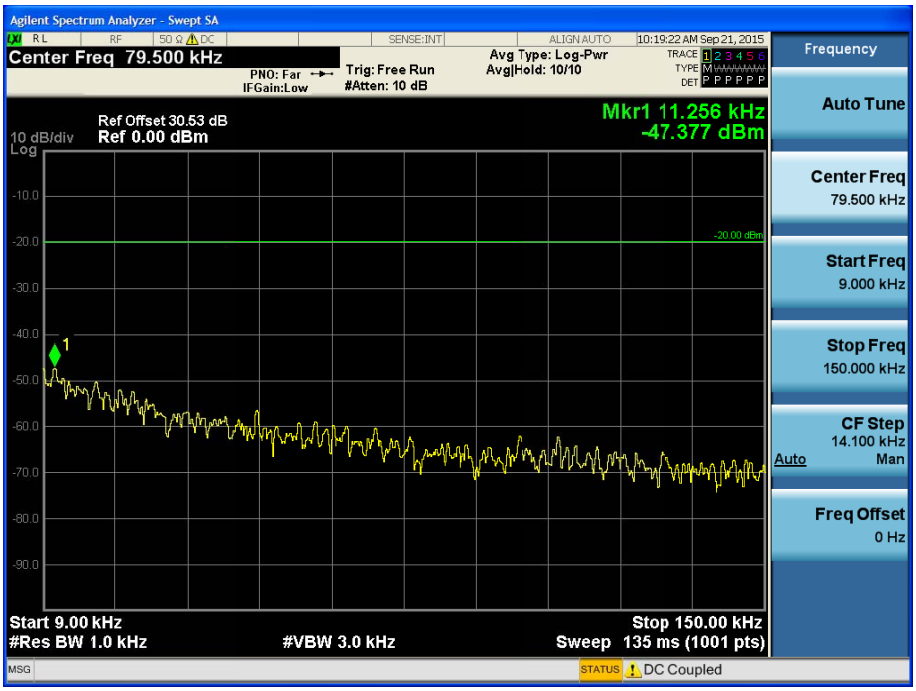


(1 GHz ~ 5.5 GHz)

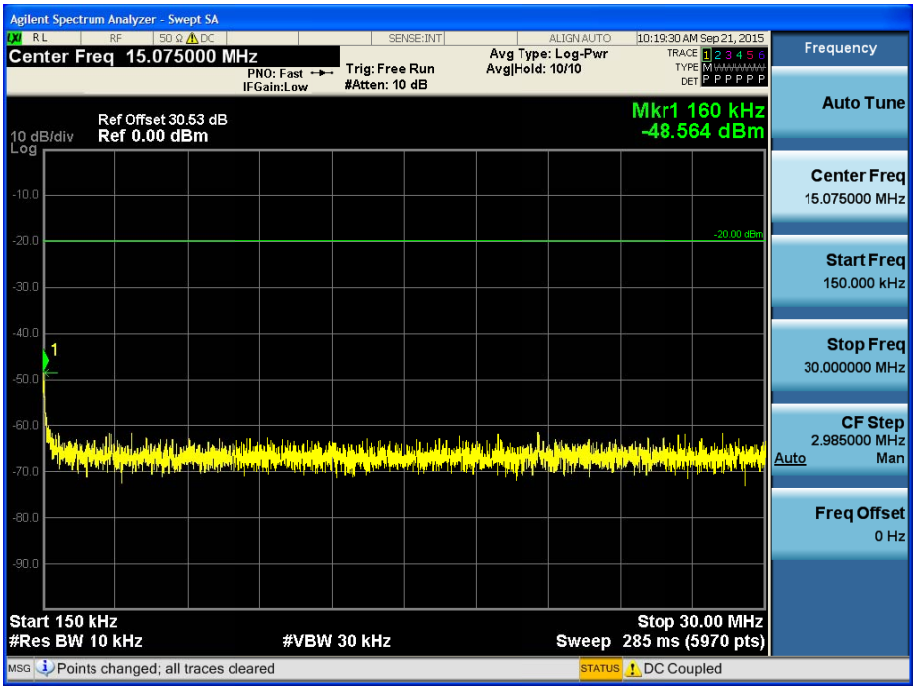


HIGH POWER_7K60FXD/7K60FXE _469.95 MHz_High

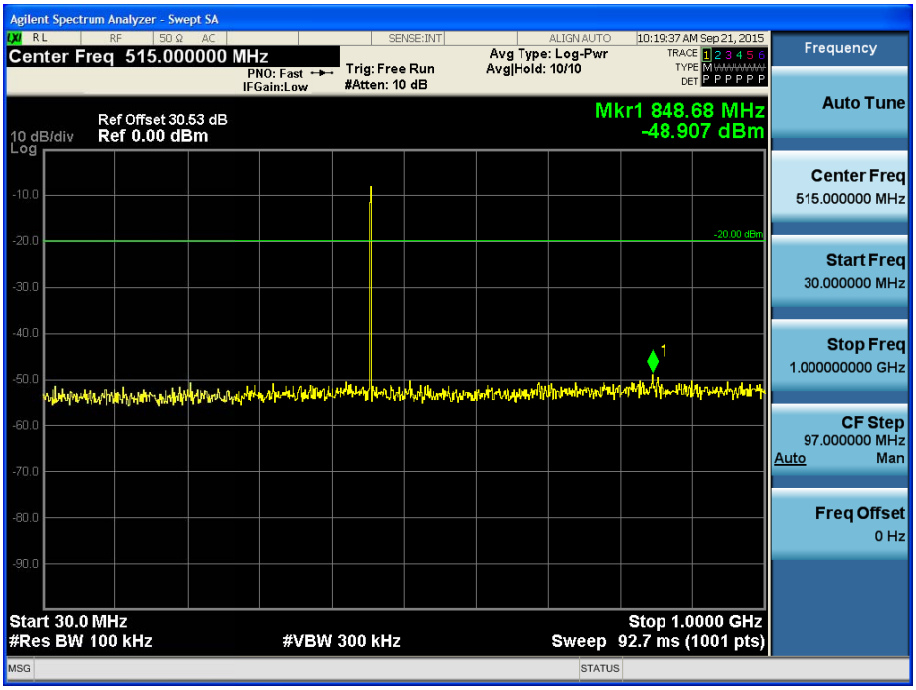
(9 kHz ~ 150 kHz)



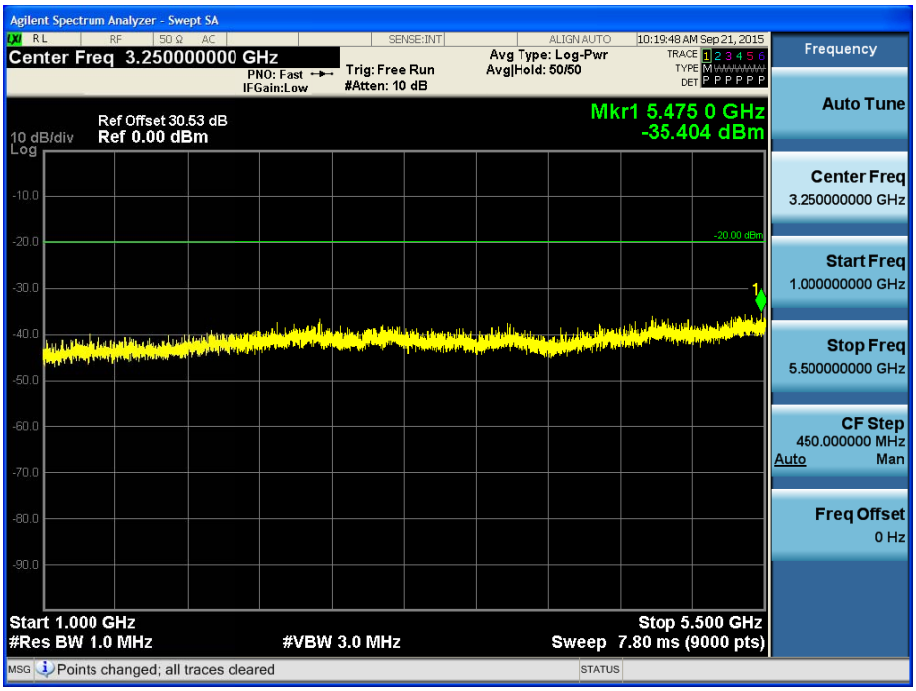
(150 kHz ~ 30 MHz)



(30 MHz ~ 1 GHz)

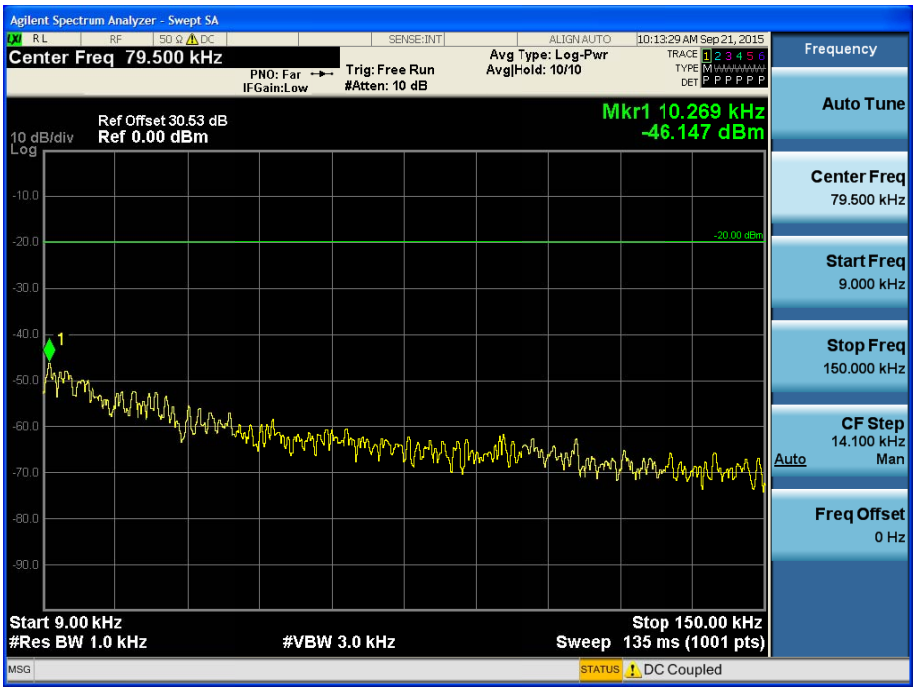


(1 GHz ~ 5.5 GHz)

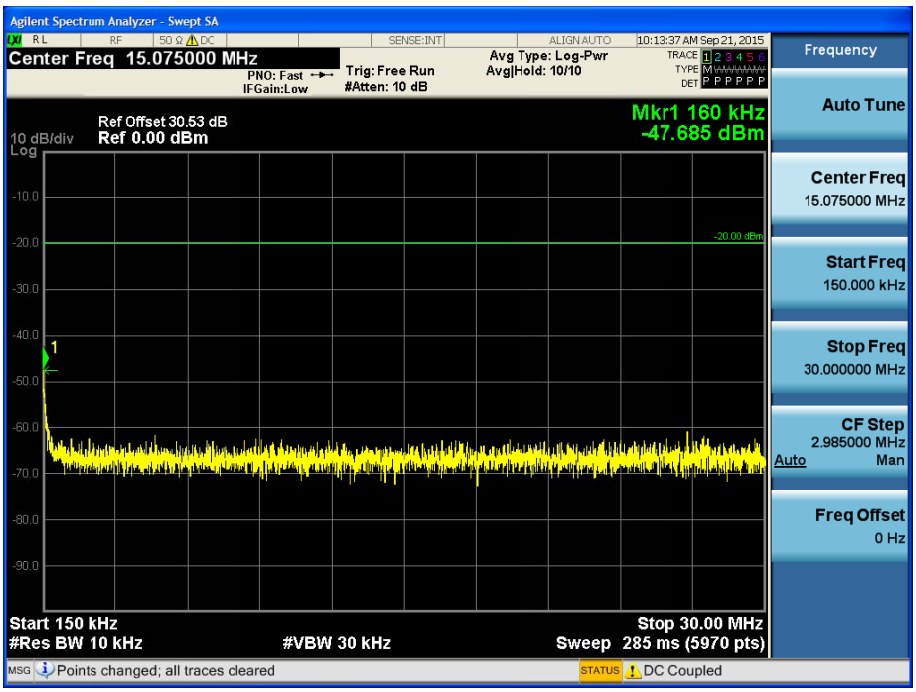


LOW POWER_7K60FXD/7K60FXE _406.15 MHz_Low

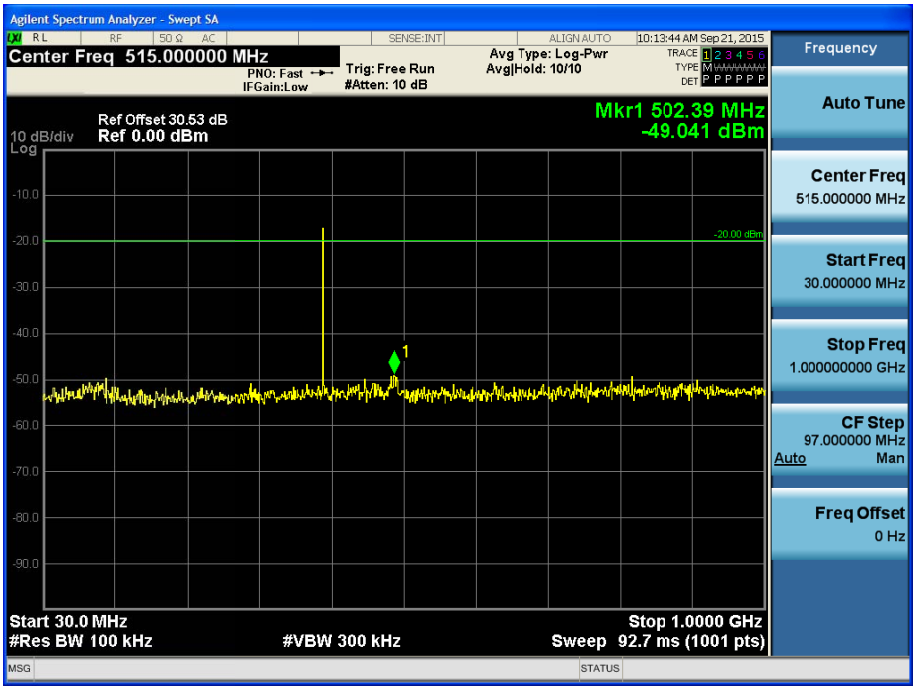
(9 kHz ~ 150 kHz)



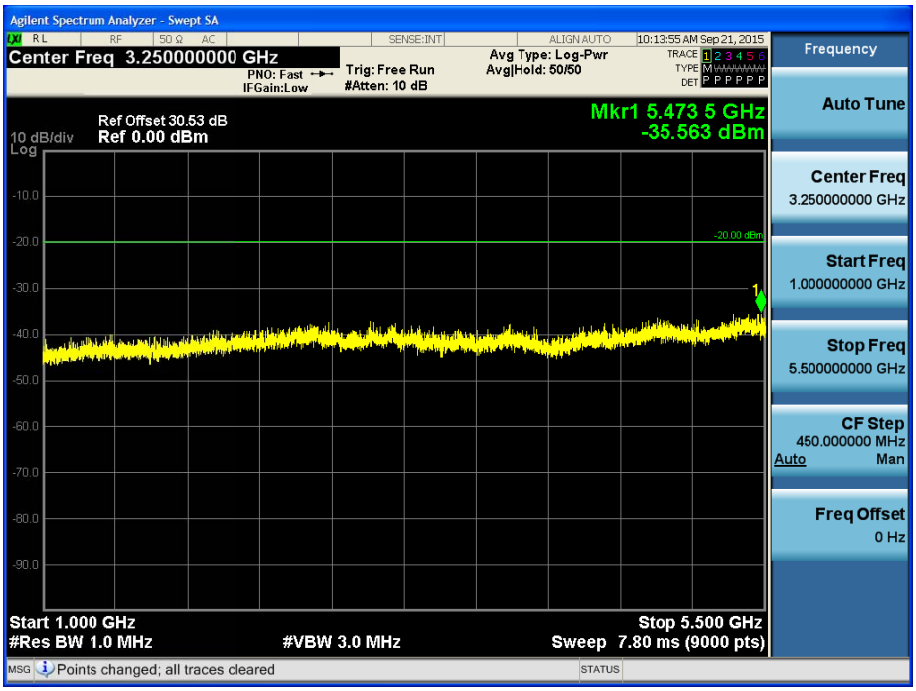
(150 kHz ~ 30 MHz)



(30 MHz ~ 1 GHz)

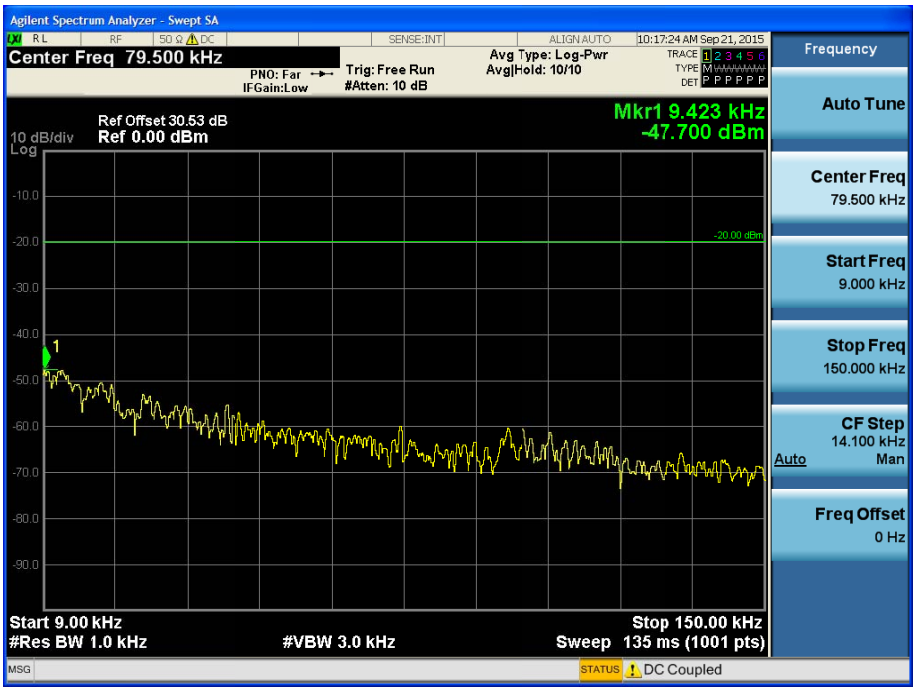


(1 GHz ~ 5.5 GHz)

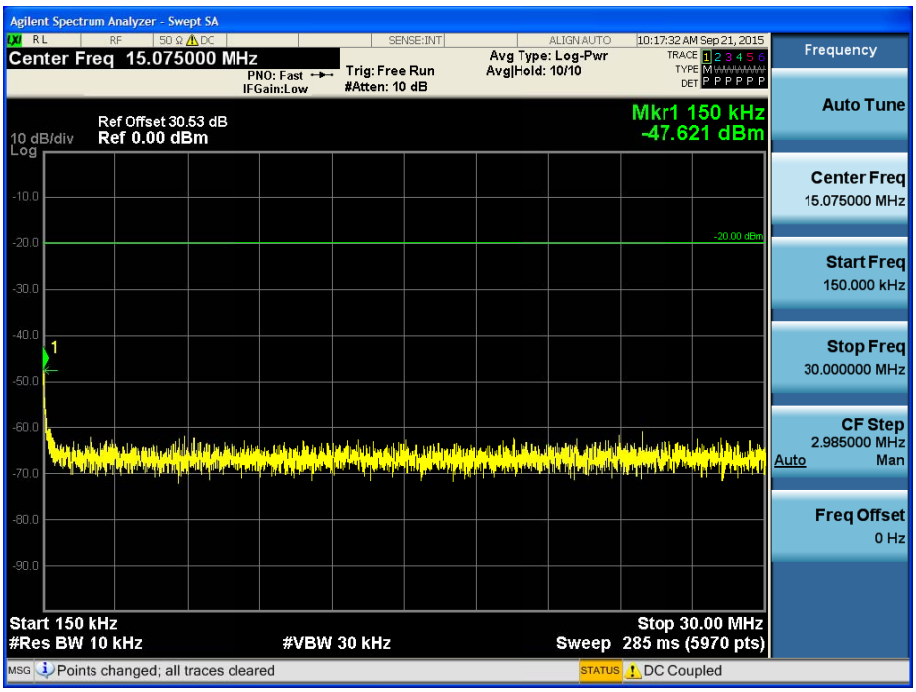


LOW POWER_7K60FXD/7K60FXE _429.95 MHz_Middle

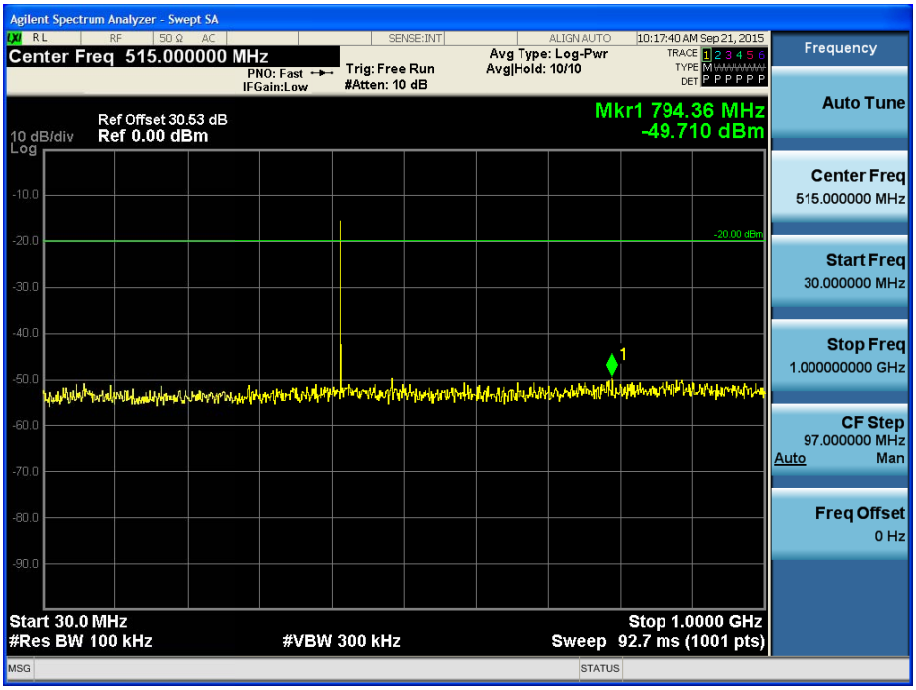
(9 kHz ~ 150 kHz)



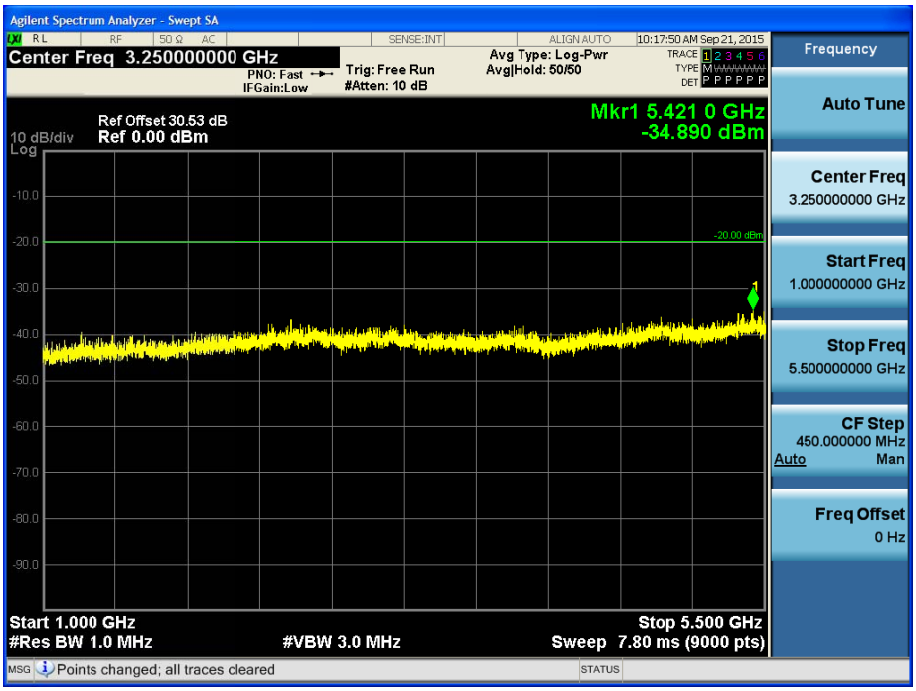
(150 kHz ~ 30 MHz)



(30 MHz ~ 1 GHz)

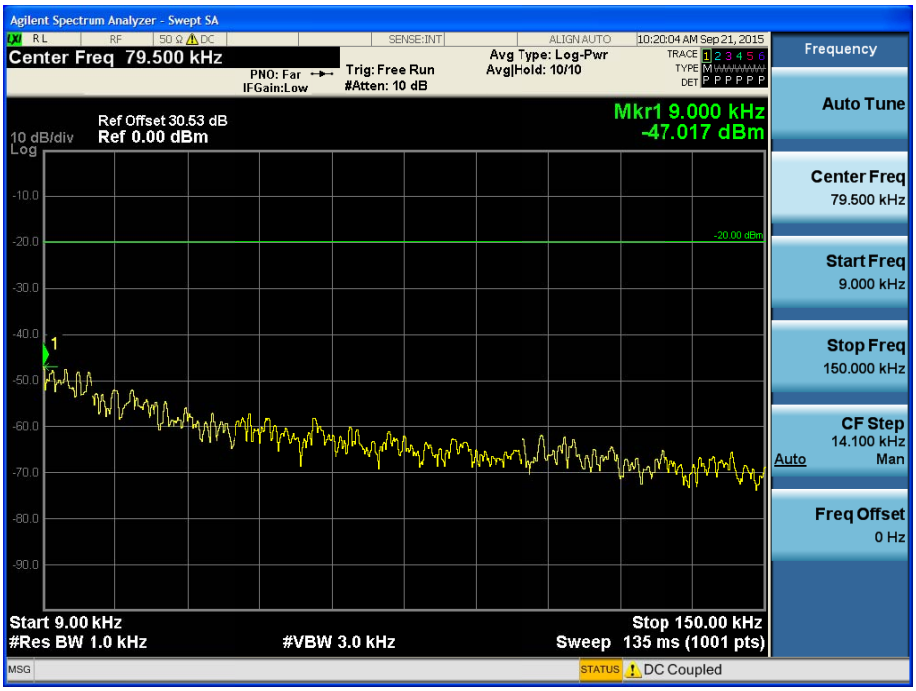


(1 GHz ~ 5.5 GHz)

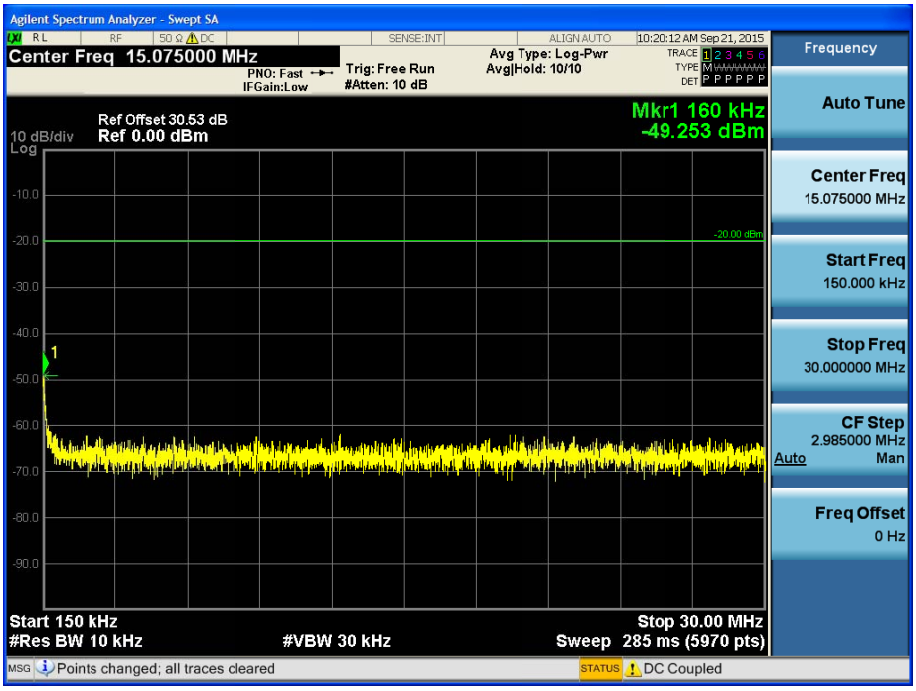


LOW POWER_7K60FXD/7K60FXE _469.95 MHz_High

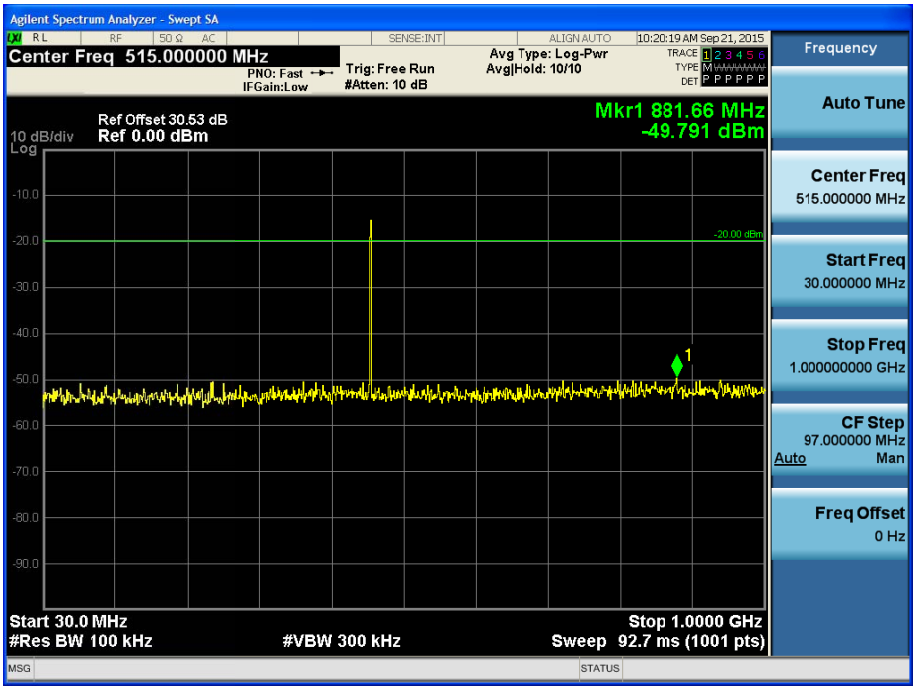
(9 kHz ~ 150 kHz)



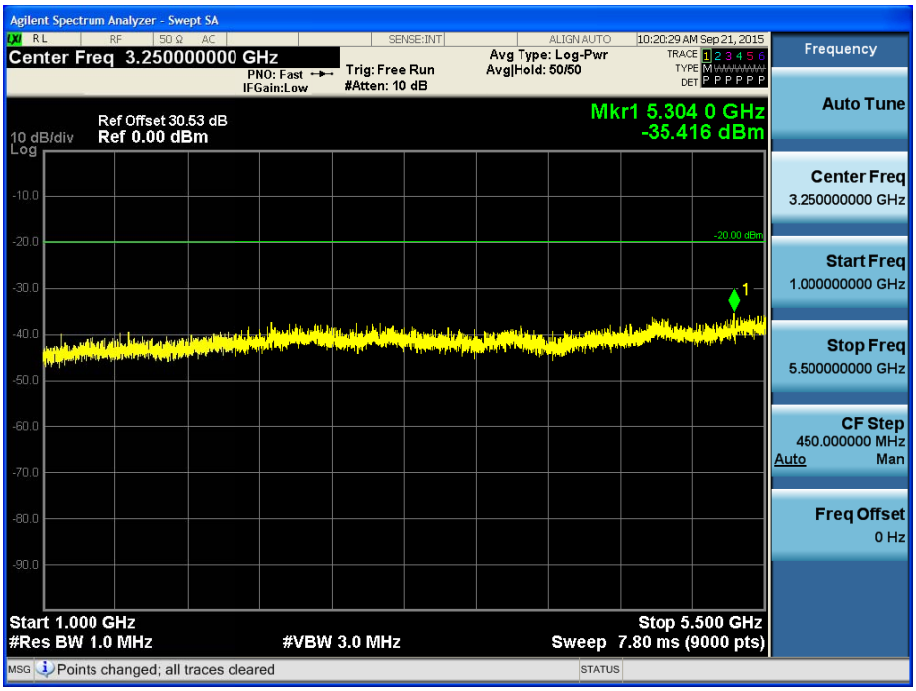
(150 kHz ~ 30 MHz)



(30 MHz ~ 1 GHz)



(1 GHz ~ 5.5 GHz)

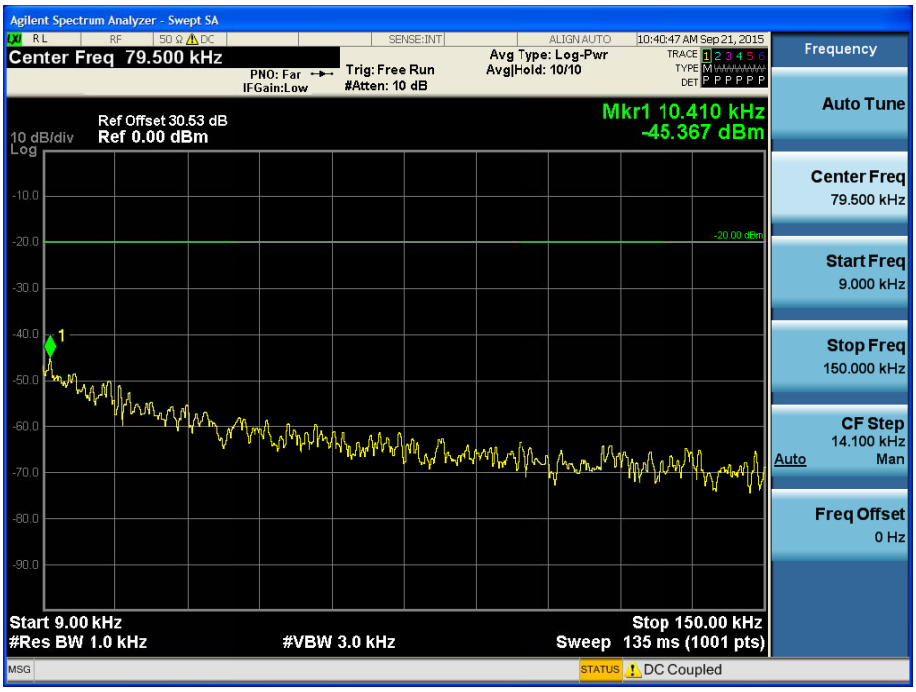


▣TEST RESULTS

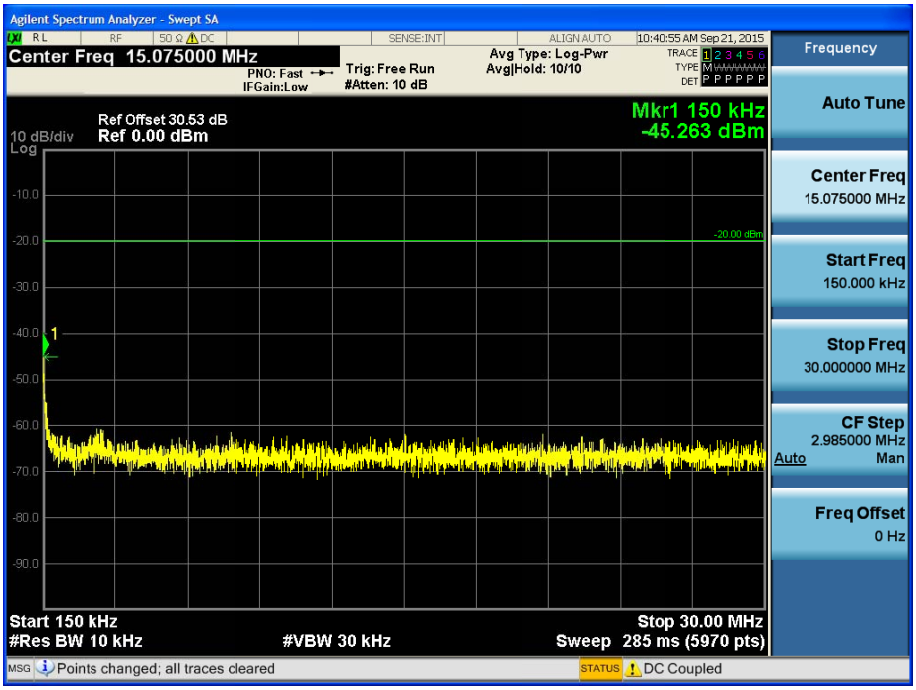
11K0F3E For FCC AND IC

HIGH POWER_11K0F3E_406.15 MHz_Low

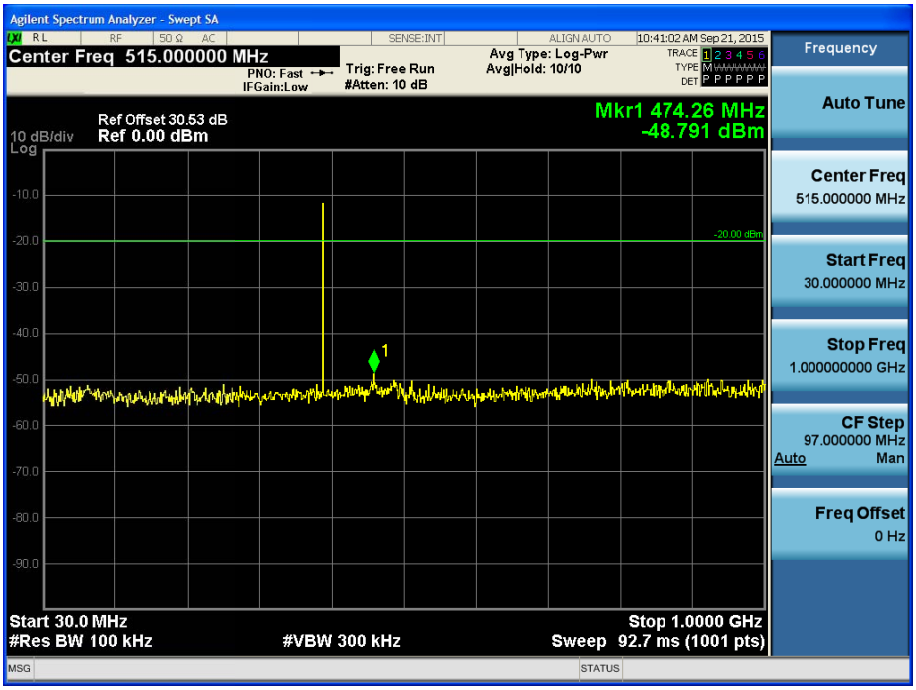
(9 kHz ~ 150 kHz)



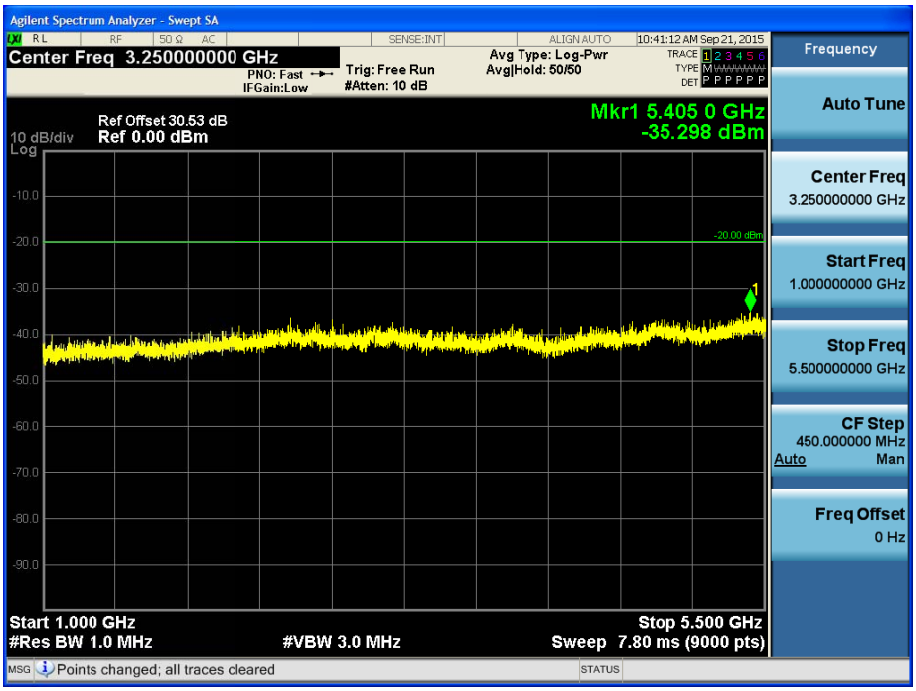
(150 kHz ~ 30 MHz)



(30 MHz ~ 1 GHz)

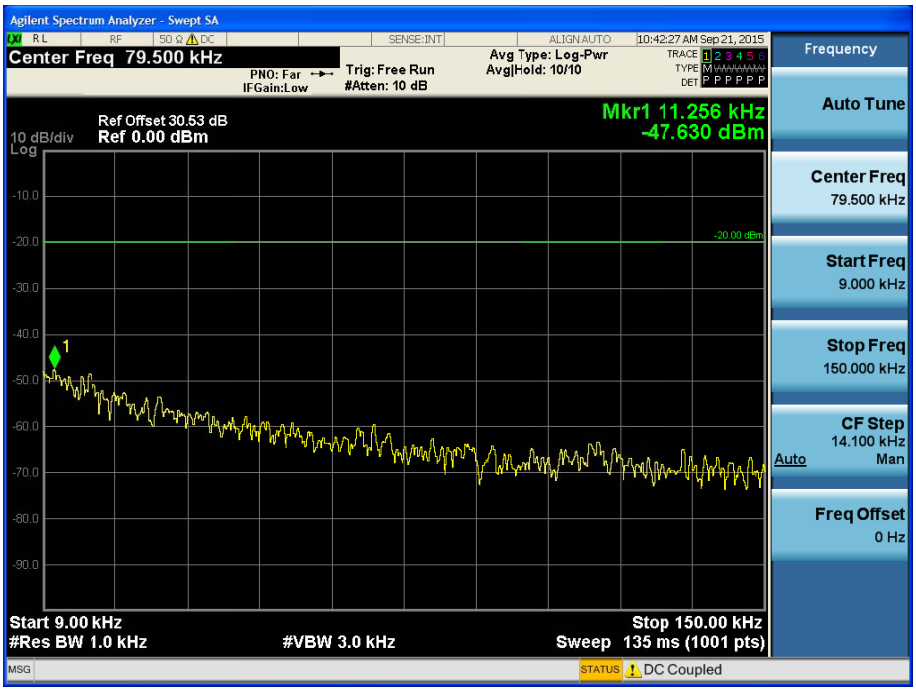


(1 GHz ~ 5.5 GHz)

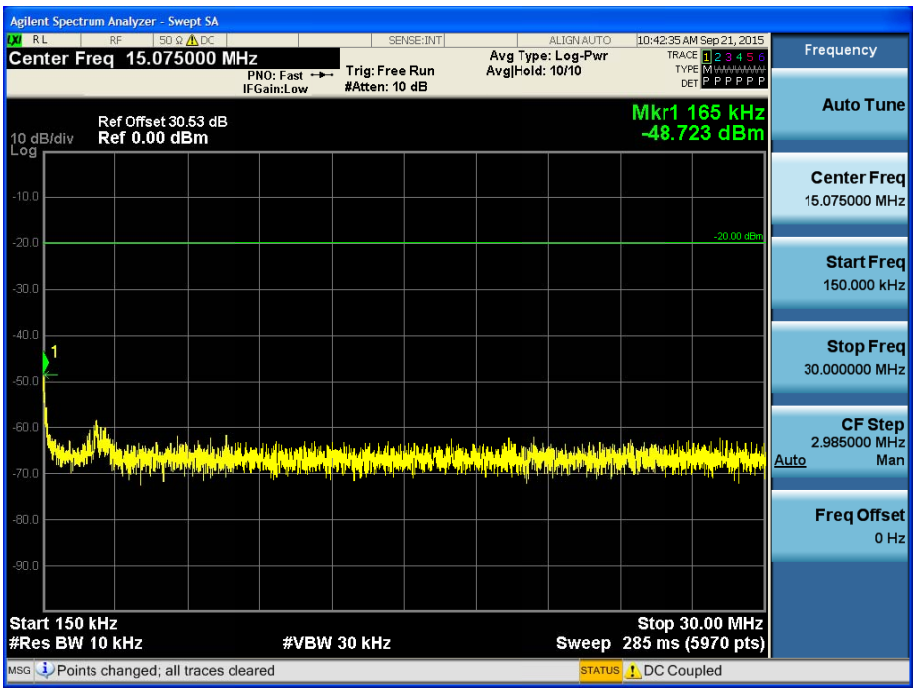


HIGH POWER_11K0F3E_429.95 MHz_Middle

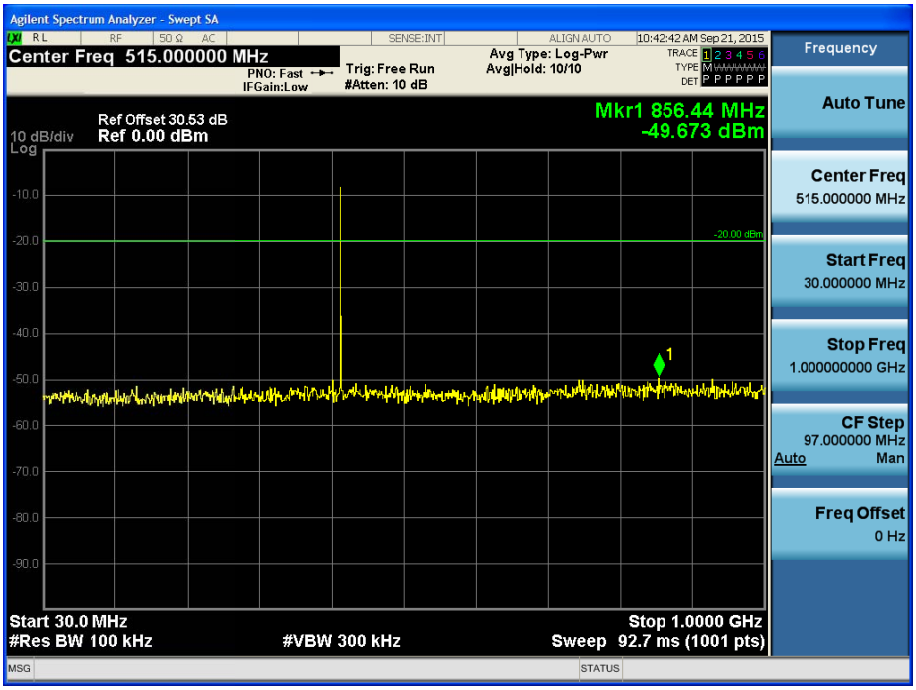
(9 kHz ~ 150 kHz)



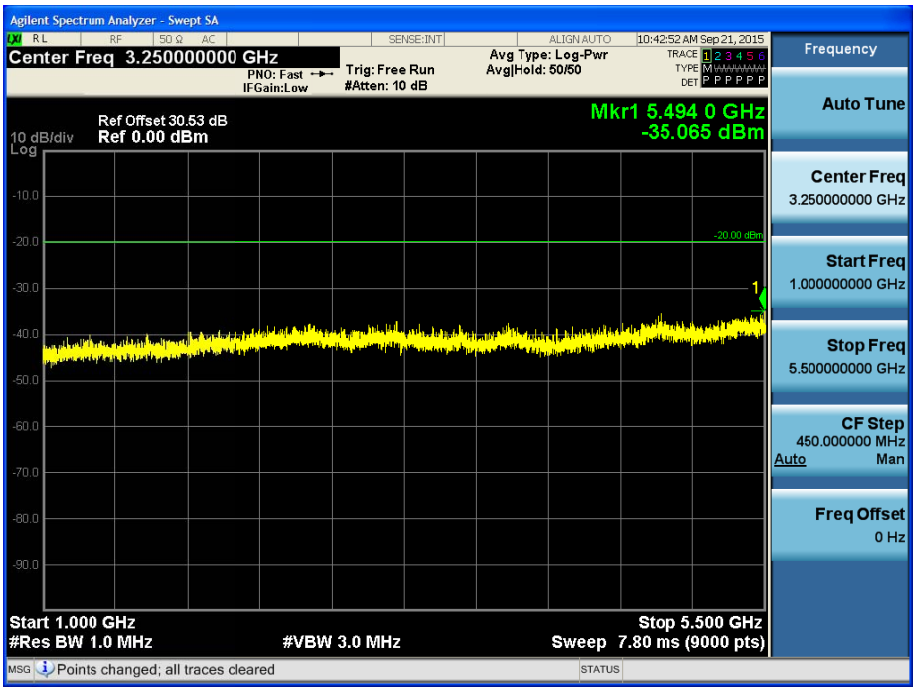
(150 kHz ~ 30 MHz)



(30 MHz ~ 1 GHz)

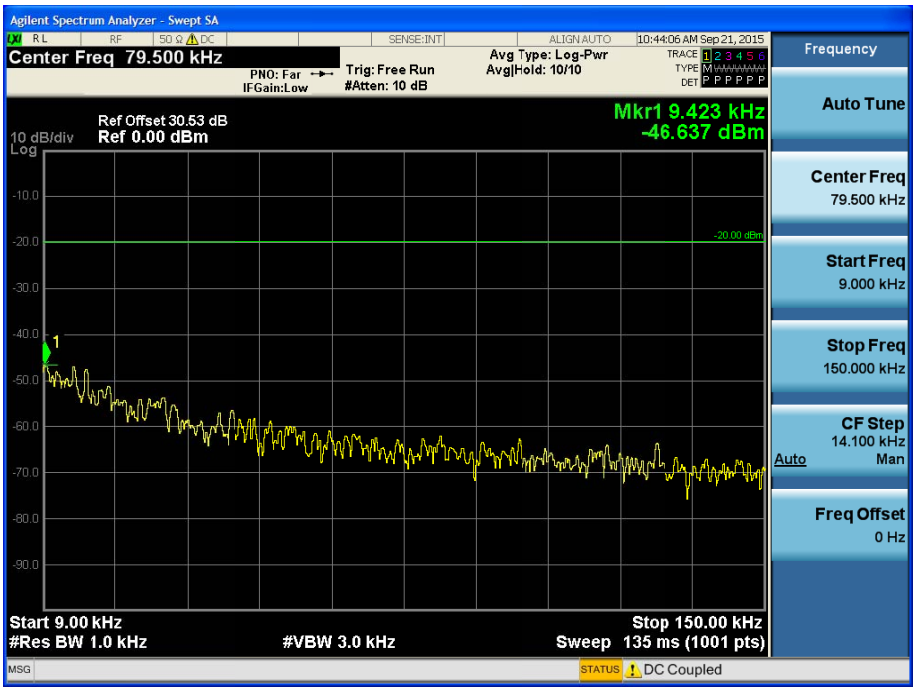


(1 GHz ~ 5.5 GHz)

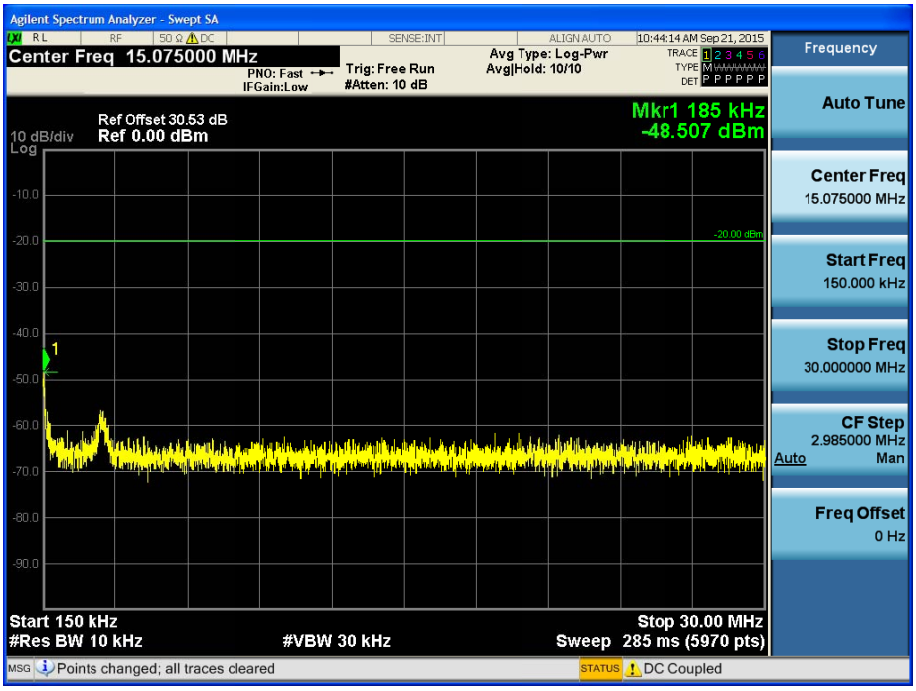


HIGH POWER_11K0F3E_469.95 MHz_High

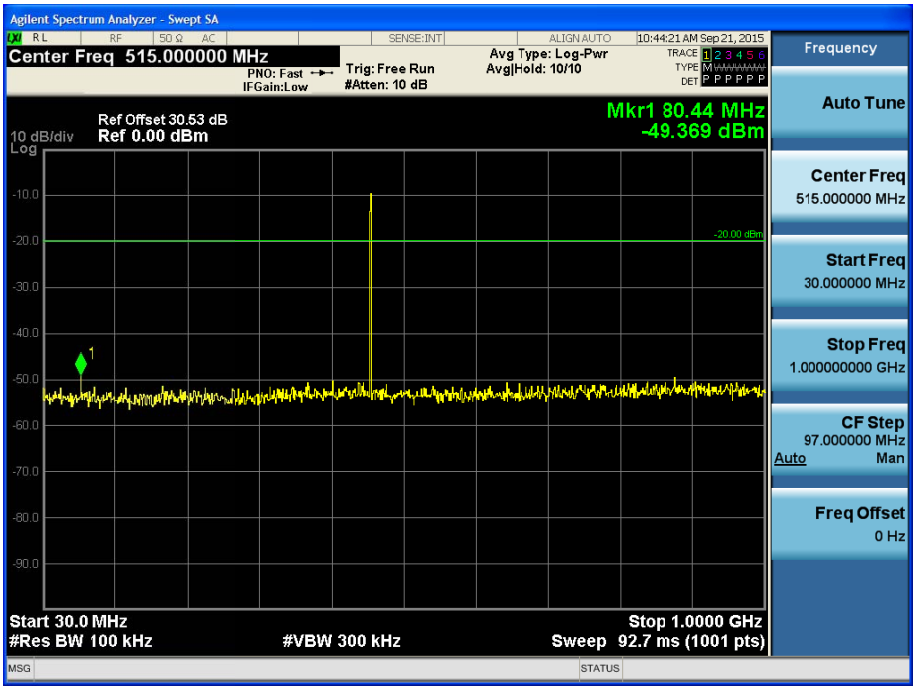
(9 kHz ~ 150 kHz)



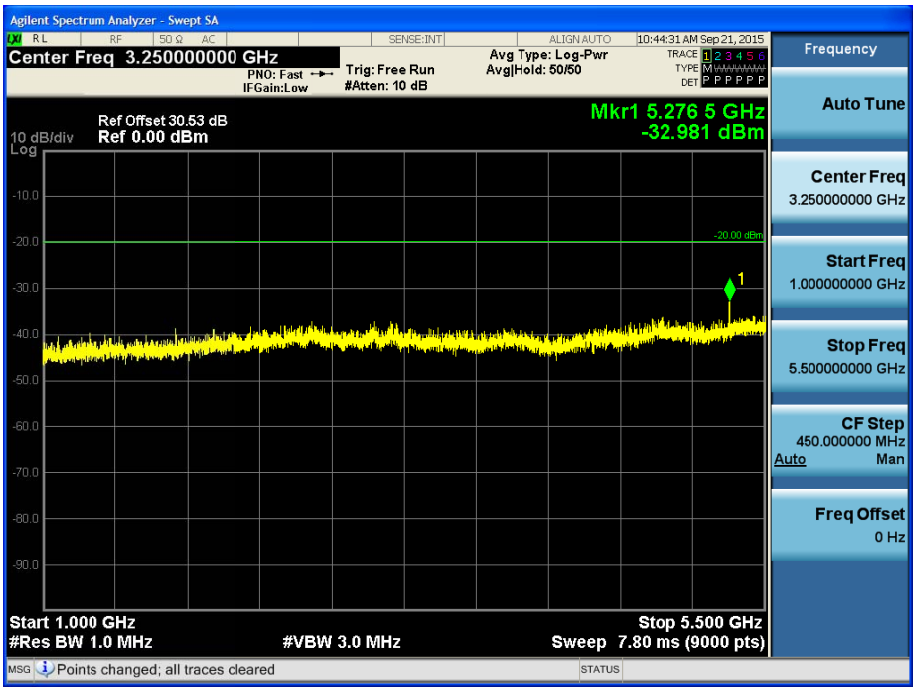
(150 kHz ~ 30 MHz)



(30 MHz ~ 1 GHz)

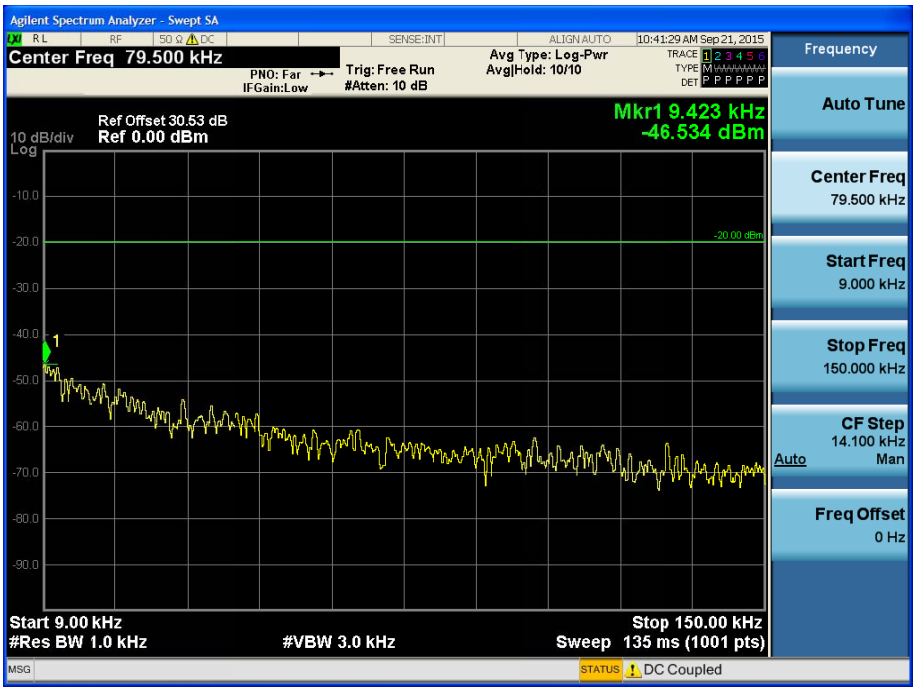


(1 GHz ~ 5.5 GHz)

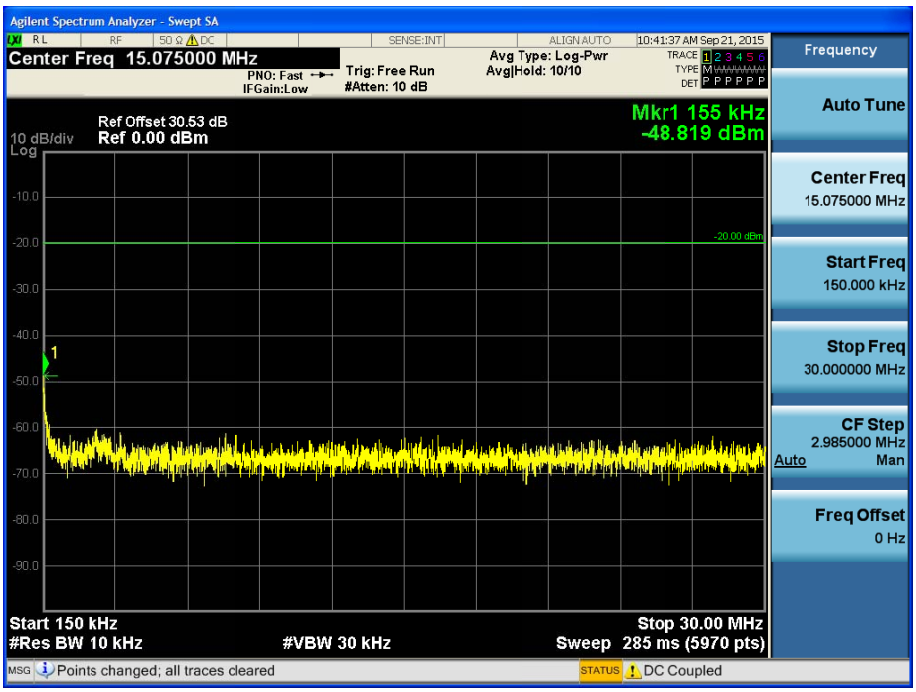


LOW POWER_11K0F3E _406.15 MHz_Low

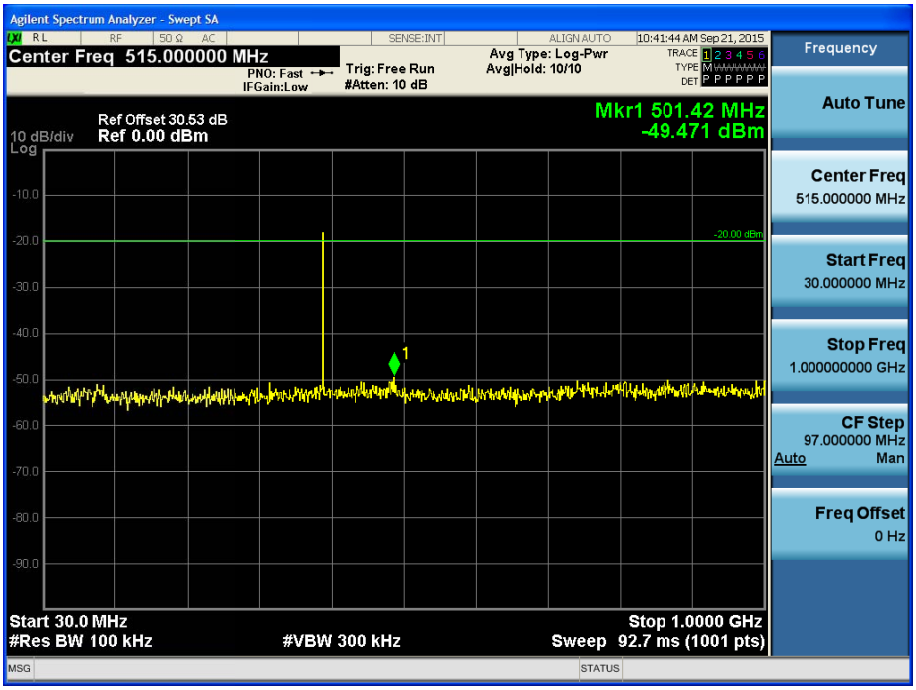
(9 kHz ~ 150 kHz)



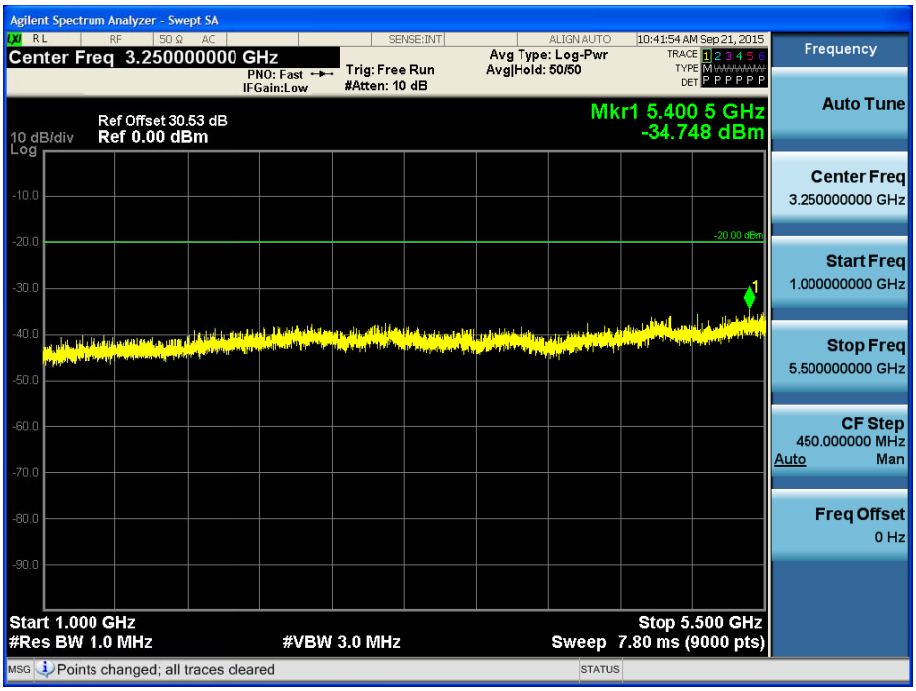
(150 kHz ~ 30 MHz)



(30 MHz ~ 1 GHz)

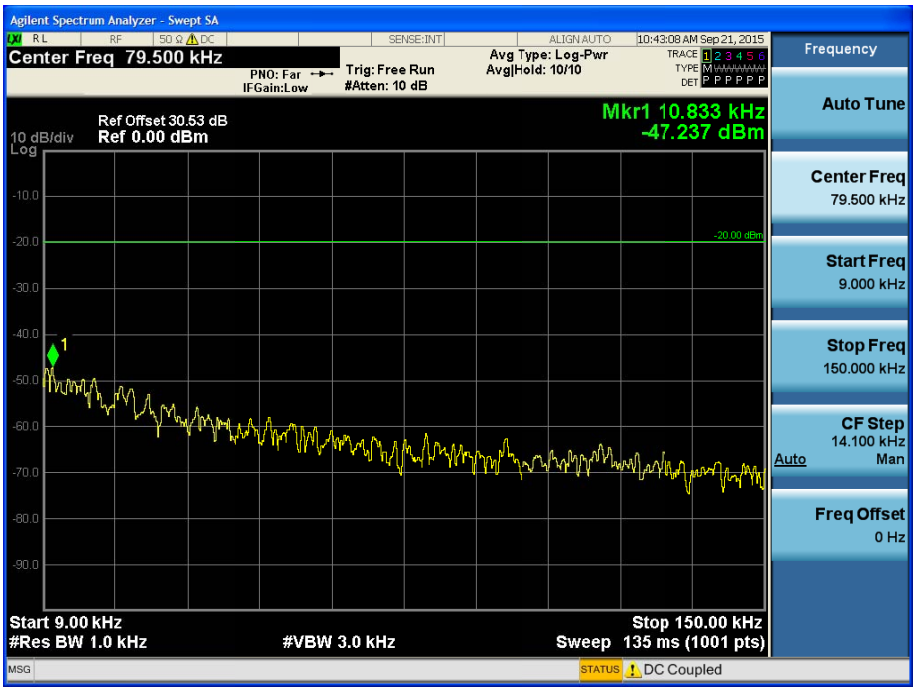


(1 GHz ~ 5.5 GHz)

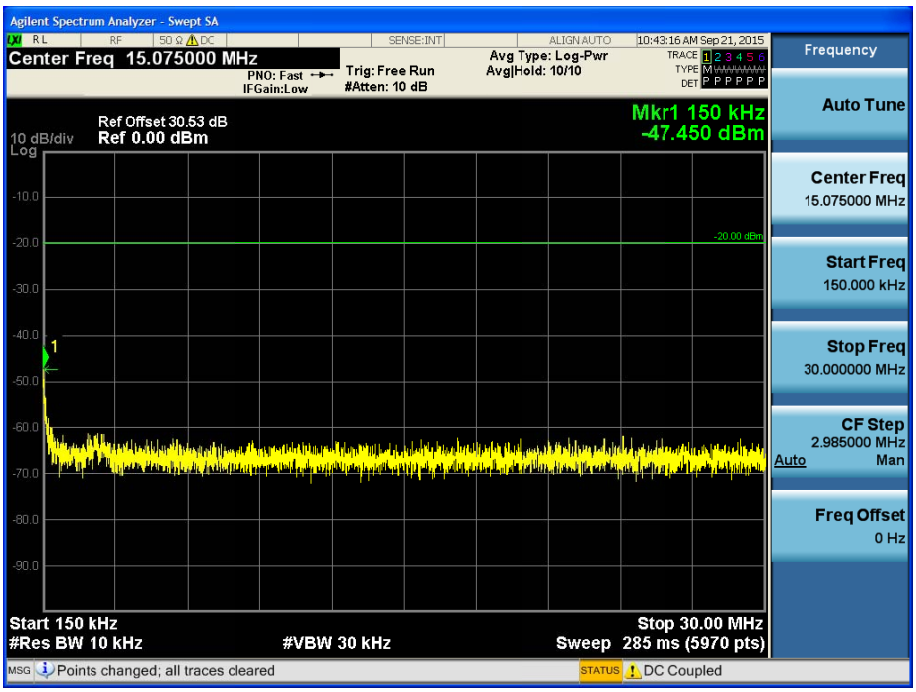


LOW POWER_11K0F3E _429.95 MHz_Middle

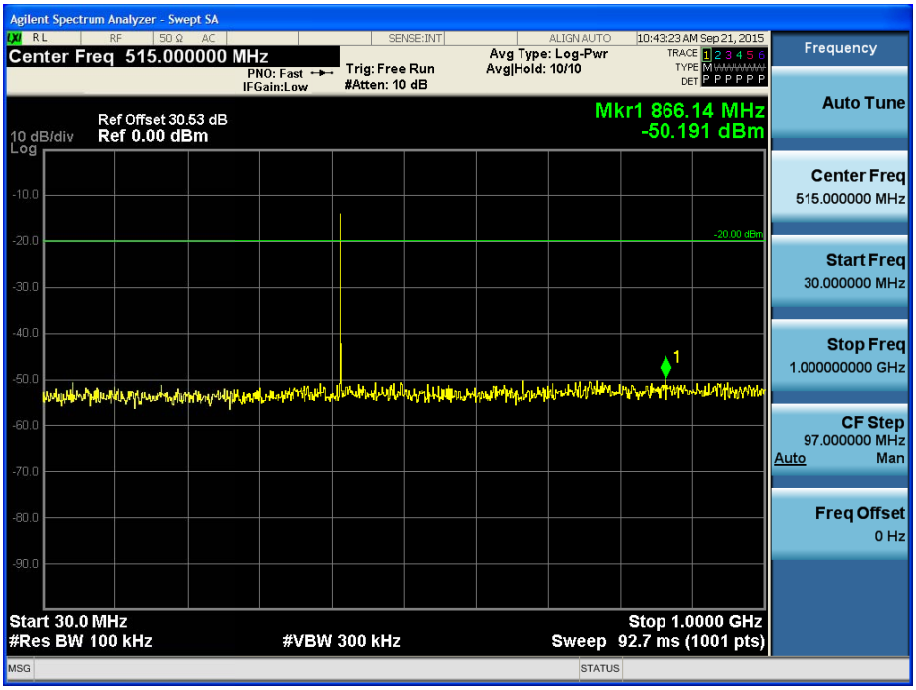
(9 kHz ~ 150 kHz)



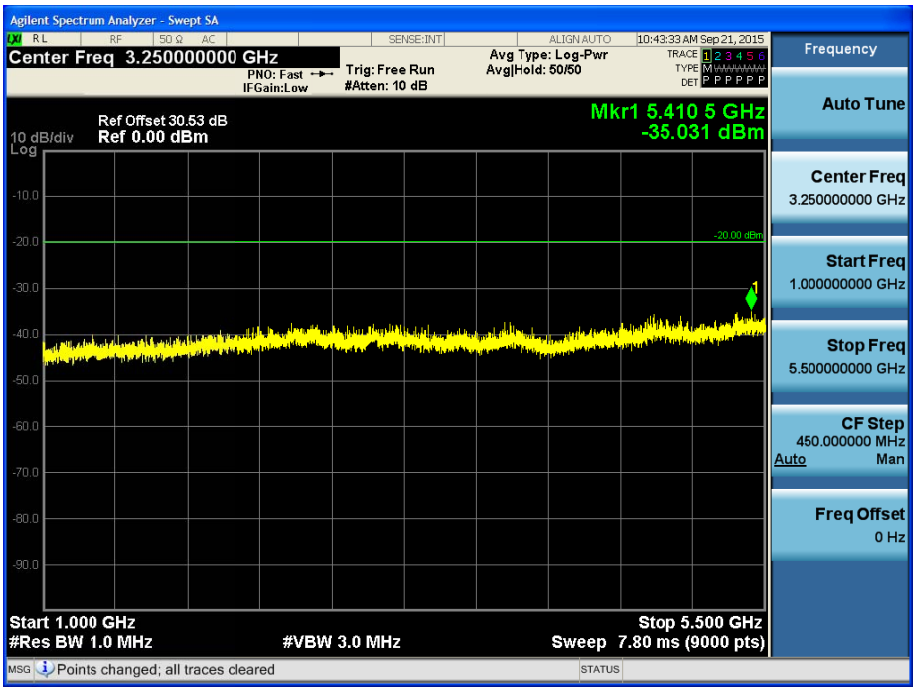
(150 kHz ~ 30 MHz)



(30 MHz ~ 1 GHz)

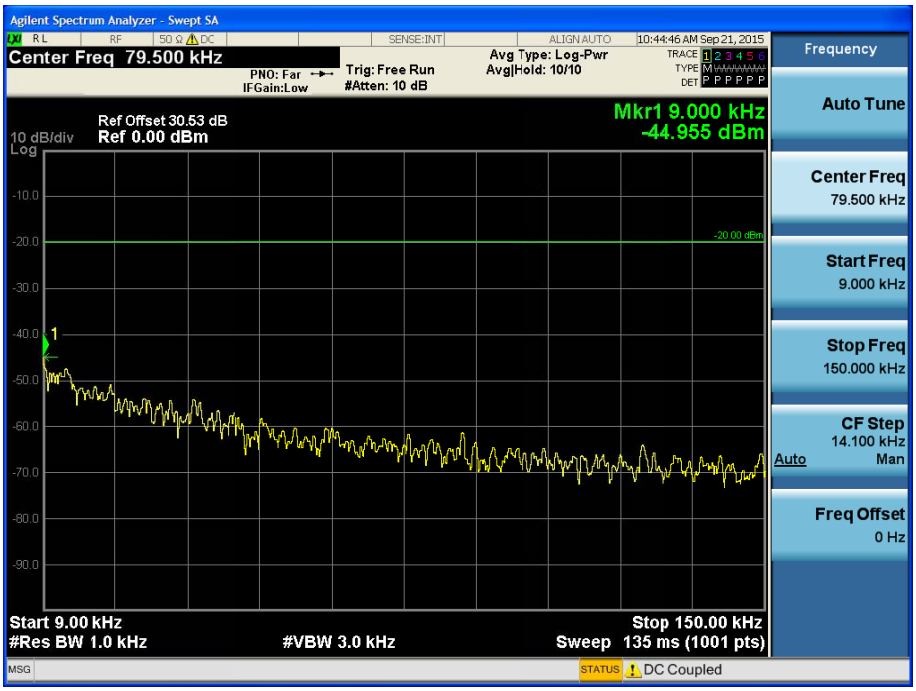


(1 GHz ~ 5.5 GHz)

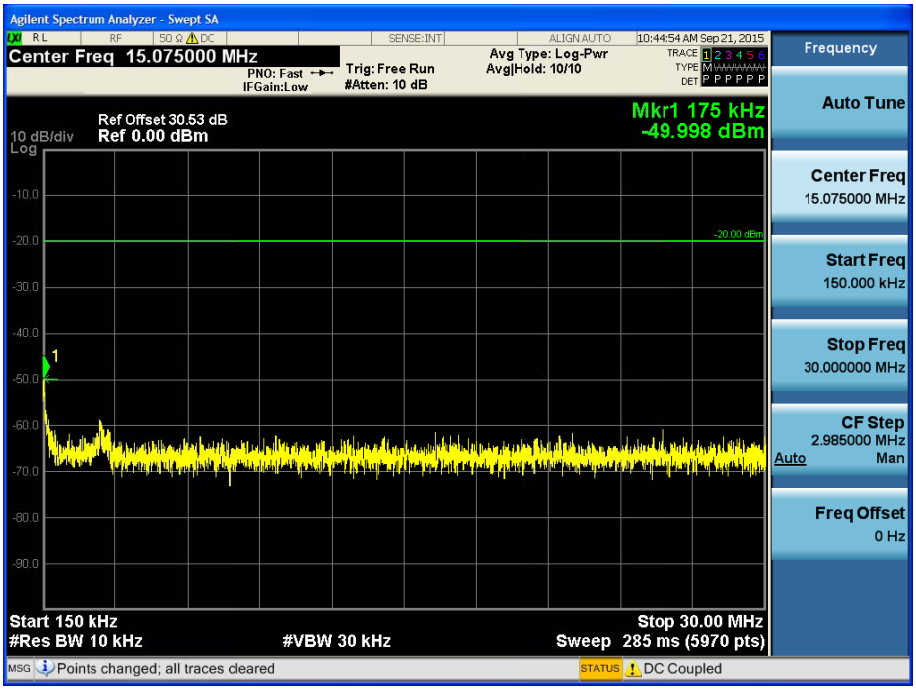


LOW POWER_11K0F3E _469.95 MHz_High

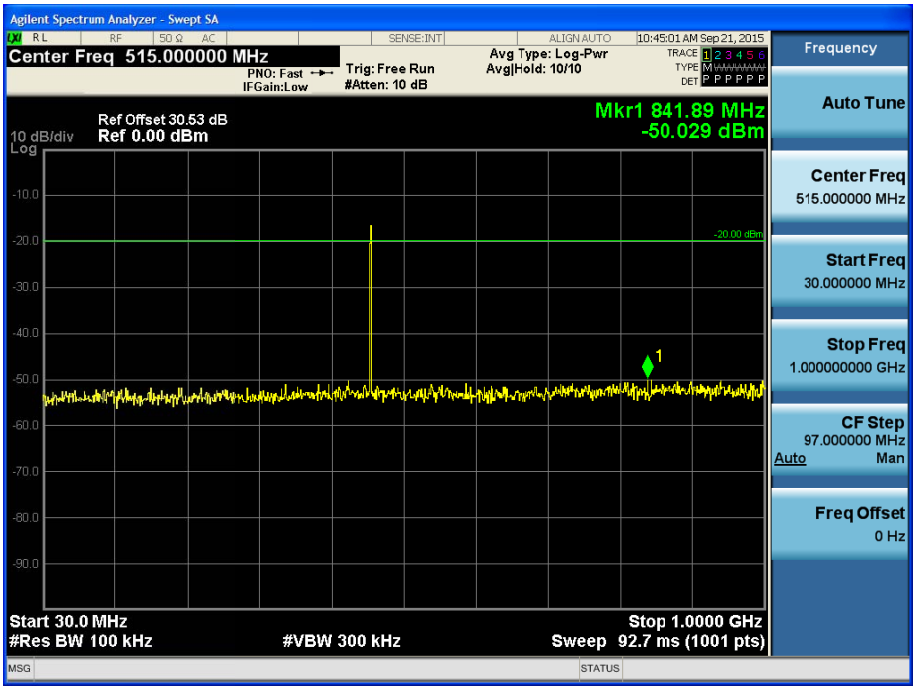
(9 kHz ~ 150 kHz)



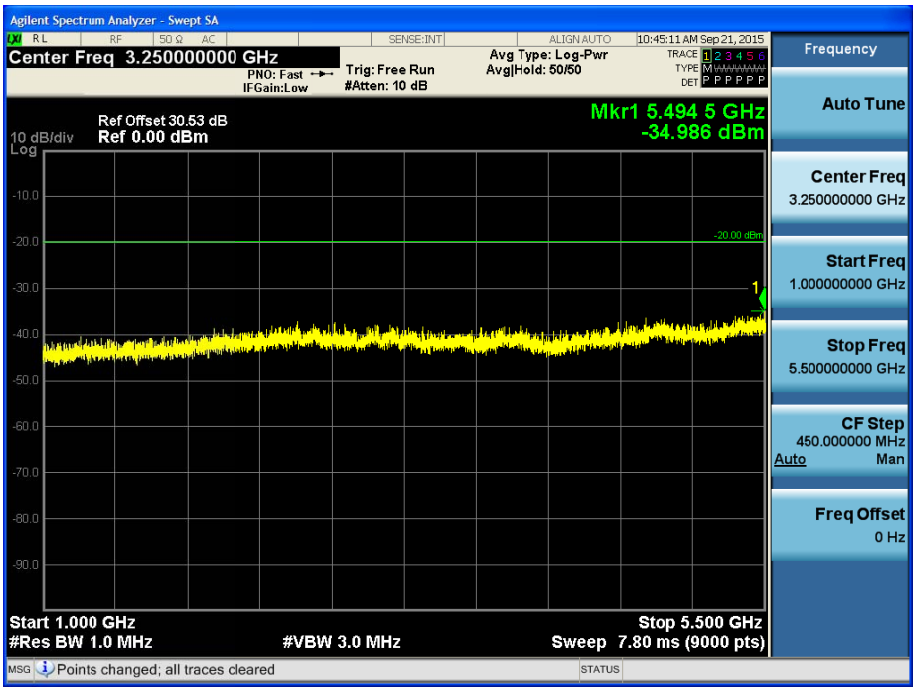
(150 kHz ~ 30 MHz)



(30 MHz ~ 1 GHz)



(1 GHz ~ 5.5 GHz)

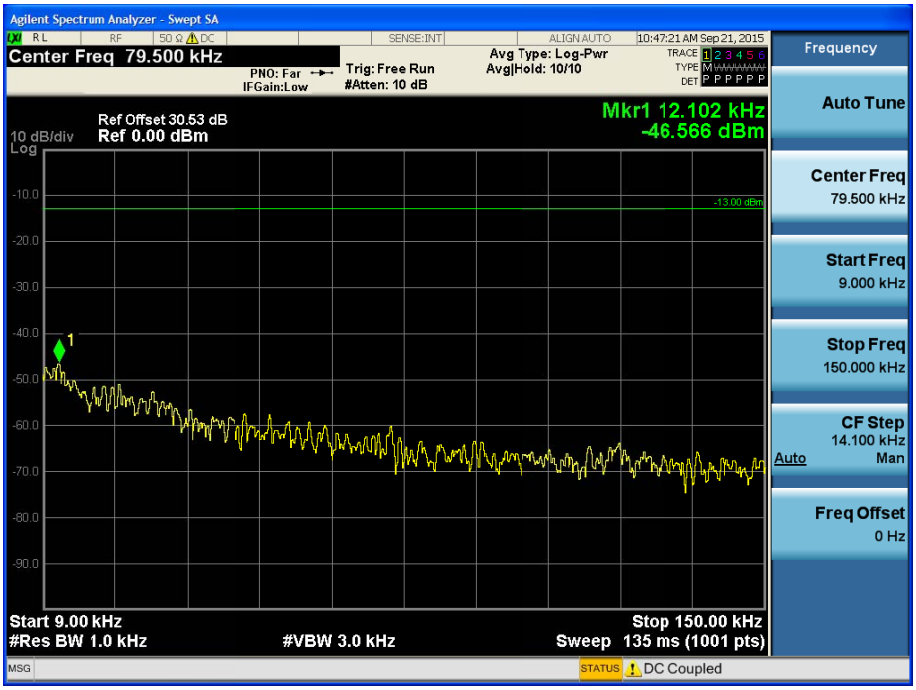


▣TEST RESULTS

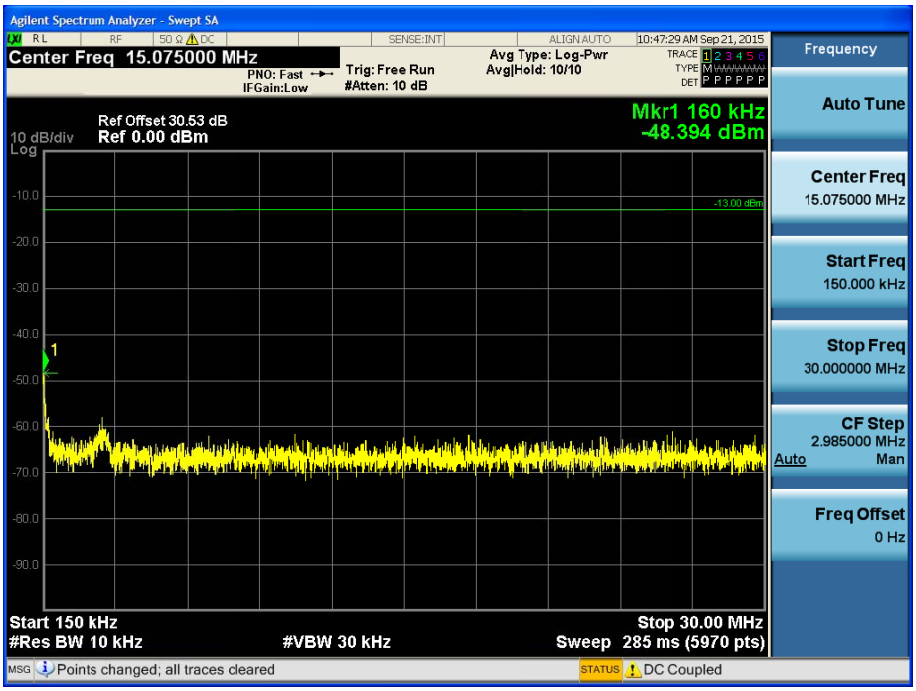
16K0F3E For ONLY IC

HIGH POWER_ 16K0F3E_406.15 MHz_Low

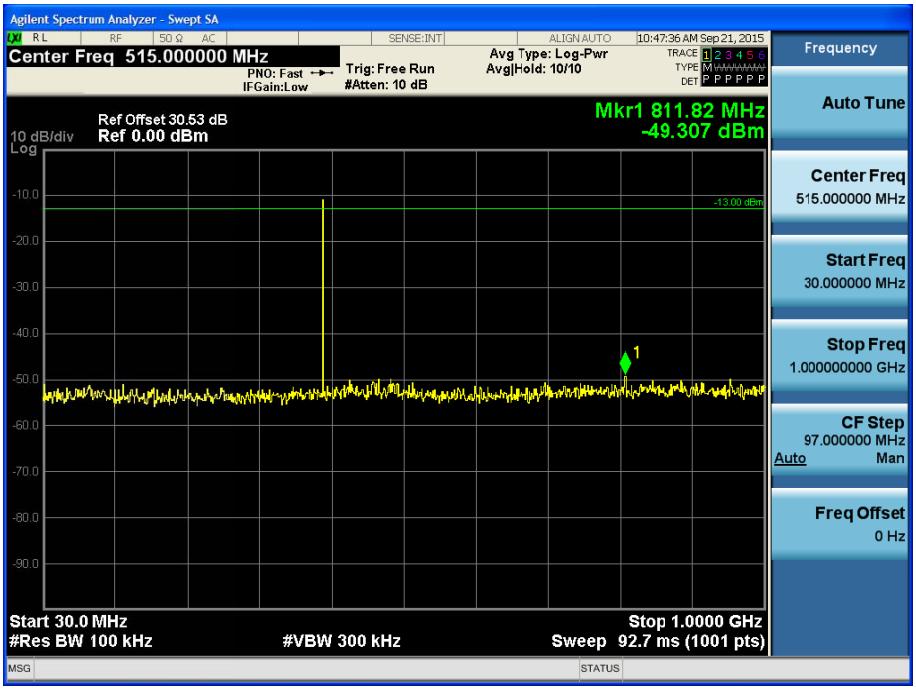
(9 kHz ~ 150 kHz)



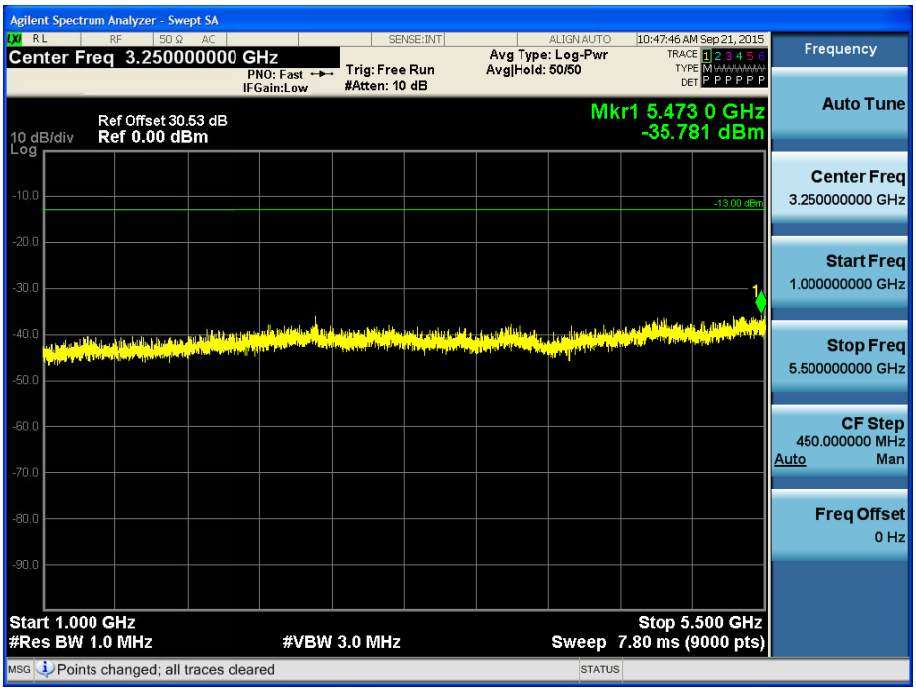
(150 kHz ~ 30 MHz)



(30 MHz ~ 1 GHz)

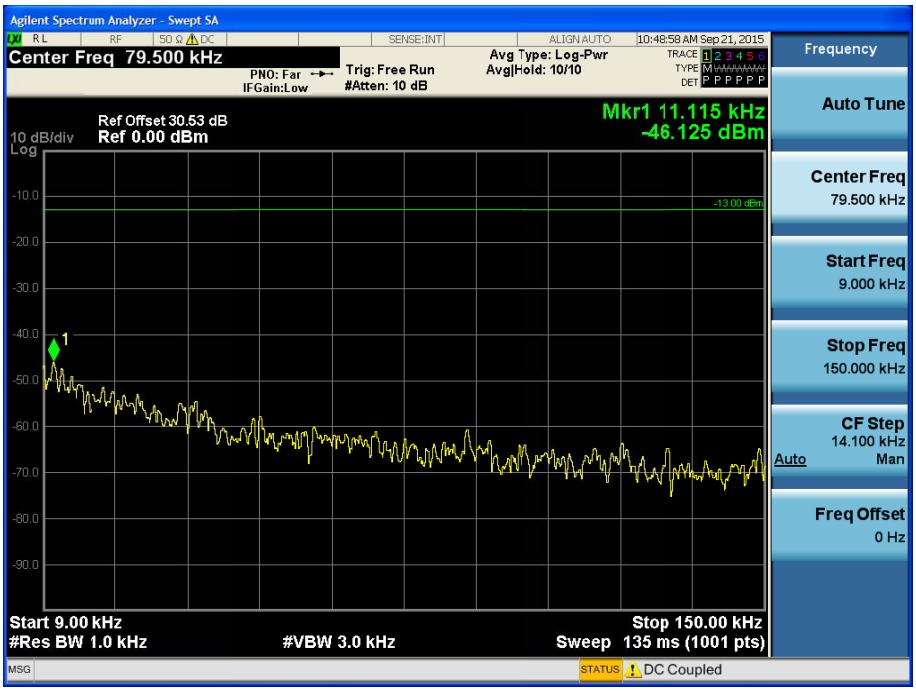


(1 GHz ~ 5.5 GHz)

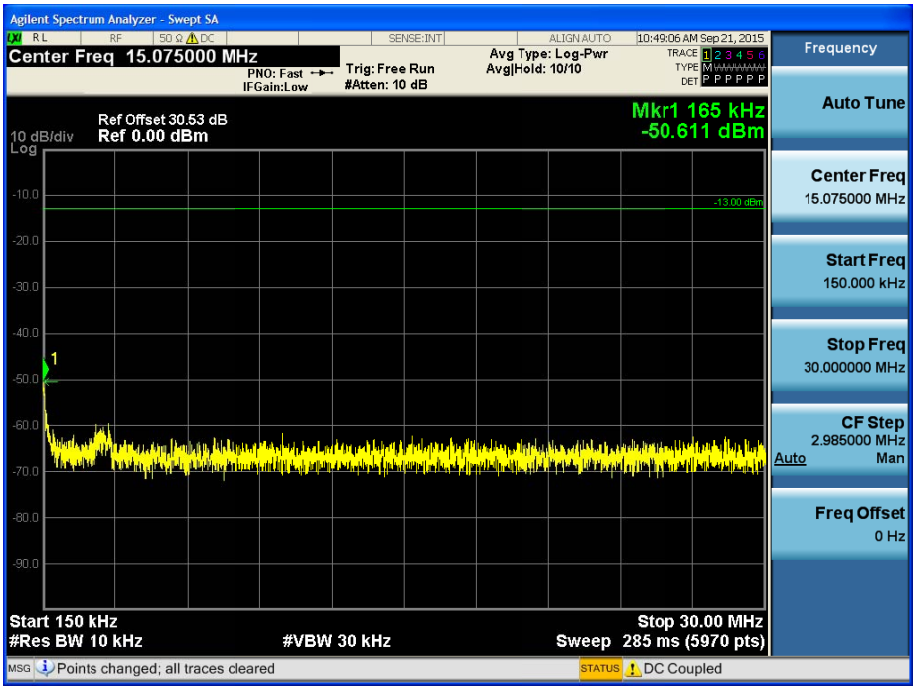


HIGH POWER_ 16K0F3E_429.95 MHz_Middle

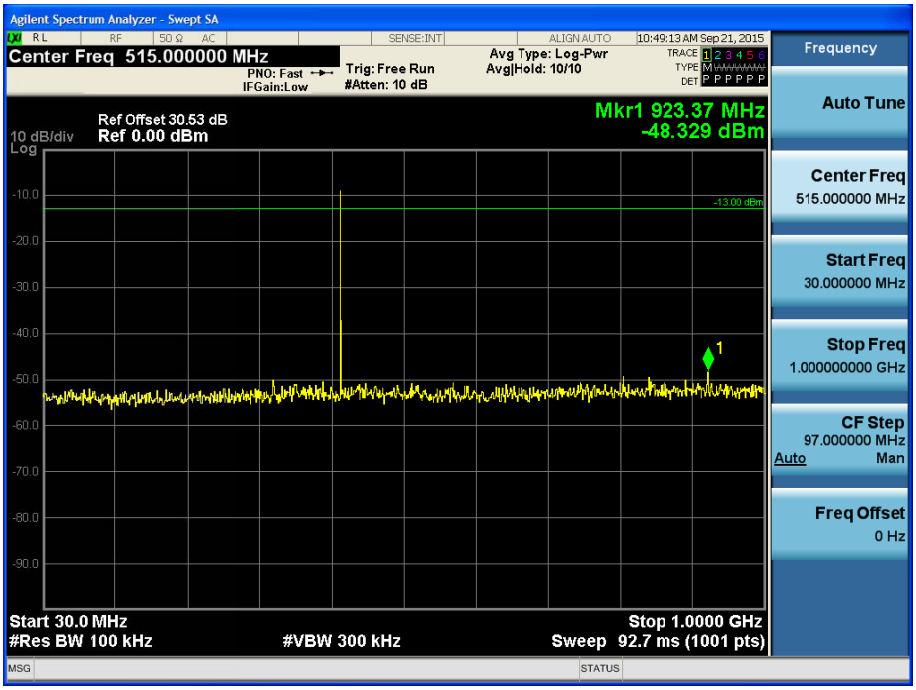
(9 kHz ~ 150 kHz)



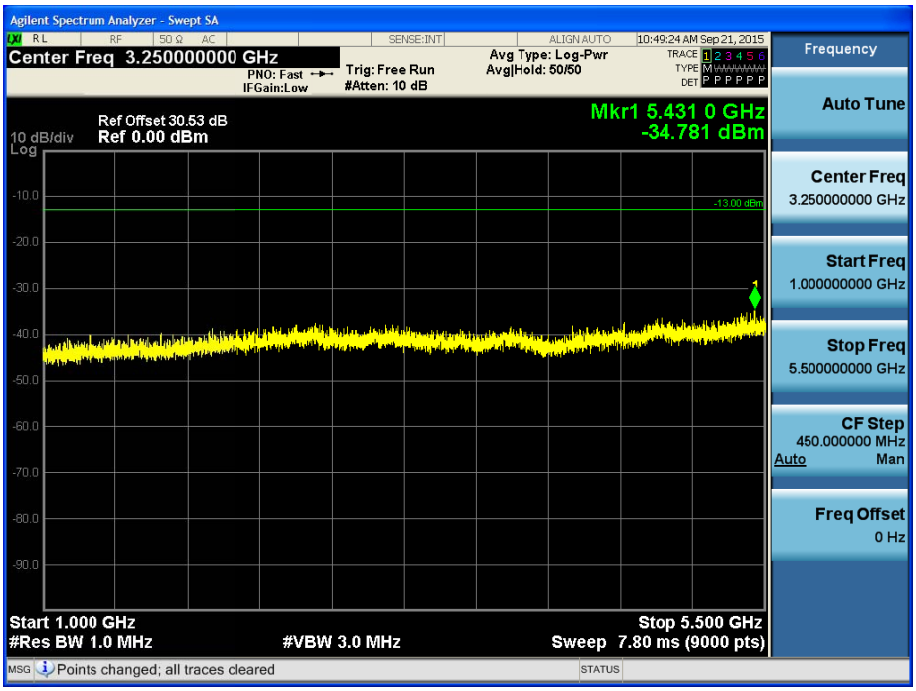
(150 kHz ~ 30 MHz)



(30 MHz ~ 1 GHz)

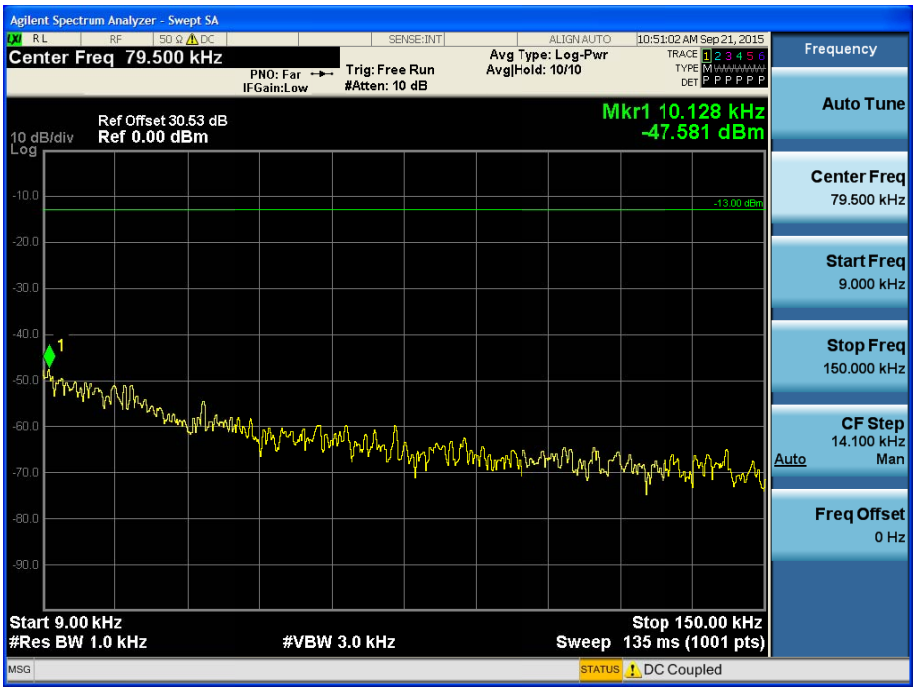


(1 GHz ~ 5.5 GHz)

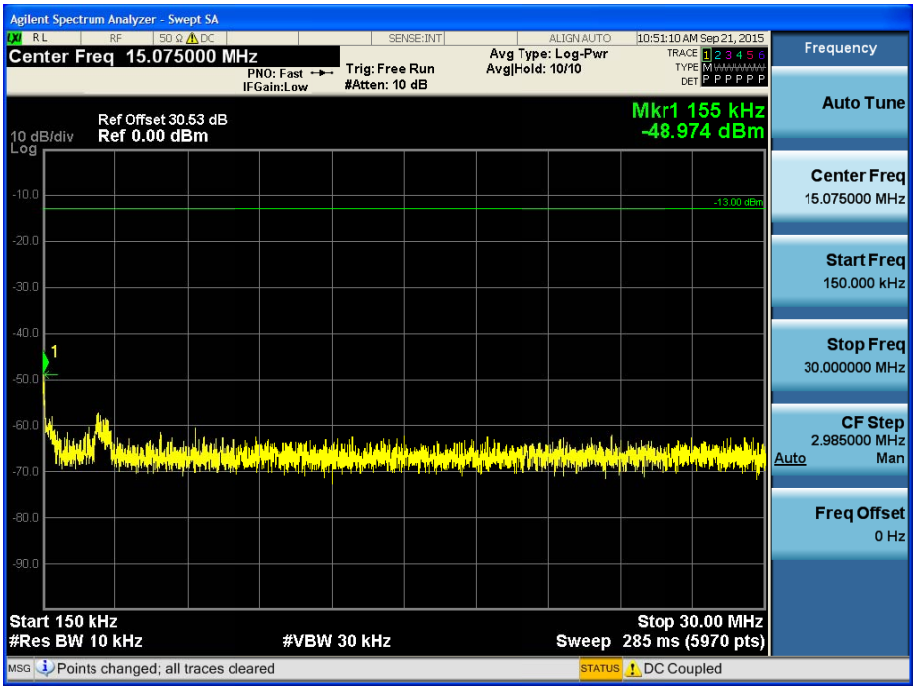


HIGH POWER_ 16K0F3E_469.95 MHz_High

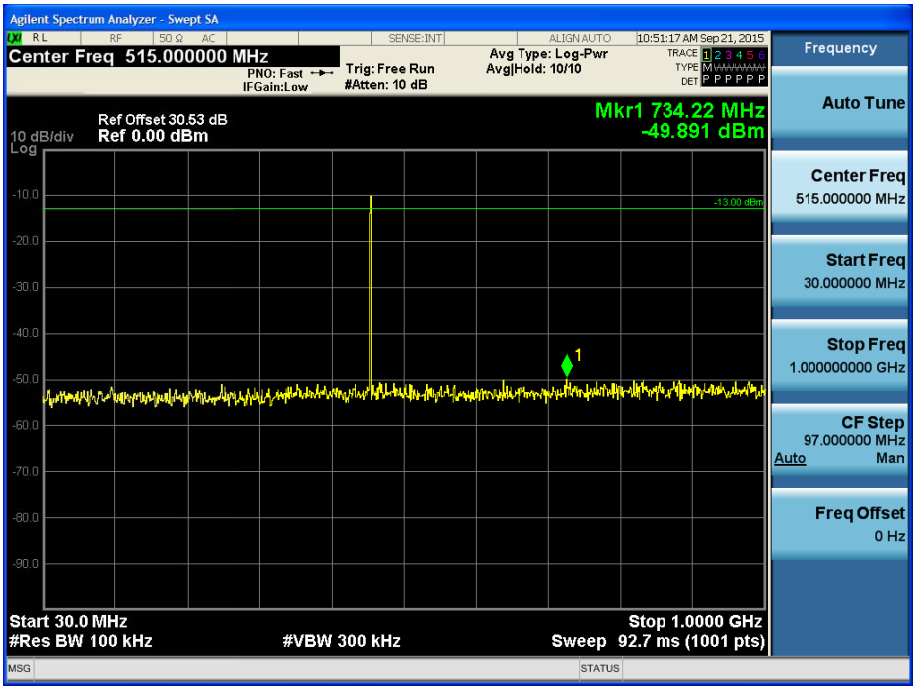
(9 kHz ~ 150 kHz)



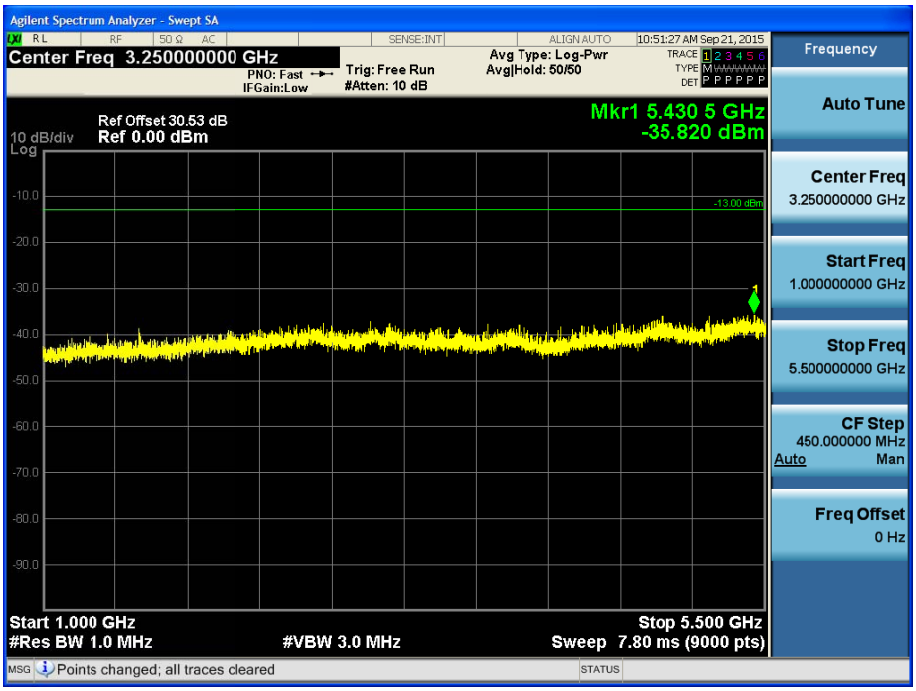
(150 kHz ~ 30 MHz)



(30 MHz ~ 1 GHz)

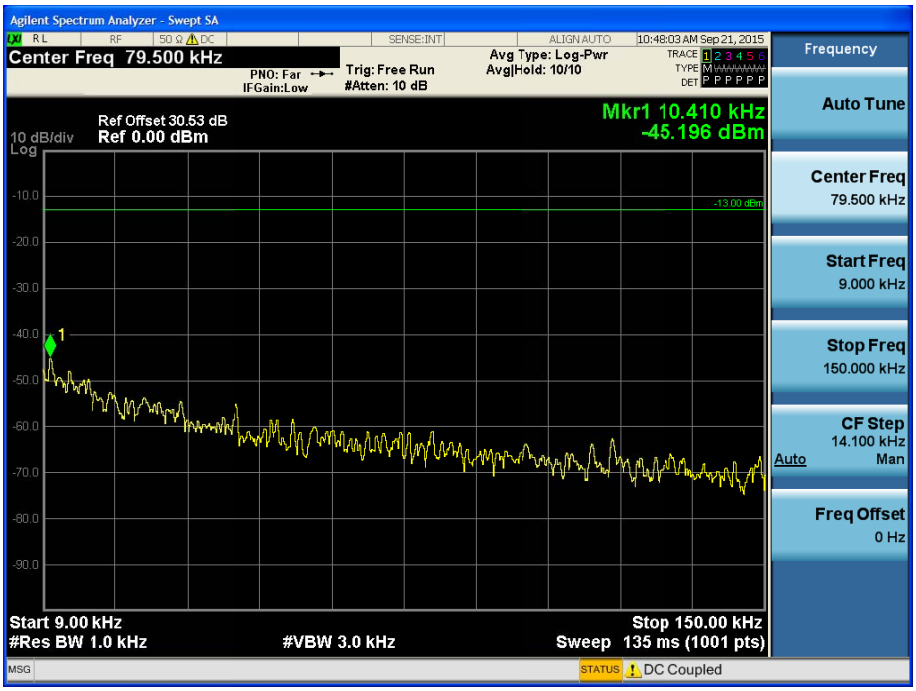


(1 GHz ~ 5.5 GHz)

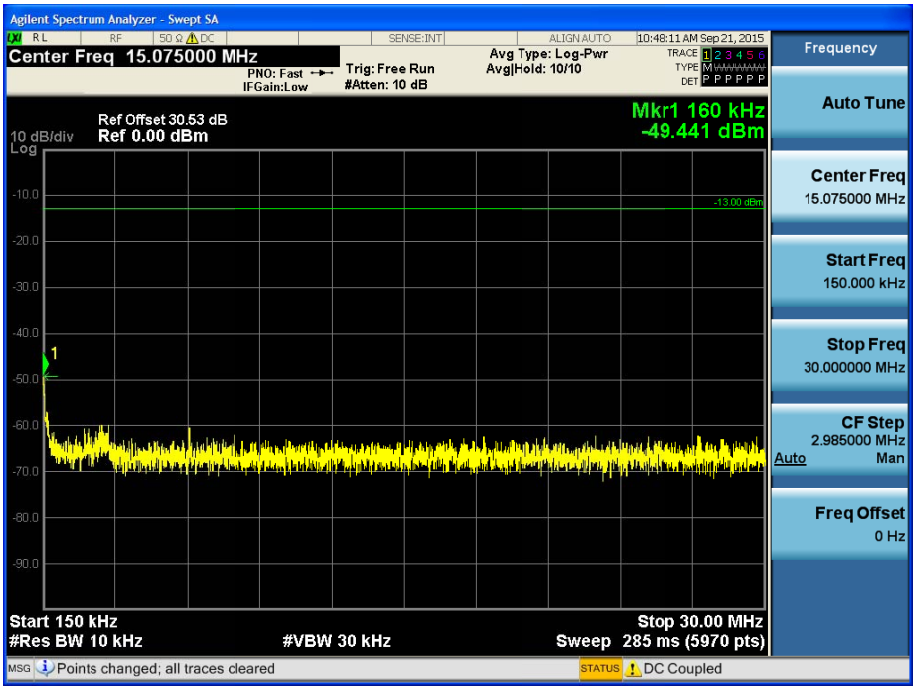


LOW POWER_ 16K0F3E _406.15 MHz_Low

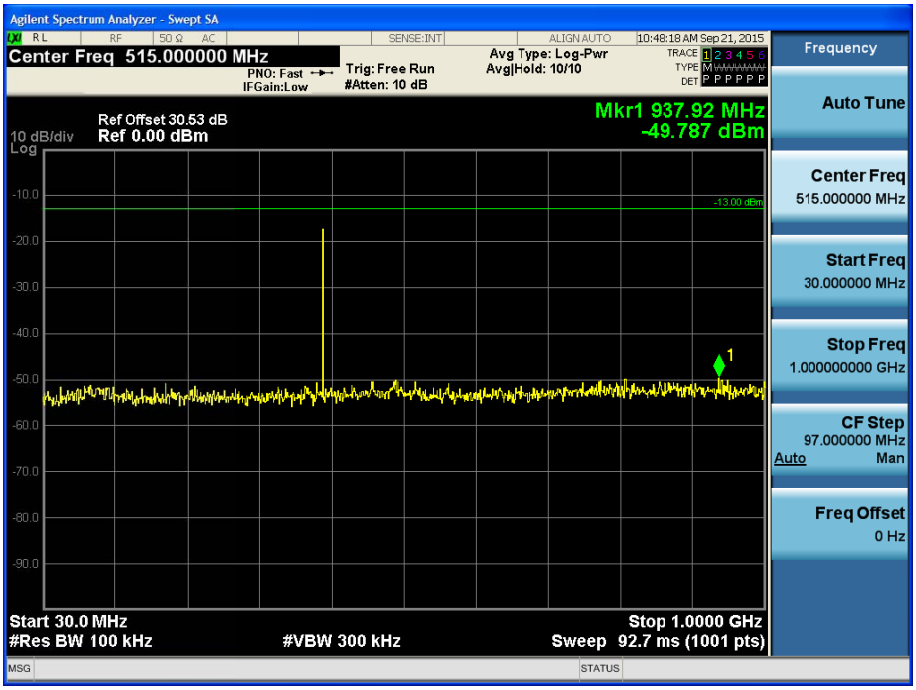
(9 kHz ~ 150 kHz)



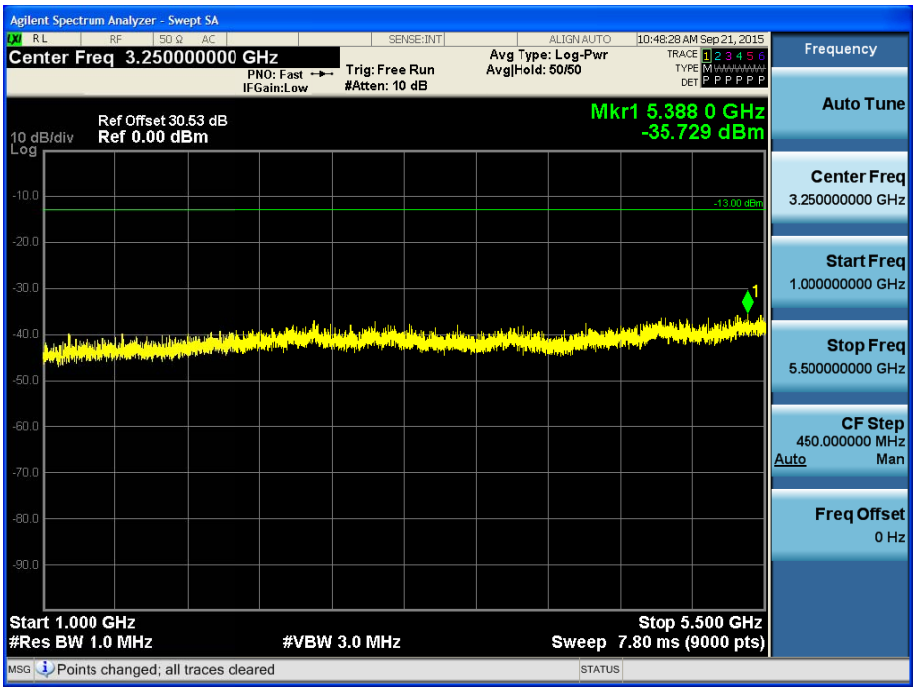
(150 kHz ~ 30 MHz)



(30 MHz ~ 1 GHz)

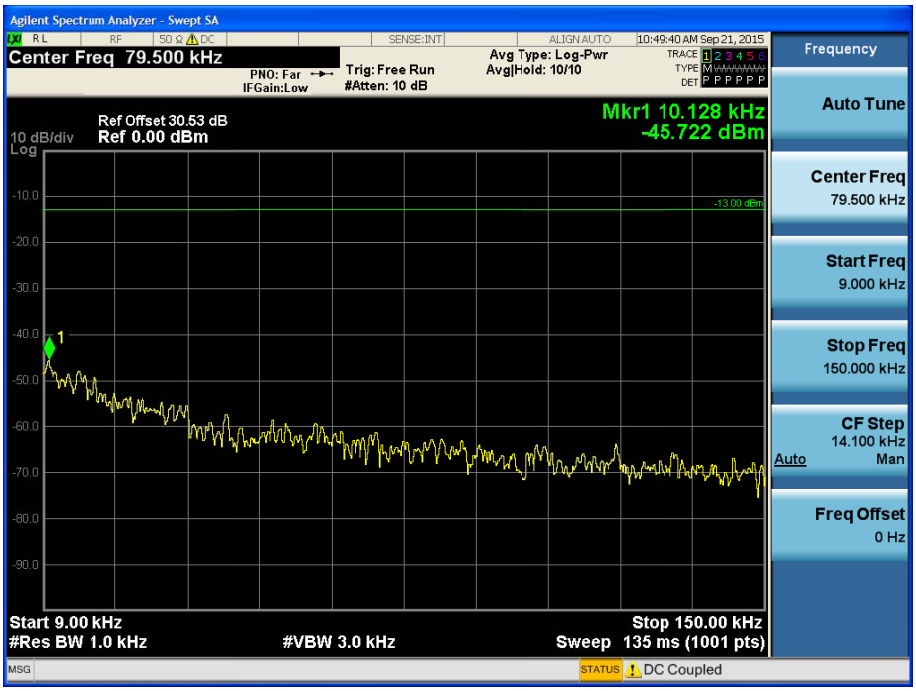


(1 GHz ~ 5.5 GHz)

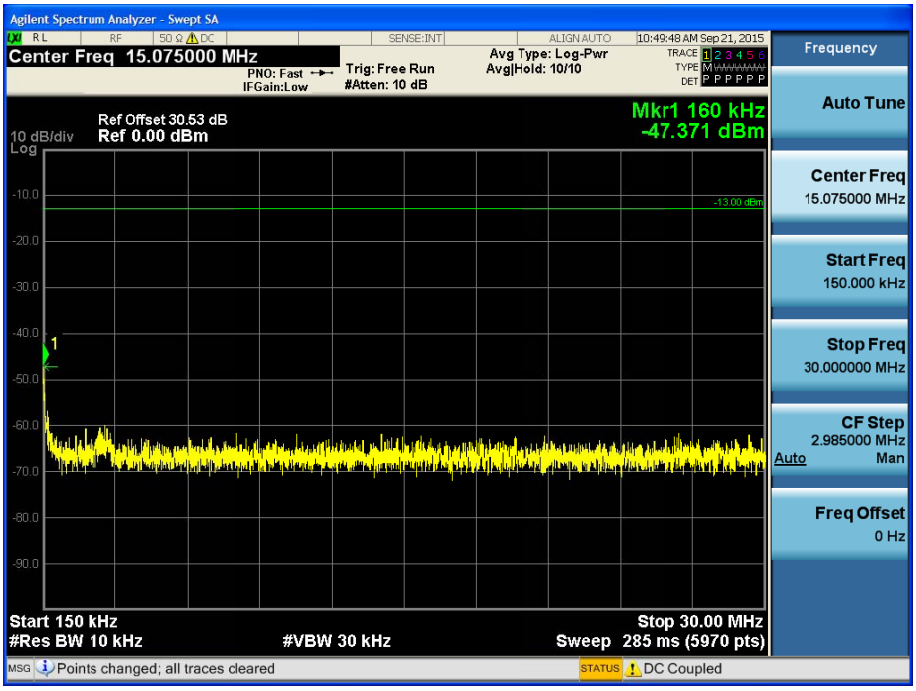


LOW POWER_ 16K0F3E _429.95 MHz_Middle

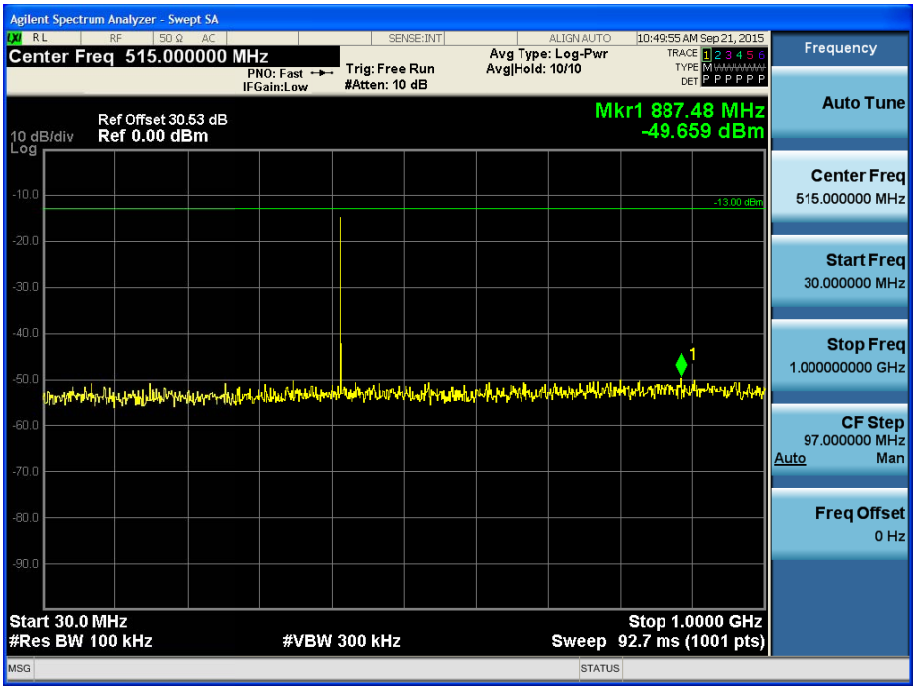
(9 kHz ~ 150 kHz)



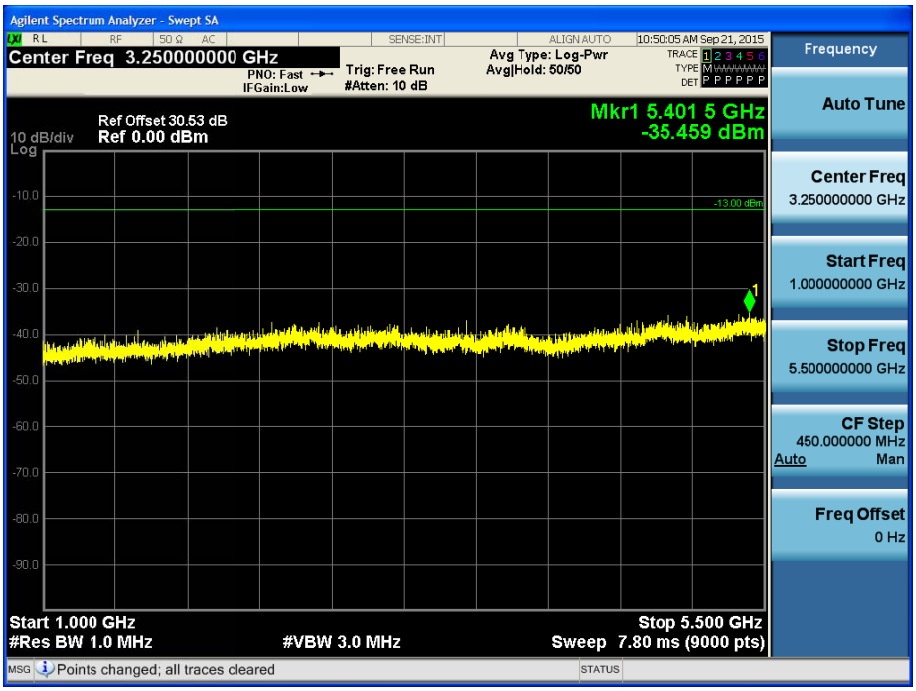
(150 kHz ~ 30 MHz)



(30 MHz ~ 1 GHz)

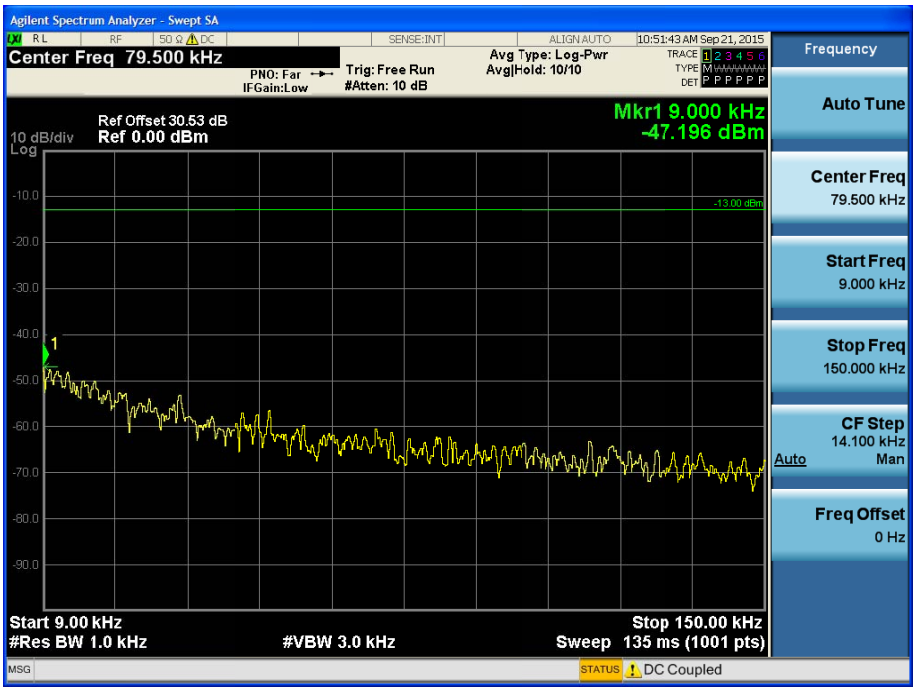


(1 GHz ~ 5.5 GHz)

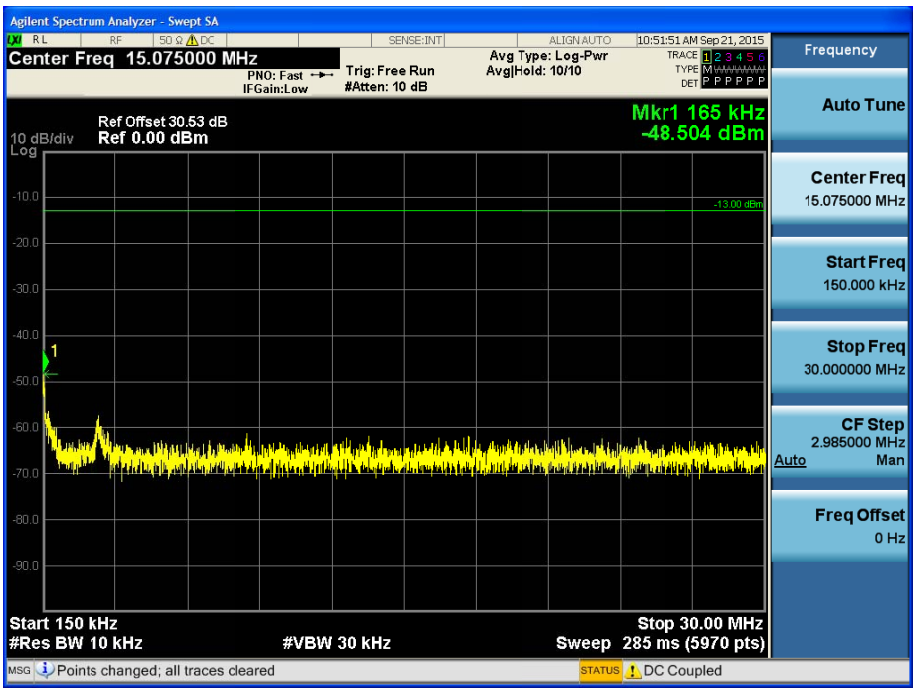


LOW POWER_ 16K0F3E _469.95 MHz_High

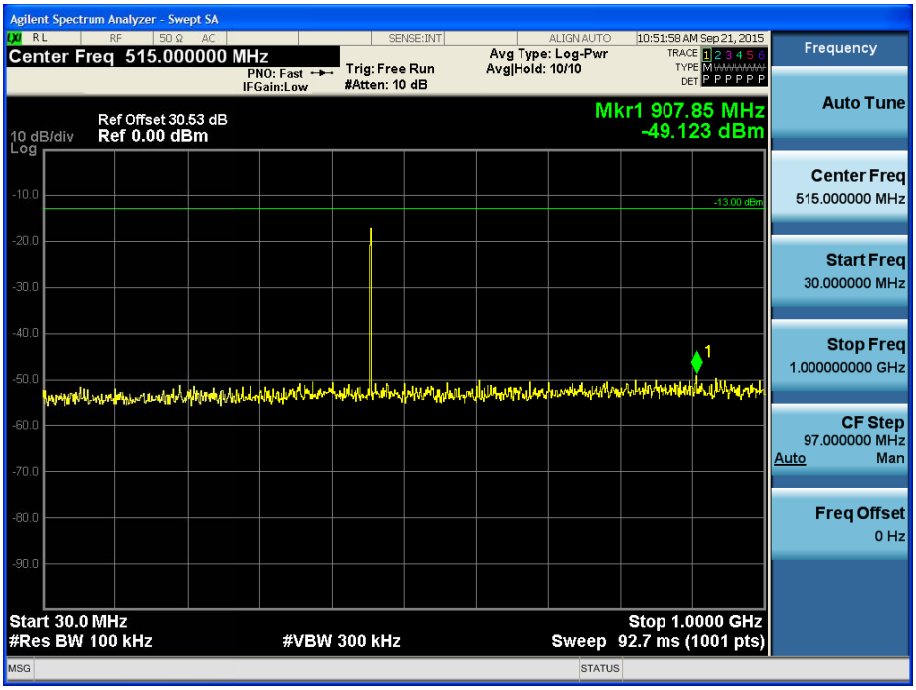
(9 kHz ~ 150 kHz)



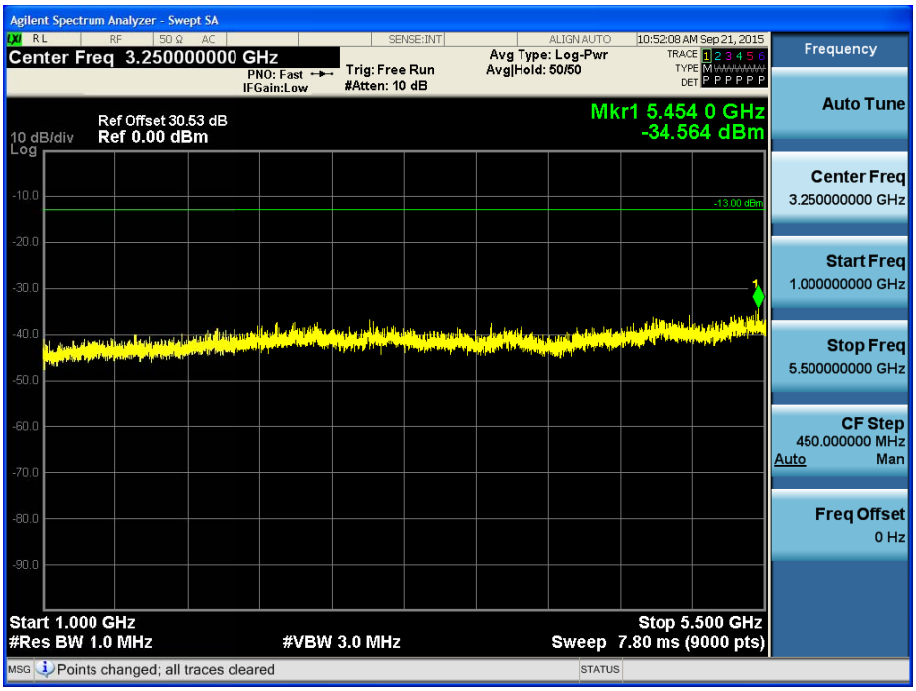
(150 kHz ~ 30 MHz)



(30 MHz ~ 1 GHz)



(1 GHz ~ 5.5 GHz)



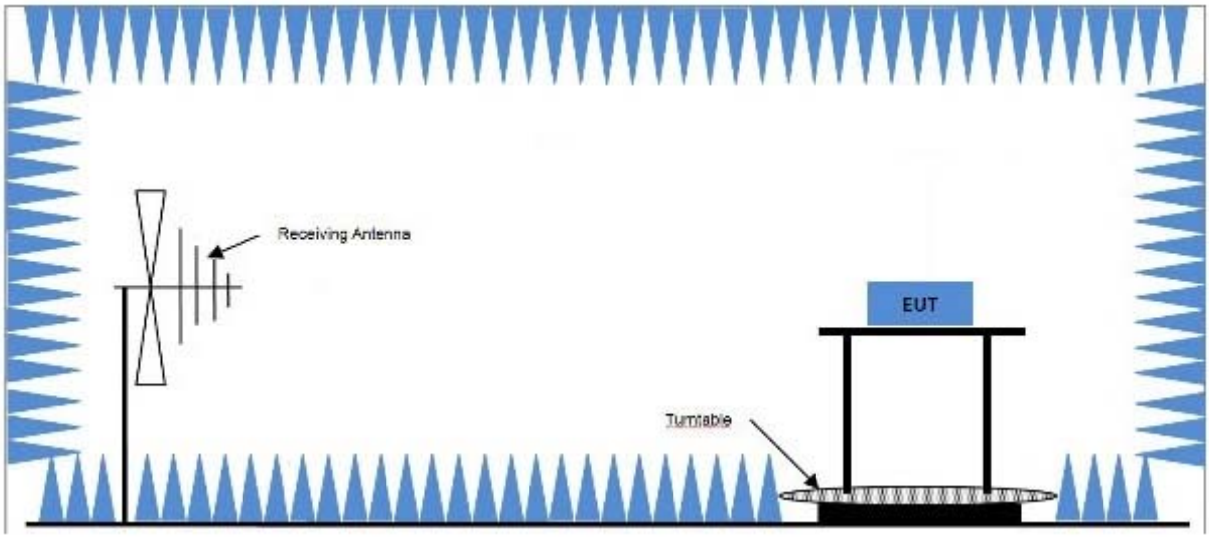
7.9 Unwanted Emissions : Radiated Spurious Emission

▣Definition

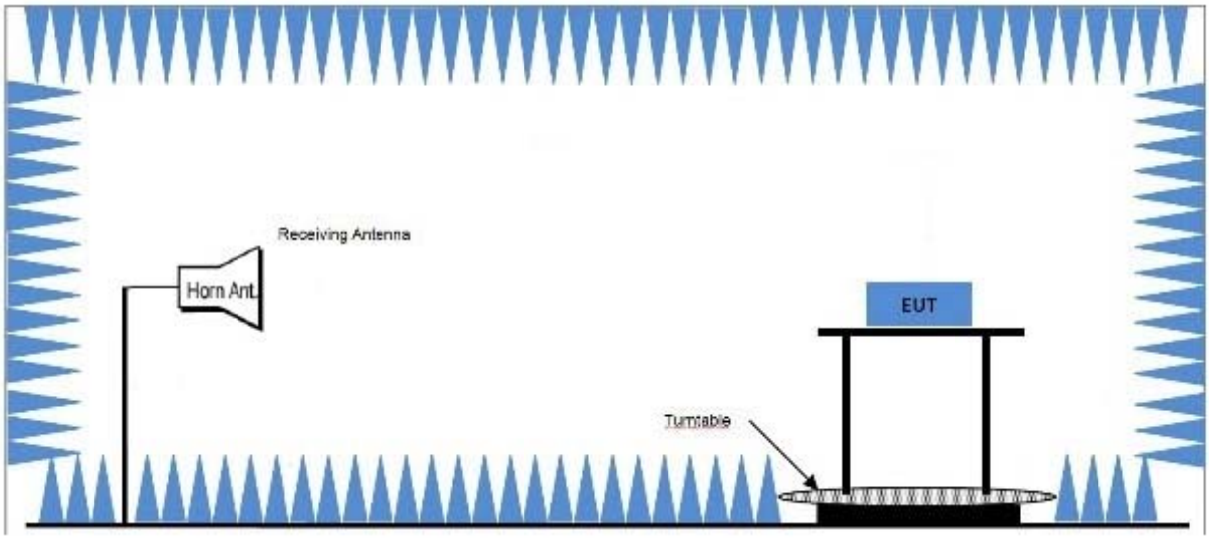
Radiated spurious emissions are emissions from the equipment when transmitting into a non-radiating load on a frequency or frequencies that are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communications desired.

▣ TEST CONFIGURATION

Below 1 GHz



Above 1 GHz



TEST PROCEDURE USED

According to 2.2.12 in TIA-603-D Standard.

a) Connect the equipment as illustrated.

b) 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 1GHz.

2) Video Bandwidth = 300 kHz for spurious emissions below 1 GHz, and 3 MHz for spurious emissions above 1 GHz.

3) Sweep Speed slow enough to maintain measurement calibration.

4) Detector Mode = Positive Peak.

c) Place the transmitter to be tested on the turntable in the standard test site, or an FCC listed site compliant with ANSI C63.4-2001 clause 5.4. The transmitter is transmitting into a nonradiating load that is placed on the turntable. The RF cable to this load should be of minimum length. For transmitters with integral antennas, the tests are to be run with the unit operating into the integral antenna.

d) For each spurious measurement the test antenna should be adjusted to the correct length for the frequency involved. This length may be determined from a calibration ruler supplied with the equipment. Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier, except for the region close to the carrier equal to± the test bandwidth (see 1.3.4.4).

e) Key the transmitter.

f) For each spurious frequency, raise and lower the test antenna from 1 m to 4 m to obtain a maximum reading on the spectrum analyzer with the test antenna at horizontal polarity. Then the turntable should be rotated 360°to determine the maximum reading.

Repeat this procedure to obtain the highest possible reading. Record this maximum reading.

g) Repeat step f) for each spurious frequency with the test antenna polarized vertically.

h) Reconnect the equipment as illustrated.

i) Keep the spectrum analyzer adjusted as in step b).

j) Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At the lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.

k) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends horizontally polarized, and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.

l) Repeat step k) with both antennas vertically polarized for each spurious frequency.

m) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps k) and l) by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an

ideal half-wave dipole antenna by the following formula:

Pd(dBm) = *Pg*(dBm) – *cable loss* (dB) + *antenna gain* (dB)

where:

Pd is the dipole equivalent power and

Pg is the generator output power into the substitution antenna.

n) The *Pd* levels record in step m) are the absolute levels of radiated spurious emissions in dBm. The radiated spurious emissions in dB can be calculated by the following:

Radiated spurious emissions (dB) =

$10*\log_{10}$(TX power in watts/0.001)- *the levels in step m)*

.

▣LIMIT

Frequency Band (MHz)	Channel bandwidth (kHz)	Limit (dBm)
406.15–469.15	25(only IC)	-13
	12.5(FCC and IC)	-20

▣Operating Mode

EUT Type	Modulation	Battery	Test frequency (MHz)	Antenna
Stand alone	16K0F3E(Only IC) 11K0F3E(FCC and IC) 7K60FXD, 7K60FXE (FCC and IC)	KNB-45L KNB-69L KNB-29N KNB-53N	406.15	KRA-42M3
				KRA-23M3
				KRA-27M3
			429.95	KRA-42M3
				KRA-23M3
				KRA-27M3
			469.95	KRA-42M
				KRA-23M
				KRA27M

Note

1. It is permissible to use other antennas provided they can be referenced to a dipole.
2. Worst case is red mark.

▣TEST RESULTS

7K60FXD/7K60FXE

Frequency [MHz] F1 : 406.15
Battery : KNB-45LAntenna : KRA-27M3

Frequency (MHz)	Reading [dBm]	Factor (dB)	Pol.	Result (dBm)	Limit (dBm)	Margin (dB)
406.15	8.77	25.61	X-H	34.38	-	-
812.3	-81.98	32.2	X-H	-49.78	-20	29.78
1218.45	-41.73	-5.41	Z-H	-47.14	-20	27.14
1624.6	-40.9	-4.51	Z-H	-45.41	-20	25.41
2030.75	-43.61	-2.27	Z-H	-45.88	-20	25.88
2436.9	-41.32	0.65	Z-H	-40.67	-20	20.67
2843.05	-52.14	2.49	Y-V	-49.65	-20	29.65
3249.2	-51.05	2.77	Z-H	-48.28	-20	28.28
3655.35	-51.74	4.75	Z-H	-46.99	-20	26.99
4061.5	-43.87	6.48	Y-V	-37.39	-20	17.39

*Note :

1. Limit = P_{dBm} – (50+10 log (P_{watt})) = -20 dBm

Frequency [MHz] F2 : 429.95
Battery : KNB-45LAntenna : KRA-27M3

Frequency (MHz)	Reading [dBm]	Factor (dB)	Pol.	Result (dBm)	Limit (dBm)	Margin (dB)
429.95	7.75	4.25	X-H	12	-	-
859.90	-97.38	31.96	Z-H	-65.42	-20	45.42
1289.85	-49.13	-4.38	Z-H	-53.51	-20	33.51
1719.80	-39.28	-4.3	Z-H	-43.58	-20	23.58
2149.75	-45.79	0.59	Z-H	-45.2	-20	25.2
2579.70	-45.69	0.31	Z-H	-45.38	-20	25.38
3009.65	-50.97	2.57	Z-H	-48.4	-20	28.4
3439.60	-52.19	3.18	Z-H	-49.01	-20	29.01
3869.55	-46.11	5.75	Y-V	-40.36	-20	20.36
4299.50	-43.65	6.6	Y-V	-37.05	-20	17.05

*Note :

1. Limit = P_{dBm} – (50+10 log (P_{watt})) = -20 dBm

Frequency [MHz] F3 : 469.95
Battery : KNB-45LAntenna : KRA-27M

Frequency (MHz)	Reading [dBm]	Factor (dB)	Pol.	Result (dBm)	Limit (dBm)	Margin (dB)
469.95	6.76	27.2	Y-V	33.96	-	-
939.90	-75.24	33.69	Z-H	-41.55	-20	21.55
1409.85	-38.46	-3.74	Z-H	-42.2	-20	22.2
1879.80	-43.48	-2.9	Z-H	-46.38	-20	26.38
2349.75	-39.74	0.89	Y-V	-38.85	-20	18.85
2819.70	-45.02	2.25	Z-H	-42.77	-20	22.77
3289.65	-42.17	2.7	Y-V	-39.47	-20	19.47
3759.60	-48.63	5.15	Y-V	-43.48	-20	23.48
4229.55	-30.75	6.45	Z-H	-24.3	-20	4.3
4699.50	-47.36	8.79	Y-V	-38.57	-20	18.57

*Note :

1. Limit = P_{dBm} – (50+10 log (P_{watt})) = -20 dBm

7.10 Unwanted Emissions :Receiver Radiated SpuriousEmission

IC Rule(s)	**RSS-GEN**
Test Requirements:	**Blow the table**
Operating conditions:	**Under normal test conditions**
Method of testing:	**Radiated**
S/A. Settings:	**F < 1 GHz: RBW: 120 kHz, VBW: 300 kHz (Quasi Peak)** **F > 1 GHz: RBW: 1 MHz, VBW: 1 MHz (Peak)**
Mode of operation:	**Receive**

Frequency (MHz)	Field Strength (microvolts/m at 3 meters)
30 – 88	100
88 – 216	150
216 – 960	200
Above 960	500

Operation Mode: Receive:

30 MHz ~ 1 GHz

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
㎒	dB㎶	dB /m	dB	(H/V)	dB㎶/m	dB㎶/m	dB
No Critical peaks found							

Above 1 GHz

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
㎒	dB㎶	dB /m	dB	(H/V)	dB㎶/m	dB㎶/m	dB
No Critical peaks found							

7.11 Necessary Bandwidth Calculations

Modulation = 16K0F3E	
Maximum Modulation (M), kHz	3
Maximum Deviation (D), kHz	5
Constant Factor (K)	1
Necessary Bandwidth (BN), kHz	(2xM)+(2xDxK)
Necessary Bandwidth (BN), kHz	16.0

Modulation = 11K0F3E	
Maximum Modulation (M), kHz	3
Maximum Deviation (D), kHz	2.5
Constant Factor (K)	1
Necessary Bandwidth (BN), kHz	(2xM)+(2xDxK)
Necessary Bandwidth (BN), kHz	11.0

Modulation = 7K60FXD/7K60FXE	
Digital information rate (R), bps	9600
Maximum Deviation (D), kHz	3.391
Signaling States (S)	4
Constant Factor (K)	0.516
Necessary Bandwidth (BN), kHz	$(R/\log_2 S)+2DK$
Necessary Bandwidth (BN), kHz	7.60

8. LIST OF TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Calibration Due	Serial No.
Agilent	N9020A/ SIGNAL ANALYZER	06/30/2015	Annual	06/30/2016	MY51110085
Agilent	N1911A/Power Meter	07/09/2015	Annual	07/09/2016	MY45100523
Agilent	N1921A /POWER SENSOR	07/09/2015	Annual	07/09/2016	MY45241059
Hewlett Packard	8903B/Audio Analyzer	12/16/2014	Annual	12/16/2015	3413A13913
Hewlett Packard	8901B/Modulation Analyzer	04/21/2015	Annual	04/21/2016	2406A00169
Tektronix	RSA3303B/Real Time Spectrum Analyzer	09/21/2015	Annual	09/21/2016	B010208
Agilent	8498A/30 dB Attenuator	11/04/2014	Annual	11/04/2015	51162
EAGLE	220NFNM/Tuneable Notch Filter	10/31/2014	Annual	10/31/2015	H00564-7
EAGLE	220NFNM/Tuneable Notch Filter	10/29/2014	Annual	10/29/2015	H00564-8
EAGLE	230NFNM/Tuneable Notch Filter	10/29/2014	Annual	10/29/2015	H00564-9
Korea Engineering	KR-1005L / Temperature Chamber	11/12/2014	Annual	11/12/2015	KRAC05063-3CH
CERNEX	AMPLIFIER_CBLU1183540B	05/21/2015	Annual	05/21/2016	25540
Wainwright	WHKX1.0/15G-12SS	08/12/2015	Annual	08/12/2016	42
Schwarzbeck	UHAP/ Dipole Antenna	03/23/2015	Biennial	03/23/2017	557
Schwarzbeck	UHAP/ Dipole Antenna	03/23/2015	Biennial	03/23/2017	558
Schwarzbeck	BBHA 9120D/ Horn Antenna	09/01/2014	Biennial	09/01/2016	147
Schwarzbeck	BBHA 9120D/ Horn Antenna	05/15/2015	Biennial	05/15/2017	1299
ROHDE&SCHWARZ	FSV40-N/Spectrum Analyzer	09/23/2015	Annual	09/23/2016	101068-SZ
Inn-co GmbH	CT 0800/Turn table	N/A	N/A	N/A	AS2000P/034/9740 305
Inn-co GmbH	DE 3260/Ant. Mast	N/A	N/A	N/A	DE3260/005/7860504/L
Schwarzbeck	VULB 9160/ TRILOG Antenna	10/10/2014	Biennial	10/10/2016	3368