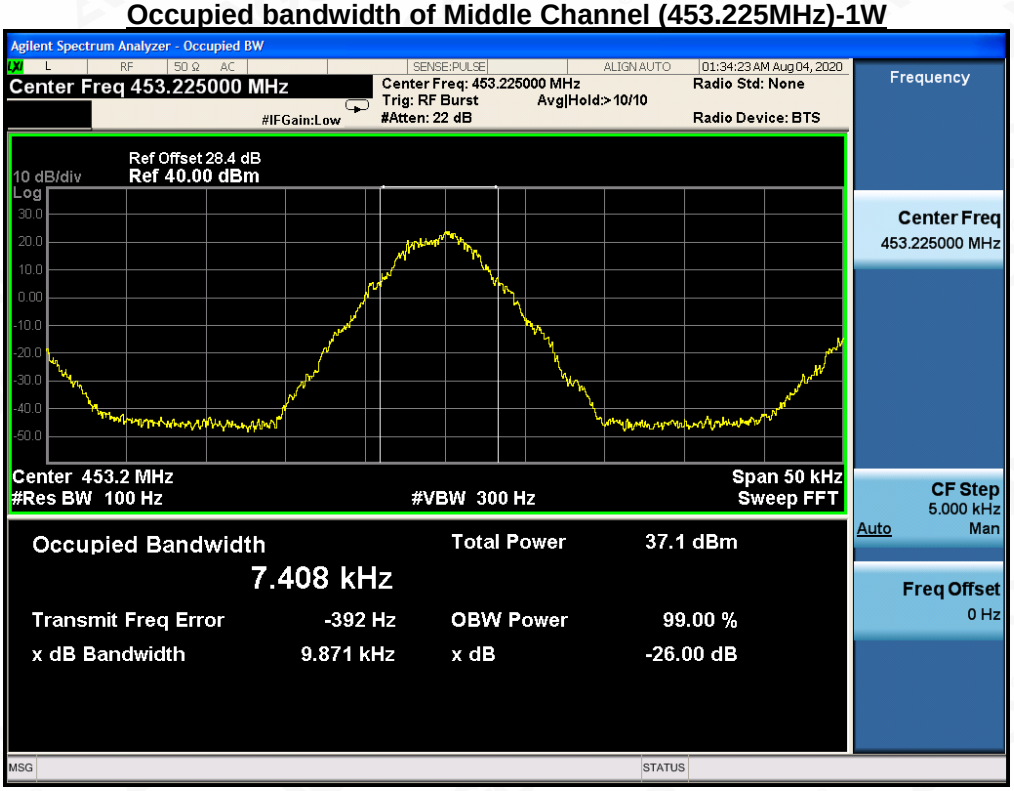
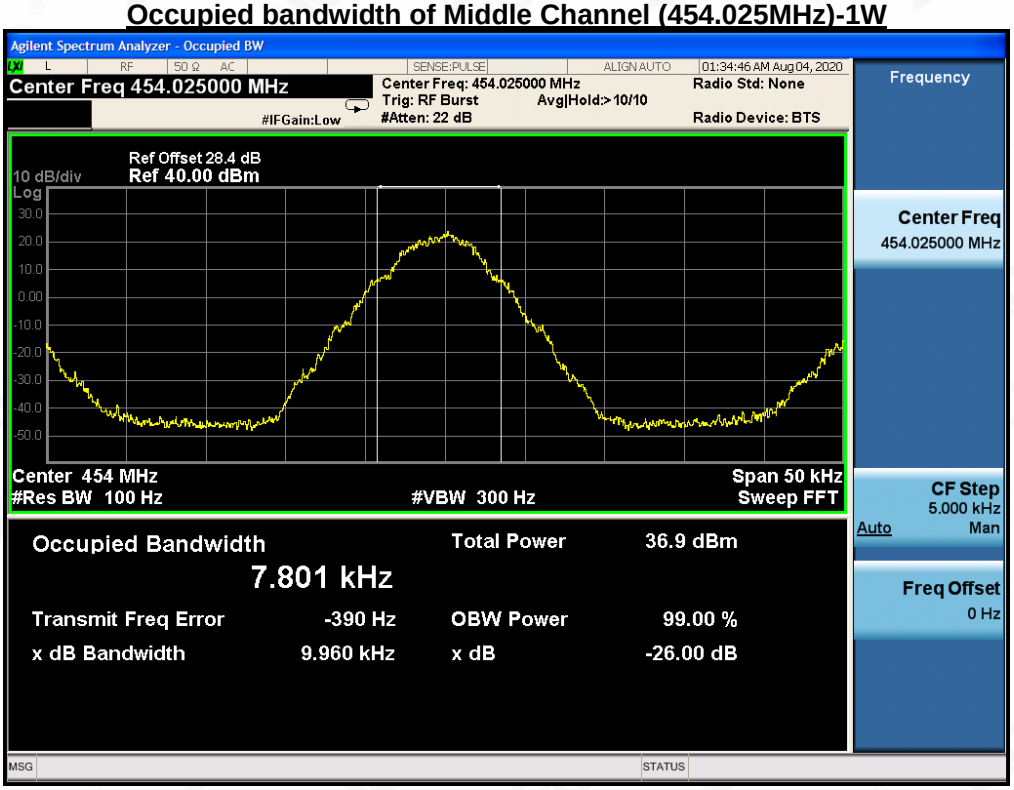
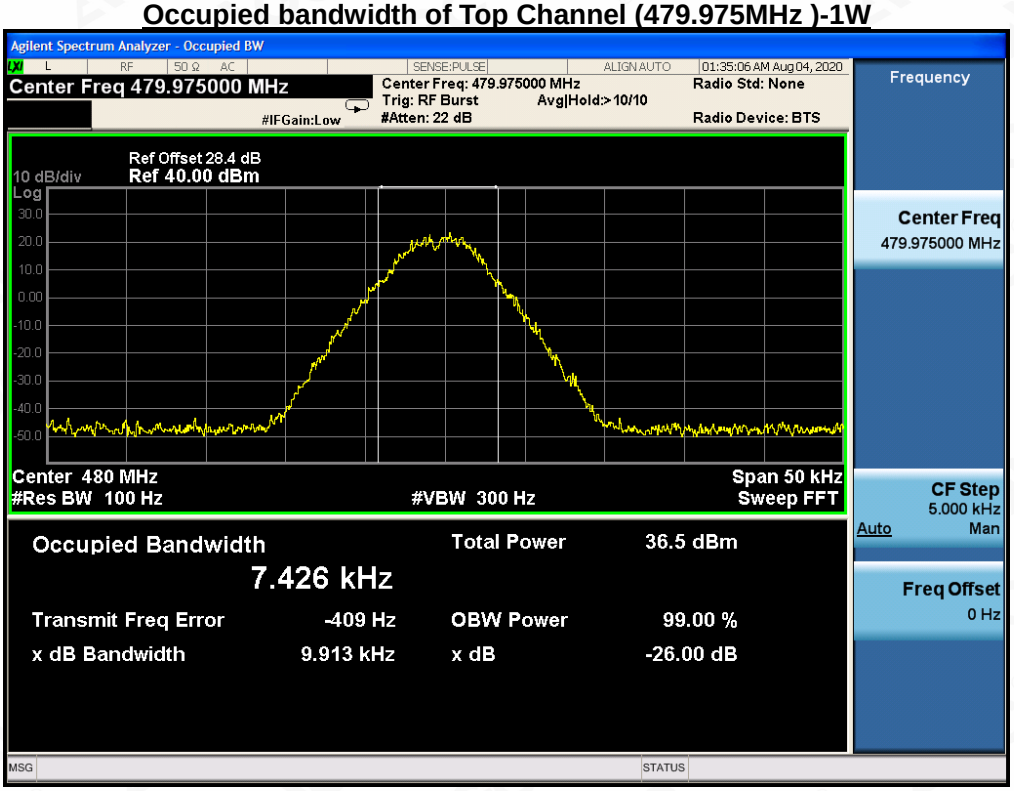
Occupied bandwidth of Middle Channel (453.225MHz)-1W



Occupied bandwidth of Middle Channel (454.025MHz)-1W



Occupied bandwidth of Top Channel (479.975MHz)-1W



8. SPURIOUS RATIATED EMISSION

8.1 PROVISIONS APPLICABLE

According to FCC §2.1053 §22.359 and §90.210, the power of each unwanted emission shall be less than Transmitted Power as specified below for transmitters designed to operate with each channel separation.

Emission Mask D -for 12.5 KHz Channel Separation:

(1).On any frequency removed from the center of the authorized bandwidth fo to 5.625 KHz removed from fo: Zero dB.

(2).On any frequency removed from the center of the authorized bandwidth by a displacement Frequency (fd in KHz) fo of more than 5.625 KHz but no more than 12.5 KHz: At least 7.27(fd-2.88 KHz) dB

(3).On any frequency removed from the center of the authorized bandwidth by a displacement Frequency (fd in KHz)fo of more than 12.5 KHz: At least 50+10 log(P) dB or 70 dB, whichever is lesser attenuation.

According to FCC §22.359:

(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

8.2 MEASUREMENT PROCEDURE

(1)On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.

(2)The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.

(3)The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.

(4)The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.

(5)The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.

(6)The transmitter shall than be rotated through 360°in the horizontal plane, until the maximum signal level is detected by the measuring receiver.

(7)The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.

(8)The maximum signal level detected by the measuring receiver shall be noted.

(9)The measurement shall be repeated with the test antenna set to horizontal polarization.

(10) Replace the antenna with a proper Antenna (substitution antenna).

(11)The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.

(12)The substitution antenna shall be connected to a calibrated signal generator.

(13)If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.

(14)The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.

(15)The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.

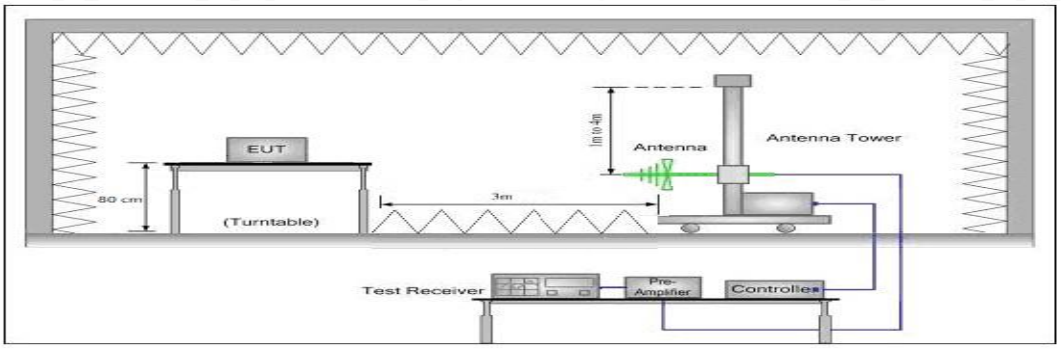
(16)The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.

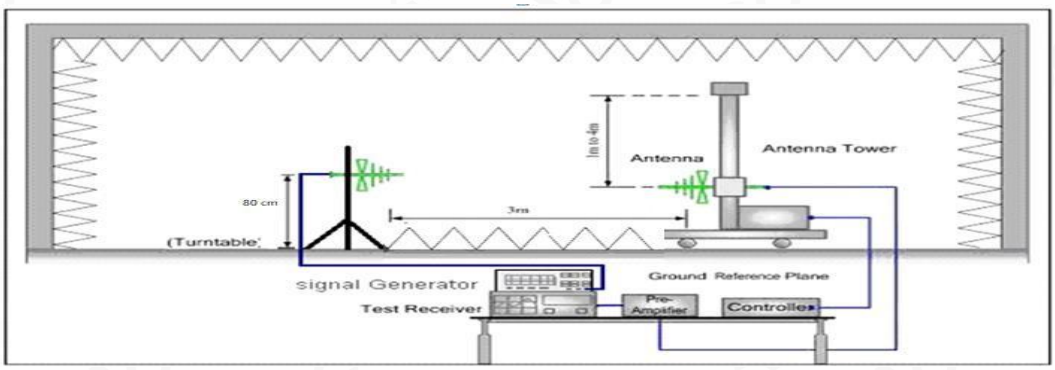
(17)The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

8.3 TEST SETUP BLOCK DIAGRAM

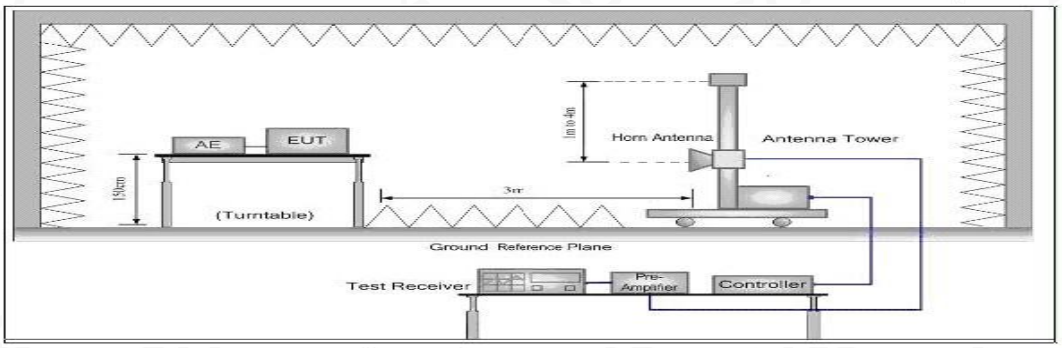
SUBSTITUTION METHOD: (Radiated Emissions)

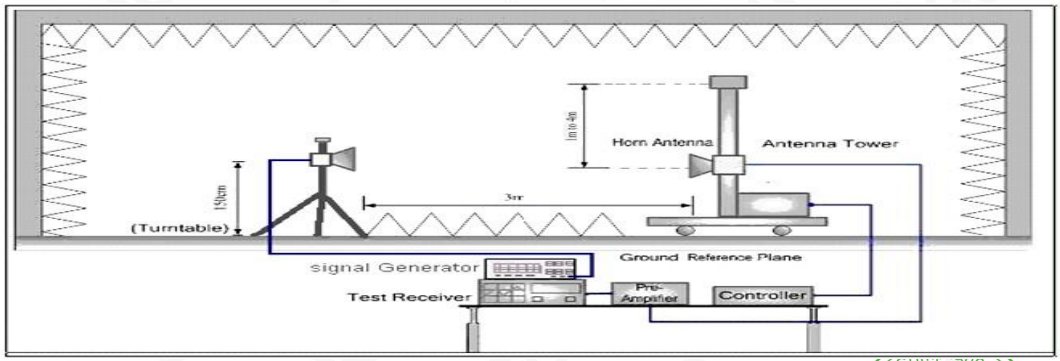
Radiated Below1GHz





Radiated Above 1 GHz





8.4 MEASUREMENT RESULTS:

Applicable Standard

FCC §2.1053, §22.359 and §90.210

On any frequency removed from the center of the authorized bandwidth by a displacement Frequency (fd in KHz)for of more than 12.5 KHz: at least 50+10 log(P) dB or 70 dB, whichever is lesser attenuation.

Test Procedure

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz for below 1GHz, and 1MHz for above 1GHz. Sufficient scans were taken to show any out of band emissions up to 10 harmonic.

In the semi-anechoic chamber, setup as illustrated above the DUT placed on the 0.8m height of Turn Table, rotated the table 45 degree each interval to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power for each degree interval. The “Read Value” is the spectrum reading of maximum power value.

The substitution antenna is substituted for DUT at the same position and signals generator (S.G) export the CW signal to the substitution antenna via a TX cable. The receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum radiation power. Record the power level of maximum radiation power from spectrum. So, the Measured substitution value = Ref level of S.G + TX cables loss – Substituted Antenna Gain.

EIRP = “Read Value” + Measured substitution value + 2.15.

Limit: FCC PART 90:

At least 50+10 log (P) =50+10log (5) =56.99 (dB)—5W 36.99-56.99=-20dBm

At least 50+10 log (P) =50+10log (1) =50 (dB)—1W 30-50=-20dBm

FCC PART 22:

At least 43+10 log (P) =43+10log (5) =49.99 (dB)—5W 36.99-49.99=-13dBm

At least 43+10 log (P) =43+10log (1) =43 (dB)—1W 30-43=-13dBm

VHF:
Analog:

Measurement Result for 12.5 KHz Channel Separation @ 136.025MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
136.025	H	-	-	pass
272.050	H	-35.89	-20	pass
408.075	H	-36.51	-20	pass
544.100	H	-40.21	-20	pass
680.125	H	-42.05	-20	pass
816.150	H	-43.66	-20	pass
952.175	H	-44.87	-20	pass
1088.200	H	-44.59	-20	pass
1224.225	H	-46.37	-20	pass
1360.250	H	-51.35	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
136.025	V	-	-	pass
272.050	V	-35.88	-20	pass
408.075	V	-40.77	-20	pass
544.100	V	-41.68	-20	pass
680.125	V	-42.18	-20	pass
816.150	V	-43.22	-20	pass
952.175	V	-44.45	-20	pass
1088.200	V	-46.77	-20	pass
1224.225	V	-48.79	-20	pass
1360.250	V	-49.76	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 151.850MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
151.850	H	-	-	pass
303.700	H	-34.99	-20	pass
455.550	H	-36.96	-20	pass
607.400	H	-38.86	-20	pass
759.250	H	-40.30	-20	pass
911.100	H	-41.13	-20	pass
1062.950	H	-40.02	-20	pass
1214.800	H	-42.27	-20	pass
1366.650	H	-42.42	-20	pass
1518.500	H	-43.57	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
151.850	V	-	-	pass
303.700	V	-33.16	-20	pass
455.550	V	-36.48	-20	pass
607.400	V	-38.27	-20	pass
759.250	V	-36.91	-20	pass
911.100	V	-43.92	-20	pass
1062.950	V	-43.75	-20	pass
1214.800	V	-43.54	-20	pass
1366.650	V	-46.92	-20	pass
1518.500	V	-50.96	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 155.025MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
155.025	H	-	-	pass
310.050	H	-31.09	-20	pass
465.075	H	-31.90	-20	pass
620.100	H	-32.22	-20	pass
775.125	H	-34.65	-20	pass
930.150	H	-40.73	-20	pass
1085.175	H	-41.79	-20	pass
1240.200	H	-46.30	-20	pass
1395.225	H	-49.07	-20	pass
1550.250	H	-49.92	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
155.025	V	-	-	pass
310.050	V	-34.10	-20	pass
465.075	V	-32.34	-20	pass
620.100	V	-36.63	-20	pass
775.125	V	-41.16	-20	pass
930.150	V	-37.87	-20	pass
1085.175	V	-39.31	-20	pass
1240.200	V	-42.85	-20	pass
1395.225	V	-43.51	-20	pass
1550.250	V	-47.22	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 161.610MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
161.610	H	-	-	pass
323.220	H	-32.87	-20	pass
484.830	H	-36.84	-20	pass
646.440	H	-37.36	-20	pass
808.050	H	-39.39	-20	pass
969.660	H	-41.15	-20	pass
1131.270	H	-44.45	-20	pass
1292.880	H	-44.85	-20	pass
1454.490	H	-48.36	-20	pass
1616.100	H	-50.62	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
161.610	V	-	-	pass
323.220	V	-37.61	-20	pass
484.830	V	-38.60	-20	pass
646.440	V	-40.02	-20	pass
808.050	V	-40.62	-20	pass
969.660	V	-41.90	-20	pass
1131.270	V	-43.69	-20	pass
1292.880	V	-46.32	-20	pass
1454.490	V	-47.24	-20	pass
1616.100	V	-50.19	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 173.975MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
173.975	H	-	-	pass
347.950	H	-36.88	-20	pass
521.925	H	-38.11	-20	pass
695.900	H	-36.77	-20	pass
869.875	H	-39.08	-20	pass
1043.850	H	-37.47	-20	pass
1217.825	H	-41.39	-20	pass
1391.800	H	-44.18	-20	pass
1565.775	H	-45.77	-20	pass
1739.750	H	-43.89	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
173.975	V	-	-	pass
347.950	V	-37.39	-20	pass
521.925	V	-38.78	-20	pass
695.900	V	-40.06	-20	pass
869.875	V	-40.89	-20	pass
1043.850	V	-43.51	-20	pass
1217.825	V	-45.78	-20	pass
1391.800	V	-44.85	-20	pass
1565.775	V	-50.57	-20	pass
1739.750	V	-51.56	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 136.025MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
136.025	H	-	-	pass
272.050	H	-37.13	-20	pass
408.075	H	-37.53	-20	pass
544.100	H	-40.24	-20	pass
680.125	H	-42.17	-20	pass
816.150	H	-43.01	-20	pass
952.175	H	-45.93	-20	pass
1088.200	H	-45.30	-20	pass
1224.225	H	-46.83	-20	pass
1360.250	H	-49.87	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
136.025	V	-	-	pass
272.050	V	-36.58	-20	pass
408.075	V	-40.63	-20	pass
544.100	V	-41.52	-20	pass
680.125	V	-41.77	-20	pass
816.150	V	-42.62	-20	pass
952.175	V	-45.06	-20	pass
1088.200	V	-46.91	-20	pass
1224.225	V	-48.52	-20	pass
1360.250	V	-50.01	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 151.850MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
151.850	H	-	-	pass
303.700	H	-35.49	-20	pass
455.550	H	-37.11	-20	pass
607.400	H	-39.17	-20	pass
759.250	H	-40.58	-20	pass
911.100	H	-41.45	-20	pass
1062.950	H	-39.86	-20	pass
1214.800	H	-41.17	-20	pass
1366.650	H	-41.66	-20	pass
1518.500	H	-46.33	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
151.850	V	-	-	pass
303.700	V	-33.15	-20	pass
455.550	V	-37.14	-20	pass
607.400	V	-37.55	-20	pass
759.250	V	-37.62	-20	pass
911.100	V	-44.67	-20	pass
1062.950	V	-42.62	-20	pass
1214.800	V	-43.97	-20	pass
1366.650	V	-47.23	-20	pass
1518.500	V	-51.03	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 155.025MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
155.025	H	-	-	pass
310.050	H	-31.23	-20	pass
465.075	H	-32.76	-20	pass
620.100	H	-32.43	-20	pass
775.125	H	-35.93	-20	pass
930.150	H	-40.47	-20	pass
1085.175	H	-41.18	-20	pass
1240.200	H	-46.70	-20	pass
1395.225	H	-48.71	-20	pass
1550.250	H	-51.04	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
155.025	V	-	-	pass
310.050	V	-33.32	-20	pass
465.075	V	-32.48	-20	pass
620.100	V	-36.17	-20	pass
775.125	V	-40.83	-20	pass
930.150	V	-37.24	-20	pass
1085.175	V	-39.94	-20	pass
1240.200	V	-43.71	-20	pass
1395.225	V	-43.95	-20	pass
1550.250	V	-47.57	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 161.610MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
161.610	H	-	-	pass
323.220	H	-34.10	-20	pass
484.830	H	-35.93	-20	pass
646.440	H	-36.54	-20	pass
808.050	H	-38.95	-20	pass
969.660	H	-41.17	-20	pass
1131.270	H	-43.56	-20	pass
1292.880	H	-45.62	-20	pass
1454.490	H	-48.61	-20	pass
1616.100	H	-50.00	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
161.610	V	-	-	pass
323.220	V	-37.44	-20	pass
484.830	V	-38.26	-20	pass
646.440	V	-39.83	-20	pass
808.050	V	-39.67	-20	pass
969.660	V	-41.75	-20	pass
1131.270	V	-43.24	-20	pass
1292.880	V	-45.68	-20	pass
1454.490	V	-46.89	-20	pass
1616.100	V	-50.88	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 173.975MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
173.975	H	-	-	pass
347.950	H	-36.44	-20	pass
521.925	H	-37.28	-20	pass
695.900	H	-36.93	-20	pass
869.875	H	-39.01	-20	pass
1043.850	H	-38.13	-20	pass
1217.825	H	-40.27	-20	pass
1391.800	H	-43.35	-20	pass
1565.775	H	-45.42	-20	pass
1739.750	H	-49.16	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
173.975	V	-	-	pass
347.950	V	-36.64	-20	pass
521.925	V	-38.70	-20	pass
695.900	V	-41.42	-20	pass
869.875	V	-40.80	-20	pass
1043.850	V	-43.59	-20	pass
1217.825	V	-46.52	-20	pass
1391.800	V	-45.90	-20	pass
1565.775	V	-49.78	-20	pass
1739.750	V	-50.71	-20	pass

Digital:

Measurement Result for 12.5 KHz Channel Separation @ 136.025MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
136.025	H	-	-	pass
272.050	H	-33.81	-20	pass
408.075	H	-36.19	-20	pass
544.100	H	-39.92	-20	pass
680.125	H	-43.27	-20	pass
816.150	H	-44.39	-20	pass
952.175	H	-47.51	-20	pass
1088.200	H	-48.91	-20	pass
1224.225	H	-51.26	-20	pass
1360.250	H	-49.28	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
136.025	V	-	-	pass
272.050	V	-34.66	-20	pass
408.075	V	-39.76	-20	pass
544.100	V	-43.16	-20	pass
680.125	V	-41.57	-20	pass
816.150	V	-45.46	-20	pass
952.175	V	-47.11	-20	pass
1088.200	V	-47.69	-20	pass
1224.225	V	-50.03	-20	pass
1360.250	V	-49.58	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 151.850MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
151.850	H	-	-	pass
303.700	H	-35.62	-20	pass
455.550	H	-38.79	-20	pass
607.400	H	-39.03	-20	pass
759.250	H	-39.50	-20	pass
911.100	H	-42.75	-20	pass
1062.950	H	-40.54	-20	pass
1214.800	H	-45.02	-20	pass
1366.650	H	-44.02	-20	pass
1518.500	H	-49.65	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
151.850	V	-	-	pass
303.700	V	-35.99	-20	pass
455.550	V	-36.51	-20	pass
607.400	V	-38.14	-20	pass
759.250	V	-37.79	-20	pass
911.100	V	-40.62	-20	pass
1062.950	V	-42.55	-20	pass
1214.800	V	-45.94	-20	pass
1366.650	V	-47.35	-20	pass
1518.500	V	-50.92	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 155.025MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
155.025	H	-	-	pass
310.050	H	-33.17	-20	pass
465.075	H	-34.49	-20	pass
620.100	H	-36.95	-20	pass
775.125	H	-40.05	-20	pass
930.150	H	-39.77	-20	pass
1085.175	H	-42.69	-20	pass
1240.200	H	-45.69	-20	pass
1395.225	H	-48.50	-20	pass
1550.250	H	-50.90	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
155.025	V	-	-	pass
310.050	V	-33.60	-20	pass
465.075	V	-36.45	-20	pass
620.100	V	-37.12	-20	pass
775.125	V	-38.43	-20	pass
930.150	V	-37.06	-20	pass
1085.175	V	-39.37	-20	pass
1240.200	V	-40.92	-20	pass
1395.225	V	-43.13	-20	pass
1550.250	V	-46.98	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 161.61MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
161.610	H	-	-	pass
323.220	H	-34.51	-20	pass
484.830	H	-35.11	-20	pass
646.440	H	-38.29	-20	pass
808.050	H	-39.36	-20	pass
969.660	H	-41.80	-20	pass
1131.270	H	-43.94	-20	pass
1292.880	H	-46.67	-20	pass
1454.490	H	-47.39	-20	pass
1616.100	H	-50.71	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
161.610	V	-	-	pass
323.220	V	-33.60	-20	pass
484.830	V	-36.54	-20	pass
646.440	V	-41.23	-20	pass
808.050	V	-40.25	-20	pass
969.660	V	-41.87	-20	pass
1131.270	V	-44.59	-20	pass
1292.880	V	-45.96	-20	pass
1454.490	V	-47.80	-20	pass
1616.100	V	-49.29	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 173.975MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
173.975	H	-	-	pass
347.950	H	-32.44	-20	pass
521.925	H	-37.83	-20	pass
695.900	H	-36.29	-20	pass
869.875	H	-38.55	-20	pass
1043.850	H	-37.95	-20	pass
1217.825	H	-40.77	-20	pass
1391.800	H	-43.31	-20	pass
1565.775	H	-45.61	-20	pass
1739.750	H	-48.84	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
173.975	V	-	-	pass
347.950	V	-37.13	-20	pass
521.925	V	-39.44	-20	pass
695.900	V	-40.04	-20	pass
869.875	V	-40.79	-20	pass
1043.850	V	-43.01	-20	pass
1217.825	V	-46.37	-20	pass
1391.800	V	-44.95	-20	pass
1565.775	V	-49.66	-20	pass
1739.750	V	-51.11	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 136.025MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
136.025	H	-	-	pass
272.050	H	-34.35	-20	pass
408.075	H	-35.89	-20	pass
544.100	H	-40.38	-20	pass
680.125	H	-43.57	-20	pass
816.150	H	-45.46	-20	pass
952.175	H	-47.12	-20	pass
1088.200	H	-48.41	-20	pass
1224.225	H	-50.06	-20	pass
1360.250	H	-49.90	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
136.025	V	-	-	pass
272.050	V	-34.12	-20	pass
408.075	V	-39.54	-20	pass
544.100	V	-43.33	-20	pass
680.125	V	-41.73	-20	pass
816.150	V	-46.44	-20	pass
952.175	V	-46.57	-20	pass
1088.200	V	-47.65	-20	pass
1224.225	V	-49.96	-20	pass
1360.250	V	-50.09	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 151.850MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
151.850	H	-	-	pass
303.700	H	-36.31	-20	pass
455.550	H	-38.24	-20	pass
607.400	H	-39.45	-20	pass
759.250	H	-39.86	-20	pass
911.100	H	-42.91	-20	pass
1062.950	H	-40.69	-20	pass
1214.800	H	-44.88	-20	pass
1366.650	H	-44.44	-20	pass
1518.500	H	-49.09	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
151.850	V	-	-	pass
303.700	V	-36.00	-20	pass
455.550	V	-36.77	-20	pass
607.400	V	-38.17	-20	pass
759.250	V	-37.49	-20	pass
911.100	V	-41.28	-20	pass
1062.950	V	-43.30	-20	pass
1214.800	V	-45.85	-20	pass
1366.650	V	-46.92	-20	pass
1518.500	V	-50.97	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 155.025MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
155.025	H	-	-	pass
310.050	H	-33.91	-20	pass
465.075	H	-35.43	-20	pass
620.100	H	-36.59	-20	pass
775.125	H	-39.68	-20	pass
930.150	H	-40.90	-20	pass
1085.175	H	-42.38	-20	pass
1240.200	H	-46.19	-20	pass
1395.225	H	-49.14	-20	pass
1550.250	H	-50.55	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
155.025	V	-	-	pass
310.050	V	-34.33	-20	pass
465.075	V	-37.04	-20	pass
620.100	V	-38.11	-20	pass
775.125	V	-38.69	-20	pass
930.150	V	-37.29	-20	pass
1085.175	V	-39.07	-20	pass
1240.200	V	-41.79	-20	pass
1395.225	V	-43.43	-20	pass
1550.250	V	-46.66	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 161.610MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
161.610	H	-	-	pass
323.220	H	-34.19	-20	pass
484.830	H	-35.86	-20	pass
646.440	H	-37.21	-20	pass
808.050	H	-40.07	-20	pass
969.660	H	-41.72	-20	pass
1131.270	H	-44.24	-20	pass
1292.880	H	-46.79	-20	pass
1454.490	H	-48.16	-20	pass
1616.100	H	-50.92	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
161.610	V	-	-	pass
323.220	V	-34.08	-20	pass
484.830	V	-35.89	-20	pass
646.440	V	-40.18	-20	pass
808.050	V	-40.21	-20	pass
969.660	V	-41.88	-20	pass
1131.270	V	-43.21	-20	pass
1292.880	V	-45.44	-20	pass
1454.490	V	-47.77	-20	pass
1616.100	V	-48.44	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 173.975MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
173.975	H	-	-	pass
347.950	H	-33.53	-20	pass
521.925	H	-37.57	-20	pass
695.900	H	-36.49	-20	pass
869.875	H	-39.57	-20	pass
1043.850	H	-37.56	-20	pass
1217.825	H	-41.08	-20	pass
1391.800	H	-42.35	-20	pass
1565.775	H	-46.05	-20	pass
1739.750	H	-48.93	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
173.975	V	-	-	pass
347.950	V	-37.20	-20	pass
521.925	V	-39.28	-20	pass
695.900	V	-40.44	-20	pass
869.875	V	-40.37	-20	pass
1043.850	V	-43.83	-20	pass
1217.825	V	-46.11	-20	pass
1391.800	V	-45.65	-20	pass
1565.775	V	-49.68	-20	pass
1739.750	V	-50.95	-20	pass

UHF:
Analog:

Measurement Result for 12.5 KHz Channel Separation @ 400.025MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
400.025	H	-	-	pass
800.050	H	-32.48	-20	pass
1200.075	H	-33.59	-20	pass
1600.100	H	-38.00	-20	pass
2000.125	H	-38.04	-20	pass
2400.150	H	-39.86	-20	pass
2800.175	H	-42.09	-20	pass
3200.200	H	-51.10	-20	pass
3600.225	H	-52.59	-20	pass
4000.250	H	-54.15	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
400.025	V	-	-	pass
800.050	V	-37.46	-20	pass
1200.075	V	-38.55	-20	pass
1600.100	V	-37.47	-20	pass
2000.125	V	-42.31	-20	pass
2400.150	V	-44.70	-20	pass
2800.175	V	-42.86	-20	pass
3200.200	V	-42.47	-20	pass
3600.225	V	-50.78	-20	pass
4000.250	V	-52.24	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 454.025MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
454.025	H	-	-	pass
908.050	H	-38.03	-20	pass
1362.075	H	-40.58	-20	pass
1816.100	H	-41.27	-20	pass
2270.125	H	-46.48	-20	pass
2724.150	H	-48.42	-20	pass
3178.175	H	-51.47	-20	pass
3632.200	H	-51.22	-20	pass
4086.225	H	-51.45	-20	pass
4540.250	H	-52.62	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
454.025	V	-	-	pass
908.050	V	-37.64	-20	pass
1362.075	V	-35.15	-20	pass
1816.100	V	-37.22	-20	pass
2270.125	V	-41.01	-20	pass
2724.150	V	-42.81	-20	pass
3178.175	V	-43.66	-20	pass
3632.200	V	-45.59	-20	pass
4086.225	V	-52.34	-20	pass
4540.250	V	-54.82	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 479.975MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
479.975	H	-	-	pass
959.950	H	-37.70	-20	pass
1439.925	H	-36.83	-20	pass
1919.900	H	-37.97	-20	pass
2399.875	H	-40.66	-20	pass
2879.850	H	-40.15	-20	pass
3359.825	H	-41.98	-20	pass
3839.800	H	-43.59	-20	pass
4319.775	H	-51.84	-20	pass
4799.750	H	-54.02	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
479.975	V	-	-	pass
959.950	V	-38.33	-20	pass
1439.925	V	-37.04	-20	pass
1919.900	V	-40.78	-20	pass
2399.875	V	-40.88	-20	pass
2879.850	V	-41.63	-20	pass
3359.825	V	-45.08	-20	pass
3839.800	V	-52.10	-20	pass
4319.775	V	-53.14	-20	pass
4799.750	V	-55.24	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 400.025MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
400.025	H	-	-	pass
800.050	H	-33.40	-20	pass
1200.075	H	-34.97	-20	pass
1600.100	H	-37.99	-20	pass
2000.125	H	-38.28	-20	pass
2400.150	H	-40.52	-20	pass
2800.175	H	-41.93	-20	pass
3200.200	H	-51.20	-20	pass
3600.225	H	-51.54	-20	pass
4000.250	H	-52.72	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
400.025	V	-	-	pass
800.050	V	-37.62	-20	pass
1200.075	V	-38.72	-20	pass
1600.100	V	-37.66	-20	pass
2000.125	V	-42.11	-20	pass
2400.150	V	-44.10	-20	pass
2800.175	V	-43.15	-20	pass
3200.200	V	-43.39	-20	pass
3600.225	V	-51.12	-20	pass
4000.250	V	-51.50	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 454.025MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
454.025	H	-	-	pass
908.050	H	-37.72	-20	pass
1362.075	H	-39.42	-20	pass
1816.100	H	-40.53	-20	pass
2270.125	H	-47.06	-20	pass
2724.150	H	-47.23	-20	pass
3178.175	H	-51.12	-20	pass
3632.200	H	-51.00	-20	pass
4086.225	H	-51.90	-20	pass
4540.250	H	-51.96	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
454.025	V	-	-	pass
908.050	V	-36.60	-20	pass
1362.075	V	-35.25	-20	pass
1816.100	V	-36.62	-20	pass
2270.125	V	-40.91	-20	pass
2724.150	V	-42.57	-20	pass
3178.175	V	-43.68	-20	pass
3632.200	V	-46.64	-20	pass
4086.225	V	-52.61	-20	pass
4540.250	V	-54.60	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 479.975MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
479.975	H	-	-	pass
959.950	H	-37.64	-20	pass
1439.925	H	-37.01	-20	pass
1919.900	H	-37.77	-20	pass
2399.875	H	-40.53	-20	pass
2879.850	H	-40.53	-20	pass
3359.825	H	-42.41	-20	pass
3839.800	H	-42.62	-20	pass
4319.775	H	-51.27	-20	pass
4799.750	H	-53.99	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
479.975	V	-	-	pass
959.950	V	-37.11	-20	pass
1439.925	V	-37.48	-20	pass
1919.900	V	-40.95	-20	pass
2399.875	V	-40.20	-20	pass
2879.850	V	-42.65	-20	pass
3359.825	V	-45.35	-20	pass
3839.800	V	-51.28	-20	pass
4319.775	V	-52.85	-20	pass
4799.750	V	-55.09	-20	pass

Digital:

Measurement Result for 12.5 KHz Channel Separation @ 400.025MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
400.025	H	-	-	pass
800.050	H	-32.03	-20	pass
1200.075	H	-34.46	-20	pass
1600.100	H	-35.90	-20	pass
2000.125	H	-38.89	-20	pass
2400.150	H	-40.77	-20	pass
2800.175	H	-41.73	-20	pass
3200.200	H	-50.64	-20	pass
3600.225	H	-51.30	-20	pass
4000.250	H	-53.63	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
400.025	V	-	-	pass
800.050	V	-37.69	-20	pass
1200.075	V	-38.19	-20	pass
1600.100	V	-37.91	-20	pass
2000.125	V	-41.25	-20	pass
2400.150	V	-44.62	-20	pass
2800.175	V	-42.61	-20	pass
3200.200	V	-42.59	-20	pass
3600.225	V	-50.49	-20	pass
4000.250	V	-52.40	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 454.025MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
454.025	H	-	-	pass
908.050	H	-37.45	-20	pass
1362.075	H	-40.70	-20	pass
1816.100	H	-40.47	-20	pass
2270.125	H	-46.89	-20	pass
2724.150	H	-47.85	-20	pass
3178.175	H	-50.86	-20	pass
3632.200	H	-50.82	-20	pass
4086.225	H	-51.46	-20	pass
4540.250	H	-51.90	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
454.025	V	-	-	pass
908.050	V	-36.88	-20	pass
1362.075	V	-35.26	-20	pass
1816.100	V	-37.39	-20	pass
2270.125	V	-41.35	-20	pass
2724.150	V	-43.18	-20	pass
3178.175	V	-43.30	-20	pass
3632.200	V	-45.55	-20	pass
4086.225	V	-52.27	-20	pass
4540.250	V	-54.66	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 479.975MHz-5W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
479.975	H	-	-	pass
959.950	H	-36.57	-20	pass
1439.925	H	-37.06	-20	pass
1919.900	H	-38.51	-20	pass
2399.875	H	-40.68	-20	pass
2879.850	H	-40.96	-20	pass
3359.825	H	-41.55	-20	pass
3839.800	H	-43.32	-20	pass
4319.775	H	-51.33	-20	pass
4799.750	H	-53.86	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
479.975	V	-	-	pass
959.950	V	-38.41	-20	pass
1439.925	V	-37.26	-20	pass
1919.900	V	-41.27	-20	pass
2399.875	V	-40.38	-20	pass
2879.850	V	-41.48	-20	pass
3359.825	V	-44.84	-20	pass
3839.800	V	-51.67	-20	pass
4319.775	V	-54.06	-20	pass
4799.750	V	-54.74	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 400.025MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
400.025	H	-	-	pass
800.050	H	-31.70	-20	pass
1200.075	H	-34.27	-20	pass
1600.100	H	-36.63	-20	pass
2000.125	H	-38.11	-20	pass
2400.150	H	-40.81	-20	pass
2800.175	H	-42.04	-20	pass
3200.200	H	-50.87	-20	pass
3600.225	H	-51.38	-20	pass
4000.250	H	-53.42	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
400.025	V	-	-	pass
800.050	V	-38.10	-20	pass
1200.075	V	-38.72	-20	pass
1600.100	V	-37.67	-20	pass
2000.125	V	-42.06	-20	pass
2400.150	V	-43.37	-20	pass
2800.175	V	-42.73	-20	pass
3200.200	V	-43.11	-20	pass
3600.225	V	-50.58	-20	pass
4000.250	V	-52.22	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 454.025MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
454.025	H	-	-	pass
908.050	H	-37.89	-20	pass
1362.075	H	-39.87	-20	pass
1816.100	H	-41.55	-20	pass
2270.125	H	-47.56	-20	pass
2724.150	H	-48.20	-20	pass
3178.175	H	-51.04	-20	pass
3632.200	H	-51.47	-20	pass
4086.225	H	-51.96	-20	pass
4540.250	H	-51.94	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
454.025	V	-	-	pass
908.050	V	-37.38	-20	pass
1362.075	V	-36.24	-20	pass
1816.100	V	-37.11	-20	pass
2270.125	V	-40.38	-20	pass
2724.150	V	-43.64	-20	pass
3178.175	V	-44.13	-20	pass
3632.200	V	-46.26	-20	pass
4086.225	V	-53.72	-20	pass
4540.250	V	-54.88	-20	pass

Measurement Result for 12.5 KHz Channel Separation @ 479.975MHz-1W

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
479.975	H	-	-	pass
959.950	H	-37.66	-20	pass
1439.925	H	-37.47	-20	pass
1919.900	H	-37.68	-20	pass
2399.875	H	-39.96	-20	pass
2879.850	H	-41.43	-20	pass
3359.825	H	-42.58	-20	pass
3839.800	H	-42.63	-20	pass
4319.775	H	-51.29	-20	pass
4799.750	H	-53.46	-20	pass

Emission Frequency (MHz)	Ant. Polarity(H/V)	Measurement Result (dBm)	Limit (dBm)	Result(P/F)
479.975	V	-	-	pass
959.950	V	-38.42	-20	pass
1439.925	V	-37.78	-20	pass
1919.900	V	-40.73	-20	pass
2399.875	V	-40.73	-20	pass
2879.850	V	-41.90	-20	pass
3359.825	V	-45.37	-20	pass
3839.800	V	-51.62	-20	pass
4319.775	V	-53.75	-20	pass
4799.750	V	-54.74	-20	pass

Note：In this case, Part 22 (-13 dBm) is less than the limit of Part 90 (-20 dBm), so we do not need to test Part 22, which meets the spurious limits of PART 90+22.

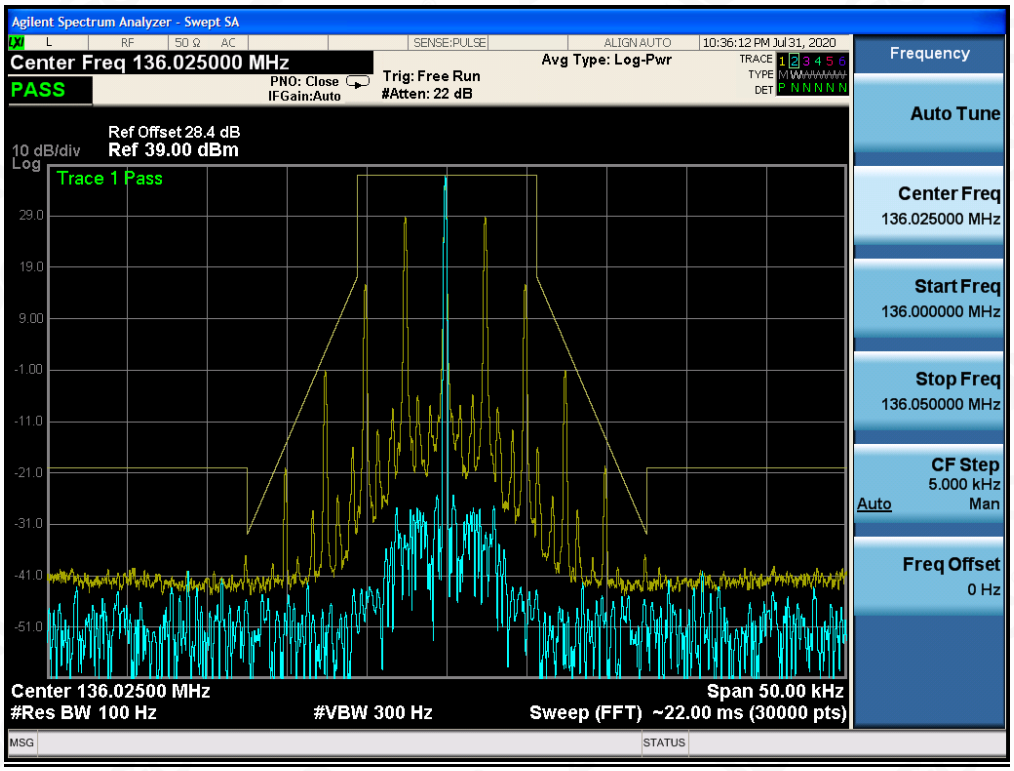
8.5 EMISSION MASK PLOT

The detailed procedure employed for Emission Mask measurements are specified as following:

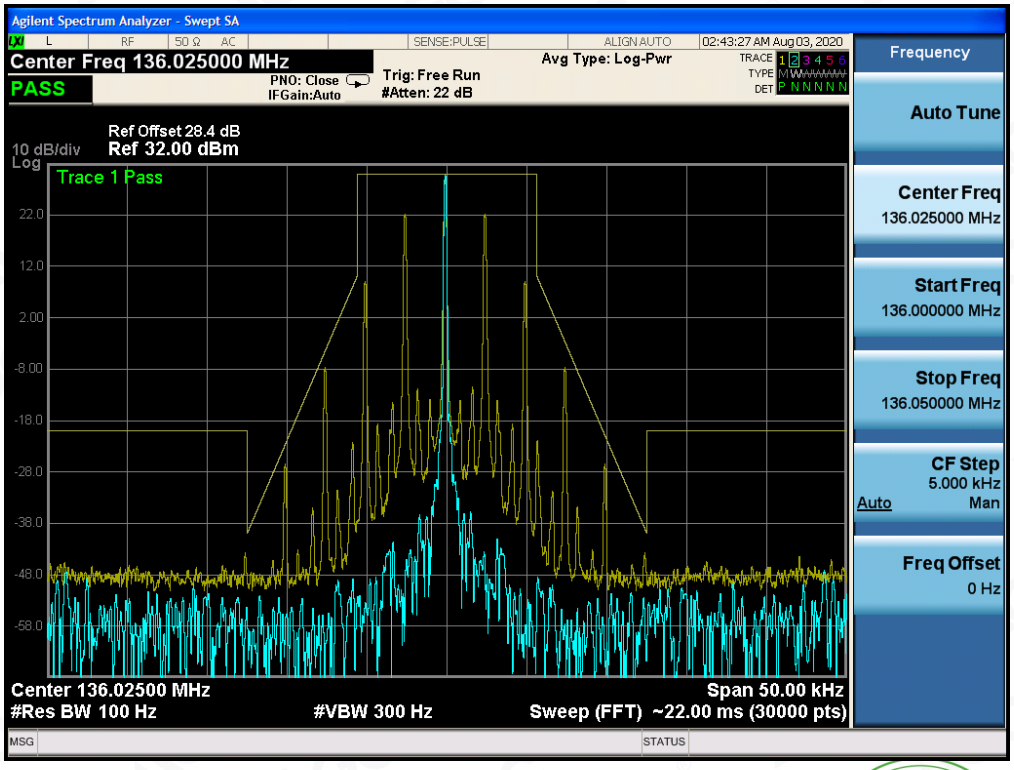
- The transmitter shall be modulated by a 2.5 kHz audio signal,
- The level of the audio signal employed is 16 dB greater than that necessary to produce 50% of rated system deviation. Rated system deviation is 2.5 kHz.

VHF:
Analog:

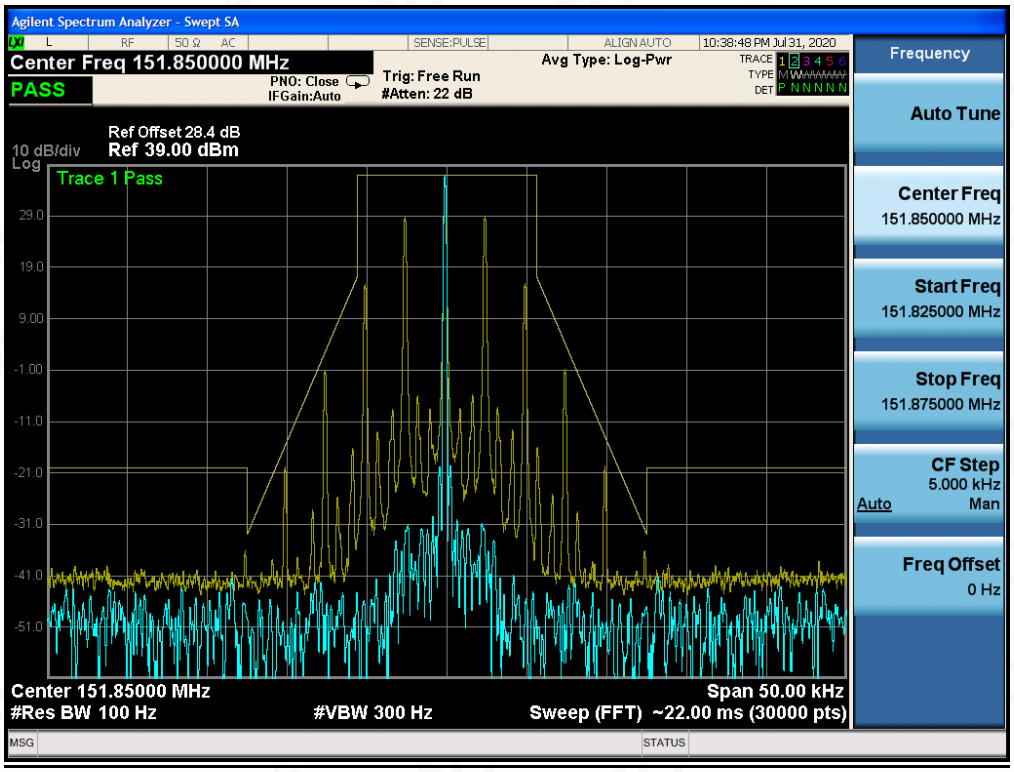
The Worst Emission Mask D for (136.025MHz) of 12.5 KHz channel Separation (5W)



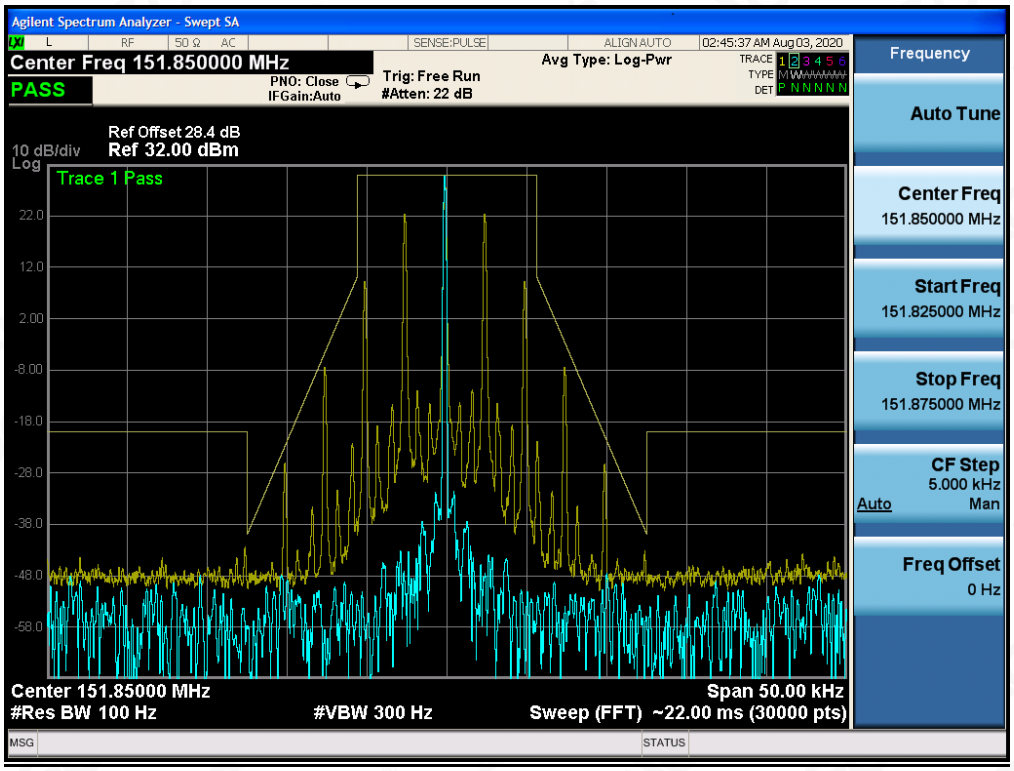
The Worst Emission Mask D for (136.025MHz) of 12.5 KHz channel Separation (1W)



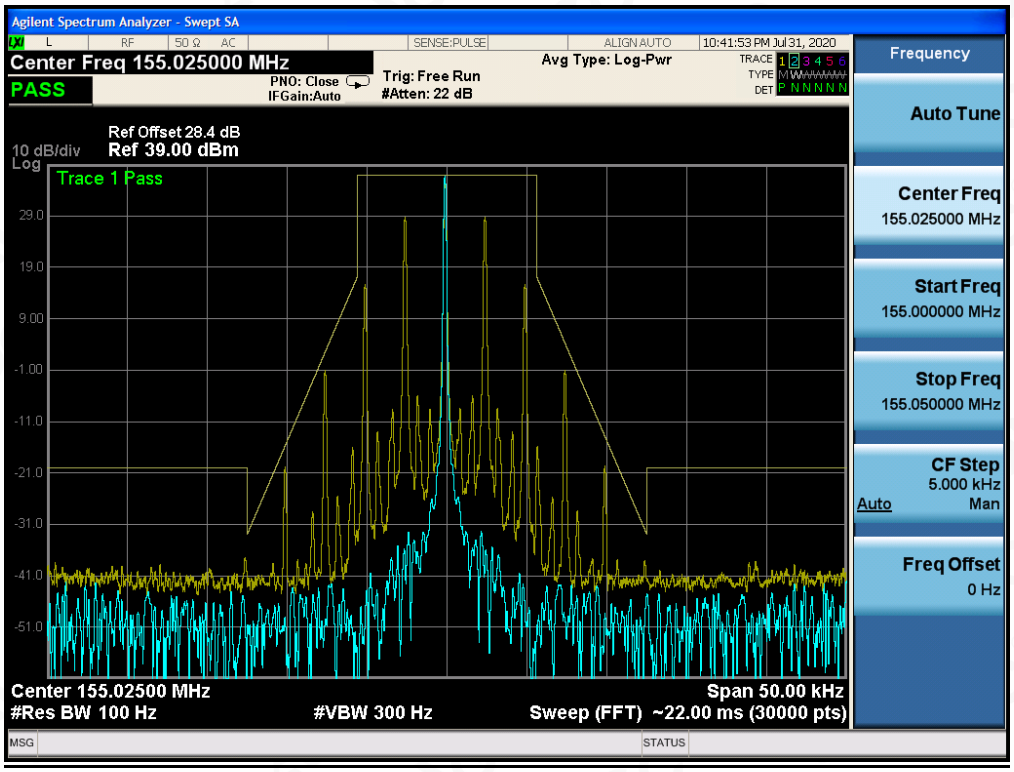
The Worst Emission Mask D for (151.85MHz) of 12.5 KHz channel Separation (5W)



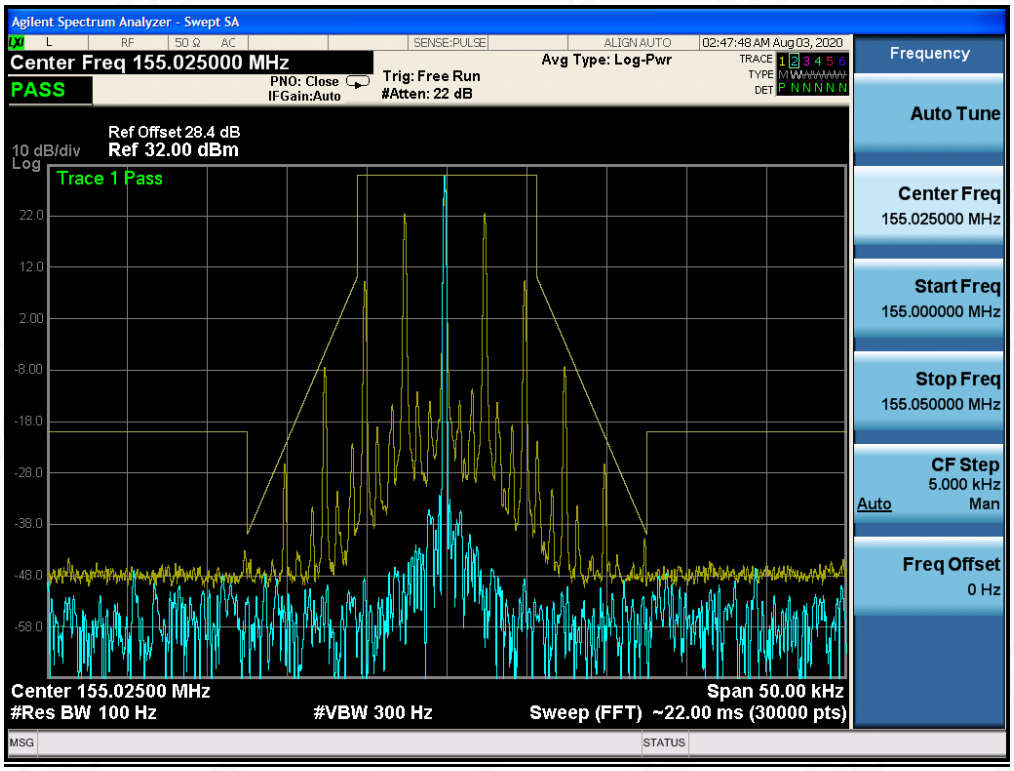
The Worst Emission Mask D for (151.85MHz) of 12.5 KHz channel Separation (1W)



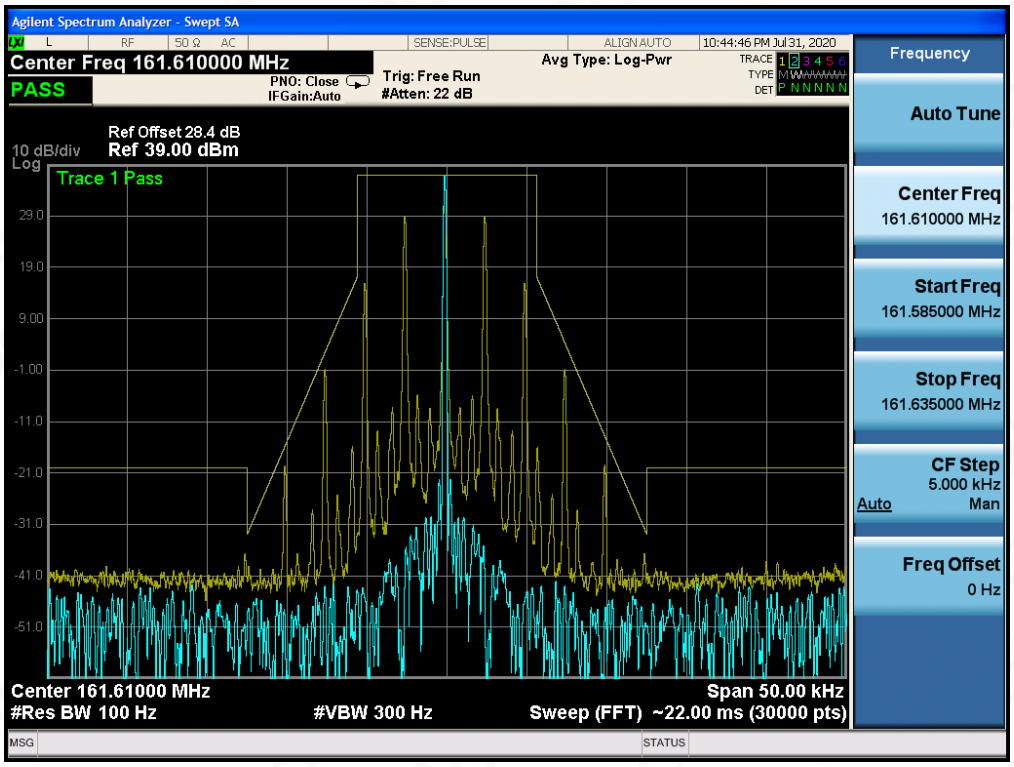
The Worst Emission Mask D for (155.025MHz) of 12.5 KHz channel Separation (5W)



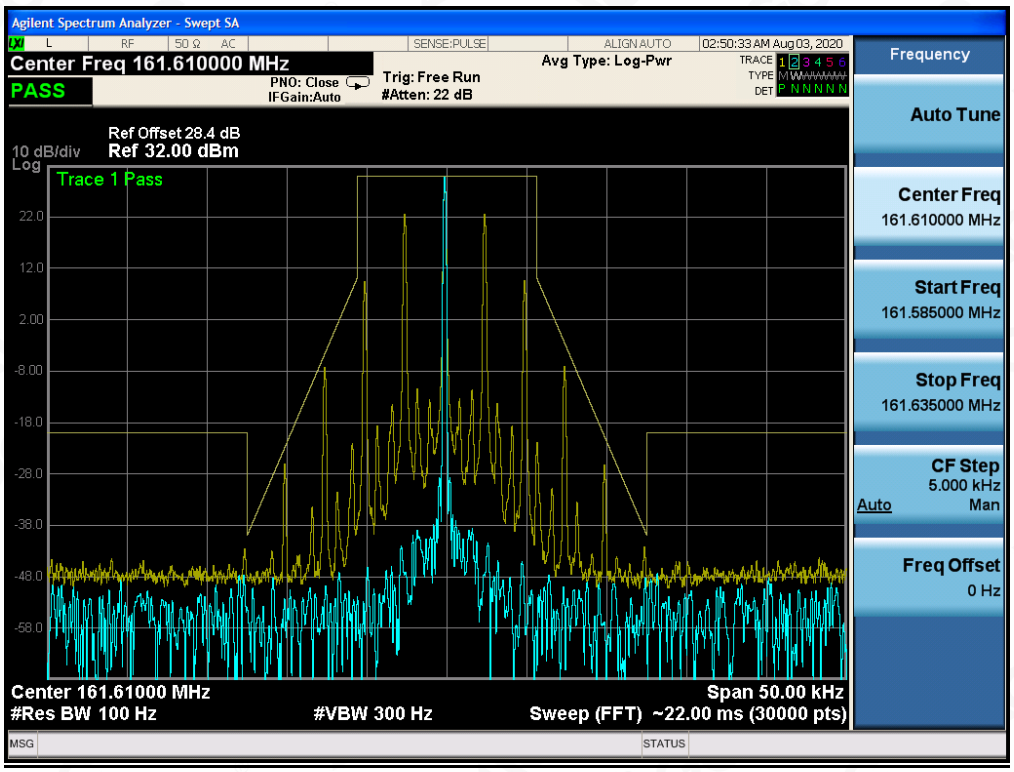
The Worst Emission Mask D for (155.025MHz) of 12.5 KHz channel Separation (1W)



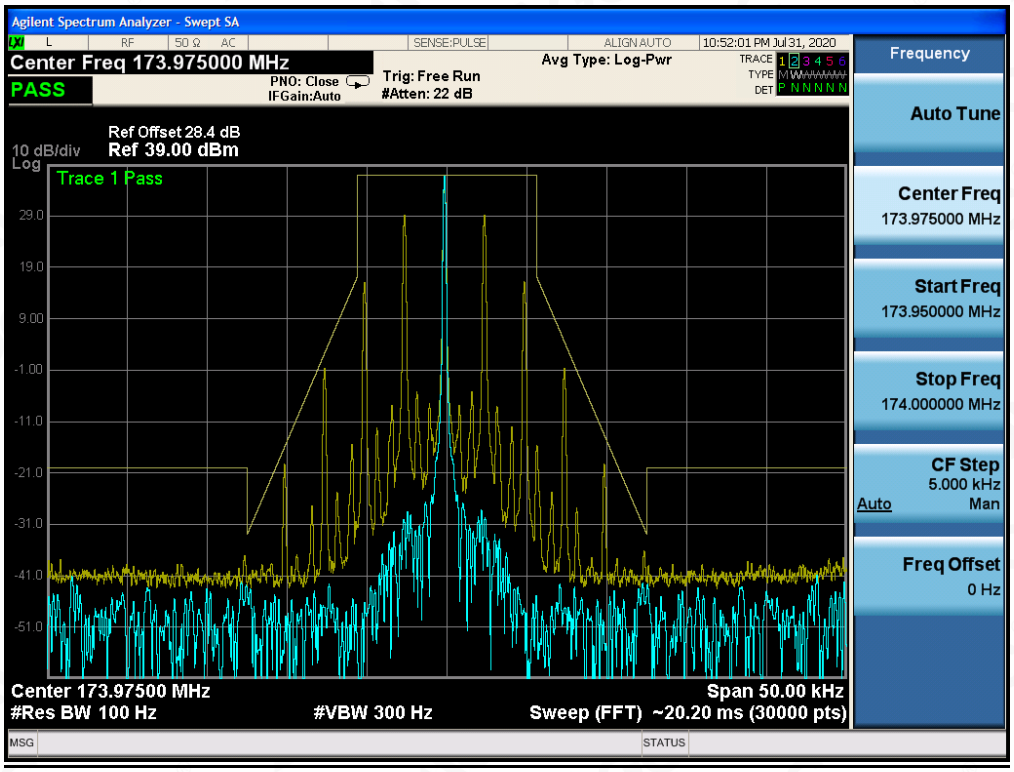
The Worst Emission Mask D for (161.61MHz) of 12.5 KHz channel Separation (5W)



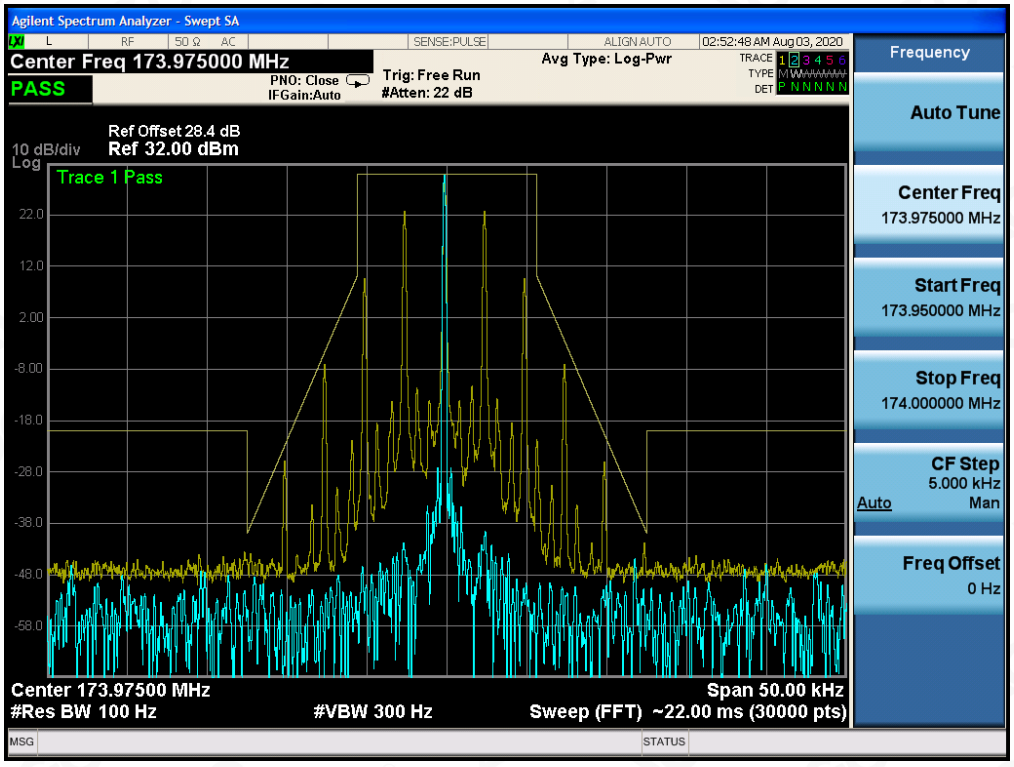
The Worst Emission Mask for (161.61MHz) of 12.5 KHz channel Separation (1W)



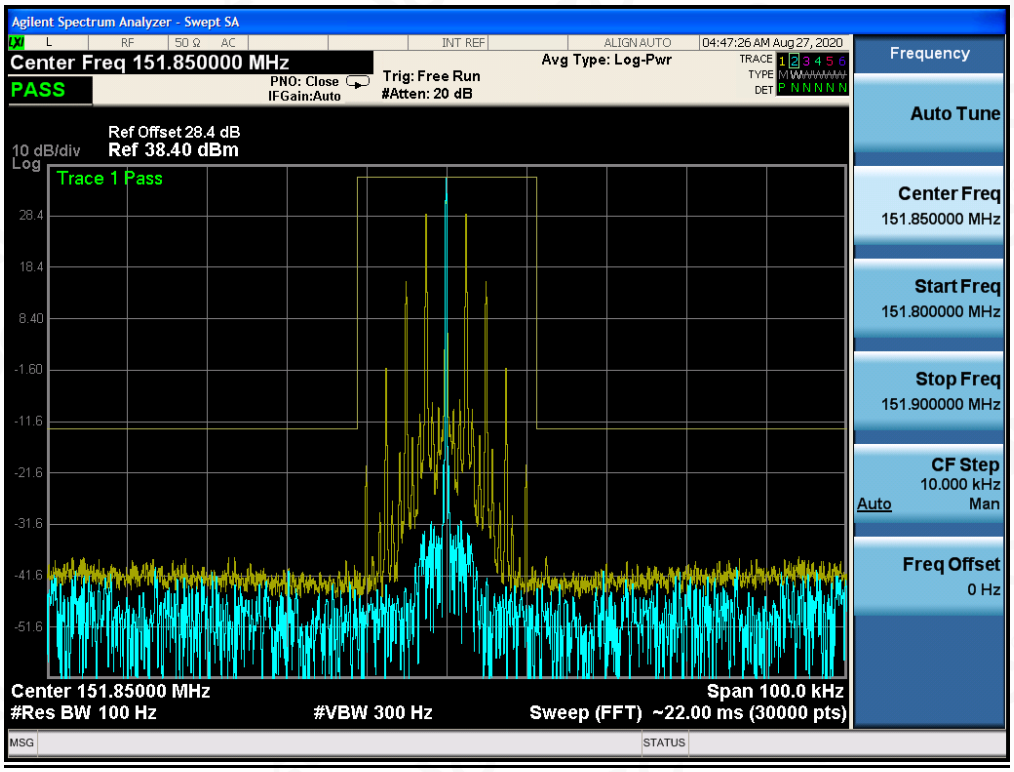
The Worst Emission Mask D for (173.975MHz) of 12.5 KHz channel Separation (5W)



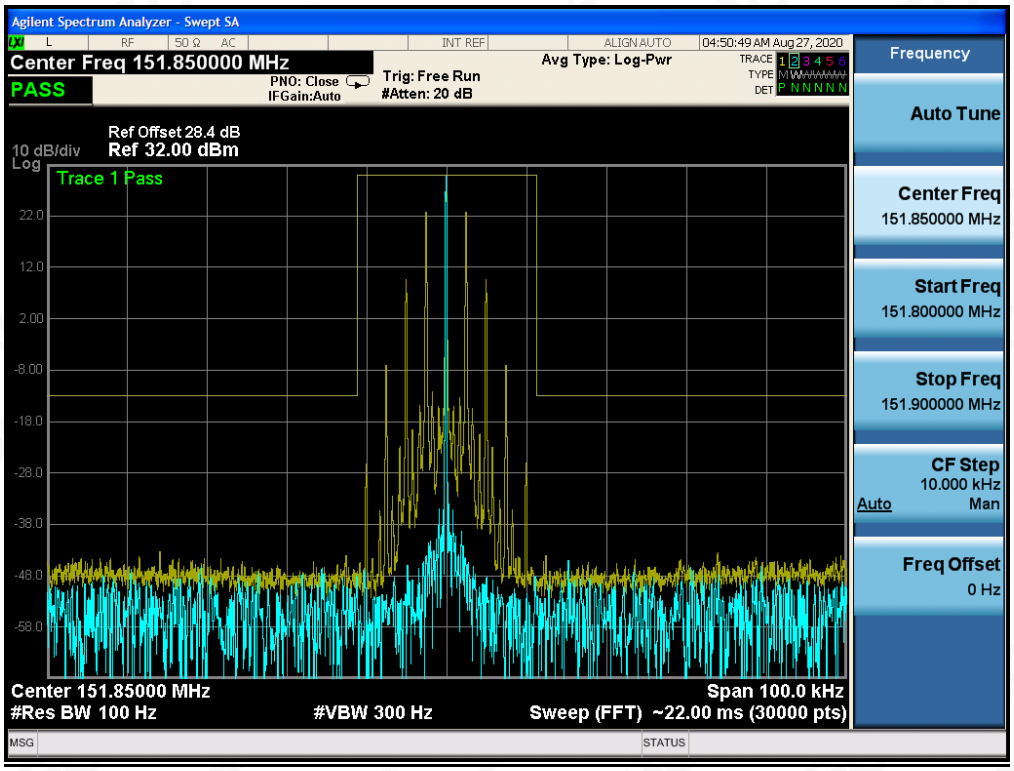
The Worst Emission Mask D for (173.975MHz) of 12.5 KHz channel Separation (1W)



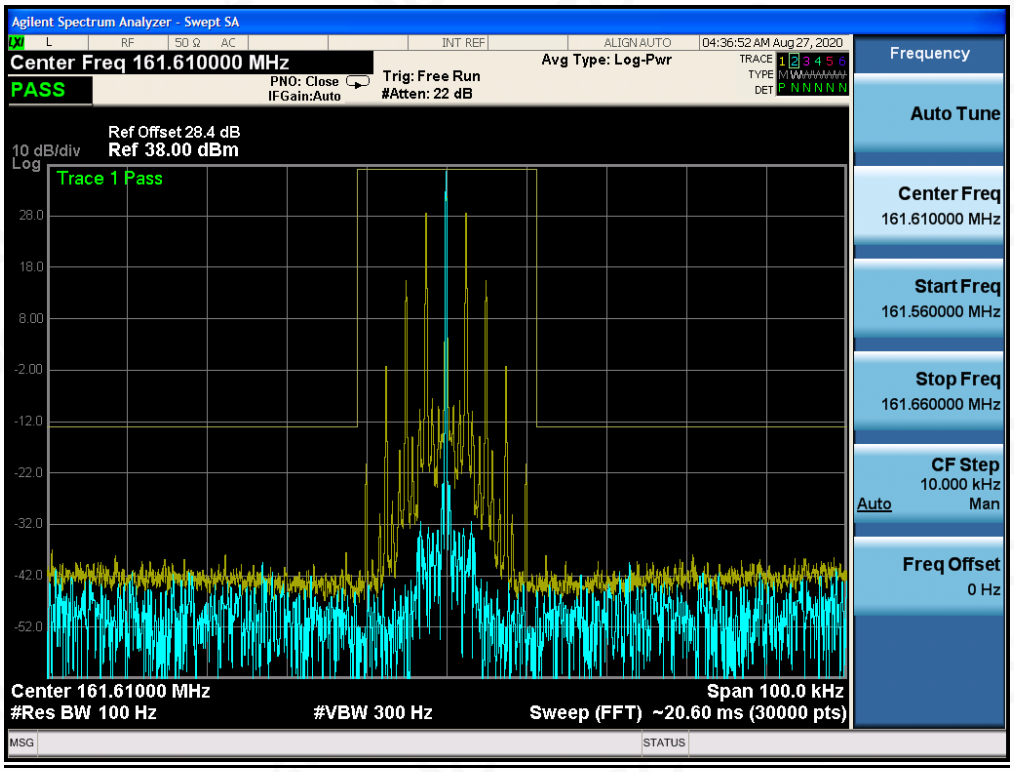
The Worst Emission Mask § 22.359 for (151.85 MHz) of 12.5 KHz channel Separation (5W)



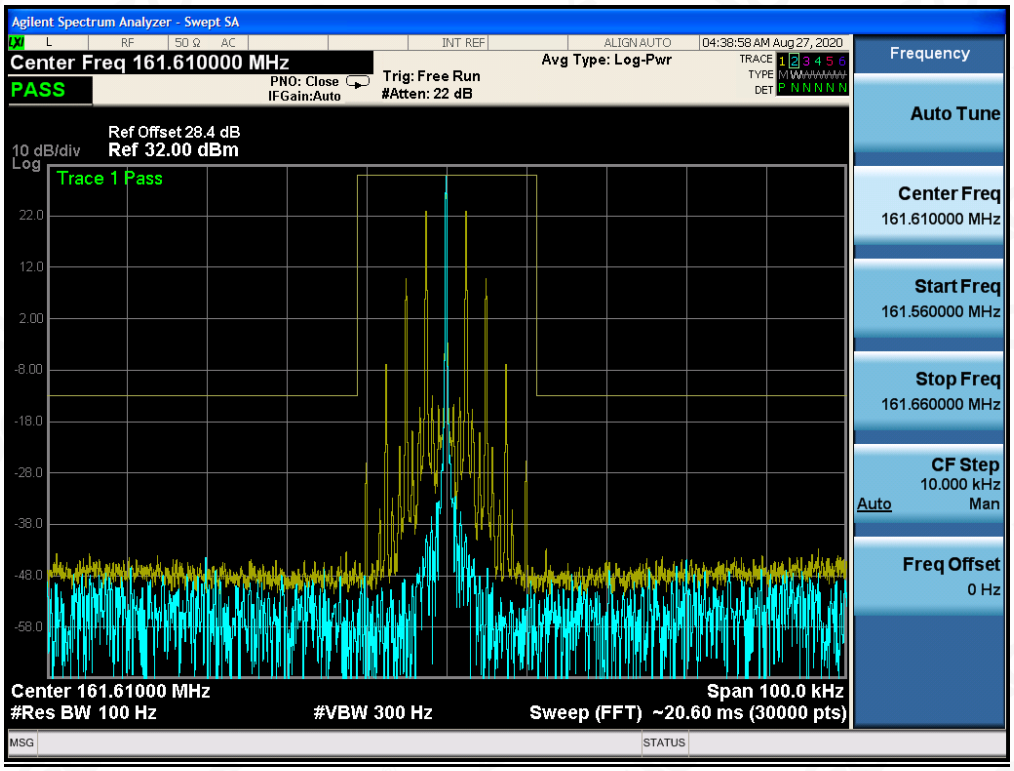
The Worst Emission Mask § 22.359 for (151.85 MHz) of 12.5 KHz channel Separation (1W)



The Worst Emission Mask § 22.359 for (161.61 MHz) of 12.5 KHz channel Separation (5W)

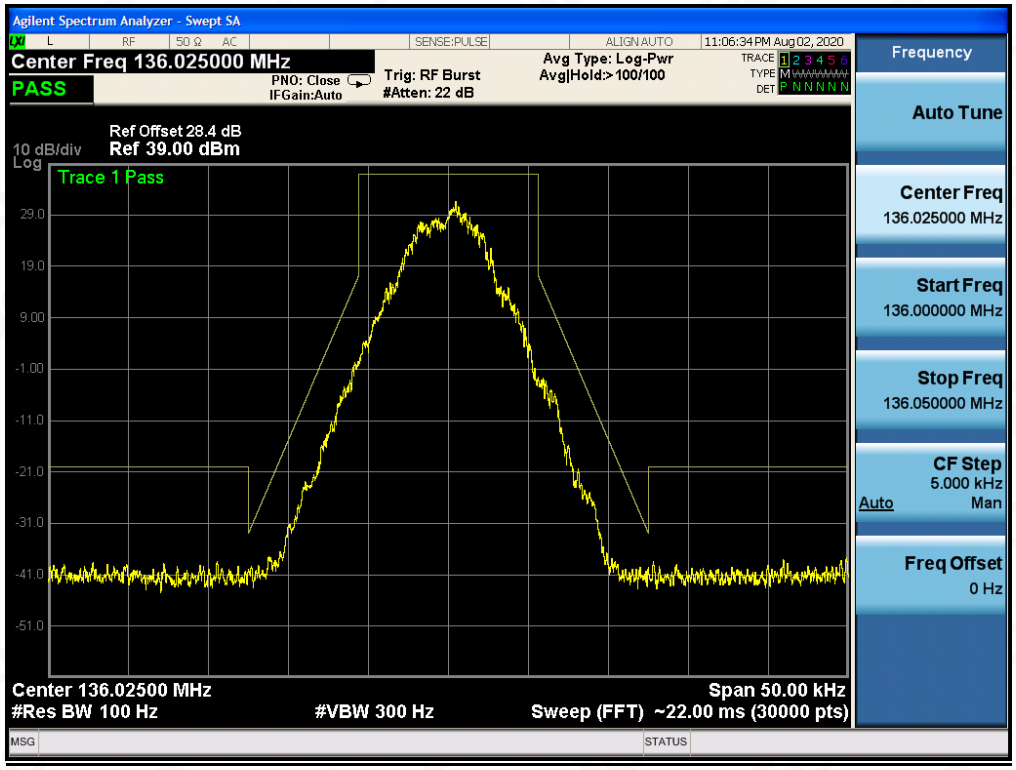


The Worst Emission Mask § 22.359 for (161.61 MHz) of 12.5 KHz channel Separation (1W)

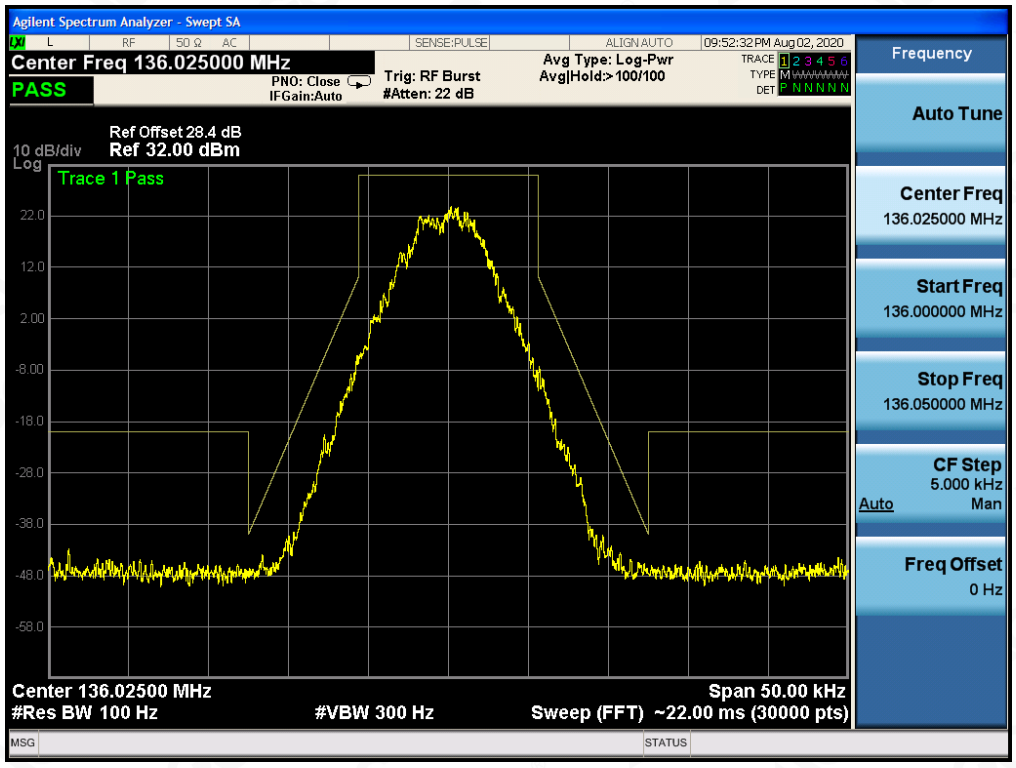


Digital：

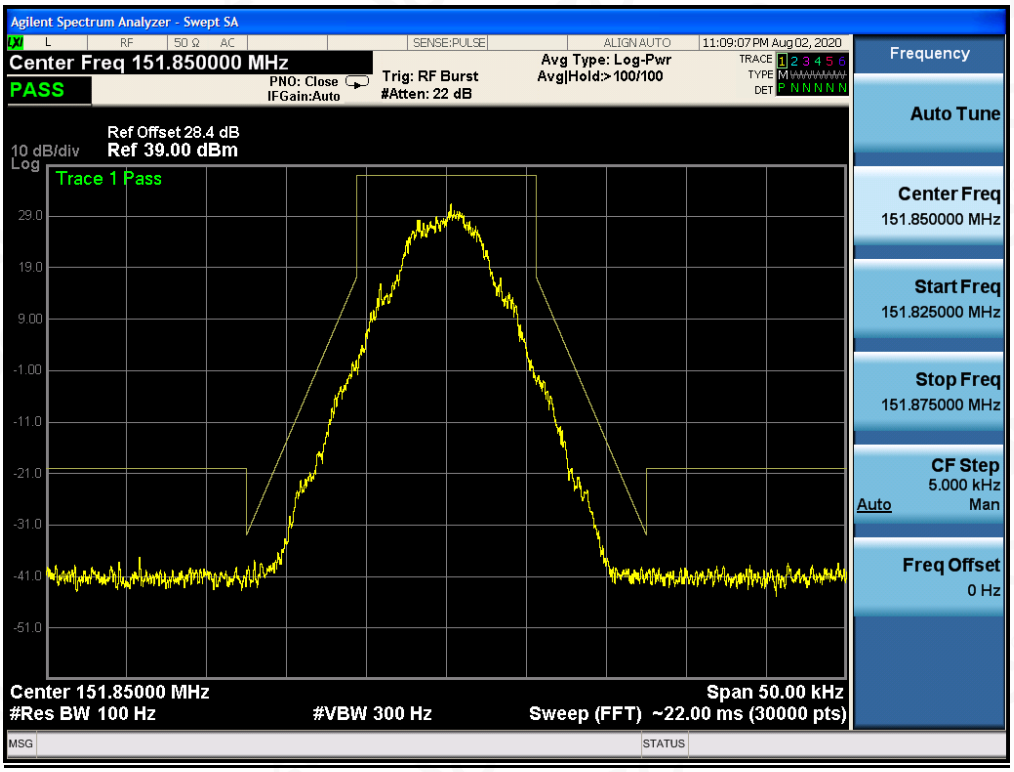
The Worst Emission Mask D for (136.025MHz) of 12.5 KHz channel Separation (5W)



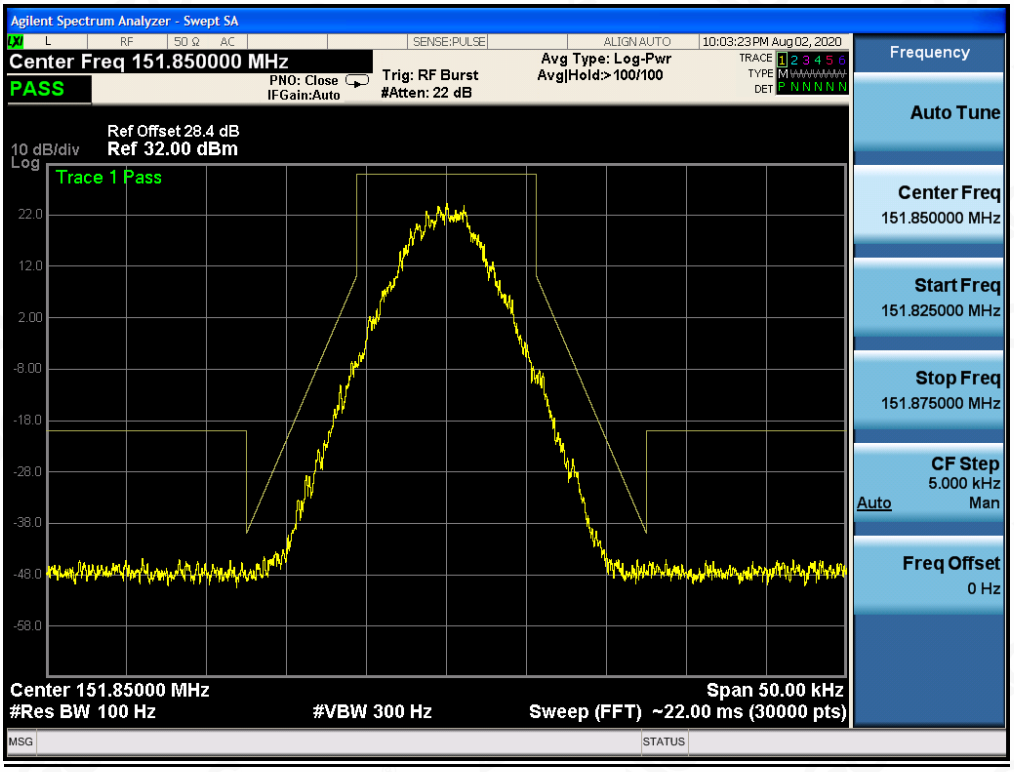
The Worst Emission Mask D for (136.025MHz) of 12.5 KHz channel Separation (1W)



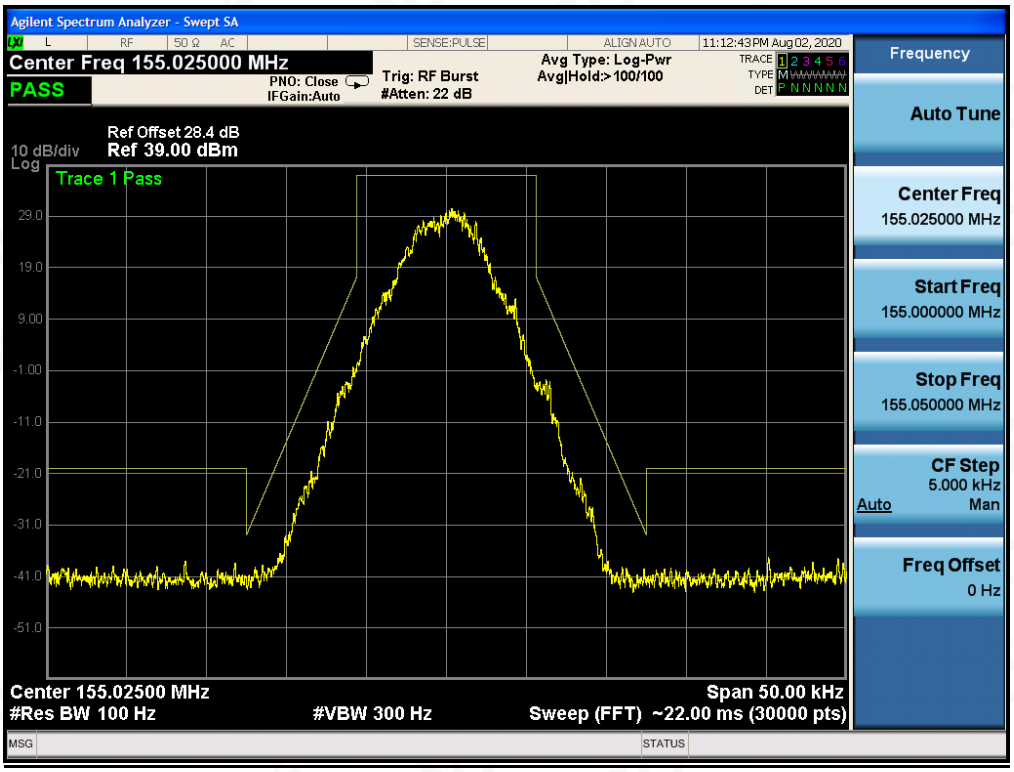
The Worst Emission Mask D for (151.85MHz) of 12.5 KHz channel Separation (5W)



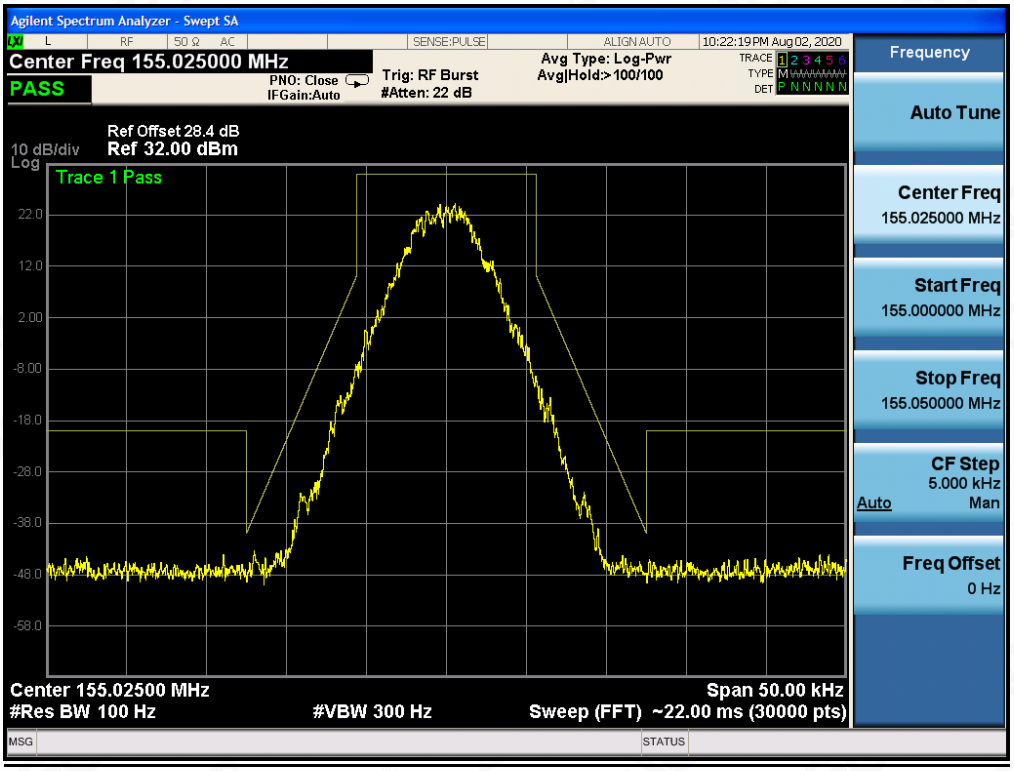
The Worst Emission Mask D for (151.85MHz) of 12.5 KHz channel Separation (1W)



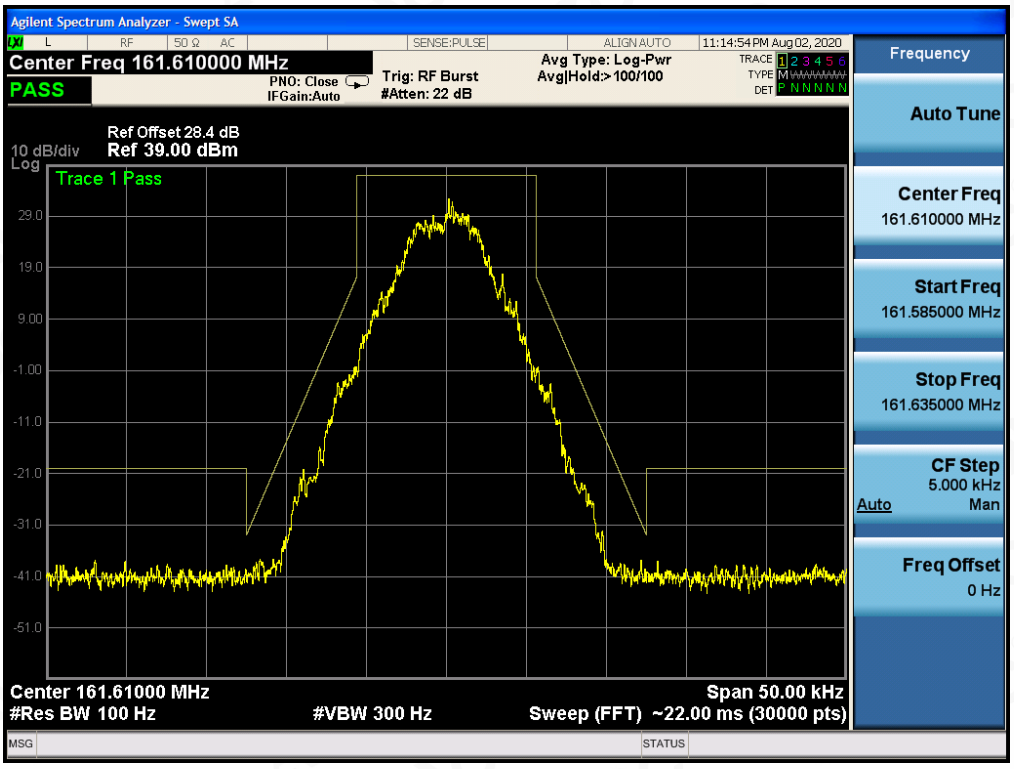
The Worst Emission Mask D for (155.025MHz) of 12.5 KHz channel Separation (5W)



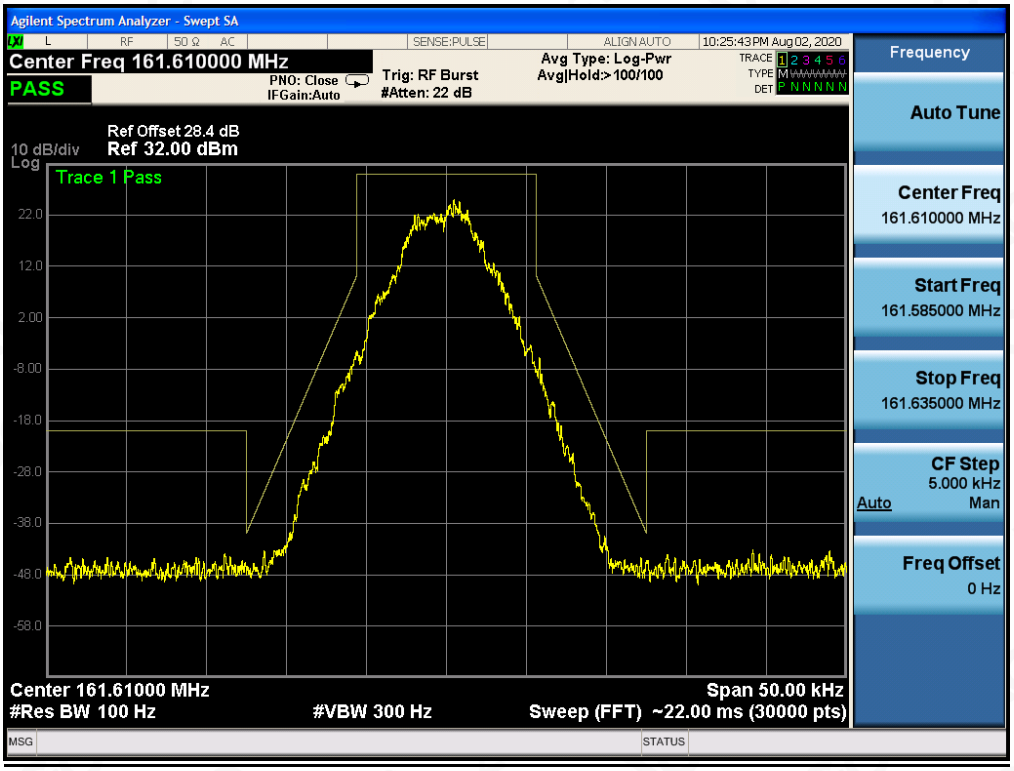
The Worst Emission Mask D for (155.025MHz) of 12.5 KHz channel Separation (1W)



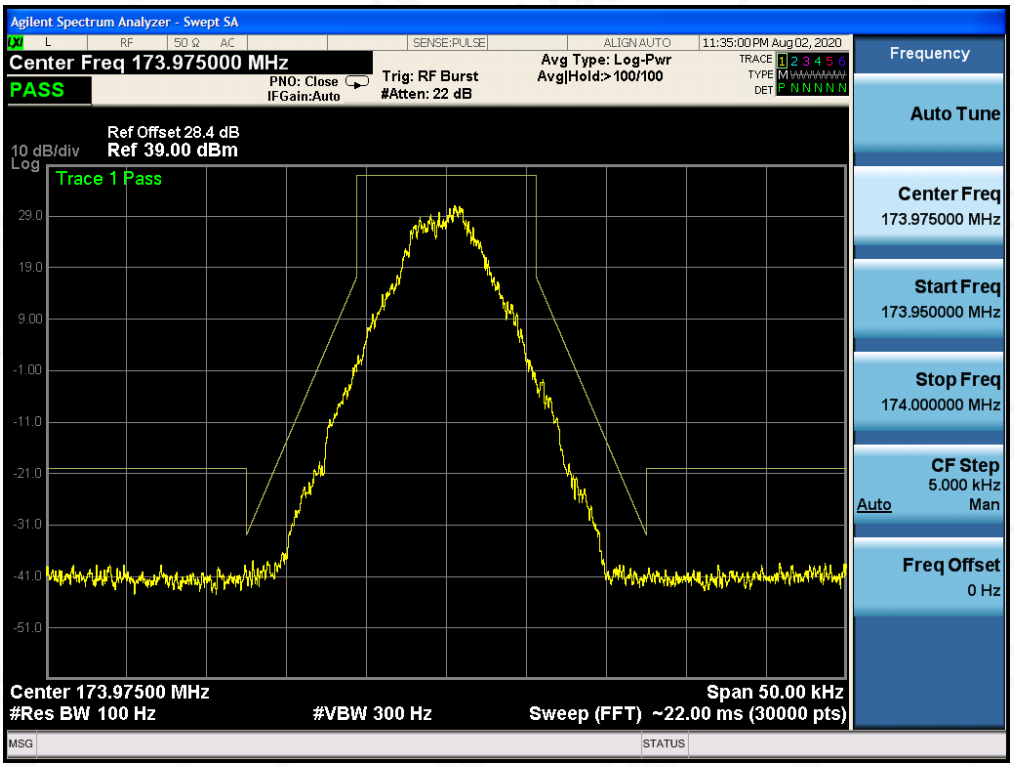
The Worst Emission Mask D for (161.61MHz) of 12.5 KHz channel Separation (5W)



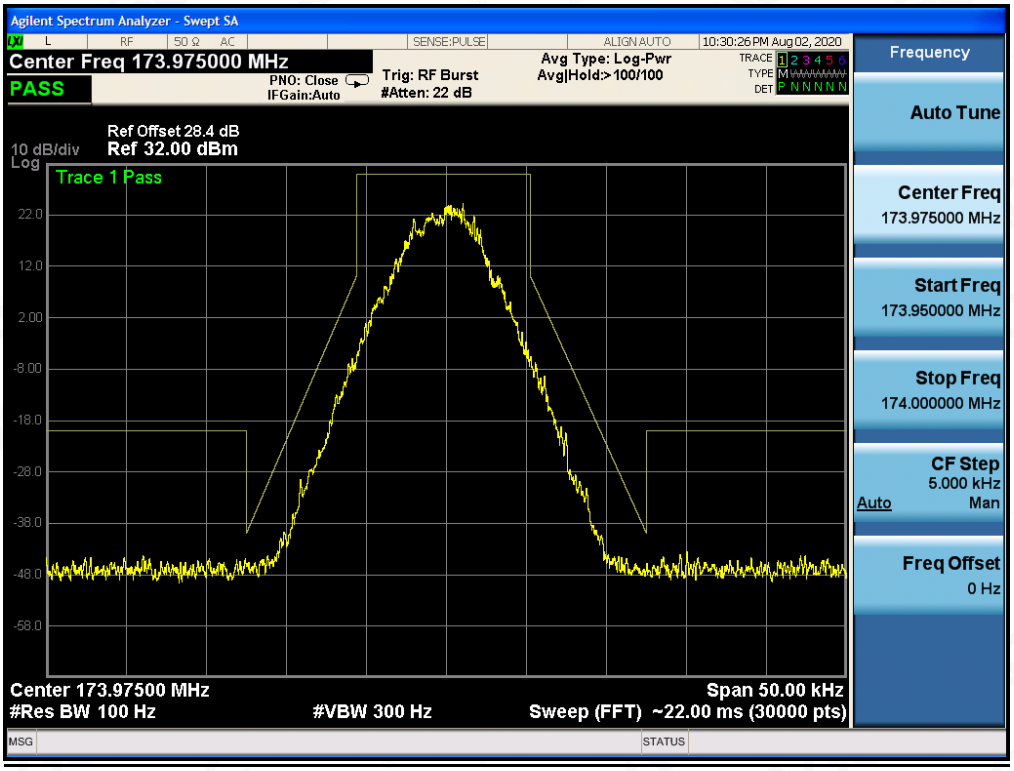
The Worst Emission Mask for (161.61MHz) of 12.5 KHz channel Separation (1W)



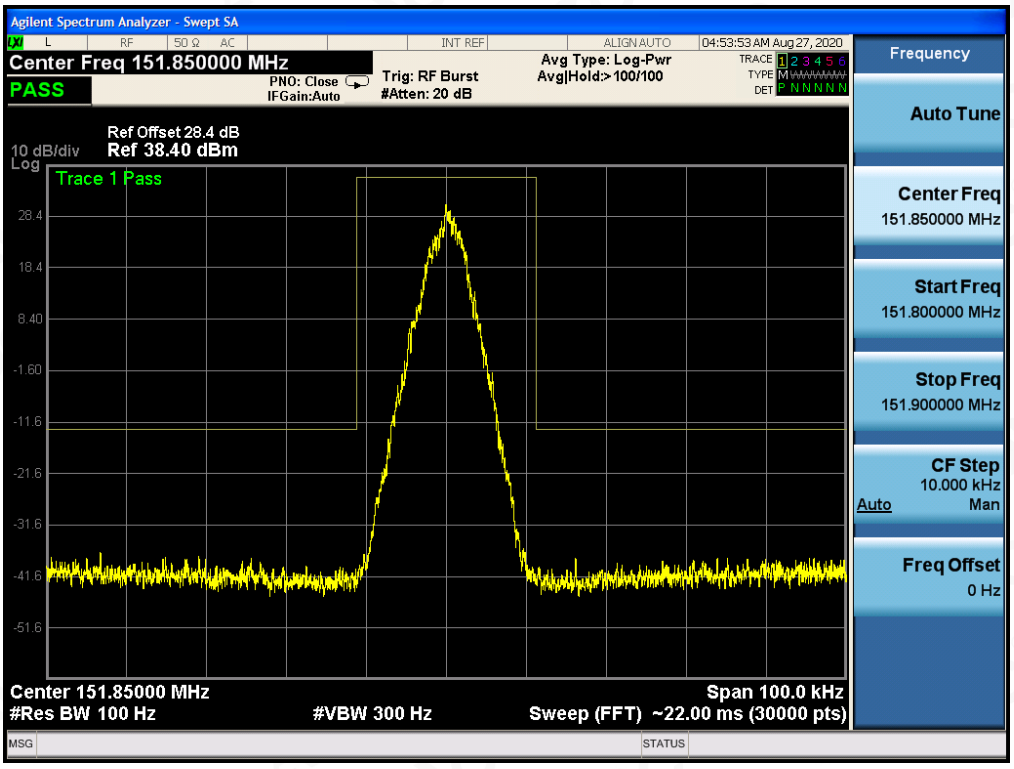
The Worst Emission Mask D for (173.975MHz) of 12.5 KHz channel Separation (5W)



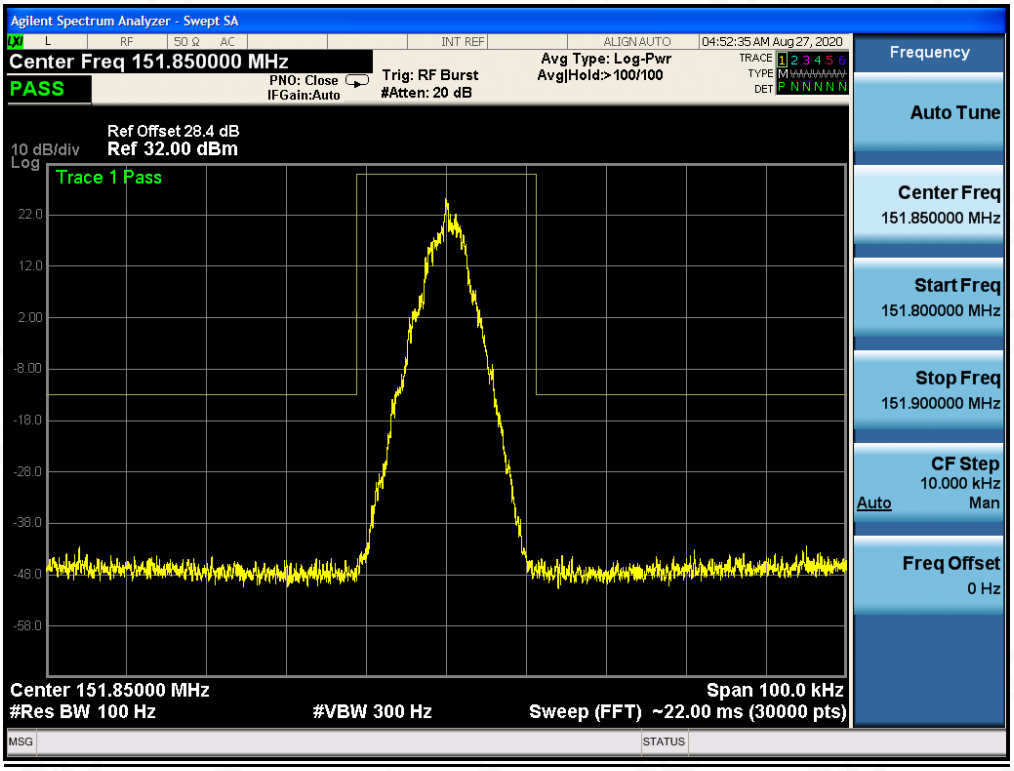
The Worst Emission Mask D for (173.975MHz) of 12.5 KHz channel Separation (1W)



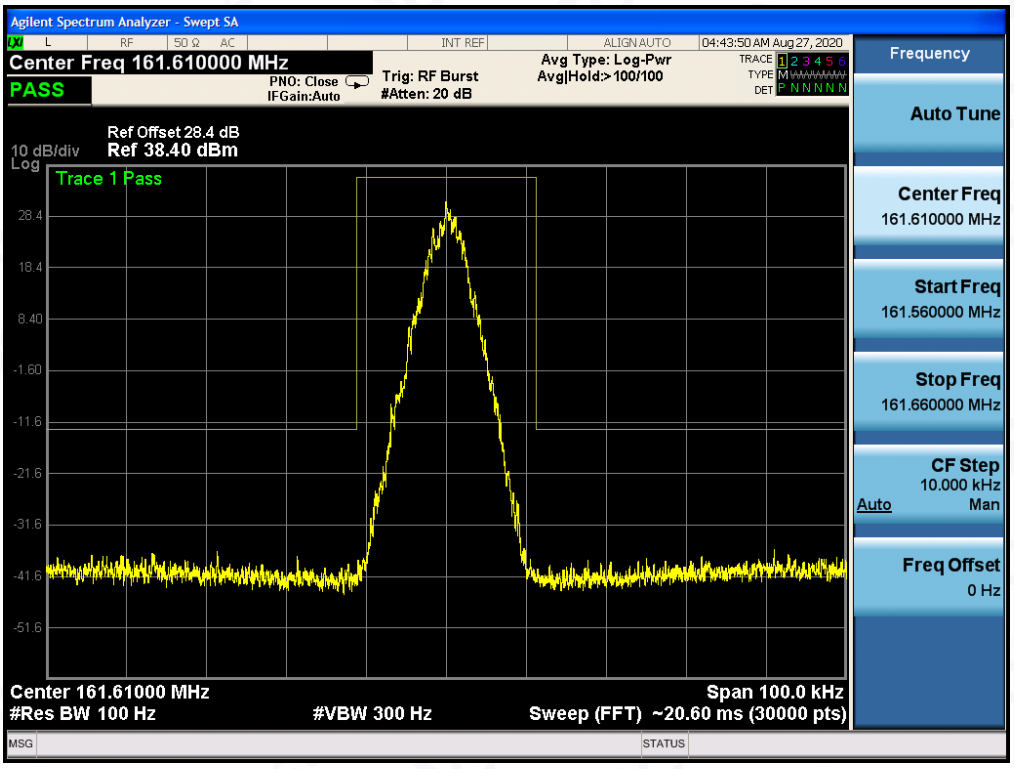
The Worst Emission Mask § 22.359 for (151.85 MHz) of 12.5 KHz channel Separation (5W)



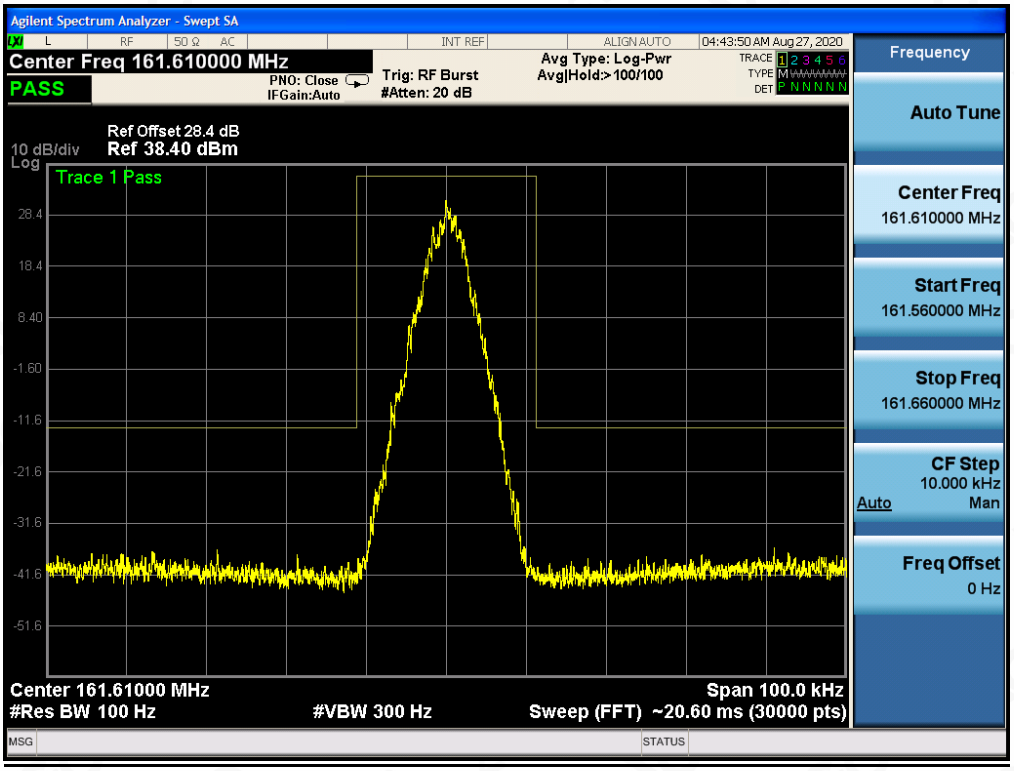
The Worst Emission Mask § 22.359 for (151.85 MHz) of 12.5 KHz channel Separation (1W)



The Worst Emission Mask § 22.359 for (161.61 MHz) of 12.5 KHz channel Separation (5W)

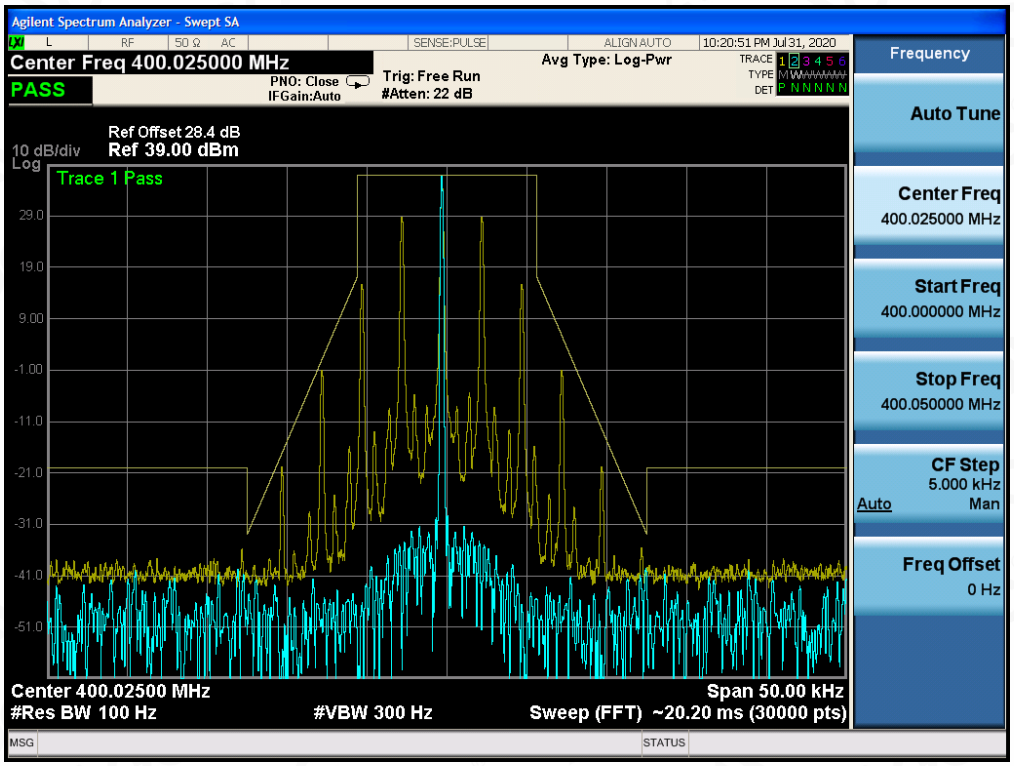


The Worst Emission Mask § 22.359 for (161.61 MHz) of 12.5 KHz channel Separation (1W)

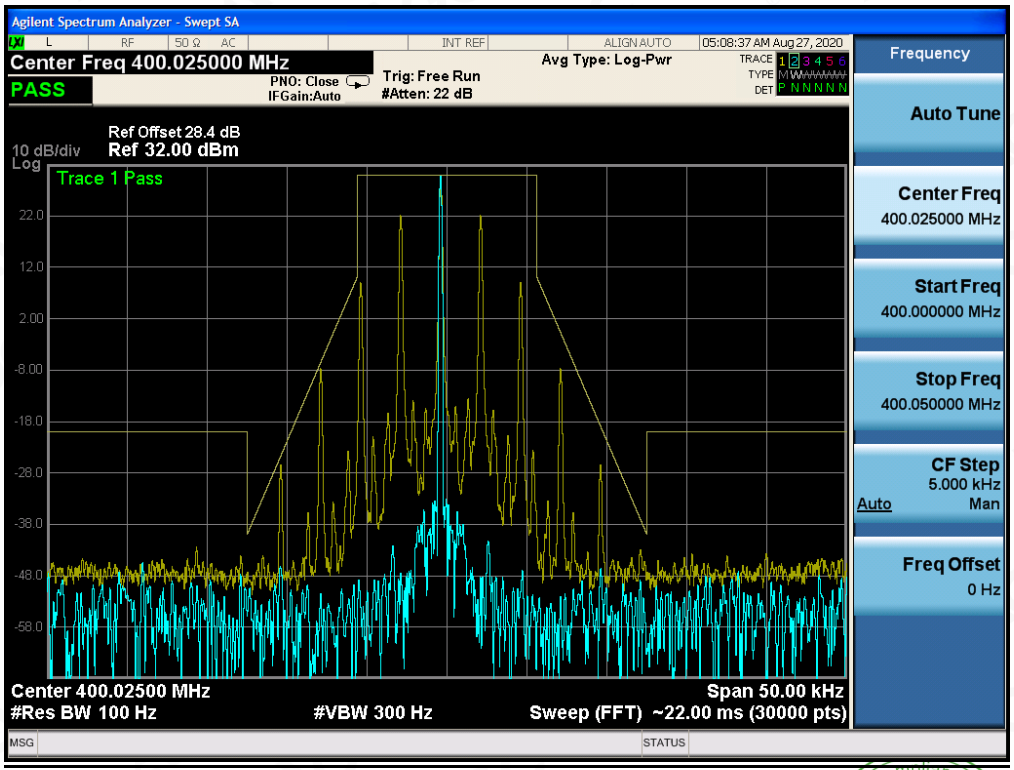


UHF:
Analog:

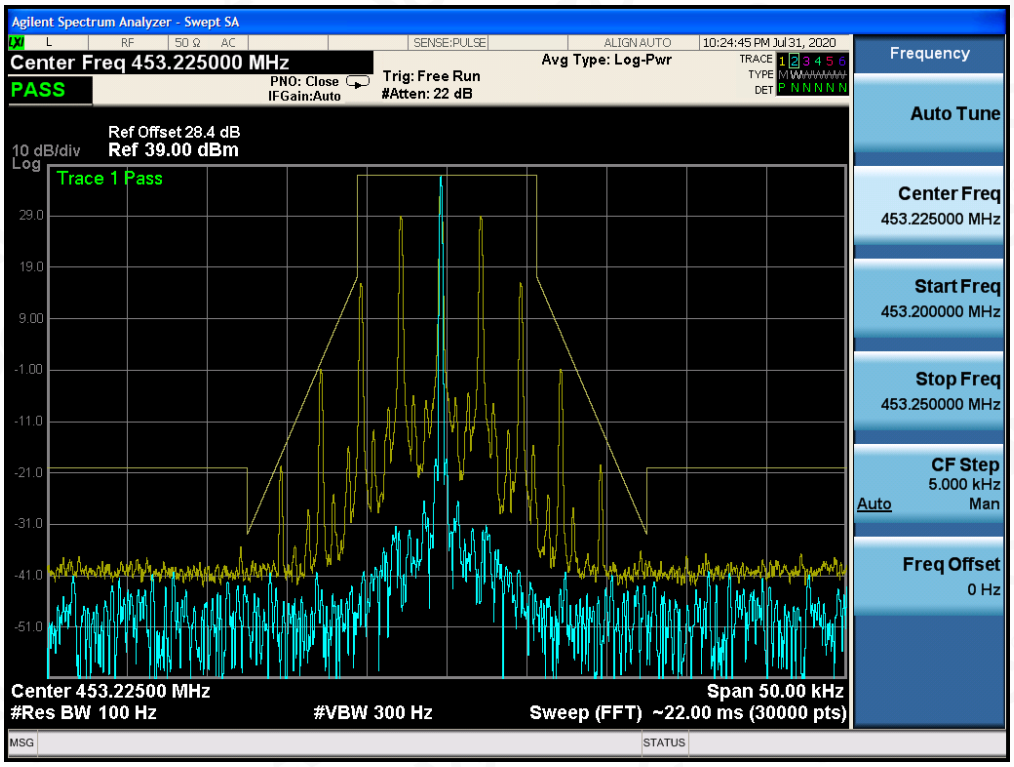
The Worst Emission Mask D for (400.025 MHz) of 12.5 KHz channel Separation (5W)



The Worst Emission Mask D for (400.025 MHz) of 12.5 KHz channel Separation (1W)



The Worst Emission Mask D for (453.225 MHz) of 12.5 KHz channel Separation (5W)



The Worst Emission Mask D for (453.225 MHz) of 12.5 KHz channel Separation (1W)