



Appendix E

RF Test Data for 5.8G WIFI (Conducted Measurement)

Product Name: SmartHub

Test Model: SmartHub v2

Environmental Conditions

Temperature:	23.8° C
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Ling Zhu
Supervised by:	Li Huan





E.1 Min emission bandwidth

Test Result

TestMode	Antenna	Channel	6db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5745	16.280	5736.840	5753.120	0.5	PASS
		5785	16.280	5776.840	5793.120	0.5	PASS
		5825	16.280	5816.840	5833.120	0.5	PASS
11N20SISO	Ant1	5745	17.520	5736.200	5753.720	0.5	PASS
		5785	17.280	5776.200	5793.480	0.5	PASS
		5825	17.320	5816.200	5833.520	0.5	PASS
11N40SISO	Ant1	5755	35.120	5737.400	5772.520	0.5	PASS
		5795	35.120	5777.400	5812.520	0.5	PASS
11AC20SISO	Ant1	5745	17.560	5736.200	5753.760	0.5	PASS
		5785	17.320	5776.200	5793.520	0.5	PASS
		5825	17.560	5816.200	5833.760	0.5	PASS
11AC40SISO	Ant1	5755	35.120	5737.400	5772.520	0.5	PASS
		5795	35.280	5777.240	5812.520	0.5	PASS
11AC80SISO	Ant1	5775	73.920	5737.400	5811.320	0.5	PASS

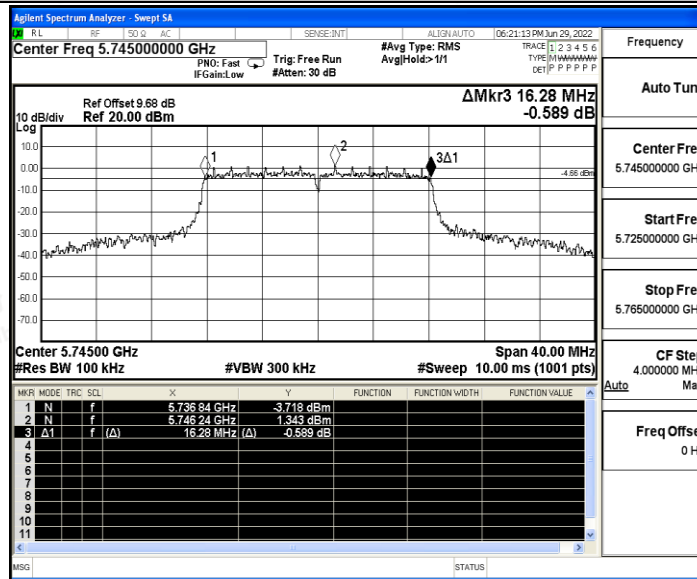


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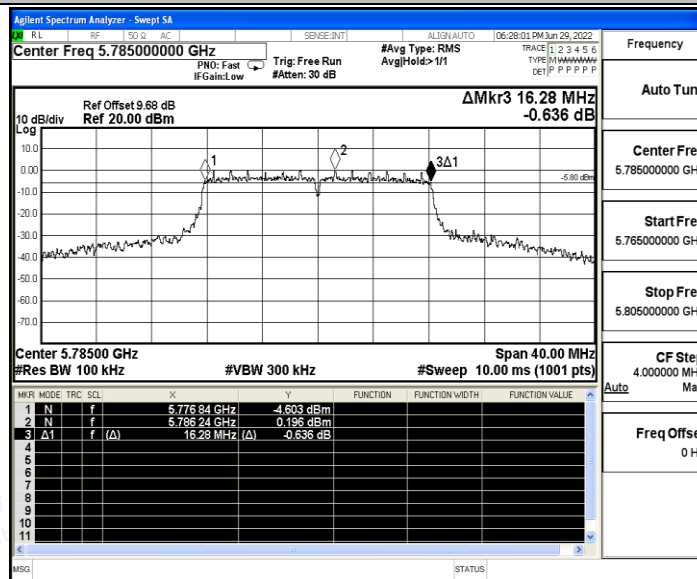


Test Graphs

11A_Ant1_5745

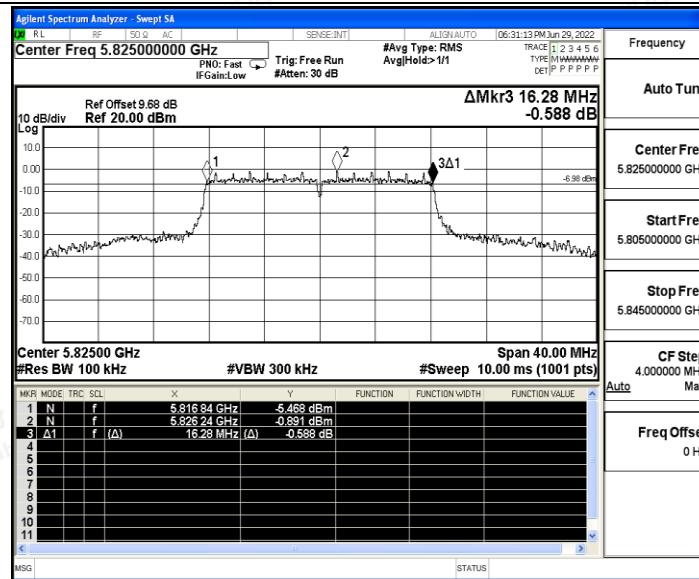


11A_Ant1_5785

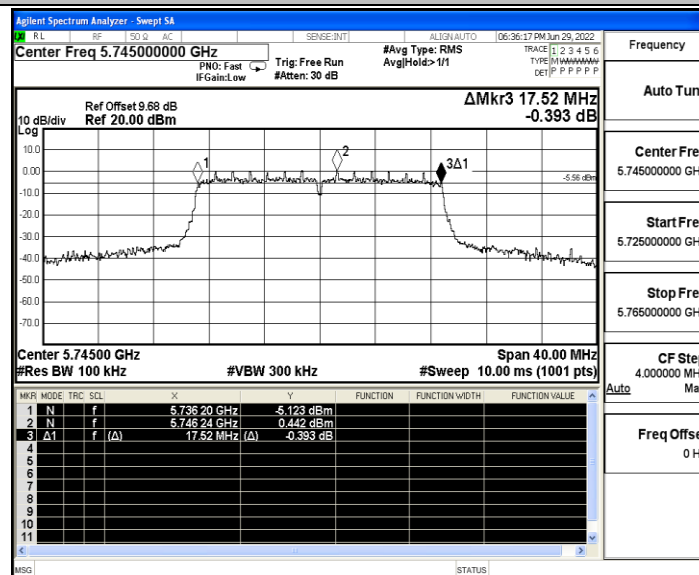


11A_Ant1_5825



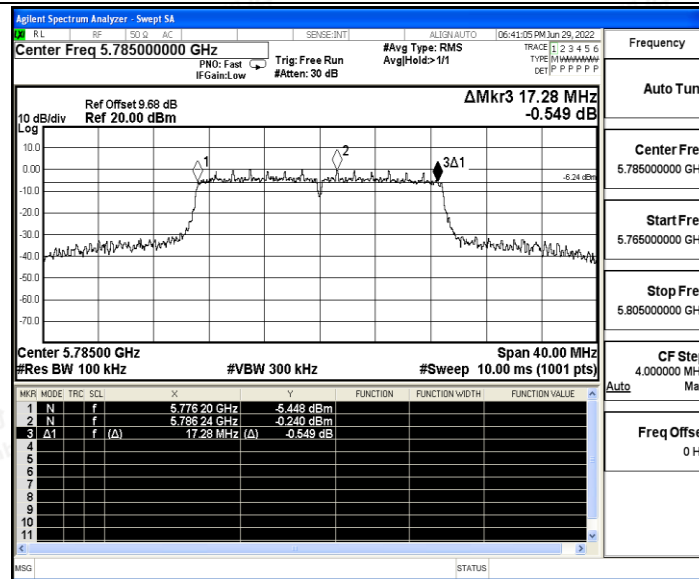


11N20SISO_Ant1_5745

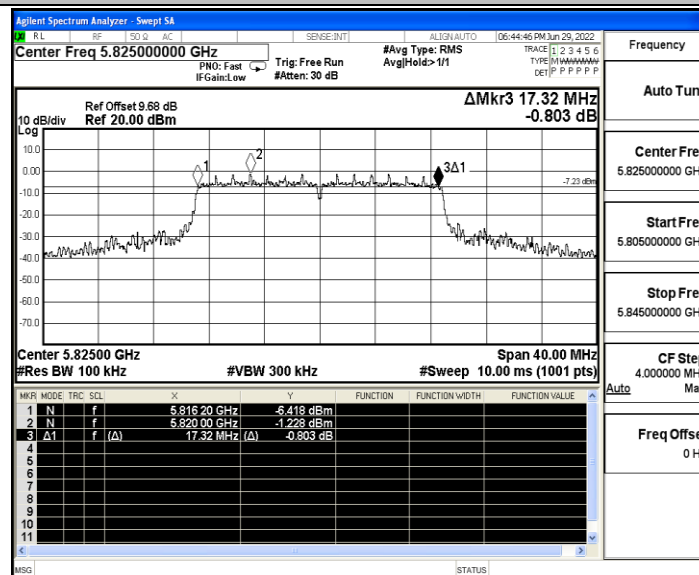


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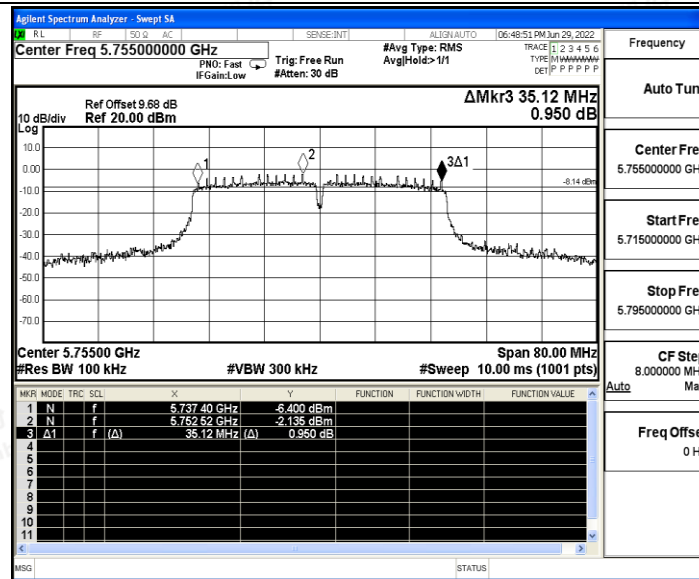


11N20SISO_Ant1_5825

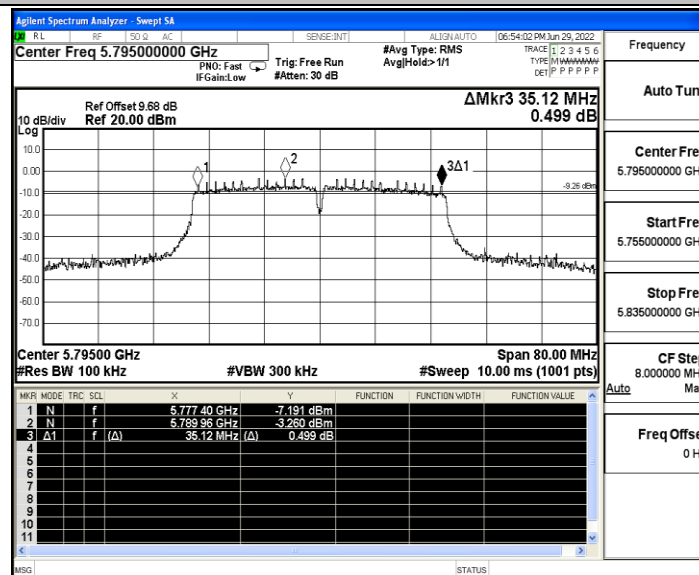


11N40SISO_Ant1_5755



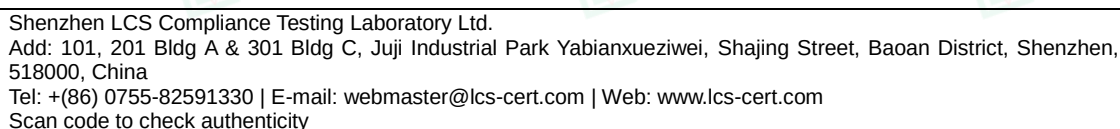
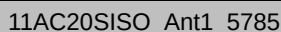


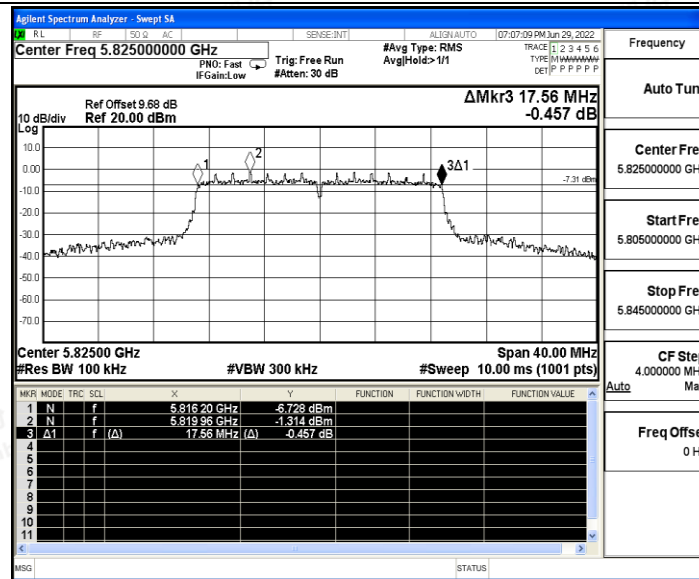
11N40SISO_Ant1_5795



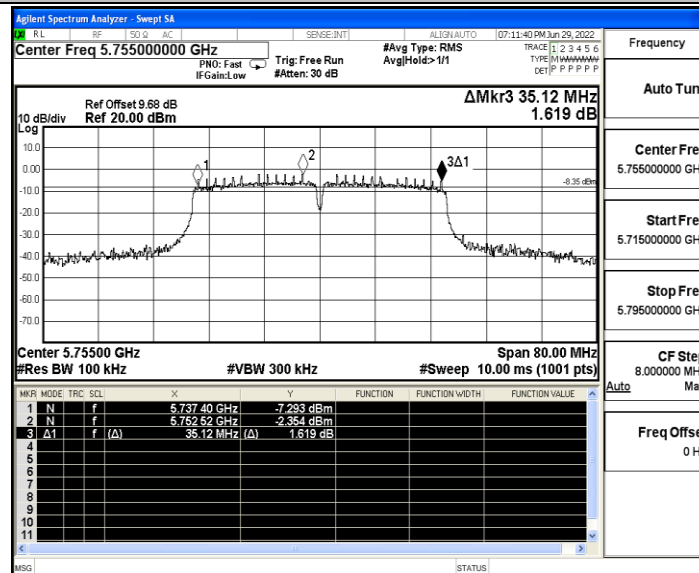
11AC20SISO_Ant1_5745





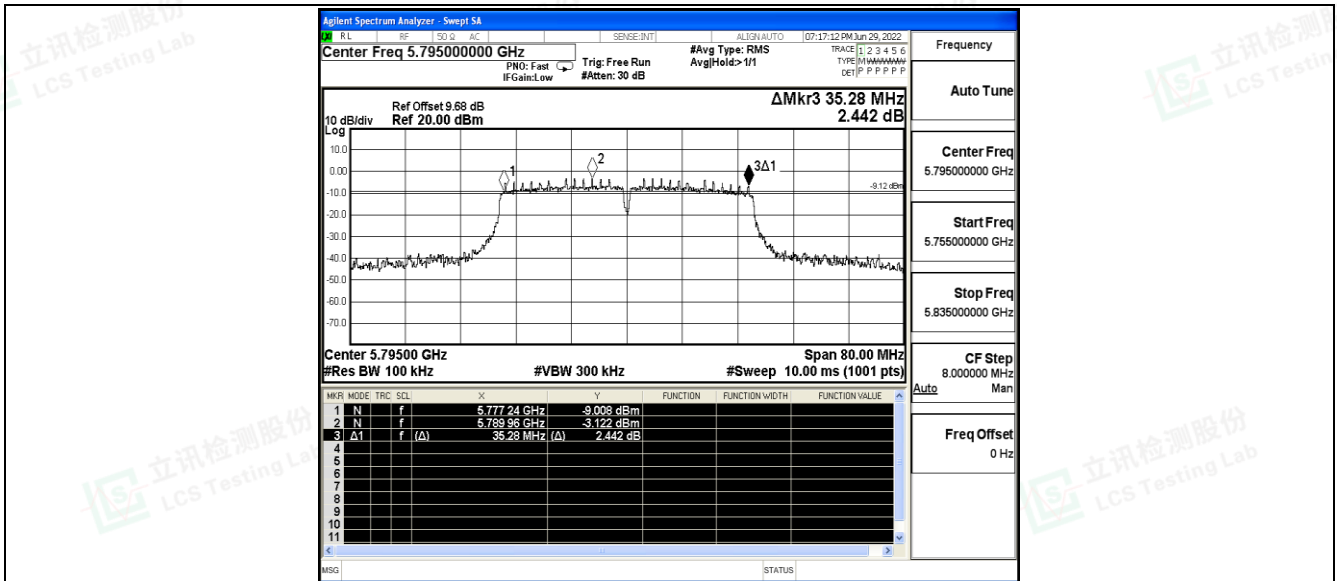


11AC40SISO_Ant1_5755

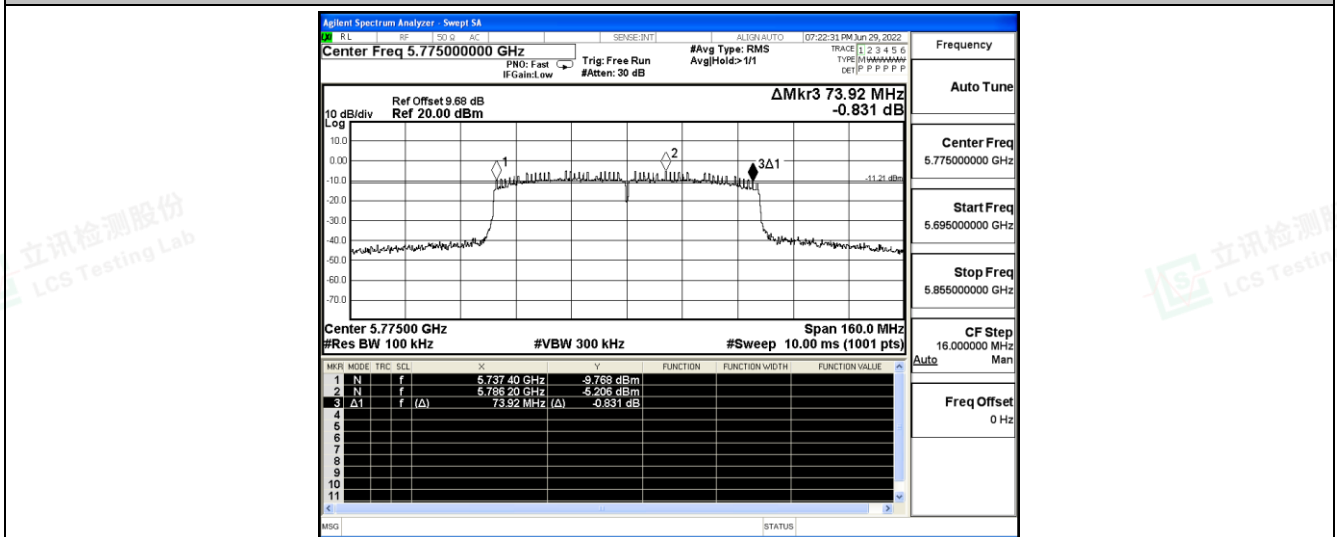


11AC40SISO_Ant1_5795





11AC80SISO_Ant1_5775





E.2 Maximum conducted output power

Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11A	Ant1	5745	11.77	≤30.00	PASS
		5785	11.93	≤30.00	PASS
		5825	10.93	≤30.00	PASS
11N20SISO	Ant1	5745	11.89	≤30.00	PASS
		5785	11.62	≤30.00	PASS
		5825	10.81	≤30.00	PASS
11N40SISO	Ant1	5755	12.21	≤30.00	PASS
		5795	11.22	≤30.00	PASS
11AC20SISO	Ant1	5745	11.84	≤30.00	PASS
		5785	11.50	≤30.00	PASS
		5825	10.82	≤30.00	PASS
11AC40SISO	Ant1	5755	12.00	≤30.00	PASS
		5795	10.90	≤30.00	PASS
11AC80SISO	Ant1	5775	11.73	≤30.00	PASS

Note: The Duty Cycle Factor is compensated in the graph.



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E.3 Maximum power spectral density

Test Result

TestMode	Antenna	Channel	Result [dBm/MHz]	Limit[dBm/MHz]	Verdict
11A	Ant1	5745	-1.86	≤30.00	PASS
		5785	-3.14	≤30.00	PASS
		5825	-4.32	≤30.00	PASS
11N20SISO	Ant1	5745	-3.26	≤30.00	PASS
		5785	-3.45	≤30.00	PASS
		5825	-4.82	≤30.00	PASS
11N40SISO	Ant1	5755	-5.31	≤30.00	PASS
		5795	-6.54	≤30.00	PASS
11AC20SISO	Ant1	5745	-3.28	≤30.00	PASS
		5785	-3.86	≤30.00	PASS
		5825	-4.84	≤30.00	PASS
11AC40SISO	Ant1	5755	-5.45	≤30.00	PASS
		5795	-6.91	≤30.00	PASS
11AC80SISO	Ant1	5775	-8.49	≤30.00	PASS

Note: 1.The Result and Limit Unit is dBm/500 kHz in the band 5.725–5.85 GHz.

2.The Duty Cycle Factor and RBW Factor is compensated in the graph.

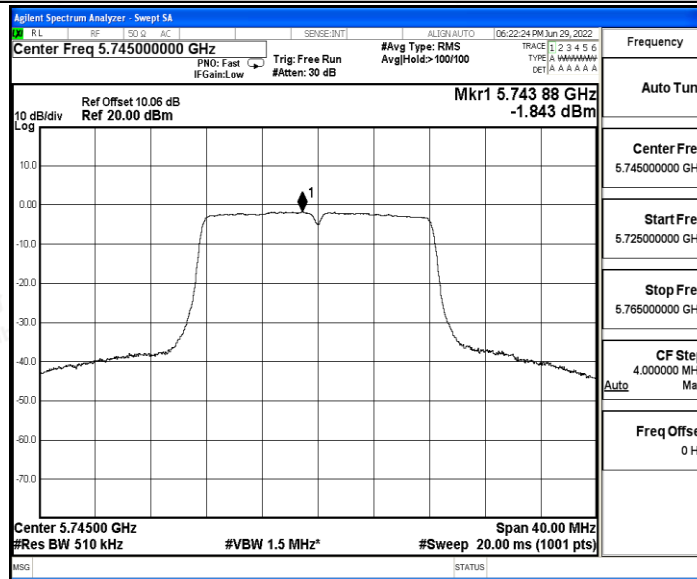


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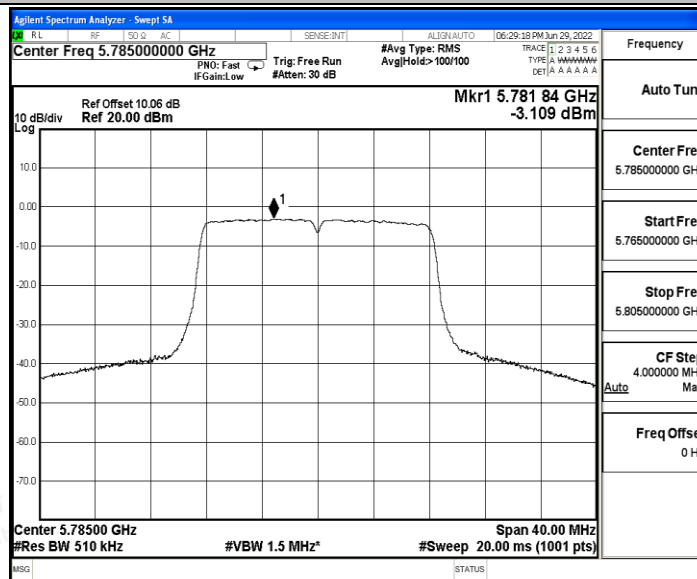


Test Graphs

11A_Ant1_5745

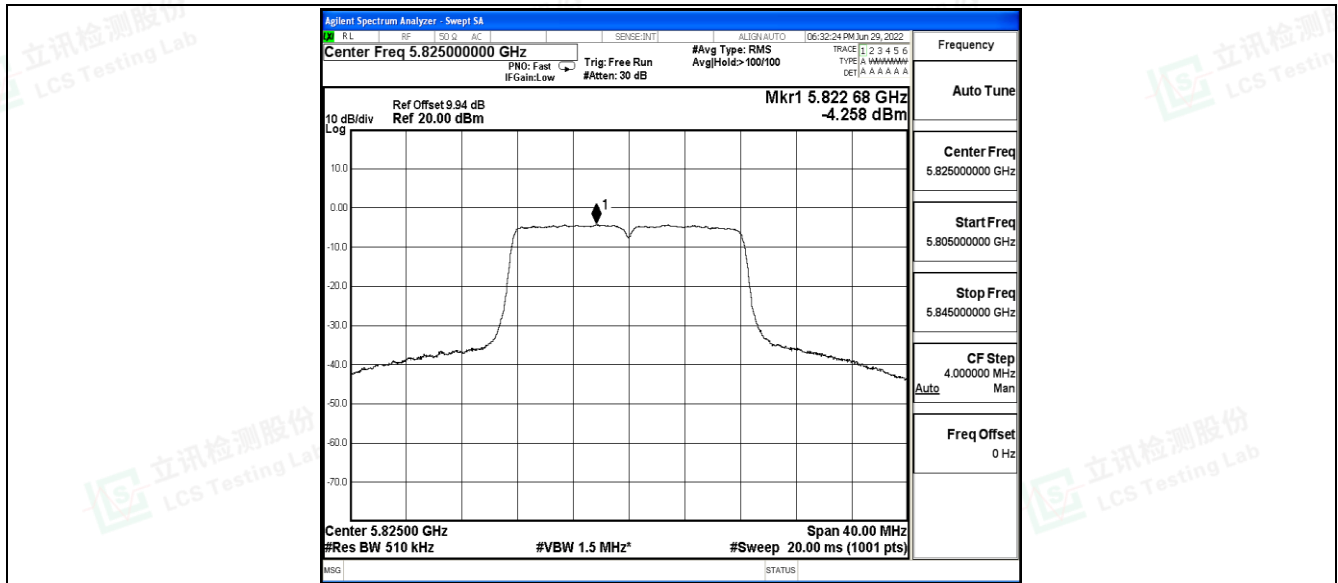


11A_Ant1_5785

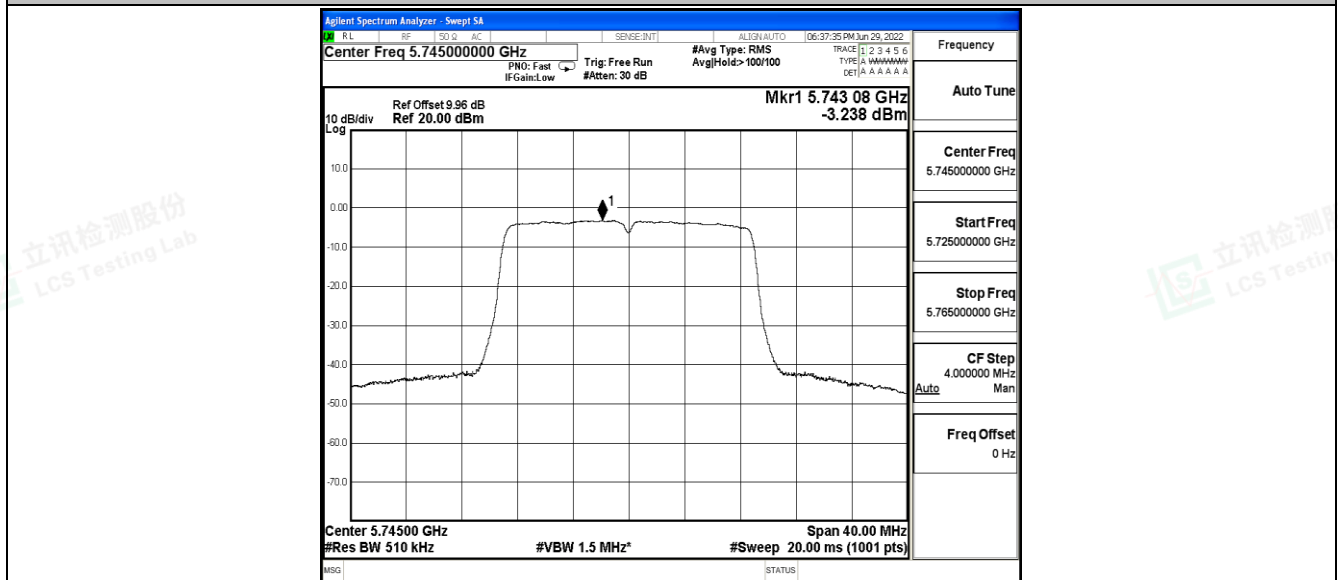


11A_Ant1_5825



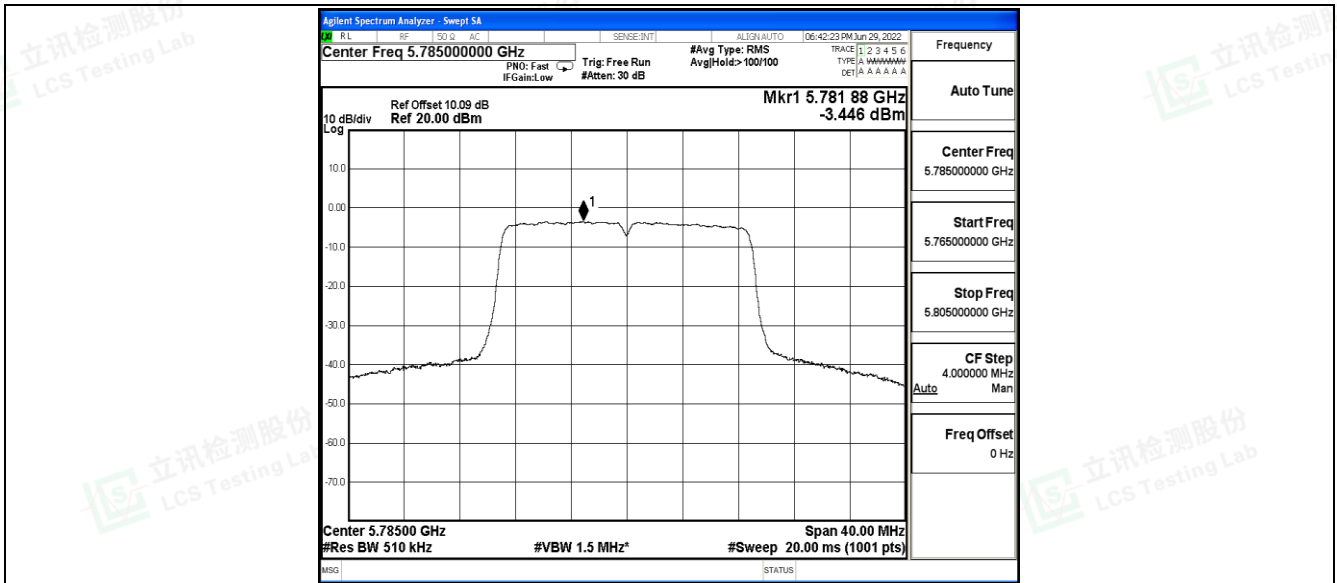


11N20SISO_Ant1_5745

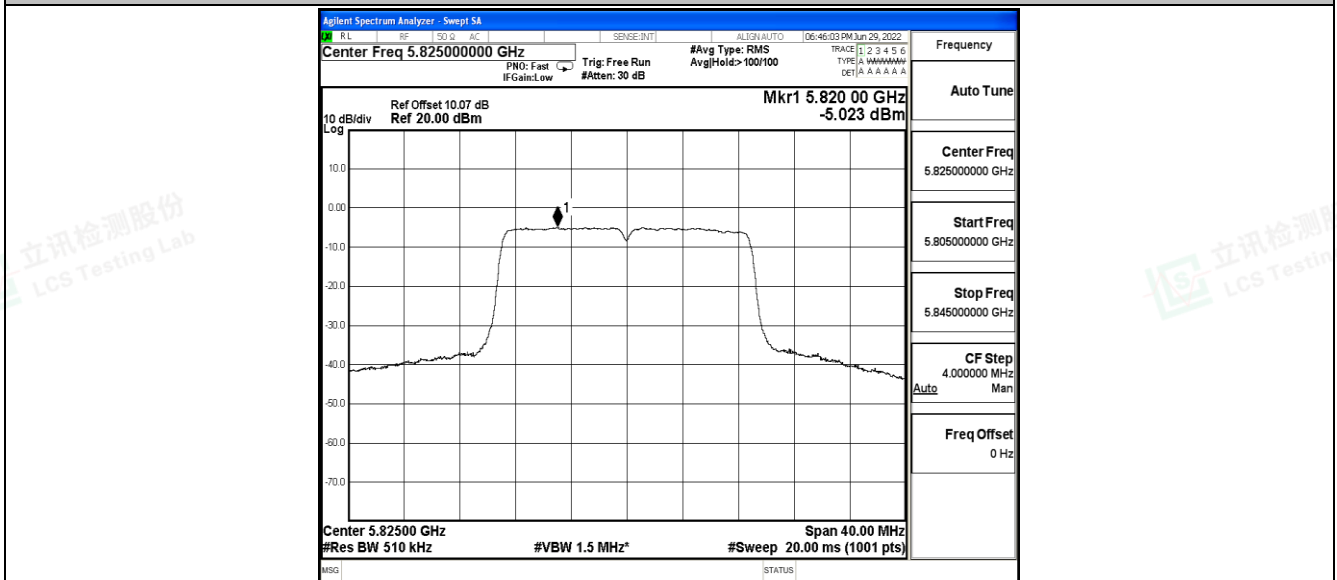


11N20SISO_Ant1_5785



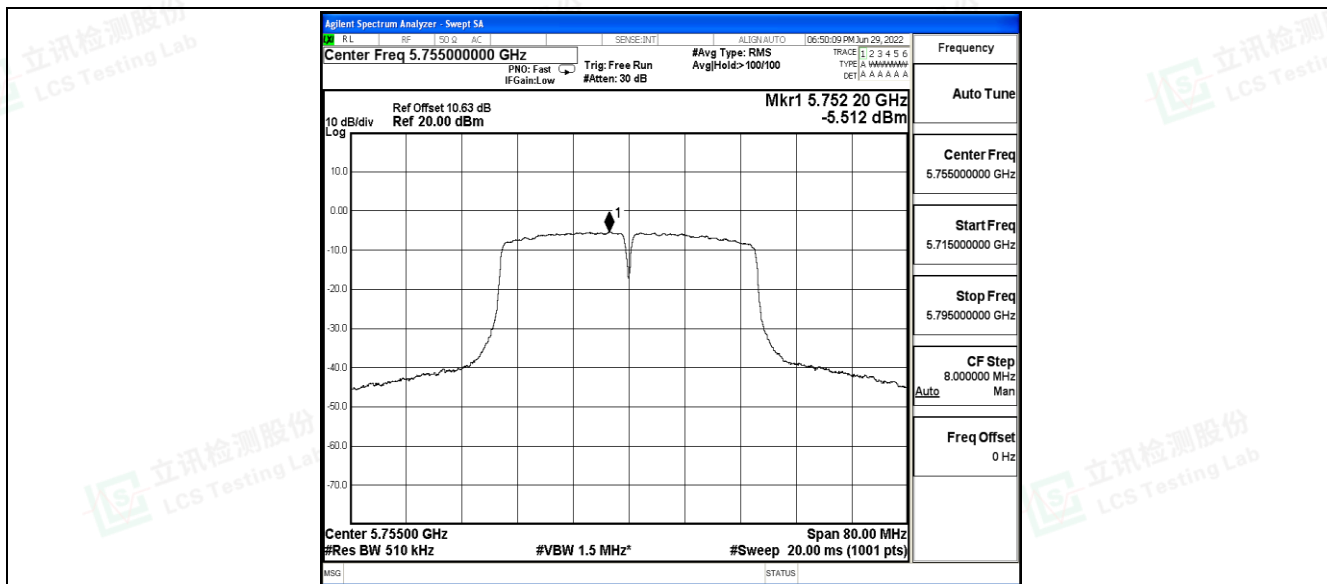


11N20SISO_Ant1_5825

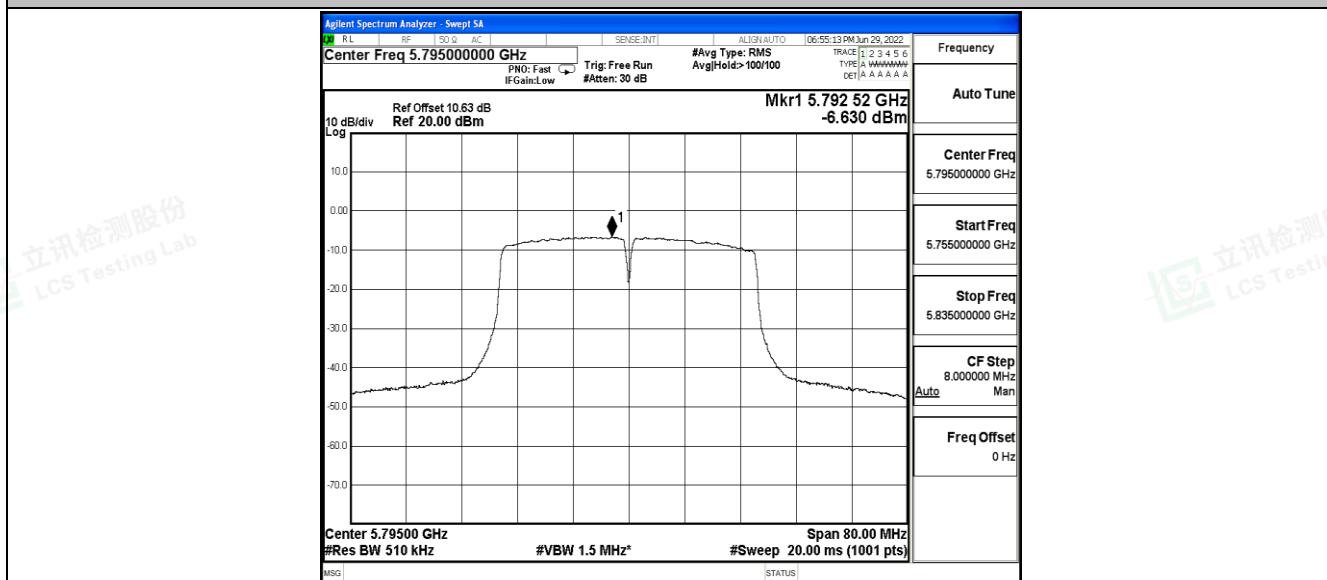


11N40SISO_Ant1_5755



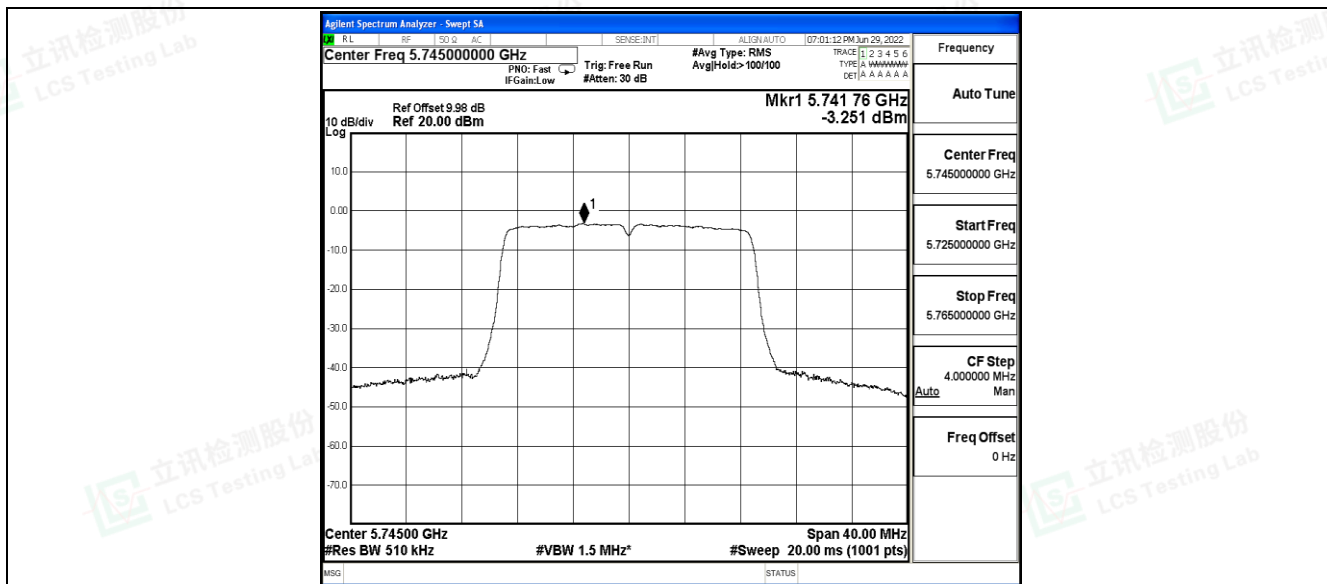


11N40SISO_Ant1_5795

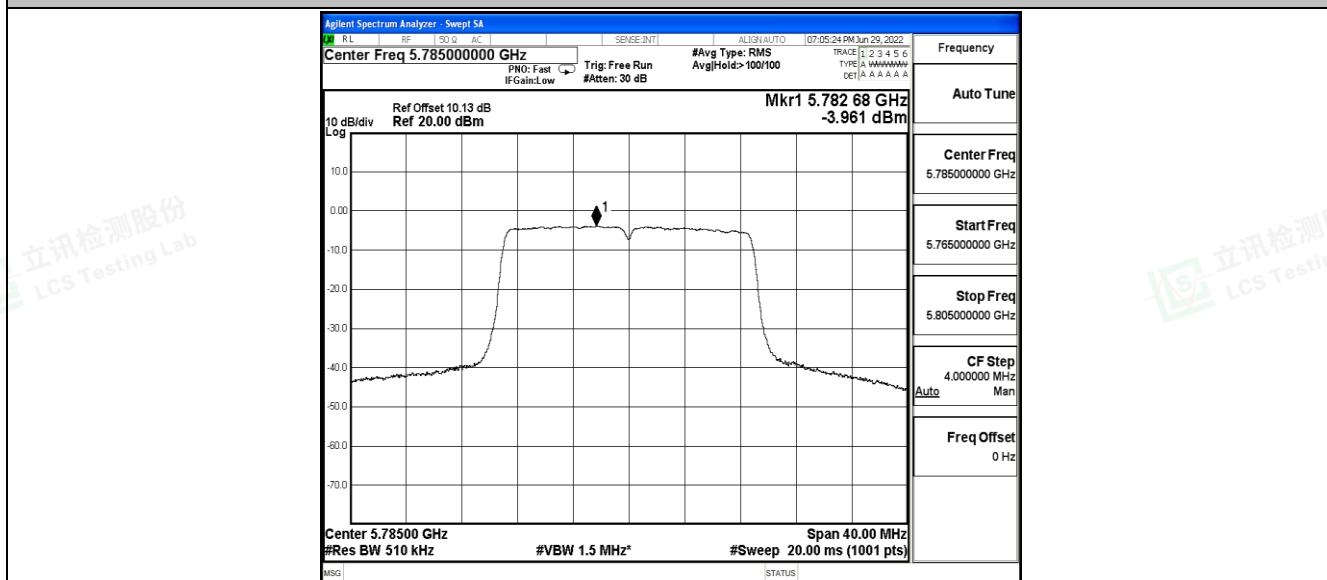


11AC20SISO_Ant1_5745



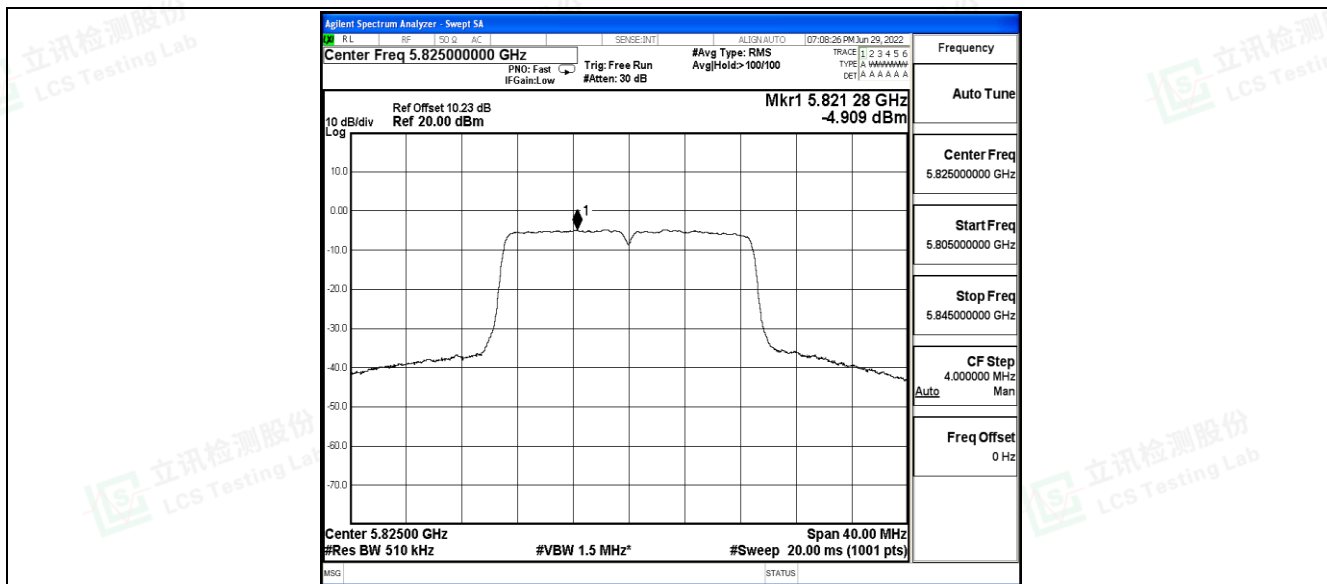


11AC20SISO_Ant1_5785

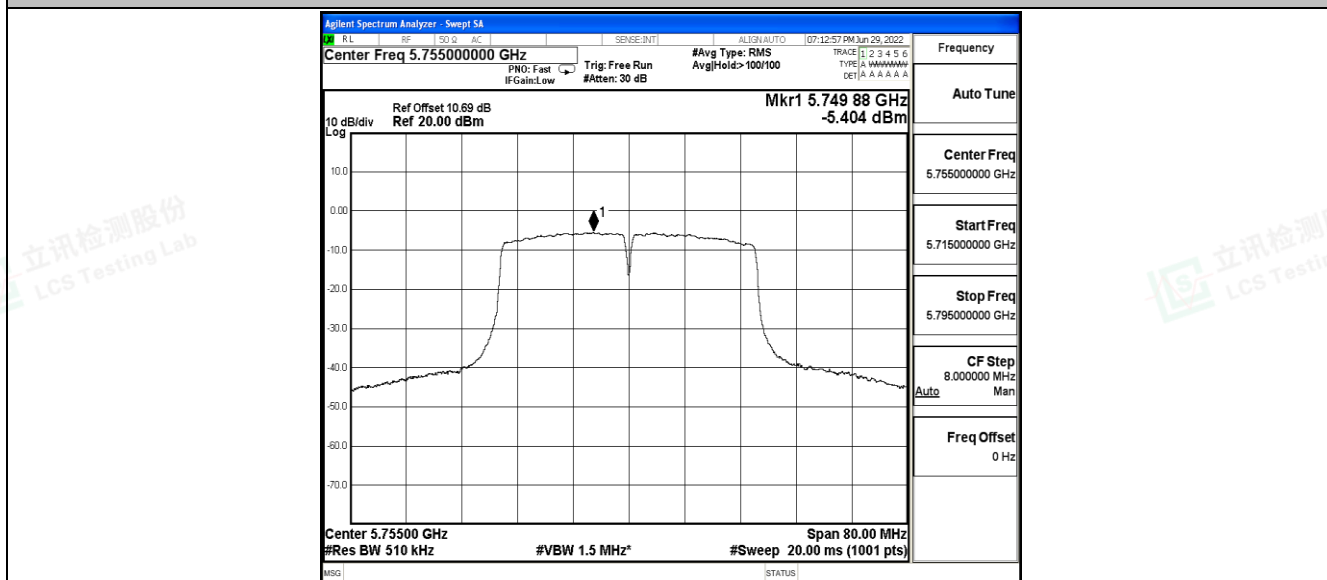


11AC20SISO_Ant1_5825



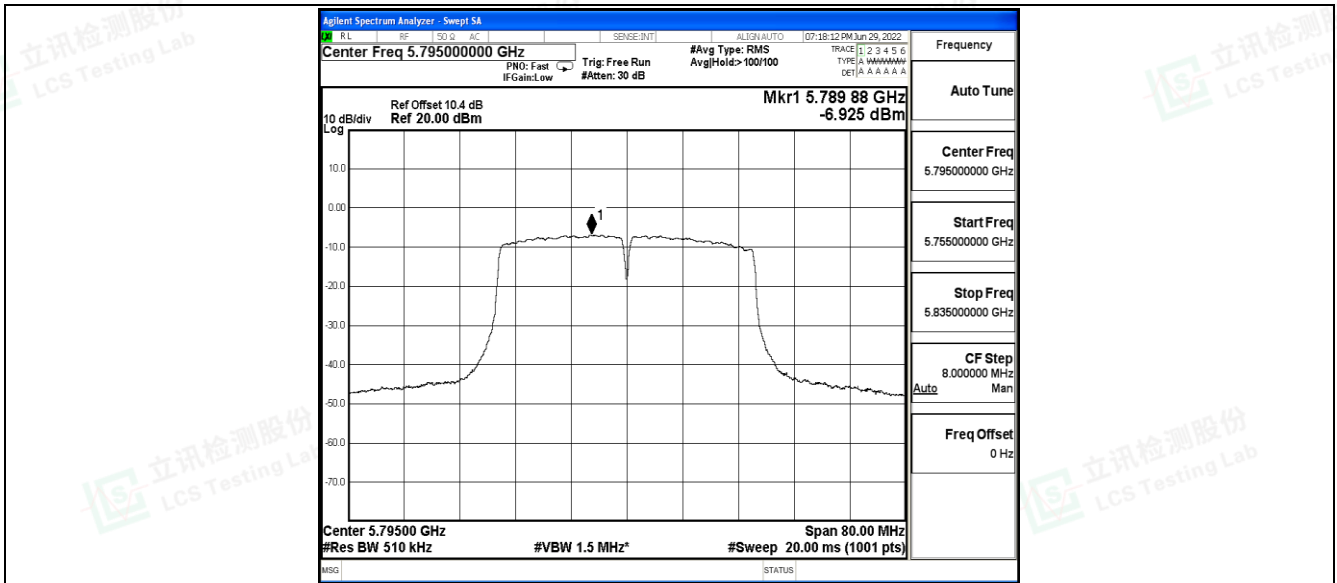


11AC40SISO_Ant1_5755

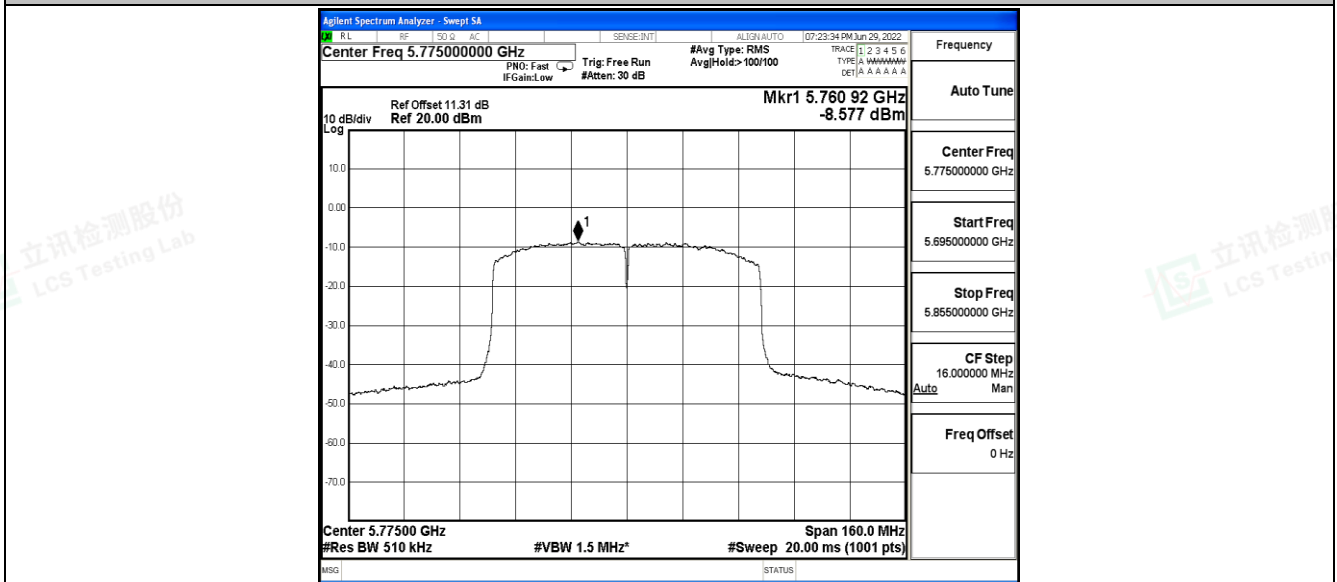


11AC40SISO_Ant1_5795





11AC80SISO_Ant1_5775





E.4 Emissions in Restricted Bands

Test Result

TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
11A	Ant1	Low	5745	Peak	5650.000	-38.751	≤-27.00	---	---	PASS
				Peak	5700.000	-37.86	≤10.00	---	---	PASS
				Peak	5720.000	-31.74	≤15.60	---	---	PASS
				Peak	5725.000	-28.22	≤27.00	---	---	PASS
		High	5825	Peak	5850.000	-36.772	≤15.60	---	---	PASS
				Peak	5855.000	-36.56	≤27.00	---	---	PASS
				Peak	5875.000	-37.71	≤15.60	---	---	PASS
				Peak	5925.000	-38.08	≤10.00	---	---	PASS
11N20SIS O	Ant1	Low	5745	Peak	5650.000	-38.156	≤-27.00	---	---	PASS
				Peak	5700.000	-38.56	≤10.00	---	---	PASS
				Peak	5720.000	-29.96	≤15.60	---	---	PASS
				Peak	5725.000	-27.32	≤27.00	---	---	PASS
		High	5825	Peak	5850.000	-33.706	≤15.60	---	---	PASS
				Peak	5855.000	-36.2	≤27.00	---	---	PASS
				Peak	5875.000	-37.32	≤15.60	---	---	PASS
				Peak	5925.000	-38.57	≤10.00	---	---	PASS
11N40SIS O	Ant1	Low	5755	Peak	5650.000	-38.605	≤-27.00	---	---	PASS
				Peak	5700.000	-38.61	≤10.00	---	---	PASS
				Peak	5720.000	-30.36	≤15.60	---	---	PASS
				Peak	5725.000	-29.89	≤27.00	---	---	PASS
		High	5795	Peak	5850.000	-37.624	≤15.60	---	---	PASS
				Peak	5855.000	-39.16	≤27.00	---	---	PASS
				Peak	5875.000	-37.97	≤15.60	---	---	PASS
				Peak	5925.000	-38.01	≤10.00	---	---	PASS
11AC20SI SO	Ant1	Low	5745	Peak	5650.000	-37.951	≤-27.00	---	---	PASS
				Peak	5700.000	-38.05	≤10.00	---	---	PASS
				Peak	5720.000	-34.51	≤15.60	---	---	PASS
				Peak	5725.000	-26.07	≤27.00	---	---	PASS
		High	5825	Peak	5850.000	-36.207	≤15.60	---	---	PASS
				Peak	5855.000	-37.19	≤27.00	---	---	PASS
				Peak	5875.000	-36.92	≤15.60	---	---	PASS
				Peak	5925.000	-38.32	≤10.00	---	---	PASS
11AC40SI SO	Ant1	Low	5755	Peak	5650.000	-36.545	≤-27.00	---	---	PASS
				Peak	5700.000	-37.01	≤10.00	---	---	PASS
				Peak	5720.000	-29.19	≤15.60	---	---	PASS



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		High	5795	Peak	5725.000	-30.21	≤27.00	---	---	PASS
				Peak	5850.000	-36.99	≤15.60	---	---	PASS
				Peak	5855.000	-37.37	≤27.00	---	---	PASS
				Peak	5875.000	-38.16	≤15.60	---	---	PASS
				Peak	5925.000	-37.31	≤10.00	---	---	PASS
11AC80SI SO	Ant1	Low	5775	Peak	5650.000	-36.988	≤-27.00	---	---	PASS
				Peak	5700.000	-37.16	≤10.00	---	---	PASS
				Peak	5720.000	-35.79	≤15.60	---	---	PASS
				Peak	5725.000	-35.34	≤27.00	---	---	PASS
		High	5775	Peak	5850.000	-37.654	≤15.60	---	---	PASS
				Peak	5855.000	-37.92	≤27.00	---	---	PASS
				Peak	5875.000	-37.87	≤15.60	---	---	PASS
				Peak	5925.000	-38.38	≤10.00	---	---	PASS

Note:

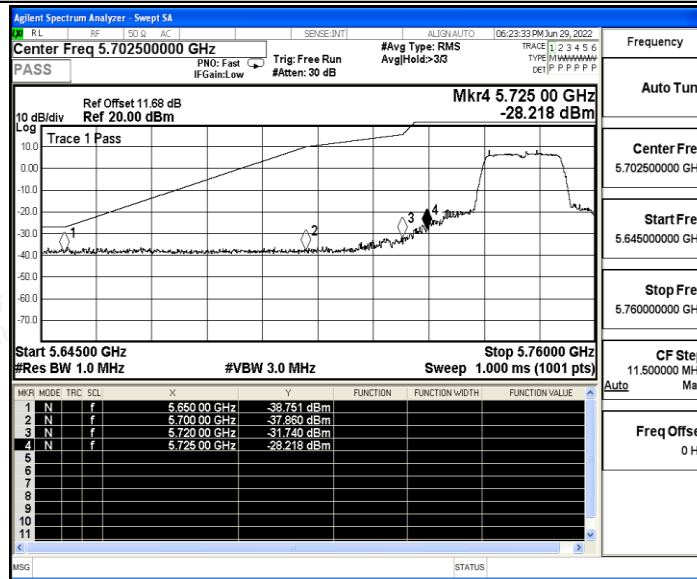
1. The Antenna Gain is compensated in the graph.
2. For transmitters operating in 5150-5350 GHz band and 5470-5725 GHz band: The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.



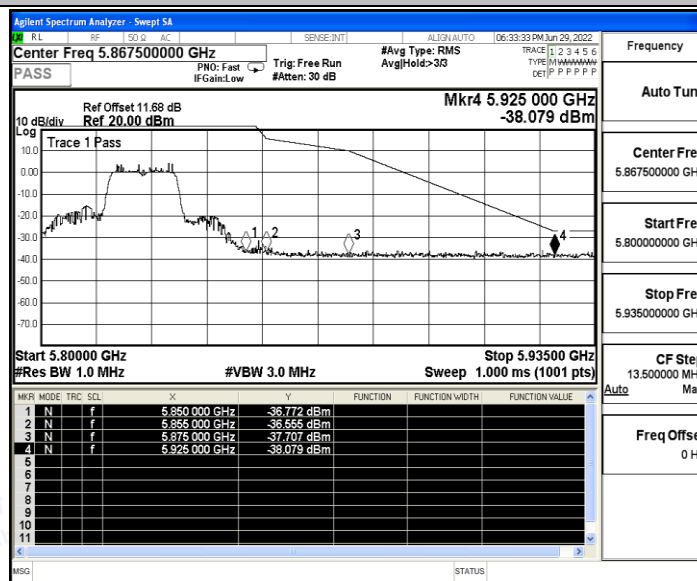


Test Graphs

11A_Ant1_Low_5745_Peak

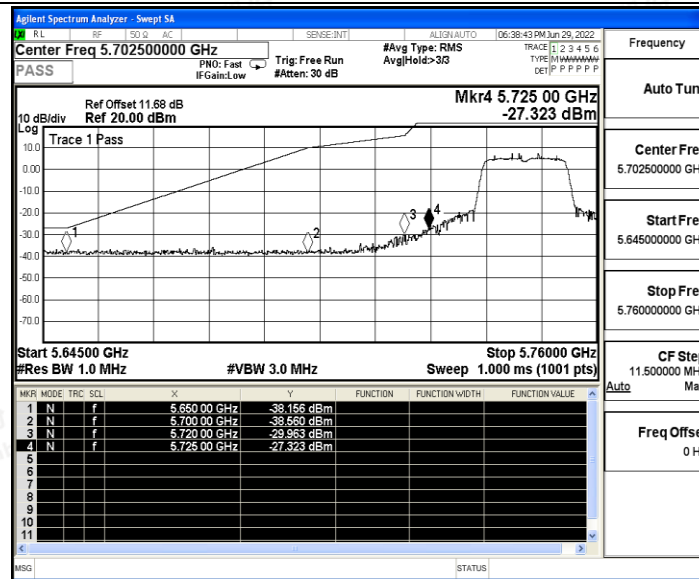


11A_Ant1_High_5825_Peak

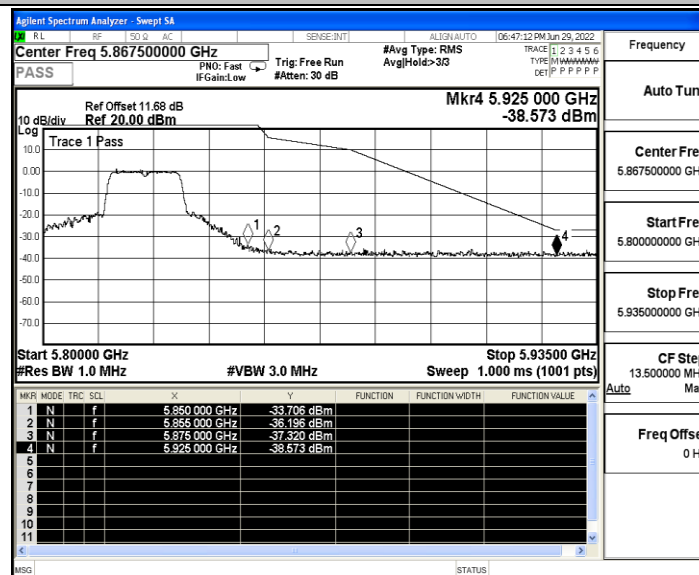


11N20SISO_Ant1_Low_5745_Peak



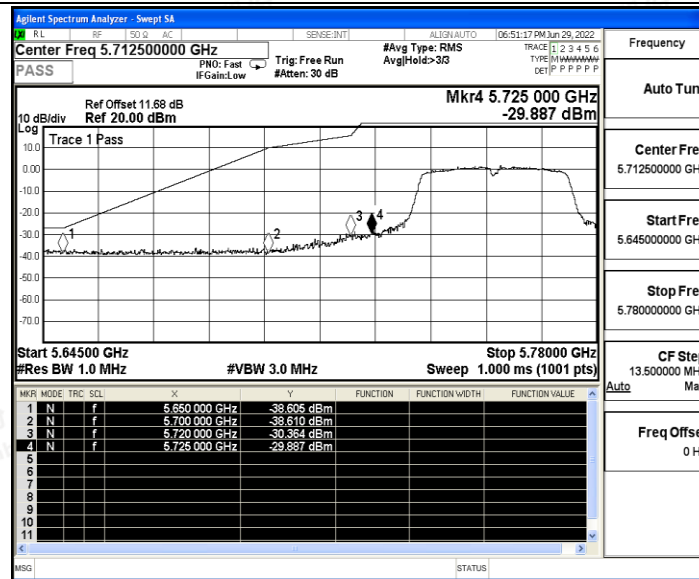


11N20SISO_Ant1_High_5825_Peak

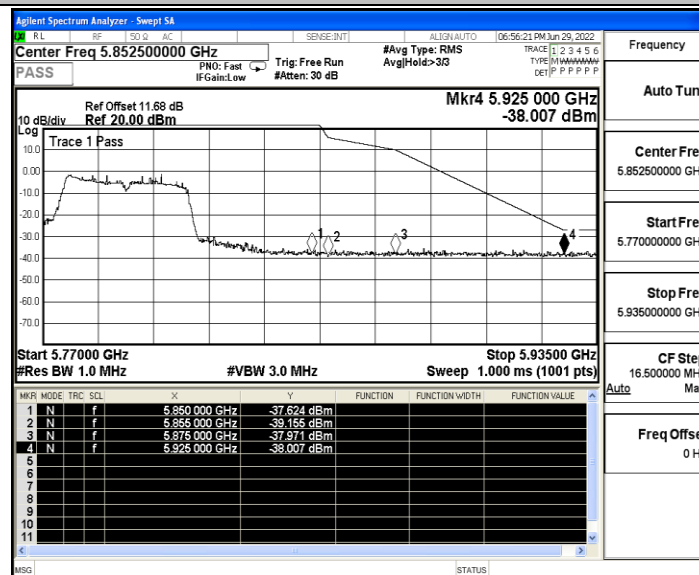


11N40SISO_Ant1_Low_5755_Peak



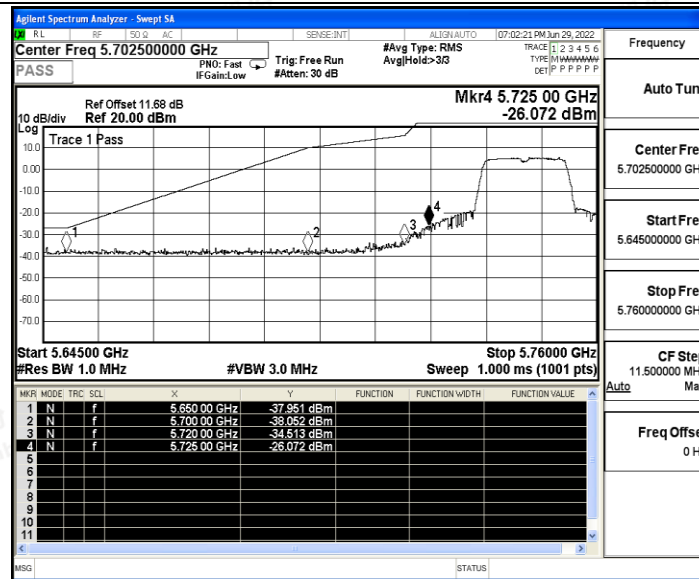


11N40SISO_Ant1_High_5795_Peak

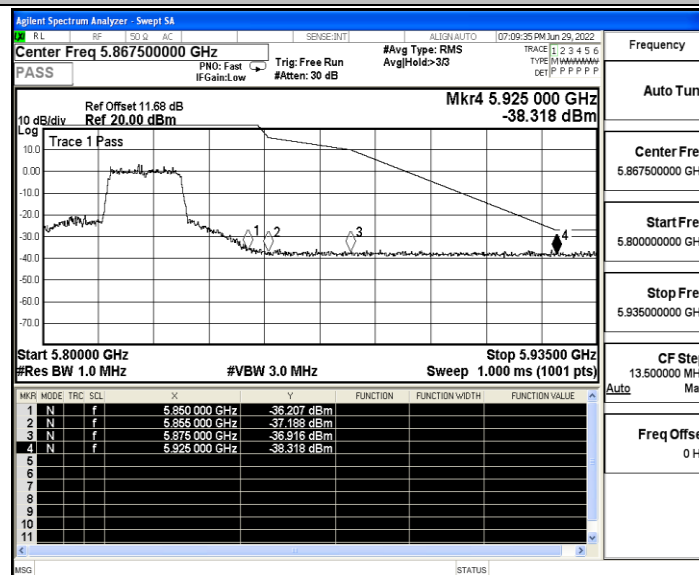


11AC20SISO_Ant1_Low_5745_Peak



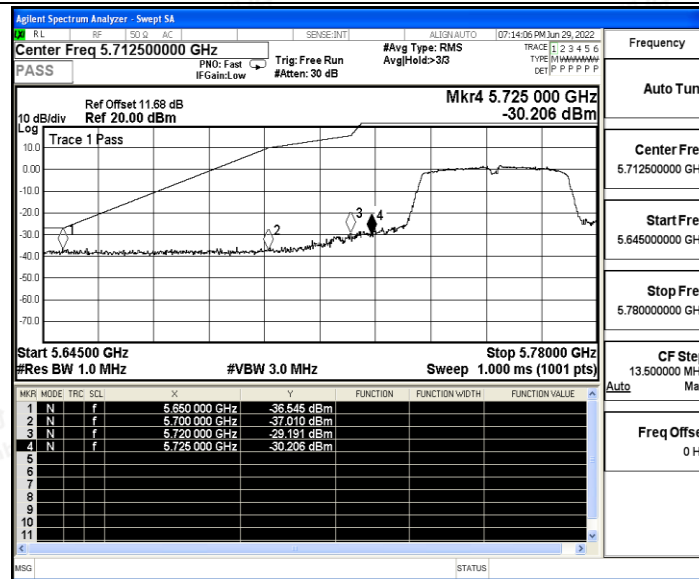


11AC20SISO_Ant1_High_5825_Peak

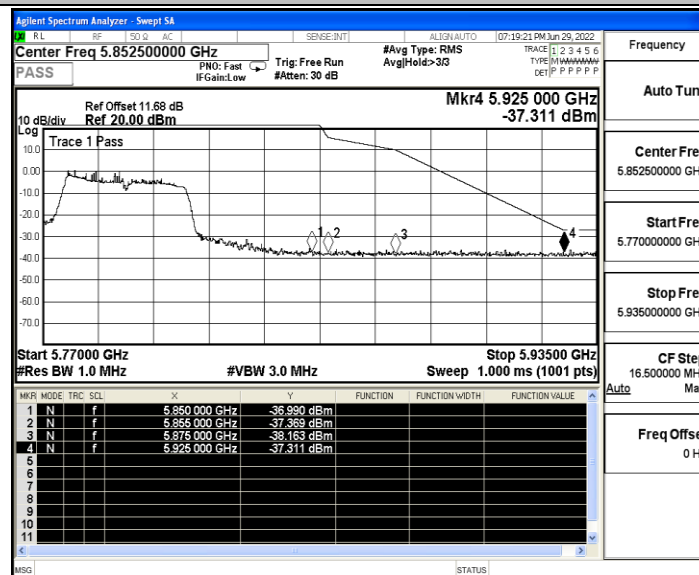


11AC40SISO_Ant1_Low_5755_Peak



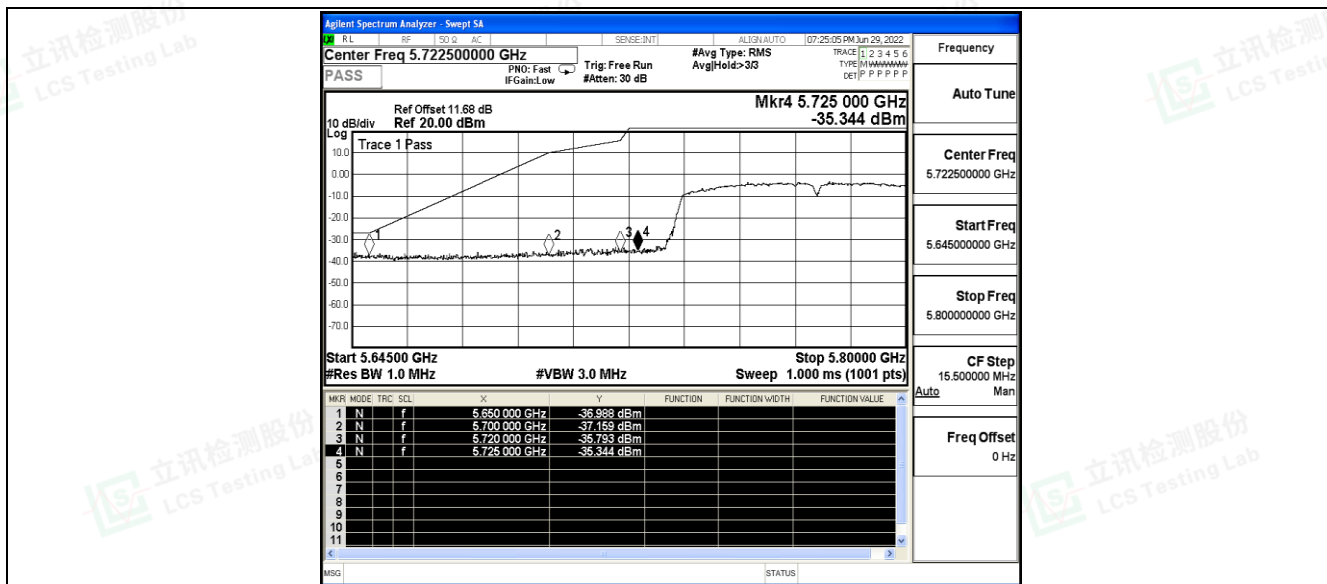


11AC40SISO_Ant1_High_5795_Peak

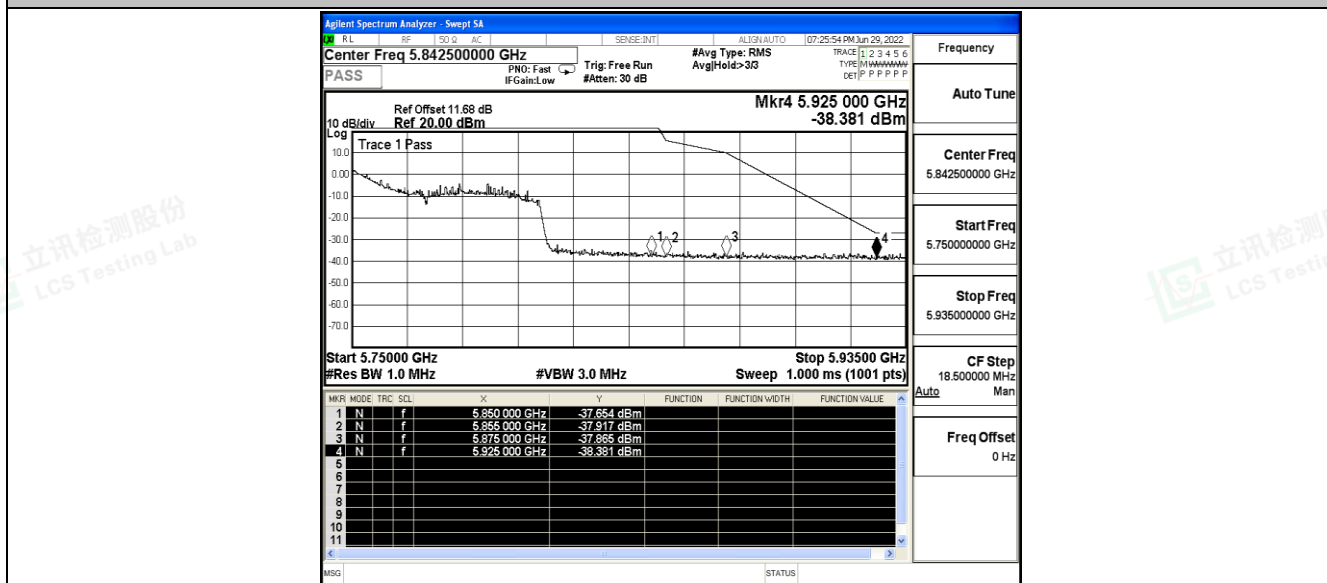


11AC80SISO_Ant1_Low_5775_Peak





11AC80SISO_Ant1_High_5775_Peak



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E.5 Frequency Stability

Test Result

Voltage								
TestMode	Antenna	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
11AC20SIS O	Ant1	5745	NV	NT	-16000	-2.78503	20	PASS
			LV	NT	-17000	-2.959095	20	PASS
			HV	NT	-18000	-3.133159	20	PASS
		5785	NV	NT	-19000	-3.284356	20	PASS
			LV	NT	-20000	-3.457217	20	PASS
			HV	NT	-20000	-3.457217	20	PASS
		5825	NV	NT	-22000	-3.776824	20	PASS
			LV	NT	-22000	-3.776824	20	PASS
			HV	NT	-23000	-3.948498	20	PASS
11AC40SIS O	Ant1	5755	NV	NT	-20000	-3.475239	20	PASS
			LV	NT	-22000	-3.822763	20	PASS
			HV	NT	-23000	-3.996525	20	PASS
		5795	NV	NT	-24000	-4.141501	20	PASS
			LV	NT	-25000	-4.314064	20	PASS
			HV	NT	-25000	-4.314064	20	PASS
11AC80SIS O	Ant1	5775	NV	NT	-24000	-4.155844	20	PASS
			LV	NT	-25000	-4.329004	20	PASS
			HV	NT	-25000	-4.329004	20	PASS

Temperature								
TestMode	Antenna	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
11AC20SIS O	Ant1	5745	NV	-30	-17000	-2.959095	20	PASS
			NV	-20	-18000	-3.133159	20	PASS
			NV	-10	-18000	-3.133159	20	PASS
			NV	0	-19000	-3.307224	20	PASS
			NV	10	-19000	-3.307224	20	PASS
			NV	20	-19000	-3.307224	20	PASS
			NV	30	-19000	-3.307224	20	PASS
			NV	40	-20000	-3.481288	20	PASS
			NV	50	-19000	-3.307224	20	PASS
		5785	NV	-30	-20000	-3.457217	20	PASS
			NV	-20	-21000	-3.630078	20	PASS
			NV	-10	-21000	-3.630078	20	PASS





			NV	0	-22000	-3.802939	20	PASS
			NV	10	-21000	-3.630078	20	PASS
			NV	20	-21000	-3.630078	20	PASS
			NV	30	-22000	-3.802939	20	PASS
			NV	40	-22000	-3.802939	20	PASS
			NV	50	-22000	-3.802939	20	PASS
		5825	NV	-30	-23000	-3.948498	20	PASS
			NV	-20	-23000	-3.948498	20	PASS
			NV	-10	-23000	-3.948498	20	PASS
			NV	0	-23000	-3.948498	20	PASS
			NV	10	-23000	-3.948498	20	PASS
			NV	20	-24000	-4.120172	20	PASS
			NV	30	-24000	-4.120172	20	PASS
			NV	40	-24000	-4.120172	20	PASS
			NV	50	-24000	-4.120172	20	PASS
11AC40SIS O	Ant1	5755	NV	-30	-23000	-3.996525	20	PASS
			NV	-20	-23000	-3.996525	20	PASS
			NV	-10	-24000	-4.170287	20	PASS
			NV	0	-24000	-4.170287	20	PASS
			NV	10	-24000	-4.170287	20	PASS
			NV	20	-24000	-4.170287	20	PASS
			NV	30	-24000	-4.170287	20	PASS
			NV	40	-24000	-4.170287	20	PASS
			NV	50	-25000	-4.344049	20	PASS
		5795	NV	-30	-25000	-4.314064	20	PASS
			NV	-20	-25000	-4.314064	20	PASS
			NV	-10	-25000	-4.314064	20	PASS
			NV	0	-25000	-4.314064	20	PASS
			NV	10	-25000	-4.314064	20	PASS
			NV	20	-26000	-4.486626	20	PASS
			NV	30	-26000	-4.486626	20	PASS
			NV	40	-26000	-4.486626	20	PASS
			NV	50	-26000	-4.486626	20	PASS
11AC80SIS O	Ant1	5775	NV	-30	-25000	-4.329004	20	PASS
			NV	-20	-26000	-4.502165	20	PASS
			NV	-10	-26000	-4.502165	20	PASS
			NV	0	-26000	-4.502165	20	PASS
			NV	10	-26000	-4.502165	20	PASS
			NV	20	-26000	-4.502165	20	PASS
			NV	30	-26000	-4.502165	20	PASS





			NV	40	-26000	-4.502165	20	PASS
			NV	50	-26000	-4.502165	20	PASS



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E.6 Duty Cycle

Test Result

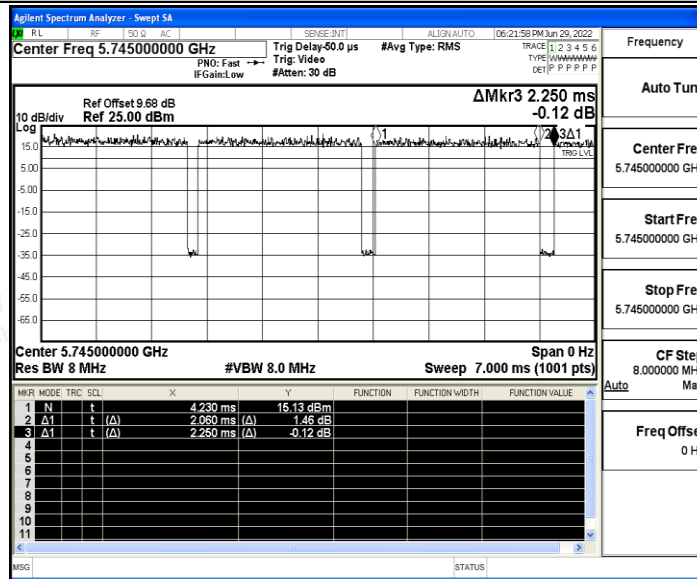
TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Factor	1/T
11A	Ant1	5745	2.06	2.25	91.56	0.38	0.44
		5785	2.06	2.25	91.56	0.38	0.44
		5825	2.07	2.20	94.09	0.26	0.45
11N20SISO	Ant1	5745	1.92	2.05	93.66	0.28	0.49
		5785	1.92	2.11	91.00	0.41	0.47
		5825	1.92	2.10	91.43	0.39	0.48
11N40SISO	Ant1	5755	0.94	1.17	80.34	0.95	0.85
		5795	0.94	1.17	80.34	0.95	0.85
11AC20SISO	Ant1	5745	1.93	2.07	93.24	0.30	0.48
		5785	1.94	2.15	90.23	0.45	0.47
		5825	1.93	2.19	88.13	0.55	0.46
11AC40SISO	Ant1	5755	0.95	1.20	79.17	1.01	0.83
		5795	0.95	1.12	84.82	0.72	0.44
11AC80SISO	Ant1	5775	0.46	0.67	68.66	1.63	0.44



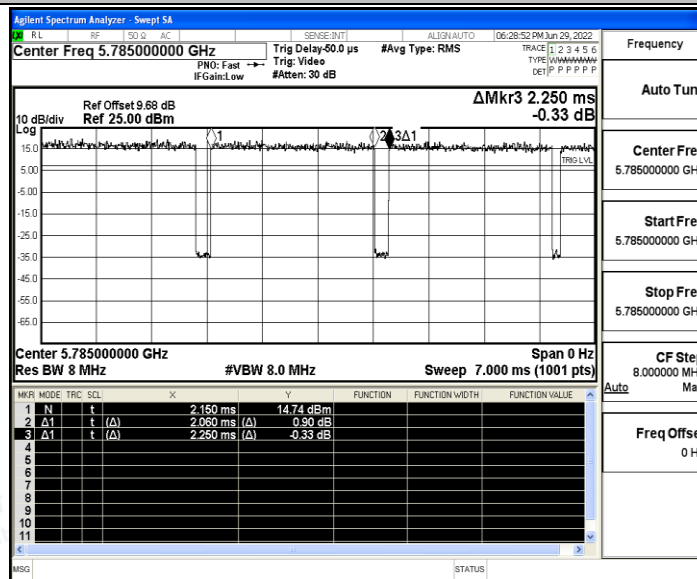


Test Graphs

11A_Ant1_5745

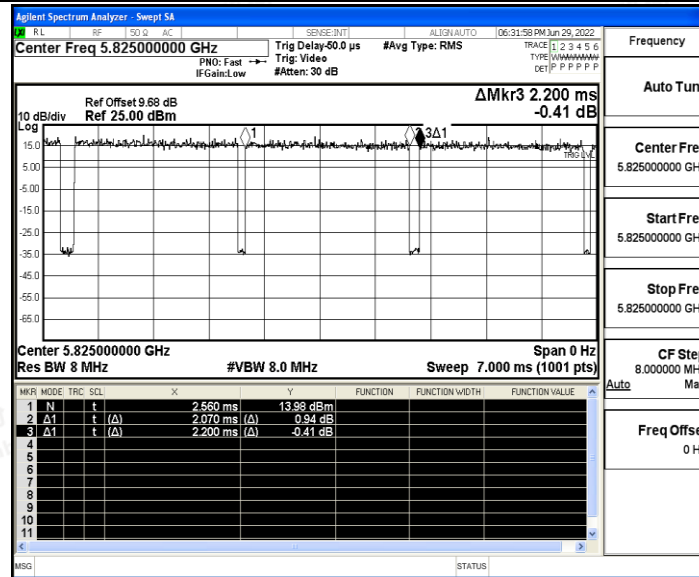


11A_Ant1_5785

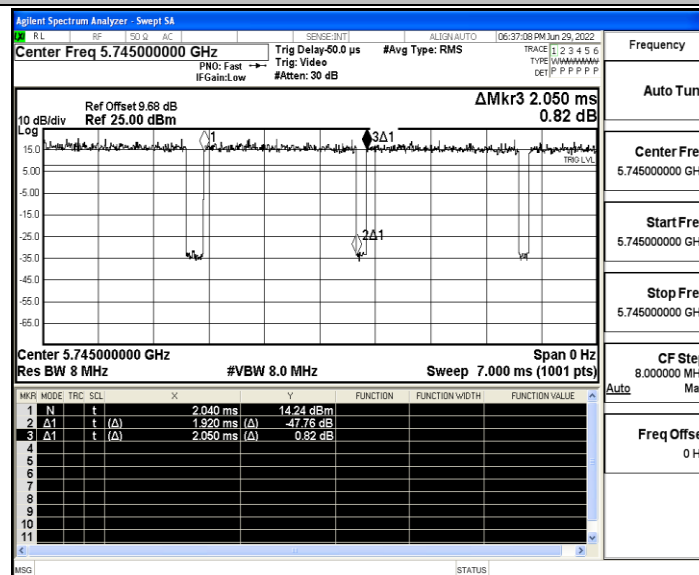


11A_Ant1_5825



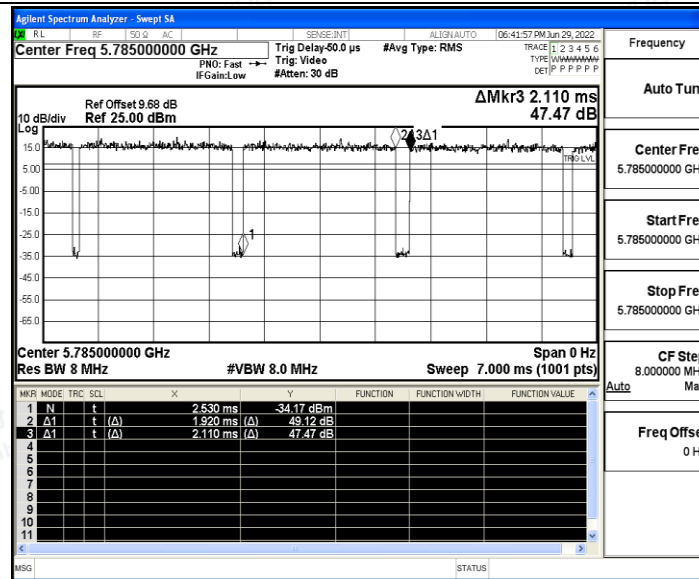


11N20SISO_Ant1_5745

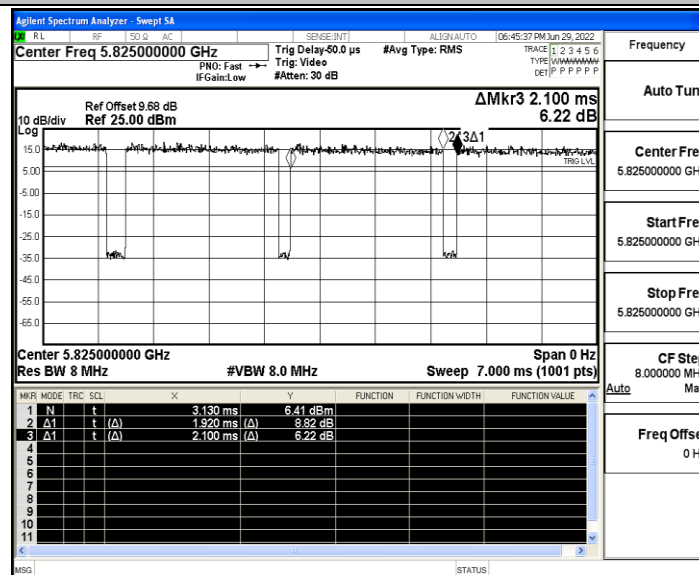


11N20SISO_Ant1_5785



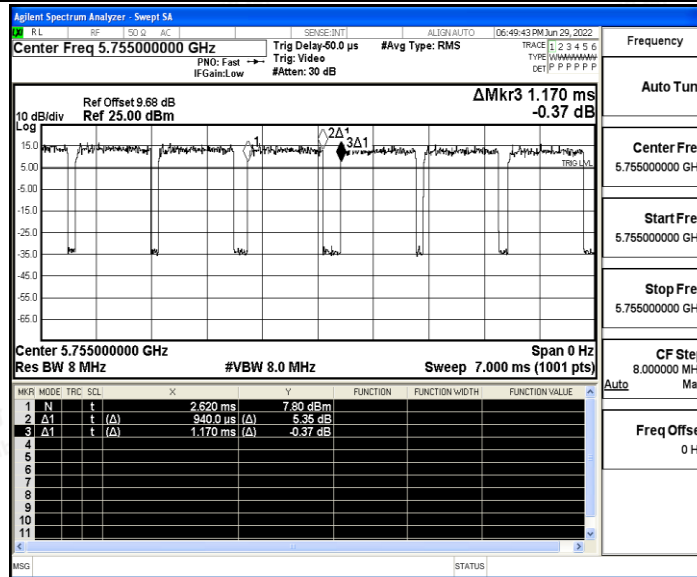


11N20SISO_Ant1_5825

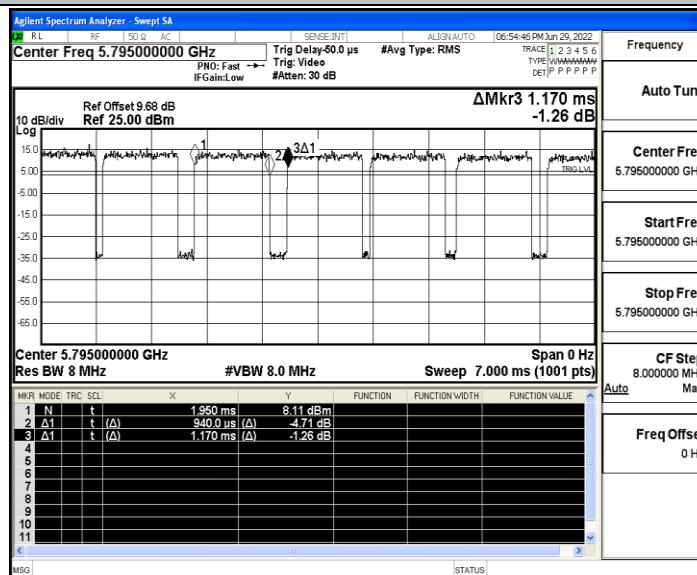


11N40SISO_Ant1_5755



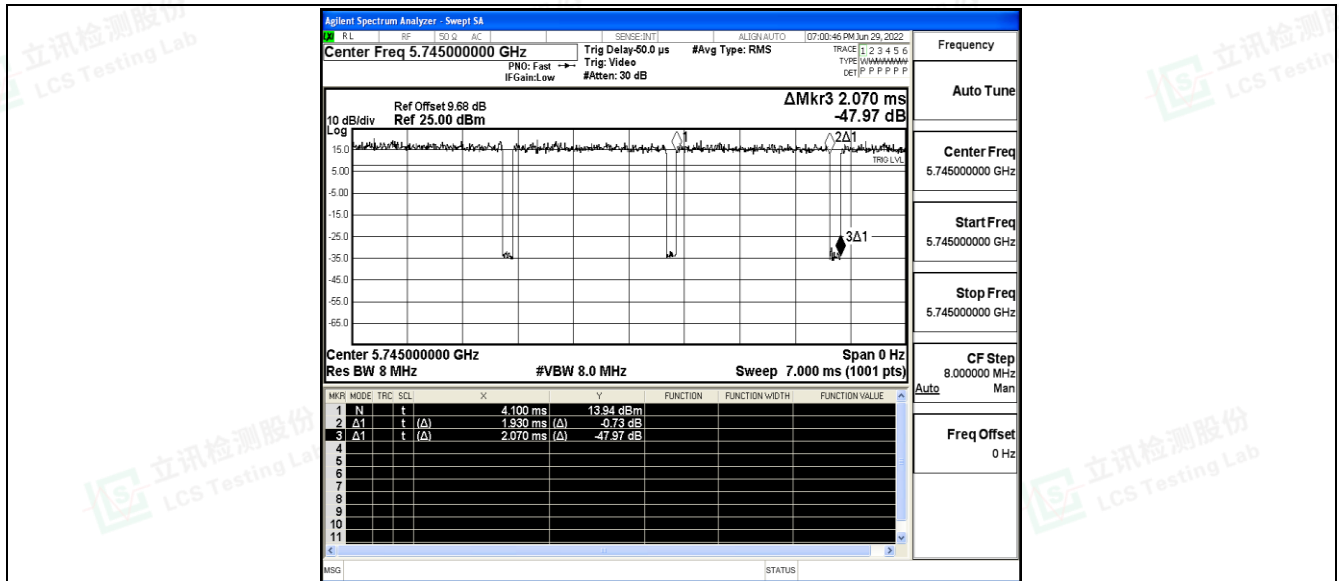


11N40SISO_Ant1_5795

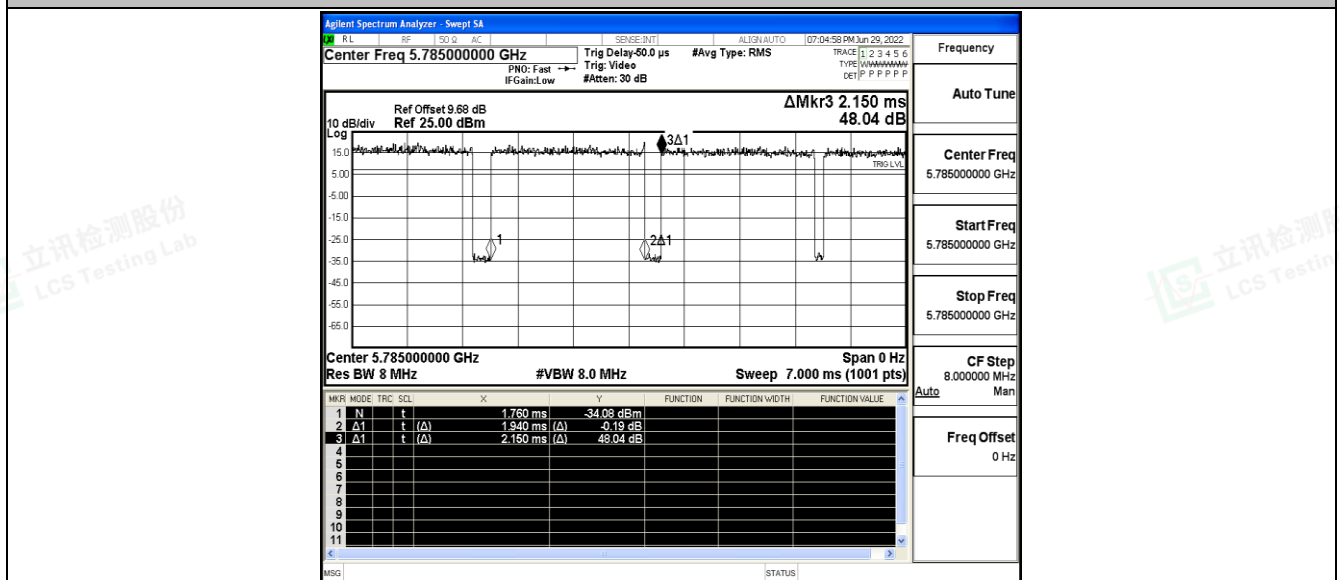


11AC20SISO_Ant1_5745



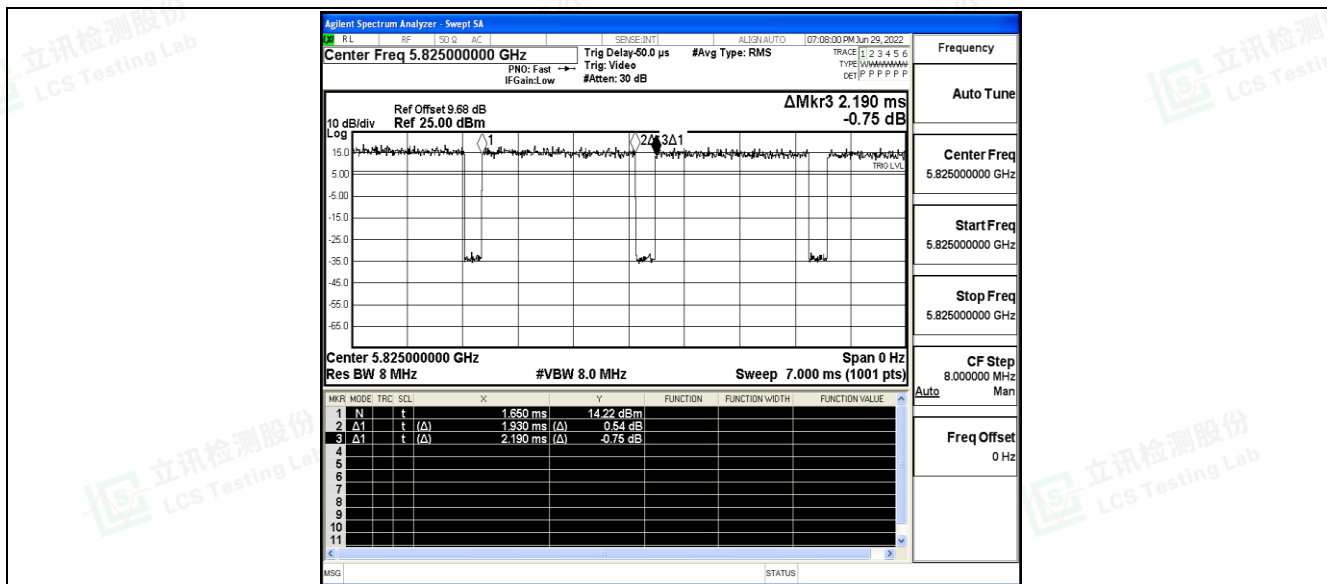


11AC20SISO_Ant1_5785

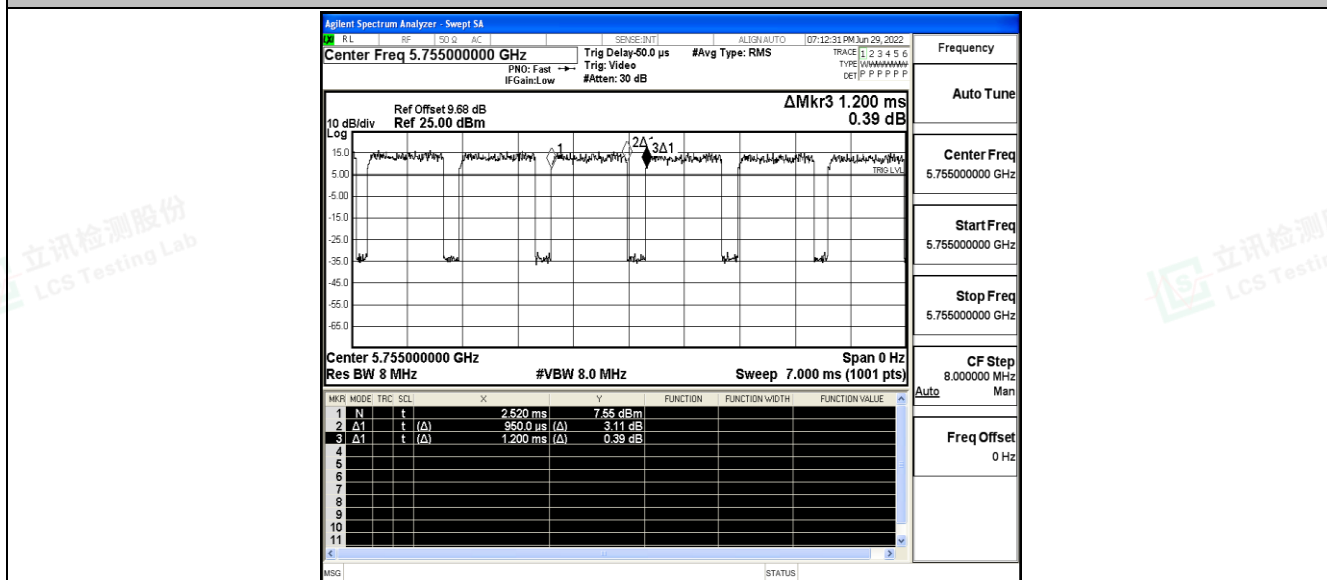


11AC20SISO_Ant1_5825





11AC40SISO_Ant1_5755



11AC40SISO_Ant1_5795



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