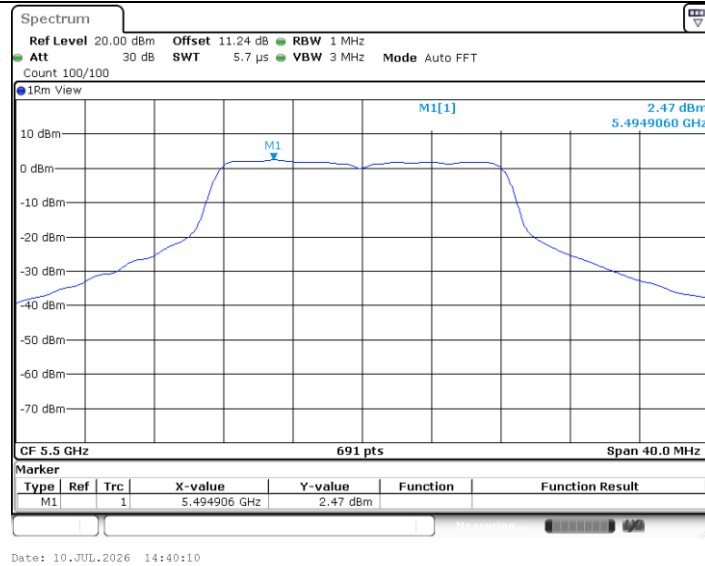
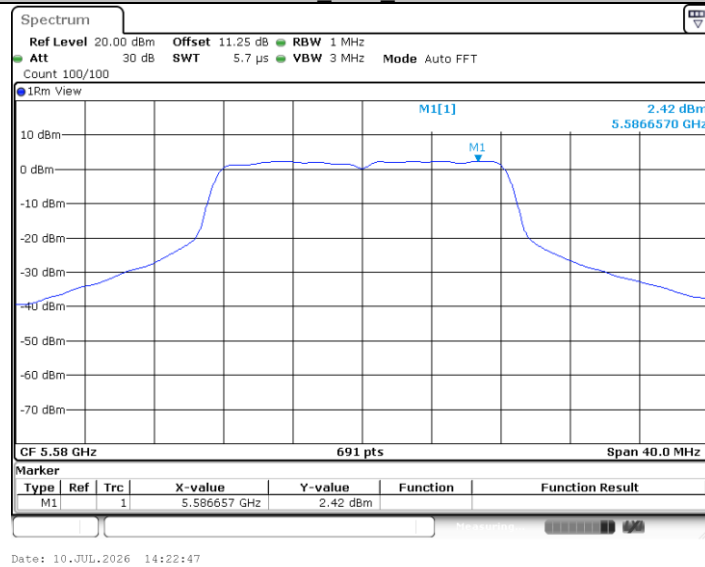
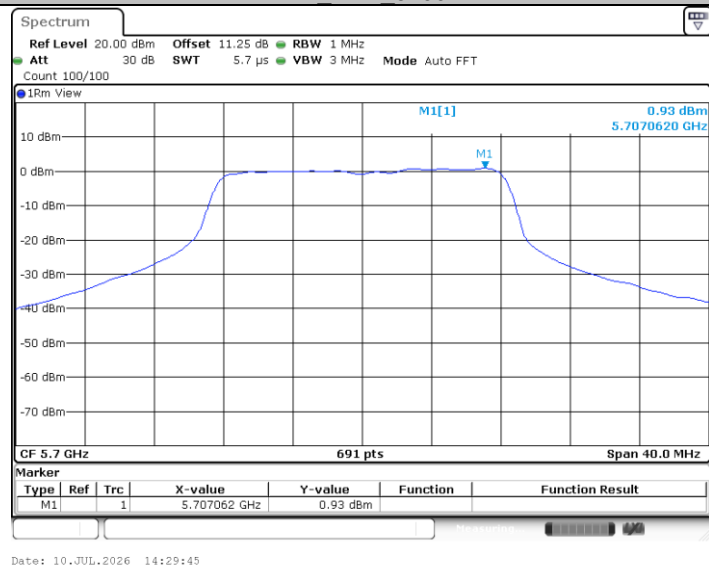




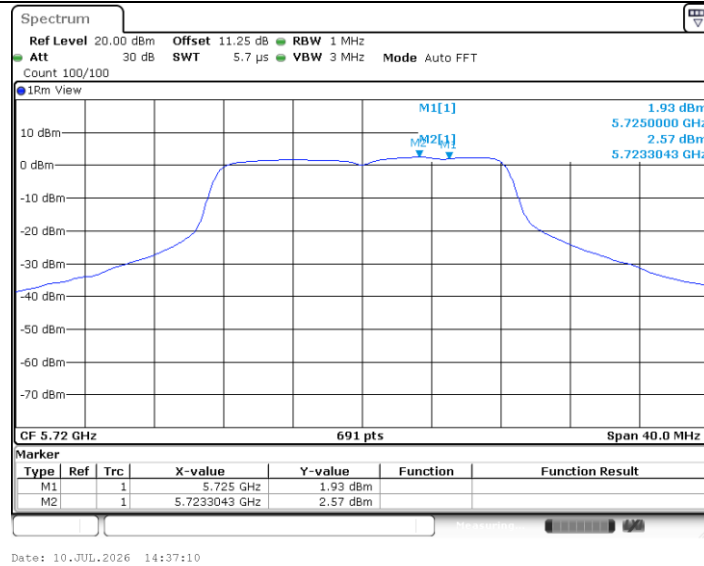
11A Ant1_5580



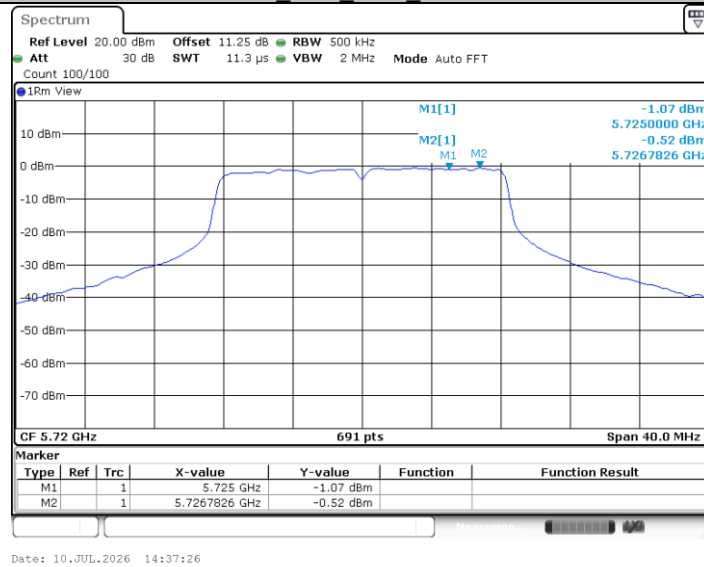
11A Ant1_5700



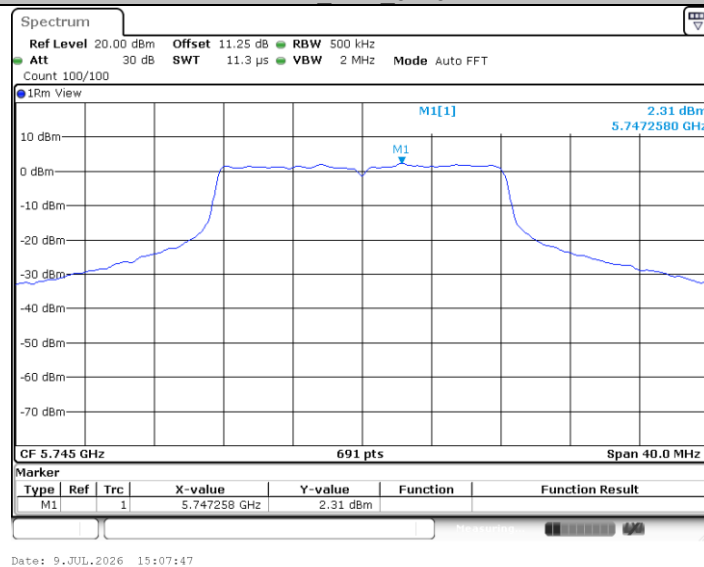
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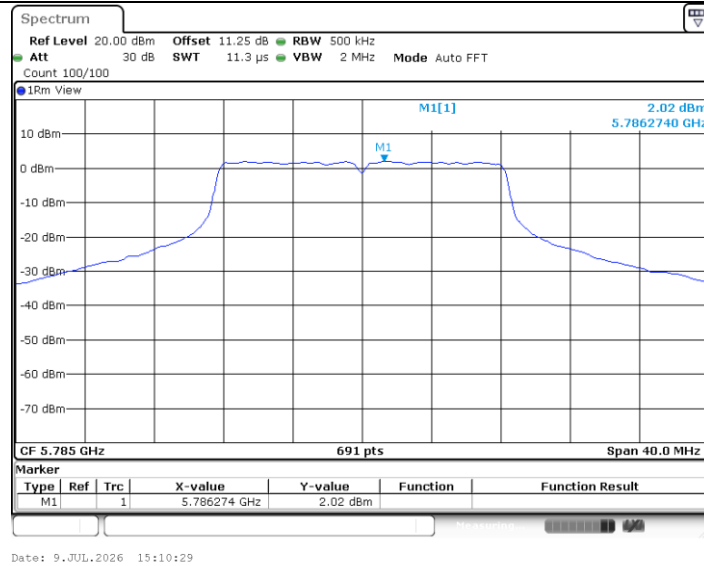
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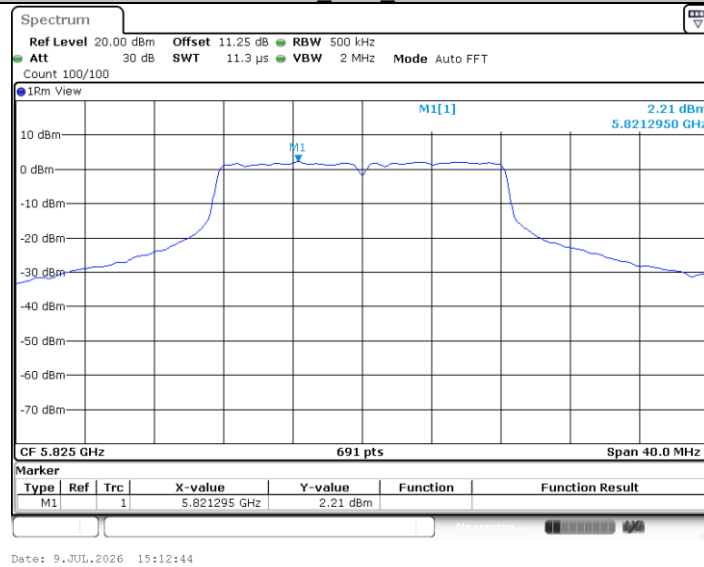
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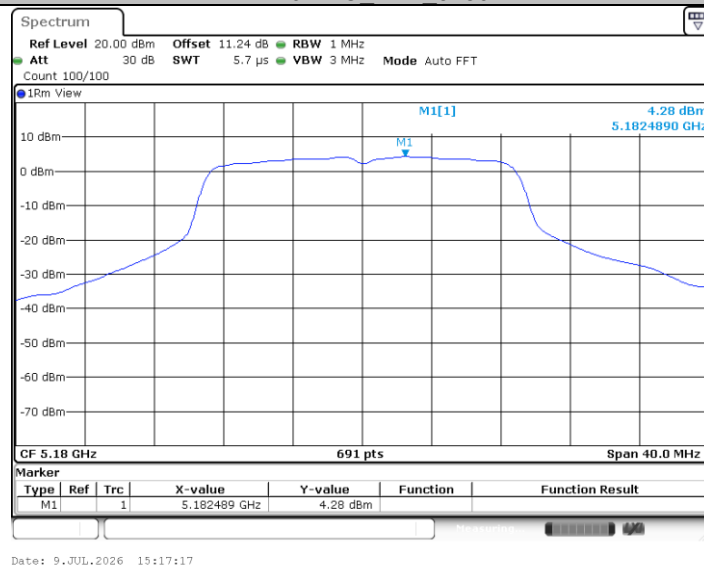
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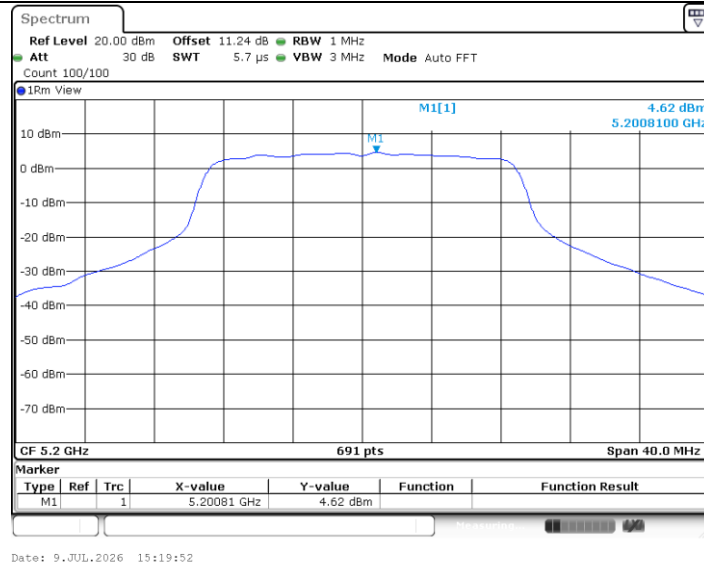
11A Ant1 5825



11N20SISO Ant1 5180



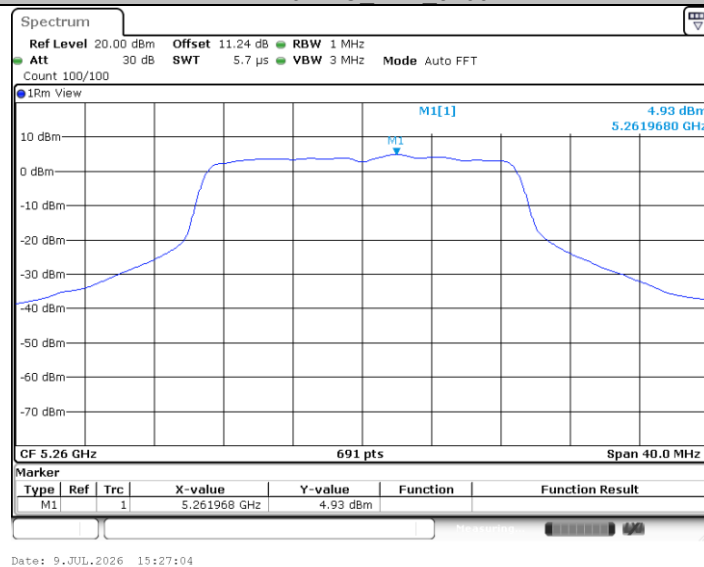
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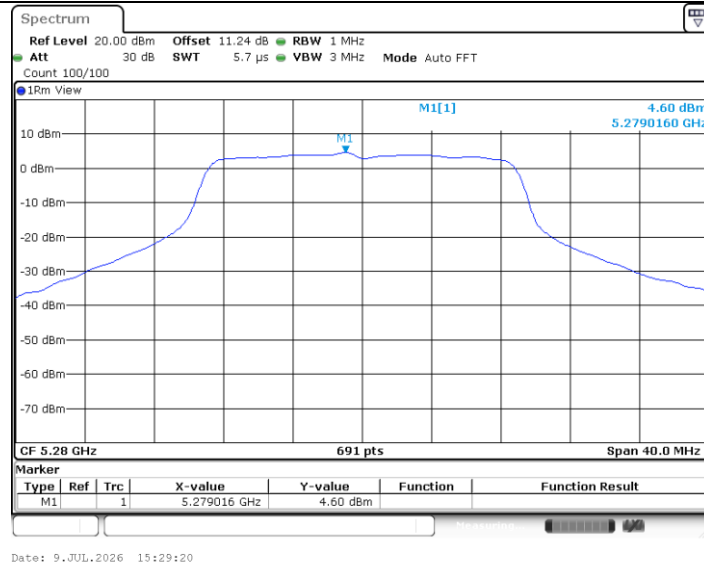
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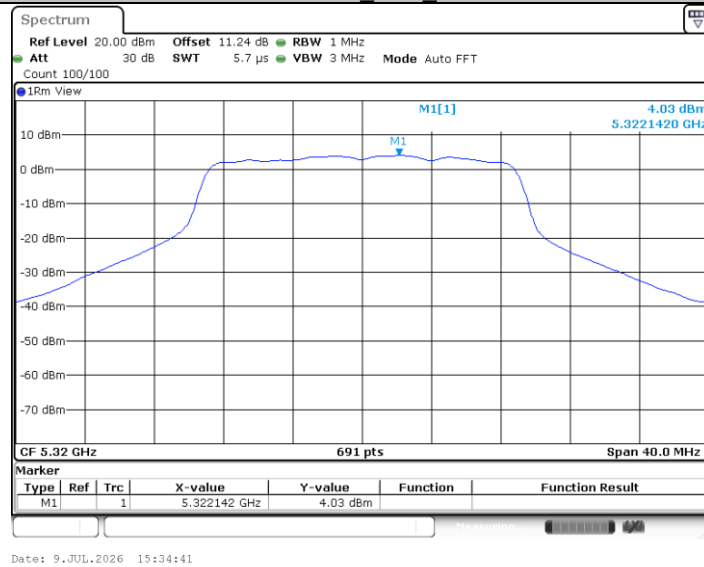
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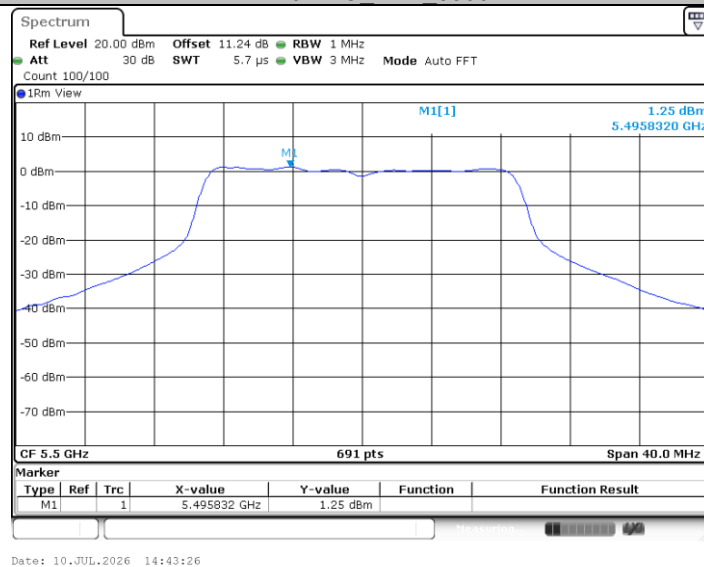
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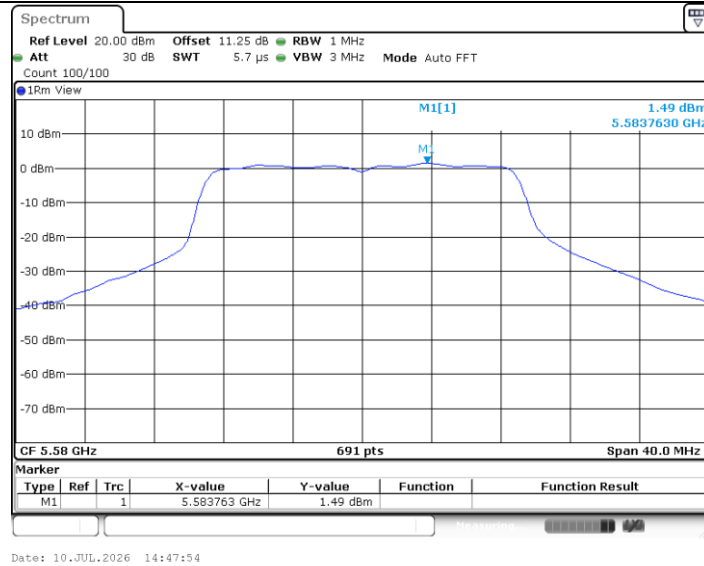
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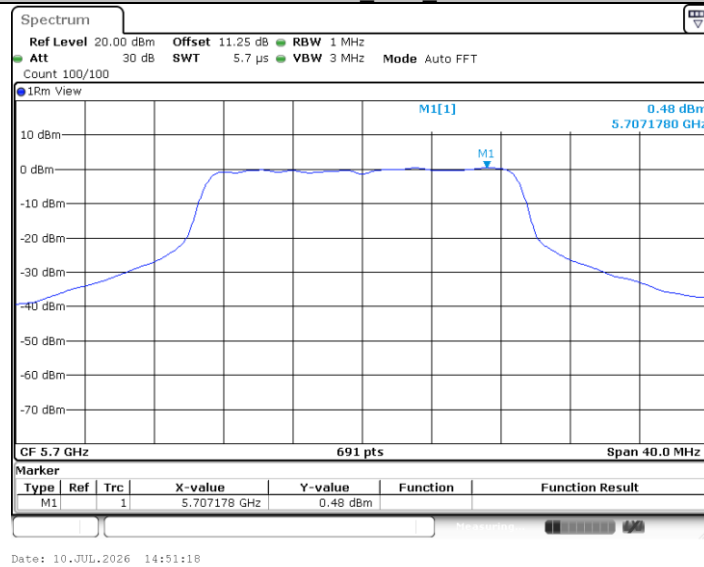
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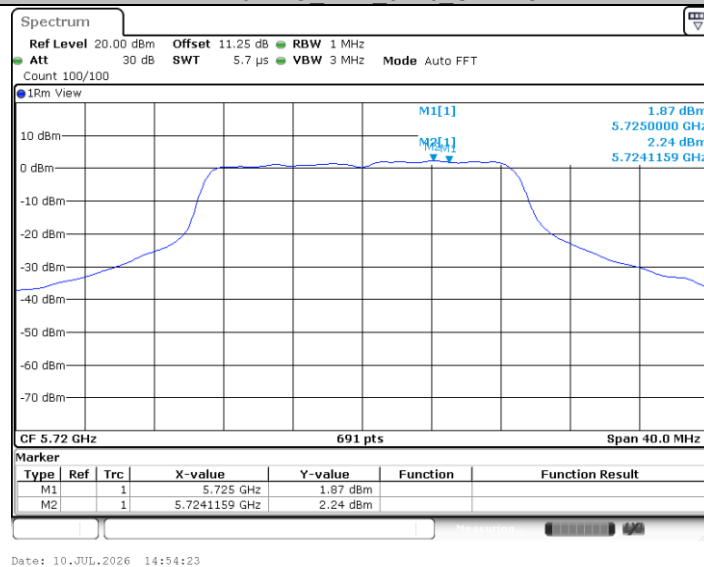
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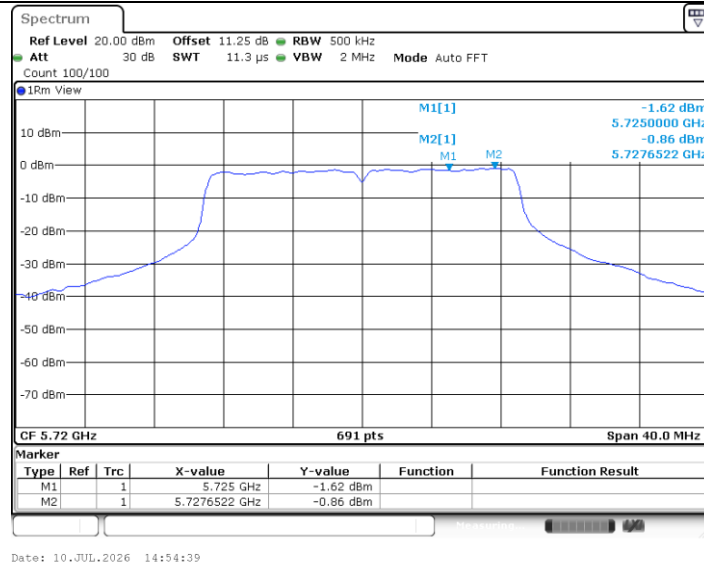
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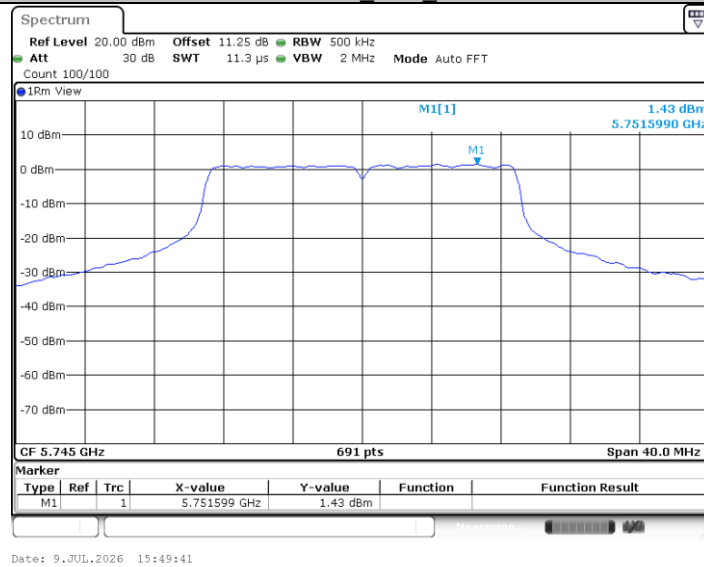
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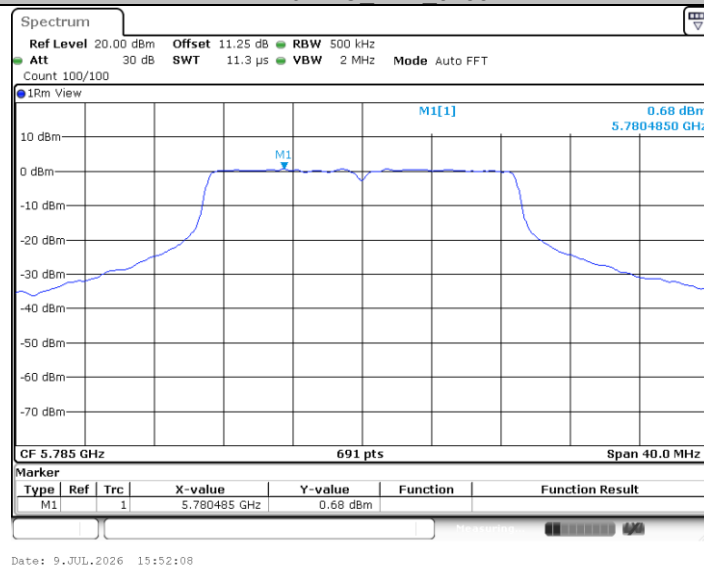
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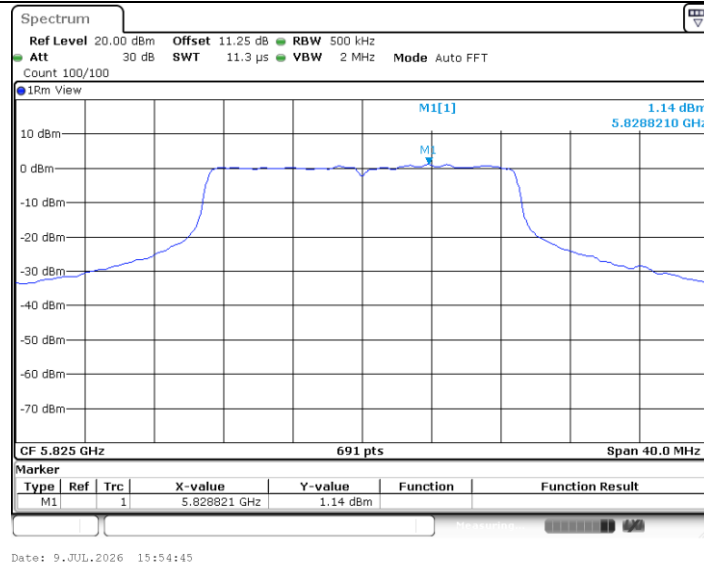
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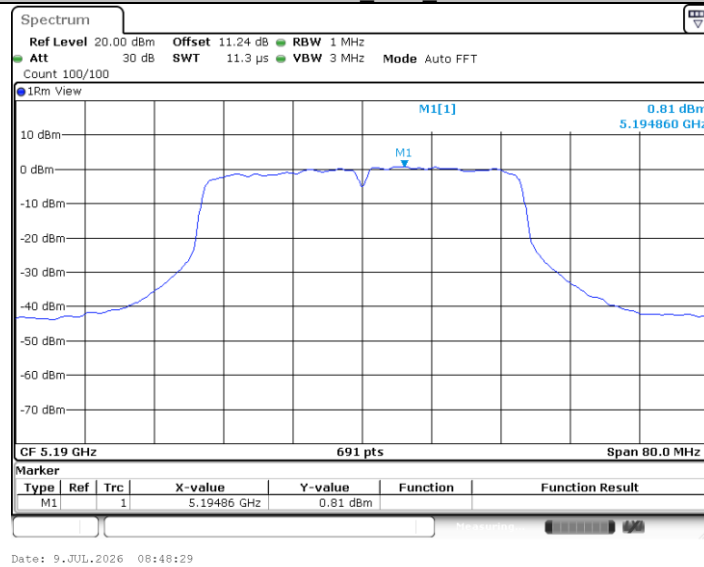
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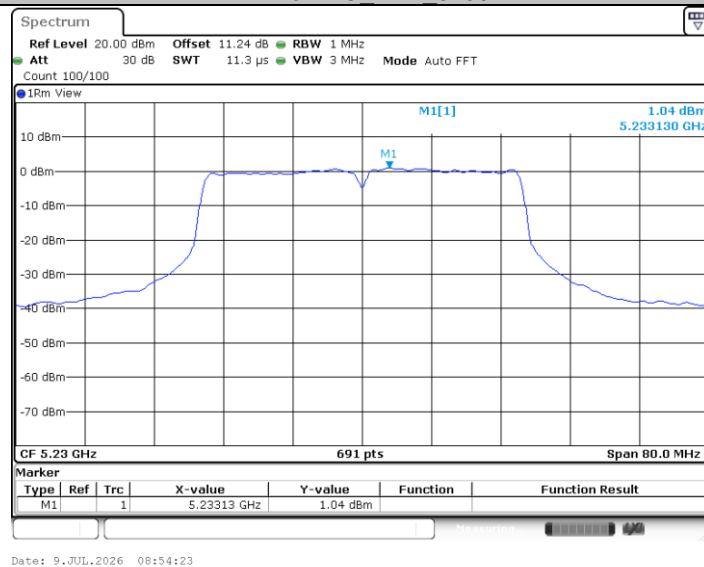
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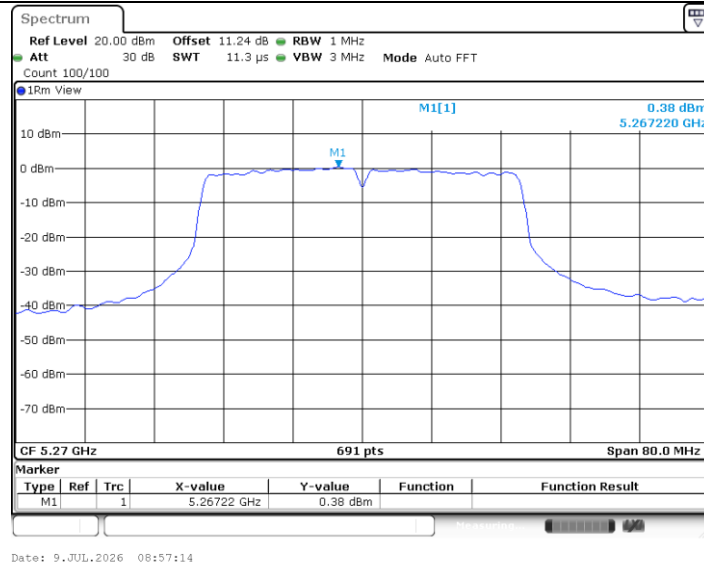
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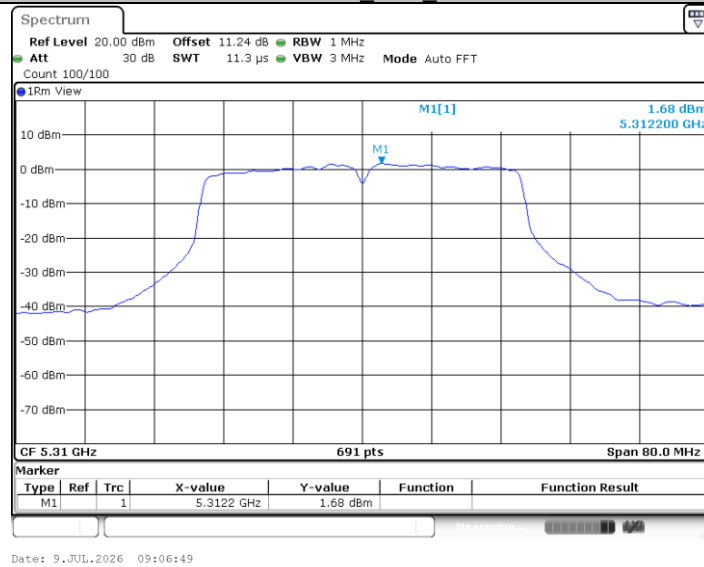
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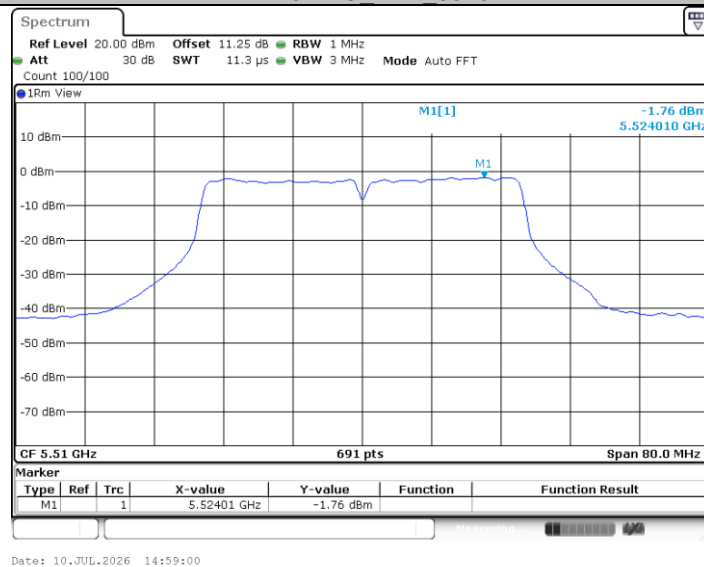
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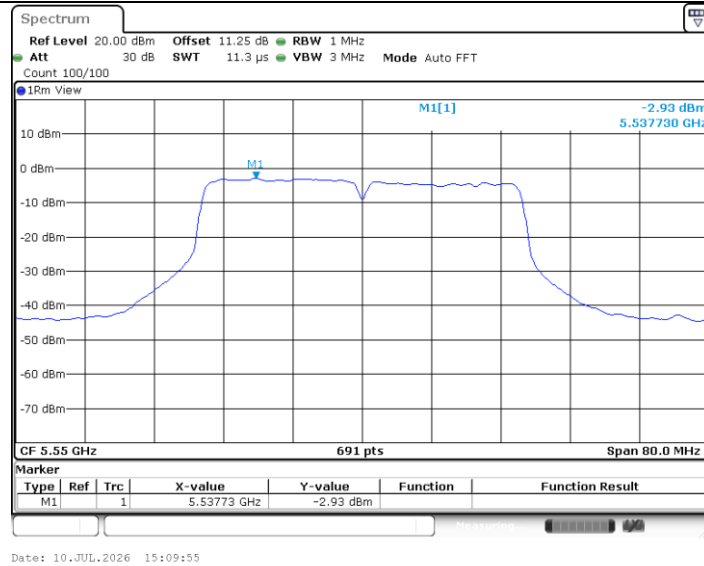
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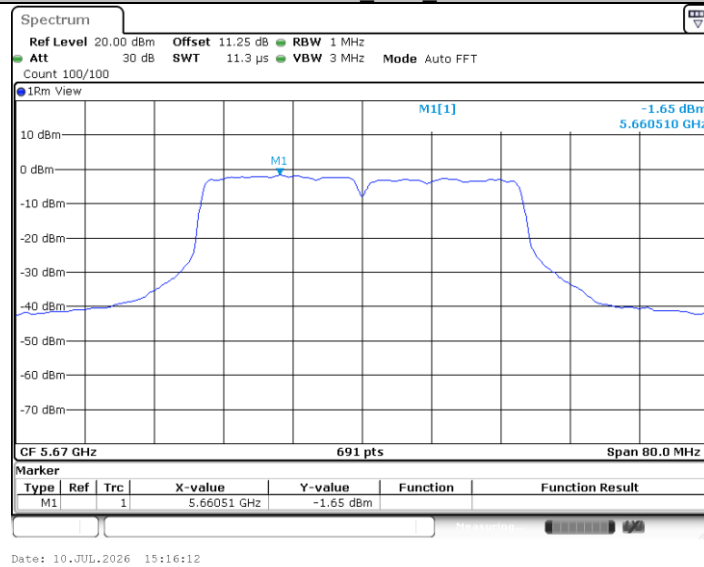
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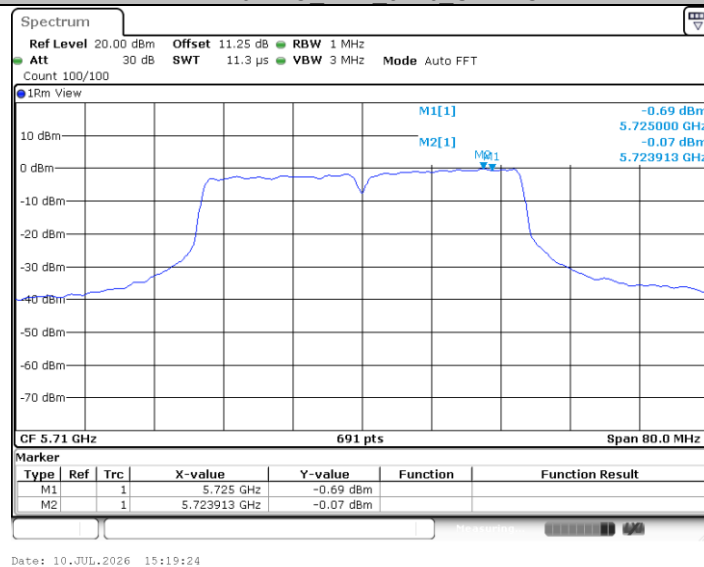
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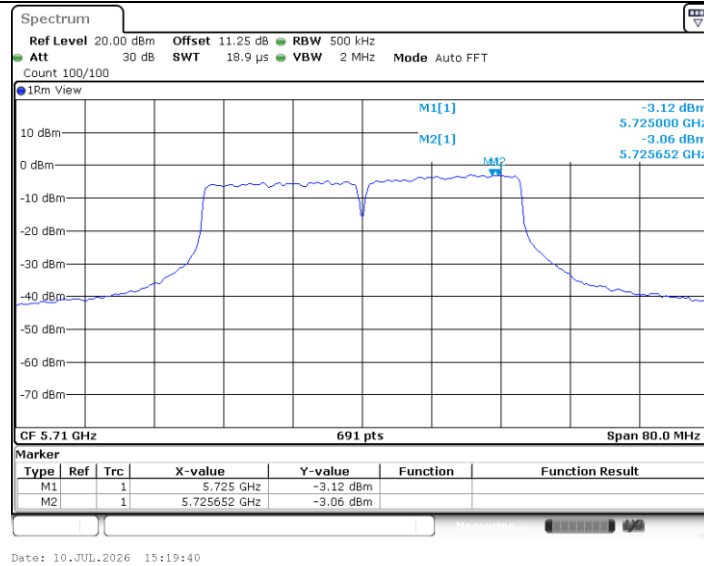
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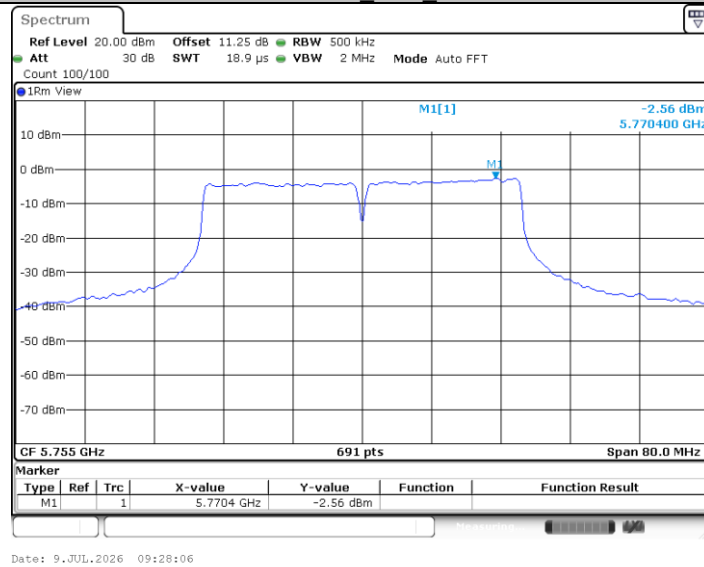
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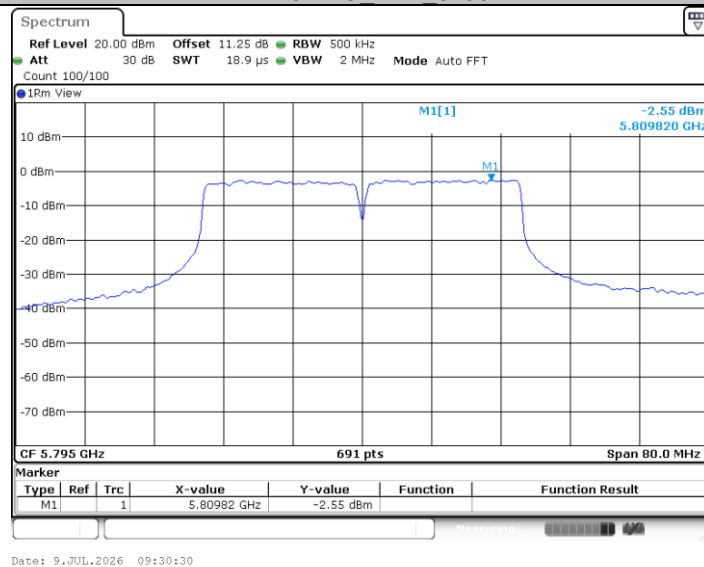
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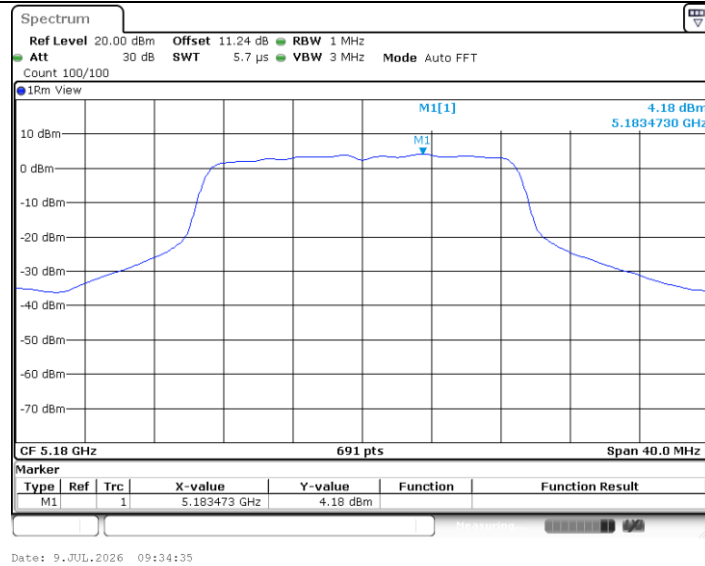
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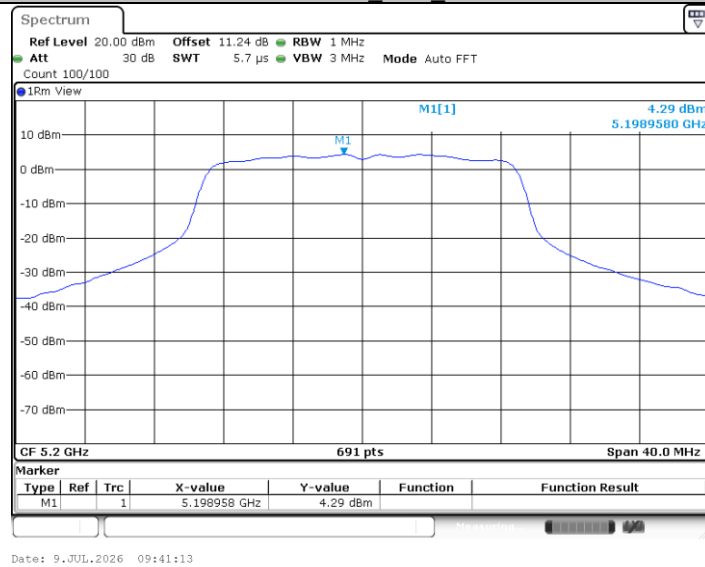
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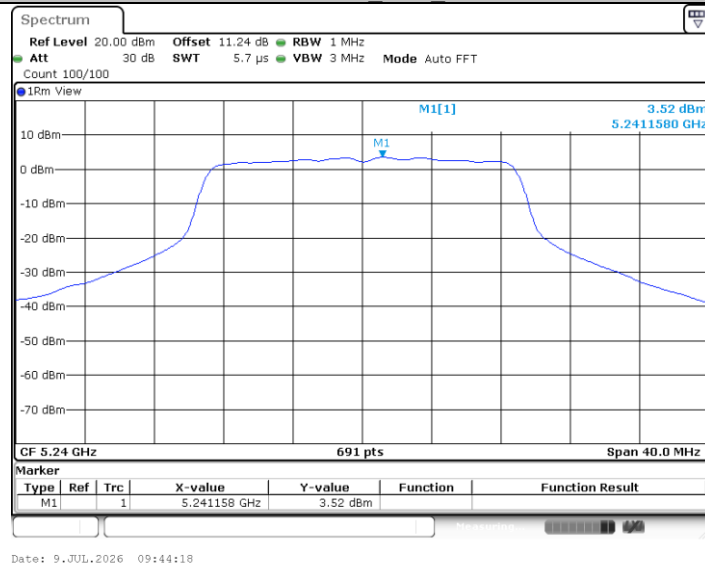
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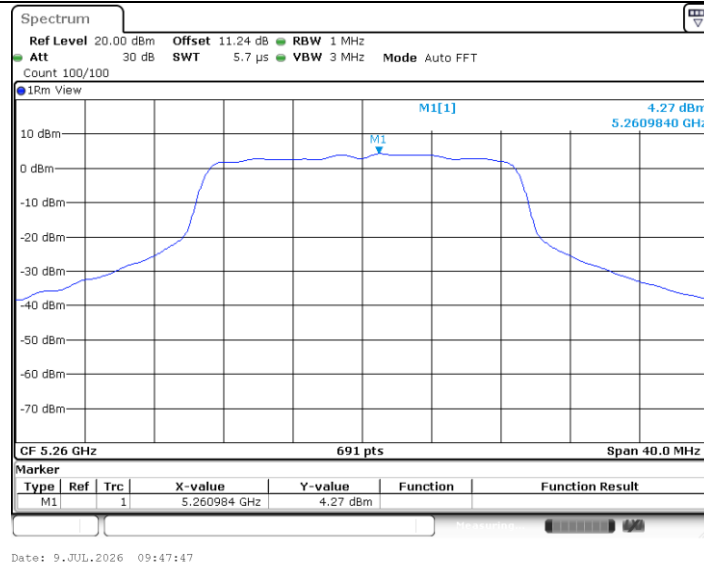
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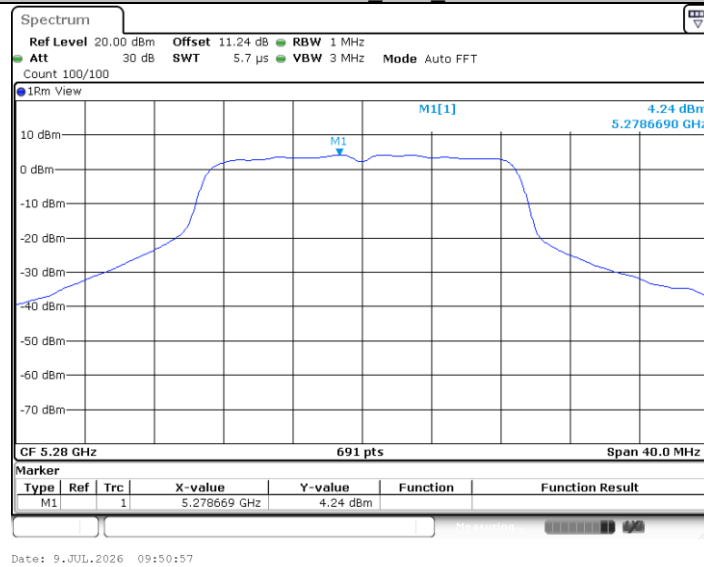
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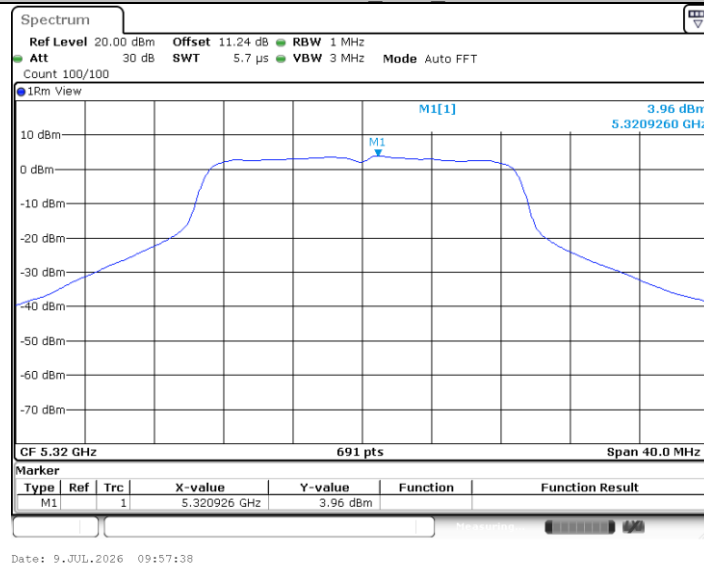
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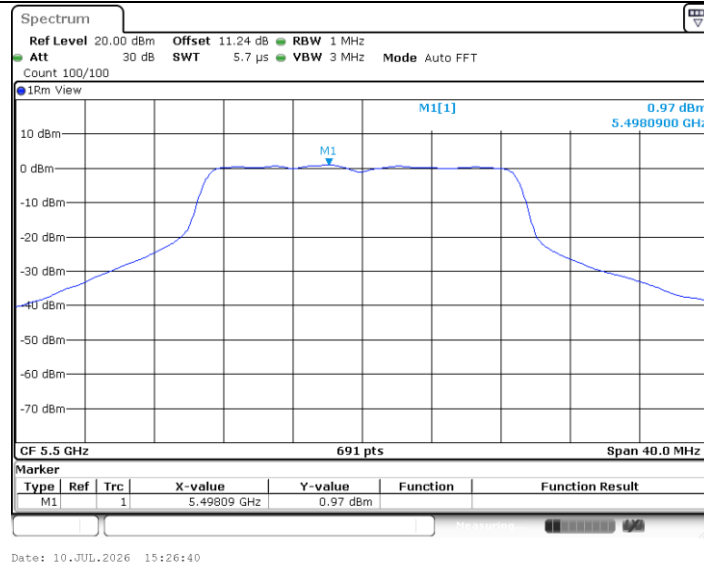
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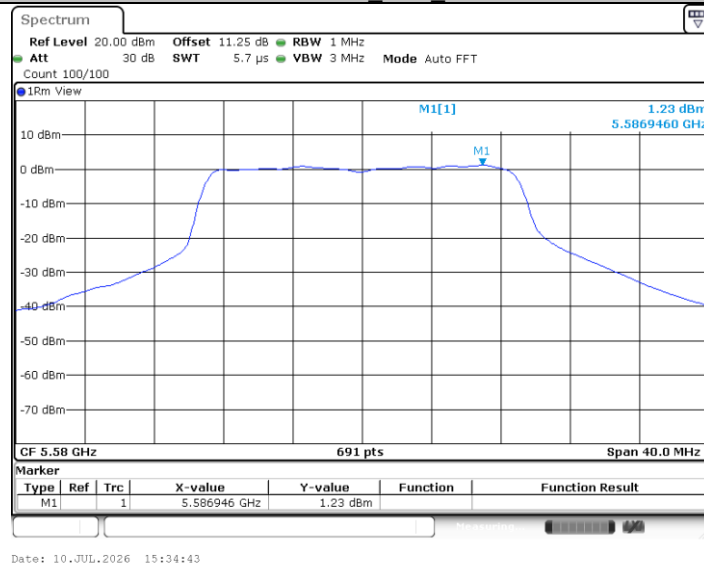
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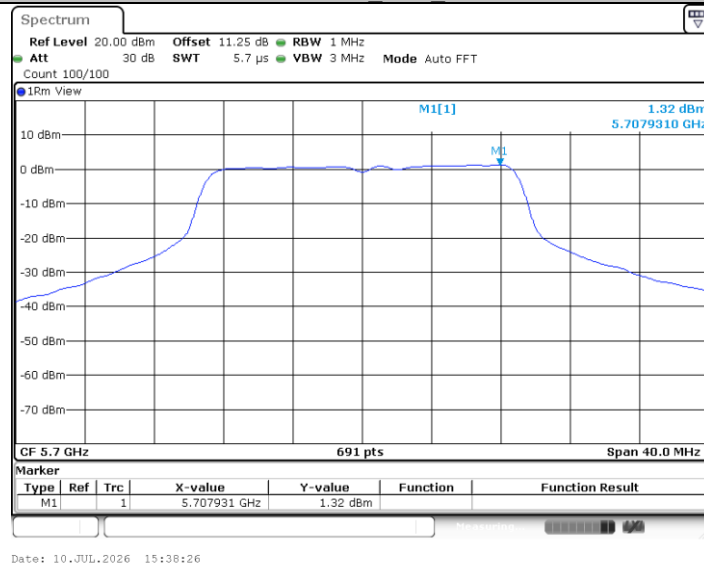
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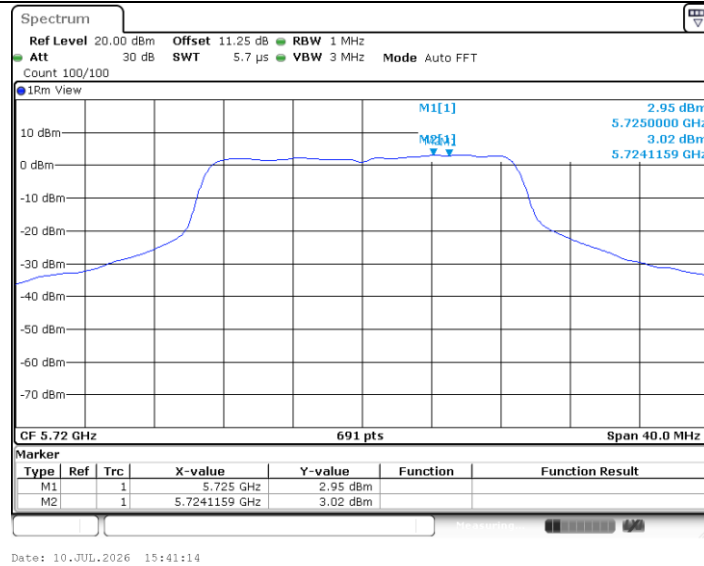
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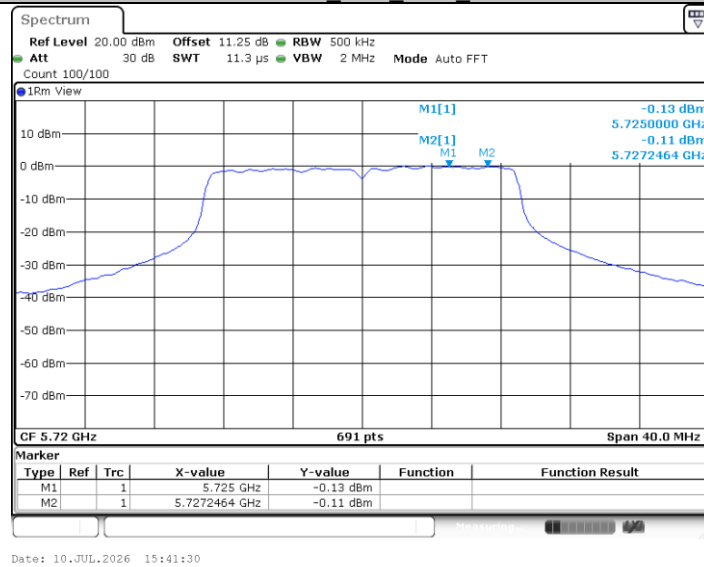
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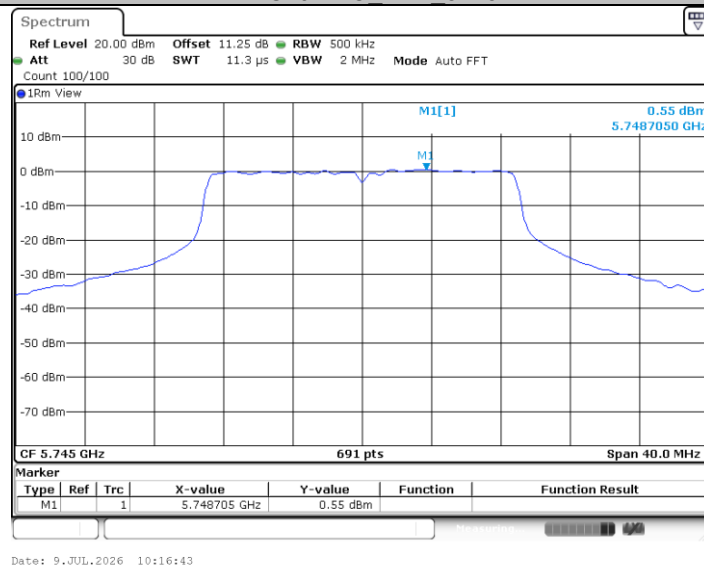
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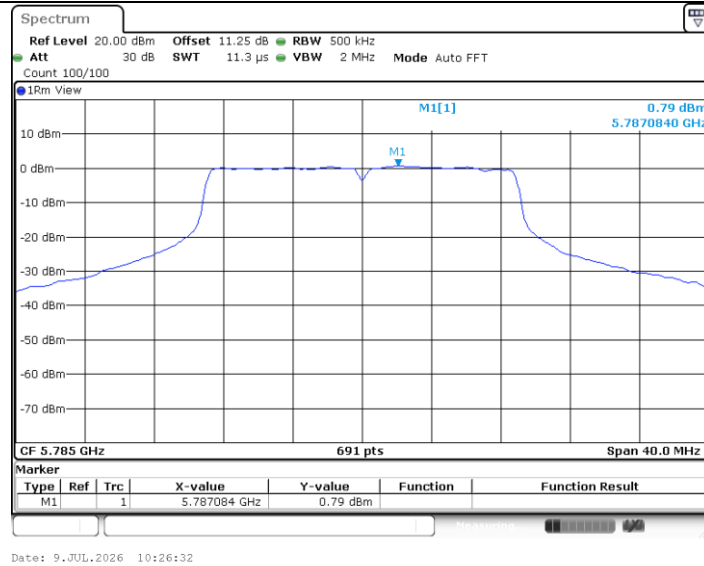
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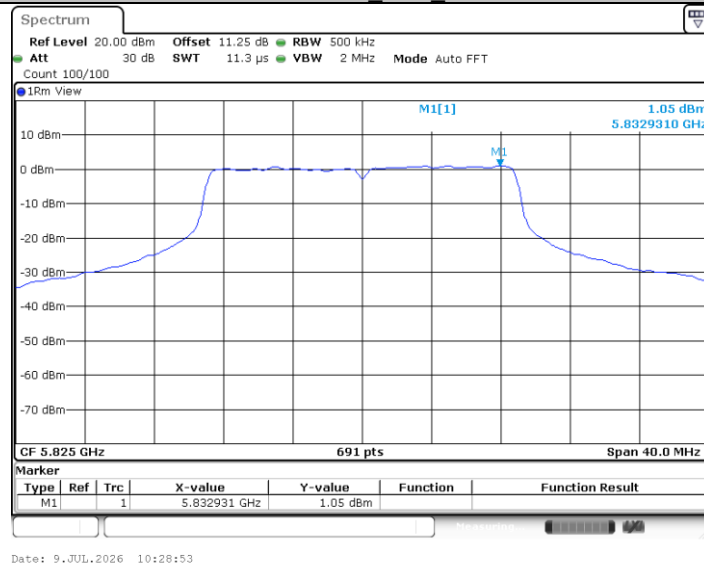
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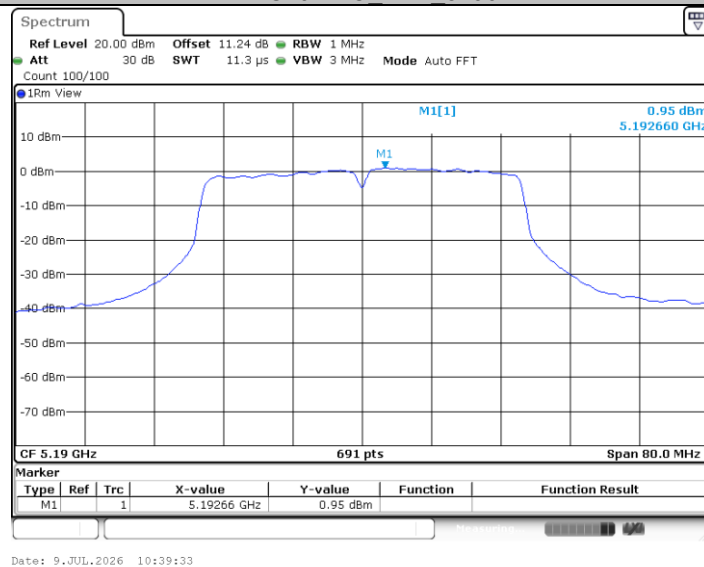
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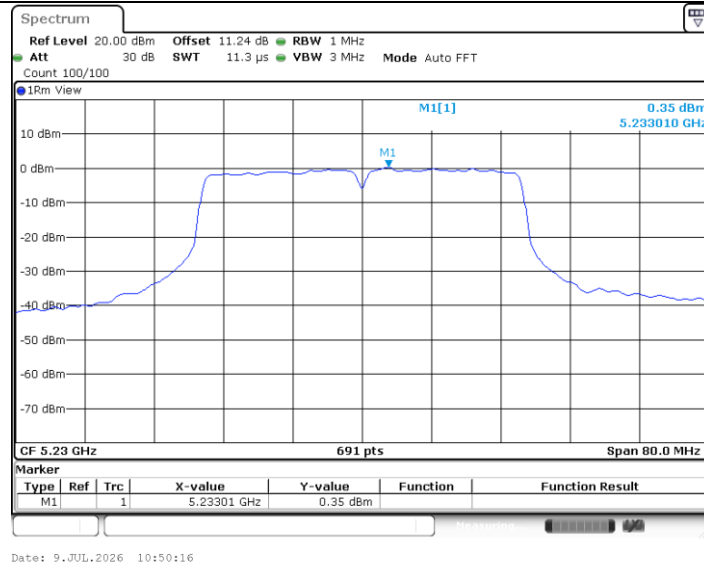
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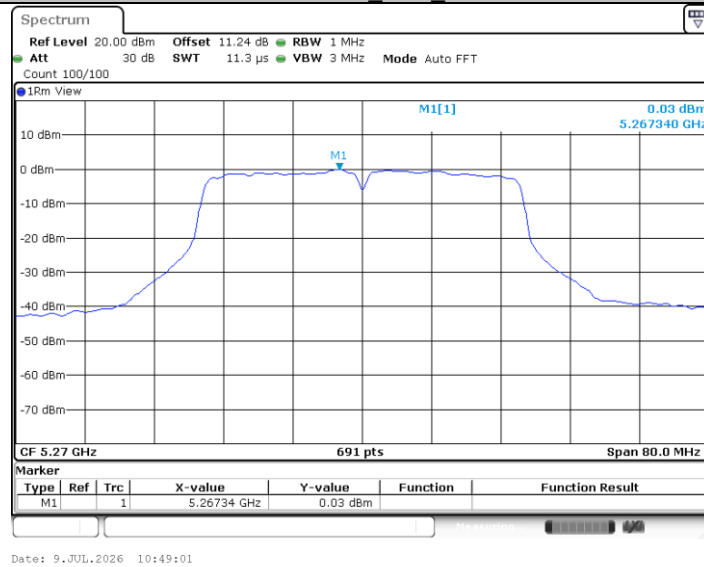
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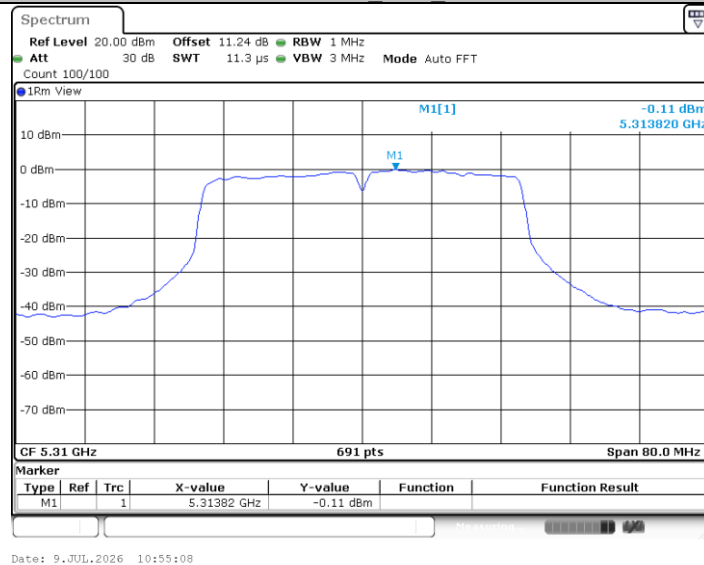
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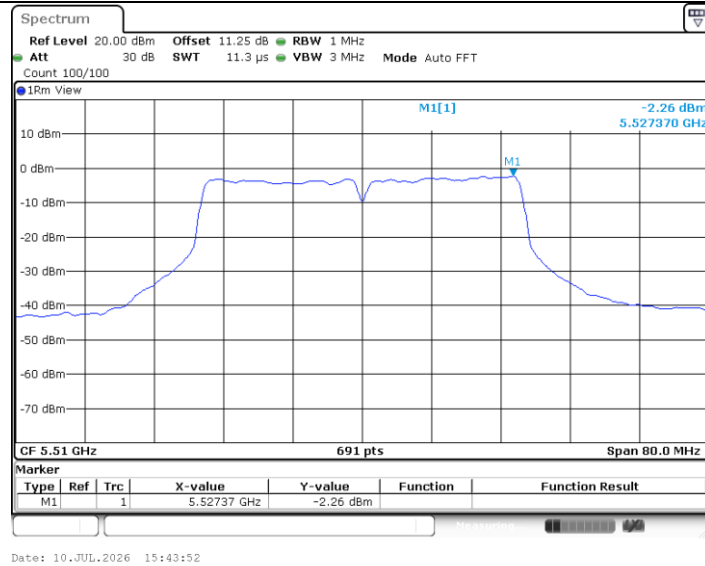
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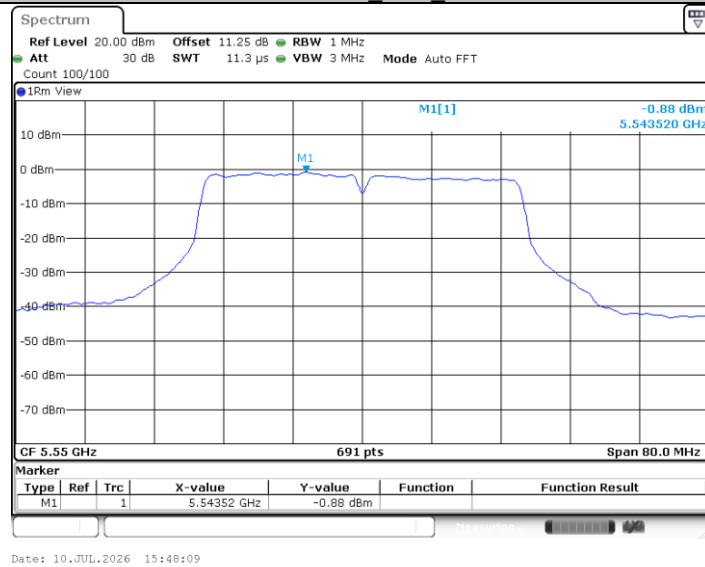
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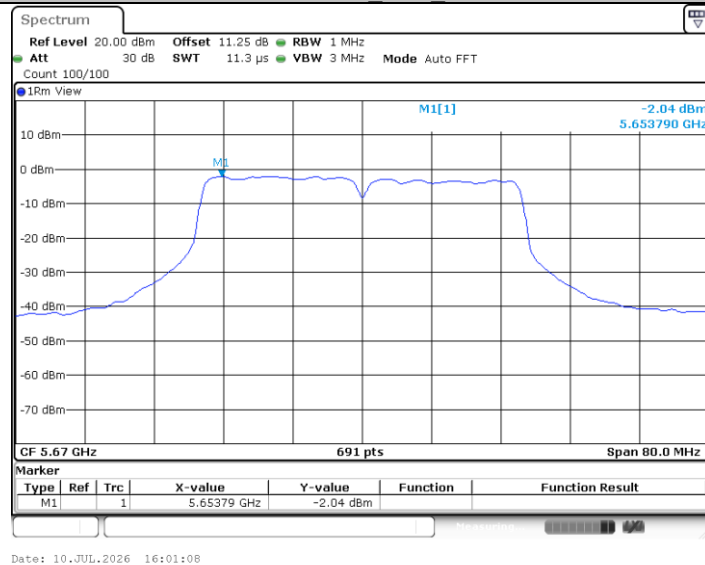
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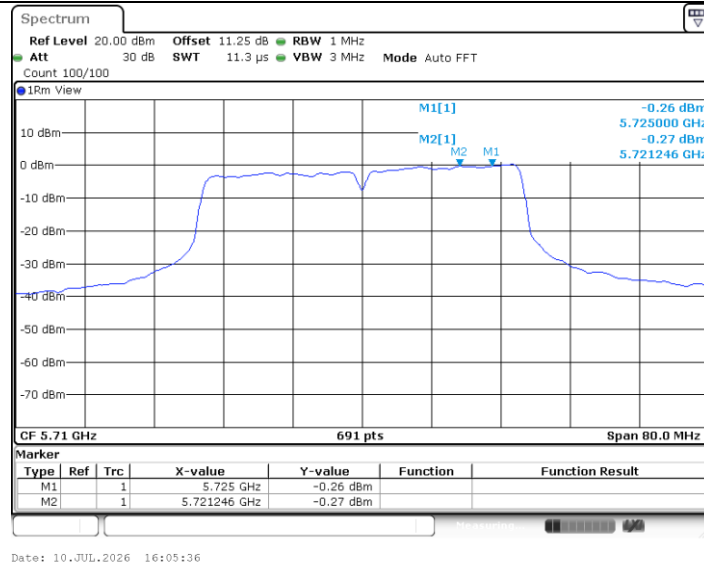
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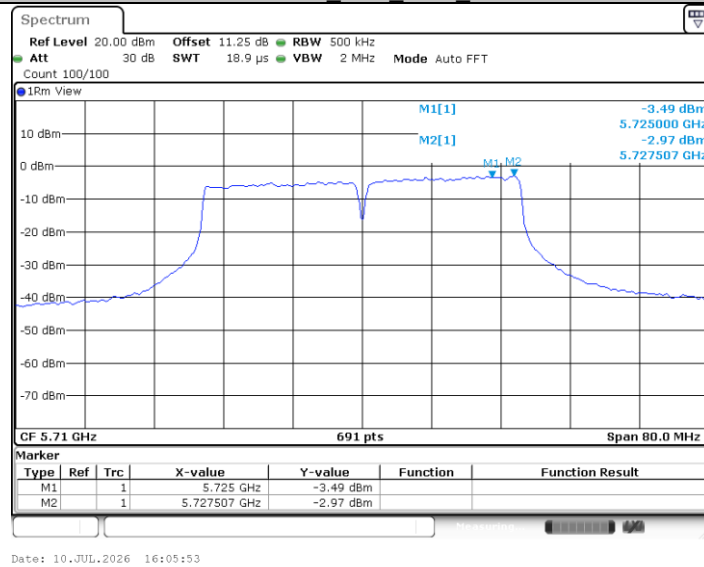
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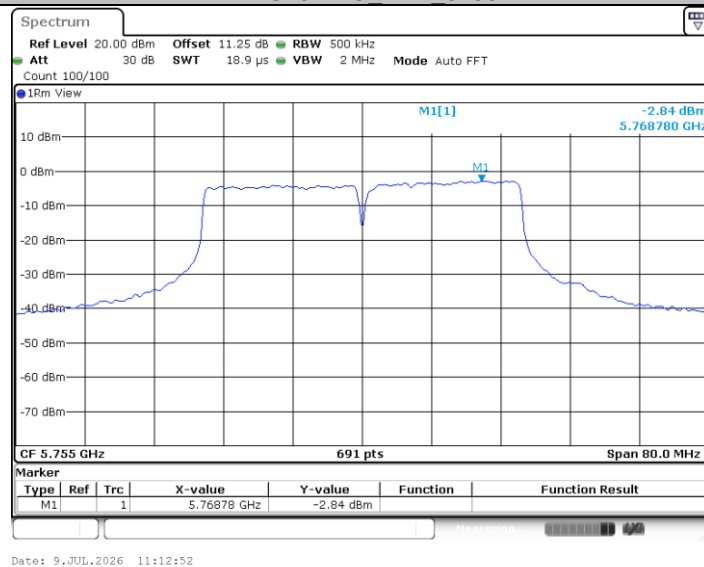
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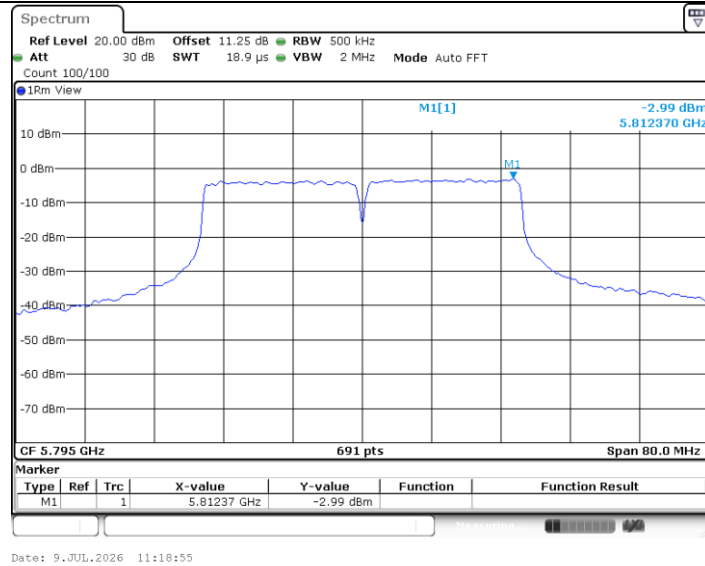
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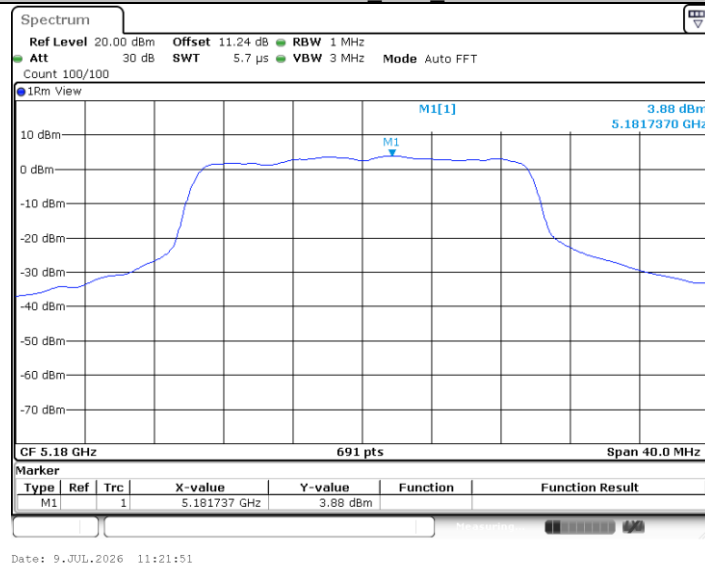
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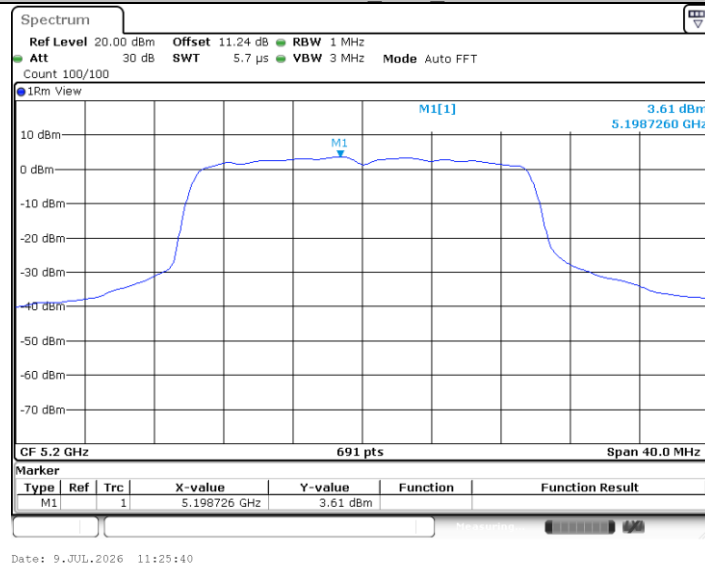
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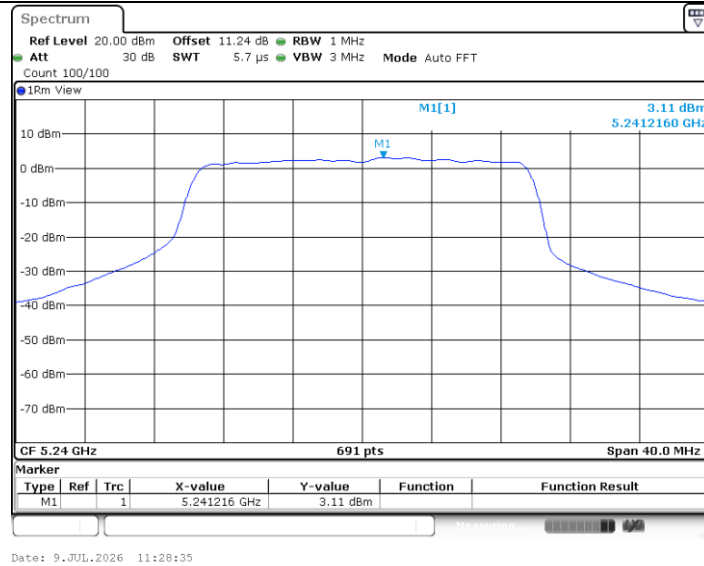
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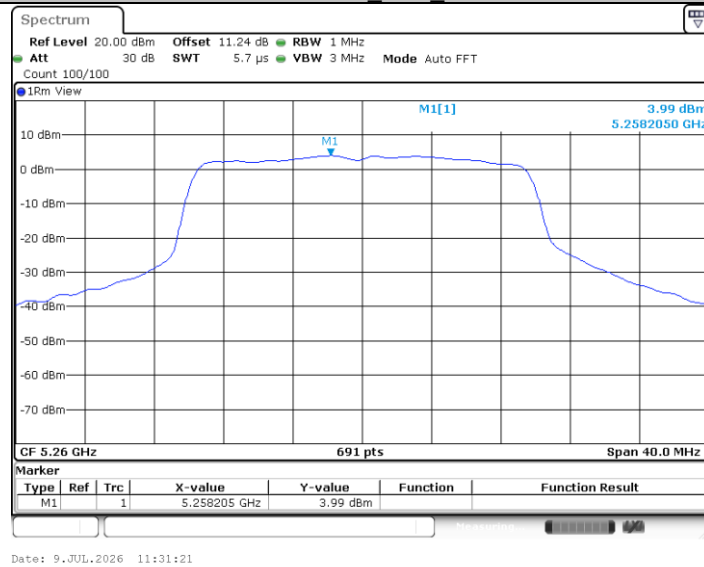
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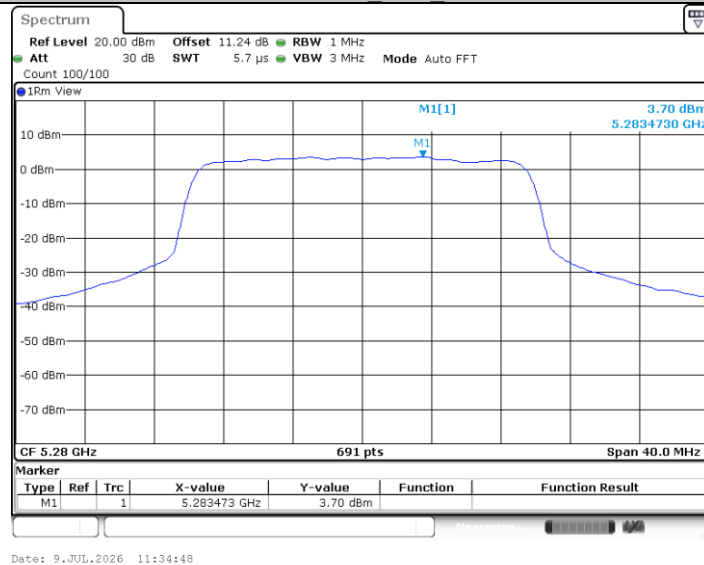
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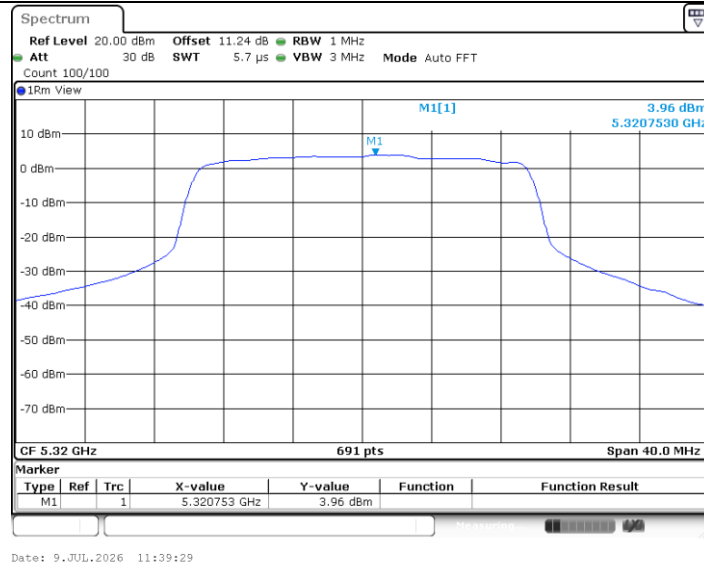
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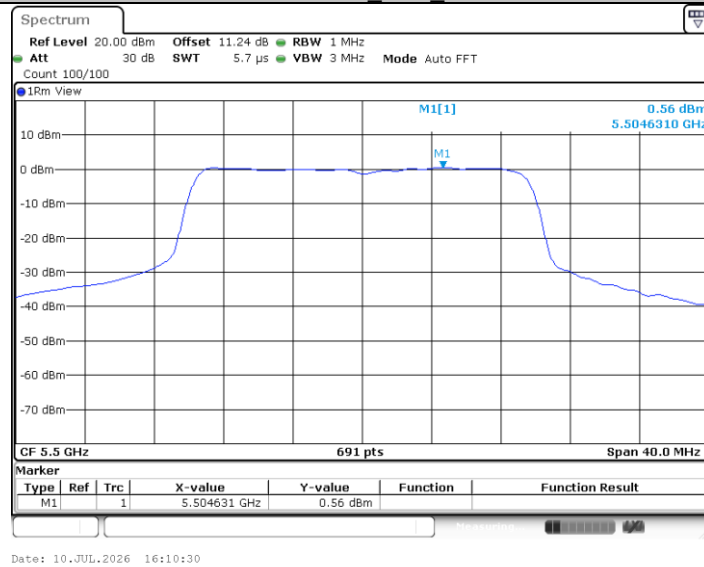
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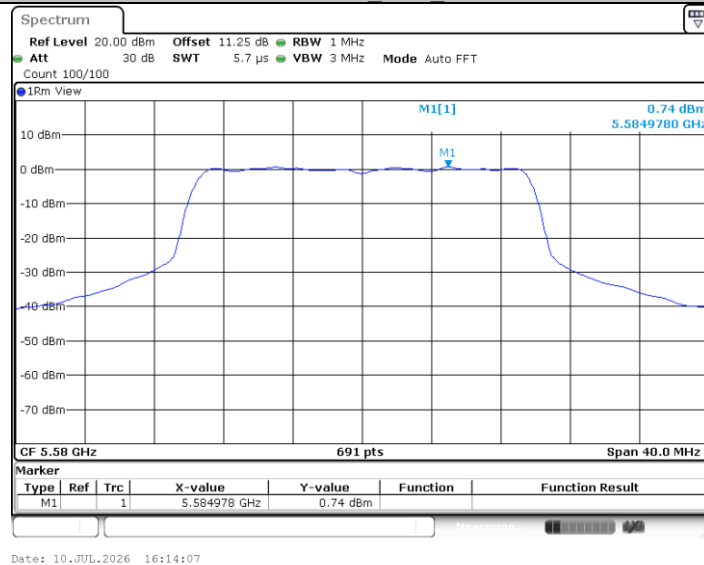
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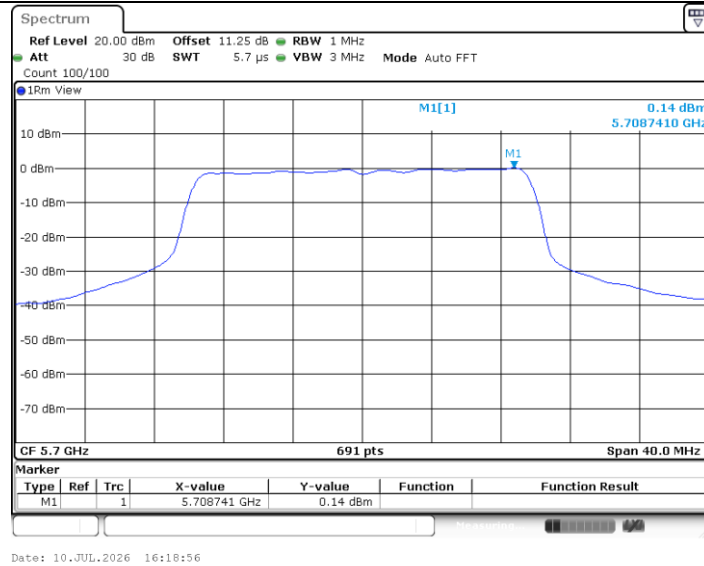
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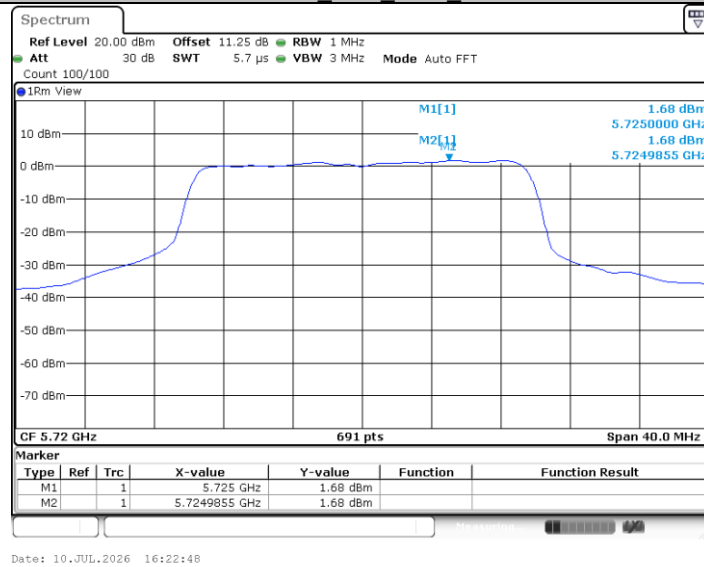
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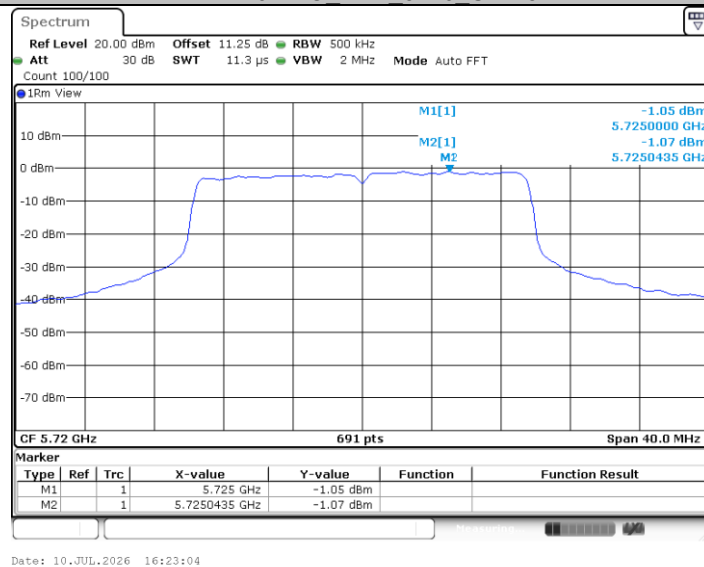
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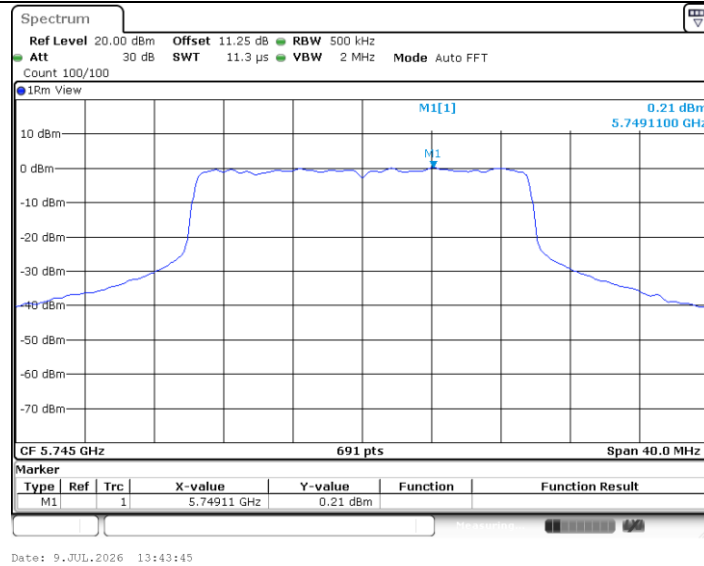
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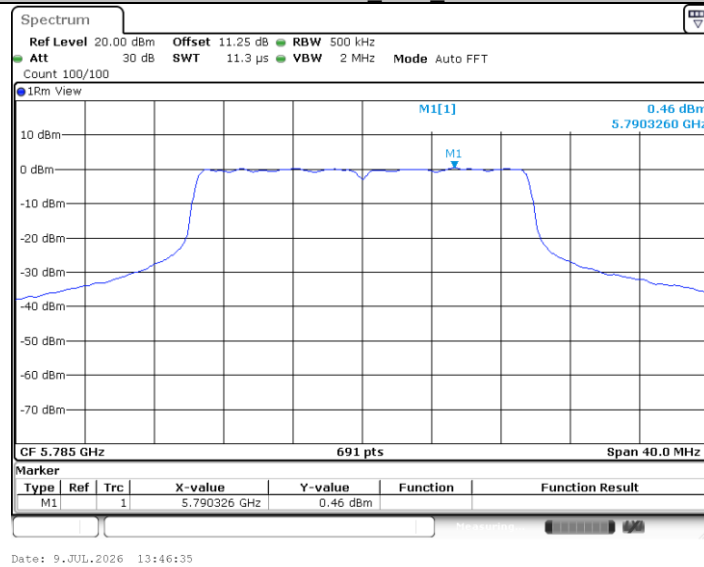
Room 107, 108, 207, 208 of Building A, Room 101 of Building B, No.7, Lanqing 1st Road, Luhua Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax: (86)755-27521011 Http://www.sz-ctc.org.cn

TRF No: CTC-TR-062_A5

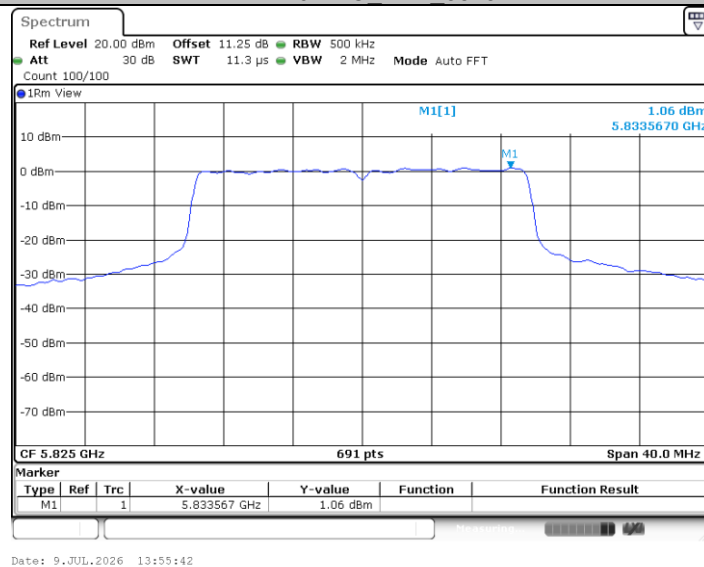
Master TRF : Dated 2026-06-01



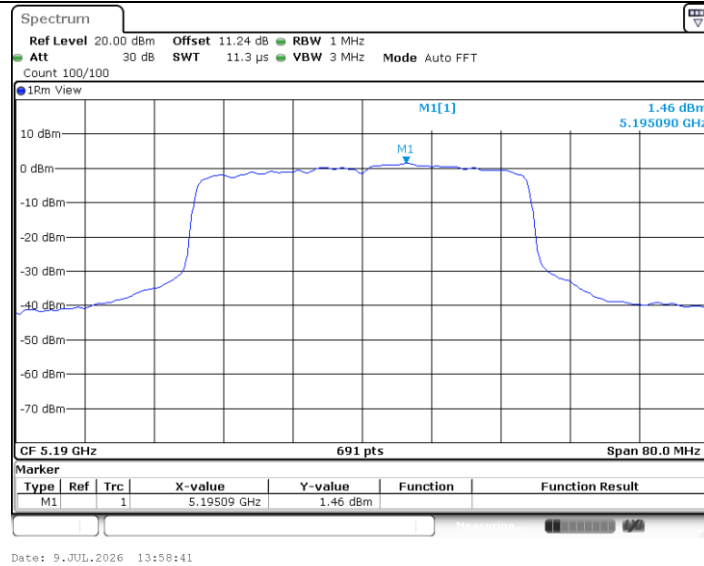
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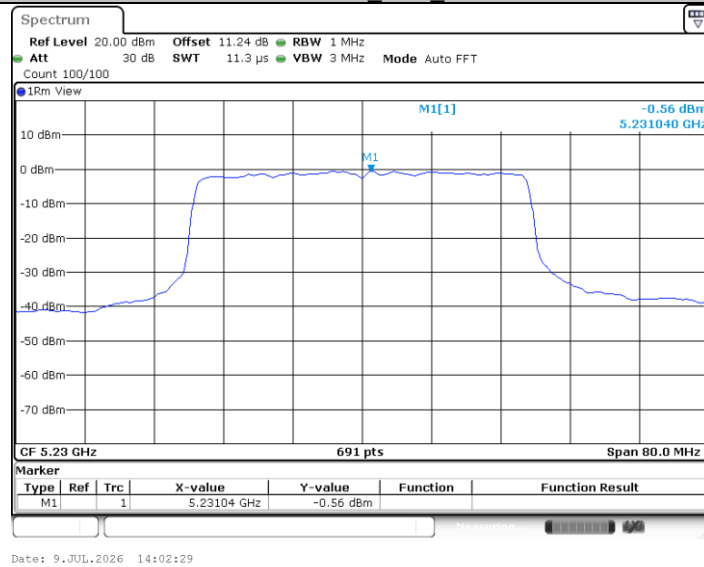
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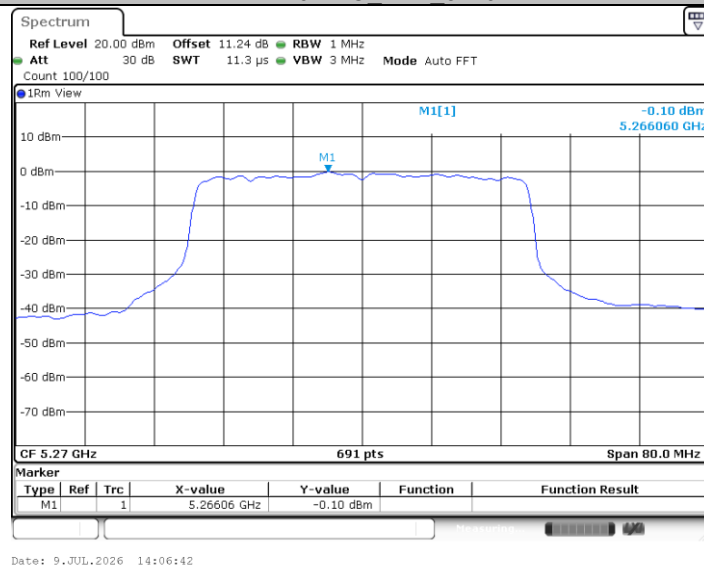
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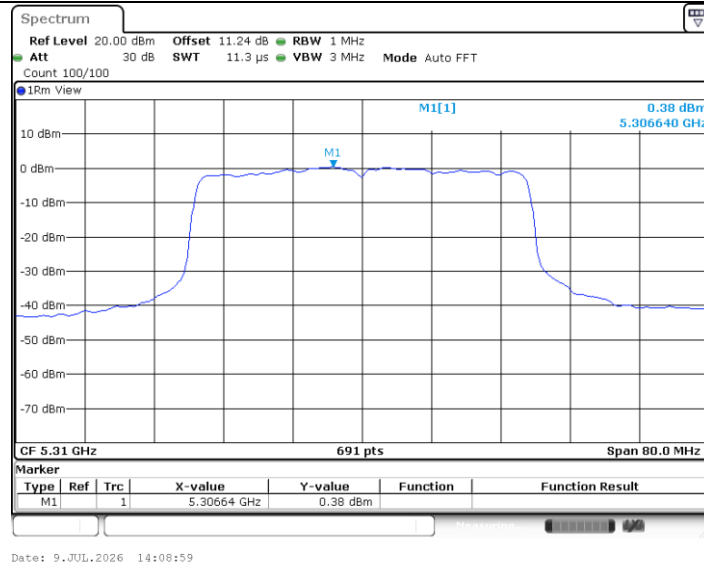
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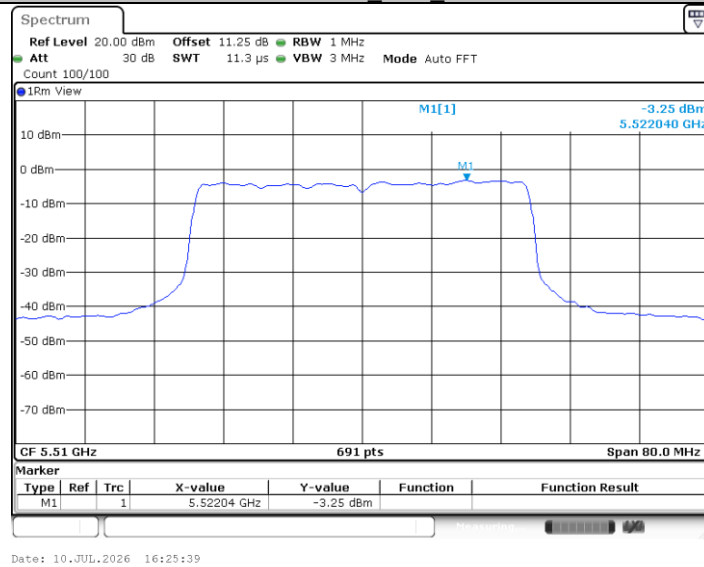
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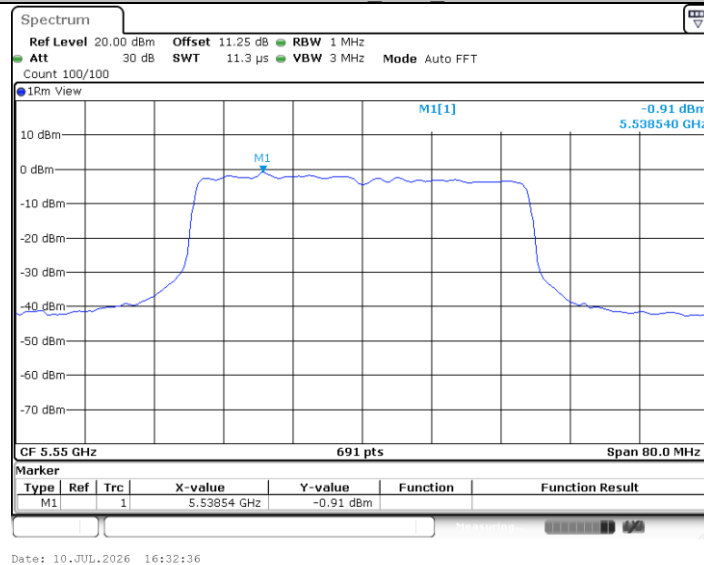
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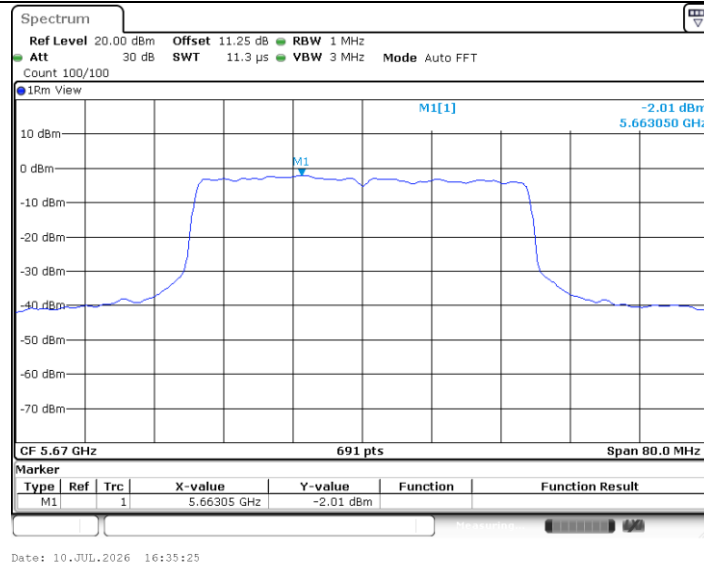
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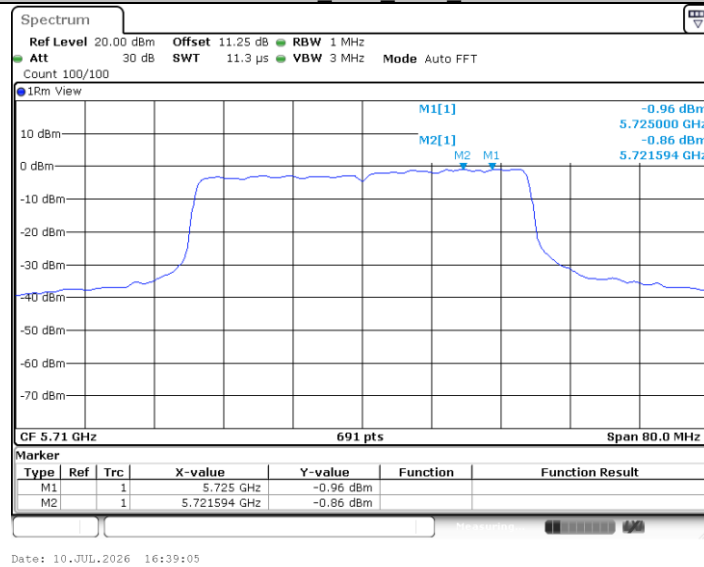
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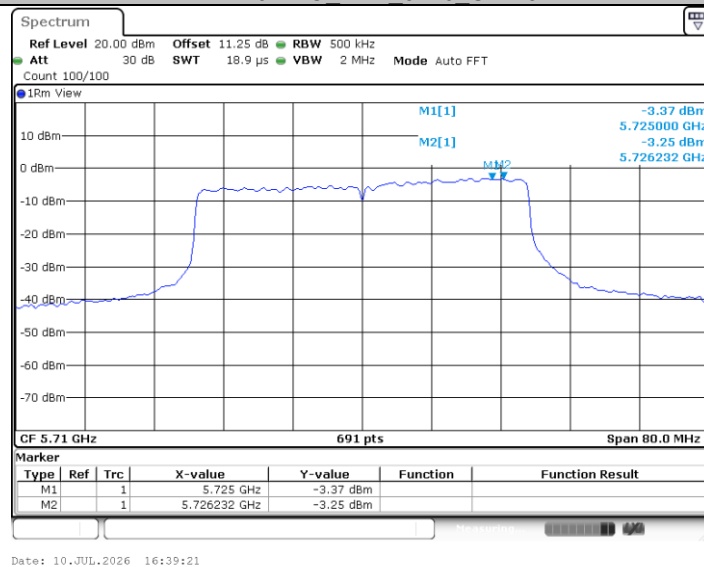
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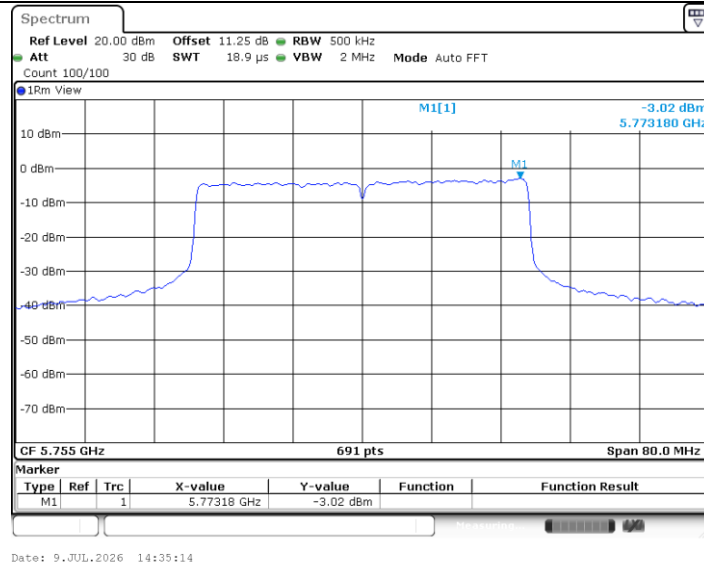
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CTC Laboratories, Inc.

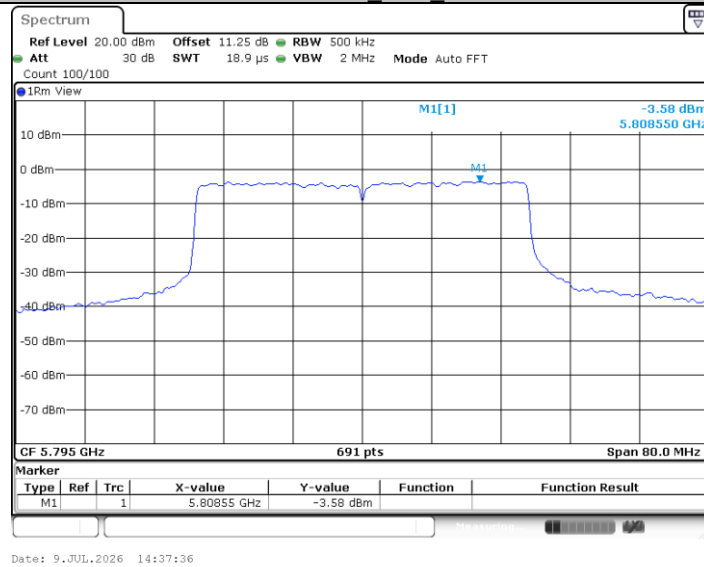
Room 107, 108, 207, 208 of Building A, Room 101 of Building B, No.7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax: (86)755-27521011 Http://www.sz-ctc.org.cn

TRF No: CTC-TR-062_A5

Master TRF : Dated 2026-06-01



11AX40SISO_Ant1_5795



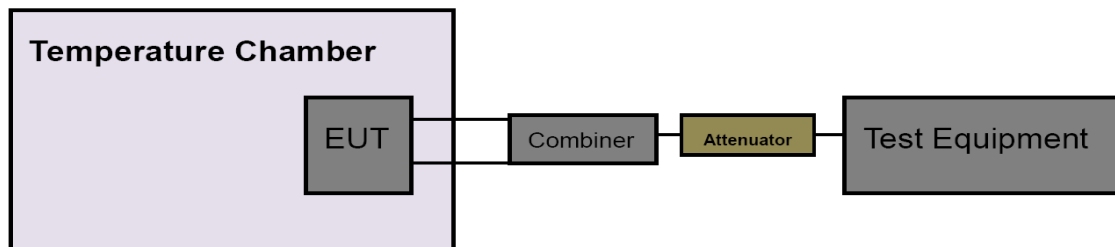
3.7. Frequency Stability

Limit

FCC CFR Title 47 Part 15 Subpart E Section 15.407(g) / RSS-Gen 6.11

Test Item	Limit	Frequency Range (MHz)
Frequency Stability	Specified in the user's manual, the transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification)	5150~5250
		5250~5350
		5500~5700
		5725~5850

Test Configuration



Test Procedure

The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above.

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Set analyzer center frequency to transmitting frequency.
- (3) Set the span to encompass the entire emissions bandwidth (EBW) of the signal.
- (4) Set the RBW to: 8MHz, VBW=8MHz with peak detector and max hold settings.
- (5) The test extreme voltage is to change the primary supply voltage from 4.5V to 5.5V percent of the nominal value.
- (6) Extreme temperature is -10°C~40°C

NOTE: The EUT was set to continuously transmitting in continuously un-modulation transmitting mode.

Test Mode

Please refer to the clause 2.4.

Test Result

TestMode	Antenna	Freq (MHz)	Voltage			Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
			Voltage [Vdc]	Temperature (°C)					
20M	Ant1	5180	NV	NT		-3000.00	-0.579151	20	PASS
			LV	NT		-4000.00	-0.772201	20	PASS
			HV	NT		-4000.00	-0.772201	20	PASS
		5200	NV	NT		-3500.00	-0.673077	20	PASS
			LV	NT		-3500.00	-0.673077	20	PASS
			HV	NT		-3500.00	-0.673077	20	PASS
		5240	NV	NT		-11490.00	-2.192748	20	PASS
			LV	NT		-11490.00	-2.192748	20	PASS
			HV	NT		-11490.00	-2.192748	20	PASS
		5260	NV	NT		-10490.00	-1.994297	20	PASS
			LV	NT		-10490.00	-1.994297	20	PASS
			HV	NT		-10490.00	-1.994297	20	PASS
		5280	NV	NT		-9990.00	-1.892045	20	PASS
			LV	NT		-10490.00	-1.986742	20	PASS
			HV	NT		-10990.00	-2.081439	20	PASS
		5320	NV	NT		-9490.00	-1.783835	20	PASS
			LV	NT		-9490.00	-1.783835	20	PASS
			HV	NT		-9490.00	-1.783835	20	PASS
		5500	NV	NT		-9490.00	-1.725455	20	PASS
			LV	NT		-9490.00	-1.725455	20	PASS
			HV	NT		-9490.00	-1.725455	20	PASS
		5580	NV	NT		-10990.00	-1.969534	20	PASS
			LV	NT		-10490.00	-1.879928	20	PASS
			HV	NT		-10990.00	-1.969534	20	PASS
		5700	NV	NT		-10990.00	-1.928070	20	PASS
			LV	NT		-10990.00	-1.928070	20	PASS
			HV	NT		-11490.00	-2.015789	20	PASS
		5720	NV	NT		-5000.00	-0.874126	20	PASS
			LV	NT		-5000.00	-0.874126	20	PASS
			HV	NT		-5990.00	-1.047203	20	PASS
		5745	NV	NT		-10990.00	-1.912968	20	PASS
			LV	NT		-10990.00	-1.912968	20	PASS
			HV	NT		-10490.00	-1.825936	20	PASS
		5785	NV	NT		-10990.00	-1.899741	20	PASS
			LV	NT		-10490.00	-1.813310	20	PASS
			HV	NT		-10990.00	-1.899741	20	PASS
		5825	NV	NT		-11990.00	-2.058369	20	PASS
			LV	NT		-11990.00	-2.058369	20	PASS
			HV	NT		-11990.00	-2.058369	20	PASS
40M	Ant1	5190	NV	NT		-8990.00	-1.732177	20	PASS
			LV	NT		-8490.00	-1.635838	20	PASS
			HV	NT		-8990.00	-1.732177	20	PASS
		5230	NV	NT		-10990.00	-2.101338	20	PASS
			LV	NT		-10490.00	-2.005736	20	PASS
			HV	NT		-10490.00	-2.005736	20	PASS
		5270	NV	NT		-9490.00	-1.800759	20	PASS
			LV	NT		-9490.00	-1.800759	20	PASS
			HV	NT		-9490.00	-1.800759	20	PASS
		5310	NV	NT		-9990.00	-1.881356	20	PASS
			LV	NT		-9990.00	-1.881356	20	PASS
			HV	NT		-9490.00	-1.787194	20	PASS
		5510	NV	NT		-10490.00	-1.903811	20	PASS
			LV	NT		-9990.00	-1.813067	20	PASS
			HV	NT		-9990.00	-1.813067	20	PASS
		5550	NV	NT		-9490.00	-1.709910	20	PASS
			LV	NT		-9490.00	-1.709910	20	PASS
			HV	NT		-9990.00	-1.800000	20	PASS
		5670	NV	NT		-9990.00	-1.761905	20	PASS
			LV	NT		-10490.00	-1.850088	20	PASS
			HV	NT		-10490.00	-1.850088	20	PASS

CTC Laboratories, Inc.

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		5710	NV	NT	-5990.00	-1.049037	20	PASS
			LV	NT	-5990.00	-1.049037	20	PASS
			HV	NT	-5990.00	-1.049037	20	PASS
		5755	NV	NT	-10990.00	-1.909644	20	PASS
			LV	NT	-10490.00	-1.822763	20	PASS
			HV	NT	-10990.00	-1.909644	20	PASS
		5795	NV	NT	-10990.00	-1.896462	20	PASS
			LV	NT	-10490.00	-1.810181	20	PASS
			HV	NT	-10990.00	-1.896462	20	PASS

Temperature								
TestMode	Antenna	Freq (MHz)	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
20M	Ant1	5180	NV	-10	-4500.00	-0.868726	20	PASS
			NV	0	-4500.00	-0.868726	20	PASS
			NV	10	-4000.00	-0.772201	20	PASS
			NV	20	-4000.00	-0.772201	20	PASS
			NV	30	-4500.00	-0.868726	20	PASS
			NV	40	-3500.00	-0.675676	20	PASS
		5200	NV	-10	-3000.00	-0.576923	20	PASS
			NV	0	-3000.00	-0.576923	20	PASS
			NV	10	-2500.00	-0.480769	20	PASS
			NV	20	-3000.00	-0.576923	20	PASS
			NV	30	-2500.00	-0.480769	20	PASS
			NV	40	-2500.00	-0.480769	20	PASS
		5240	NV	-10	-10990.00	-2.097328	20	PASS
			NV	0	-10990.00	-2.097328	20	PASS
			NV	10	-11490.00	-2.192748	20	PASS
			NV	20	-11490.00	-2.192748	20	PASS
			NV	30	-11490.00	-2.192748	20	PASS
			NV	40	-11490.00	-2.192748	20	PASS
		5260	NV	-10	-10490.00	-1.994297	20	PASS
			NV	0	-10490.00	-1.994297	20	PASS
			NV	10	-10490.00	-1.994297	20	PASS
			NV	20	-10990.00	-2.089354	20	PASS
			NV	30	-10490.00	-1.994297	20	PASS
			NV	40	-10490.00	-1.994297	20	PASS
		5280	NV	-10	-10490.00	-1.986742	20	PASS
			NV	0	-10490.00	-1.986742	20	PASS
			NV	10	-9990.00	-1.892045	20	PASS
			NV	20	-10490.00	-1.986742	20	PASS
			NV	30	-10490.00	-1.986742	20	PASS
			NV	40	-9990.00	-1.892045	20	PASS
		5320	NV	-10	-9990.00	-1.877820	20	PASS
			NV	0	-9990.00	-1.877820	20	PASS
			NV	10	-9990.00	-1.877820	20	PASS
			NV	20	-9990.00	-1.877820	20	PASS
			NV	30	-9490.00	-1.783835	20	PASS
			NV	40	-9990.00	-1.877820	20	PASS
		5500	NV	-10	-9490.00	-1.725455	20	PASS
			NV	0	-9490.00	-1.725455	20	PASS
			NV	10	-9990.00	-1.816364	20	PASS
			NV	20	-9990.00	-1.816364	20	PASS
			NV	30	-9490.00	-1.725455	20	PASS
			NV	40	-9990.00	-1.816364	20	PASS
		5580	NV	-10	-10990.00	-1.969534	20	PASS
			NV	0	-10990.00	-1.969534	20	PASS
			NV	10	-10990.00	-1.969534	20	PASS
			NV	20	-10990.00	-1.969534	20	PASS
			NV	30	-10990.00	-1.969534	20	PASS
			NV	40	-10490.00	-1.879928	20	PASS
		5700	NV	-10	-11490.00	-2.015789	20	PASS
			NV	0	-10990.00	-1.928070	20	PASS
			NV	10	-11490.00	-2.015789	20	PASS
			NV	20	-10990.00	-1.928070	20	PASS

			NV	30	-11490.00	-2.015789	20	PASS
			NV	40	-10990.00	-1.928070	20	PASS
		5720	NV	-10	-5990.00	-1.047203	20	PASS
			NV	0	-5990.00	-1.047203	20	PASS
			NV	10	-6490.00	-1.134615	20	PASS
			NV	20	-5990.00	-1.047203	20	PASS
			NV	30	-5990.00	-1.047203	20	PASS
			NV	40	-6490.00	-1.134615	20	PASS
		5745	NV	-10	-10990.00	-1.912968	20	PASS
			NV	0	-10490.00	-1.825936	20	PASS
			NV	10	-10990.00	-1.912968	20	PASS
			NV	20	-10490.00	-1.825936	20	PASS
			NV	30	-10490.00	-1.825936	20	PASS
			NV	40	-10490.00	-1.825936	20	PASS
		5785	NV	-10	-10990.00	-1.899741	20	PASS
			NV	0	-10990.00	-1.899741	20	PASS
			NV	10	-10490.00	-1.813310	20	PASS
			NV	20	-10990.00	-1.899741	20	PASS
			NV	30	-10490.00	-1.813310	20	PASS
			NV	40	-10990.00	-1.899741	20	PASS
		5825	NV	-10	-11990.00	-2.058369	20	PASS
			NV	0	-11490.00	-1.972532	20	PASS
			NV	10	-11490.00	-1.972532	20	PASS
			NV	20	-11490.00	-1.972532	20	PASS
			NV	30	-11490.00	-1.972532	20	PASS
			NV	40	-11490.00	-1.972532	20	PASS
40M	Ant1	5190	NV	-10	-8990.00	-1.732177	20	PASS
			NV	0	-8990.00	-1.732177	20	PASS
			NV	10	-8990.00	-1.732177	20	PASS
			NV	20	-8990.00	-1.732177	20	PASS
			NV	30	-8990.00	-1.732177	20	PASS
			NV	40	-8990.00	-1.732177	20	PASS
		5230	NV	-10	-10490.00	-2.005736	20	PASS
			NV	0	-10490.00	-2.005736	20	PASS
			NV	10	-10490.00	-2.005736	20	PASS
			NV	20	-10490.00	-2.005736	20	PASS
			NV	30	-10490.00	-2.005736	20	PASS
			NV	40	-10490.00	-2.005736	20	PASS
		5270	NV	-10	-9490.00	-1.800759	20	PASS
			NV	0	-9490.00	-1.800759	20	PASS
			NV	10	-9490.00	-1.800759	20	PASS
			NV	20	-9490.00	-1.800759	20	PASS
			NV	30	-9490.00	-1.800759	20	PASS
			NV	40	-9490.00	-1.800759	20	PASS
		5310	NV	-10	-9490.00	-1.787194	20	PASS
			NV	0	-9990.00	-1.881356	20	PASS
			NV	10	-9990.00	-1.881356	20	PASS
			NV	20	-9490.00	-1.787194	20	PASS
			NV	30	-9990.00	-1.881356	20	PASS
			NV	40	-9490.00	-1.787194	20	PASS
		5510	NV	-10	-10490.00	-1.903811	20	PASS
			NV	0	-9990.00	-1.813067	20	PASS
			NV	10	-10490.00	-1.903811	20	PASS
			NV	20	-9990.00	-1.813067	20	PASS
			NV	30	-9990.00	-1.813067	20	PASS
			NV	40	-9990.00	-1.813067	20	PASS
		5550	NV	-10	-9490.00	-1.709910	20	PASS
			NV	0	-9990.00	-1.800000	20	PASS
			NV	10	-9990.00	-1.800000	20	PASS
			NV	20	-9490.00	-1.709910	20	PASS
			NV	30	-9490.00	-1.709910	20	PASS
			NV	40	-9990.00	-1.800000	20	PASS
		5670	NV	-10	-10490.00	-1.850088	20	PASS
			NV	0	-9990.00	-1.761905	20	PASS
			NV	10	-10490.00	-1.850088	20	PASS
			NV	20	-10490.00	-1.850088	20	PASS

			NV	30	-10490.00	-1.850088	20	PASS
			NV	40	-9990.00	-1.761905	20	PASS
		5710	NV	-10	-5990.00	-1.049037	20	PASS
			NV	0	-5490.00	-0.961471	20	PASS
			NV	10	-5490.00	-0.961471	20	PASS
			NV	20	-5490.00	-0.961471	20	PASS
			NV	30	-5490.00	-0.961471	20	PASS
			NV	40	-5990.00	-1.049037	20	PASS
		5755	NV	-10	-10490.00	-1.822763	20	PASS
			NV	0	-10490.00	-1.822763	20	PASS
			NV	10	-10990.00	-1.909644	20	PASS
			NV	20	-10490.00	-1.822763	20	PASS
			NV	30	-10490.00	-1.822763	20	PASS
			NV	40	-10490.00	-1.822763	20	PASS
		5795	NV	-10	-10990.00	-1.896462	20	PASS
			NV	0	-10490.00	-1.810181	20	PASS
			NV	10	-10990.00	-1.896462	20	PASS
			NV	20	-10990.00	-1.896462	20	PASS
			NV	30	-10490.00	-1.810181	20	PASS
			NV	40	-10490.00	-1.810181	20	PASS

3.8. Antenna Requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C Section 15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

RSS-Gen Issue 5 Section 6.8

The applicant for equipment certification, as per RSP-100, must provide a list of all antenna types that may be used with the licence-exempt transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. Licence-exempt transmitters that have received equipment certification may operate with different types of antennas. However, it is not permissible to exceed the maximum equivalent isotropically radiated power(e.i.r.p.) limits specified in the applicable standard (RSS) for licence-exempt apparatus.

Test Result

The directional gain of the antenna is less than 6dBi, please refer to the EUT internal photographs antenna photo.

3.9. Dynamic Frequency Selection

KDB 905462 Requirement

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	Master Device or Client with Radar Detection	Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar Detection	Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

Limit**1. DFS Detection Thresholds**

Table 3: DFS Detection Thresholds for Master Devices and Client Devices With Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP $\geq$ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm

Note 1: This is the level at the input of the receiver assuming a 0dBi receive antenna.
Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.
Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.

2. DFS Response Requirements

Table 4: DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.

Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.
Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required facilitating a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.
Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

Radar Test Waveforms

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Table 5 Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	$\text{Roundup} \left\{ \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B.

For example if in Short Pulse Radar Type 1 Test B a PRI of 3066 μsec is selected, the number of pulses

would be Round up $\left\{ \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{3066} \right) \right\} = \text{Round up } \{17.2\} = 18$.

Table 5a - Pulse Repetition Intervals Values for Test A

Pulse Repetition Frequency Number	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (Microseconds)
1	1930.5	518
2	1858.7	538
3	1792.1	558
4	1730.1	578
5	1672.2	598
6	1618.1	618
7	1567.4	638
8	1519.8	658
9	1474.9	678

Pulse Repetition Frequency Number	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (Microseconds)
10	1432.7	698
11	1392.8	718
12	1355	738
13	1319.3	758
14	1285.3	778
15	1253.1	798
16	1222.5	818
17	1193.3	838
18	1165.6	858
19	1139	878
20	1113.6	898
21	1089.3	918
22	1066.1	938
23	326.2	3066

Table 6 – Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

The parameters for this waveform are randomly chosen. Thirty unique waveforms are required for the Long Pulse Radar Type waveforms. If more than 30 waveforms are used for the Long Pulse Radar Type waveforms, then each additional waveform must also be unique and not repeated from the previous waveforms.

Table 7 – Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70%	30

For the Frequency Hopping Radar Type, the same Burst parameters are used for each wave form. The hopping sequence is different for each wave form and a 100-length segment is selected from the hopping sequence defined by the following algorithm:

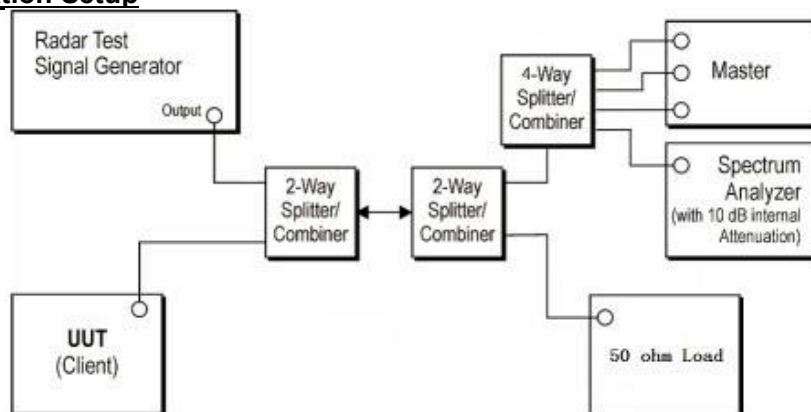
The first frequency in a hopping sequence is selected randomly from the group of 475 integer frequencies from 5250–5724MHz. Next, the frequency that was just chosen is removed from the group and a frequency is randomly selected from the remaining 474 frequencies in the group. This process continues until all 475 frequencies are chosen for the set. For selection of a random frequency, the frequencies remaining within the group are always treated as equally likely.

Calibration of Radar Waveform

Radar Waveform Calibration Procedure

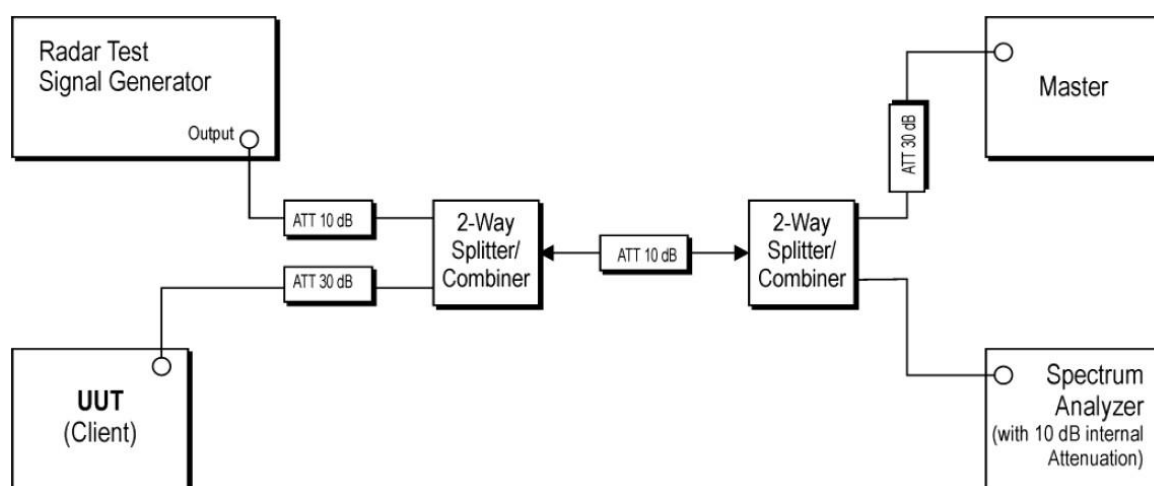
- 1) A 50 ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to place of the master
- 2) The interference Radar Detection Threshold Level is $-62\text{dBm} + 0\text{dBi} + 1\text{dB} = -61\text{dBm}$ that had been taken into account the output power range and antenna gain.
- 3) The following equipment setup was used to calibrate the conducted radar waveform. A vector signal generator was utilized to establish the test signal level for radar type 0. During this process there were no transmissions by either the master or client device. The spectrum analyzer was switched to the zero spans (time domain) at the frequency of the radar waveform generator. Peak detection was used. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3 MHz. The spectrum analyzer had offset -1.0dB to compensate RF cable loss 1.0dB .
- 4) The vector signal generator amplitude was set so that the power level measured at the spectrum analyzer was $-62\text{dBm} + 0\text{dBi} + 1\text{dB} = -61\text{dBm}$. Capture the spectrum analyzer plots on short pulse radar waveform.

Conducted Calibration Setup

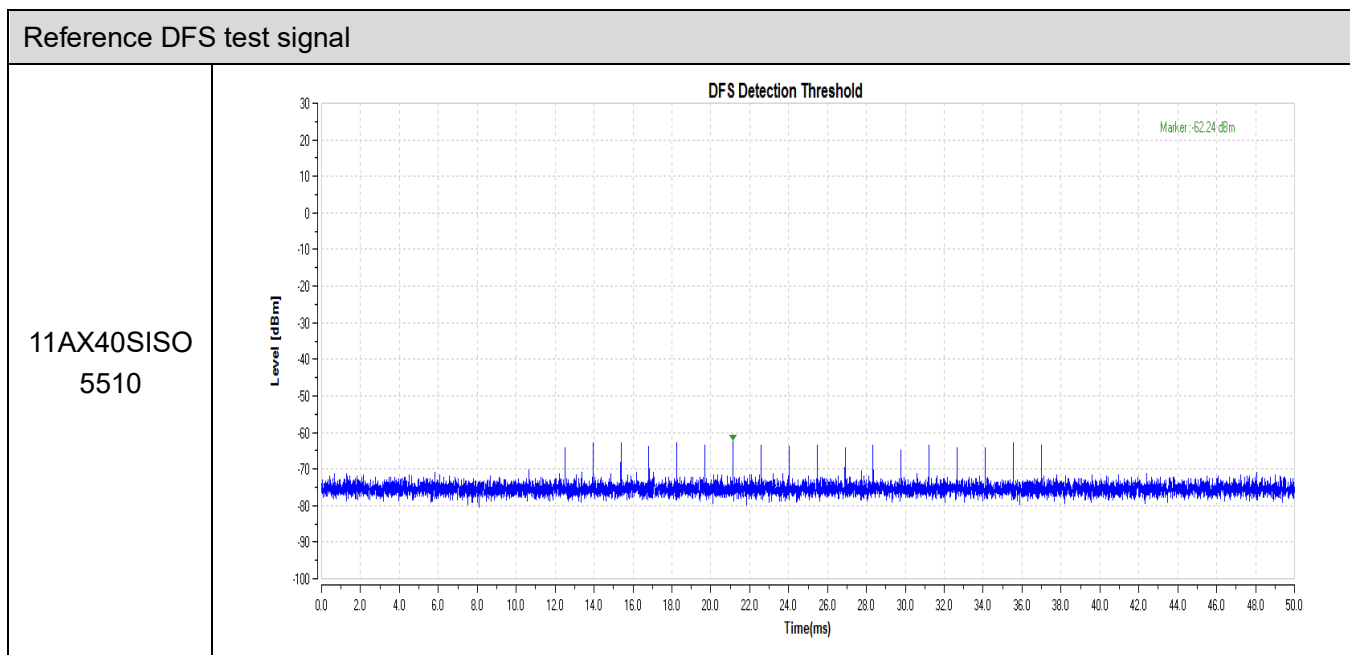


Test Configuration

Setup for Client with injection at the Master



Radar Waveform Calibration Result



Test Procedure

1. The radar pulse generator is setup to provide a pulse at frequency that the master and client are operating. A type 0 radar pulse with a 1us pulse width and a 1428us PRI is used for the testing.
2. The vector signal generator is adjusted to provide the radar burst (18 pulses) at the level of approximately -61dBm at the antenna port of the master device
3. A trigger is provided from the pulse generator to the DFS monitoring system in order to capture the traffic and the occurrence of the radar pulse.
4. EUT will associate with the master at channel. The file "iperf.exe" specified by the FCC is streamed from the PC 2 through the master and the client device to the PC 1 and played in full motion video using Media Player Classic Ver. 6.4.8.6 in order to properly load the network for the entire period of the test.
5. When radar burst with a level equal to the DFS Detection Threshold +1dB is generated on the operating channel of the U-NII device. At time T0 the radar waveform generator sends a burst of pulse of the radar waveform at Detection Threshold +1dB.
6. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel Measure and record the transmissions from the UUT during the observation time (Channel Move Time). One 15 seconds plot is reported for the Short Pulse Radar Type 0. The plot for the Short Pulse Radar Types start at the end of the radar burst. The Channel Move Time will be calculated based on the zoom in 600ms plot of the Short Pulse Radar Type
7. Measurement of the aggregate duration of the Channel Closed Transmission Time method. With the spectrum analyzer set to zero span tuned to the center frequency of the EUT operating channel at the radar simulated frequency, peak detection, and max hold, the dwell time per bin is given by: $Dwell (0.3ms) = S (12000ms) / B (4000)$; where Dwell is the dwell time per spectrum analyzer sampling bin, S is sweep time and B is the number of spectrum analyzer sampling bins. An upper bound of the aggregate duration of the intermittent control signals of Channel Closing Transmission Time is calculated by: $C (ms) = N \times Dwell (0.3ms)$; where C is the Closing Time, N is the number of spectrum analyzer sampling bins (intermittent control signals) showing a U-NII transmission and Dwell is the dwell time per bin.
8. Measurement the EUT for more than 30 minutes following the channel move time to verify that no transmission or beacons occur on this channel.

Test Mode

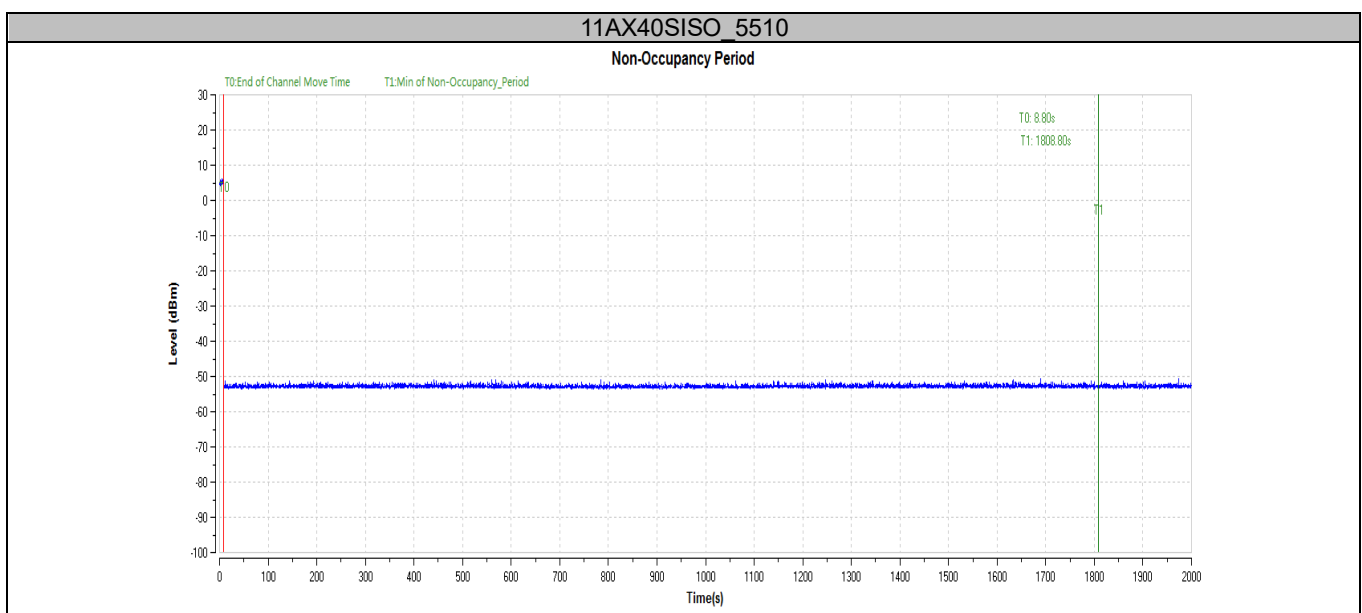
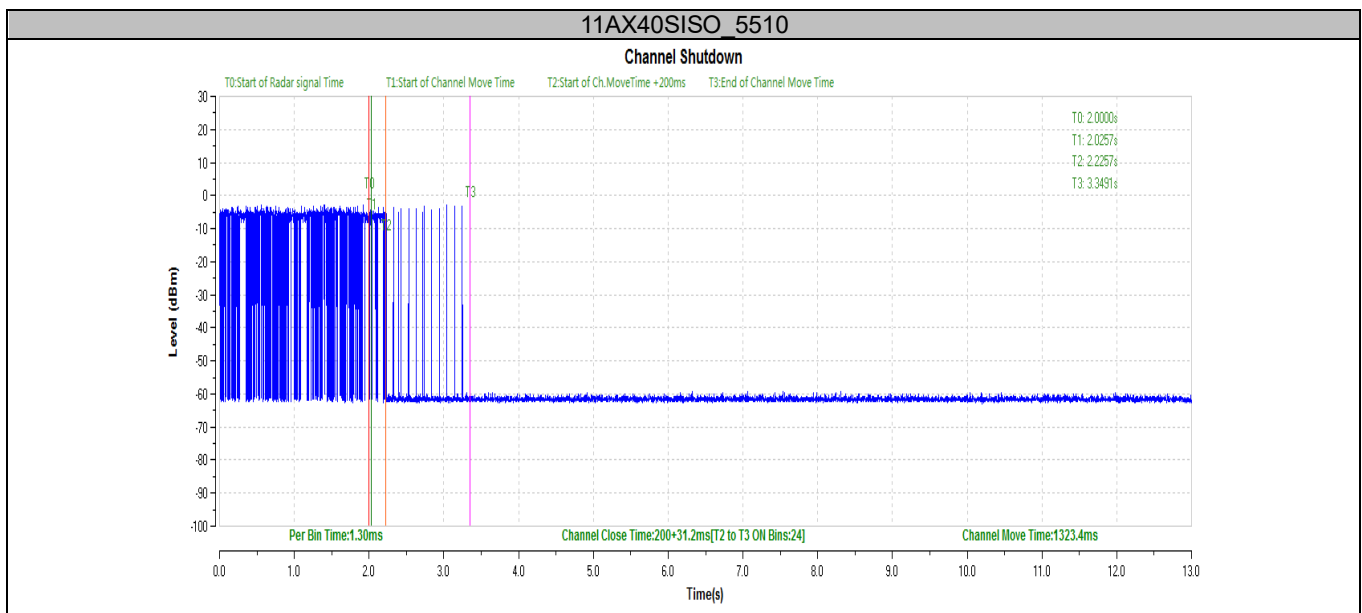
Please refer to the clause 2.4.

Test Result

The product in this report belongs to Client Without Radar Detection.

TestMode	Frequency [MHz]	CCTT [ms]	Limit[ms]	CMT [ms]	Limit[ms]	Verdict
11AX40SISO	5510	200+31.2	200+60	1323.4	10000	PASS

TestMode	Frequency [MHz]	Result	Limit[s]	Verdict
11AX40SISO	5510	see test graph	≥1800	PASS



EN 301893 Requirement

Radar detection is required when operating on channels whose nominal bandwidth falls partly or completely within the frequency ranges 5 250 MHz to 5 350 MHz or 5 470 MHz to 5 725 MHz. This requirement applies to all types of RLAN devices regardless of the type of communication between these devices.

Table 5: Applicability of DFS requirements

Requirement	DFS operational mode		
	Primary device	Secondary device without radar detection (see table D.2, note 2)	Secondary device with radar detection (see table D.2, note 2)
CAC	Required	Not required	Required (see note 2)
Off-channel CAC (see note 1)	Required	Not required	Required (see note 2)
In-service monitoring	Required	Not required	Required
Channel shutdown	Required	Required	Required
Non-occupancy period	Required	Not required	Required
Uniform spreading	Required	Not required	Not required
NOTE 1: If implemented.			
NOTE 2: A secondary device with radar detection is not required to perform a CAC or off-channel CAC at initial use of a channel but only before returning to the use of a channel where it has detected a radar signal by in-service monitoring. Where the secondary device with radar detection is under the control of its primary device and does not start transmissions on the channel until connected to that primary device, then the secondary device with radar detection does not have to perform a CAC or off-channel CAC and may rely on the CAC performed by the primary device to enable in-service monitoring.			

Table D.1: DFS requirement values

Parameter	Value
Channel Availability Check (CAC) time	60 s (see note 1)
Minimum off-channel CAC time	6 minutes (see note 2)
Maximum off-channel CAC time	4 hours (see note 2)
Channel move time	10 s
Channel closing transmission time	1 s
Non-occupancy period	30 minutes
NOTE 1: For channels whose nominal channel bandwidth falls completely or partly within the band 5 600 MHz to 5 650 MHz, the CAC time shall be 10 minutes.	
NOTE 2: For channels whose nominal channel bandwidth falls completely or partly within the band 5 600 MHz to 5 650 MHz, the off-channel CAC time shall be within the range 1 hour to 24 hours.	

Table D.2: Radar detection threshold

Power Spectral Density (PSD) (dBm/MHz)	Radar detection threshold (dBm) (see note 1 and note 2)
10	-62
NOTE 1: This is the level at the input of the receiver of an RLAN device with a maximum PSD of 10 dBm/MHz and assuming a 0 dBi receive antenna. For devices employing a different PSD and/or a different receive antenna assembly gain G (dBi), the radar detection threshold at the receiver input follows the following relationship: $\text{radar detection threshold (dBm)} = -62 + 10 \cdot \text{PSD (dBm/MHz)} + G \text{ (dBi)}.$ However, the radar detection threshold shall not be less than -64 dBm assuming a 0 dBi receive antenna gain.	
NOTE 2: Secondary devices with a maximum RF output power of less than or equal to 23 dBm EIRP do not have to implement radar detection unless these devices are used in fixed outdoor point-to-point or fixed outdoor point-to-multipoint applications (see clause 4.2.6.1.3).	

Table D.3: Parameters of the reference DFS test signal

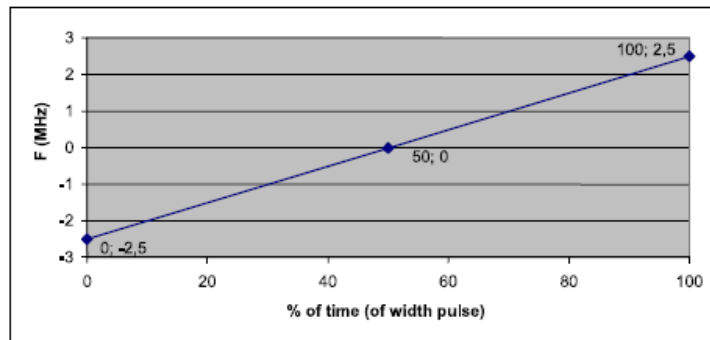
Pulse width W (μ s)	PRF (PPS)	Pulses Per Burst (PPB)
1	700	18

Table D.4: Parameters of radar test signals

Radar test signal (see note 1 to note 3)	Pulse width W (μ s)		PRF (PPS)		Number of different PRFs	PPB for each PRF (see note 5)
	Min	Max	Min	Max		
1	0,5	5	200	1 000	1	10 (see note 6)
2	0,5	15	200	1 600	1	15 (see note 6)
3	0,5	15	2 300	4 000	1	25
4	20	30	2 000	4 000	1	20
5	0,5	2	300	400	2/3	10 (see note 6)
6	0,5	2	400	1 200	2/3	15 (see note 6)

NOTE 1: Radar test signal 1 to signal 4 are signals with constant PRF (see figure D.1). These radar test signals are intended to simulate also radars using a packet-based staggered PRF (see figure D.2).

NOTE 2: Radar test signal 4 is a modulated radar test signal. The modulation is a chirp modulation with a $\pm 2,5$ MHz frequency deviation as shown in the following graph.



NOTE 3: Radar test signal 5 and radar test signal 6 are signals with single pulse-based staggered PRF using 2 or 3 different PRF values. For radar test signal 5, the difference between the PRF values chosen shall be between 20 PPS and 50 PPS. For radar test signal 6, the difference between the PRF values chosen shall be between 80 PPS and 400 PPS (see figure D.3).

NOTE 4: Apart from off-channel CAC testing, the radar test signals shall only contain a single burst of pulses (see figure D.1, figure D.3 and figure D.4). For off-channel CAC testing, repetitive bursts shall be used for the total duration of the test (see figure D.2 and figure D.5 (see also clause 4.2.6.2.3, clause 5.4.8.2.1.4.2 and clause 5.4.8.2.1.4.3)).

NOTE 5: The total number of pulses in a burst is equal to the number of pulses for a single PRF multiplied by the number of different PRFs used.

NOTE 6: For the CAC and off-channel CAC requirements, the minimum number of pulses (for each PRF) for any of the radar test signals to be detected in the band 5 600 MHz to 5 650 MHz shall be 18.

Table D.5: Detection probability

Parameter	Detection probability (P_d) (see note)	
	Channels whose nominal channel bandwidth falls partly or completely within the 5 600 MHz to 5 650 MHz band	Other channels
CAC, off-channel CAC	99,99 %	60 %
In-service monitoring	60 %	60 %
NOTE: P_d gives the probability of detection per radar test signal and represents a minimum level of detection performance under defined conditions.		

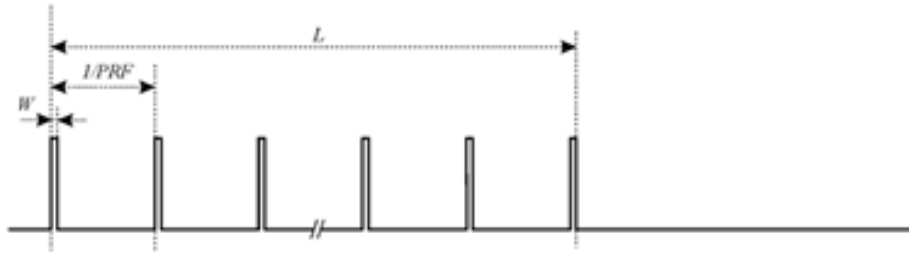


Figure D.1: General structure of a single-burst radar test signal with constant PRF

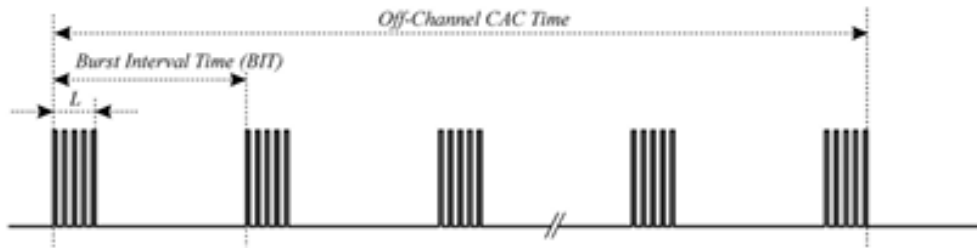


Figure D.2: General structure of a multi-burst radar test signal with constant PRF

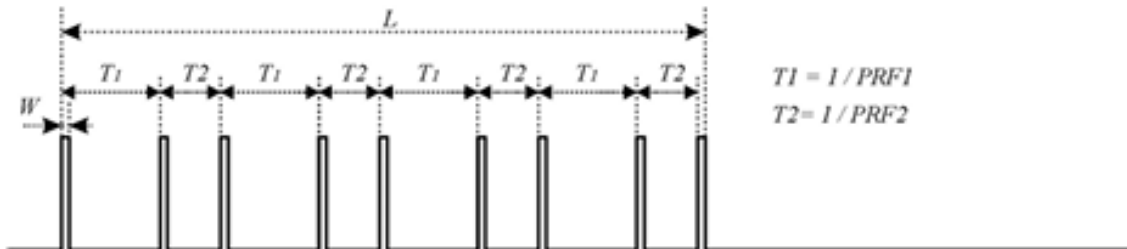


Figure D.3: General structure of a single-burst radar test signal with single pulse-based staggered PRF

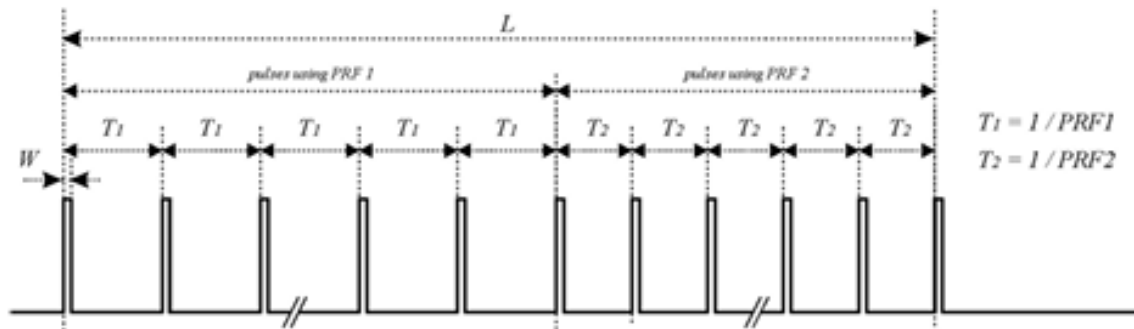


Figure D.4: General structure of a single-burst radar test signal with packet-based staggered PRF

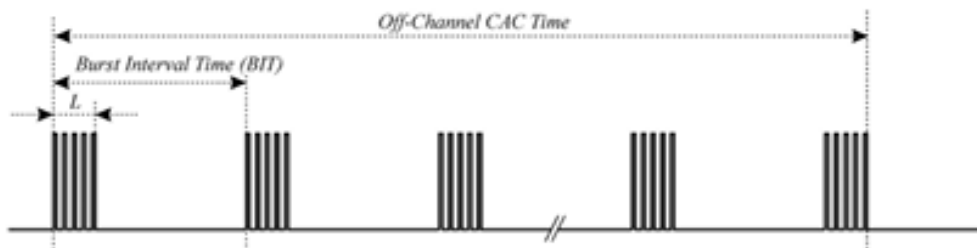


Figure D.5: General structure of a multi-burst radar test signal with packet-based staggered PRF

Conducted Calibration Setup

Setup A is a setup in which the UUT is an RLAN device operating as primary device. Radar test signals are injected into the UUT. This setup also contains an RLAN device operating as secondary device without radar detection and which is associated with the UUT.

Figure 8 shows an example for setup A. The setup used shall be documented in the test report.

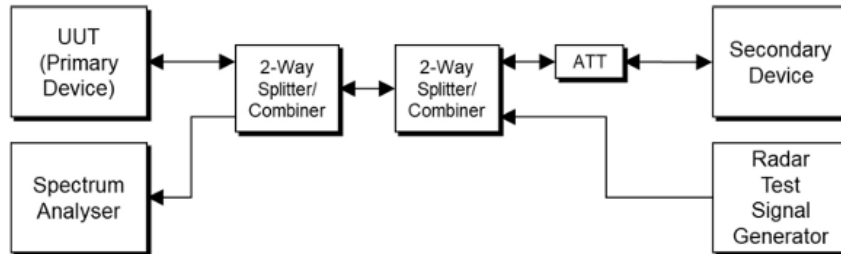


Figure 8: Setup A

Setup B is a setup in which the UUT is an RLAN device operating as secondary device with or without radar detection. This setup also contains an RLAN device operating as primary device. The radar test signals are injected into the primary device. The UUT (secondary device) is associated with the primary device.

Figure 9 shows an example for setup B. When the UUT is a secondary device with radar detection, the value of the attenuator shall be sufficient to prevent radar detection by the secondary device. The setup used shall be documented in the test report.

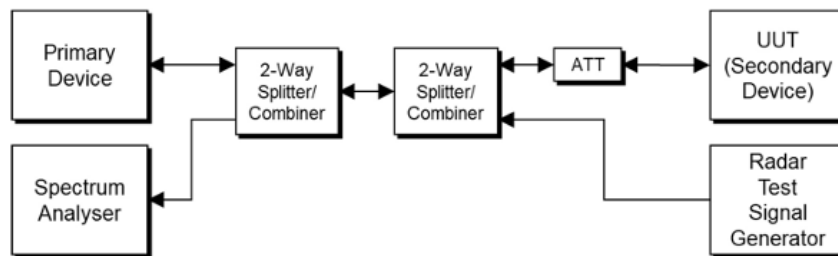


Figure 9: Setup B

The UUT is an RLAN device operating as secondary device with radar detection. Radar test signals are injected into the secondary device. This setup also contains an RLAN device operating as primary device. The UUT (secondary device) is associated with the primary device.

Figure 10 shows an example for setup C. The value of the attenuator shall be sufficient to prevent radar detection by the primary device. The setup used shall be documented in the test report.

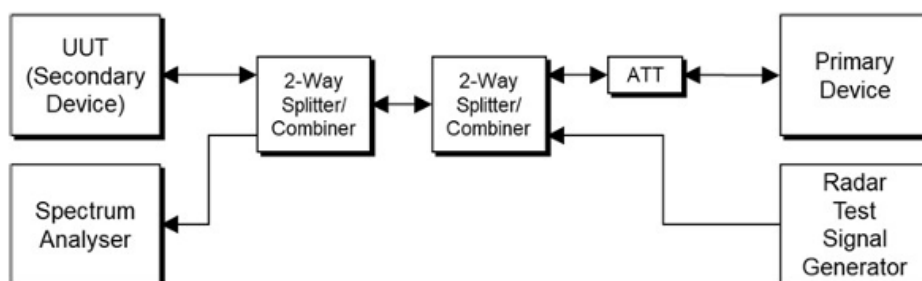
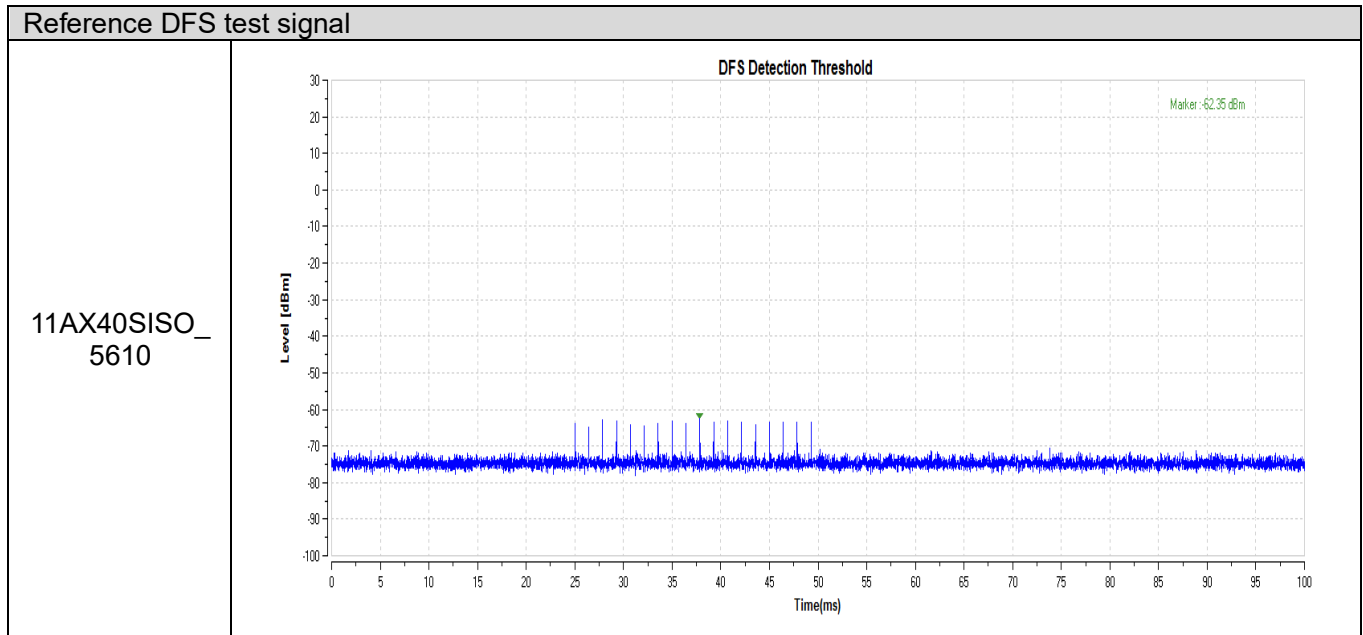


Figure 10: Setup C

Radar Waveform Calibration Result



Test Procedure

5600MHz-5650MHz refer to ETSI EN 301 893 Sub-clause 5.4.8.2.1.6 for the measurement method

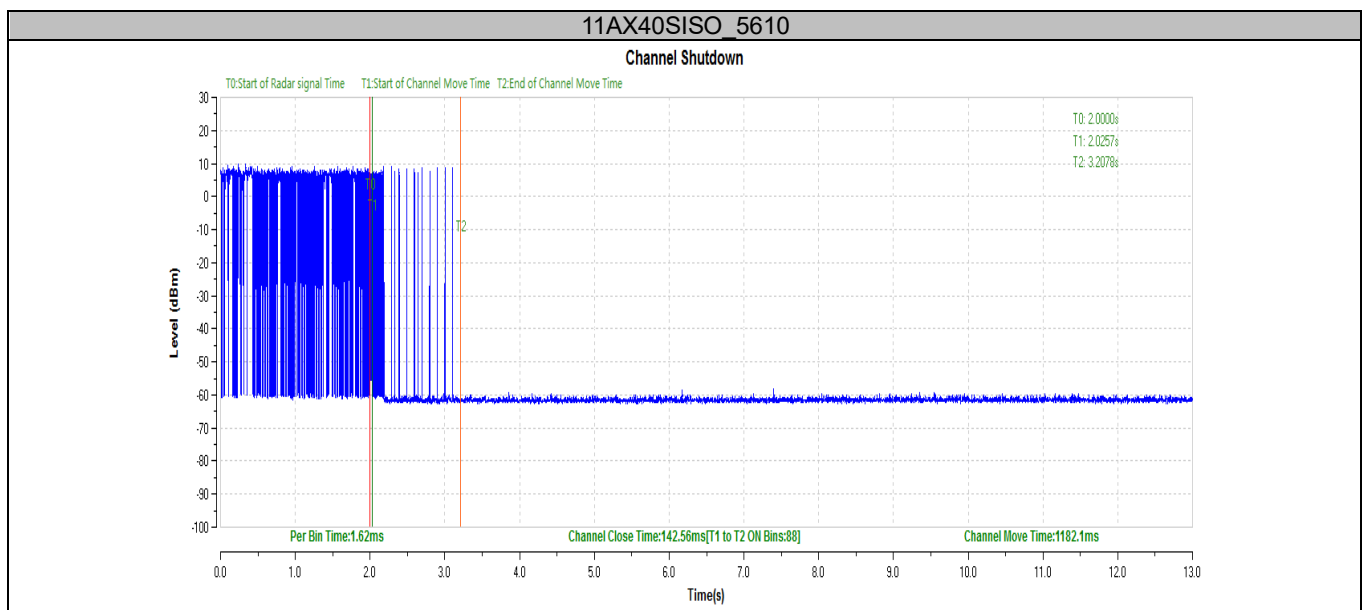
Test Mode

Please refer to the clause 2.4.

Test Result

The product in this report belongs to Secondary device without radar detection.

TestMode	Frequency [MHz]	CCTT [ms]	Limit[ms]	CMT [ms]	Limit[ms]	Verdict
11AX40SISO	5610	142.56	1000	1182.1	10000	PASS



*****THE END OF REPORT*****

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