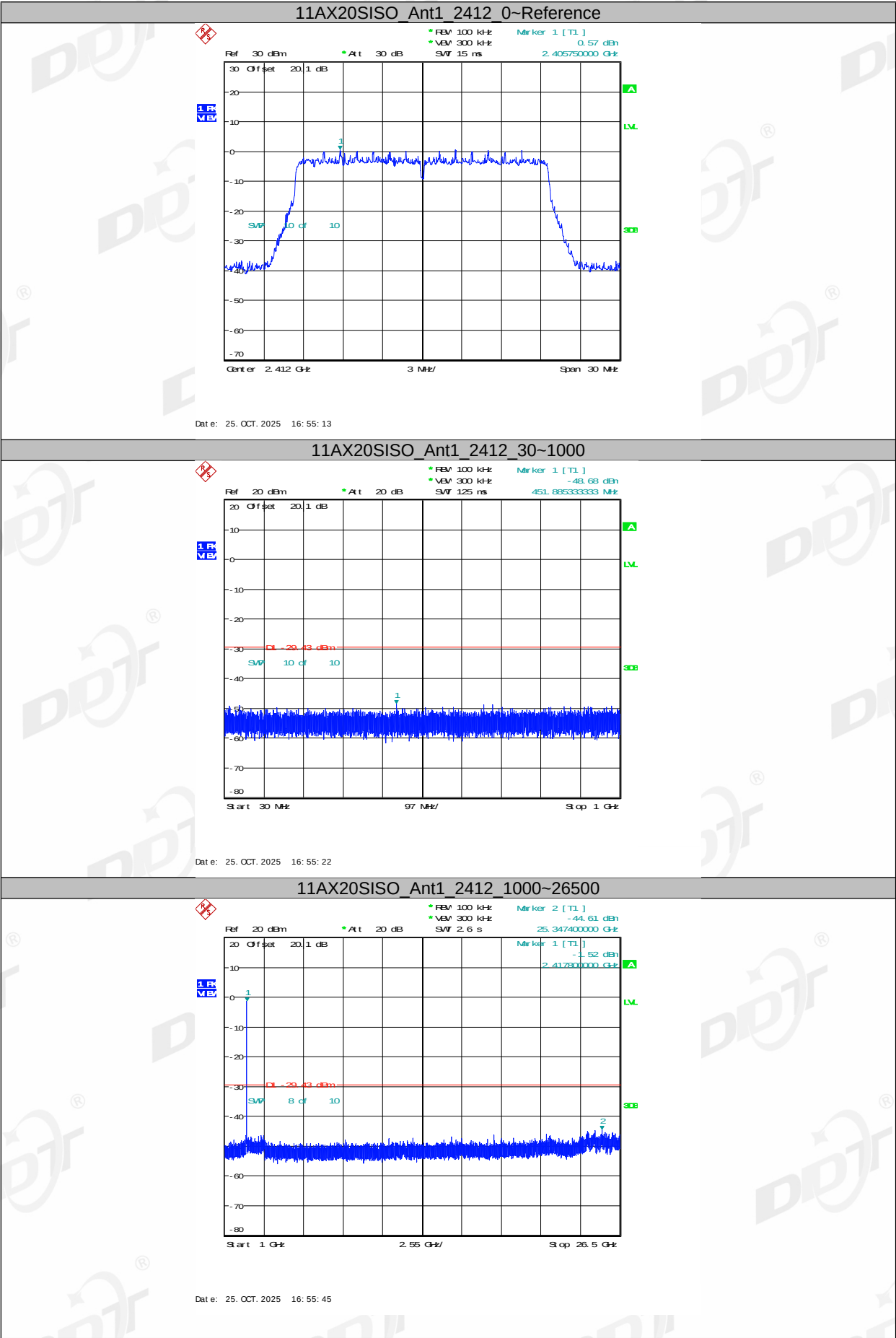




11AX20SISO_Ant1_2412_1000~26500

Ref 20 dBm

Att 20 dB

RBW 100 kHz

VBW 300 kHz

SWF 2.6 s

Marker 2 [T1]

-44.61 dBm

25.347400000 GHz

Marker 1 [T1]

-1.52 dBm

2.412801000 GHz

20

20.1 dB

10

0

-10

-20

-30

-40

-50

-60

-70

-80

1

8 dB

10

30

20

10

0

-10

-20

-30

-40

-50

-60

-70

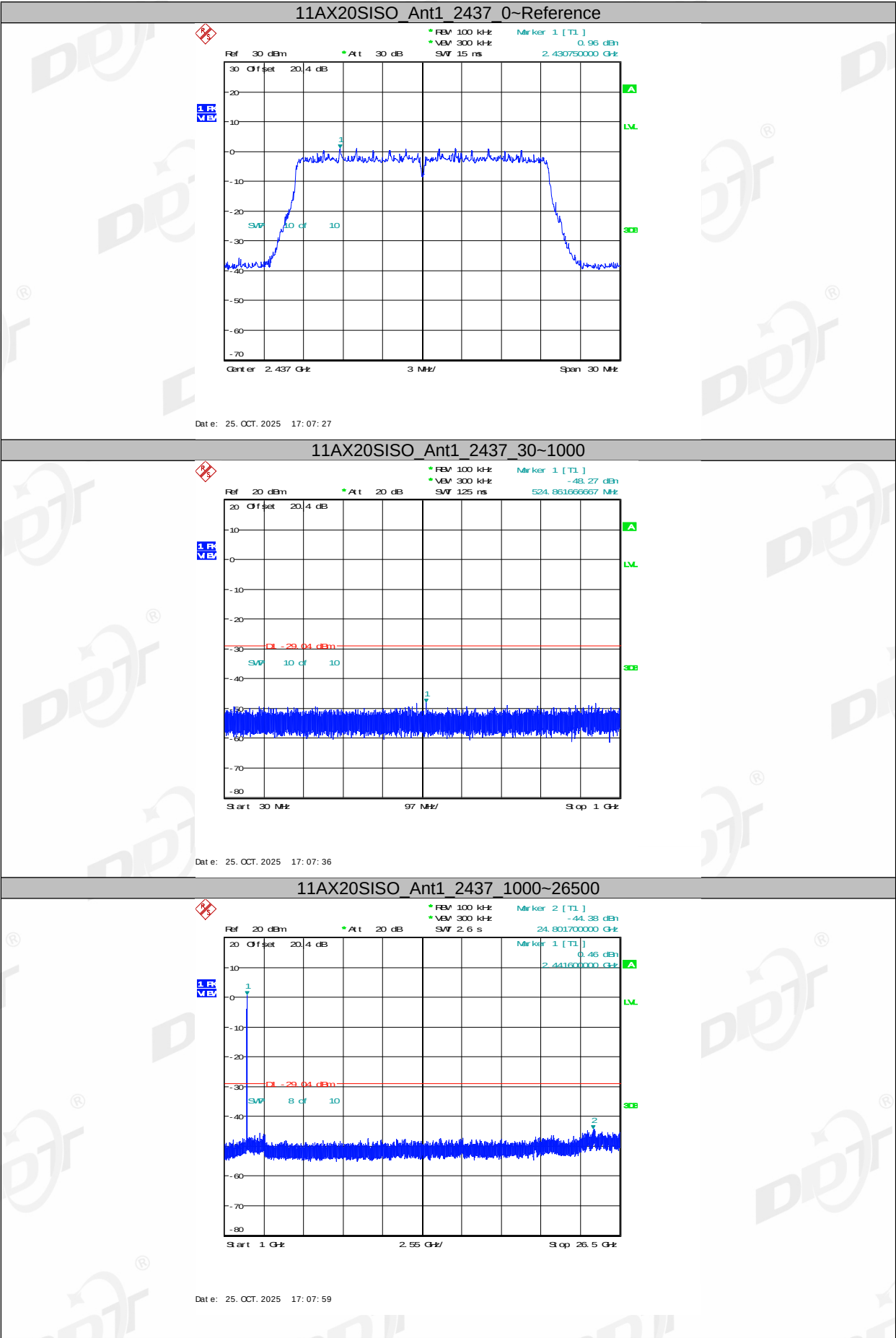
-80

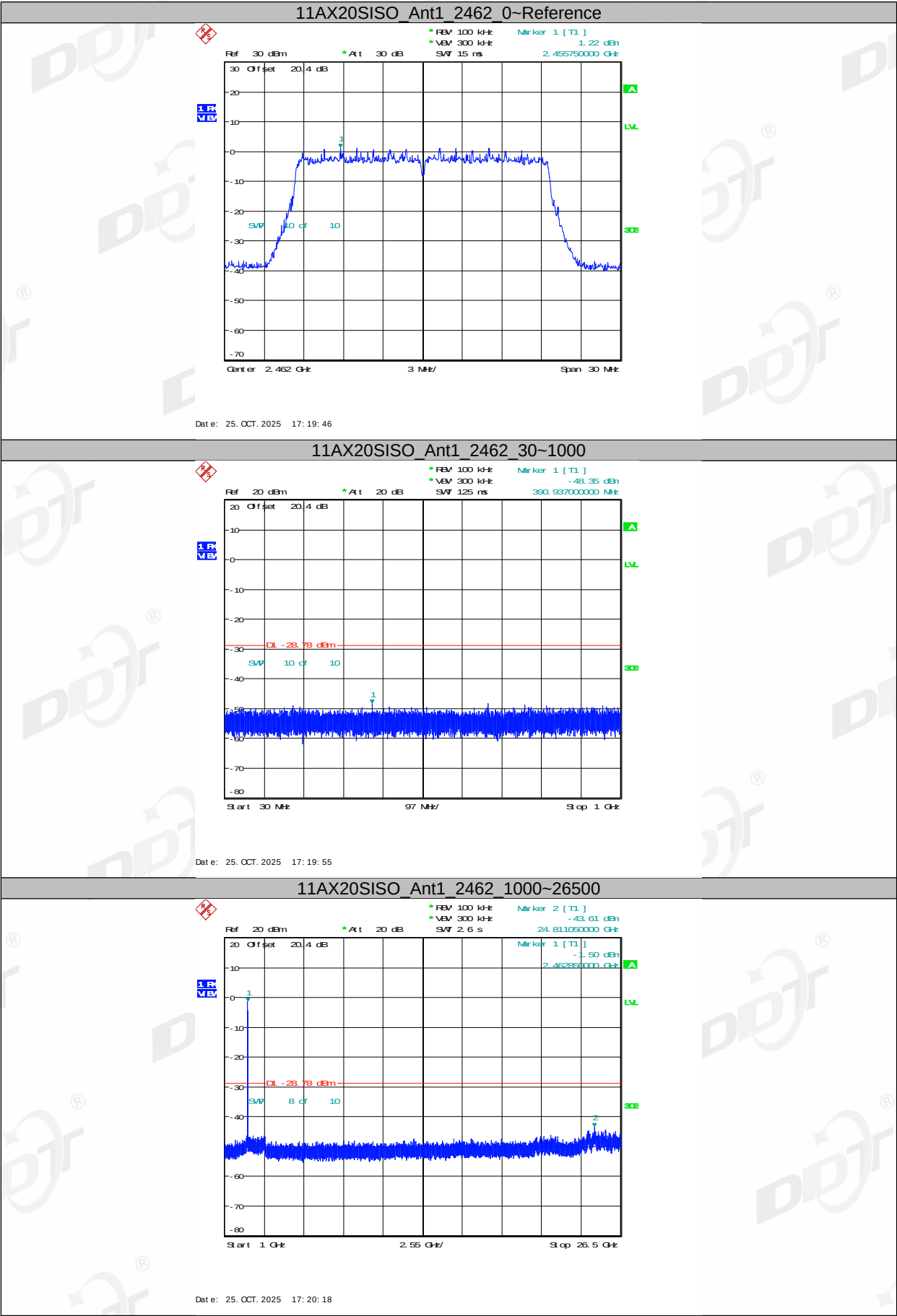
Start 1 GHz

2.55 GHz

Stop 26.5 GHz

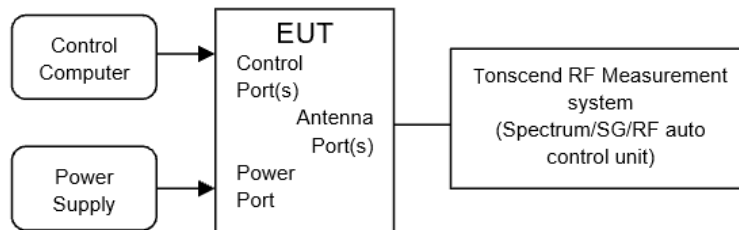
Date: 25. OCT. 2025 16:55:45





10. Duty Cycle

10.1. Block diagram of test setup



10.2. Limit

Just for Report.

10.3. Test procedure

- (1) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, The cable loss and attenuator loss have been put into spectrum analyzer as amplitude offset.

set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the middle hopping channel.

Resolution BW: 10 MHz.

Video BW: 10 MHz.

Span: Zero span.

Detector: Peak.

Trace Mode: Clear Write.

Sweep: Video Trigger

- (2) When the trace is complete, measure the sending time of 1 burst and the duty cycle of 1 burst cycle.

- (3) Calculate dwell time follow below formula:

Duty cycle= Pulse's on time / Burst cycle

10.4. Test result

Test Engineer:	Wayne Huang	Test Site:	RF Measurement System 1# RF Measurement System 4#
Ambient Condition:	24.4℃,47.3%RH-25.6℃,45.8%RH	Test Date:	2025.10.25-2025.12.10
Test Power Supply:	DC 12V	Sample Number:	S25060926-001

PCB B:

Test Mode	Antenna	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11B	Ant1	2412	8.43	8.52	98.94
		2437	8.44	8.54	98.83
		2462	8.43	8.52	98.94
11G	Ant1	2412	1.40	1.50	93.33
		2437	1.41	1.51	93.38
		2462	1.41	1.51	93.38
11N20SISO	Ant1	2412	1.31	1.41	92.91
		2437	1.32	1.42	92.96
		2462	1.31	1.41	92.91
11AX20SISO	Ant1	2412	1.03	1.13	91.15
		2437	1.03	1.13	91.15
		2462	1.03	1.13	91.15

Test Mode	Antenna	Frequency [MHz]	Ru Size	Ru Index	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11AX20SISO	Ant1	2412	26Tone	RU0	2.89	3.91	73.91
				RU4	2.90	3.90	74.36
				RU8	2.90	3.91	74.17
			52Tone	RU37	1.48	2.48	59.68
				RU39	1.48	2.48	59.68
				RU40	1.48	2.48	59.68
			106Tone	RU53	0.29	0.44	65.91
				RU54	0.29	0.44	65.91

		2437	26Tone	RU0	2.89	3.90	74.10
				RU4	2.90	3.91	74.17
				RU8	2.90	3.90	74.36
			52Tone	RU37	1.46	2.48	58.87
				RU39	1.48	2.49	59.44
				RU40	1.48	2.48	59.68
		2462	106Tone	RU53	0.29	0.44	65.91
				RU54	0.29	0.44	65.91
			26Tone	RU0	2.89	3.90	74.10
				RU4	2.90	3.90	74.36
				RU8	2.90	3.91	74.17
			52Tone	RU37	1.48	2.48	59.68
				RU39	1.48	2.48	59.68
				RU40	1.48	2.49	59.44
			106Tone	RU53	0.29	0.44	65.91
				RU54	0.29	0.44	65.91

PCB A:

Test Mode	Antenna	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11B	Ant1	2412	8.42	8.51	98.94
		2437	8.42	8.52	98.83
		2462	8.42	8.52	98.83
11G	Ant1	2412	1.40	1.50	93.33
		2437	1.40	1.50	93.33
		2462	1.40	1.50	93.33
11N20SISO	Ant1	2412	1.31	1.41	92.91
		2437	1.31	1.41	92.91
		2462	1.31	1.41	92.91
11AX20SISO	Ant1	2412	1.02	1.12	91.07

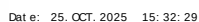
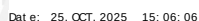
		2437	1.02	1.12	91.07
		2462	1.02	1.12	91.07

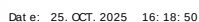
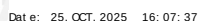
Test Mode	Antenna	Frequency [MHz]	Ru Size	Ru Index	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11AX20SISO	Ant1	2412	26Tone	RU0	2.90	3.90	74.36
				RU4	2.90	3.90	74.36
				RU8	2.90	3.90	74.36
			52Tone	RU37	1.48	2.48	59.68
				RU39	1.48	2.49	59.44
				RU40	1.48	2.48	59.68
			106Tone	RU53	0.29	0.44	65.91
				RU54	0.29	0.45	64.44
		2437	26Tone	RU0	2.88	3.90	73.85
				RU4	2.90	3.90	74.36
				RU8	2.90	3.90	74.36
			52Tone	RU37	1.49	2.49	59.84
				RU39	1.48	2.48	59.68
				RU40	1.48	2.48	59.68
			106Tone	RU53	0.29	0.44	65.91
				RU54	0.29	0.45	64.44
		2462	26Tone	RU0	2.90	3.91	74.17
				RU4	2.90	3.91	74.17
				RU8	2.89	3.90	74.10
			52Tone	RU37	1.48	2.48	59.68
				RU39	1.49	2.49	59.84
				RU40	1.49	2.49	59.84
			106Tone	RU53	0.29	0.44	65.91
				RU54	0.29	0.44	65.91

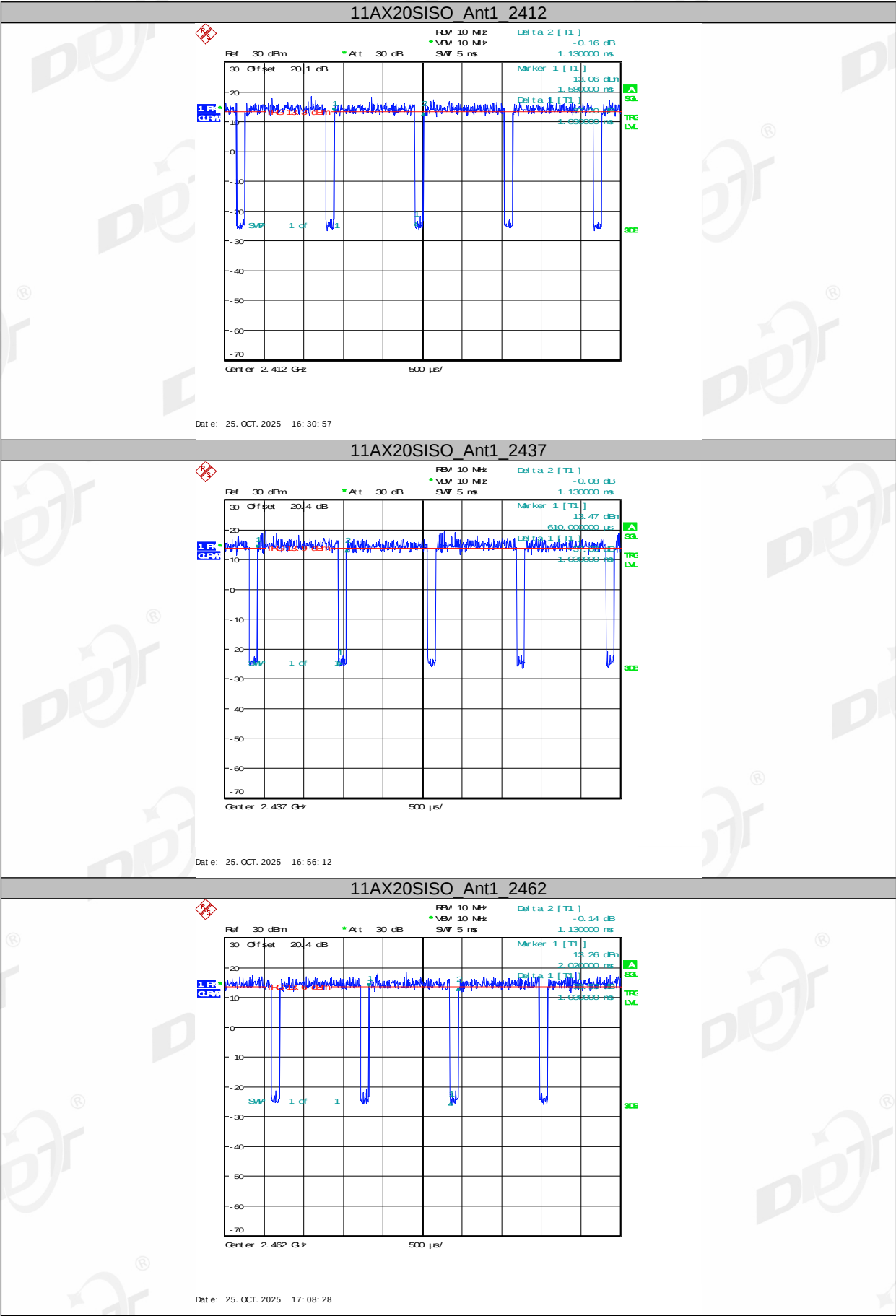
10.5. Test graphs

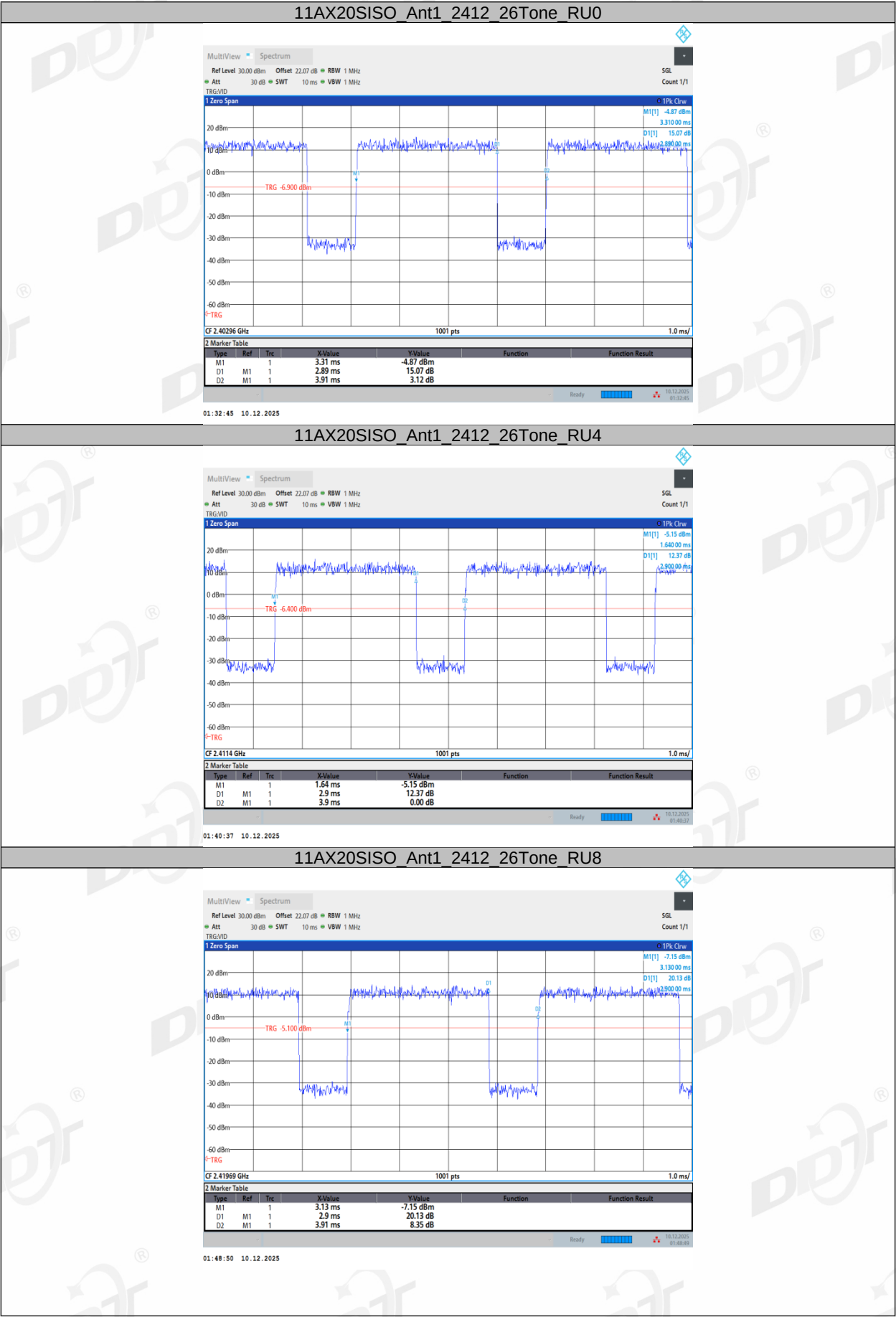
PCB B:







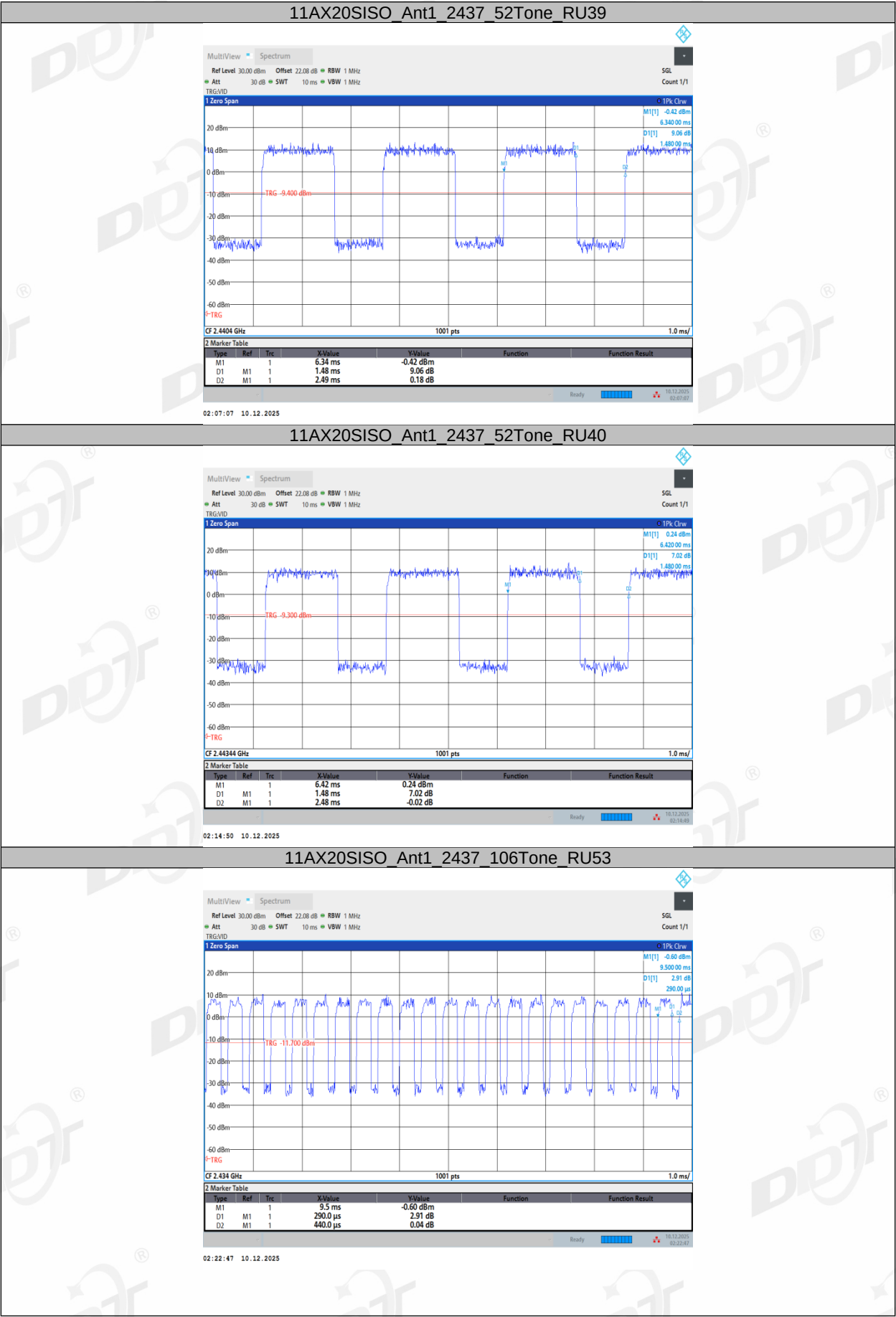






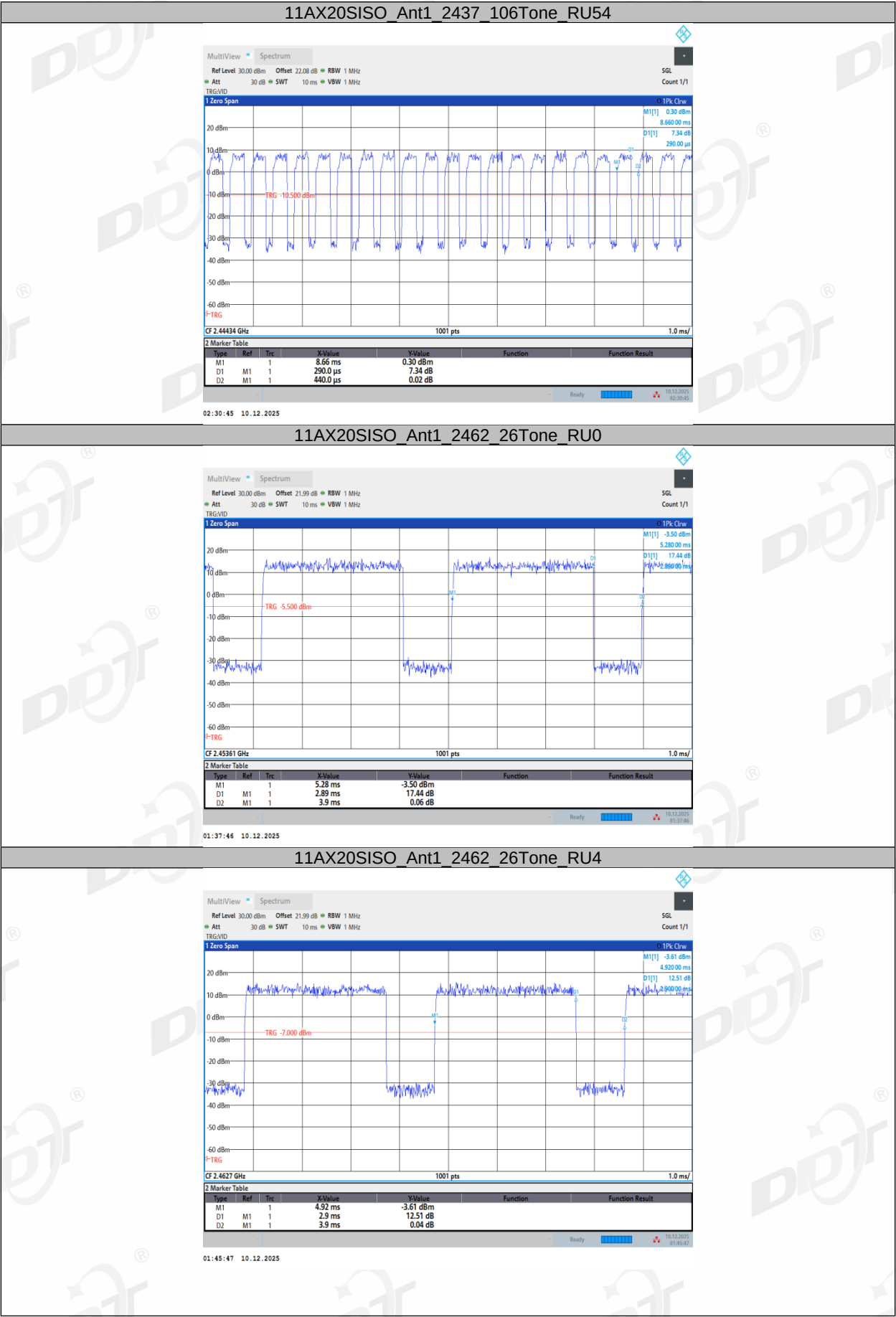


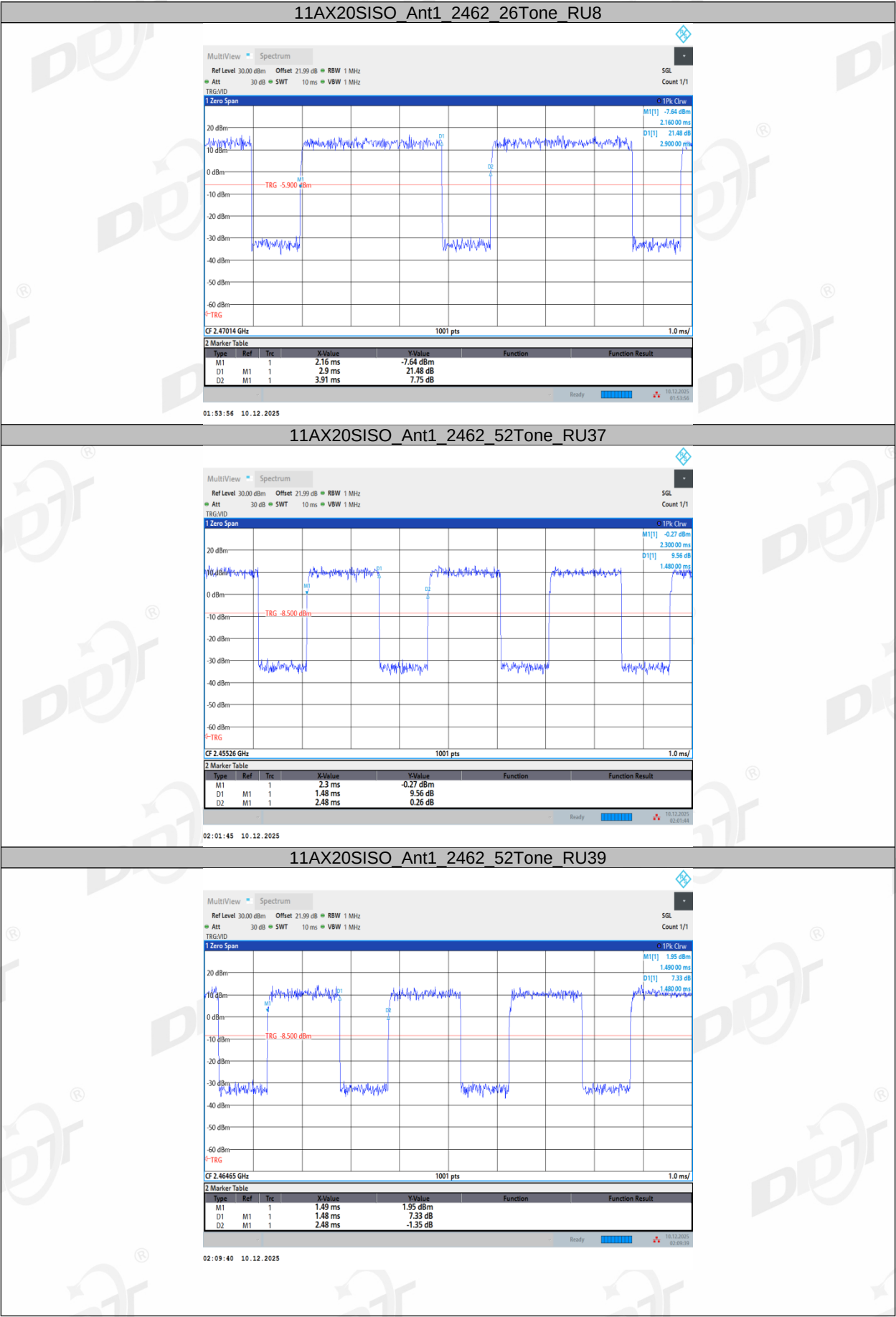




11AX20SISO_Ant1_2437_52Tone_RU40

11AX20SISO_Ant1_2437_106Tone_RU53



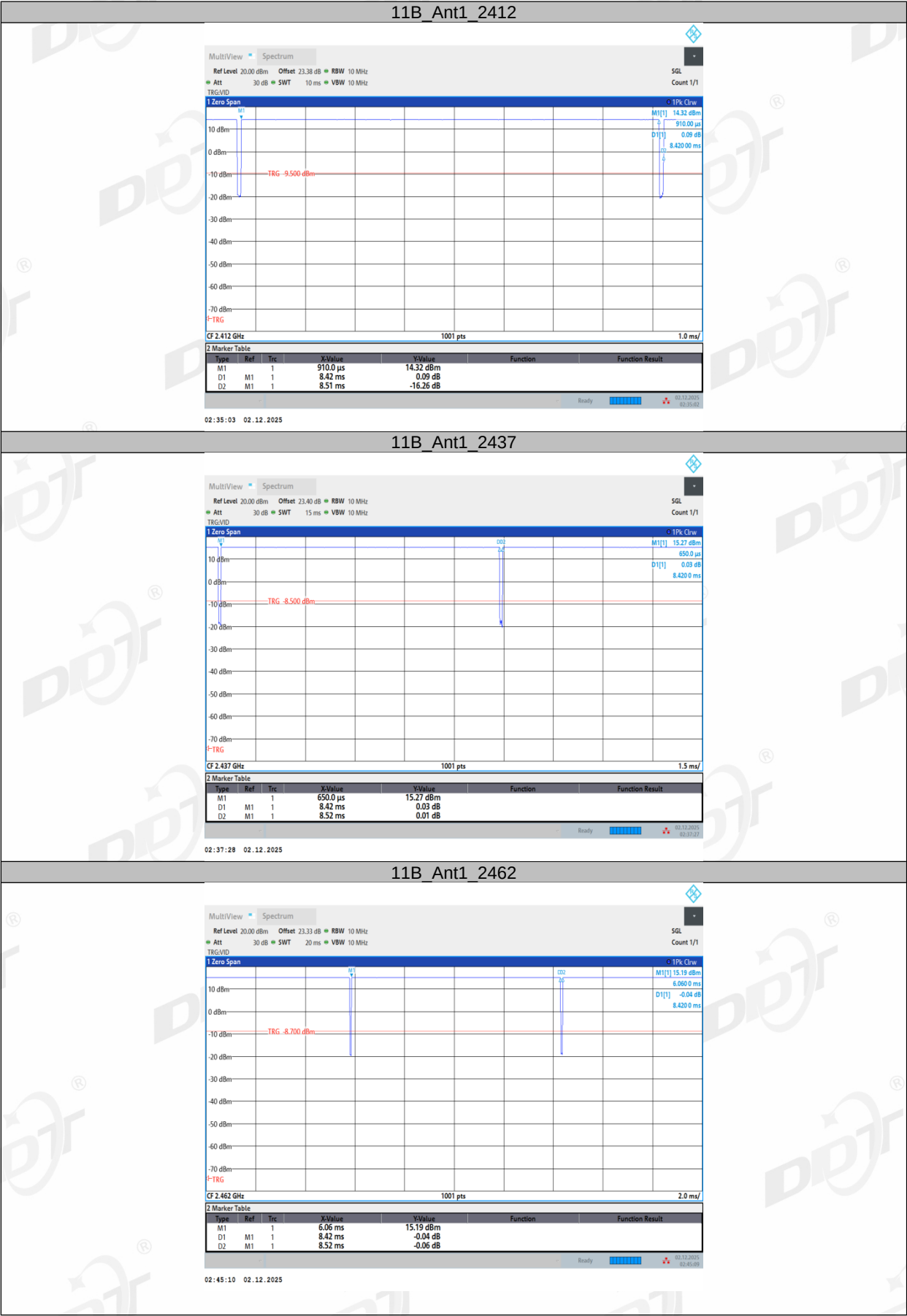


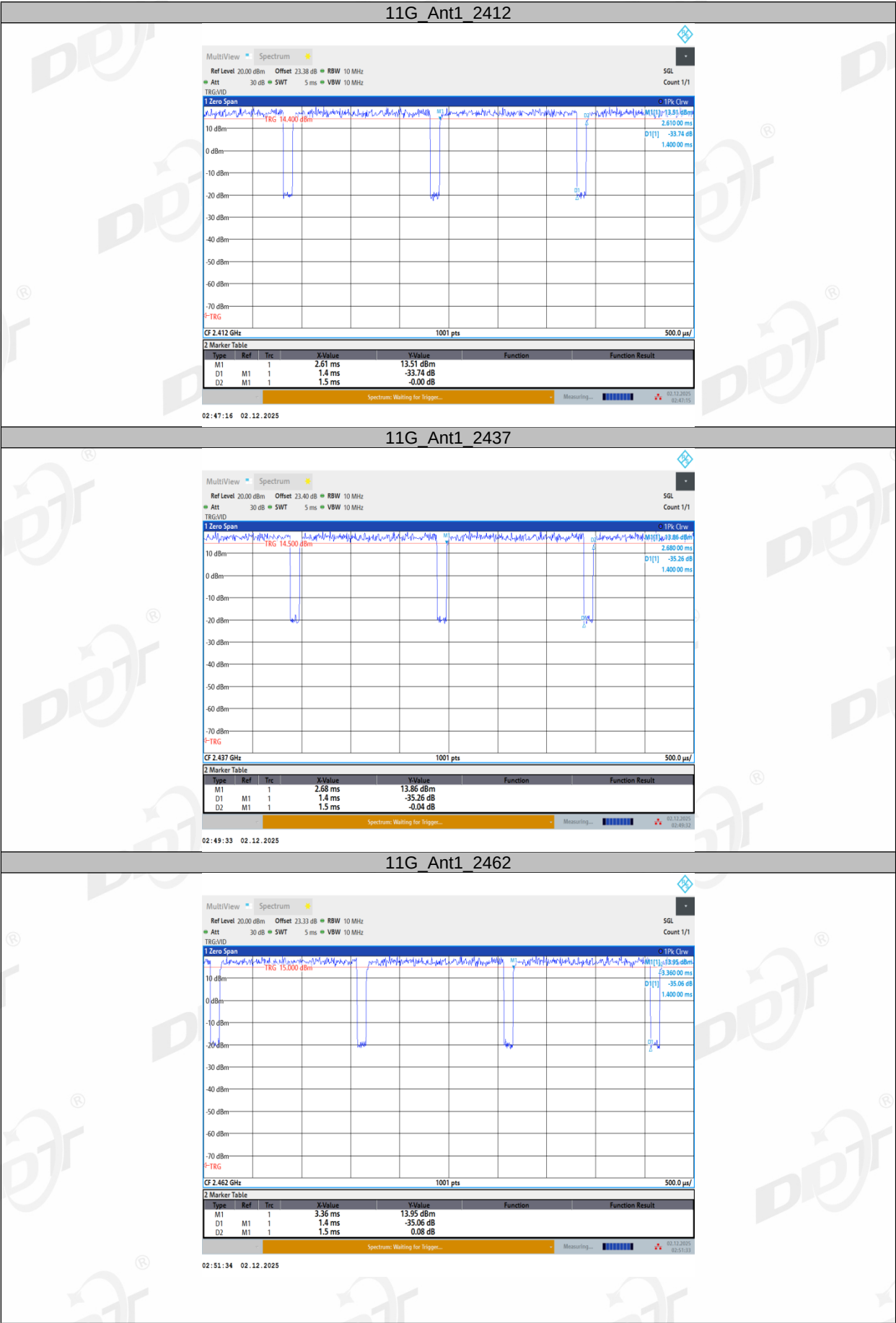
11AX20SISO_Ant1_2462_52Tone_RU37

11AX20SISO_Ant1_2462_52Tone_RU39

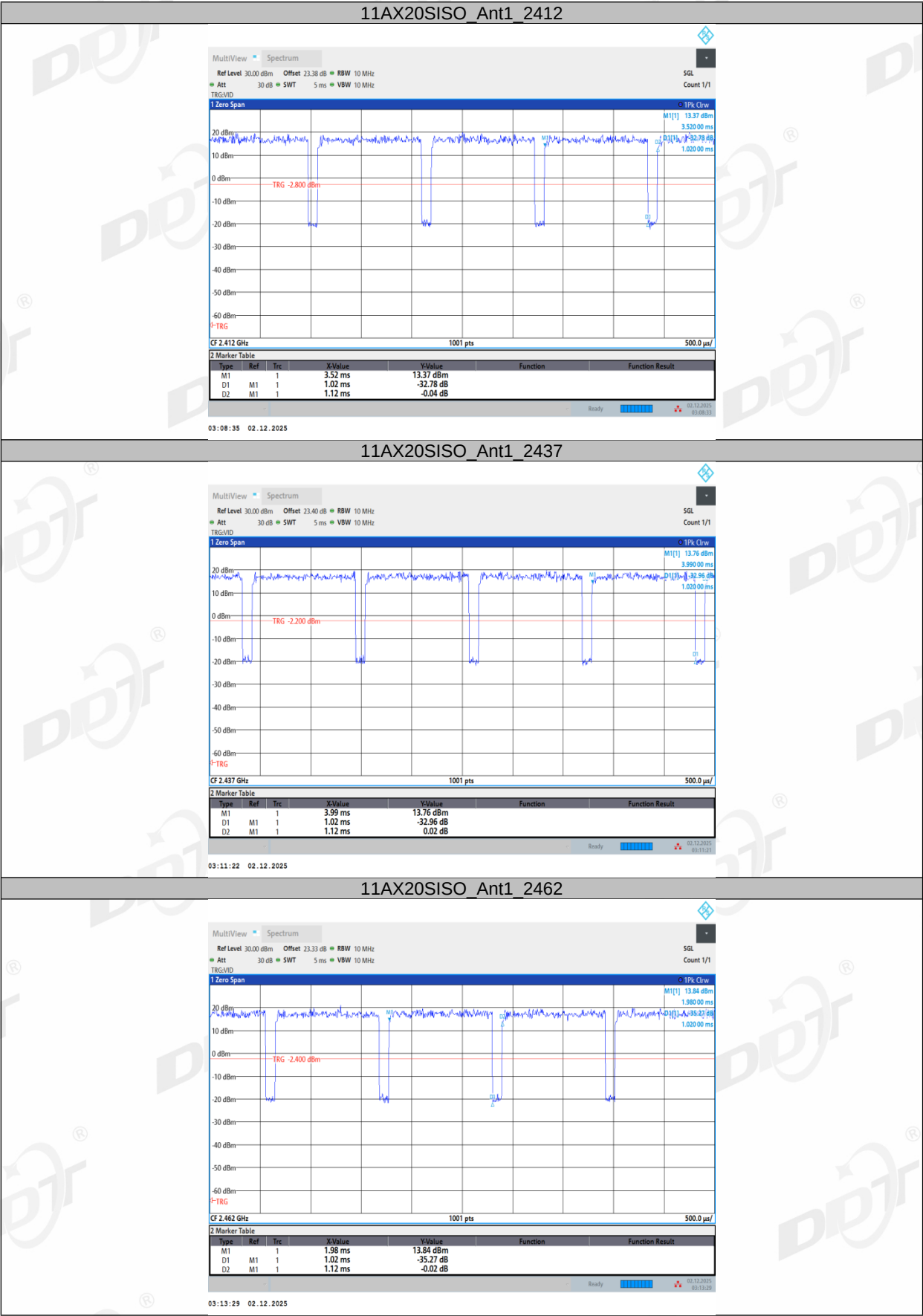


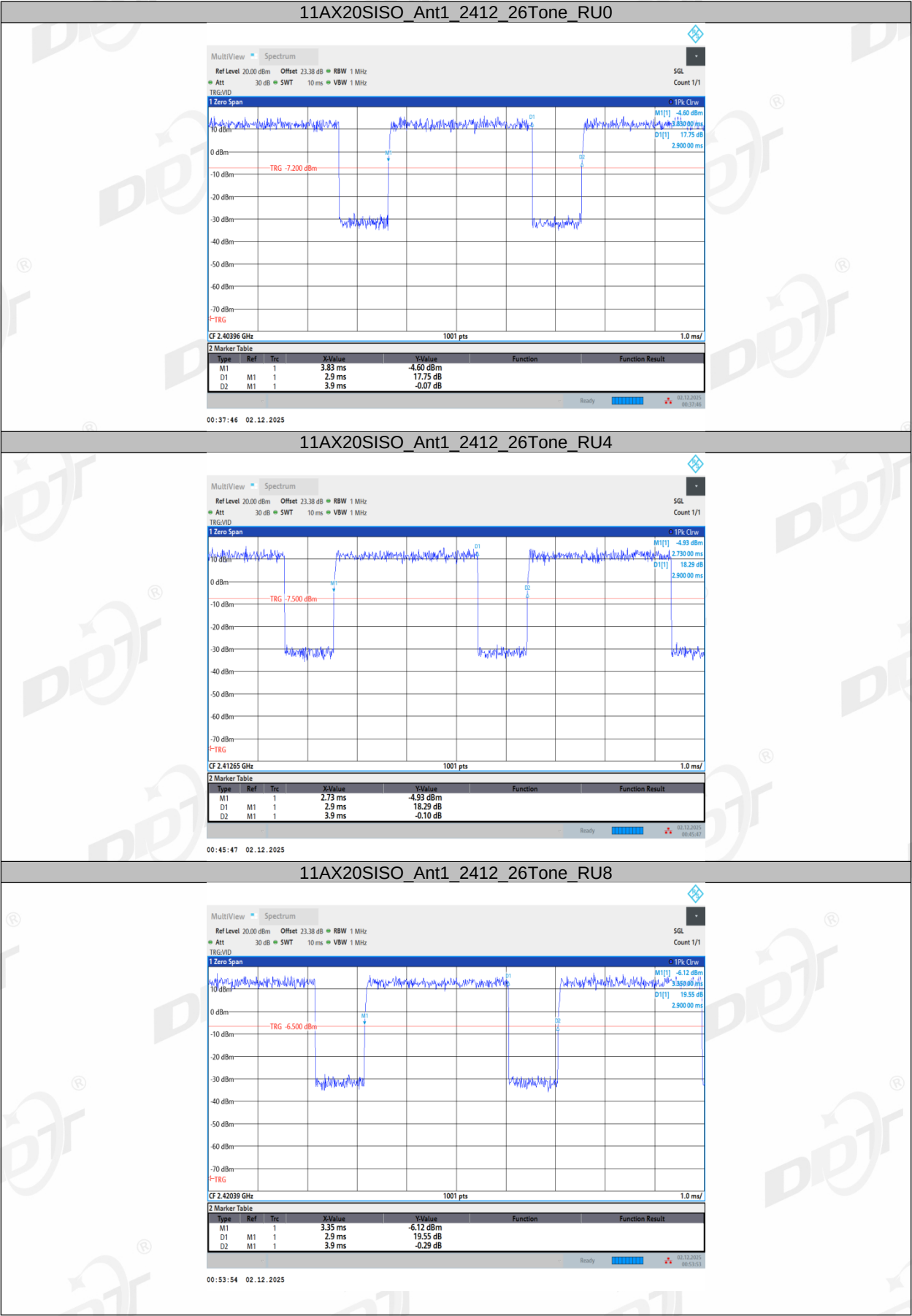
PCB A:





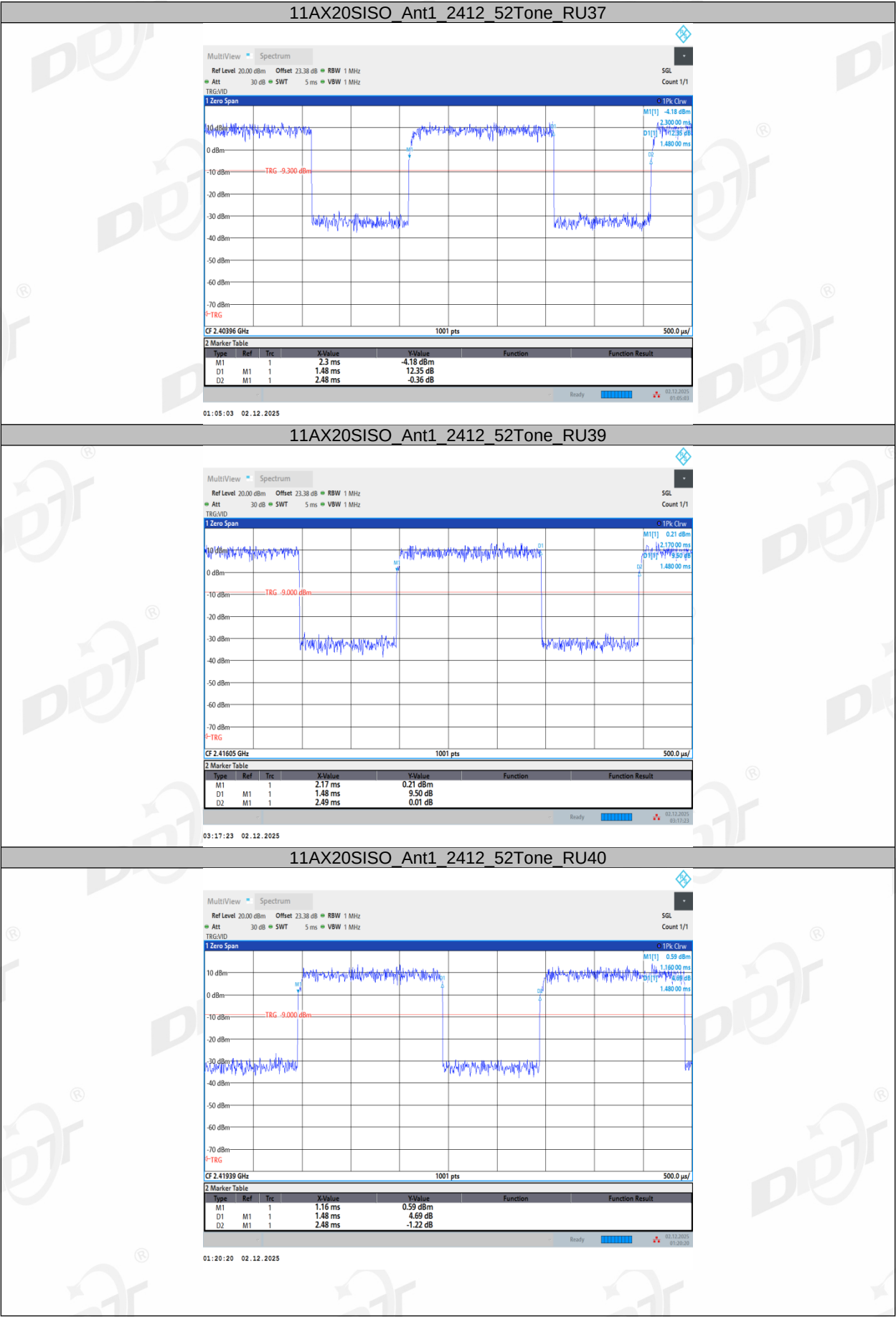






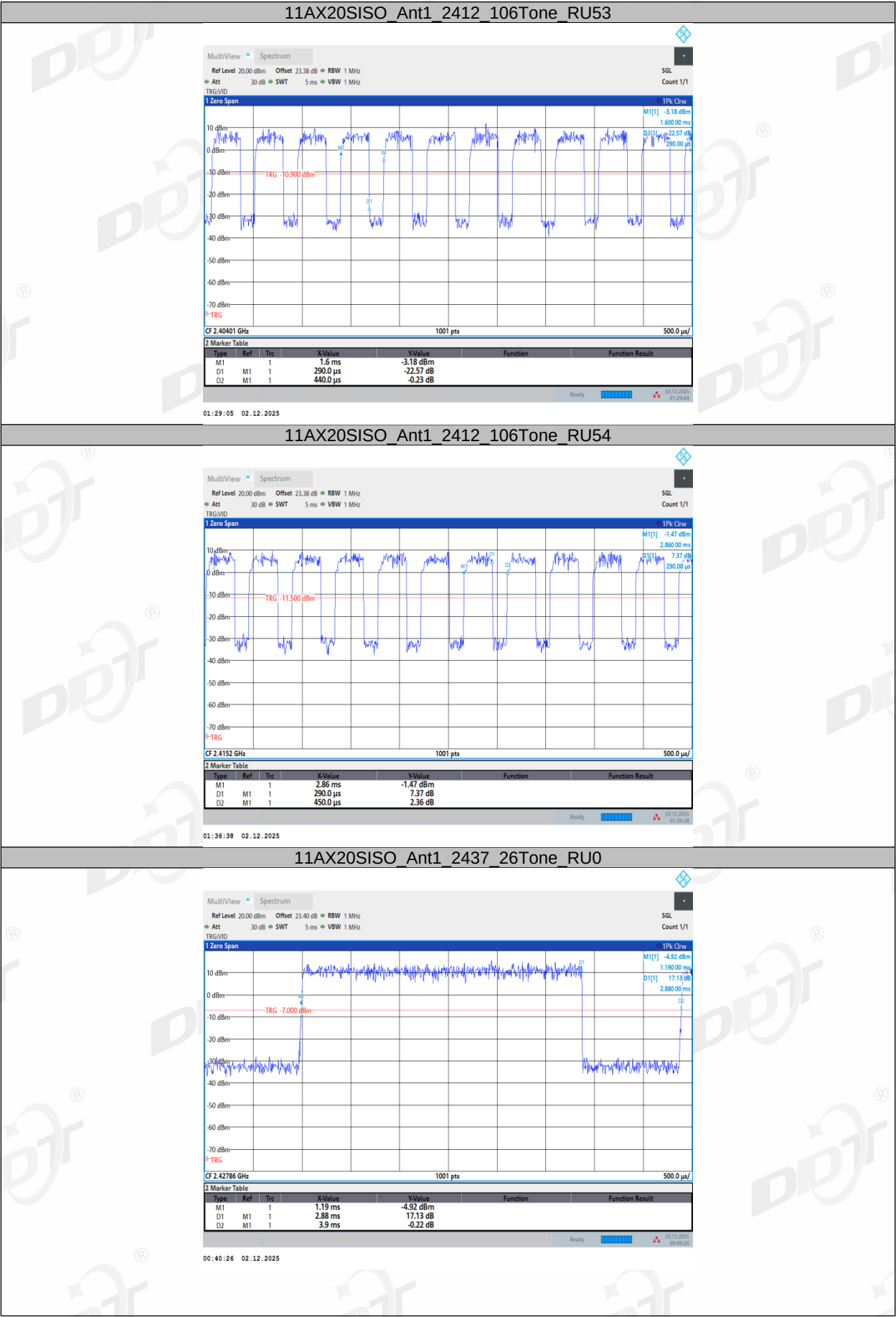
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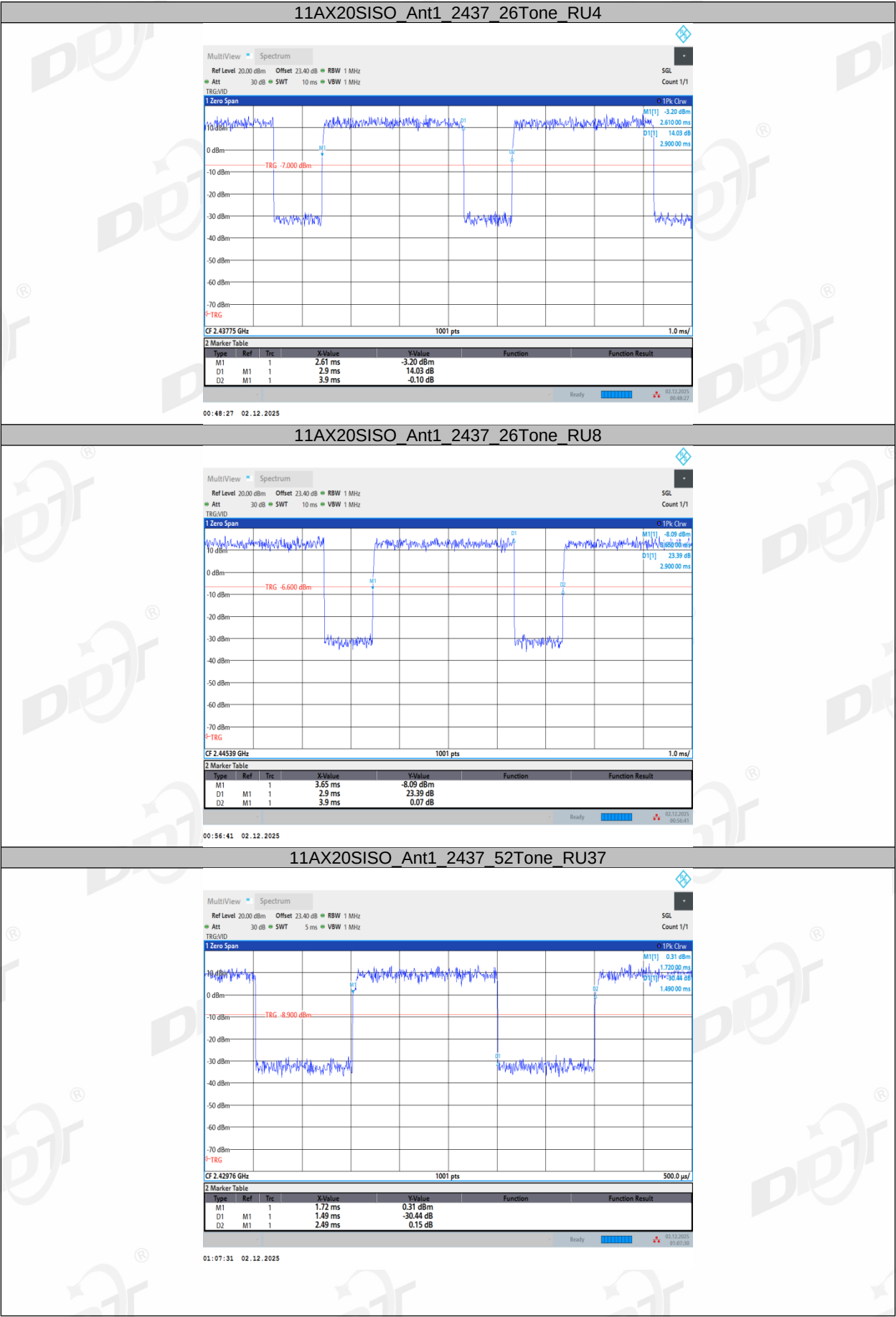
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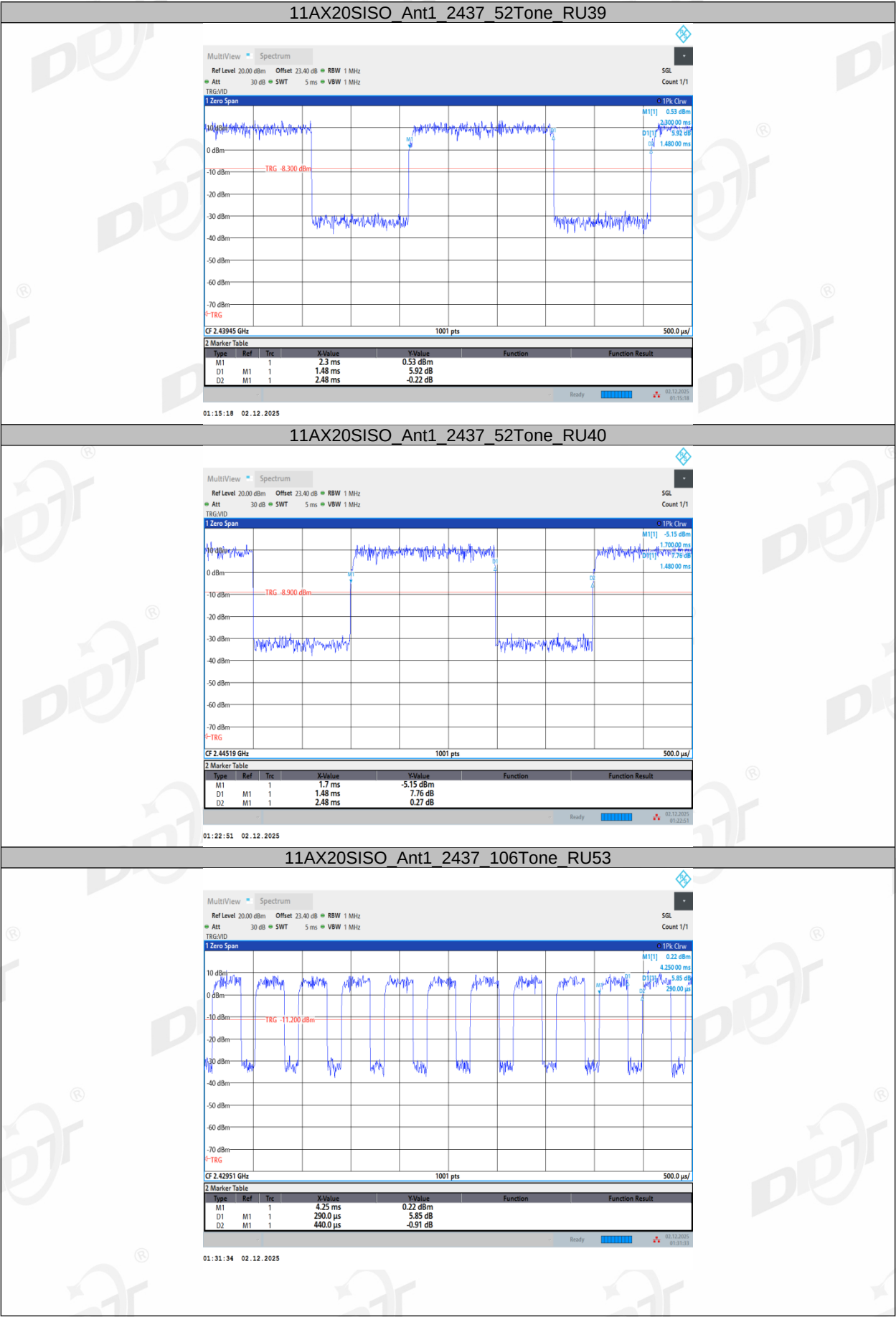


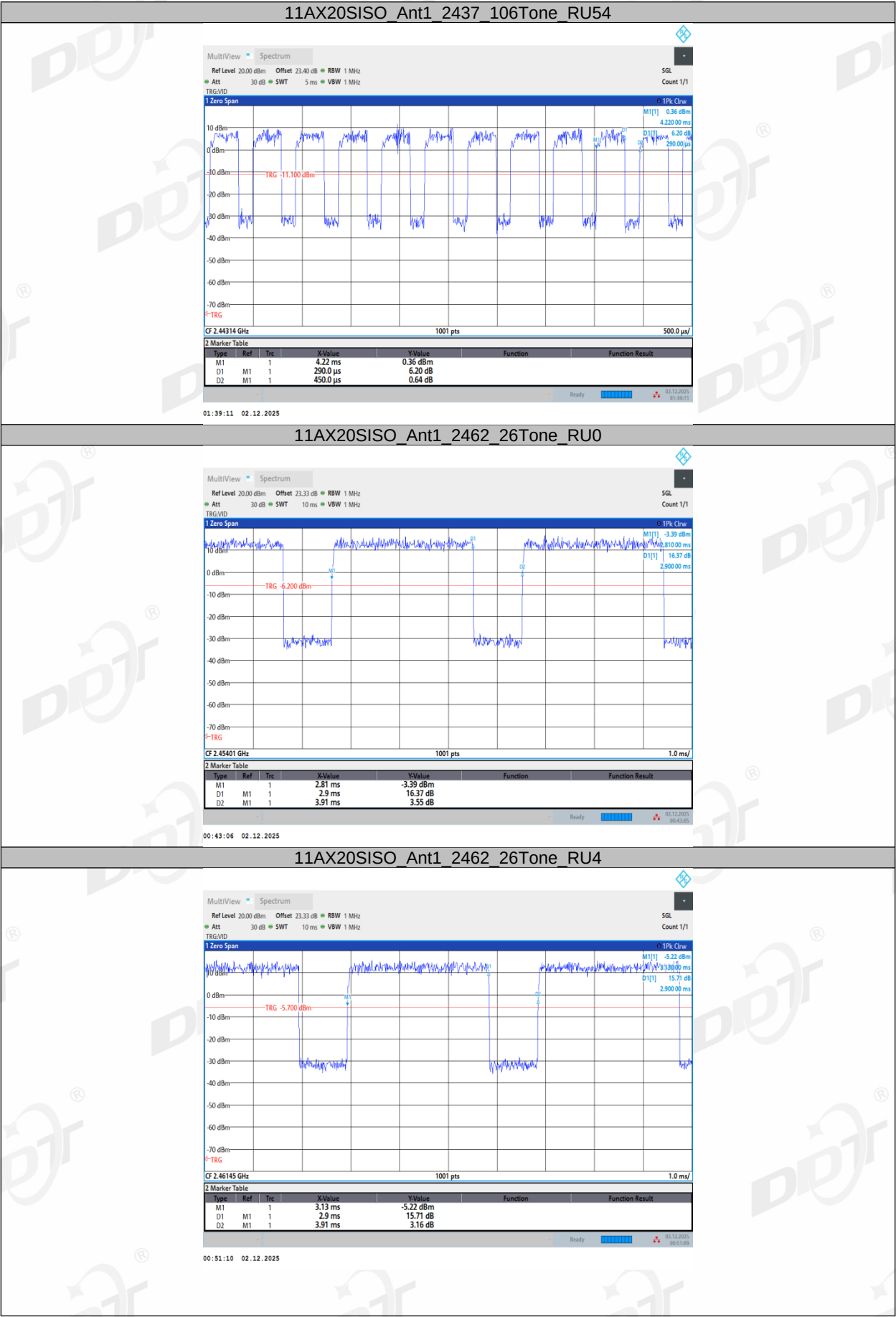
11AX20SISO_Ant1_2412_52Tone_RU39

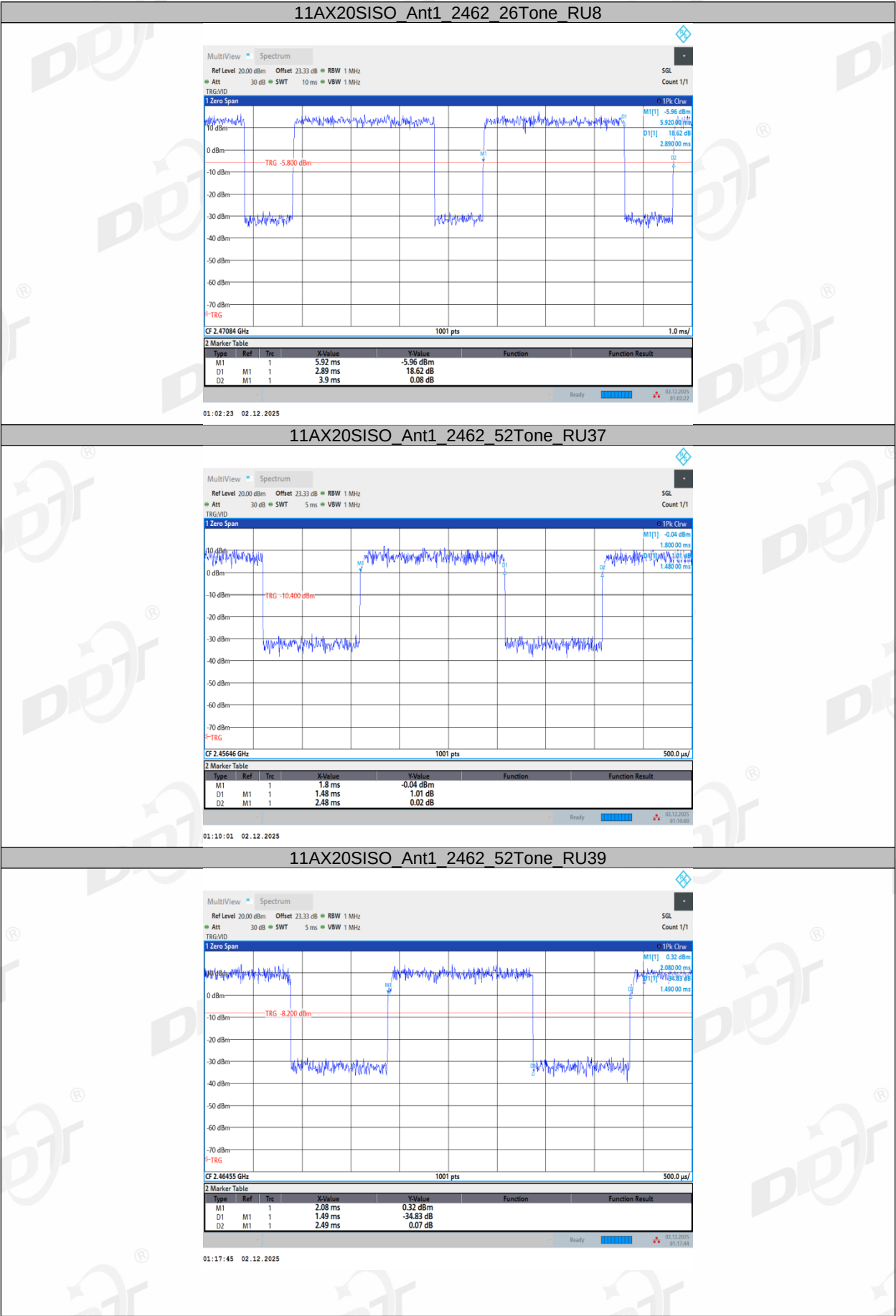
11AX20SISO_Ant1_2412_52Tone_RU40

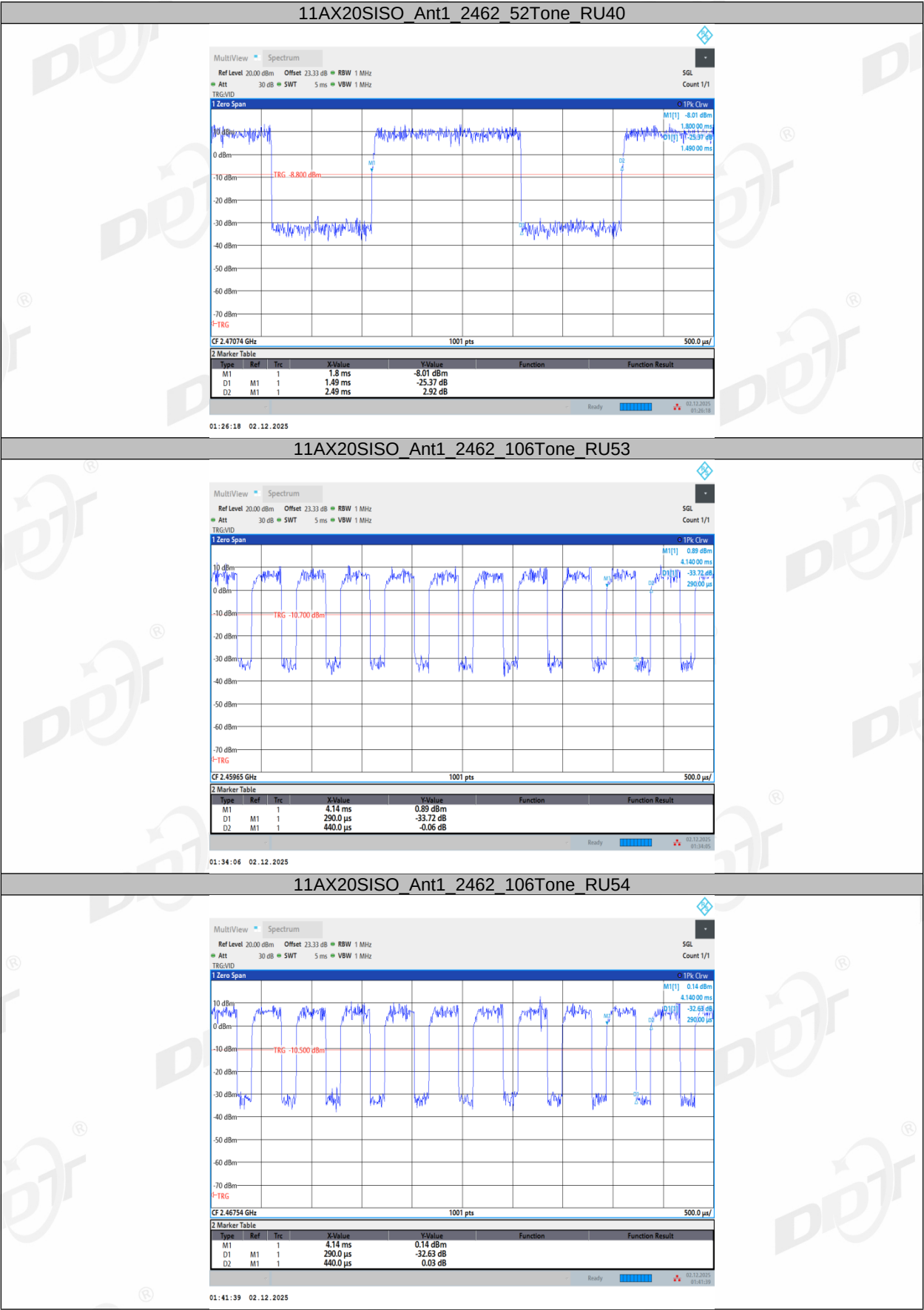












11. Antenna Requirements

11.1. Limit

For intentional device, according to FCC 47 CFR 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

11.2. Result

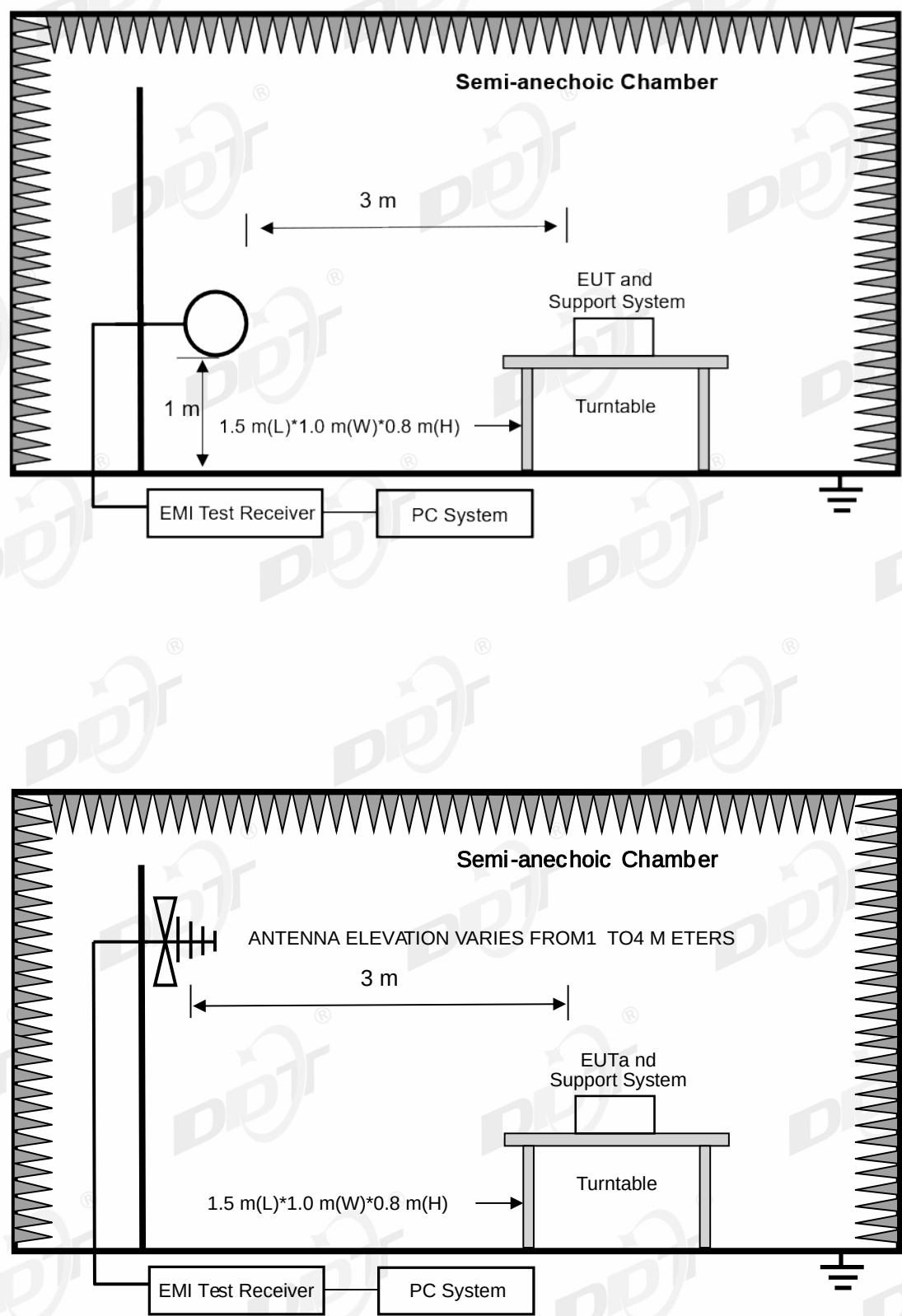
The antenna used for this product as Antenna information described in section 2.1 of the report, and there is no other antenna than that furnished by the responsible party shall be used with the device.

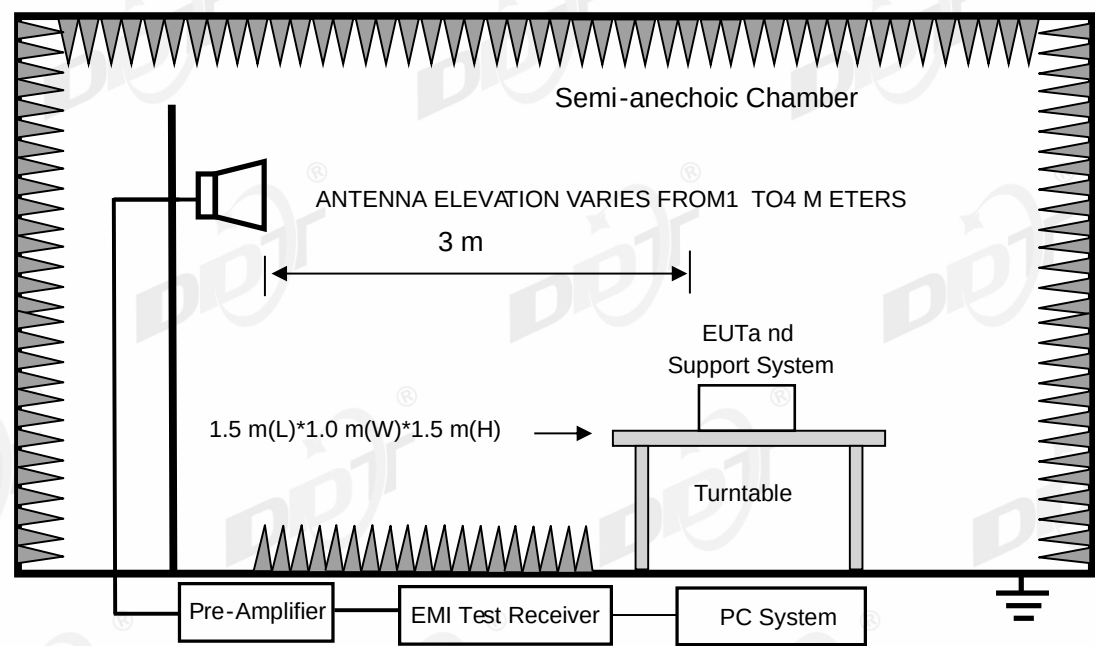
12. Radiated Emission

12.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Cal Due To	Cal. Interval
High pass filter	Micro-Tronics	HPM50102	DDT-ZC00561	2026/03/28	1 Year
Radiation disturbance fully automated test software	Tonscend	JS32-RE	DDT-ZC02739	/	/
Pre-amplifier	SONOMA	310N	DDT-ZC01969	2026/07/06	1 Year
RF Cable	N/A	W24.02 HL-562	DDT-ZC04022	2026/03/28	1 Year
RF cable	Yuhu Technology	JCTB810-NJ-NJ-9M	DDT-ZC02538	2026/03/28	1 Year
RF cable	Zhongke Junchuang	JCT26S-NJ-NJ-1.5M	DDT-ZC02762	/	/
RF cable	Yuhu Technology	ZT26S-SMAJ-SMAJ-1M	DDT-ZC02037	2026/03/28	1 Year
RF Cable	N/A	W13.02 AP1-X2	DDT-ZC04023	2026/03/28	1 Year
Pre-amplifier	COM-POWER	PAM-840A	DDT-ZC01693	2026/03/28	1 Year
Pre-amplifier	COM-POWER	PAM-118A	DDT-ZC01293	2026/08/10	1 Year
EMI TEST RECEIVER	R&S	ESU26	DDT-ZC01909	2026/03/28	1 Year
Micro-Tronics filters	REBES	BRM50702	DDT-ZC03242	/	/
High pass filter	Micro-Tronics	HPM50108	DDT-ZC00560	2026/03/28	1 Year
High Pass filter	Xi'an Xingbo	XBLBQ-GTA67	DDT-ZC02179	2026/03/28	1 Year
Micro-Tronics filters	REBES	BRM50716	DDT-ZC03240	/	/
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	DDT-ZC00506	2026/04/01	1 Year
Trilog Broadband Antenna	Schwarzbeck	VULB 9163	DDT-ZC02050	2026/07/25	1 Year
Hochgewinn-Hornantenne	SCHWARZBECK	BBHA 9120 D	DDT-ZC02129	2026/08/11	1 Year
Active Loop Antenna	Schwarzbeck	FMZB1519	DDT-ZC00524	2026/08/18	1 Year
PSA Series Spectrum Analyzer	Agilent	E4447A	DDT-ZC00517	2026/03/28	1 Year

12.2. Block diagram of test setup





12.3. Limits

(1) FCC 15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.1772&4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.2072&4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

1Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

2Above 38.6

(2) FCC 15.209 Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		uV/m	dBuV/m
0.009 ~ 0.490	300	2400/F (kHz)	67.6-20log (F)
0.490 ~ 1.705	30	24000/F (kHz)	87.6-20log (F)
1.705 ~ 30.0	30	30	29.54
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dBuV/m (Peak)	
		54.0 dBuV/m (Average)	

Note:

(1) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9 - 90 kHz, 110 - 490 kHz and above 1000 MHz, radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30 MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3m}(\text{dBuV/m}) = \text{Limit}_{30m}(\text{dBuV/m}) + 40\text{Log}(30m/3m)$$

(3) Limit for this EUT

The emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, and the emissions appearing within RSS-Gen section 8.10 Restricted frequency bands shall not exceed the limits shown in RSS-Gen section 8.9, all the other emissions shall be at least 20 dB below the fundamental emissions or comply with 15.209 limits and RSS-Gen section 8.9 limits.

12.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description
Laptop	Lenovo	00425-00000-00002-AA135	NA

12.5. Test procedure

(1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber for below 1G and 150 cm above the ground plane inside a fully-anechoic chamber for above 1G.

(2) Test antenna was located 3 m from the EUT on an adjustable mast, and the antenna used as below table.

Test frequency range	Test antenna used	Test antenna distance
9 kHz - 30 MHz	Active Loop antenna	3 m
30 MHz - 1 GHz	Trilog Broadband Antenna	3 m
1 GHz - 18 GHz	Double Ridged Horn Antenna (1 GHz-18 GHz)	3 m
18 GHz - 40 GHz	Horn Antenna (18 GHz-40 GHz)	1 m

According ANSI C63.10:2020 clause 6.4.6 and 6.5.3, for measurements below 30 MHz, Antenna was located 3 m from EUT, the loop antenna was positioned in three antenna orientations (parallel, perpendicular, and round-parallel), for each measurement antenna alignment, the EUT shall be rotated through 0° to 360° on a turntable, and the lowest height of the magnetic antenna shall be 1 m above the ground. For measurement above 30MHz, the trilog Broadband Antenna or Horn Antenna was located 3m from EUT, Measurements were made with the antenna positioned in both the horizontal and vertical planes of Polarization, and the measurement antenna was varied from 1 m to 4 m. in height above the reference ground plane to obtain the maximum signal strength.

(3) Below pre-scan procedure was first performed in order to find prominent frequency spectrum radiated emissions from 9 kHz to 25 GHz:

(a) Scanning the peak frequency spectrum with the antenna specified in step (3), and the EUT was rotated 360 degree, the antenna height was varied from 1 m to 4 m (Except loop antenna, it's fixed 1 m above ground.)

(b) Change work frequency or channel of device if practicable.

(c) Change modulation type of device if practicable.

(d) Change power supply range from 85% to 115% of the rated supply voltage

(e) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions.

Spectrum frequency from 9 kHz to 25 GHz (tenth harmonic of fundamental frequency) was investigated, and no any obvious emission were detected from 18 GHz to 25 GHz, so below final test was performed with frequency range from 9 kHz to 18 GHz.

(4) For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1 m and 4 m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed according to ANSI C63.10:2020 on Radiated Emission test.

(5) The emissions from 9 kHz to 1 GHz were measured based on CISPR QP detector except for the frequency bands 9 - 90 kHz, 110 - 490 kHz, for emissions from 9 kHz - 90 kHz, 110 kHz - 490 kHz and above 1 GHz were measured based on average detector, for emissions above 1 GHz, peak emissions also be measured and need comply with Peak limit.

(6) The emissions from 9 kHz to 1 GHz, QP or average values were measured with EMI receiver with below RBW.

Frequency band	RBW
9 kHz - 150 kHz	200 Hz
150 kHz - 30 MHz	9 kHz
30 MHz - 1 GHz	120 kHz

(7) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1 MHz, VBW is set at 3 MHz for Peak measure; According ANSI C63.10:2020 clause 4.1.4.2.2 procedure for average measure.

(8) For portable device, X axis, Y axis, Z axis are tested, and worse setup is reported.

(9) According exploratory test, the emission levels are 20 dB below the limit detected from 9 kHz to 30 MHz and 18 GHz to 25 GHz, so the final test was performed with frequency range from 30 MHz to 18 GHz and recorded in below.

(10) 30 MHz ~ 25 GHz: (Scan with all mode, the worst case is record and report)

(11) For emissions below 1 GHz, according exploratory explorer test, when change Tx mode and channel, have no distinct influence on emissions level, so for emissions below 1 GHz, the final test was only performed with the worst mode.

(12) The worst simultaneous case and was recorded.

12.6. Test result

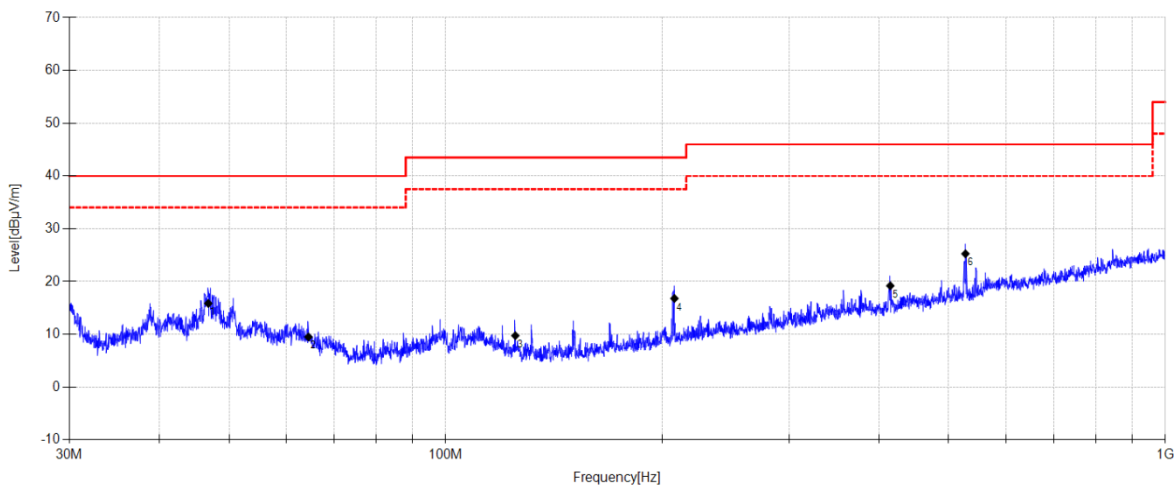
PASS. (See below detailed test result)

12.7. Test data

PCB B:

TR-4-E-009 Radiated Emission Test Result

Test Date:	2025-11-29	Tested By:	Nan Zhong
EUT:	In-vehicle Multimedia Host	Model Number:	MTD421-B2
Test Mode:	TX 2.4G 11AX20 2462 Mode	Power Supply:	DC 12V
Condition:	Temp:22.2°C;Humi:56.2%	Test Site:	DDT 3# Chamber
File Path:	d:\ts\2025 report date\Q25060926-1E\FCC BELOW1G\7		
Memo:	Sample Number:S25060926-001		



Final Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable Loss [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	46.793	30.86	13.32	3.96	15.84	40.00	24.16	QP	Horizontal
2	64.468	25.52	12.15	4.11	9.48	40.00	30.52	QP	Horizontal
3	124.971	28.41	9.20	4.44	9.73	43.50	33.77	QP	Horizontal
4	207.915	33.63	10.64	4.91	16.78	43.50	26.72	QP	Horizontal
5	414.795	30.55	15.39	5.76	19.19	46.00	26.81	QP	Horizontal
6	527.573	34.52	17.26	6.14	25.25	46.00	20.75	QP	Horizontal

- Note:
1. Result Level = Reading + Cable loss + Antenna Factor + AMP
 2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
 3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2025-11-29

Tested By:

Nan Zhong

EUT:

In-vehicle Multimedia Host

Model Number:

MTD421-B2

Test Mode:

TX 2.4G 11AX20 2462 Mode

Power Supply:

DC 12V

Condition:

Temp:22.2°C;Humi:56.2%

Test Site:

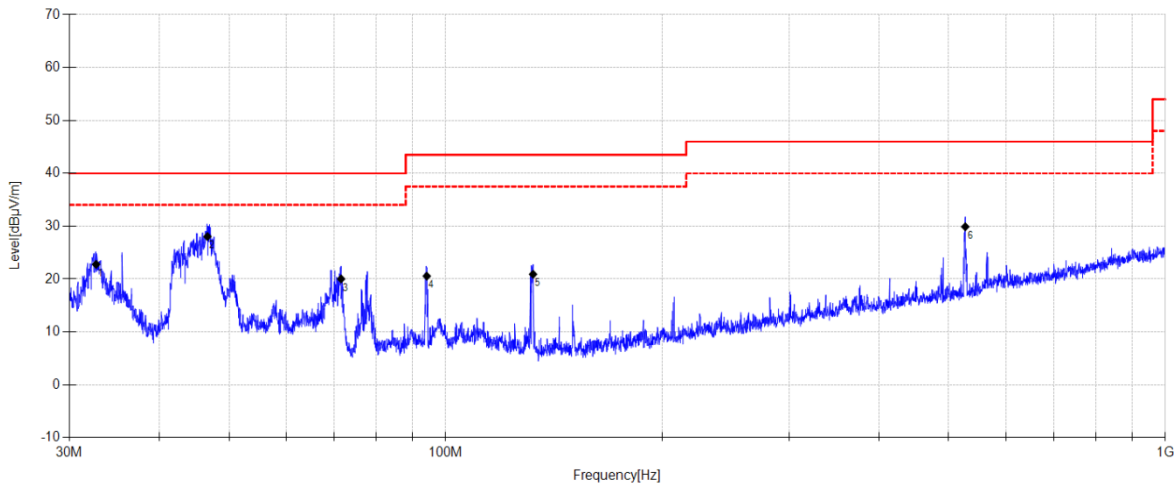
DDT 3# Chamber

File Path:

d:\ts\2025 report date\Q25060926-1E\FCC BELOW1G\8

Memo:

Sample Number:S25060926-001



Final Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable Loss [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	32.679	40.35	10.90	3.82	22.77	40.00	17.23	QP	Vertical
2	46.662	43.12	13.26	3.96	28.04	40.00	11.96	QP	Vertical
3	71.568	38.61	9.54	4.17	20.02	40.00	19.98	QP	Vertical
4	94.142	38.29	10.29	4.27	20.55	43.50	22.95	QP	Vertical
5	132.274	40.15	8.59	4.49	20.90	43.50	22.60	QP	Vertical
6	527.203	39.2	17.22	6.14	29.89	46.00	16.11	QP	Vertical

Note:

- Result Level = Reading + Cable loss + Antenna Factor + AMP
- If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
- Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.