Industrial Internet Innovation Center (Shanghai) Co.,Ltd.

SRD TEST REPORT

PRODUCT	5G CPE
BRAND	ATEL
MODEL	PW550+,PW550,PW550 Plus,PW550 Pro,JW515, PW550-NA
APPLICANT	Asiatelco Technologies Co.
FCC ID	XYO-PW550NA
ISSUE DATE	September 30, 2024
STANDARD(S)	FCC Part15E

Prepared by: ***Tao Lingyan*** **Reviewed by:** ***Yang Fan*** **Approved by:** ***Zhang Min***

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1. Summary of Test Report

1.1 Test Standard(s)

No.	Test Standard	Title	Version
1	FCC Part15E	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices	--

1.2 Reference Documents

No.	Test Standard	Title	Version
1	ANSI 63.10	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2013
2	KDB 789033 D02 General UNII Test Procedures New Rules v02r01	Guidelines For Compliance Testing Of Unlicensed National Information Infrastructure (U-Nii) Devices (Part 15, Subpart E)	--
Note: The standard of KDB 789033 D02 General UNII Test Procedures New Rules v02r01 has not been accredited by A2LA.			

1.3 Summary of Test Results

No.	Measurement Items	FCC Rules	Verdict
1	Duty cycle	15.407(a)	Pass
2	Maximum Output Power	15.407(a)	Pass
3	Power Spectral Density	15.407(a)	Pass
4	6dB Occupied Bandwidth	15.407(e)	Pass
5	99% Occupied Bandwidth	15.407(e)	Pass
6	Band edge compliance	15.407(b)	Pass
7	Transmitter Spurious Emission - Radiated	15.407/15.205/15.209	Pass
8	AC Powerline Conducted Emission	15.207	Pass
9	Frequency Stability	15.407(g)	Pass
10	Antenna requirement	15.203/15.247(c)	Pass

Note 1:

The PW550,PW550Plus,PW550 Pro,JW515, PW550-NA,PW550+ manufactured by Asiatelco Technologies Co. is a new product for testing.

Industrial Internet Innovation Center (Shanghai) Co., Ltd. only performed test cases which identified with Pass/Fail/Inc result in section 1.3.

Industrial Internet Innovation Center (Shanghai) Co., Ltd. has verified that the compliance of the tested device specified in section 4 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 1 of this test report.

Note 2:

5.8G RLAN used a internal antenna with max Gain 4.85/3.50 dBi that complied with 15.203 Requirements.

1.4 Data Provided by Applicant

No.	Item(s)	Data
1	Antenna gain of EUT	ANT1: 4.85 dBi ANT2: 3.50 dBi
Note: The data of antenna gain is provided by the Antenna specification may affect the validity of the test results in this report, and the impact and consequences of this shall be undertaken by the customer.		

Cyclic Delay Diversity(CDD)System:

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

If all antennas have the same gain, *GANT*, Directional gain = GANT + Array Gain,

where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain = 10 log(NANT/NSS) dB.

For power measurements on IEEE 802.11 devices, 1,2

Array Gain = 0 dB (i.e., no array gain) for *NANT* ≤ 4;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any *NANT*;

Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less, for 20-MHz channel widths with *NANT* ≥ 5.

For power measurements on all other devices:

Array Gain = 10 log(NANT/NSS) dB. The FCC may permit a lower array gain value based on analysis involving the specific cyclic delays, signal bandwidths, channelization, and antenna configurations used by the device. Contact the FCC through the Knowledge

Unequal antenna gains, with equal transmit powers. For antenna gains given by G1, G2, …, GN dBi

(i) If transmit signals are *correlated*, then

Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + … + $10^{GN/20}$) 2 /NANT] dBi [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

(ii) If all transmit signals are *completely uncorrelated*, then

Directional gain = 10 log[($10^{G1/10}$+ $10^{G2/10}$ + … + 10^{GN10})/NANT] dBi

The Power and PSD limit should be modified if the directional gain ofeut is over 6dbi.

The EUT supports CDD System Unequal antenna gain:

Operation Frequency	ANT Gain1 (dBi)	ANT Gain2 (dBi)	Directional gainFor Power (dBi)	Directional gainFor PSD(dBi)	Power Limit Reduction (dBm)	PSD LimitReduction (dBm)
5150MHz -5250MHz	6.05	5.28	8.68	8.68	2.68	2.68
5725MHz -5850MHz	4.85	3.50	7.21	7.21	1.21	1.21

5150MHz to 5250MHz:Power Limit Reduction = Directional gain- 6dBi, (Directional gain >6dBi)= 8.68-6=2.68

PSD Limit Reduction= Directional gain -6dBi, (Directional gain> 6dBi)=8.68-6=2.68

5725MHz to 5850MHz:Power Limit Reduction = Directional gain- 6dBi, (Directional gain> 6dBi)=7.21-6=1.21

PSD Limit Reduction= Directional gain -6dBi, (Directional gain > 6dBi)=7.21-6= 1.21

2. General Information of The Laboratory

2.1 Testing Laboratory

Lab Name	Industrial Internet Innovation Center (Shanghai) Co.,Ltd.
Address	Building 4，No. 766，Jingang Road，Pudong，Shanghai，China
Telephone	021-68866880
FCC Registration No.	708870
FCC Designation No.	CN1364

2.2 Laboratory Environmental Requirements

Temperature	15℃~35℃
Relative Humidity	25%RH~75%RH
Atmospheric Pressure	86kPa~106kPa

2.3 Project Information

Project Manager	Xu Yuting
Test Date	August 26, 2024 to September 25, 2024

3. General Information of The Customer

3.1 Applicant

Company	Asiatelco Technologies Co.
Address	#68 HuaTuo Road, Building-8, Zhangjiang Hi-Tech Park, Pudong, Shanghai 201204, China
Telephone	N/A

3.2 Manufacturer

Company	Asiatelco Technologies Co.
Address	#68 HuaTuo Road, Building-8, Zhangjiang Hi-Tech Park, Pudong, Shanghai 201204, China
Telephone	N/A

4. General Information of The Product

4.1 Product Description for Equipment under Test (EUT)

Product Name	5G CPE
Model name	PW550, PW550 Plus, PW550 Pro,JW515, PW550-NA,PW550+
Date of Receipt	S01aa/S04aa:August 26,2024
EUT ID*	S01aa/S04aa
SN/IMEI	S01aa:862424050281897 S04aa:NA
Supported Radio Technology and Bands	WCDMA Band II/IV/V LTE Band 2/4/5/7/12/13/14/17/25/26/30/41/48/66/71 LTE Band CA_41C NR n2/n5/n7/n12/n14/n25/n30/n41/n66/n71/n77/n78 WLAN 802.11b/g/n/ax WLAN 802.11a/ac/ax BT 5.0 BLE
Hardware Version	PW55-P1
Software Version	CPE5_PW550_N0_00_v1.0.2
FCC ID	XYO-PW550NA
NOTE1:EUT ID is the internal identification code of the laboratory. NOTE2: Samples in the test report are provided by the customer. The test results are only applicable to the samples received by the laboratory.	

4.2 Internal Identification of AE used during the test

AE ID*	Description	Model	SN/Remark
AE1	RF cable	N/A	N/A
NOTE: *AE ID is the internal identification code of the laboratory.			

4.3 Additional Information

WLAN Frequency	UNII 3: 5725MHz-5850MHz
Occupied Channel Bandwidth	20 MHz for Wi-Fi (802.11 a/ac/ax) 40 MHz for Wi-Fi (802.11 ac/ax) 80 MHz for Wi-Fi(802.11 ac/ax)
WLAN type of modulation	OFDM

Test frequency list:

UNII-3:

BW_20M	Channel	149	153	157	161	165
	Freq. (MHz)	5745	5765	5785	5805	5825
BW_40M	Channel	151		159		/
	Freq. (MHz)	5755		5795		

BW_80M	Channel	155	
	Freq. (MHz)	5775	
Note：“/” Represents empty			

Note: This report is for WLAN UNII-3 only.

4.4 Emissions Information WIFI 5.8G

TestMode	Frequency Min(MHz)	Frequency Max(MHz)	Max OutPut Power EIRP(dBm)	Max OutPut Power EIRP(W)	OBW (KHz)	Necessary Bandwidth & Emission Classification
11A	5745	5825	27.3	0.537	17320	17M3D1D
11AC20	5745	5825	27.23	0.5284	18080	18M1D1D
11AC40	5755	5795	27.22	0.5272	36480	36M5D1D
11AC80	5775	5775	27.29	0.5358	75040	75M0D1D
11AX20	5745	5825	26.98	0.4989	19520	19M5D1D
11AX40	5755	5795	27.49	0.561	37680	37M7D1D
11AX80	5775	5775	26.74	0.4721	76960	77M0D1D

5. Test Configuration Information

5.1 Laboratory Environmental Conditions

5.1.1 Permanent Facilities

Relative Humidity	Min. = 45 %, Max. = 55 %		
Atmospheric Pressure	101kPa		
Temperature	Normal	Minimum	Maximum
	25℃	-20℃	60℃
Working Voltage of EUT	Normal	Minimum	Maximum
	24V	22.8V	25.2V

5.2 Test Equipments Utilized

5.2.1 Conducted Test System

No.	Name	Model	S/N	SW Version	HW Version	Manufacturer	Cal. Date	Cal. Interval
1	Test Software	TS1120	10671	V3.2.22	N/A	Tonscend	N/A	N/A
2	Automatic control unit	JS0806-2	2218060621	N/A	N/A	Tonscend	2024-03-25	1 Year
3	Wireless communication comprehensive tester	CMW270	100919	V3.5.137	N/A	R&S	2024-07-25	1 Year
4	Spectrum Analyzer	FSQ40	200063	V4.75	N/A	R&S	2023-10-16	1 Year
5	Vector Signal Generator	SMU200A	104684	V03.20.286.21	N/A	R&S	2024-07-25	1 Year
6	Vector Signal Generator	SMBV100A	257904	V4.15.125.49	N/A	R&S	2023-12-19	1 Year
7	Programmable Power Supply	Keithley 2303	4039070	N/A	N/A	Keithley	2024-06-07	1 Year
8	Temperature box	B-TF-107C	BTF107C-201804107	N/A	N/A	Boyi	2024-06-07	1 Year
9	Network test unit AP	GT-AXE11000	N2IG0X401637KWF	V3.0.0.4.386_45940	N/A	ASUS	N/A	N/A
10	Vector Signal Generator	SMBV100A	257904	V4.15.125.49	N/A	R&S	2023-10-16	1 Year

5.2.2 Radiated Emission Test System

No.	Name	Model	S/N	SW Version	HW Version	Manufacturer	Cal. Date	Cal. Interval
1	Universal Radio Communication Tester	CMU200	123126	V5.2.1	B12	R&S	2023-10-16	1 Year
2	Universal Radio Communication Tester	CMW500	104178	V3.7.20	1206.0600.00	R&S	2023-10-16	1 Year
3	EMI Test Receiver	ESU40	100307	V5.1-24-3	01	R&S	2023-12-19	1 Year
4	TRILOG Broadband Antenna	VULB9163	01345	N/A	N/A	Schwarzbeck	2024-03-29	1 Year
5	Double- ridged Waveguide Antenna	ETS-3117	00135890	N/A	N/A	ETS	2024-03-16	1 Year
6	EMI Test Software	EMC32 V10.35.02	N/A	V10.35.02	N/A	R&S	N/A	N/A
7	Horn Antenna	3160-09	LM6321	N/A	N/A	R&S	2024-08-03	1 Year
8	Horn Antenna	3160-10	LM5942	N/A	N/A	R&S	2024-08-03	1 Year
9	Preamplifier	SCU08F1	8320024	N/A	N/A	R&S	2023-10-16	1 Year
10	Preamplifier	SCU18	10155	N/A	N/A	R&S	2023-10-16	1 Year
11	Preamplifier	SCU26	10025	N/A	N/A	R&S	2023-10-16	1 Year
12	Preamplifier	SCU40	10020	N/A	N/A	R&S	2023-10-16	1 Year
13	2-Line V-Network	ENV216	101380	N/A	N/A	R&S	2023-12-19	1 Year
14	EMI Test Software	EMC32 V10.35.02	N/A	N/A	N/A	R&S	N/A	N/A
15	Test Receiver	ESCI	101235	V5.1-24-3	0	R&S	2023-12-19	1 Year
16	Antenna Tower	TPMDC-LF	N/A	N/A	N/A	Top Precision	N/A	N/A
17	Antenna Tower	TPMDC-HF	N/A	N/A	N/A	Top Precision	N/A	N/A

5.2.3 Test Environment

Shielding Room1 (6.0 meters×3.0 meters×2.7 meters) did not exceed following limits along the conducted RF performance testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Ground system resistance	< 0.5 Ω
Temperature	Min. = 15 ℃, Max. = 35 ℃

Control room did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. =30 %, Max. = 60 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

Fully-anechoic chamber1 (9.8 meters×6.7 meters×6.7 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. = 25 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
VSWR	Between 0 and 6 dB, from 1GHz to 18GHz
Site Attenuation Deviation	Between -4 and 4 dB,30MHz to 1GHz

5.3 Measurement Uncertainty

Measurement Uncertainty of Conduction test

Measurement Items	Range	Confidence Level	Calculated Uncertainty
Emission Bandwidth	5150-5850MHz	95%	±1.9%
Maximum Conduct Output Power	5150-5850MHz	95%	± 1.18 dB
Power Spectral Density	5150-5850MHz	95%	±0.98 dB
Band Edge Measurements	5150-5850MHz	95%	±1.21dB
Unwanted Emissions Measurement	9kHz-40GHz	95%	9kHz-7GHz:±1.21dB 7GHz-40GHz: ±3.31dB

Frequency Stability	5150-5850MHz	95%	±1.9%

Measurement Uncertainty of Radiation test

Measurement Items	**Uncertainty(dB)**
Radiated Emission 30MHz-1000MHz	±5.10
Radiated Emission 1000MHz-18000MHz	±5.66
Radiated Emission 18000MHz-40000MHz	±5.22
AC Powerline Conducted Emission	±4.38
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of *k*=2.	

6. Measurement Results

6.1 Duty cycle

6.1.1 Measurement Limit and Method

Standard	Limit (dBm)
FCC CRF Part 15.407(a)	N/A

6.1.2 Test Procedure

The measurement method is made according to KDB 789033 B

Measurements of duty cycle and transmission duration shall be performed using one of thefollowing techniques:

a) A diode detector and an oscilloscope that together have sufficiently short response time topermit accurate measurements of the on and off times of the transmitted signal.

b) The zero-span mode on a spectrum analyzer or EMI receiver, if the response time andspacing between bins on the sweep are sufficient to permit accurate measurements of the onand off times of the transmitted signal. Set the center frequency of the instrument to thecenter frequency of the transmission, Set RBW> EBW if possible: otherwise. set RBW tothe largest available value. Set VBW > RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T. where 7is defined in II.B.1.a), and the number of sweep points across duration Texceeds 100. (Forexample. if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuringduty cycle shall not be used if 7 < 16.7 microseconds.)

6.1.3 Measurement Results

TestMode	Antenna	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11A	Ant1	5745	1.40	1.46	95.89
11A	Ant2	5745	1.39	1.45	95.86
11A	Ant1	5785	1.40	1.46	95.89
11A	Ant2	5785	1.40	1.46	95.89
11A	Ant1	5825	1.39	1.45	95.86
11A	Ant2	5825	1.39	1.45	95.86
11A-CDD	Ant1	5745	1.39	1.45	95.86
11A-CDD	Ant2	5745	1.40	1.46	95.89
11A-CDD	Ant1	5785	1.40	1.45	96.55
11A-CDD	Ant2	5785	1.39	1.45	95.86
11A-CDD	Ant1	5825	1.40	1.45	96.55
11A-CDD	Ant2	5825	1.40	1.46	95.89
11AC20SISO	Ant1	5745	1.31	1.37	95.62
11AC20SISO	Ant2	5745	1.31	1.37	95.62
11AC20SISO	Ant1	5785	1.32	1.38	95.65
11AC20SISO	Ant2	5785	1.32	1.38	95.65
11AC20SISO	Ant1	5825	1.32	1.37	96.35
11AC20SISO	Ant2	5825	1.32	1.38	95.65

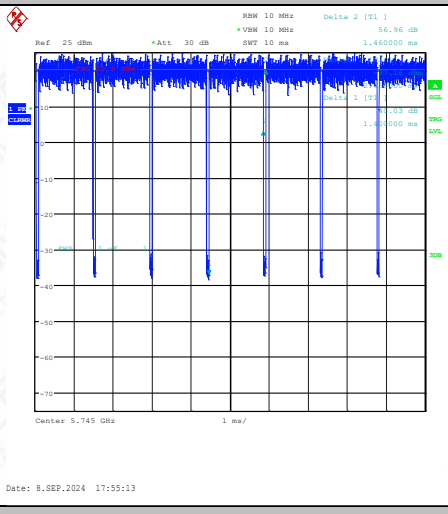
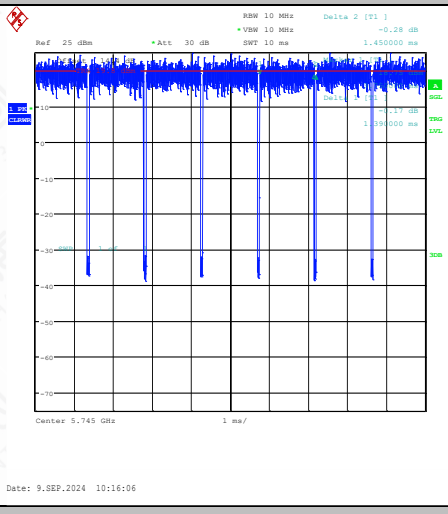
11AC20MIMO	Ant1	5745	0.69	0.75	92.00
11AC20MIMO	Ant2	5745	0.69	0.75	92.00
11AC20MIMO	Ant1	5785	0.69	0.75	92.00
11AC20MIMO	Ant2	5785	0.68	0.74	91.89
11AC20MIMO	Ant1	5825	0.68	0.74	91.89
11AC20MIMO	Ant2	5825	0.69	0.75	92.00
11AC40SISO	Ant1	5755	0.65	0.71	91.55
11AC40SISO	Ant2	5755	0.66	0.72	91.67
11AC40SISO	Ant1	5795	0.66	0.72	91.67
11AC40SISO	Ant2	5795	0.66	0.71	92.96
11AC40MIMO	Ant1	5755	0.35	0.41	85.37
11AC40MIMO	Ant2	5755	0.35	0.41	85.37
11AC40MIMO	Ant1	5795	0.35	0.41	85.37
11AC40MIMO	Ant2	5795	0.35	0.41	85.37
11AC80SISO	Ant1	5775	0.32	0.38	84.21
11AC80SISO	Ant2	5775	0.32	0.38	84.21
11AC80MIMO	Ant1	5775	0.19	0.25	76.00
11AC80MIMO	Ant2	5775	0.18	0.24	75.00
11AX20SISO	Ant1	5745	0.32	0.37	86.49
11AX20SISO	Ant2	5745	0.32	0.37	86.49
11AX20SISO	Ant1	5785	0.32	0.38	84.21
11AX20SISO	Ant2	5785	0.31	0.37	83.78
11AX20SISO	Ant1	5825	0.32	0.37	86.49
11AX20SISO	Ant2	5825	0.31	0.37	83.78
11AX20MIMO	Ant1	5745	0.21	0.26	80.77
11AX20MIMO	Ant2	5745	0.21	0.27	77.78
11AX20MIMO	Ant1	5785	0.21	0.27	77.78
11AX20MIMO	Ant2	5785	0.21	0.26	80.77
11AX20MIMO	Ant1	5825	0.21	0.26	80.77
11AX20MIMO	Ant2	5825	0.21	0.27	77.78
11AX40SISO	Ant1	5755	0.31	0.37	83.78
11AX40SISO	Ant2	5755	0.32	0.37	86.49
11AX40SISO	Ant1	5795	0.32	0.37	86.49
11AX40SISO	Ant2	5795	0.31	0.37	83.78
11AX40MIMO	Ant1	5755	0.20	0.26	76.92
11AX40MIMO	Ant2	5755	0.20	0.26	76.92
11AX40MIMO	Ant1	5795	0.20	0.26	76.92
11AX40MIMO	Ant2	5795	0.20	0.26	76.92
11AX80SISO	Ant1	5775	0.30	0.36	83.33
11AX80SISO	Ant2	5775	0.29	0.35	82.86
11AX80MIMO	Ant1	5775	0.19	0.25	76.00
11AX80MIMO	Ant2	5775	0.20	0.25	80.00

AX Part RU_Multi-User

TestMode	Antenna	Frequency [MHz]	RuSize	RuIndex	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11AX20SISO	Ant1	5745	26Tone	RU0	0.06	0.12	50.00
11AX20SISO	Ant2	5745	26Tone	RU0	0.07	0.12	58.33
11AX20SISO	Ant1	5745	52Tone	RU37	0.54	0.60	90.00
11AX20SISO	Ant2	5745	52Tone	RU37	0.54	0.60	90.00
11AX20SISO	Ant1	5745	106Tone	RU53	0.39	0.45	86.67
11AX20SISO	Ant2	5745	106Tone	RU53	0.40	0.45	88.89
11AX20SISO	Ant1	5785	26Tone	RU0	0.57	0.62	91.94
11AX20SISO	Ant2	5785	26Tone	RU0	0.38	0.44	86.36
11AX20SISO	Ant1	5785	52Tone	RU37	0.54	0.60	90.00
11AX20SISO	Ant2	5785	52Tone	RU37	0.45	0.51	88.24
11AX20SISO	Ant1	5785	106Tone	RU53	0.40	0.46	86.96
11AX20SISO	Ant2	5785	106Tone	RU53	0.39	0.45	86.67
11AX20SISO	Ant1	5825	26Tone	RU0	0.81	0.87	93.10
11AX20SISO	Ant2	5825	26Tone	RU0	0.26	0.32	81.25
11AX20SISO	Ant1	5825	52Tone	RU37	0.54	0.59	91.53
11AX20SISO	Ant2	5825	52Tone	RU37	0.54	0.60	90.00
11AX20SISO	Ant1	5825	106Tone	RU53	0.39	0.45	86.67
11AX20SISO	Ant2	5825	106Tone	RU53	0.40	0.46	86.96
11AX20MIMO	Ant1	5745	26Tone	RU0	0.18	0.23	78.26
11AX20MIMO	Ant2	5745	26Tone	RU0	0.33	0.82	40.24
11AX20MIMO	Ant1	5745	52Tone	RU37	0.54	0.59	91.53
11AX20MIMO	Ant2	5745	52Tone	RU37	0.42	0.48	87.50
11AX20MIMO	Ant1	5745	106Tone	RU53	0.40	0.46	86.96
11AX20MIMO	Ant2	5745	106Tone	RU53	0.40	0.45	88.89
11AX20MIMO	Ant1	5785	26Tone	RU0	0.16	0.22	72.73
11AX20MIMO	Ant2	5785	26Tone	RU0	0.29	0.35	82.86
11AX20MIMO	Ant1	5785	52Tone	RU37	0.54	0.60	90.00
11AX20MIMO	Ant2	5785	52Tone	RU37	0.54	0.60	90.00
11AX20MIMO	Ant1	5785	106Tone	RU53	0.40	0.45	88.89
11AX20MIMO	Ant2	5785	106Tone	RU53	0.39	0.45	86.67
11AX20MIMO	Ant1	5825	26Tone	RU0	0.20	0.25	80.00
11AX20MIMO	Ant2	5825	26Tone	RU0	0.64	0.69	92.75
11AX20MIMO	Ant1	5825	52Tone	RU37	0.54	0.60	90.00
11AX20MIMO	Ant2	5825	52Tone	RU37	0.54	0.59	91.53
11AX20MIMO	Ant1	5825	106Tone	RU53	0.39	0.45	86.67
11AX20MIMO	Ant2	5825	106Tone	RU53	0.40	0.46	86.96
11AX40SISO	Ant1	5755	242Tone	RU61	0.31	0.37	83.78
11AX40SISO	Ant2	5755	242Tone	RU61	0.31	0.37	83.78
11AX40SISO	Ant1	5755	242Tone	RU62	0.31	0.37	83.78
11AX40SISO	Ant2	5755	242Tone	RU62	0.31	0.37	83.78

11AX40SISO	Ant2	5795	242Tone	RU61	0.31	0.37	83.78
11AX40SISO	Ant1	5795	242Tone	RU61	0.31	0.36	86.11
11AX40SISO	Ant1	5795	242Tone	RU62	0.31	0.37	83.78
11AX40SISO	Ant2	5795	242Tone	RU62	0.31	0.37	83.78
11AX40MIMO	Ant1	5755	242Tone	RU61	0.31	0.37	83.78
11AX40MIMO	Ant2	5755	242Tone	RU61	0.31	0.37	83.78
11AX40MIMO	Ant1	5755	242Tone	RU62	0.31	0.37	83.78
11AX40MIMO	Ant2	5755	242Tone	RU62	0.31	0.37	83.78
11AX40MIMO	Ant1	5795	242Tone	RU61	0.31	0.36	86.11
11AX40MIMO	Ant2	5795	242Tone	RU61	0.31	0.37	83.78
11AX40MIMO	Ant1	5795	242Tone	RU62	0.31	0.37	83.78
11AX40MIMO	Ant2	5795	242Tone	RU62	0.31	0.37	83.78
11AX80SISO	Ant1	5775	484Tone	RU65	0.29	0.35	82.86
11AX80SISO	Ant2	5775	484Tone	RU65	0.30	0.36	83.33
11AX80MIMO	Ant1	5775	484Tone	RU65	0.29	0.35	82.86
11AX80MIMO	Ant2	5775	484Tone	RU65	0.30	0.36	83.33

Test Graphs

NTNV-11A-Ant1-5745	NTNV-11A-Ant2-5745
	
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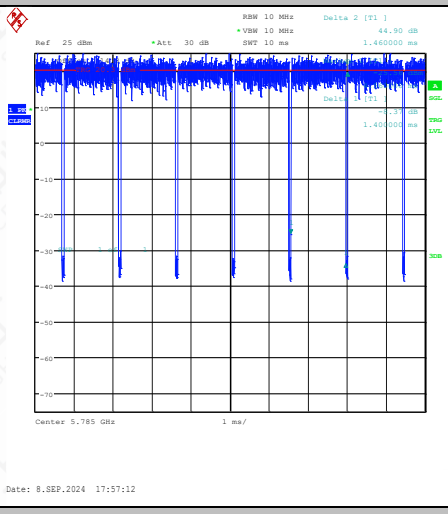	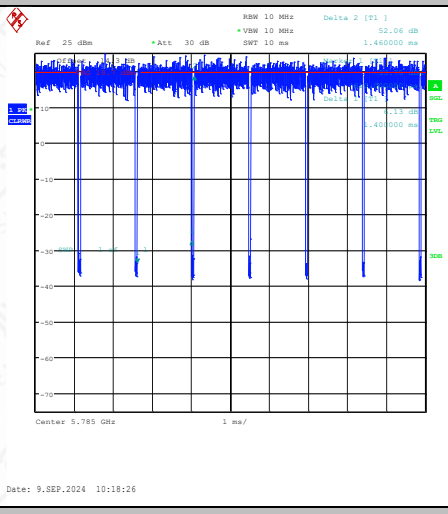
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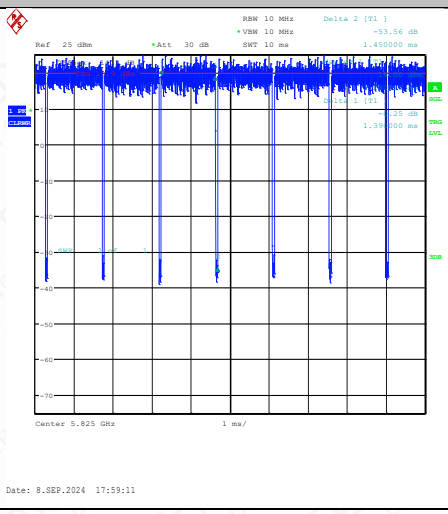	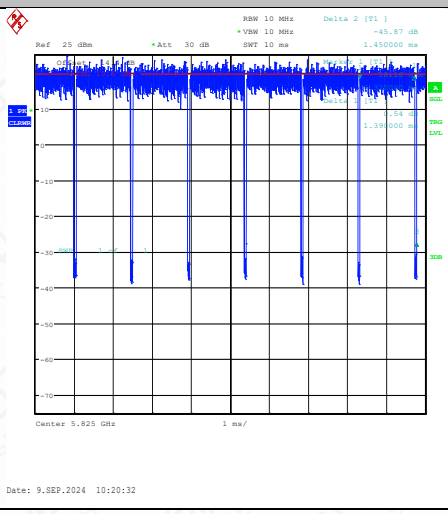

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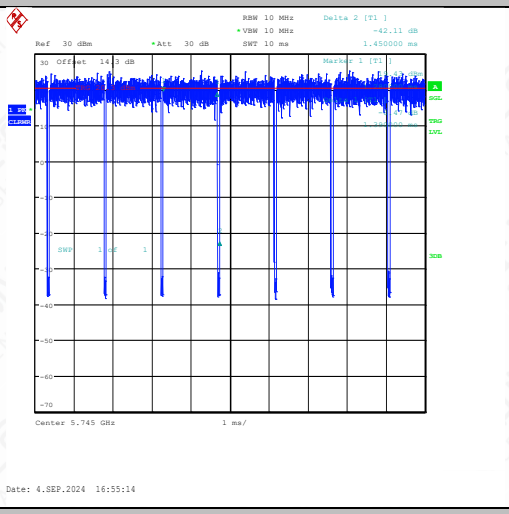	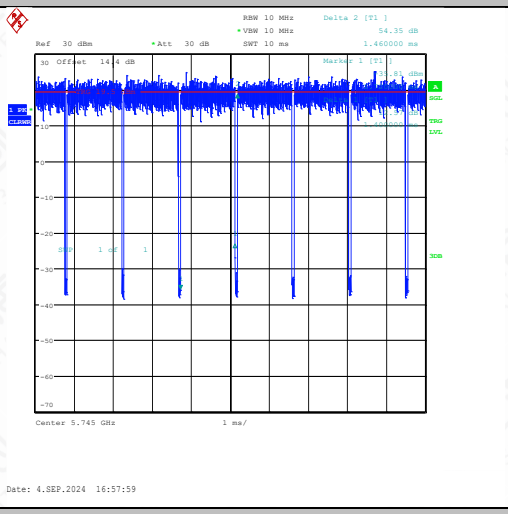
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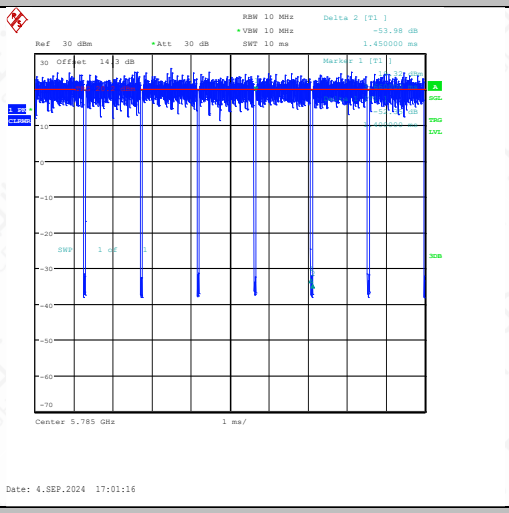	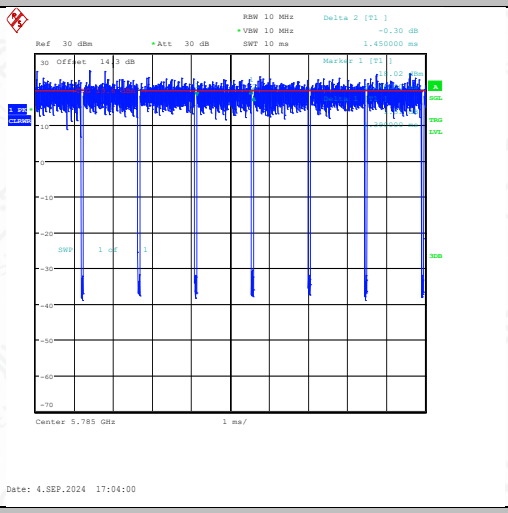
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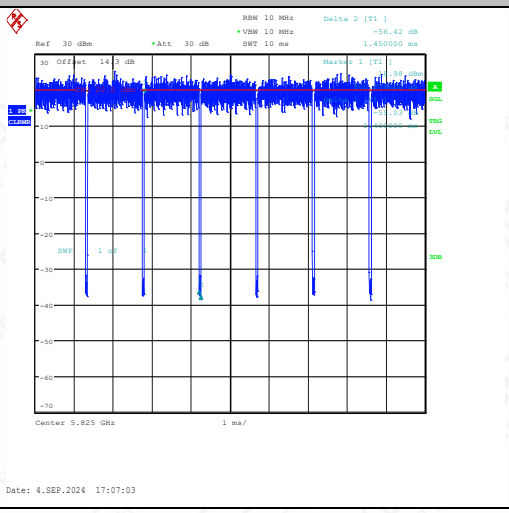	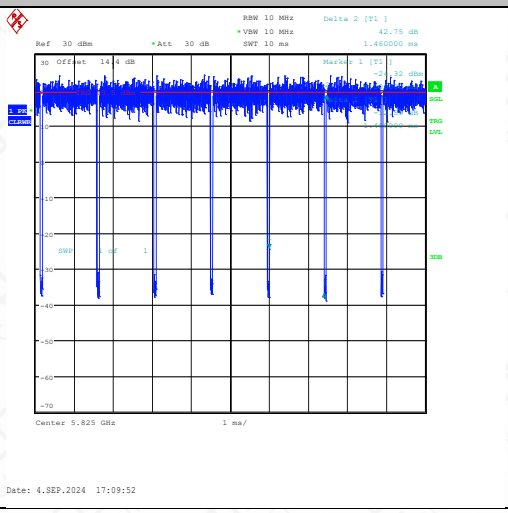

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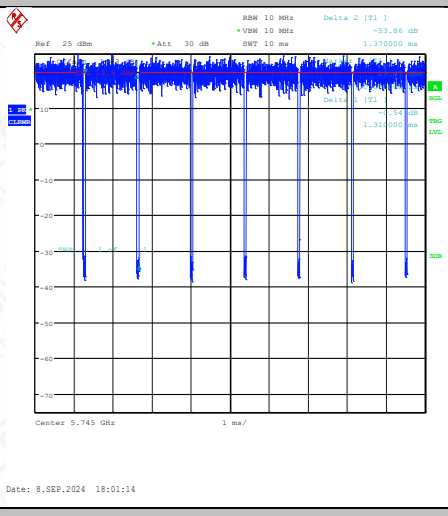	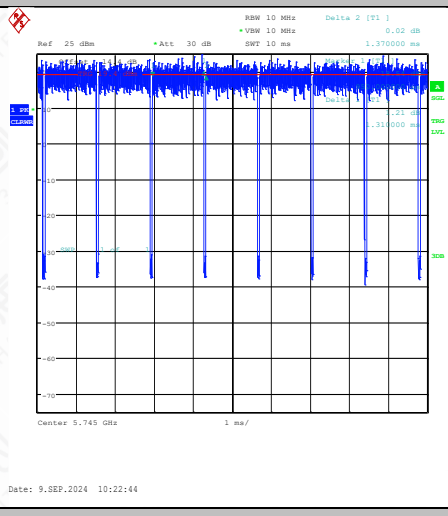
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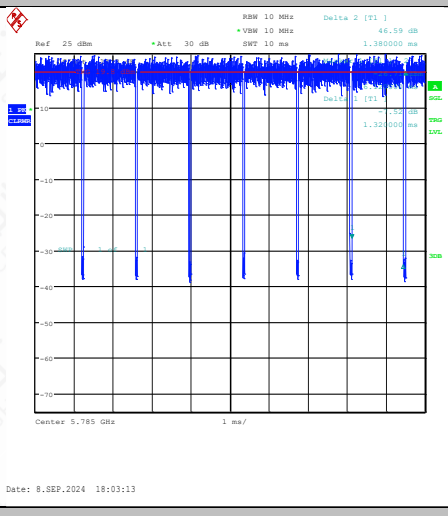	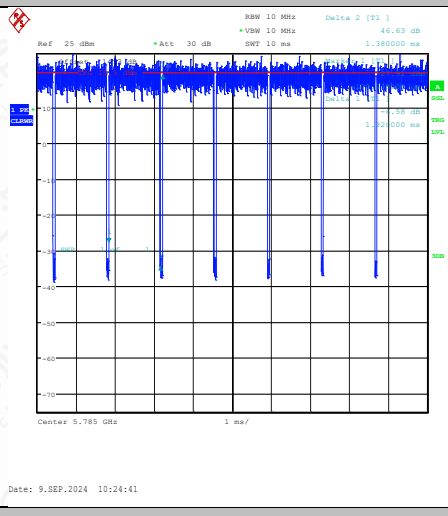
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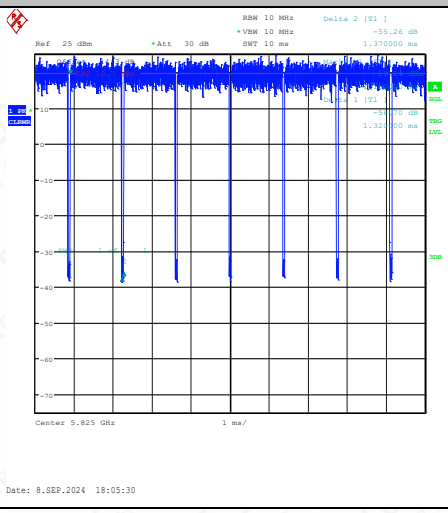	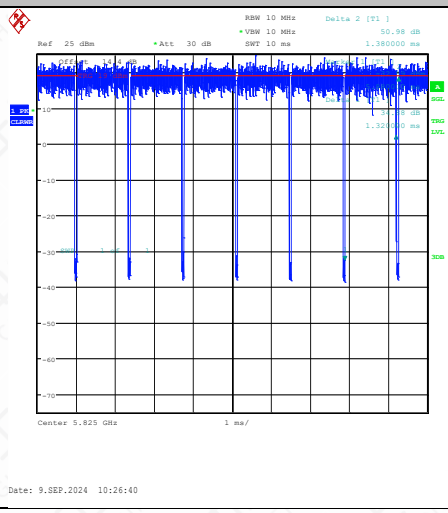

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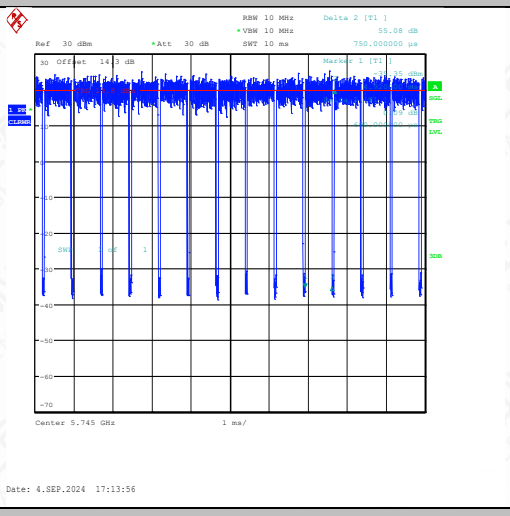	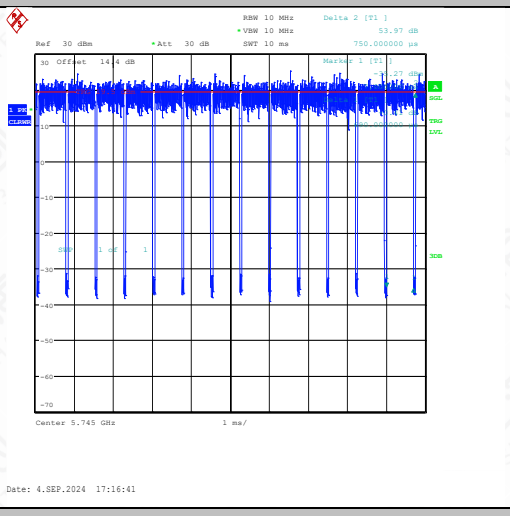
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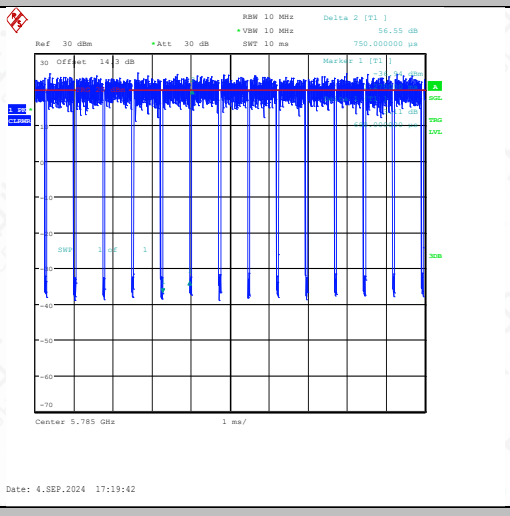	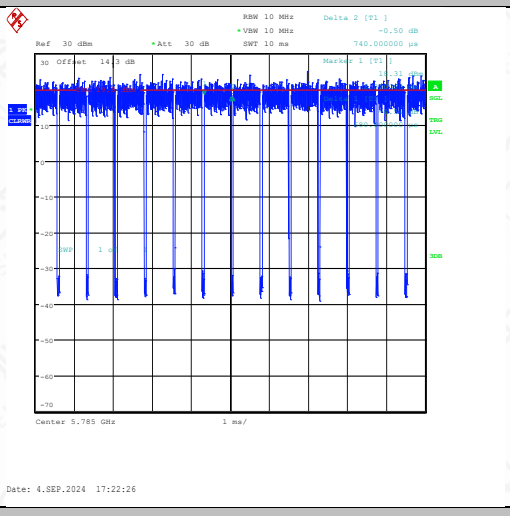
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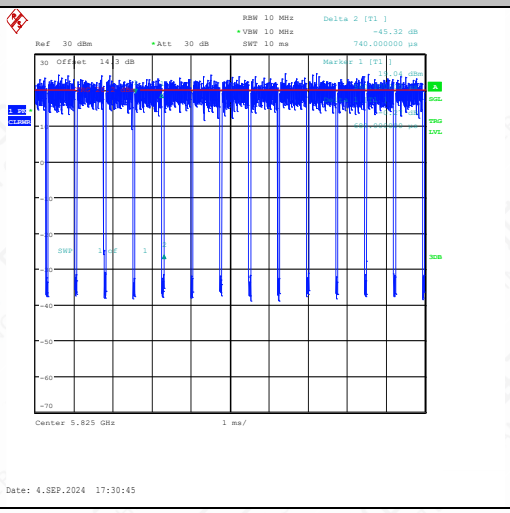	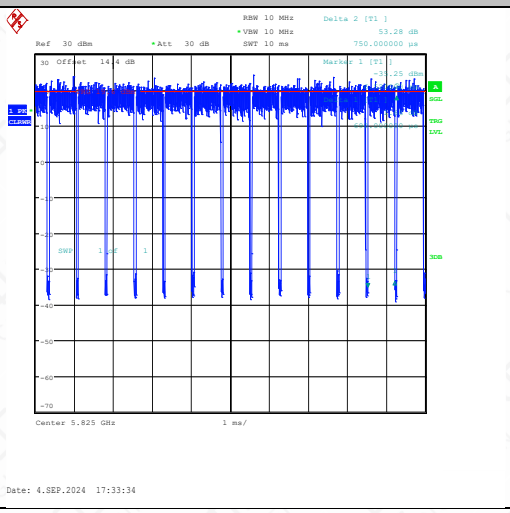

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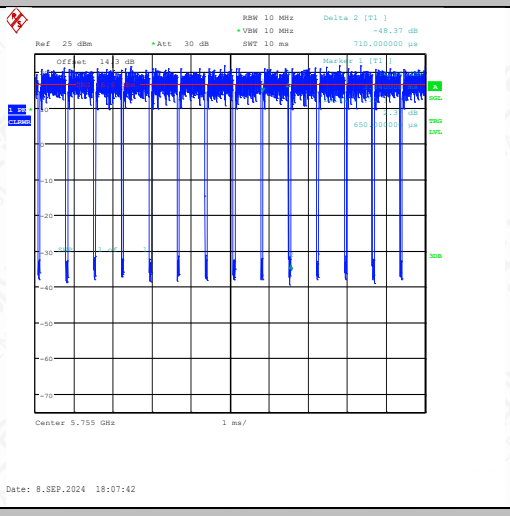	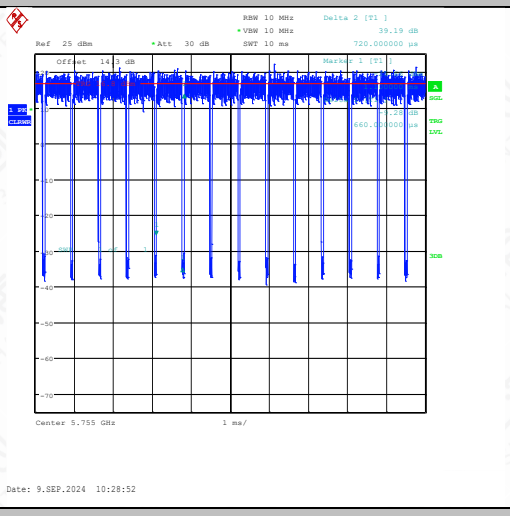
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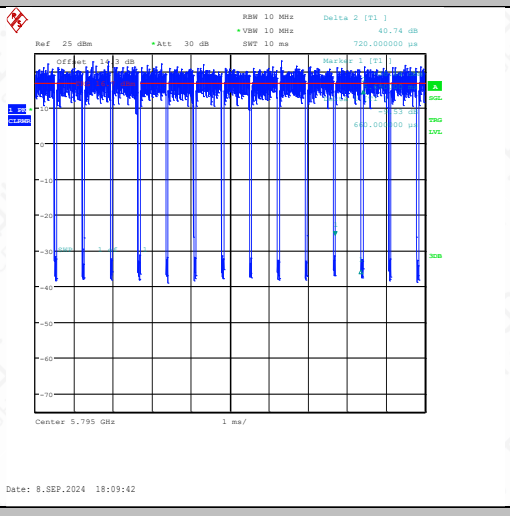	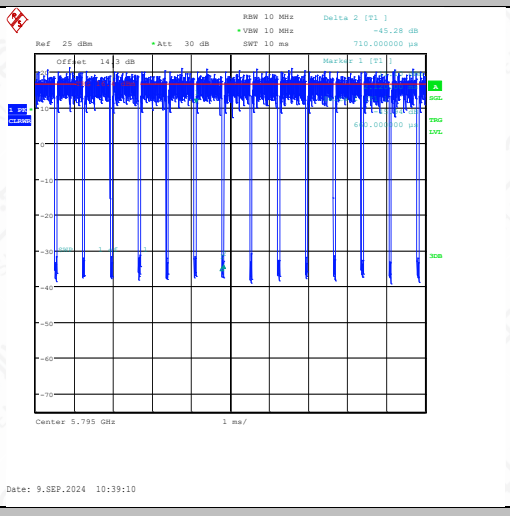
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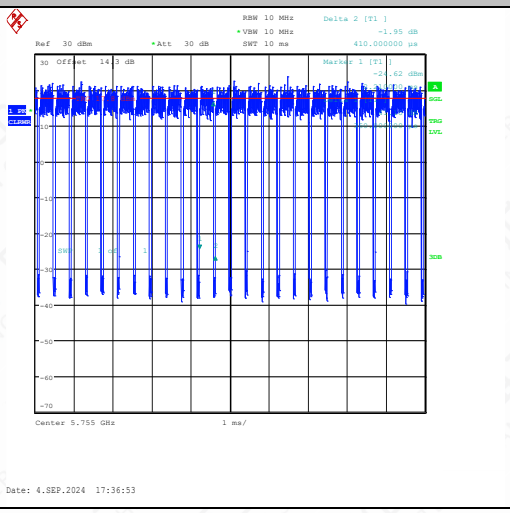	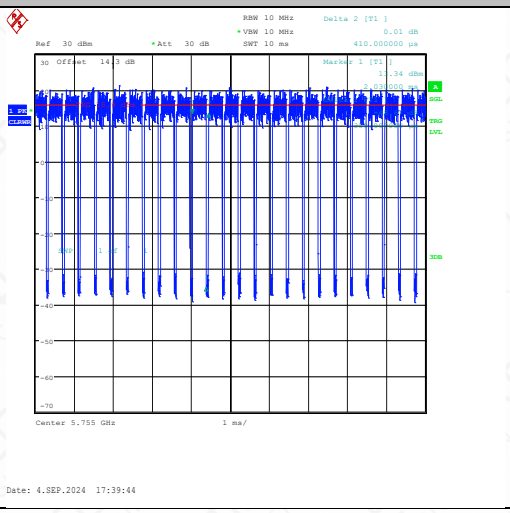

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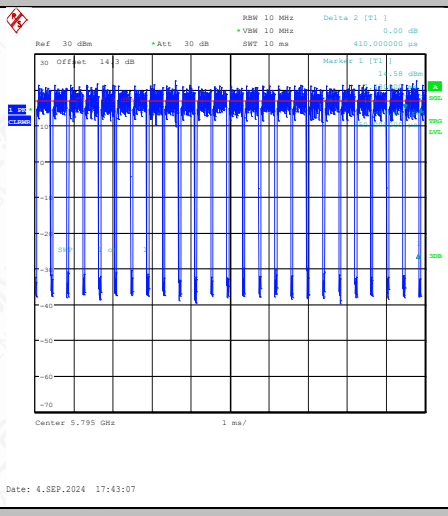	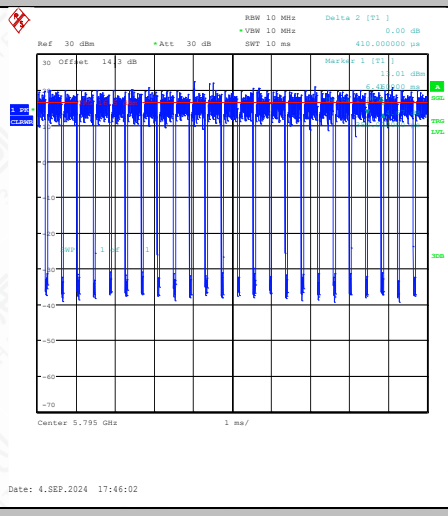
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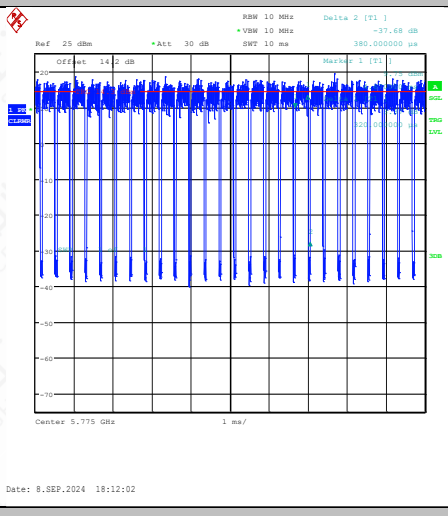	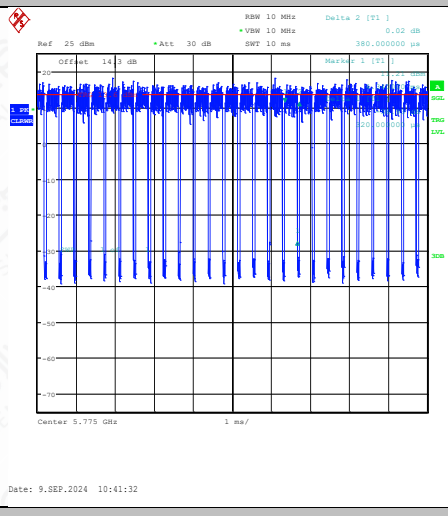
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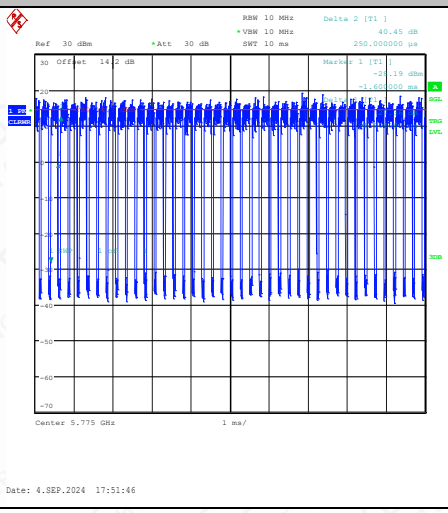	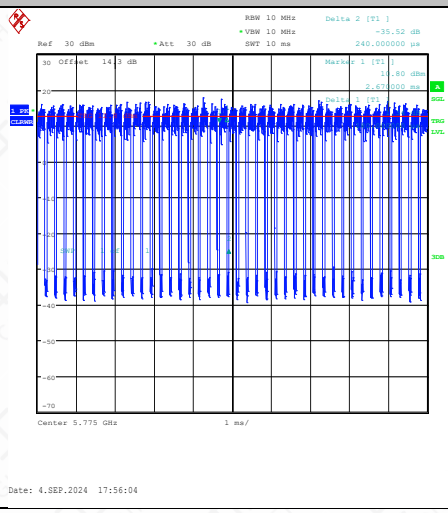

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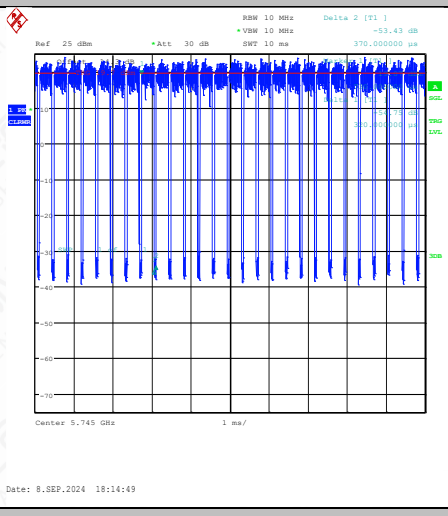	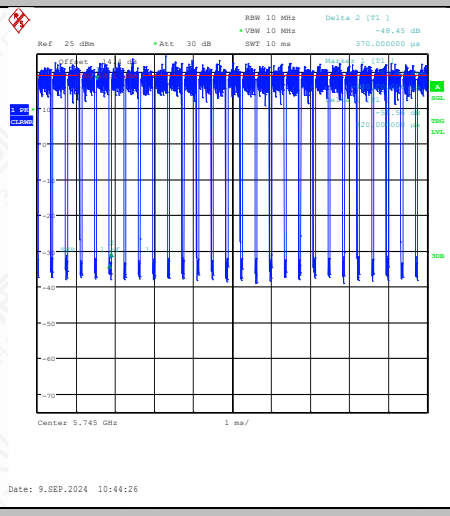
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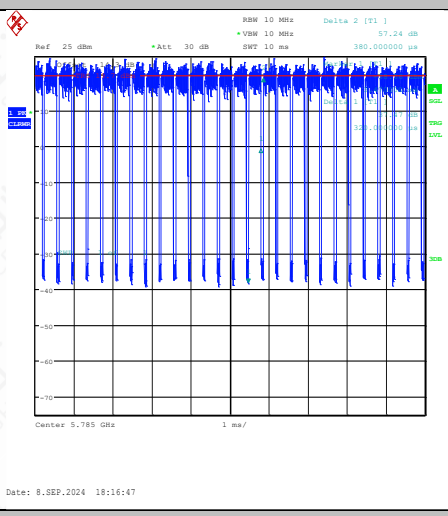	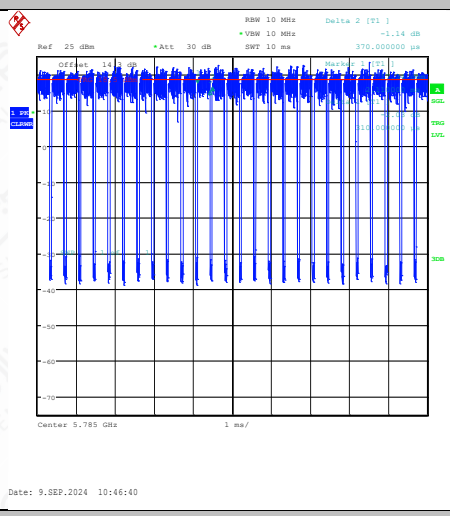
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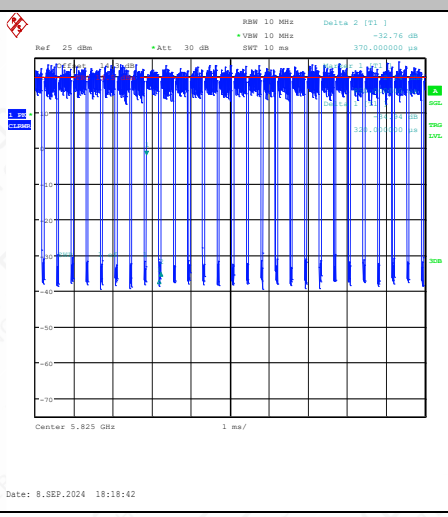	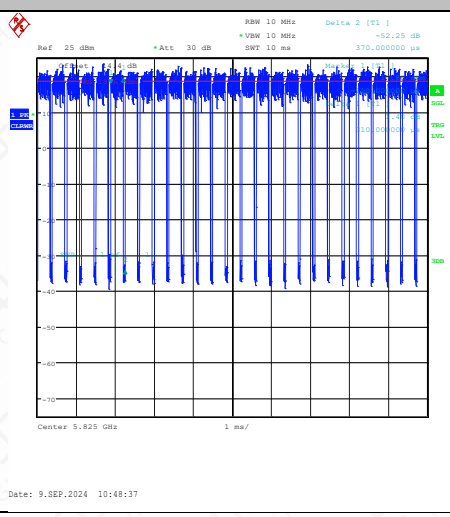

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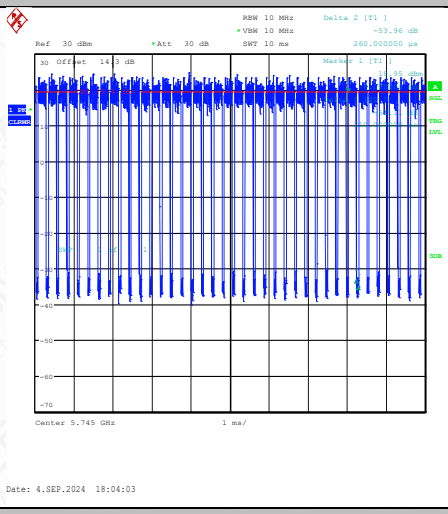	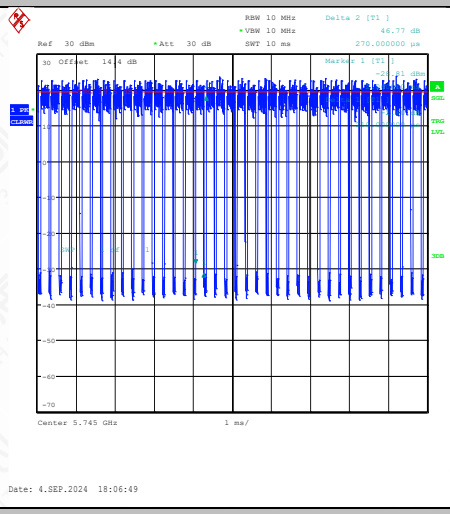
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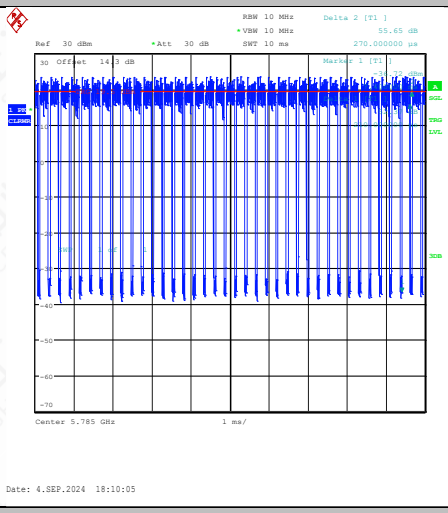	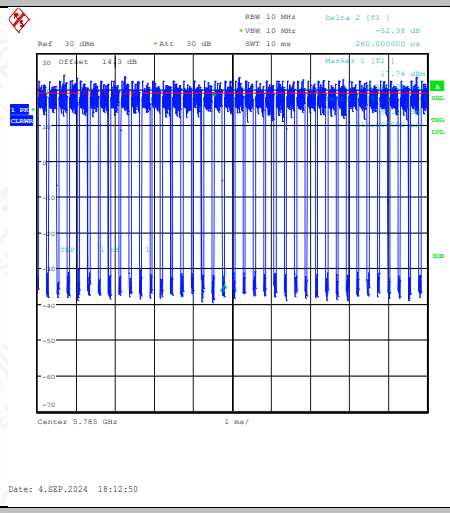
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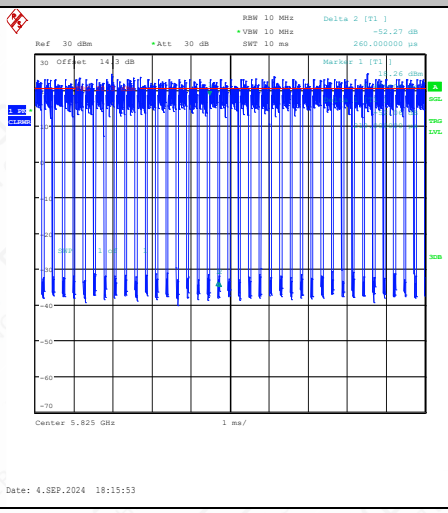	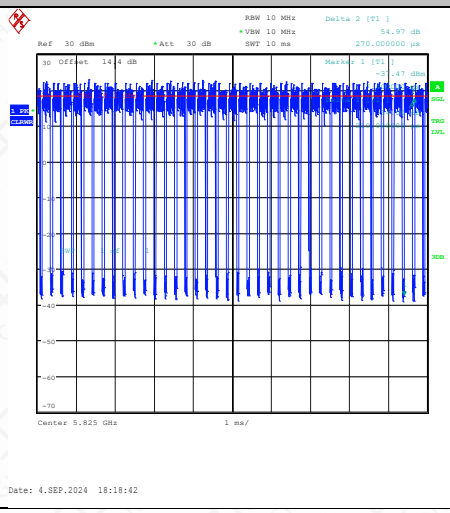

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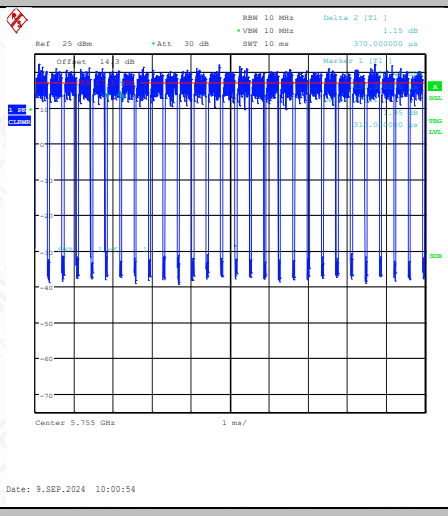	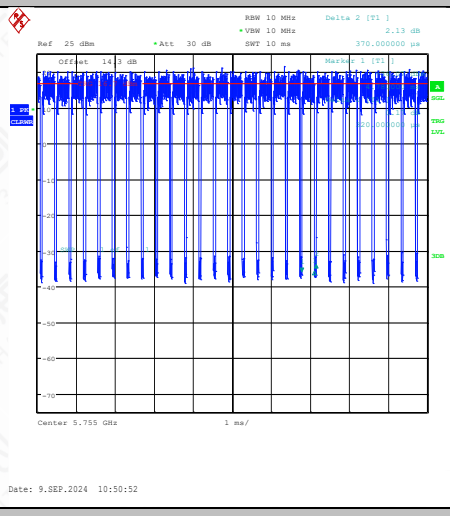
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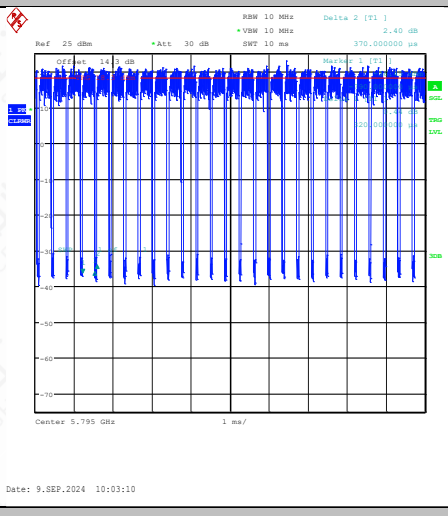	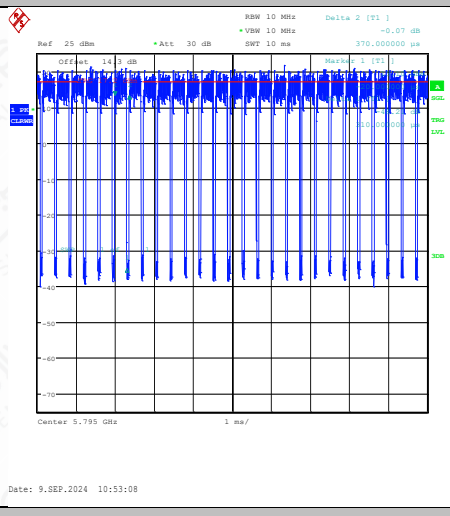
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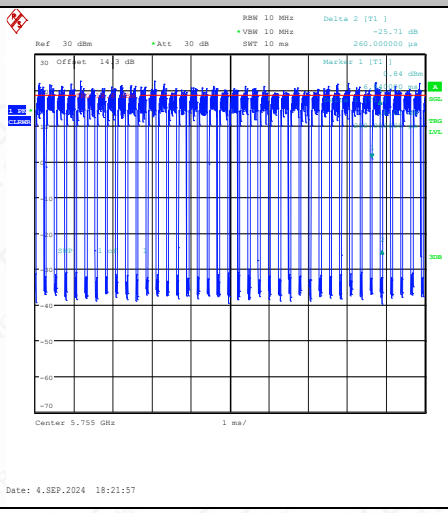	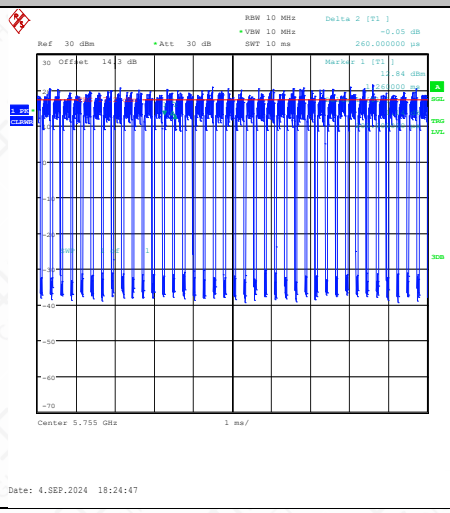

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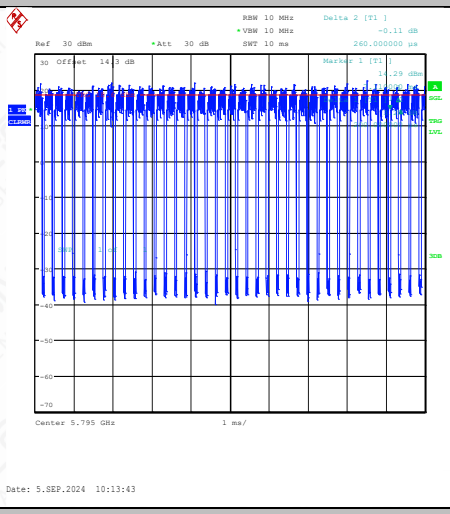	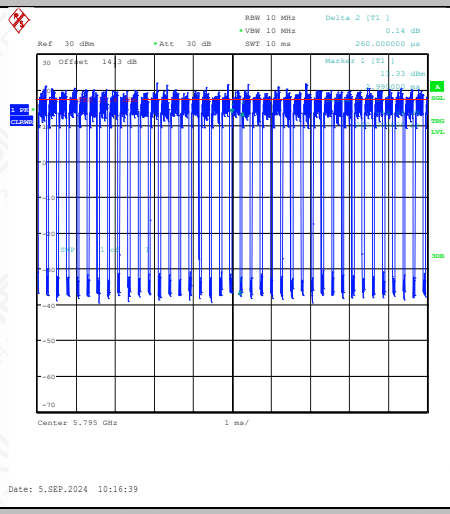
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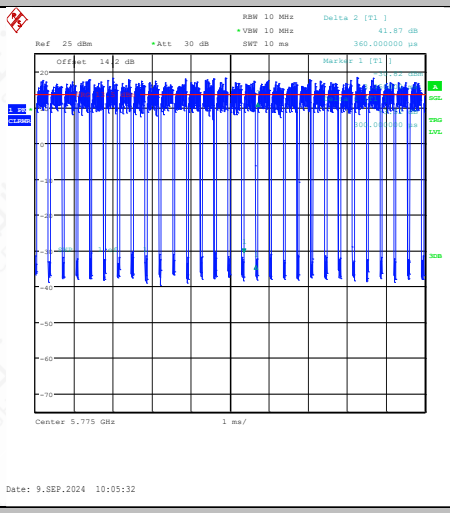	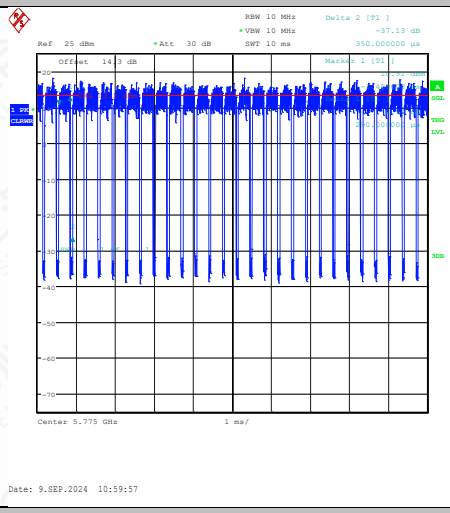
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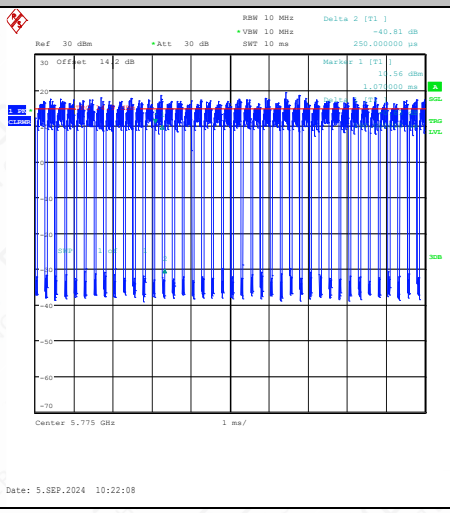	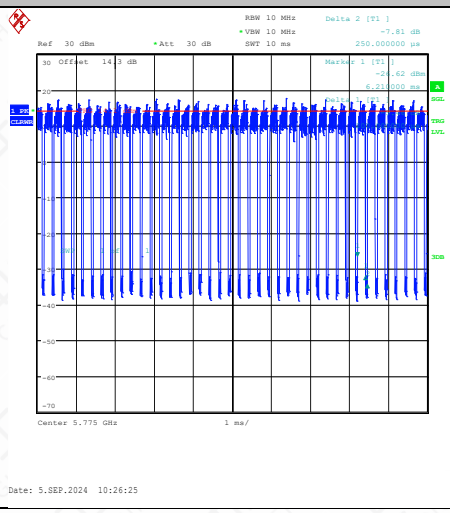

AX Part RU_Multi-User Test Graph

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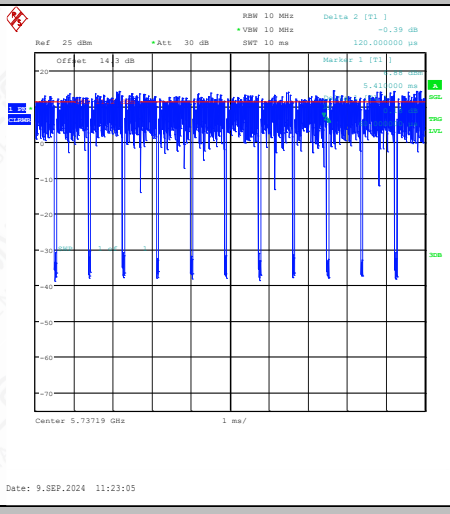	/
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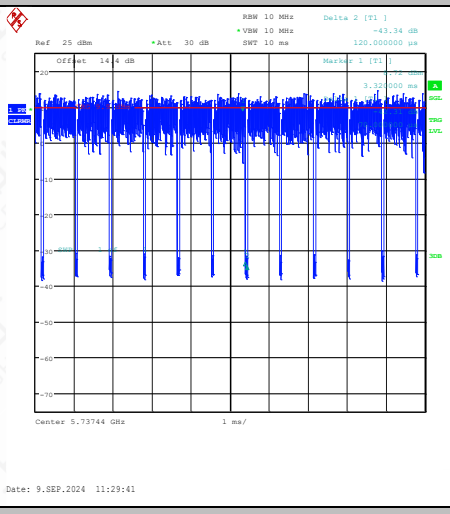	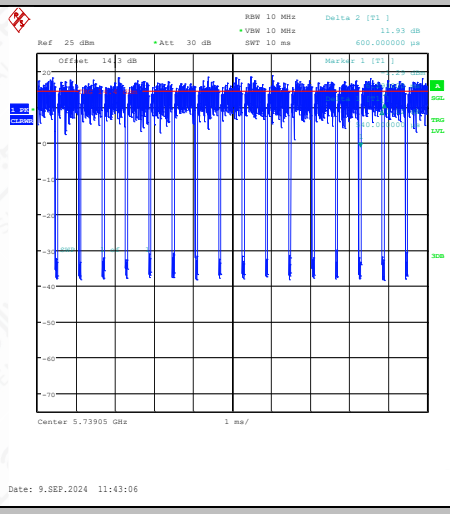
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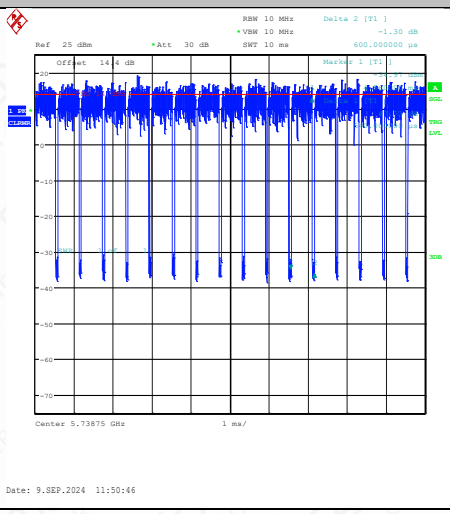	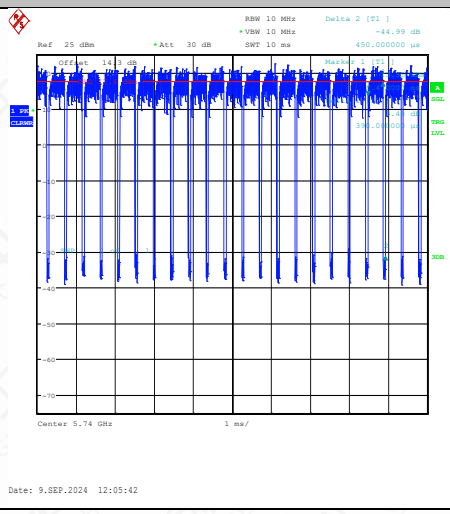

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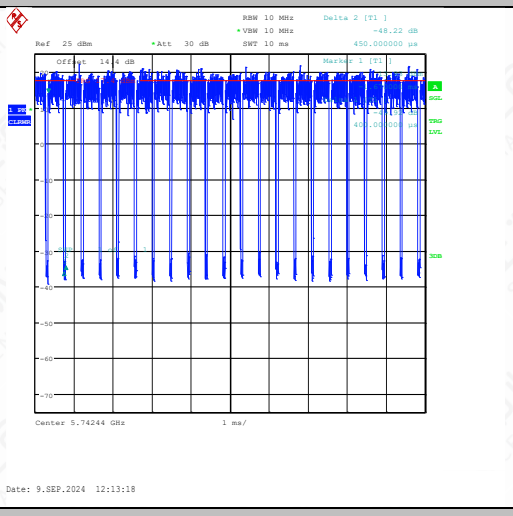	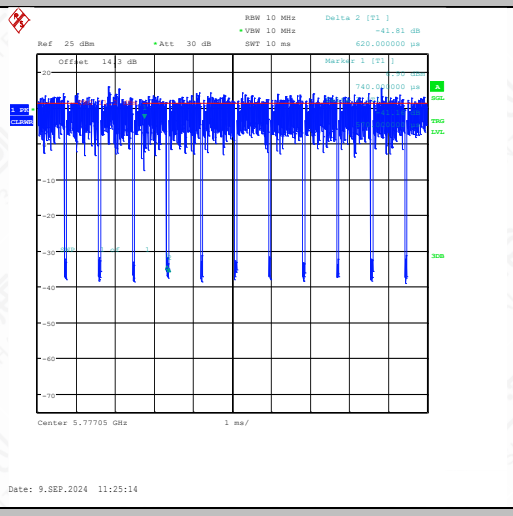
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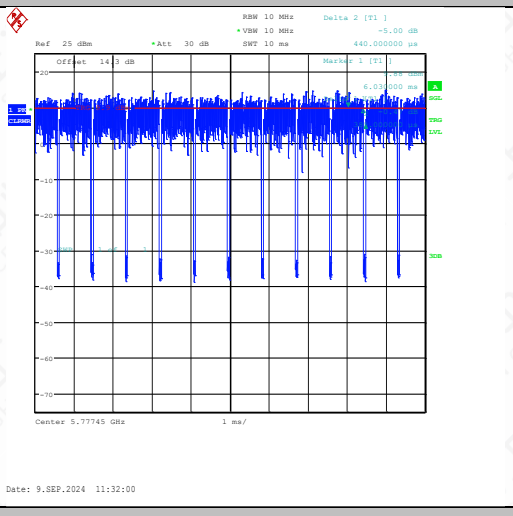	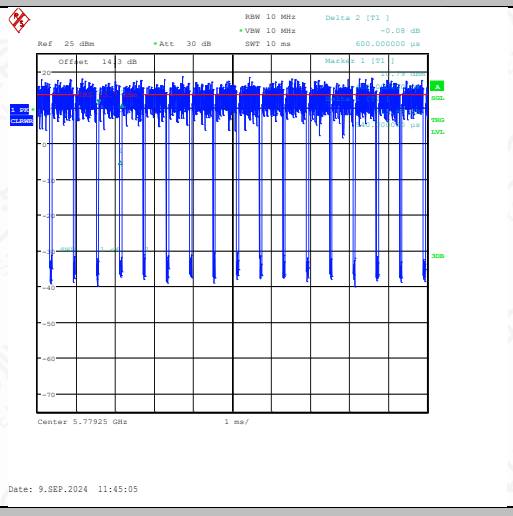
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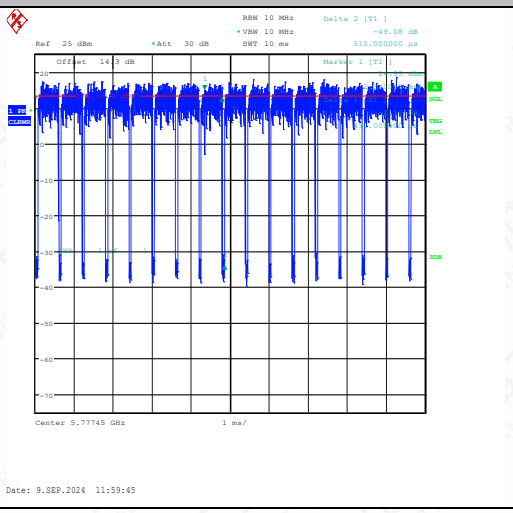	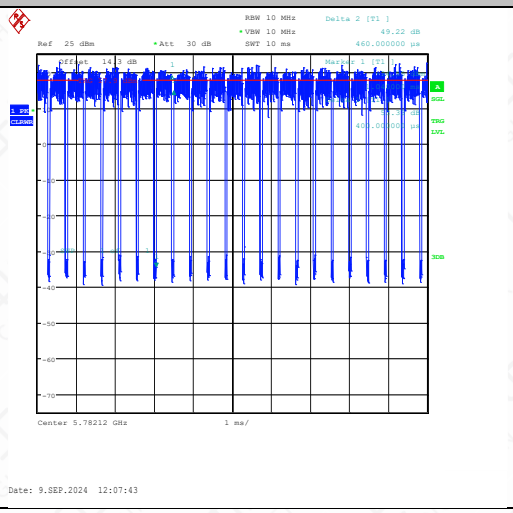

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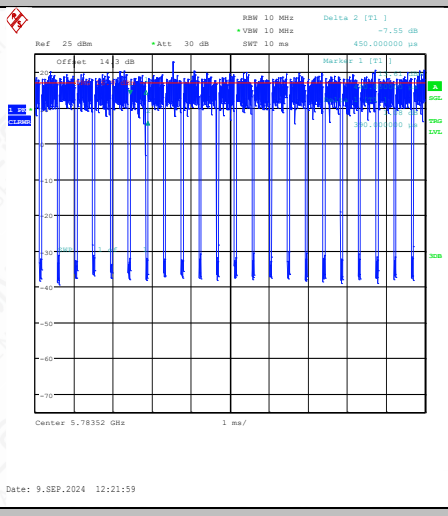	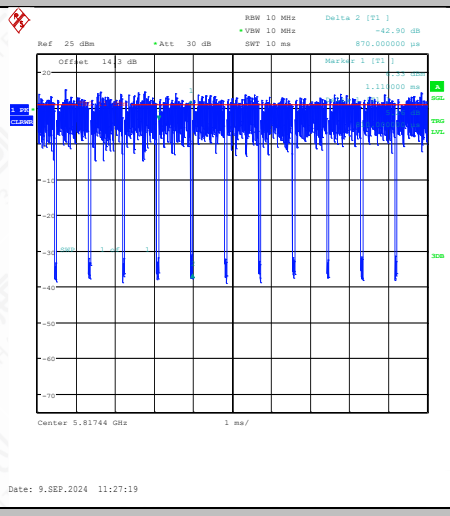
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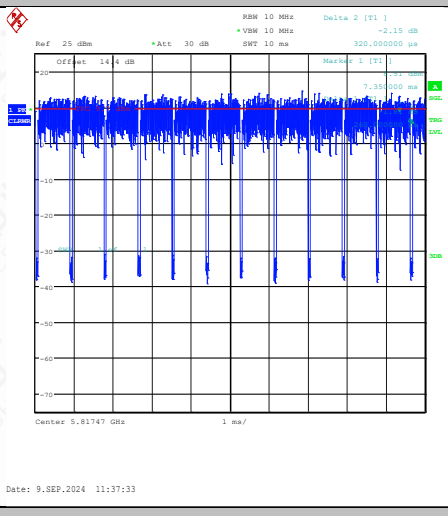	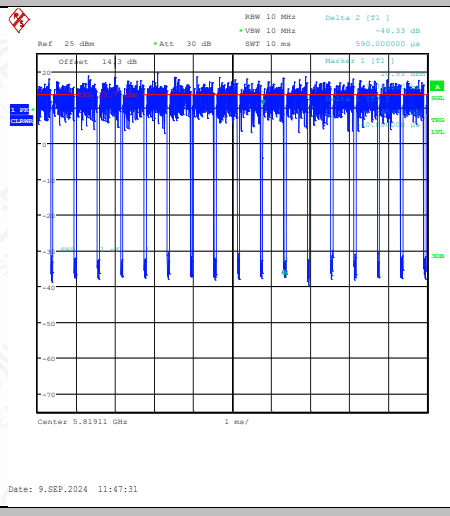
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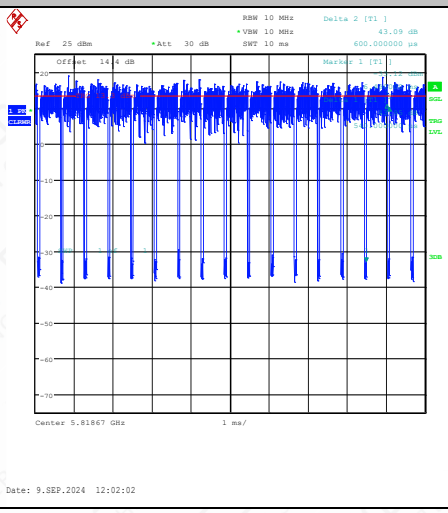	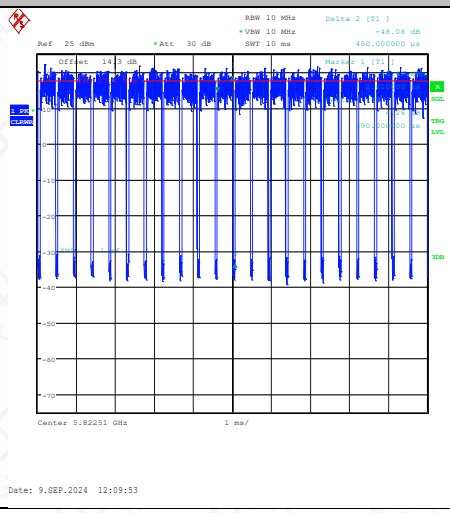

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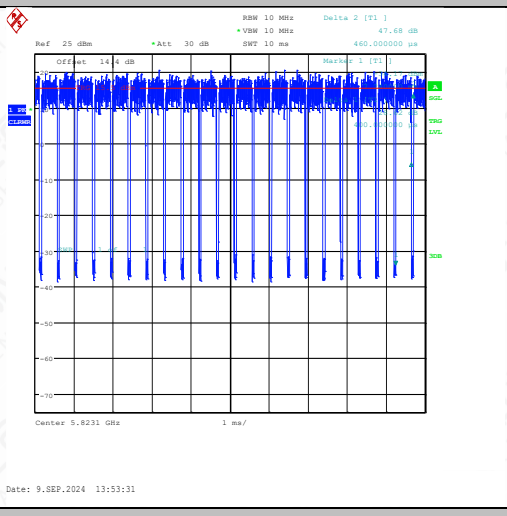	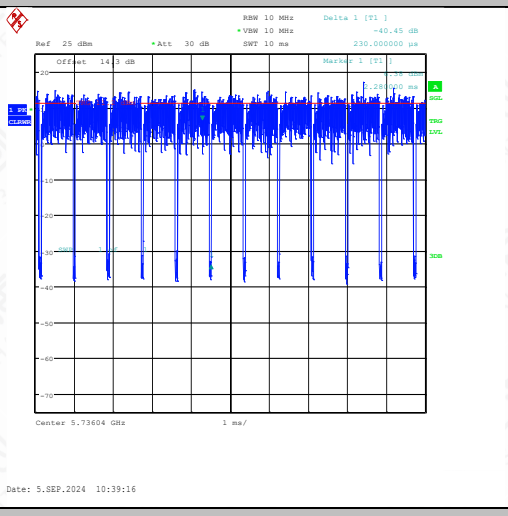
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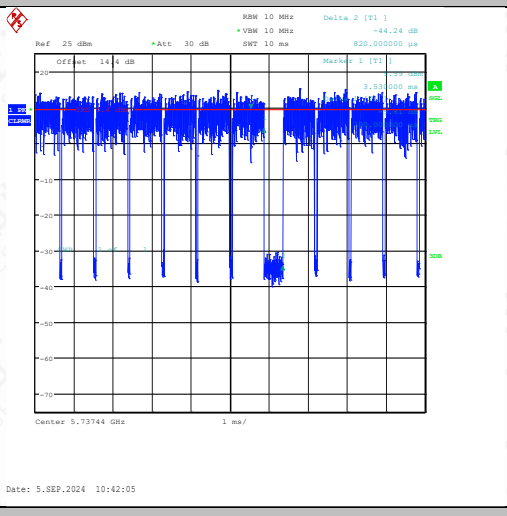	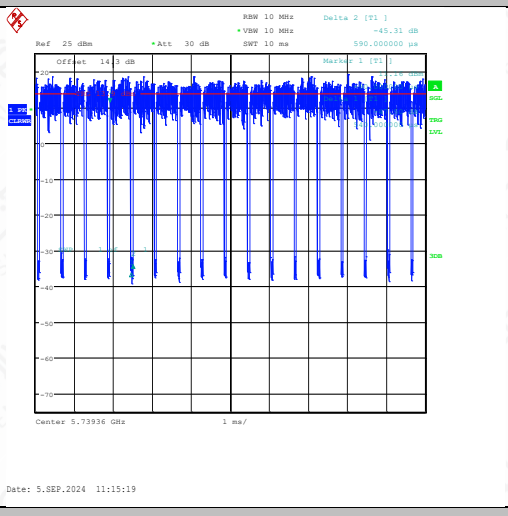
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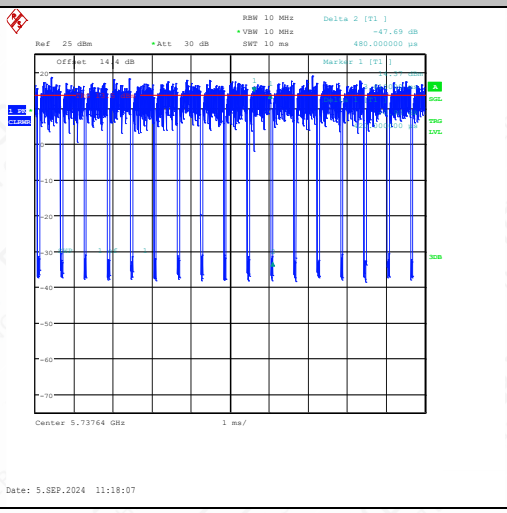	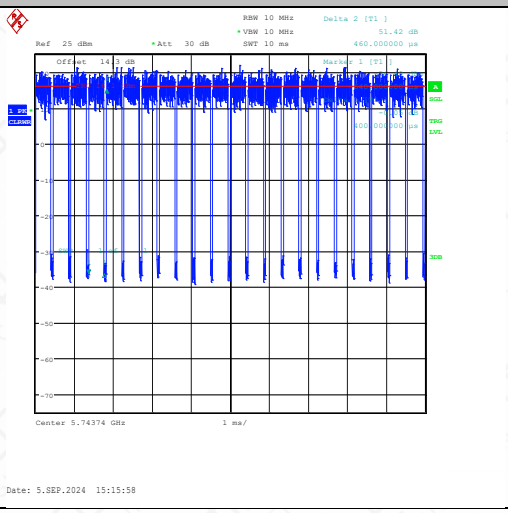

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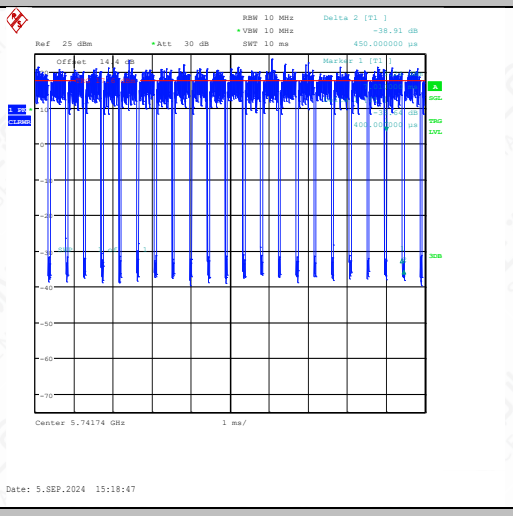	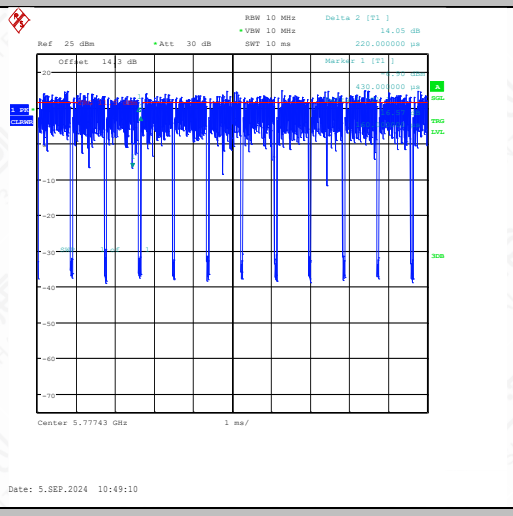
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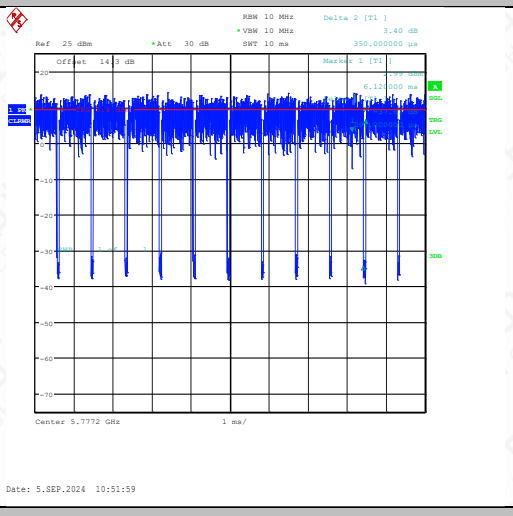	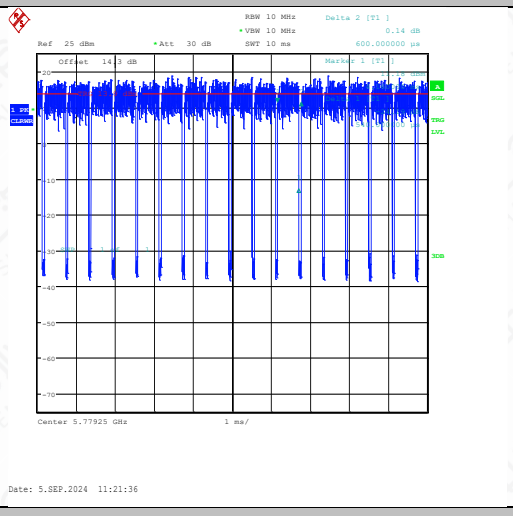
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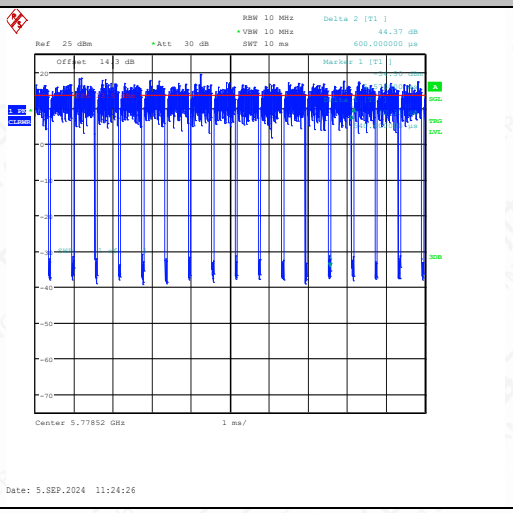	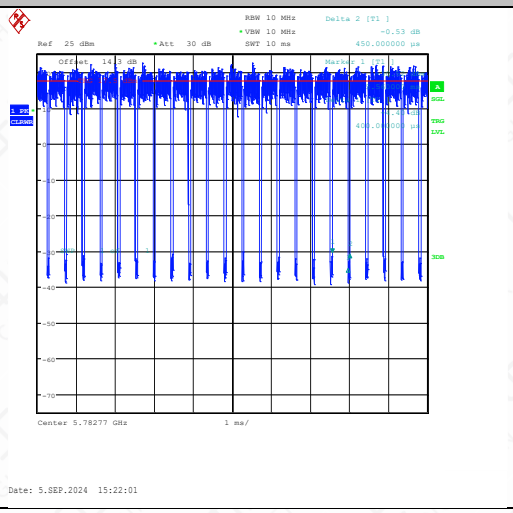

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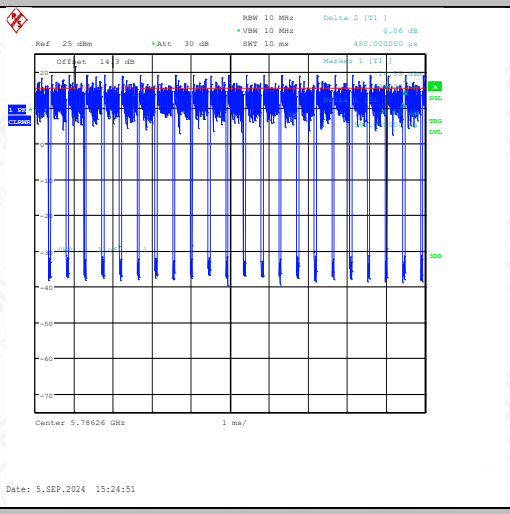	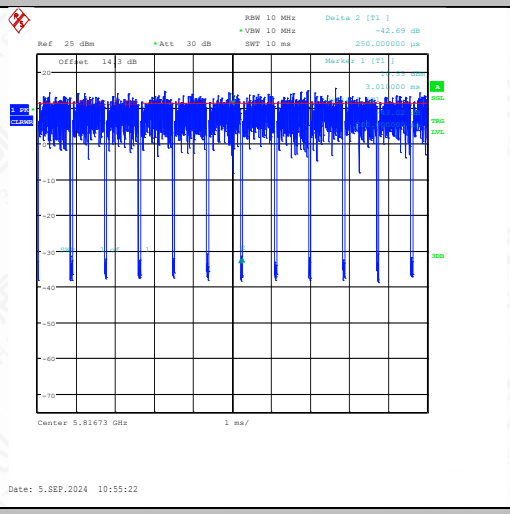
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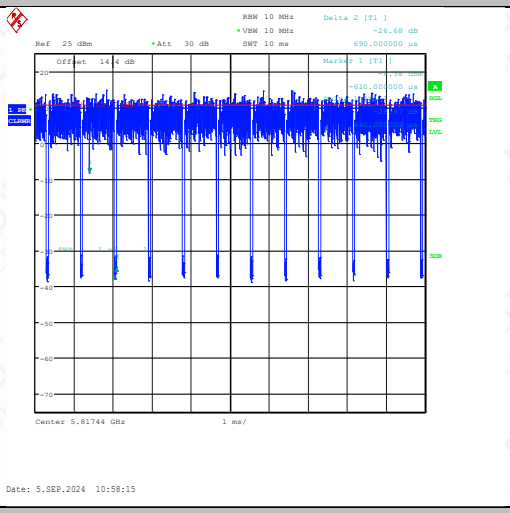	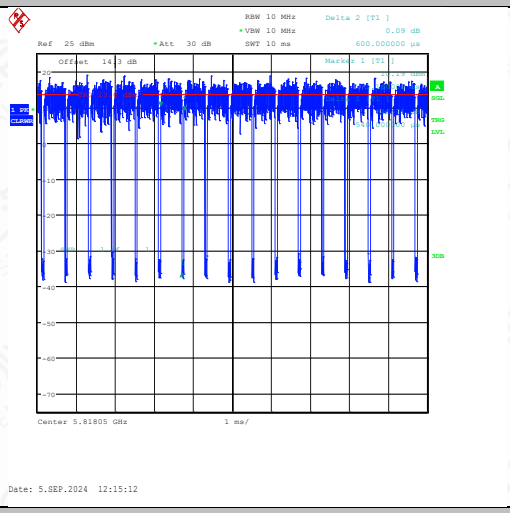
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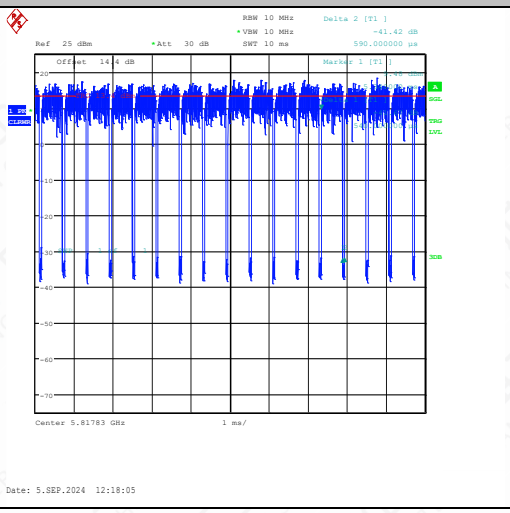	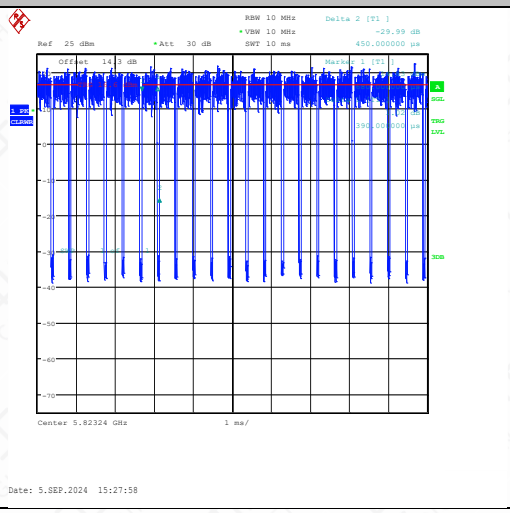

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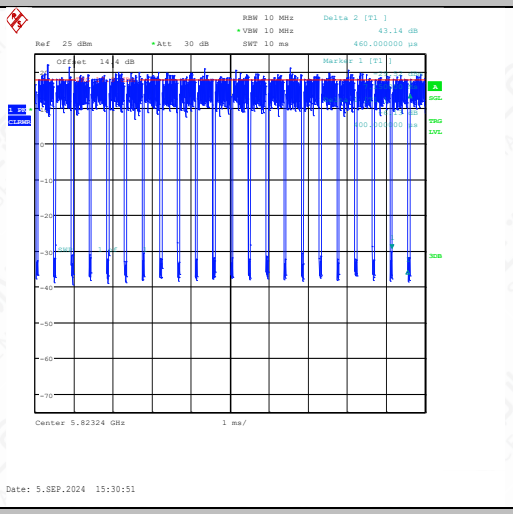	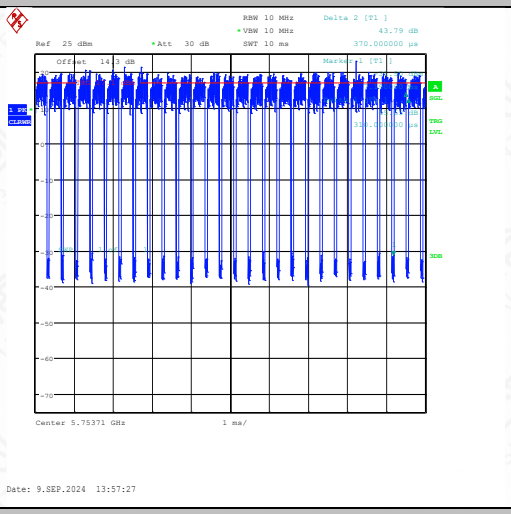
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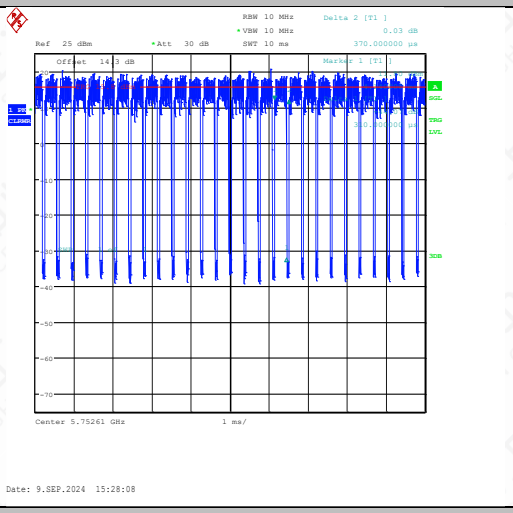	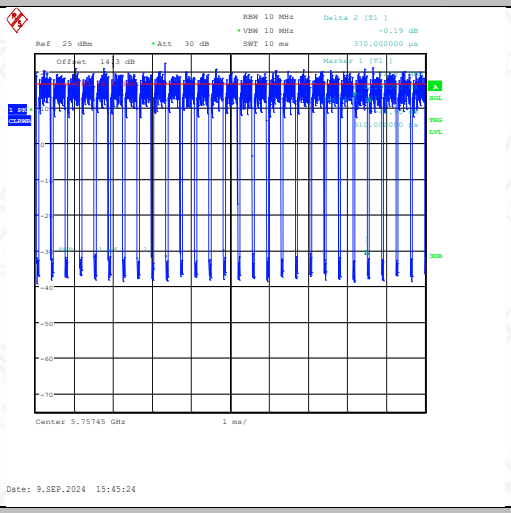
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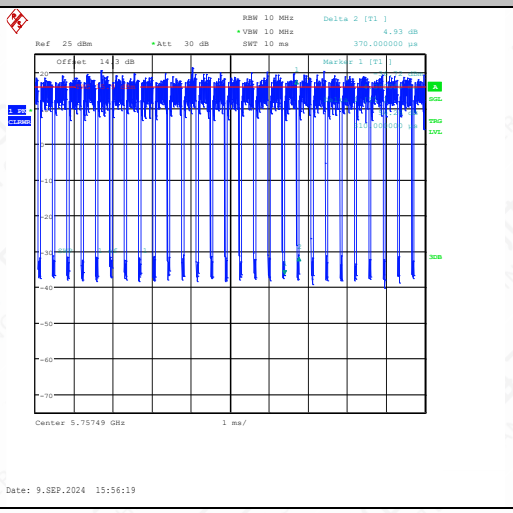	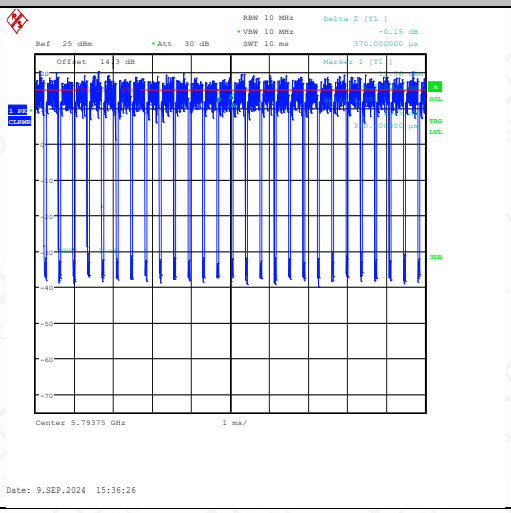

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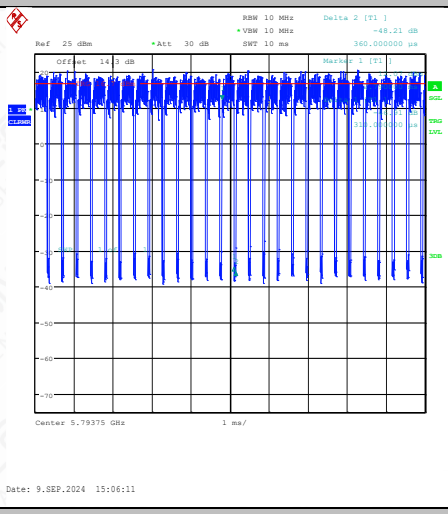	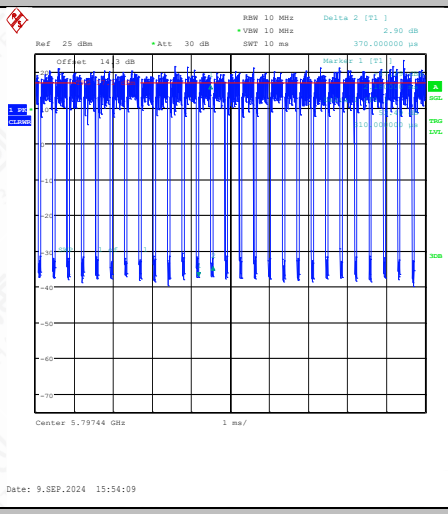
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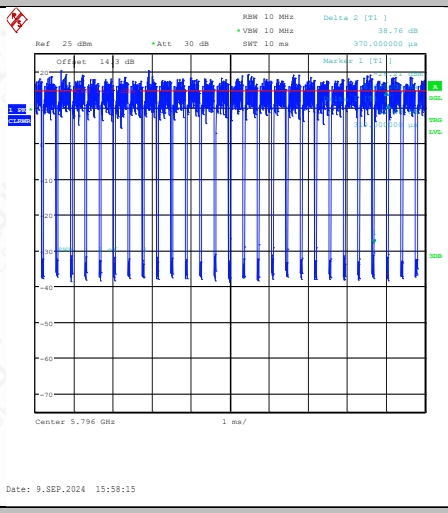	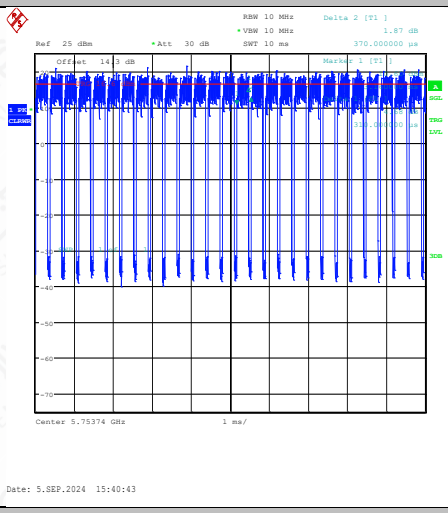
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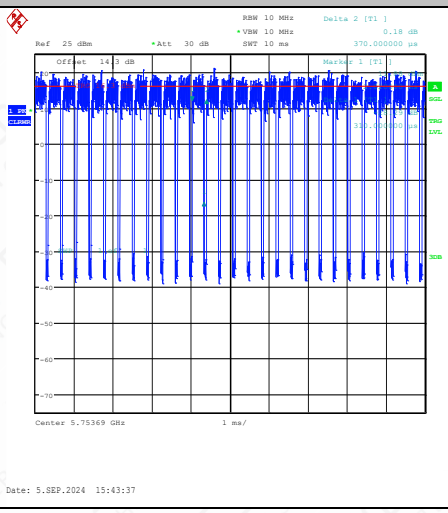
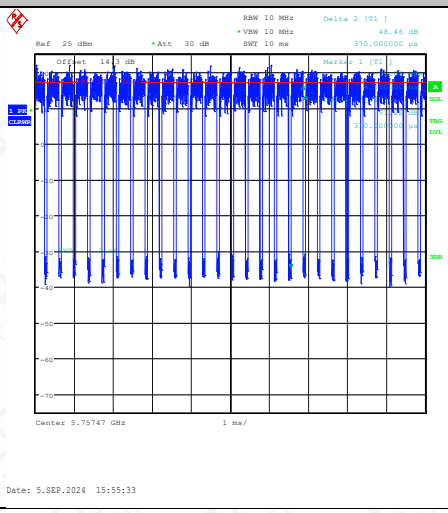
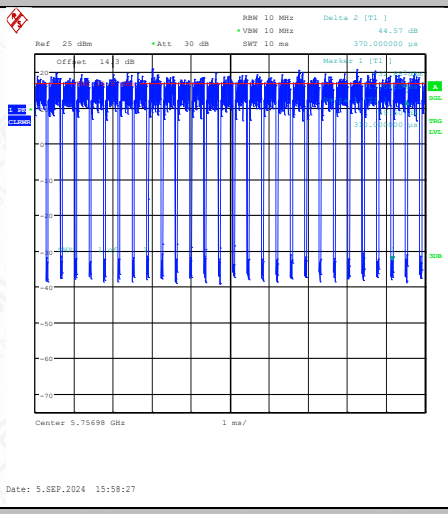
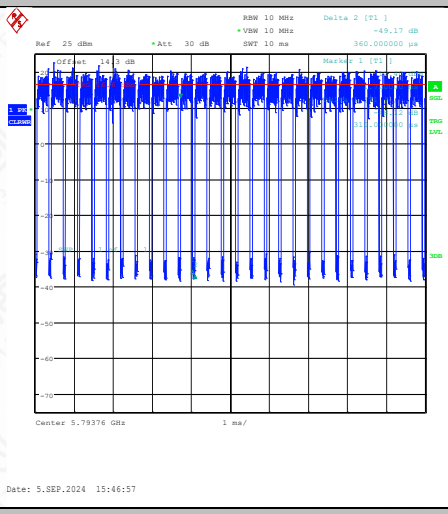
	

NTNV-11AX40MIMO-Ant2-5755-242Tone-RU62	NTNV-11AX40MIMO-Ant1-5795-242Tone-RU61
	
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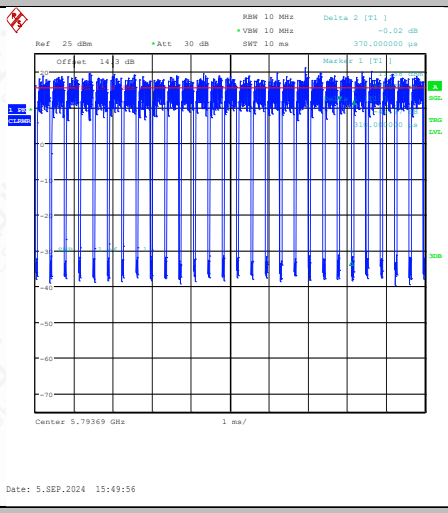
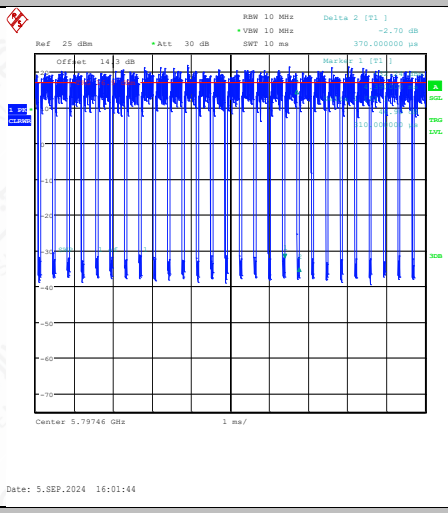
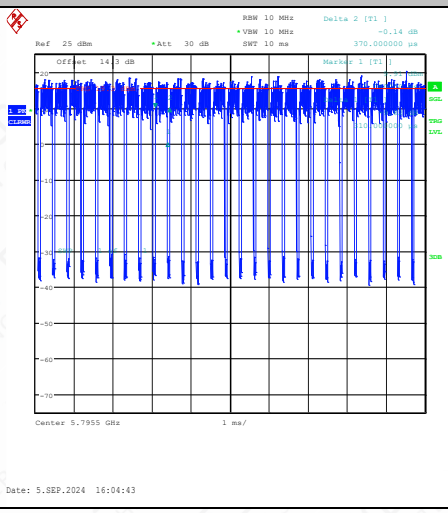
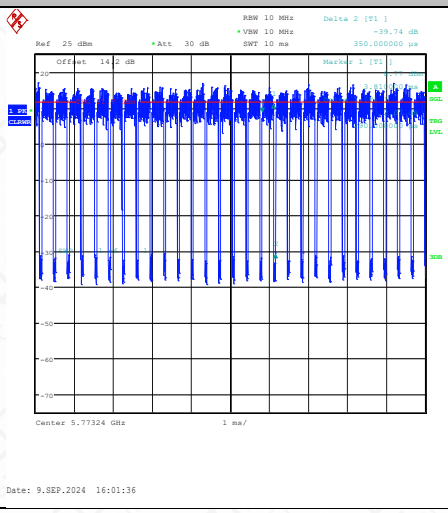
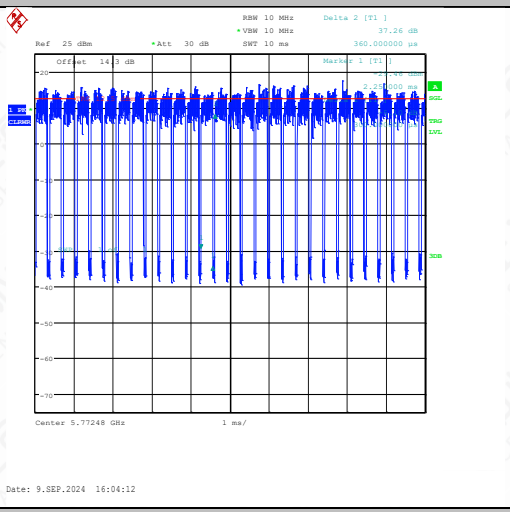
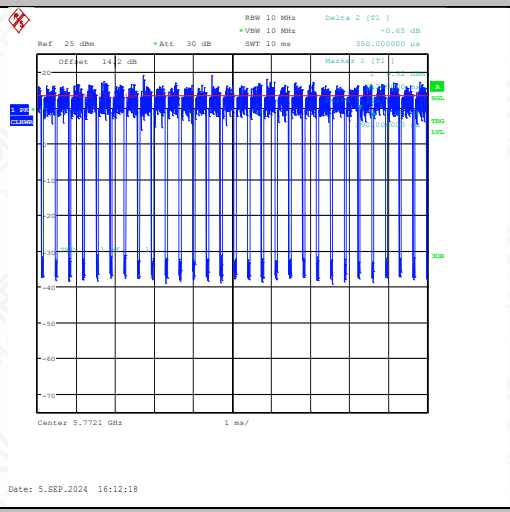
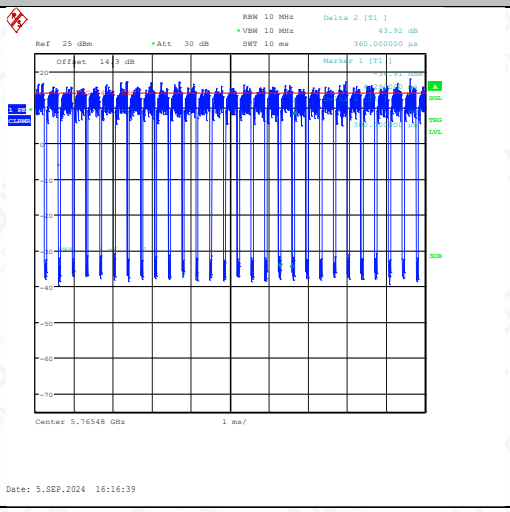
	
NTNV-11AX40MIMO-Ant2-5795-242Tone-RU62	NTNV-11AX80SISO-Ant1-5775-484Tone-RU65
	

NTNV-11AX80SISO-Ant2-5775-484Tone-RU65	NTNV-11AX80MIMO-Ant1-5775-484Tone-RU65
	
NTNV-11AX80MIMO-Ant2-5775-484Tone-RU65	/
	/

6.2 Maximum Average Output Power

6.2.1 Measurement Limit and Method

Standard	Limit (dBm)
FCC CRF Part 15.407(a)	< 30

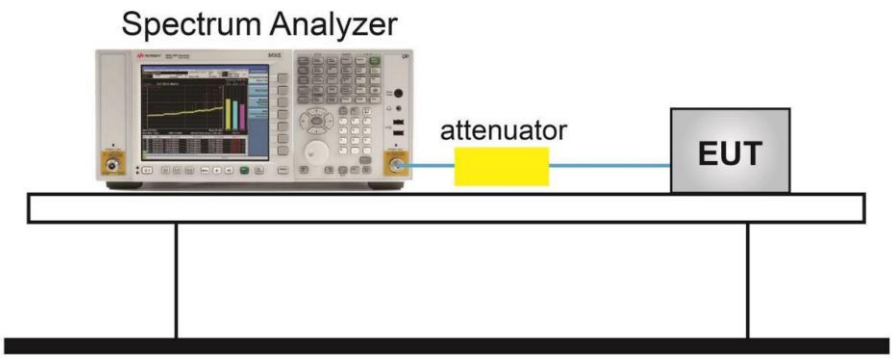
6.2.2 Test Procedure

The measurement method SA-2 is made according to KDB 789033 E

Method SA-2 (trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

1. Measure the duty cycle, x, of the transmitter output signal as described in II.B.
2. Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
3. Set RBW = 1 MHz. (iv) Set VBW ≥ 3 MHz.
4. Number of points in sweep ≥ 2 × span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
5. Sweep time = auto.
6. Detector = power averaging (rms), if available. Otherwise, use sample detector mode.
7. Do not use sweep triggering. Allow the sweep to “free run.”
8. Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.
9. Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
10. Add 10 log (1/x), where x is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add 10 log (1/0.25) = 6 dB if the duty cycle is 25%

6.2.3 Test setup



6.2.4 Measurement Results

Test Mode	Antenna	Frequency [MHz]	Set Power	Channel Power [dBm]	Duty Cycle [%]	DC Factor [dBm]	Result [dBm]	Limit [dBm]	Gain [dBi]	Verdict
11A	Ant1	5745	---	17.48	95.89	0.18	17.66	≤30.00	4.85	PASS
11A	Ant2	5745	---	16.48	95.86	0.18	16.66	≤30.00	3.50	PASS
11A	Ant1	5785	---	17.36	95.89	0.18	17.54	≤30.00	4.85	PASS
11A	Ant2	5785	---	16.15	95.89	0.18	16.33	≤30.00	3.50	PASS
11A	Ant1	5825	---	17.25	95.86	0.18	17.43	≤30.00	4.85	PASS
11A	Ant2	5825	---	15.94	95.86	0.18	16.12	≤30.00	3.50	PASS
11A-CDD	Ant1	5745	---	17.50	95.86	0.18	17.68	≤30.00	4.85	PASS
11A-CDD	Ant2	5745	---	16.21	95.89	0.18	16.39	≤30.00	3.50	PASS
11A-CDD	total	5745	---	---	---	---	20.09	≤28.79	7.21	PASS
11A-CDD	Ant1	5785	---	17.32	96.55	0.15	17.47	≤30.00	4.85	PASS
11A-CDD	Ant2	5785	---	15.92	95.86	0.18	16.10	≤30.00	3.50	PASS
11A-CDD	total	5785	---	---	---	---	19.85	≤28.79	7.21	PASS
11A-CDD	Ant1	5825	---	17.09	96.55	0.15	17.24	≤30.00	4.85	PASS
11A-CDD	Ant2	5825	---	16.10	95.89	0.18	16.28	≤30.00	3.50	PASS
11A-CDD	total	5825	---	---	---	---	19.80	≤28.79	7.21	PASS
11AC20SISO	Ant1	5745	---	17.38	95.62	0.19	17.57	≤30.00	4.85	PASS
11AC20SISO	Ant2	5745	---	16.47	95.62	0.19	16.66	≤30.00	3.50	PASS
11AC20SISO	Ant1	5785	---	17.53	95.65	0.19	17.72	≤30.00	4.85	PASS
11AC20SISO	Ant2	5785	---	16.19	95.65	0.19	16.38	≤30.00	3.50	PASS
11AC20SISO	Ant1	5825	---	17.14	96.35	0.16	17.30	≤30.00	4.85	PASS
11AC20SISO	Ant2	5825	---	15.99	95.65	0.19	16.18	≤30.00	3.50	PASS
11AC20MIMO	Ant1	5745	---	17.24	92.00	0.36	17.60	≤30.00	4.85	PASS
11AC20MIMO	Ant2	5745	---	15.96	92.00	0.36	16.32	≤30.00	3.50	PASS
11AC20MIMO	total	5745	---	---	---	---	20.02	≤28.79	7.21	PASS
11AC20MIMO	Ant1	5785	---	17.20	92.00	0.36	17.56	≤30.00	4.85	PASS
11AC20MIMO	Ant2	5785	---	15.77	91.89	0.37	16.14	≤30.00	3.50	PASS
11AC20MIMO	total	5785	---	---	---	---	19.92	≤28.79	7.21	PASS
11AC20MIMO	Ant1	5825	---	16.71	91.89	0.37	17.08	≤30.00	4.85	PASS
11AC20MIMO	Ant2	5825	---	15.46	92.00	0.36	15.82	≤30.00	3.50	PASS
11AC20MIMO	total	5825	---	---	---	---	19.51	≤28.79	7.21	PASS
11AC40SISO	Ant1	5755	---	16.92	91.55	0.38	17.30	≤30.00	4.85	PASS
11AC40SISO	Ant2	5755	---	16.04	91.67	0.38	16.42	≤30.00	3.50	PASS
11AC40SISO	Ant1	5795	---	17.19	91.67	0.38	17.57	≤30.00	4.85	PASS
11AC40SISO	Ant2	5795	---	15.72	92.96	0.32	16.04	≤30.00	3.50	PASS
11AC40MIMO	Ant1	5755	---	16.86	85.37	0.69	17.55	≤30.00	4.85	PASS
11AC40MIMO	Ant2	5755	---	15.68	85.37	0.69	16.37	≤30.00	3.50	PASS
11AC40MIMO	total	5755	---	---	---	---	20.01	≤28.79	7.21	PASS
11AC40MIMO	Ant1	5795	---	16.89	85.37	0.69	17.58	≤30.00	4.85	PASS

11AC40MIMO	Ant2	5795	---	15.48	85.37	0.69	16.17	≤30.00	3.50	PASS
11AC40MIMO	total	5795	---	---	---	---	19.94	≤28.79	7.21	PASS
11AC80SISO	Ant1	5775	---	16.80	84.21	0.75	17.55	≤30.00	4.85	PASS
11AC80SISO	Ant2	5775	---	15.88	84.21	0.75	16.63	≤30.00	3.50	PASS
11AC80MIMO	Ant1	5775	---	16.46	76.00	1.19	17.65	≤30.00	4.85	PASS
11AC80MIMO	Ant2	5775	---	15.16	75.00	1.25	16.41	≤30.00	3.50	PASS
11AC80MIMO	total	5775	---	---	---	---	20.08	≤28.79	7.21	PASS
11AX20SISO	Ant1	5745	---	16.43	86.49	0.63	17.06	≤30.00	4.85	PASS
11AX20SISO	Ant2	5745	---	15.48	86.49	0.63	16.11	≤30.00	3.50	PASS
11AX20SISO	Ant1	5785	---	16.40	84.21	0.75	17.15	≤30.00	4.85	PASS
11AX20SISO	Ant2	5785	---	15.48	83.78	0.77	16.25	≤30.00	3.50	PASS
11AX20SISO	Ant1	5825	---	16.16	86.49	0.63	16.79	≤30.00	4.85	PASS
11AX20SISO	Ant2	5825	---	15.21	83.78	0.77	15.98	≤30.00	3.50	PASS
11AX20MIMO	Ant1	5745	---	16.20	80.77	0.93	17.13	≤30.00	4.85	PASS
11AX20MIMO	Ant2	5745	---	15.26	77.78	1.09	16.35	≤30.00	3.50	PASS
11AX20MIMO	total	5745	---	---	---	---	19.77	≤28.79	7.21	PASS
11AX20MIMO	Ant1	5785	---	16.16	77.78	1.09	17.25	≤30.00	4.85	PASS
11AX20MIMO	Ant2	5785	---	15.00	80.77	0.93	15.93	≤30.00	3.50	PASS
11AX20MIMO	total	5785	---	---	---	---	19.65	≤28.79	7.21	PASS
11AX20MIMO	Ant1	5825	---	15.75	80.77	0.93	16.68	≤30.00	4.85	PASS
11AX20MIMO	Ant2	5825	---	14.72	77.78	1.09	15.81	≤30.00	3.50	PASS
11AX20MIMO	total	5825	---	---	---	---	19.28	≤28.79	7.21	PASS
11AX40SISO	Ant1	5755	---	16.60	83.78	0.77	17.37	≤30.00	4.85	PASS
11AX40SISO	Ant2	5755	---	15.98	86.49	0.63	16.61	≤30.00	3.50	PASS
11AX40SISO	Ant1	5795	---	16.79	86.49	0.63	17.42	≤30.00	4.85	PASS
11AX40SISO	Ant2	5795	---	15.87	83.78	0.77	16.64	≤30.00	3.50	PASS
11AX40MIMO	Ant1	5755	---	16.57	76.92	1.14	17.71	≤30.00	4.85	PASS
11AX40MIMO	Ant2	5755	---	15.28	76.92	1.14	16.42	≤30.00	3.50	PASS
11AX40MIMO	total	5755	---	---	---	---	20.12	≤28.79	7.21	PASS
11AX40MIMO	Ant1	5795	---	16.58	76.92	1.14	17.72	≤30.00	4.85	PASS
11AX40MIMO	Ant2	5795	---	15.63	76.92	1.14	16.77	≤30.00	3.50	PASS
11AX40MIMO	total	5795	---	---	---	---	20.28	≤28.79	7.21	PASS
11AX80SISO	Ant1	5775	---	15.98	83.33	0.79	16.77	≤30.00	4.85	PASS
11AX80SISO	Ant2	5775	---	15.38	82.86	0.82	16.20	≤30.00	3.50	PASS
11AX80MIMO	Ant1	5775	---	15.95	76.00	1.19	17.14	≤30.00	4.85	PASS
11AX80MIMO	Ant2	5775	---	14.82	80.00	0.97	15.79	≤30.00	3.50	PASS
11AX80MIMO	total	5775	---	---	---	---	19.53	≤28.79	7.21	PASS

AX Part RU_Multi-User

TestMode	Antenna	Frequency[MHz]	RuSize	RuIndex	Result [dBm]	Limit[dBm]	Verdict
11AX20SISO	Ant1	5745	26Tone	RU0	8.37	≤30.00	PASS
11AX20SISO	Ant2	5745	26Tone	RU0	7.60	≤30.00	PASS
11AX20SISO	Ant1	5745	52Tone	RU37	9.33	≤30.00	PASS
11AX20SISO	Ant2	5745	52Tone	RU37	8.98	≤30.00	PASS
11AX20SISO	Ant1	5745	106Tone	RU53	13.28	≤30.00	PASS
11AX20SISO	Ant2	5745	106Tone	RU53	12.61	≤30.00	PASS
11AX20SISO	Ant1	5785	26Tone	RU0	5.95	≤30.00	PASS
11AX20SISO	Ant2	5785	26Tone	RU0	5.99	≤30.00	PASS
11AX20SISO	Ant1	5785	52Tone	RU37	9.36	≤30.00	PASS
11AX20SISO	Ant2	5785	52Tone	RU37	9.02	≤30.00	PASS
11AX20SISO	Ant1	5785	106Tone	RU53	13.45	≤30.00	PASS
11AX20SISO	Ant2	5785	106Tone	RU53	12.56	≤30.00	PASS
11AX20SISO	Ant1	5825	26Tone	RU0	5.65	≤30.00	PASS
11AX20SISO	Ant2	5825	26Tone	RU0	6.07	≤30.00	PASS
11AX20SISO	Ant1	5825	52Tone	RU37	9.15	≤30.00	PASS
11AX20SISO	Ant2	5825	52Tone	RU37	8.75	≤30.00	PASS
11AX20SISO	Ant1	5825	106Tone	RU53	13.13	≤30.00	PASS
11AX20SISO	Ant2	5825	106Tone	RU53	12.09	≤30.00	PASS
11AX20MIMO	Ant1	5745	26Tone	RU0	6.66	≤30.00	PASS
11AX20MIMO	Ant2	5745	26Tone	RU0	9.35	≤30.00	PASS
11AX20MIMO	total	5745	26Tone	RU0	11.22	≤28.79	PASS
11AX20MIMO	total	5745	52Tone	RU37	12.31	≤28.79	PASS
11AX20MIMO	Ant1	5745	52Tone	RU37	9.56	≤30.00	PASS
11AX20MIMO	Ant2	5745	52Tone	RU37	9.02	≤30.00	PASS
11AX20MIMO	Ant1	5745	106Tone	RU53	13.25	≤30.00	PASS
11AX20MIMO	Ant2	5745	106Tone	RU53	12.76	≤30.00	PASS
11AX20MIMO	total	5745	106Tone	RU53	16.02	≤28.79	PASS
11AX20MIMO	Ant1	5785	26Tone	RU0	7.32	≤30.00	PASS
11AX20MIMO	Ant2	5785	26Tone	RU0	6.17	≤30.00	PASS
11AX20MIMO	total	5785	26Tone	RU0	9.79	≤28.79	PASS
11AX20MIMO	Ant1	5785	52Tone	RU37	9.68	≤30.00	PASS
11AX20MIMO	Ant2	5785	52Tone	RU37	8.91	≤30.00	PASS
11AX20MIMO	total	5785	52Tone	RU37	12.32	≤28.79	PASS
11AX20MIMO	Ant1	5785	106Tone	RU53	13.56	≤30.00	PASS
11AX20MIMO	Ant2	5785	106Tone	RU53	12.62	≤30.00	PASS
11AX20MIMO	total	5785	106Tone	RU53	16.13	≤28.79	PASS
11AX20MIMO	Ant1	5825	26Tone	RU0	6.66	≤30.00	PASS
11AX20MIMO	Ant2	5825	26Tone	RU0	5.41	≤30.00	PASS
11AX20MIMO	total	5825	26Tone	RU0	9.09	≤28.79	PASS
11AX20MIMO	Ant1	5825	52Tone	RU37	9.47	≤30.00	PASS
11AX20MIMO	Ant2	5825	52Tone	RU37	8.66	≤30.00	PASS

11AX20MIMO	total	5825	52Tone	RU37	12.09	≤28.79	PASS
11AX20MIMO	Ant1	5825	106Tone	RU53	13.23	≤30.00	PASS
11AX20MIMO	Ant2	5825	106Tone	RU53	12.25	≤30.00	PASS
11AX20MIMO	total	5825	106Tone	RU53	15.78	≤28.79	PASS
11AX40SISO	Ant1	5755	242Tone	RU61	14.71	≤30.00	PASS
11AX40SISO	Ant2	5755	242Tone	RU61	13.79	≤30.00	PASS
11AX40SISO	Ant1	5755	242Tone	RU62	14.34	≤30.00	PASS
11AX40SISO	Ant2	5755	242Tone	RU62	13.85	≤30.00	PASS
11AX40SISO	Ant1	5795	242Tone	RU61	14.18	≤30.00	PASS
11AX40SISO	Ant2	5795	242Tone	RU61	13.78	≤30.00	PASS
11AX40SISO	Ant1	5795	242Tone	RU62	14.55	≤30.00	PASS
11AX40SISO	Ant2	5795	242Tone	RU62	13.62	≤30.00	PASS
11AX40MIMO	Ant1	5755	242Tone	RU61	14.71	≤30.00	PASS
11AX40MIMO	Ant2	5755	242Tone	RU61	14.15	≤30.00	PASS
11AX40MIMO	total	5755	242Tone	RU61	17.45	≤28.79	PASS
11AX40MIMO	Ant1	5755	242Tone	RU62	14.89	≤30.00	PASS
11AX40MIMO	Ant2	5755	242Tone	RU62	13.88	≤30.00	PASS
11AX40MIMO	total	5755	242Tone	RU62	17.42	≤28.79	PASS
11AX40MIMO	Ant1	5795	242Tone	RU61	14.78	≤30.00	PASS
11AX40MIMO	Ant2	5795	242Tone	RU61	13.82	≤30.00	PASS
11AX40MIMO	total	5795	242Tone	RU61	17.34	≤28.79	PASS
11AX40MIMO	Ant1	5795	242Tone	RU62	14.61	≤30.00	PASS
11AX40MIMO	Ant2	5795	242Tone	RU62	13.52	≤30.00	PASS
11AX40MIMO	total	5795	242Tone	RU62	17.11	≤28.79	PASS
11AX80SISO	Ant1	5775	484Tone	RU65	14.01	≤30.00	PASS
11AX80SISO	Ant2	5775	484Tone	RU65	13.28	≤30.00	PASS
11AX80MIMO	Ant1	5775	484Tone	RU65	14.18	≤30.00	PASS
11AX80MIMO	Ant2	5775	484Tone	RU65	13.22	≤30.00	PASS
11AX80MIMO	total	5775	484Tone	RU65	16.74	≤28.79	PASS

Note:

1.The Duty Cycle Factor is compensated in the graph.

2. In the graph, the Center frequency = (Low frequency of 26dB OBW + High frequency of 26dB OBW) /2.

3.The 11a data rate 6Mbps is selected as worse condition, 11ac/11ax data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.