



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*

陶玲艳

杨帆

张曼

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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	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	99% Occupied Bandwidth	N/A	Pass
5	-26dB Occupied Bandwidth	15. 407(a)	Pass
6	Band edge compliance	15.407(b)	Pass
7	Transmitter spurious emissions radiated	15.209 & 15.407(b)	Pass
8	Frequency Stability	15.407(g)	Pass
9	Transmit Power Control	15.407(h)	N/A
10	AC Powerline Conducted Emission	15.207	Pass
11	Antenna requirement	15.203	Pass ^{Note 2}

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.

Note2:

5G RLAN used a internal antenna with max Gain 6.05/5.28 dBi that complied with 15.203 Requirements.

1.4 Data Provided by Applicant

No.	Item(s)	Data
1	Antenna gain of EUT	ANT1: 6.05 dBi ANT2: 5.28 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, G_{ANT} , Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

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

$Array\ Gain = 10 \log(N_{ANT}/N_{SS})\ dB$.

For power measurements on IEEE 802.11 devices, 1,2

$Array\ Gain = 0\ dB$ (i.e., no array gain) for $N_{ANT} \leq 4$;

$Array\ Gain = 0\ dB$ (i.e., no array gain) for channel widths $\geq 40\ MHz$ for any N_{ANT} ;

$Array\ Gain = 5 \log(N_{ANT}/N_{SS})\ dB$ or $3\ dB$, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices:

$Array\ Gain = 10 \log(N_{ANT}/N_{SS})\ dB$. 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 $G_1, G_2, \dots, G_N\ dBi$

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

Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}]\ dBi$ [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 = $10 \log[(10^{G_1/10} + 10^{G_2/10} + \dots + 10^{G_N/10}) / N_{ANT}]\ dBi$

The Power and PSD limit should be modified if the directional gain of eut 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_NO_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 1: 5150MHz-5240MHz
Occupied Channel Bandwidth	20 MHz: 802.11 a/ac/ax 40 MHz: 802.11 ac/ax 80 MHz: 802.11 ac/ax
WLAN type of modulation	OFDM

Test frequency list:

UNII-1:

BW_20M	Channel	36	40	44	48
	Freq. (MHz)	5180	5200	5220	5240
BW_40M	Channel	38		46	
	Freq. (MHz)	5190		5230	
BW_80M	Channel	42			
	Freq. (MHz)	5210			

Note: This report is for WLAN UNII-1, UNII-2A and UNII-2C only.

4.4 Emissions Information WIFI 5G

TestMode	TestBand	Frequency Min(MHz)	Frequency Max(MHz)	Max OutPut Power EIRP(dBm)	Max OutPut Power EIRP(W)	OBW (KHz)	Necessary Bandwidth & Emission Classification
11A	UNII-1	5180	5240	26.58	0.455	17160	17M2D1D
11AC20	UNII-1	5180	5240	26.45	0.4416	18040	18M0D1D
11AC40	UNII-1	5190	5230	28.69	0.7396	36400	36M4D1D
11AC80	UNII-1	5210	5210	19.3	0.0851	75200	75M2D1D
11AX20	UNII-1	5180	5240	26.23	0.4198	19600	19M6D1D
11AX40	UNII-1	5190	5230	29.23	0.8375	37680	37M7D1D
11AX80	UNII-1	5210	5210	19.47	0.0885	77120	77M1D1D

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°C	-20°C	60°C
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	Tonsce nd	N/A	N/A
2	Automatic control unit	JS0806-2	2218060621	N/A	N/A	Tonsce nd	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 Years
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 °C, Max. = 35 °C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Ground system resistance	< 0.5 Ω
Temperature	Min. = 15 °C, Max. = 35 °C

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

Temperature	Min. = 15 °C, Max. = 35 °C
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 °C, Max. = 35 °C
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%
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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 47 CFR 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 the following techniques:

- A diode detector and an oscilloscope that together have sufficiently short response time to permit accurate measurements of the on and off times of the transmitted signal.
- The zero-span mode on a spectrum analyzer or EMI receiver, if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission, Set $RBW > EBW$ if possible; otherwise, set RBW to the 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 T is defined in II.B.1.a), and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if $T < 16.7$ microseconds.)

6.1.3. Measurement Results

Test Mode	Antenna	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11A	Ant1	5180	1.39	1.45	95.86
11A	Ant2	5180	1.39	1.45	95.86
11A	Ant1	5200	1.39	1.45	95.86
11A	Ant2	5200	1.40	1.46	95.89
11A	Ant1	5240	1.39	1.45	95.86
11A	Ant2	5240	1.39	1.45	95.86
11A-CDD	Ant1	5180	1.39	1.45	95.86
11A-CDD	Ant2	5180	1.39	1.45	95.86
11A-CDD	Ant1	5200	1.39	1.45	95.86
11A-CDD	Ant2	5200	1.40	1.46	95.89
11A-CDD	Ant1	5240	1.40	1.46	95.89
11A-CDD	Ant2	5240	1.39	1.45	95.86
11A-C20SISO	Ant1	5180	1.31	1.37	95.62

11AC20SISO	Ant2	5180	1.31	1.37	95.62
11AC20SISO	Ant1	5200	1.32	1.37	96.35
11AC20SISO	Ant2	5200	1.31	1.37	95.62
11AC20SISO	Ant1	5240	1.32	1.38	95.65
11AC20SISO	Ant2	5240	1.32	1.37	96.35
11AC20MIMO	Ant1	5180	0.68	0.74	91.89
11AC20MIMO	Ant2	5180	0.68	0.74	91.89
11AC20MIMO	Ant1	5200	0.68	0.74	91.89
11AC20MIMO	Ant2	5200	0.69	0.74	93.24
11AC20MIMO	Ant1	5240	0.69	0.75	92.00
11AC20MIMO	Ant2	5240	0.68	0.74	91.89
11AC40SISO	Ant1	5190	0.66	0.71	92.96
11AC40SISO	Ant2	5190	0.66	0.72	91.67
11AC40SISO	Ant1	5230	0.66	0.72	91.67
11AC40SISO	Ant2	5230	0.65	0.71	91.55
11AC40MIMO	Ant1	5190	0.36	0.41	87.80
11AC40MIMO	Ant2	5190	0.36	0.41	87.80
11AC40MIMO	Ant1	5230	0.35	0.41	85.37
11AC40MIMO	Ant2	5230	0.35	0.41	85.37
11AC80SISO	Ant1	5210	0.32	0.38	84.21
11AC80SISO	Ant2	5210	0.32	0.38	84.21
11AC80MIMO	Ant1	5210	0.19	0.25	76.00
11AC80MIMO	Ant2	5210	0.19	0.24	79.17
11AX20SISO	Ant1	5180	1.03	1.09	94.50
11AX20SISO	Ant2	5180	1.03	1.09	94.50
11AX20SISO	Ant1	5200	1.03	1.09	94.50
11AX20SISO	Ant2	5200	1.03	1.08	95.37
11AX20SISO	Ant1	5240	1.03	1.08	95.37
11AX20SISO	Ant2	5240	1.03	1.09	94.50
11AX20MIMO	Ant1	5180	0.21	0.27	77.78
11AX20MIMO	Ant2	5180	0.20	0.26	76.92
11AX20MIMO	Ant1	5200	0.21	0.26	80.77
11AX20MIMO	Ant2	5200	0.20	0.26	76.92
11AX20MIMO	Ant1	5240	0.20	0.26	76.92
11AX20MIMO	Ant2	5240	0.21	0.26	80.77
11AX40SISO	Ant1	5190	0.54	0.60	90.00
11AX40SISO	Ant2	5190	0.55	0.61	90.16
11AX40SISO	Ant1	5230	0.55	0.60	91.67
11AX40SISO	Ant2	5230	0.55	0.61	90.16
11AX40MIMO	Ant1	5190	0.21	0.26	80.77
11AX40MIMO	Ant2	5190	0.20	0.26	76.92
11AX40MIMO	Ant1	5230	0.20	0.26	76.92

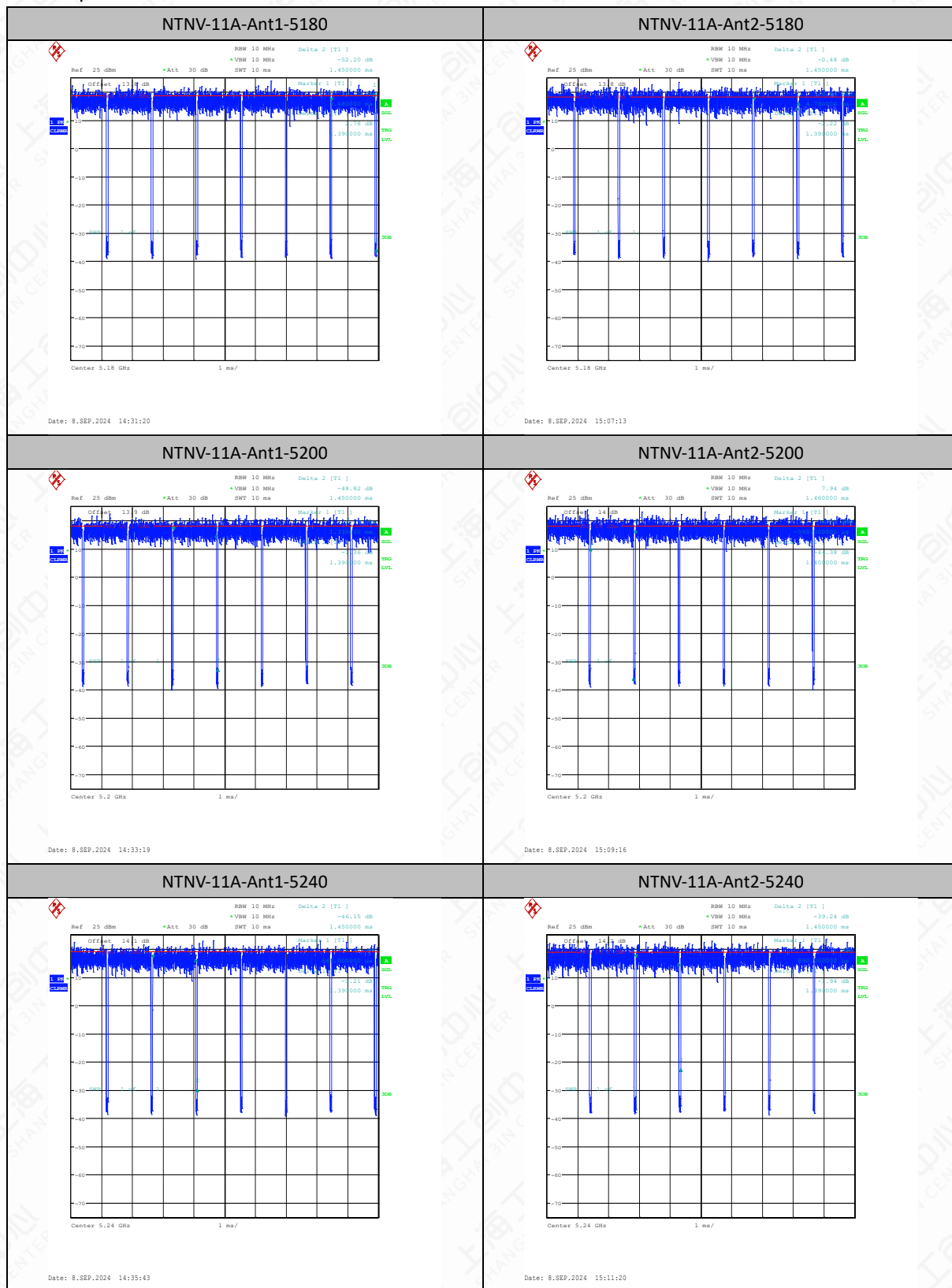
11AX40MIMO	Ant2	5230	0.20	0.26	76.92
11AX80SISO	Ant1	5210	0.29	0.35	82.86
11AX80SISO	Ant2	5210	0.30	0.36	83.33
11AX80MIMO	Ant1	5210	0.20	0.26	76.92
11AX80MIMO	Ant2	5210	0.20	0.26	76.92

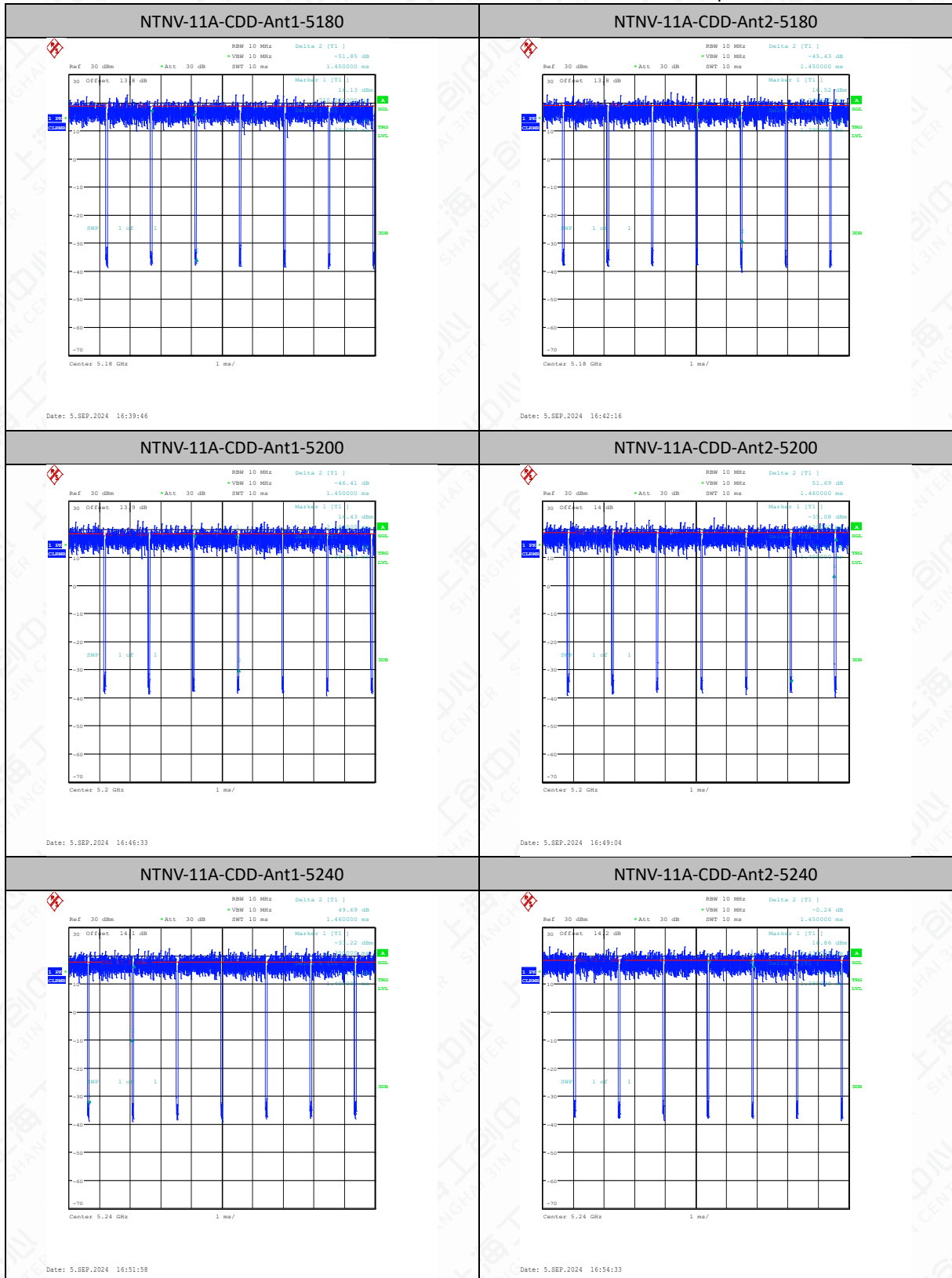
AX Part RU_Multi-User

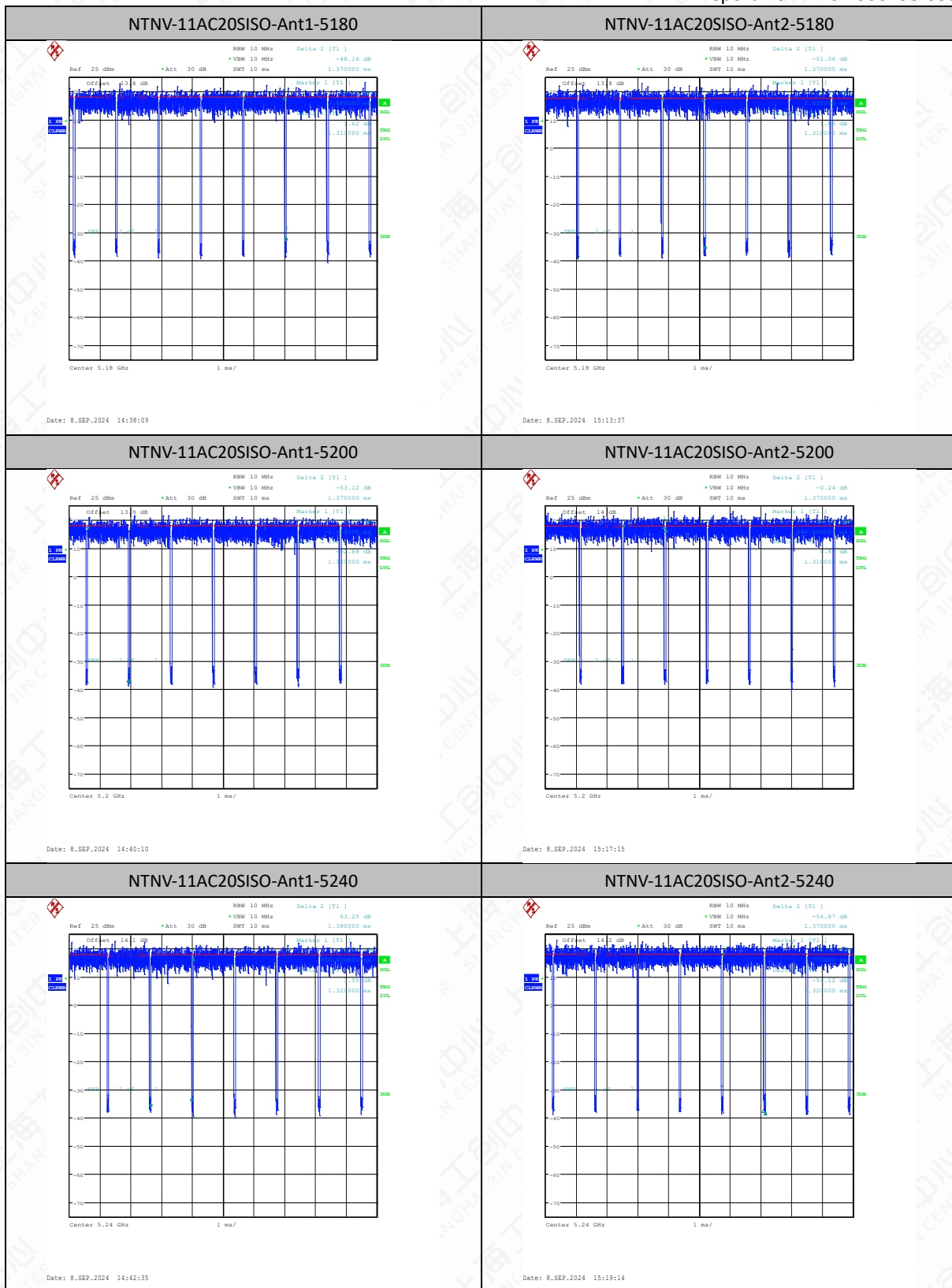
TestMode	Antenna	Frequency [MHz]	RuSize	RuIndex	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11AX20SISO	Ant1	5180	26Tone	RU0	0.01	0.07	14.29
11AX20SISO	Ant2	5180	26Tone	RU0	0.49	0.55	89.09
11AX20SISO	Ant1	5180	52Tone	RU37	0.54	0.60	90.00
11AX20SISO	Ant2	5180	52Tone	RU37	0.55	0.61	90.16
11AX20SISO	Ant1	5180	106Tone	RU53	0.40	0.46	86.96
11AX20SISO	Ant2	5180	106Tone	RU53	0.39	0.45	86.67
11AX20SISO	Ant1	5200	26Tone	RU0	0.07	0.13	53.85
11AX20SISO	Ant2	5200	26Tone	RU0	0.82	0.87	94.25
11AX20SISO	Ant1	5200	52Tone	RU37	0.55	0.61	90.16
11AX20SISO	Ant2	5200	52Tone	RU37	0.54	0.60	90.00
11AX20SISO	Ant1	5200	106Tone	RU53	0.40	0.45	88.89
11AX20SISO	Ant2	5200	106Tone	RU53	0.40	0.46	86.96
11AX20SISO	Ant1	5240	26Tone	RU0	0.04	0.09	44.44
11AX20SISO	Ant2	5240	26Tone	RU0	0.82	0.88	93.18
11AX20SISO	Ant1	5240	52Tone	RU37	0.54	0.60	90.00
11AX20SISO	Ant2	5240	52Tone	RU37	0.55	0.60	91.67
11AX20SISO	Ant1	5240	106Tone	RU53	0.40	0.46	86.96
11AX20SISO	Ant2	5240	106Tone	RU53	0.40	0.45	88.89
11AX20MIMO	Ant1	5180	26Tone	RU0	0.46	0.51	90.20
11AX20MIMO	Ant2	5180	26Tone	RU0	0.13	0.19	68.42
11AX20MIMO	Ant1	5180	52Tone	RU37	0.54	0.60	90.00
11AX20MIMO	Ant2	5180	52Tone	RU37	0.26	0.32	81.25
11AX20MIMO	Ant1	5180	106Tone	RU53	0.40	0.45	88.89
11AX20MIMO	Ant2	5180	106Tone	RU53	0.39	0.45	86.67
11AX20MIMO	Ant1	5200	26Tone	RU0	0.57	0.63	90.48
11AX20MIMO	Ant2	5200	26Tone	RU0	3.25	3.49	93.12
11AX20MIMO	Ant1	5200	52Tone	RU37	0.54	0.60	90.00
11AX20MIMO	Ant2	5200	52Tone	RU37	0.54	0.60	90.00
11AX20MIMO	Ant1	5200	106Tone	RU53	0.39	0.45	86.67
11AX20MIMO	Ant2	5200	106Tone	RU53	0.40	0.46	86.96
11AX20MIMO	Ant1	5240	26Tone	RU0	0.14	0.20	70.00
11AX20MIMO	Ant2	5240	26Tone	RU0	0.21	0.27	77.78
11AX20MIMO	Ant1	5240	52Tone	RU37	0.54	0.60	90.00
11AX20MIMO	Ant2	5240	52Tone	RU37	0.54	0.59	91.53

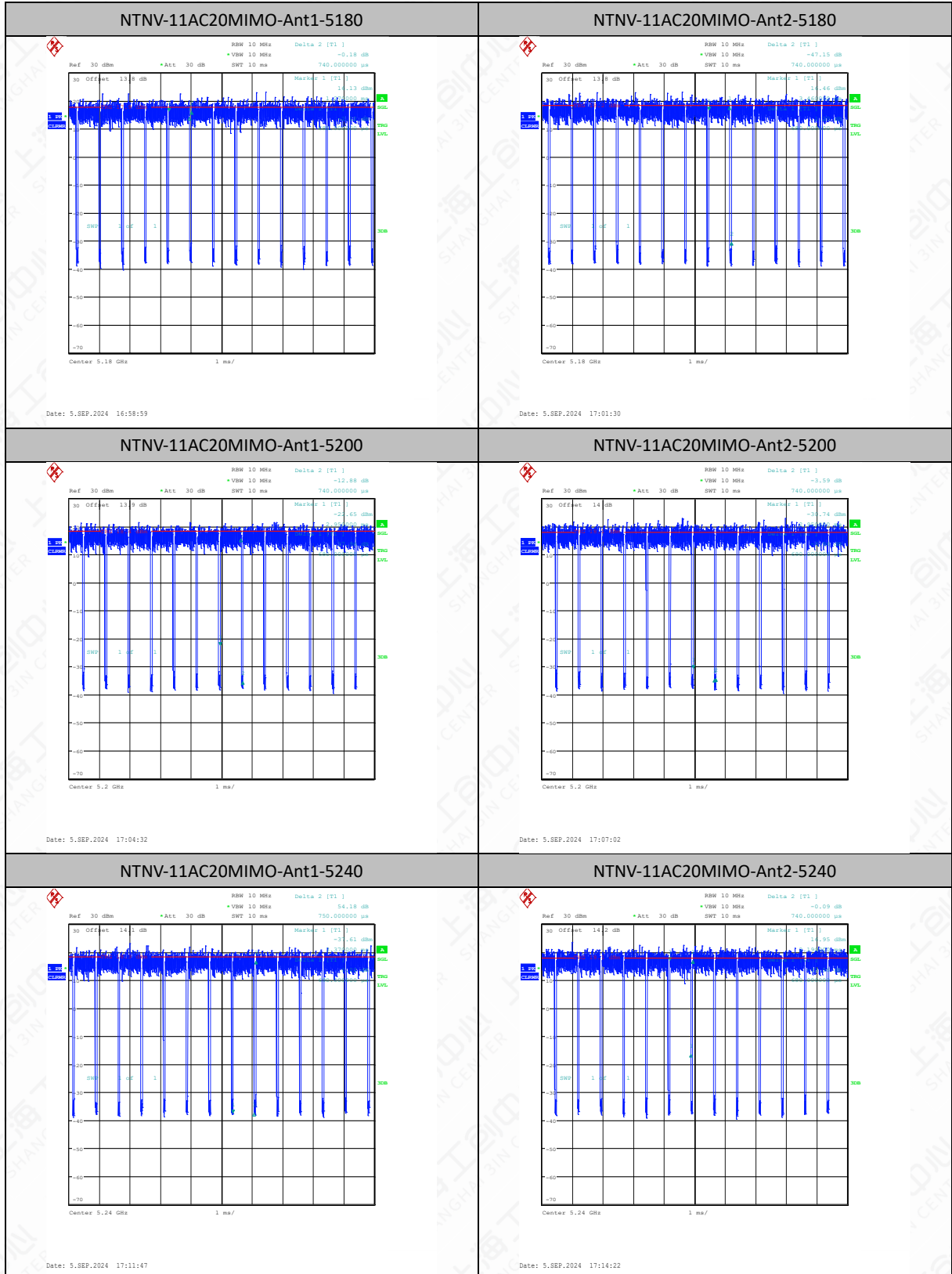
11AX20MIMO	Ant1	5240	106Tone	RU53	0.39	0.45	86.67
11AX20MIMO	Ant2	5240	106Tone	RU53	0.40	0.46	86.96
11AX40SISO	Ant1	5190	242Tone	RU61	0.31	0.37	83.78
11AX40SISO	Ant2	5190	242Tone	RU61	0.31	0.37	83.78
11AX40SISO	Ant1	5190	242Tone	RU62	0.31	0.37	83.78
11AX40SISO	Ant2	5190	242Tone	RU62	0.31	0.37	83.78
11AX40SISO	Ant1	5230	242Tone	RU61	0.31	0.37	83.78
11AX40SISO	Ant2	5230	242Tone	RU61	0.31	0.37	83.78
11AX40SISO	Ant1	5230	242Tone	RU62	0.31	0.37	83.78
11AX40SISO	Ant2	5230	242Tone	RU62	0.31	0.37	83.78
11AX40MIMO	Ant1	5190	242Tone	RU61	0.31	0.37	83.78
11AX40MIMO	Ant2	5190	242Tone	RU61	0.31	0.36	86.11
11AX40MIMO	Ant1	5190	242Tone	RU62	0.31	0.37	83.78
11AX40MIMO	Ant2	5190	242Tone	RU62	0.31	0.36	86.11
11AX40MIMO	Ant1	5230	242Tone	RU61	0.31	0.37	83.78
11AX40MIMO	Ant2	5230	242Tone	RU61	0.31	0.37	83.78
11AX40MIMO	Ant1	5230	242Tone	RU62	0.31	0.37	83.78
11AX40MIMO	Ant2	5230	242Tone	RU62	0.31	0.37	83.78
11AX80SISO	Ant1	5210	484Tone	RU65	0.29	0.35	82.86
11AX80SISO	Ant2	5210	484Tone	RU65	0.30	0.36	83.33
11AX80MIMO	Ant1	5210	484Tone	RU65	0.00	0.06	100
11AX80MIMO	Ant2	5210	484Tone	RU65	0.29	0.35	82.86

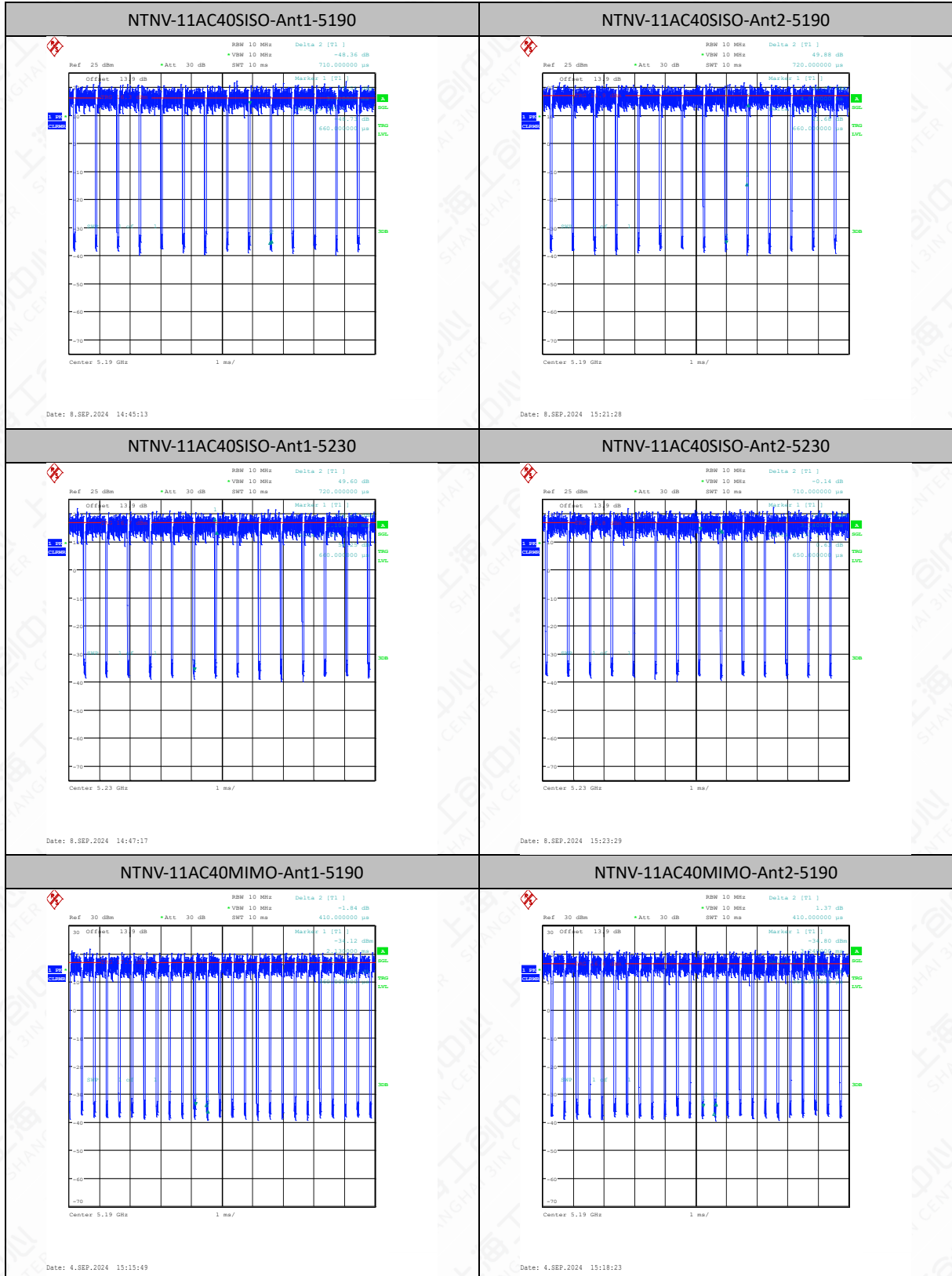
Test Graphs

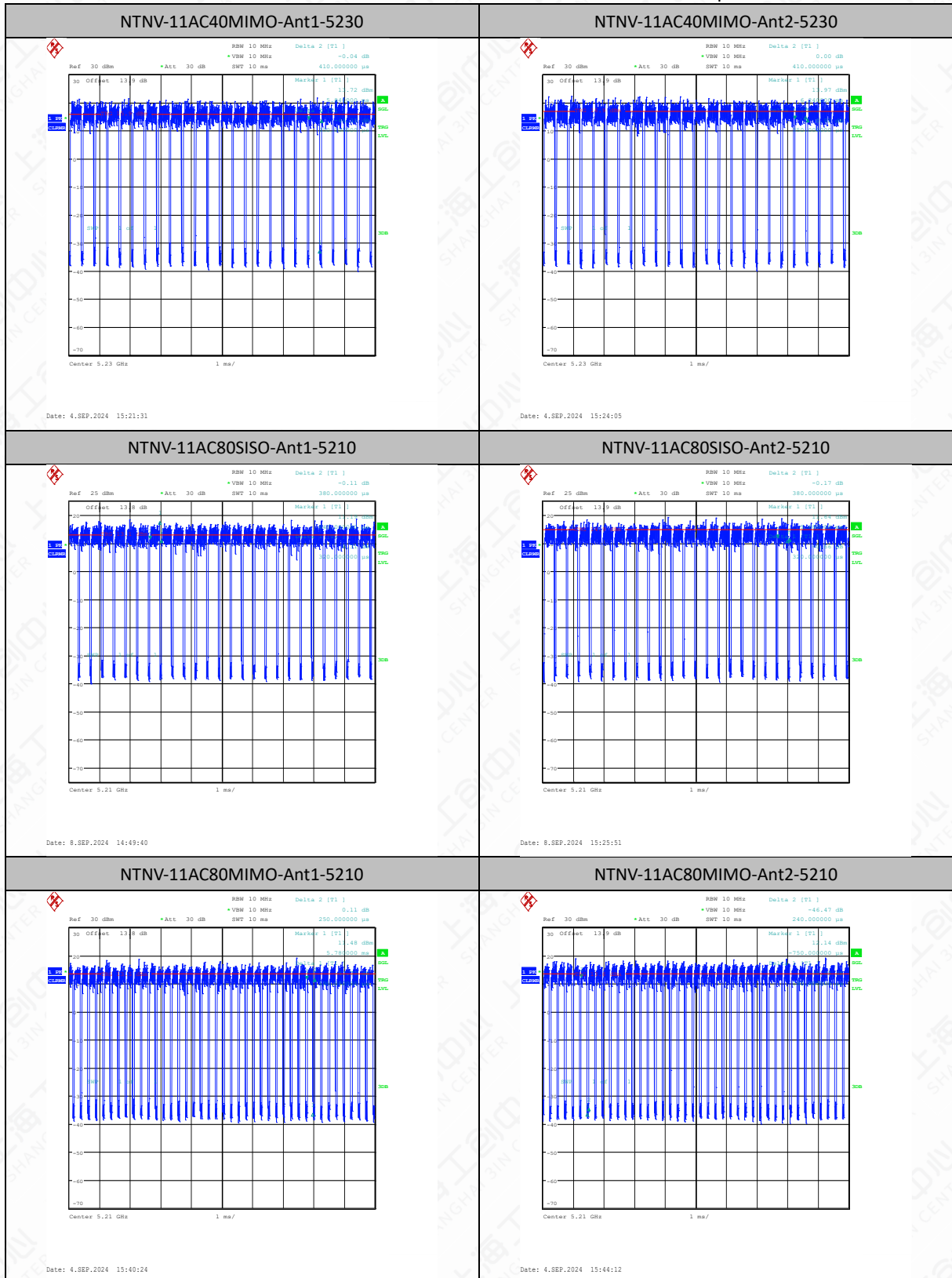


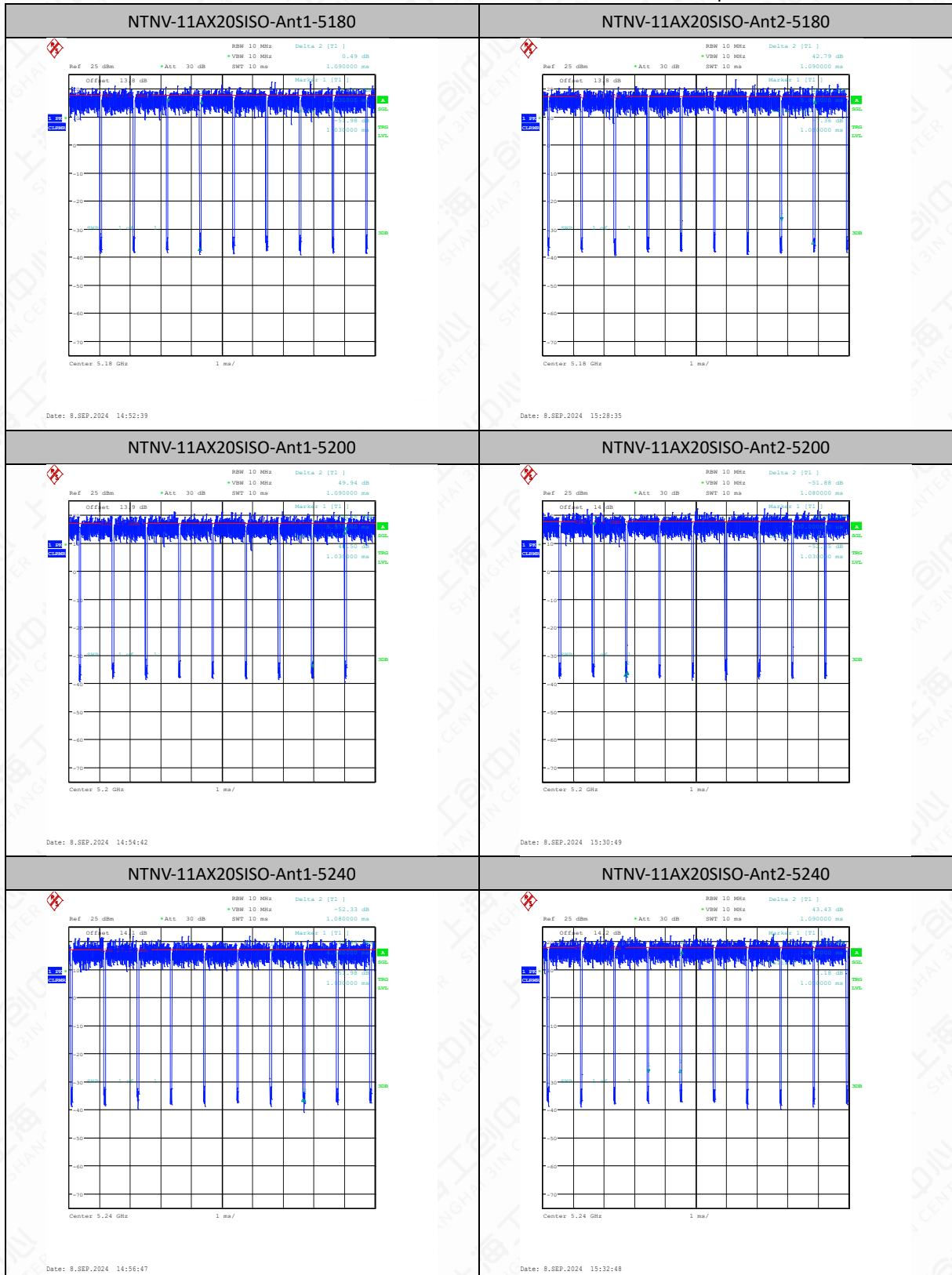




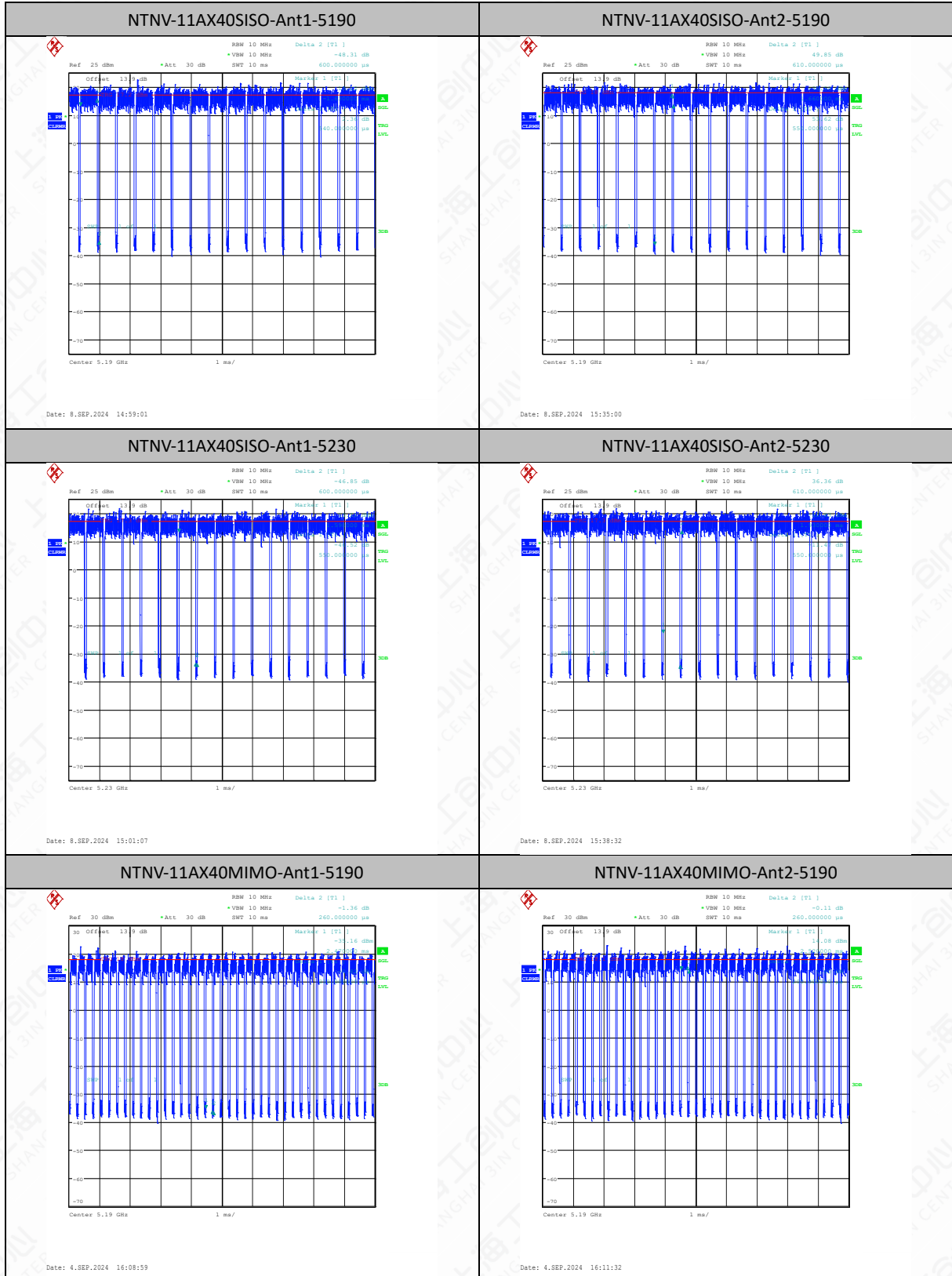




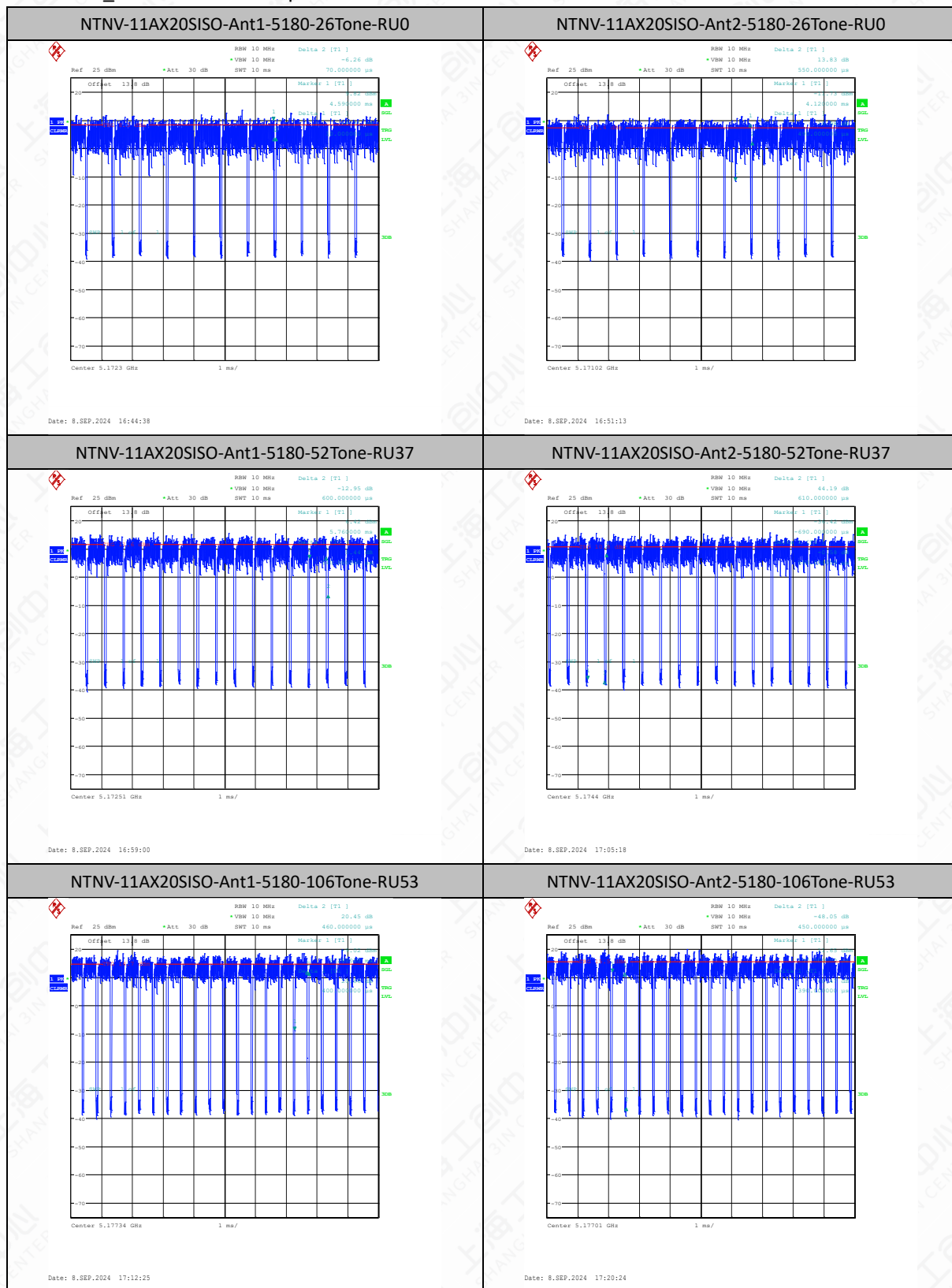


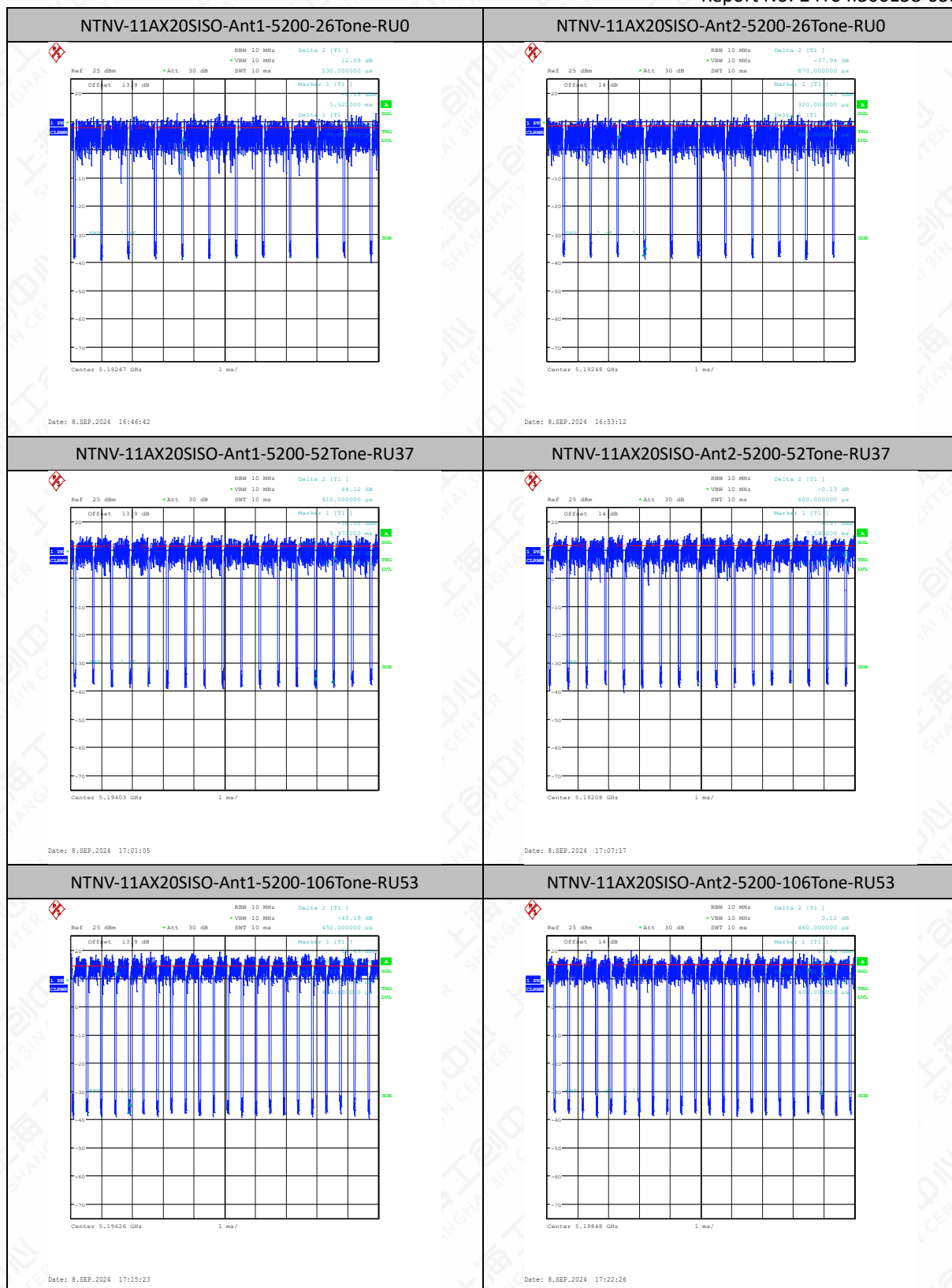


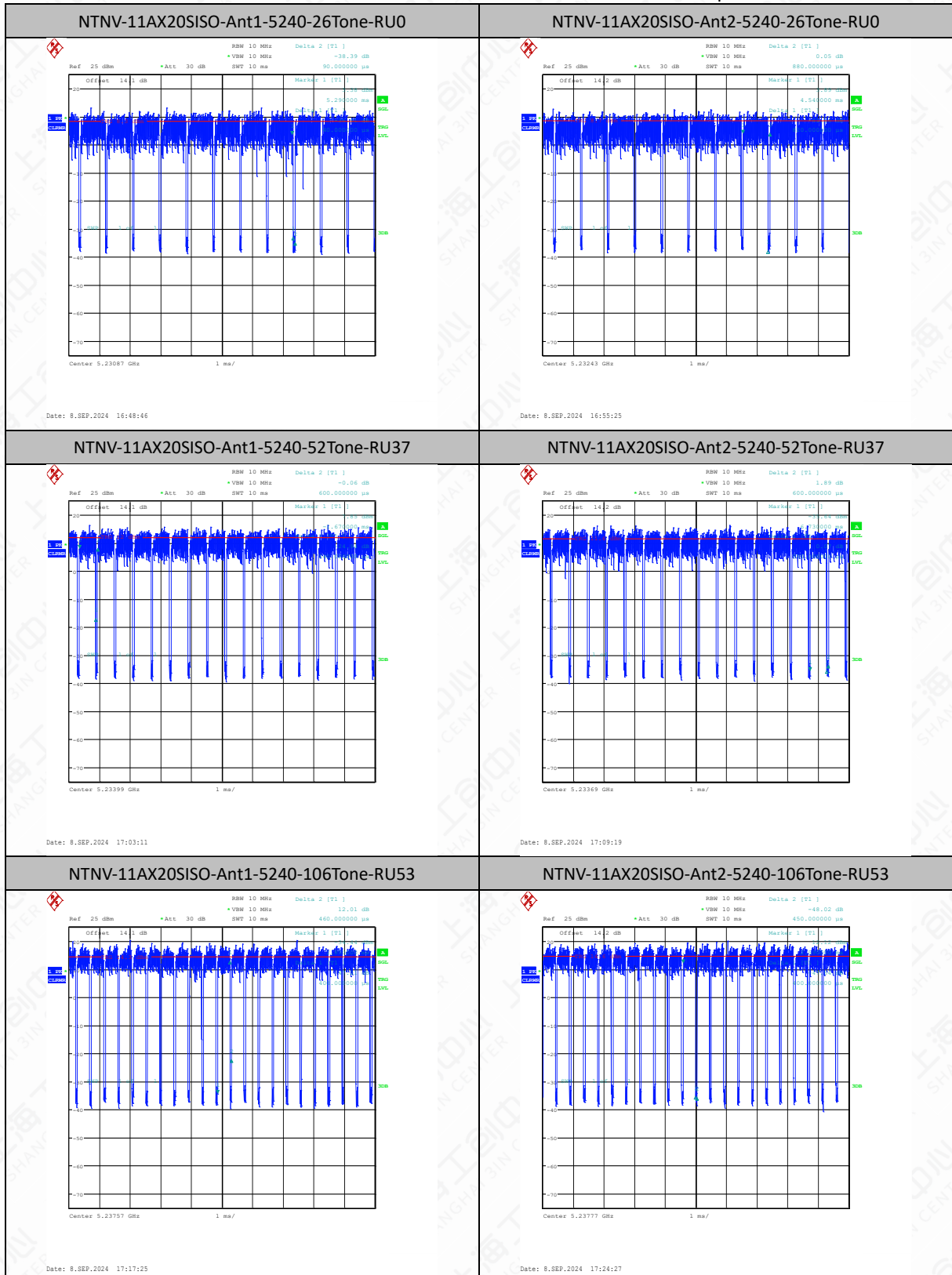


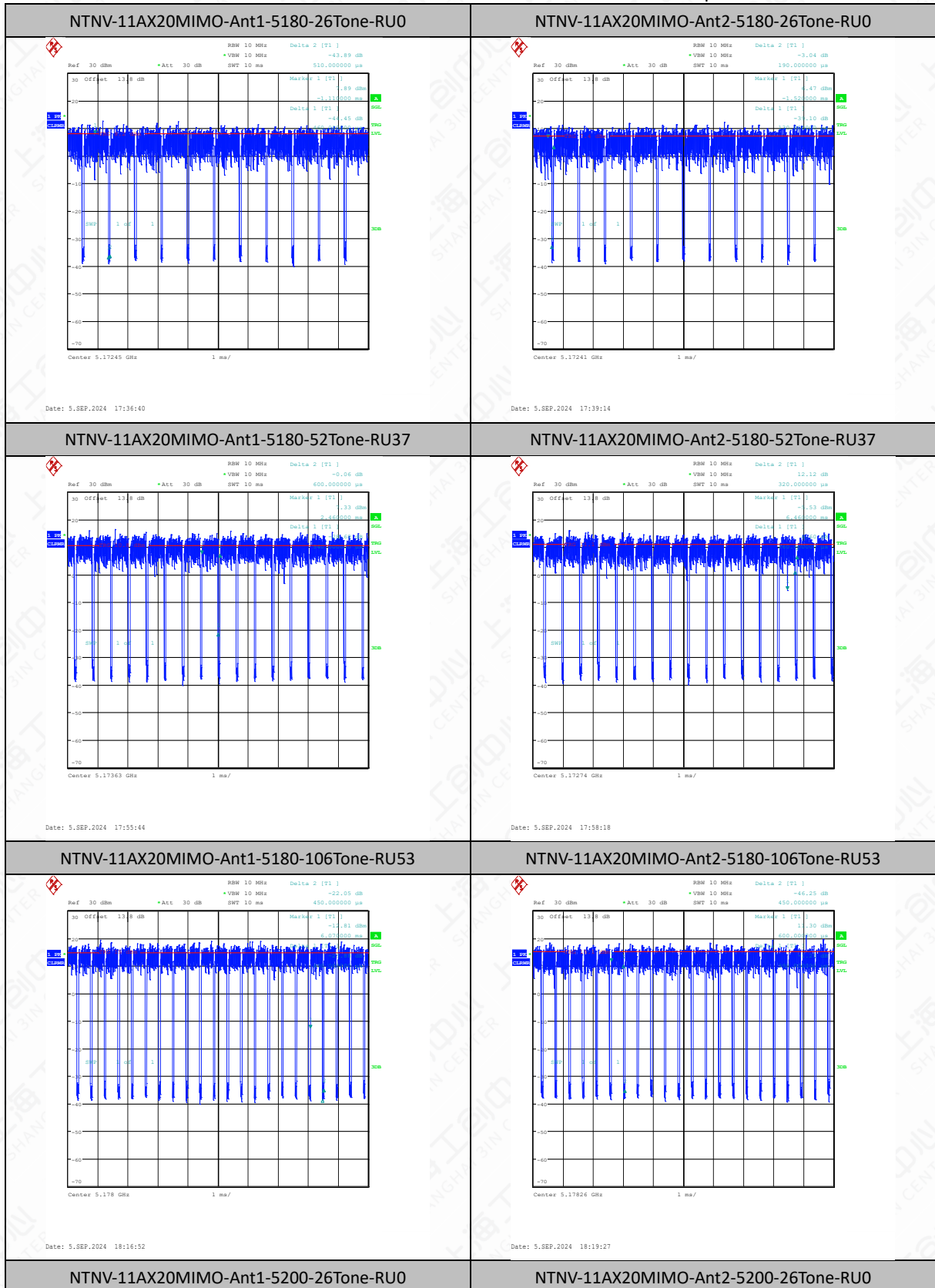


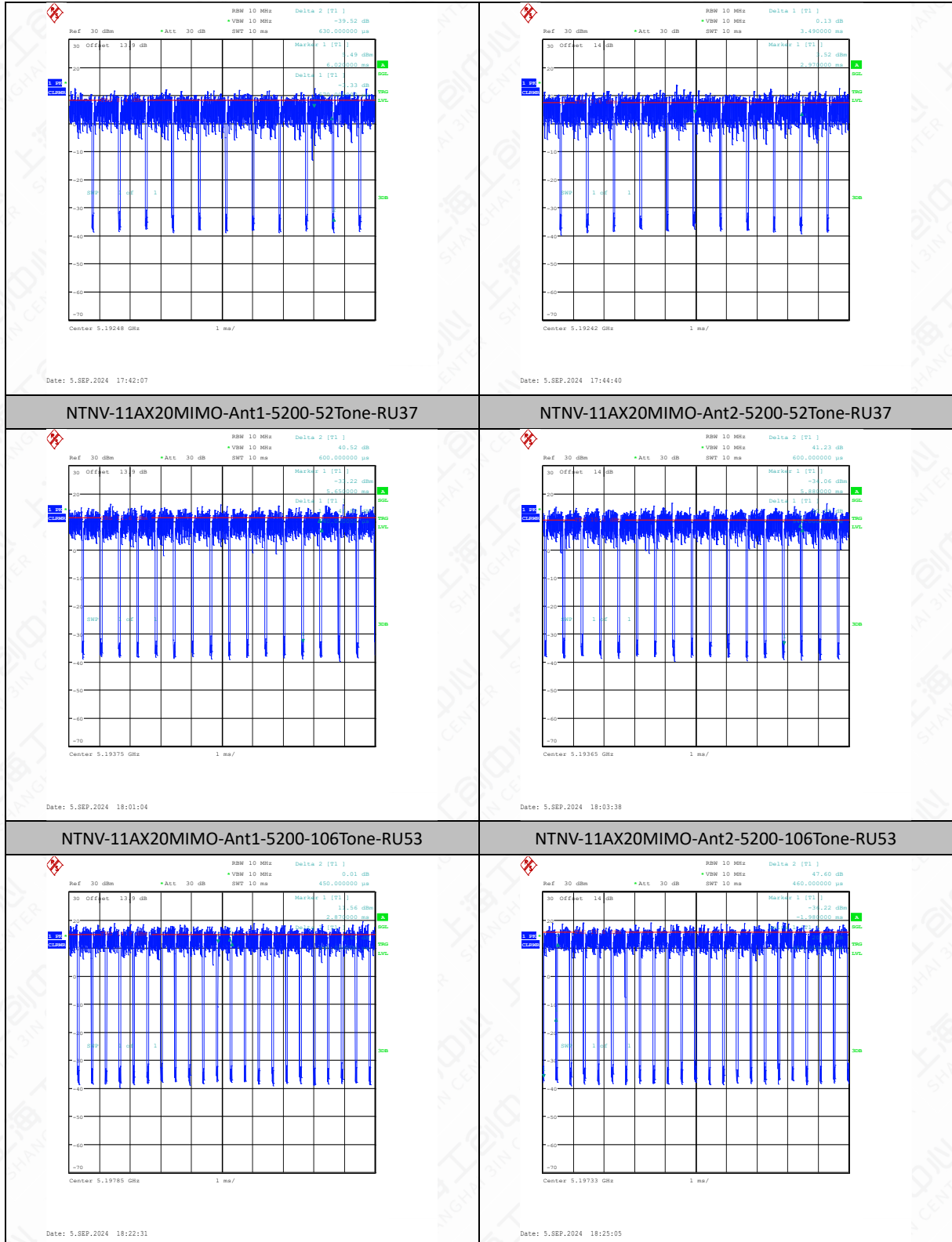


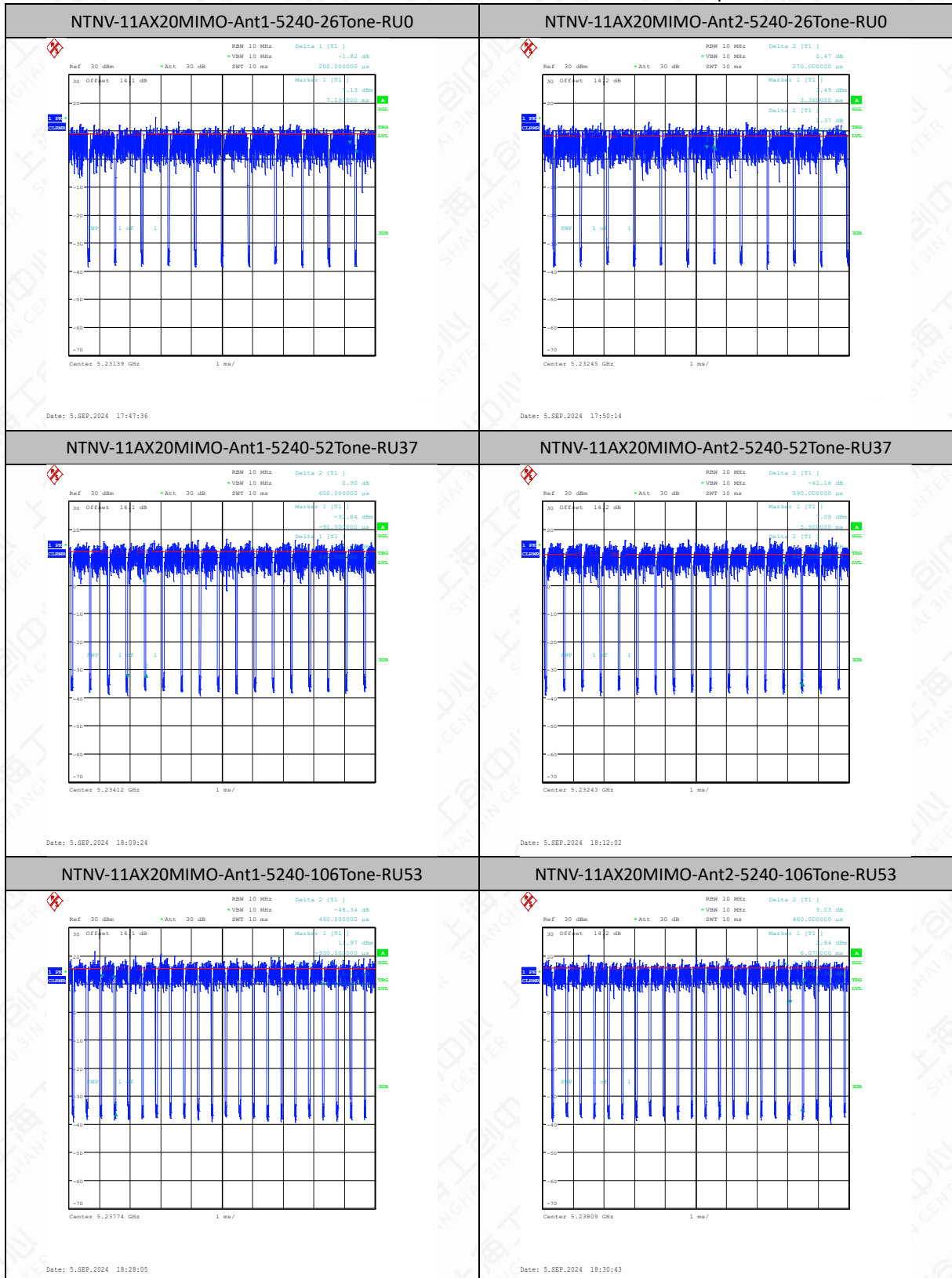
AX Part RU_Multi-User Test Graph


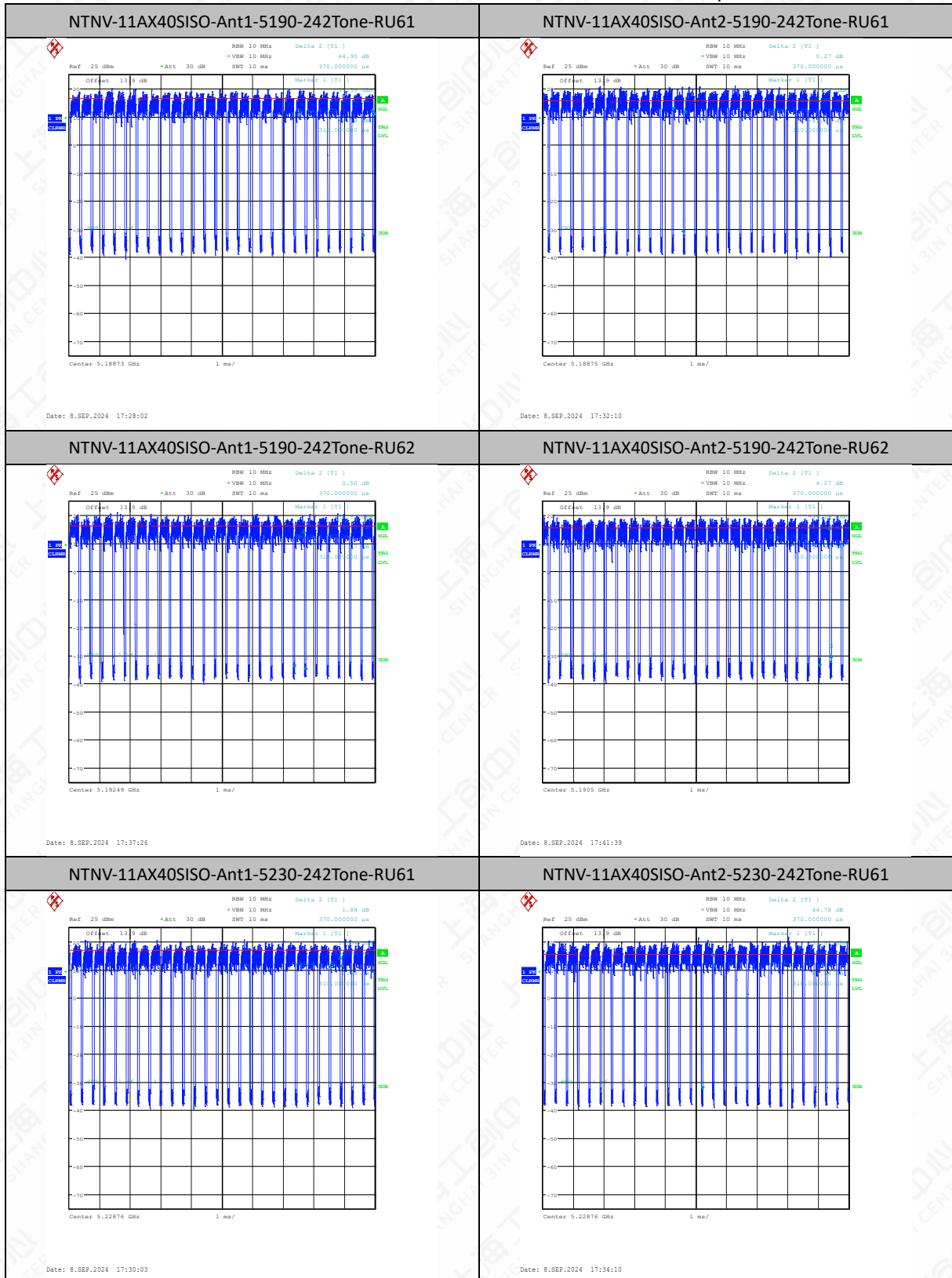


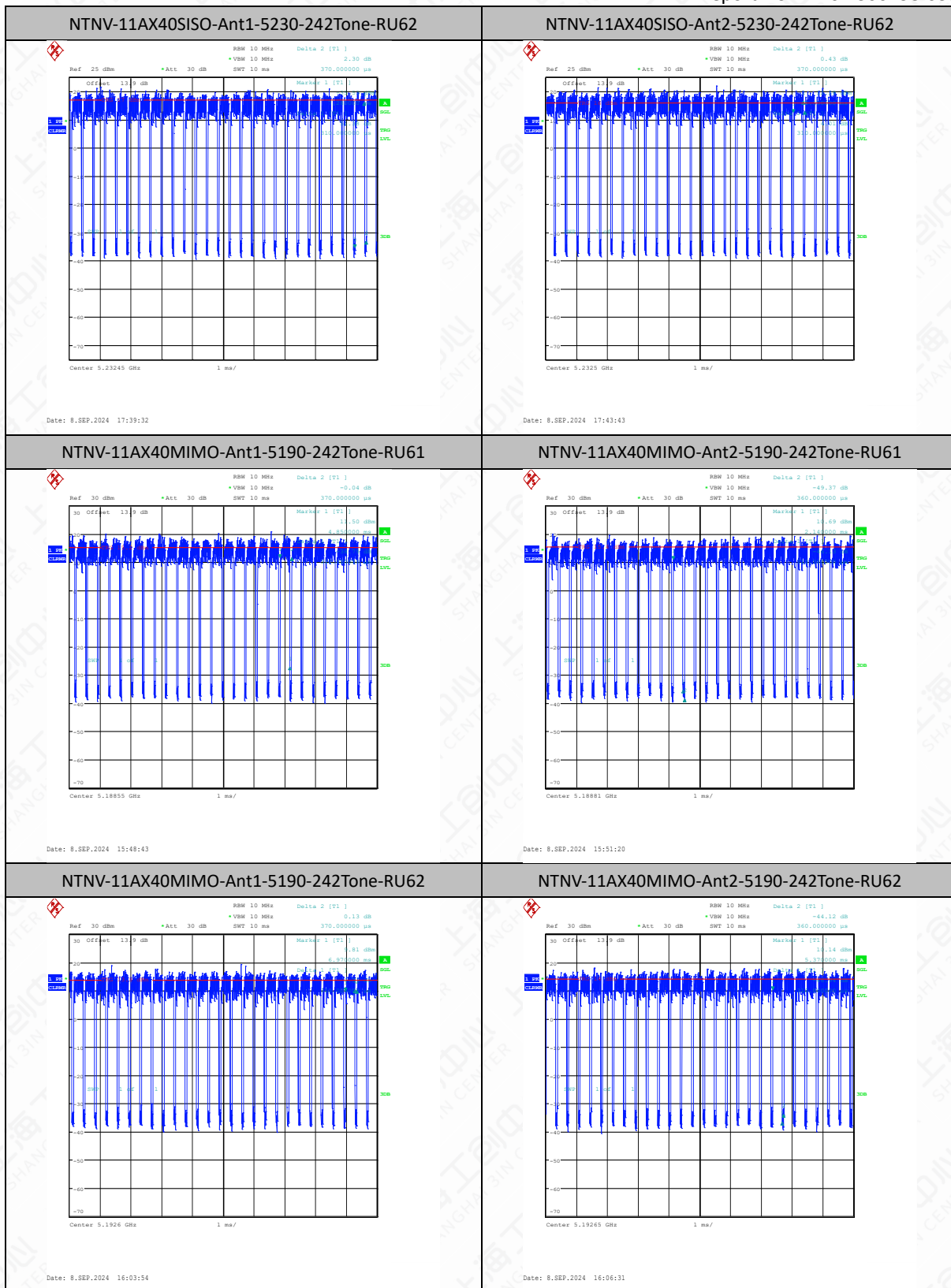


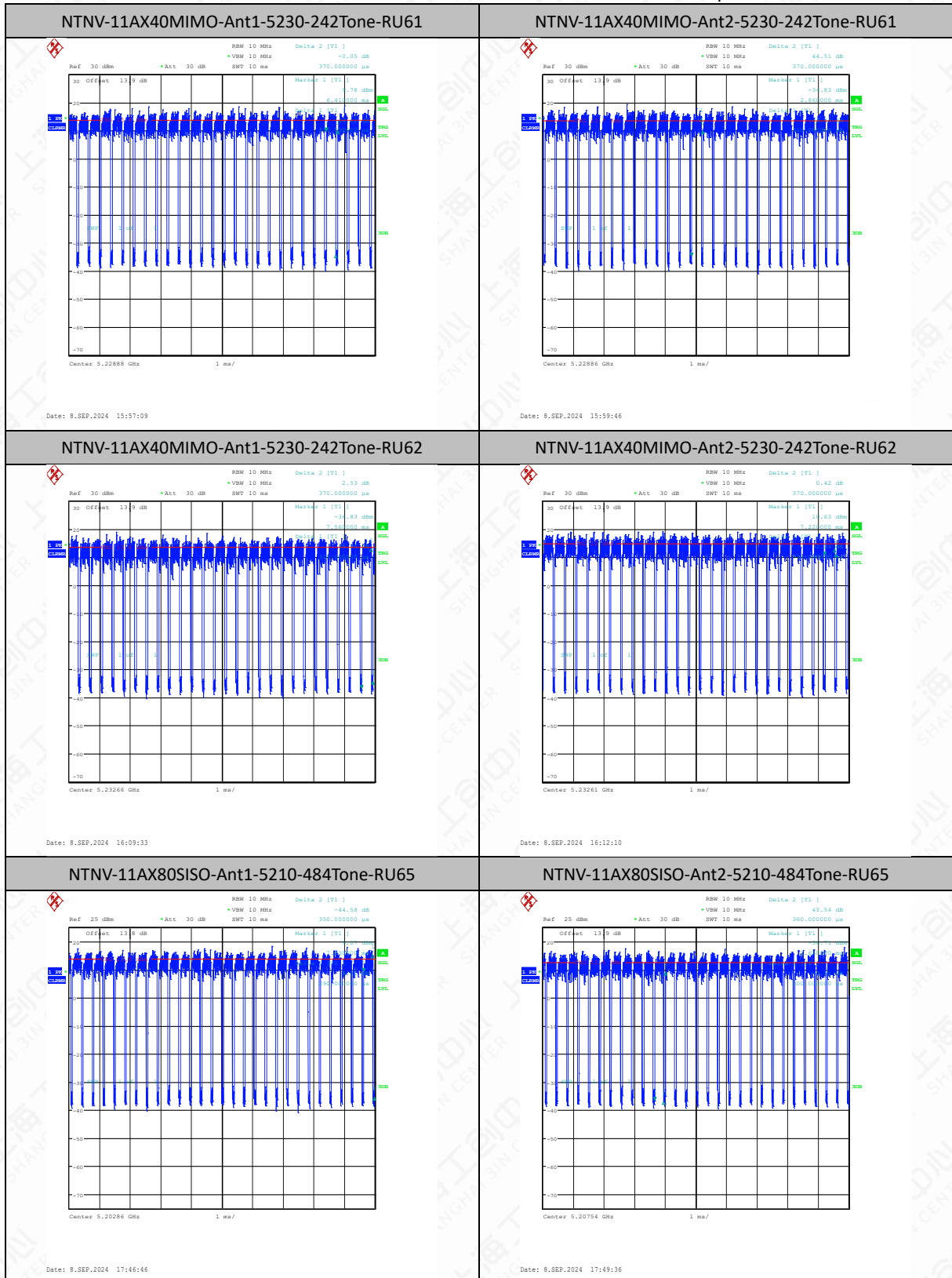


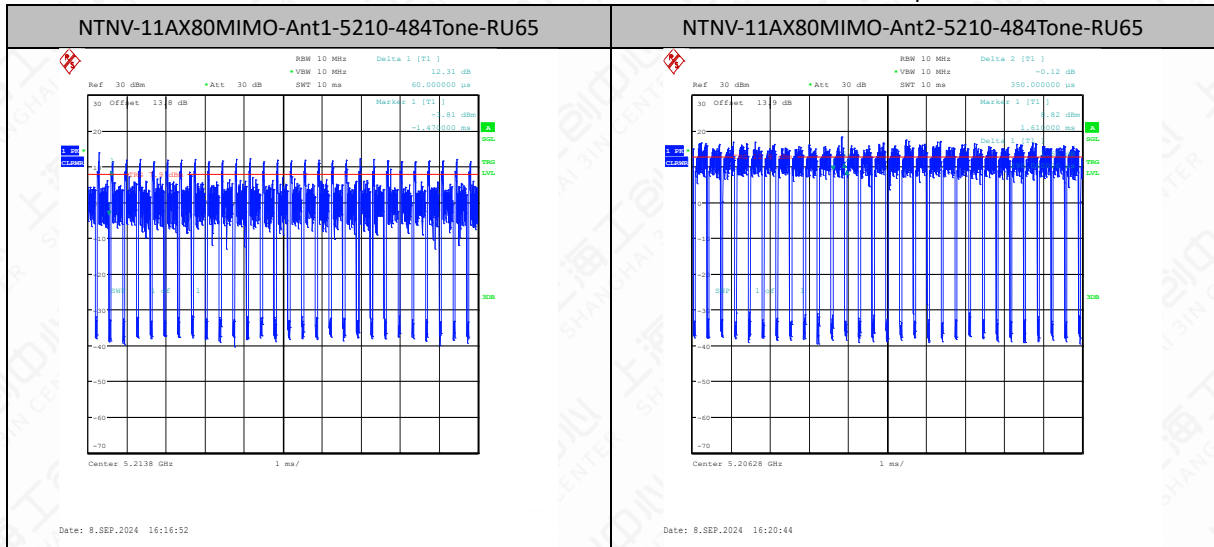












6.2. Maximum Output Power-Conducted

6.2.1. Measurement Limit and Method

Standard	Limit (dBm)
FCC 47 CFR Part 15.407(a)(1)(iv)	For client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

6.2.2. Test Procedure

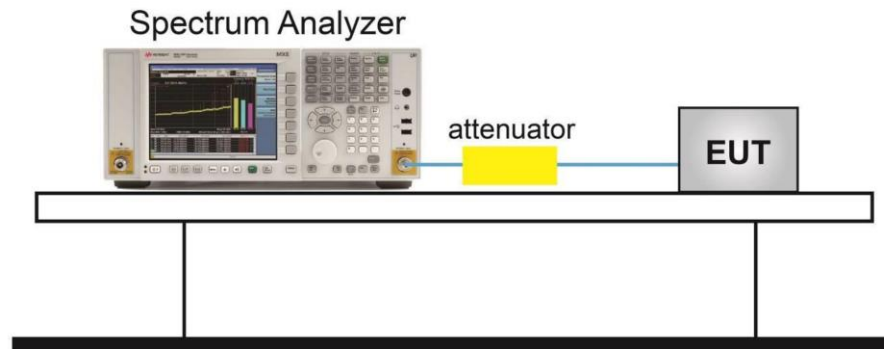
The measurement method SA-2 is made according to KDB 789033 E

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 $\geq$ 3 MHz.
4. Number of points in sweep $\geq 2 \times \text{span} / \text{RBW}$. (This ensures that bin-to-bin spacing is $\leq \text{RBW}/2$, 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.

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 $10 \log (1/0.25) = 6 \text{ dB}$ if the duty cycle is 25%

6.2.3. Test setup



6.2.4. Measurement Result

Test Mode	Antenna	Frequency [MHz]	Set Power	Channel Power [dBm]	Duty Cycle [%]	DC Factor [dBm]	Result [dBm]	Limit [dBm]	Gain [dBi]	Verdict
11A	Ant1	5180	---	14.47	95.86	0.18	14.65	≤23.93	6.05	PASS
11A	Ant2	5180	---	14.48	95.86	0.18	14.66	≤23.98	5.28	PASS
11A	Ant1	5200	---	14.53	95.86	0.18	14.71	≤23.93	6.05	PASS
11A	Ant2	5200	---	14.59	95.89	0.18	14.77	≤23.98	5.28	PASS
11A	Ant1	5240	---	14.72	95.86	0.18	14.90	≤23.93	6.05	PASS
11A	Ant2	5240	---	14.95	95.86	0.18	15.13	≤23.98	5.28	PASS
11A-CDD	Ant1	5180	---	14.30	95.86	0.18	14.48	≤23.93	6.05	PASS
11A-CDD	Ant2	5180	---	14.58	95.86	0.18	14.76	≤23.98	5.28	PASS
11A-CDD	total	5180	---	---	---	---	17.63	≤21.30	8.68	PASS
11A-CDD	Ant1	5200	---	14.38	95.86	0.18	14.56	≤23.93	6.05	PASS
11A-CDD	Ant2	5200	---	14.79	95.89	0.18	14.97	≤23.98	5.28	PASS
11A-CDD	total	5200	---	---	---	---	17.78	≤21.30	8.68	PASS
11A-CDD	Ant1	5240	---	14.45	95.89	0.18	14.63	≤23.93	6.05	PASS
11A-CDD	Ant2	5240	---	14.95	95.86	0.18	15.13	≤23.98	5.28	PASS
11A-CDD	total	5240	---	---	---	---	17.90	≤21.30	8.68	PASS
11AC20SISO	Ant1	5180	---	14.13	95.62	0.19	14.32	≤23.93	6.05	PASS
11AC20SISO	Ant2	5180	---	14.32	95.62	0.19	14.51	≤23.98	5.28	PASS
11AC20SISO	Ant1	5200	---	14.06	96.35	0.16	14.22	≤23.93	6.05	PASS
11AC20SISO	Ant2	5200	---	14.66	95.62	0.19	14.85	≤23.98	5.28	PASS
11AC20SISO	Ant1	5240	---	14.23	95.65	0.19	14.42	≤23.93	6.05	PASS
11AC20SISO	Ant2	5240	---	14.78	96.35	0.16	14.94	≤23.98	5.28	PASS
11AC20MIMO	Ant1	5180	---	14.11	91.89	0.37	14.48	≤23.93	6.05	PASS
11AC20MIMO	Ant2	5180	---	14.41	91.89	0.37	14.78	≤23.98	5.28	PASS
11AC20MIMO	total	5180	---	---	---	---	17.64	≤21.30	8.68	PASS
11AC20MIMO	Ant1	5200	---	14.03	91.89	0.37	14.40	≤23.93	6.05	PASS

11AC20MIMO	Ant2	5200	---	14.49	93.24	0.30	14.79	≤23.98	5.28	PASS
11AC20MIMO	total	5200	---	---	---	---	17.61	≤21.30	8.68	PASS
11AC20MIMO	Ant1	5240	---	14.21	92.00	0.36	14.57	≤23.93	6.05	PASS
11AC20MIMO	Ant2	5240	---	14.58	91.89	0.37	14.95	≤23.98	5.28	PASS
11AC20MIMO	total	5240	---	---	---	---	17.77	≤21.30	8.68	PASS
11AC40SISO	Ant1	5190	---	7.48	92.96	0.32	7.80	≤23.93	6.05	PASS
11AC40SISO	Ant2	5190	---	8.76	91.67	0.38	9.14	≤23.98	5.28	PASS
11AC40SISO	Ant1	5230	---	16.03	91.67	0.38	16.41	≤23.93	6.05	PASS
11AC40SISO	Ant2	5230	---	17.02	91.55	0.38	17.40	≤23.98	5.28	PASS
11AC40MIMO	Ant1	5190	---	8.94	87.80	0.57	9.51	≤23.93	6.05	PASS
11AC40MIMO	Ant2	5190	---	8.83	87.80	0.57	9.40	≤23.98	5.28	PASS
11AC40MIMO	total	5190	---	---	---	---	12.47	≤21.30	8.68	PASS
11AC40MIMO	Ant1	5230	---	16.04	85.37	0.69	16.73	≤23.93	6.05	PASS
11AC40MIMO	Ant2	5230	---	16.56	85.37	0.69	17.25	≤23.98	5.28	PASS
11AC40MIMO	total	5230	---	---	---	---	20.01	≤21.30	8.68	PASS
11AC80SISO	Ant1	5210	---	5.67	84.21	0.75	6.42	≤23.93	6.05	PASS
11AC80SISO	Ant2	5210	---	7.20	84.21	0.75	7.95	≤23.98	5.28	PASS
11AC80MIMO	Ant1	5210	---	6.36	76.00	1.19	7.55	≤23.93	6.05	PASS
11AC80MIMO	Ant2	5210	---	6.65	79.17	1.01	7.66	≤23.98	5.28	PASS
11AC80MIMO	total	5210	---	---	---	---	10.62	≤21.30	8.68	PASS
11AX20SISO	Ant1	5180	---	13.66	94.50	0.25	13.91	≤23.93	6.05	PASS
11AX20SISO	Ant2	5180	---	13.70	94.50	0.25	13.95	≤23.98	5.28	PASS
11AX20SISO	Ant1	5200	---	13.62	94.50	0.25	13.87	≤23.93	6.05	PASS
11AX20SISO	Ant2	5200	---	14.14	95.37	0.21	14.35	≤23.98	5.28	PASS
11AX20SISO	Ant1	5240	---	13.78	95.37	0.21	13.99	≤23.93	6.05	PASS
11AX20SISO	Ant2	5240	---	14.39	94.50	0.25	14.64	≤23.98	5.28	PASS
11AX20MIMO	Ant1	5180	---	12.91	77.78	1.09	14.00	≤23.93	6.05	PASS
11AX20MIMO	Ant2	5180	---	13.23	76.92	1.14	14.37	≤23.98	5.28	PASS
11AX20MIMO	total	5180	---	---	---	---	17.20	≤21.30	8.68	PASS
11AX20MIMO	Ant1	5200	---	13.03	80.77	0.93	13.96	≤23.93	6.05	PASS
11AX20MIMO	Ant2	5200	---	13.39	76.92	1.14	14.53	≤23.98	5.28	PASS
11AX20MIMO	total	5200	---	---	---	---	17.26	≤21.30	8.68	PASS
11AX20MIMO	Ant1	5240	---	13.33	76.92	1.14	14.47	≤23.93	6.05	PASS
11AX20MIMO	Ant2	5240	---	13.68	80.77	0.93	14.61	≤23.98	5.28	PASS
11AX20MIMO	total	5240	---	---	---	---	17.55	≤21.30	8.68	PASS
11AX40SISO	Ant1	5190	---	7.89	90.00	0.46	8.35	≤23.93	6.05	PASS
11AX40SISO	Ant2	5190	---	7.98	90.16	0.45	8.43	≤23.98	5.28	PASS
11AX40SISO	Ant1	5230	---	16.18	91.67	0.38	16.56	≤23.93	6.05	PASS
11AX40SISO	Ant2	5230	---	17.20	90.16	0.45	17.65	≤23.98	5.28	PASS
11AX40MIMO	Ant1	5190	---	8.12	80.77	0.93	9.05	≤23.93	6.05	PASS
11AX40MIMO	Ant2	5190	---	7.98	76.92	1.14	9.12	≤23.98	5.28	PASS
11AX40MIMO	total	5190	---	---	---	---	12.10	≤21.30	8.68	PASS

11AX40MIMO	Ant1	5230	---	16.13	76.92	1.14	17.27	≤23.93	6.05	PASS
11AX40MIMO	Ant2	5230	---	16.66	76.92	1.14	17.80	≤23.98	5.28	PASS
11AX40MIMO	total	5230	---	---	---	---	20.55	≤21.30	8.68	PASS
11AX80SISO	Ant1	5210	---	6.81	82.86	0.82	7.63	≤23.93	6.05	PASS
11AX80SISO	Ant2	5210	---	6.88	83.33	0.79	7.67	≤23.98	5.28	PASS
11AX80MIMO	Ant1	5210	---	6.47	76.92	1.14	7.61	≤23.93	6.05	PASS
11AX80MIMO	Ant2	5210	---	6.81	76.92	1.14	7.95	≤23.98	5.28	PASS
11AX80MIMO	total	5210	---	---	---	---	10.79	≤21.30	8.68	PASS

AX Part RU_Multi-User

TestMode	Antenna	Frequency [MHz]	RuSize	RuIndex	Result [dBm]	Limit[dBm]	Verdict
11AX20SISO	Ant1	5180	26Tone	RU0	11.06	≤23.93	PASS
11AX20SISO	Ant2	5180	26Tone	RU0	3.01	≤23.98	PASS
11AX20SISO	Ant1	5180	52Tone	RU37	6.19	≤23.93	PASS
11AX20SISO	Ant2	5180	52Tone	RU37	6.28	≤23.98	PASS
11AX20SISO	Ant1	5180	106Tone	RU53	10.27	≤23.93	PASS
11AX20SISO	Ant2	5180	106Tone	RU53	10.84	≤23.98	PASS
11AX20SISO	Ant1	5200	26Tone	RU0	5.57	≤23.93	PASS
11AX20SISO	Ant2	5200	26Tone	RU0	3.00	≤23.98	PASS
11AX20SISO	Ant1	5200	52Tone	RU37	6.68	≤23.93	PASS
11AX20SISO	Ant2	5200	52Tone	RU37	6.40	≤23.98	PASS
11AX20SISO	Ant1	5200	106Tone	RU53	10.26	≤23.93	PASS
11AX20SISO	Ant2	5200	106Tone	RU53	10.75	≤23.98	PASS
11AX20SISO	Ant1	5240	26Tone	RU0	6.83	≤23.93	PASS
11AX20SISO	Ant2	5240	26Tone	RU0	3.50	≤23.98	PASS
11AX20SISO	Ant1	5240	52Tone	RU37	6.99	≤23.93	PASS
11AX20SISO	Ant2	5240	52Tone	RU37	6.57	≤23.98	PASS
11AX20SISO	Ant1	5240	106Tone	RU53	10.78	≤23.93	PASS
11AX20SISO	Ant2	5240	106Tone	RU53	10.87	≤23.98	PASS
11AX20MIMO	Ant1	5180	26Tone	RU0	3.02	≤23.93	PASS
11AX20MIMO	Ant2	5180	26Tone	RU0	4.15	≤23.98	PASS
11AX20MIMO	total	5180	26Tone	RU0	6.63	≤21.30	PASS
11AX20MIMO	Ant1	5180	52Tone	RU37	6.41	≤23.93	PASS
11AX20MIMO	Ant2	5180	52Tone	RU37	6.76	≤23.98	PASS
11AX20MIMO	total	5180	52Tone	RU37	9.60	≤21.30	PASS
11AX20MIMO	Ant1	5180	106Tone	RU53	10.43	≤23.93	PASS
11AX20MIMO	Ant2	5180	106Tone	RU53	10.33	≤23.98	PASS
11AX20MIMO	total	5180	106Tone	RU53	13.39	≤21.30	PASS
11AX20MIMO	Ant1	5200	26Tone	RU0	3.26	≤23.93	PASS
11AX20MIMO	Ant2	5200	26Tone	RU0	3.10	≤23.98	PASS
11AX20MIMO	total	5200	26Tone	RU0	6.19	≤21.30	PASS
11AX20MIMO	Ant1	5200	52Tone	RU37	6.54	≤23.93	PASS
11AX20MIMO	Ant2	5200	52Tone	RU37	6.44	≤23.98	PASS