

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

SRD TEST REPORT

PRODUCT	Smart counter scale
BRAND	SUNMI
MODEL	ACS-F2521,ACS-F2522,ACS-F2523
APPLICANT	Shanghai Sunmi Technology Co.,Ltd.
FCC ID	2AH25S2CC
IC	22621-S2CC
ISSUE DATE	March 1, 2024
STANDARD(S)	FCC Part15E, RSS-247 Issue 3, RSS-Gen Issue 5

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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	--
2	RSS-247 Issue 3	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices	2023
3	RSS-Gen Issue 5	General Requirements for Compliance of Radio Apparatus	2021

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: KDB 789033 D02 General UNII Test Procedures New Rules v02r01 is not A2LA certified.

1.3 Summary of Test Results

No.	Measurement Items	FCC Rules	IC Rules	Verdict
1	Maximum Output Power	15.407(a)	RSS-247 6.2	Pass
2	Power Spectral Density	15.407(a)	RSS-247 6.2	Pass
3	99% Occupied Bandwidth	N/A	RSS-247 6.2	Pass
4	-26dB Occupied Bandwidth	15.407(a)	RSS-Gen 6.7	Pass
5	Band edge compliance	15.407(b)	RSS-247 6.2	Pass
6	Transmitter spurious emissions radiated	15.407(b)	RSS-Gen 8.9, RSS-247 6.2	Pass
7	Spurious emissions radiated < 30 MHz	15.209 & 15.407(b)	RSS-Gen 8.9, RSS-247 6.2	Pass
8	Spurious emissions conducted < 30 MHz	15.407(b)	RSS-Gen 8.11	Pass
9	Frequency Stability	15.407(g)	RSS-247 6.2	Pass
10	Transmit Power Control	15.407(h)	RSS-Gen 8.8	N/A
11	AC Powerline Conducted Emission	15.207	RSS Gen 6.8	Pass
12	Antenna requirement	15.203	RSS-247 6.2	Pass ^{Note 2}

NOTE1:

The ACS-F2521,ACS-F2522,ACS-F2523 manufactured by Shanghai Sunmi Technology Co.,Ltd. is a new

products for testing.

There are three configurations S03aa&S08aa (Mainly Supply), S16aa (Secondary Supply) and S12(Thirdly supply) in this project. We mainly tested the S03aa&S08aa (Mainly Supply), and the S16aa (Secondary Supply) and S12(Thirdly supply) tested the worst mode of the mainly supply, and recorded the test results of the worst mode respectively in the report.

The description of the differences between S03aa&S08aa (Mainly Supply), S16aa (Secondary Supply) and S12(Thirdly supply) are as follows:

Model	Screen size
ACS-F2521: S16aa (Secondary Supply)	15.6" screen+10.1" screen
ACS-F2522: S08aa (Mainly Supply)	15.6" screen+15.6" screen
ACS-F2523: S12aa (Thirdly Supply)	15.6" screen

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 FPC antenna with max Gain 0.78/0.88/0.93 dBi that complied with 15.203 Requirements.

a. All the test data for each data were verified, but only the worst case was reported.

1.4 Data Provided by Applicant

No.	Item(s)	Data
1	Antenna gain of EUT	0.78/0.88/0.93 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.

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
IC Designation No.	10766A
CAB identifier	CN0067

2.2 Laboratory Environmental Requirements

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

2.3 Project Information

Project Manager	Gao Hongning
Test Date	January 02, 2024 to February 02, 2024

3. General Information of The Customer

3.1 Applicant

Company	Shanghai Sunmi Technology Co.,Ltd.
Address	Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China
Telephone	+86 17302160204

3.2 Manufacturer

Company	Shanghai Sunmi Technology Co.,Ltd.
Address	Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China
Telephone	+86 17302160204

4. General Information of The Product

4.1 Product Description for Equipment under Test (EUT)

Product Name	Smart counter scale
Model name	ACS-F2521,ACS-F2522,ACS-F2523
Date of Receipt	S03aa/S08aa/S16aa/S12aa:February 02, 2024
EUT ID*	S03aa/S08aa/S16aa/S12aa
SN/IMEI	NA
Supported Radio Technology and Bands	BT 4.2 BR/EDR/BLE WLAN 802.11b/g/n WLAN 802.11a/n/ac
Hardware Version	RK3568_MB_V2.0
Software Version	3.0.11
FCC ID	2AH25S2CC
IC	22621-S2CC
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
CB04	Adapter	CYSE65-240250	Jiangsu Chenyang Electron Co., Ltd. 24V,2.5A
UB04	AC Cable	N/A	N/A
AE1	Notebook PC	DELL Latitude E6510	N/A
AE2	LAN Cable	N/A	N/A
AE3	Keyboard	KB212-B	CN-0Y88XT-65890-12I-005Q-A00
AE4	Mouse	MS111-P	CN-011D3V-71581-19J-1A64
AE5	Earphone	N/A	N/A
AE6	Micro SD card	Kingston SDC4/4GB 77	N/A
AE7	Cash Box	NC020	N/A
AE8	Telephone	HA8000(28) P/T S	N/A
AE9	U disk	Kingston DTSE9 16GB	N/A

AE10	U disk	Kingston DTSE9 16GB	N/A
AE11	USB Cable	N/A	N/A
AE12	Object of weight	N/A	N/A

NOTE: AE ID is the internal identification code of the laboratory.

4.3 Additional Information

WLAN Frequency	U-NII-1: 5180-5240MHz U-NII-2A: 5260-5320MHz U-NII-2C: 5500MHz-5700MHz
Occupied Channel Bandwidth	20 MHz: 802.11 a/n/ac 40 MHz: 802.11 n/ac 80 MHz: 802.11 ac
WLAN type of modulation	OFDM

Test frequency list:

UNII-1 and UNII-2A:

BW_20M	Channel	36	40	44	48	52	56	60	64
	Freq. (MHz)	5180	5200	5220	5240	5260	5280	5300	5320
BW_40M	Channel	38		46		54		62	
	Freq. (MHz)	5190		5230		5270		5310	
BW_80M	Channel	42				58			
	Freq. (MHz)	5210				5290			

UNII-2C:

BW_20M	Channel	100	104	108	112	116	120	124	128	132	136	140	
	Freq. (MHz)	5500	5520	5540	5560	5580	5600	5620	5640	5660	5680	5700	
BW_40M	Channel	102		110		118		126		134		/	
	Freq. (MHz)	5510		5550		5590		5630		5670		/	
BW_80M	Channel	106				122				/			
	Freq. (MHz)	5530				5610				/			

Note: "/" Represents empty

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

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	-10°C	40°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	10727	V3.2.22	N/A	Tonscnd	N/A	N/A
2	Automatic control unit	JS0806-2	2218060623	N/A	N/A	Tonscnd	2023-05-06	1 Year
3	Wireless communication comprehensive tester	CMW500	164865	V3.8.12	N/A	R&S	2023-07-26	1 Year
4	Spectrum Analyzer	FSQ40	200063	V4.75	N/A	R&S	2023-10-16	1 Year
5	Analog Signal Generator	SMF	104770	V3.0.13.0-2.20.530.15.4	N/A	R&S	2023-10-16	1 year
6	Vector Signal Generator	SMCV100B	103691	V5.00.122.24	N/A	R&S	2023-07-27	1 Year
7	Programmable Power Supply	Keithley 2303	4039070	N/A	N/A	Keithley	2023-06-23	1 Year
8	Temperature box	B-TF-107C	BTF107C-201804107	N/A	N/A	Boyi	2023-06-28	1 Year
9	Network test unit AP	GT-AXE11000	N2IGOX401637KWF	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	2022-12-19	1 Year
4	TRILOG Broadband Antenna	VULB9163	01345	N/A	N/A	Schwarzbeck	2023-03-23	1 Year
5	Double-ridged Waveguide Antenna	ETS-3117	00135890	N/A	N/A	ETS	2022-03-09	2 Years
6	EMI Test Software	EMC32 V10.35.02	N/A	N/A	N/A	R&S	N/A	N/A
7	Horn Antenna	3160-09	LM6321	N/A	N/A	R&S	2023-07-16	1 Year
8	Horn Antenna	3160-10	LM5942	N/A	N/A	R&S	2023-07-16	1 Year
9	Loop Antenna	AL-130R	121083	N/A	N/A	COM-POWER	2023-9-13	1 Year
10	Preamplifier	SCU08F1	8320024	N/A	N/A	R&S	2023-10-16	1 Year
11	Preamplifier	SCU18	10155	N/A	N/A	R&S	2023-10-16	1 Year
12	Preamplifier	SCU26	10025	N/A	N/A	R&S	2023-10-16	1 Year
13	Preamplifier	SCU40	10020	N/A	N/A	R&S	2023-10-16	1 Year
14	2-Line V-Network	ENV216	101380	N/A	N/A	R&S	2023-12-19	1 Year
15	EMI Test Software	EMC32 V10.35.02	N/A	N/A	N/A	R&S	N/A	N/A
16	Test Receiver	ESCI	101235	V5.1-24-3	0	R&S	2023-12-19	1 Year

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
RSS-247 6.2	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:

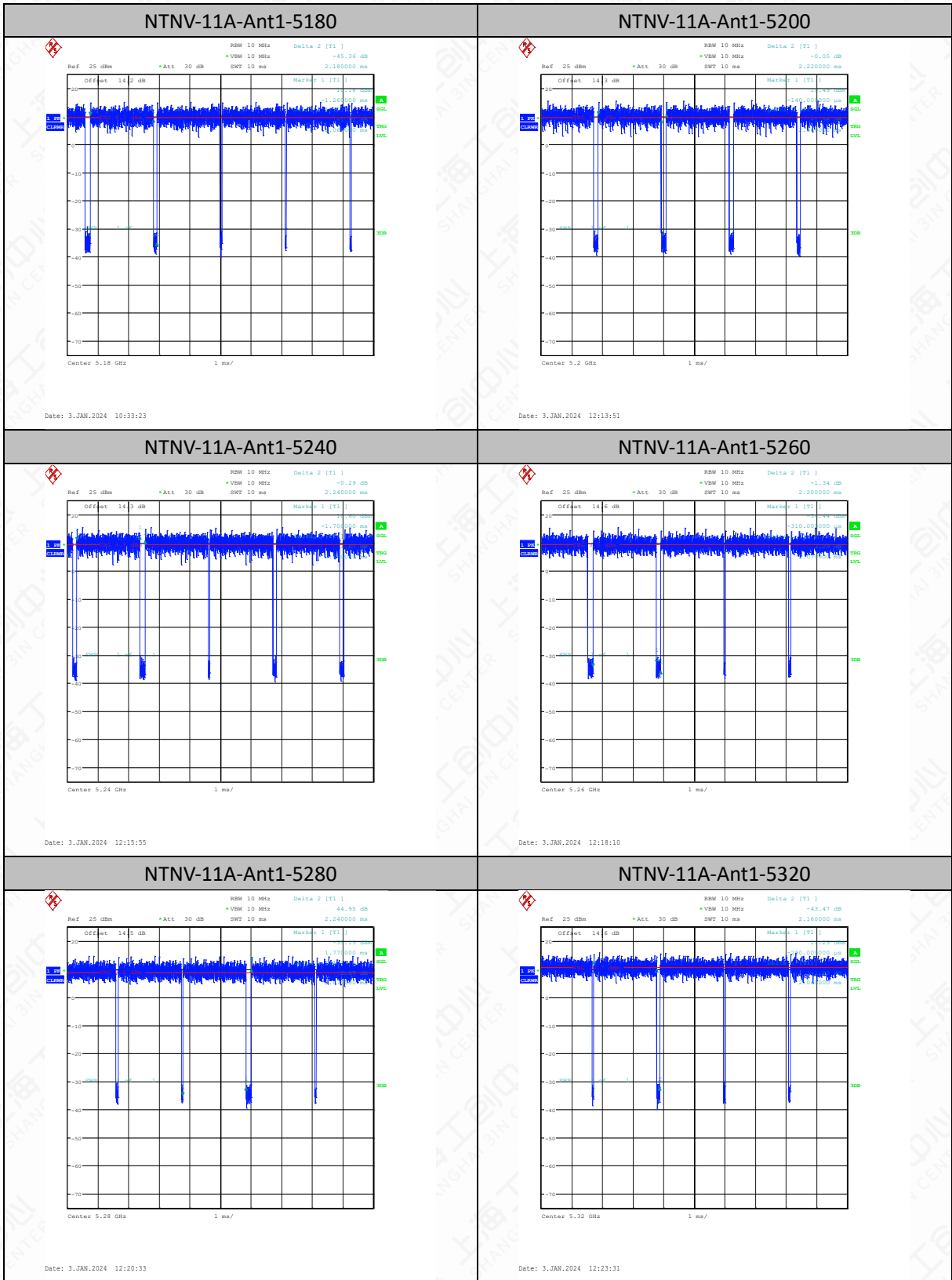
- a) A diode detector and an oscilloscope that together have sufficiently short response time to permit accurate measurements of the on and off times of the transmitted signal.
- b) The zero-span mode on a spectrum analyzer or EMI receiver, if the response time and spacing between bins on the sweep are 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.)

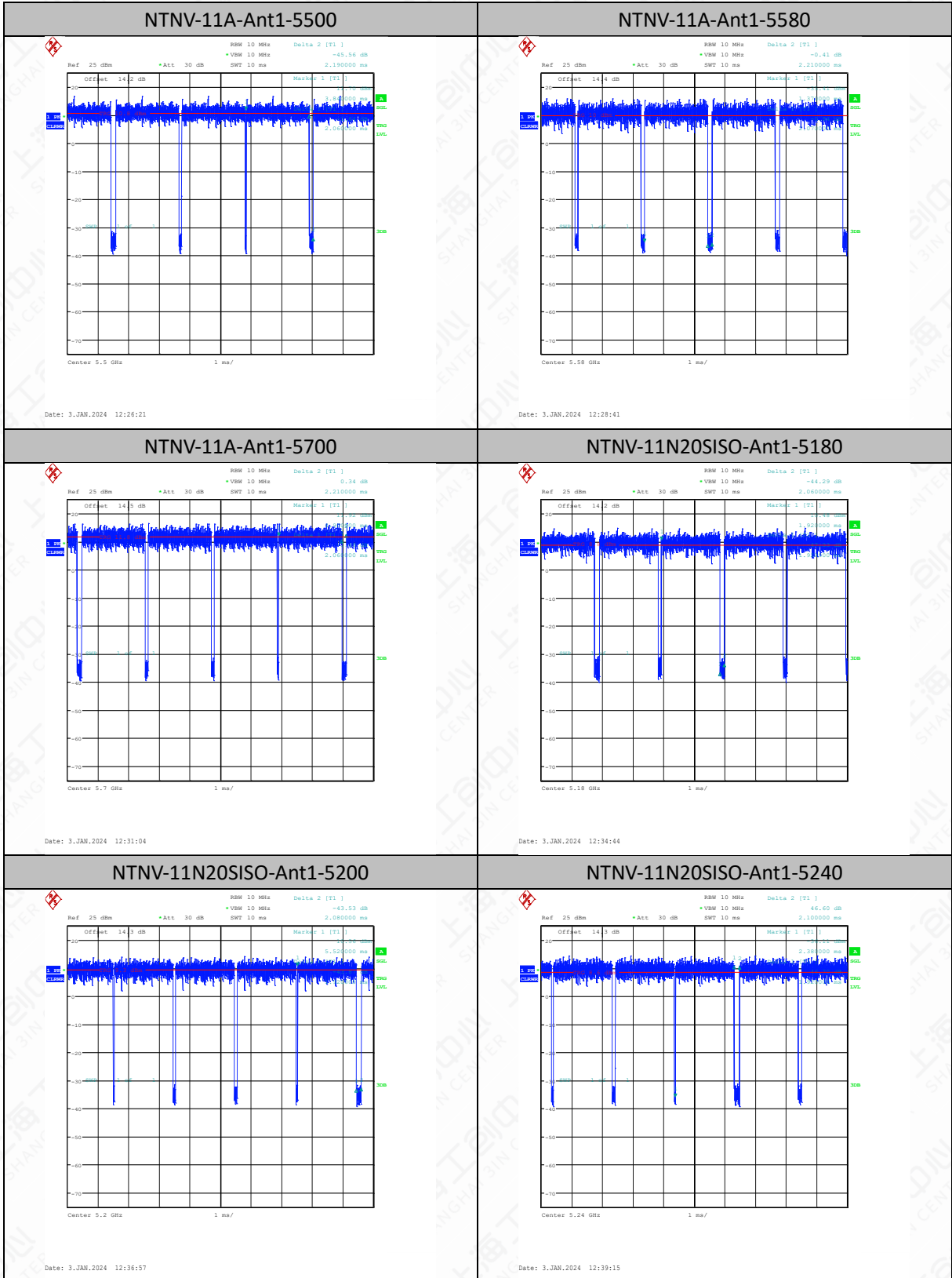
6.1.3. Measurement Results

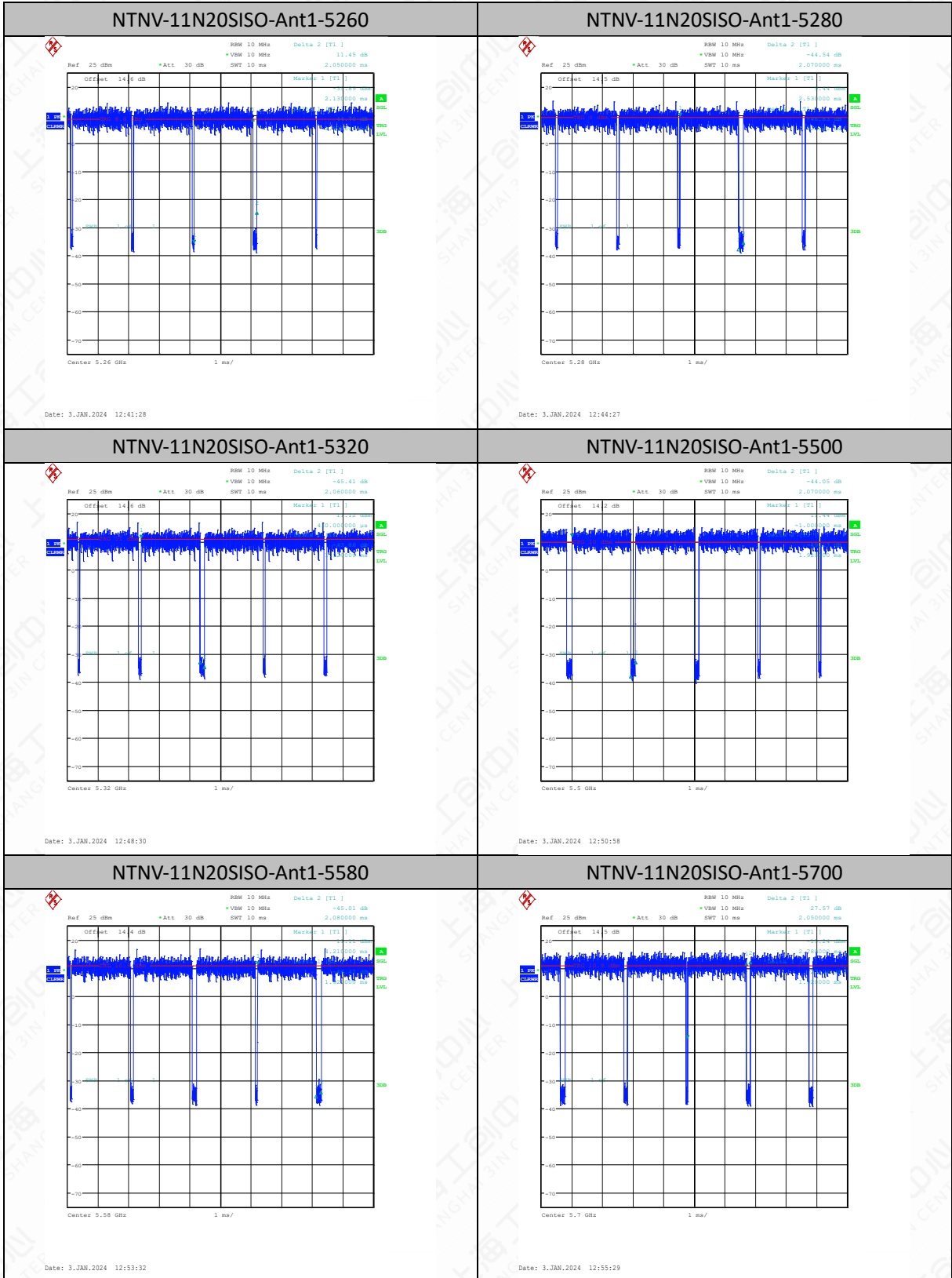
Test Mode	Antenna	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11A	Ant1	5180	2.06	2.18	94.50
11A	Ant1	5200	2.06	2.22	92.79
11A	Ant1	5240	2.06	2.24	91.96
11A	Ant1	5260	2.07	2.20	94.09
11A	Ant1	5280	2.07	2.24	92.41
11A	Ant1	5320	2.06	2.16	95.37
11A	Ant1	5500	2.06	2.19	94.06
11A	Ant1	5580	2.07	2.21	93.67
11A	Ant1	5700	2.06	2.21	93.21
11N20SISO	Ant1	5180	1.92	2.06	93.20
11N20SISO	Ant1	5200	1.92	2.08	92.31
11N20SISO	Ant1	5240	1.92	2.10	91.43

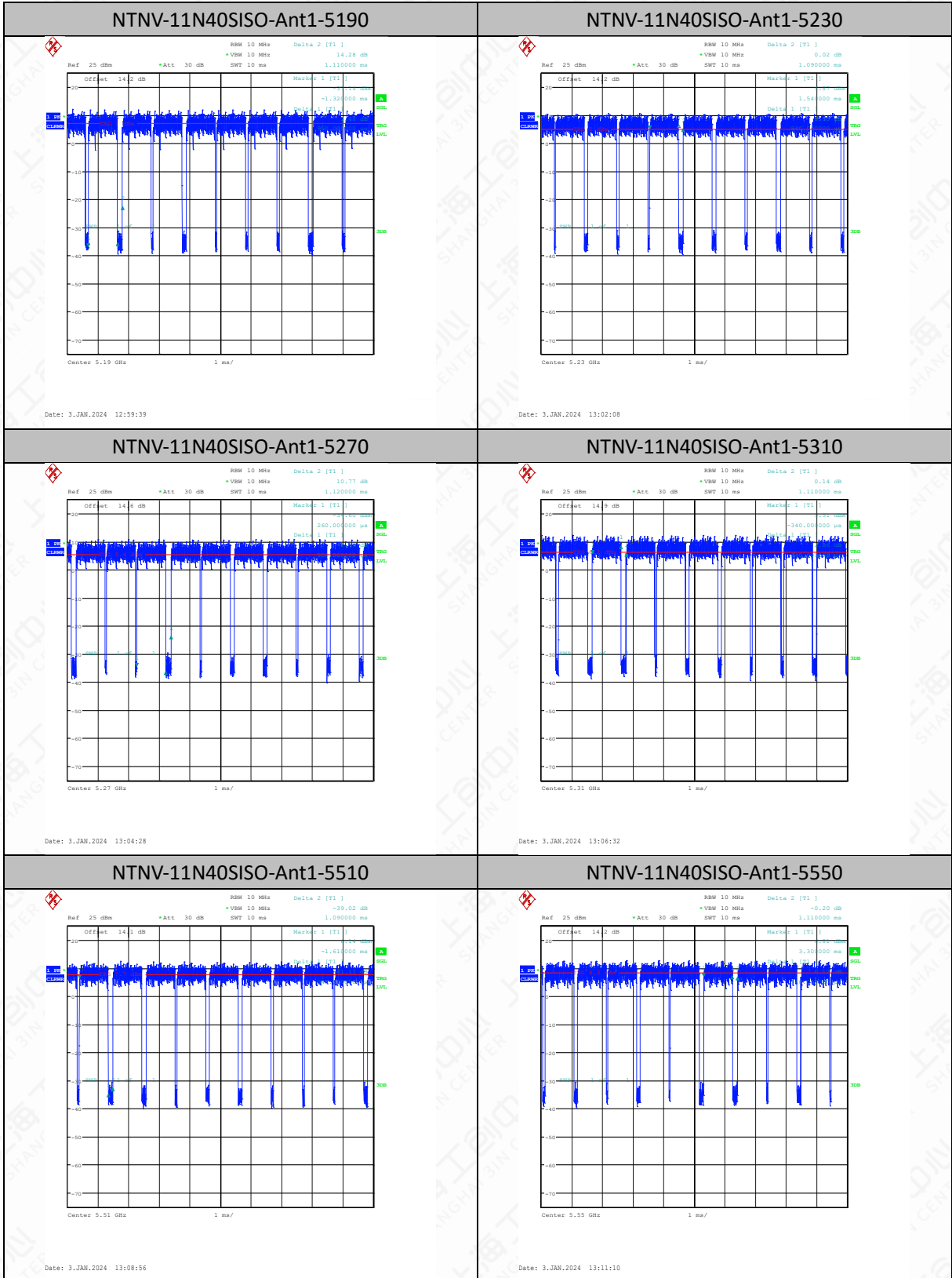
11N20SISO	Ant1	5260	1.92	2.05	93.66
11N20SISO	Ant1	5280	1.92	2.07	92.75
11N20SISO	Ant1	5320	1.92	2.06	93.20
11N20SISO	Ant1	5500	1.92	2.07	92.75
11N20SISO	Ant1	5580	1.92	2.08	92.31
11N20SISO	Ant1	5700	1.92	2.05	93.66
11N40SISO	Ant1	5190	0.95	1.11	85.59
11N40SISO	Ant1	5230	0.94	1.09	86.24
11N40SISO	Ant1	5270	0.95	1.12	84.82
11N40SISO	Ant1	5310	0.94	1.11	84.68
11N40SISO	Ant1	5510	0.94	1.09	86.24
11N40SISO	Ant1	5550	0.94	1.11	84.68
11N40SISO	Ant1	5670	0.94	1.09	86.24
11AC20SISO	Ant1	5180	1.93	2.08	92.79
11AC20SISO	Ant1	5200	1.94	2.11	91.94
11AC20SISO	Ant1	5240	1.93	2.10	91.90
11AC20SISO	Ant1	5260	1.93	2.09	92.34
11AC20SISO	Ant1	5280	1.94	2.07	93.72
11AC20SISO	Ant1	5320	1.93	2.00	96.50
11AC20SISO	Ant1	5500	1.93	2.09	92.34
11AC20SISO	Ant1	5580	1.93	2.06	93.69
11AC20SISO	Ant1	5700	1.93	2.08	92.79
11AC40SISO	Ant1	5190	0.95	1.13	84.07
11AC40SISO	Ant1	5230	0.95	1.10	86.36
11AC40SISO	Ant1	5270	0.95	1.11	85.59
11AC40SISO	Ant1	5310	0.95	1.11	85.59
11AC40SISO	Ant1	5510	0.95	1.57	60.51
11AC40SISO	Ant1	5550	0.95	1.11	85.59
11AC40SISO	Ant1	5670	0.95	1.10	86.36
11AC80SISO	Ant1	5210	0.46	0.63	73.02
11AC80SISO	Ant1	5290	0.46	0.63	73.02
11AC80SISO	Ant1	5530	0.46	0.98	46.94
11AC80SISO	Ant1	5610	0.46	0.62	74.19

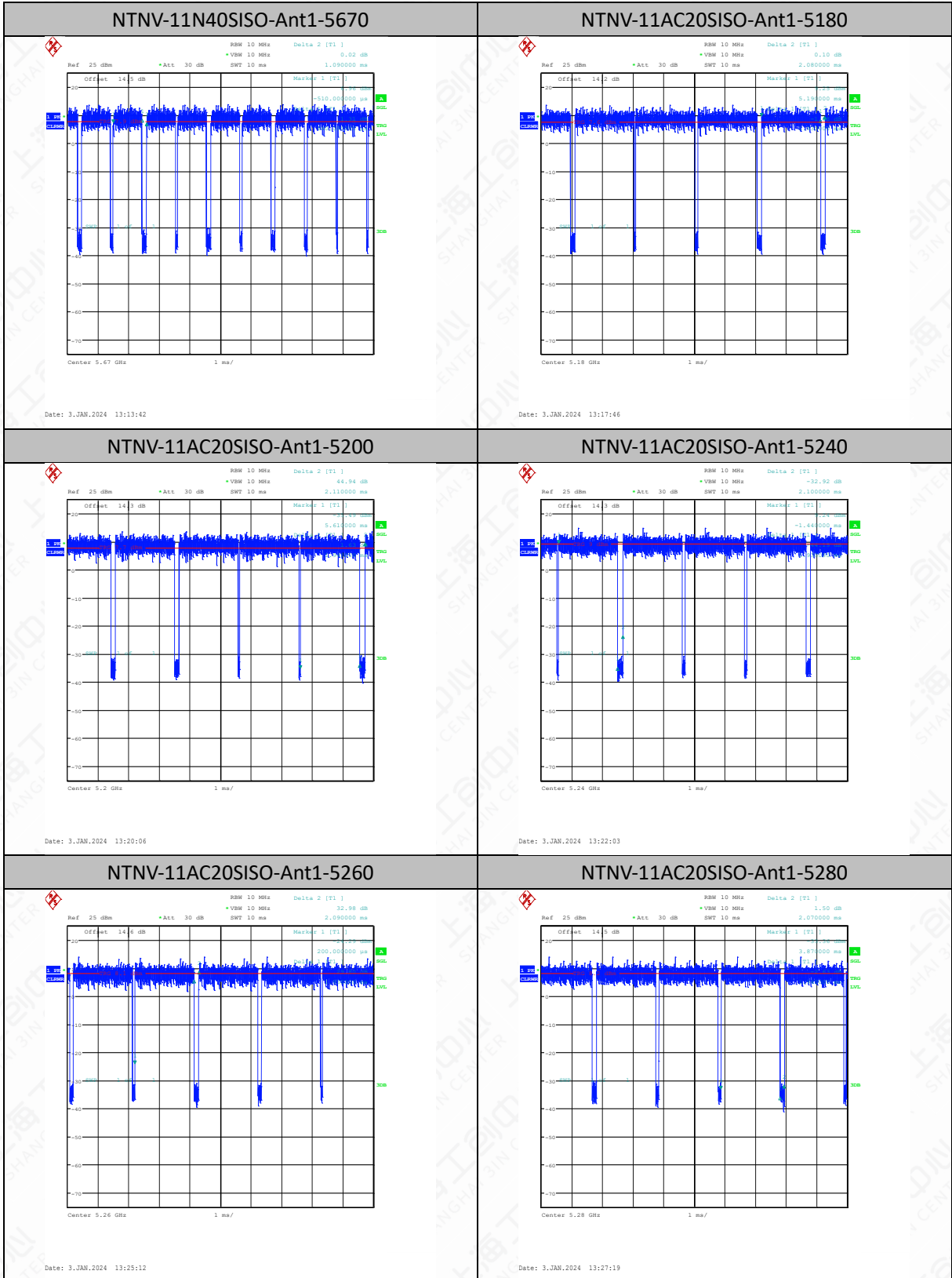
Test Graphs

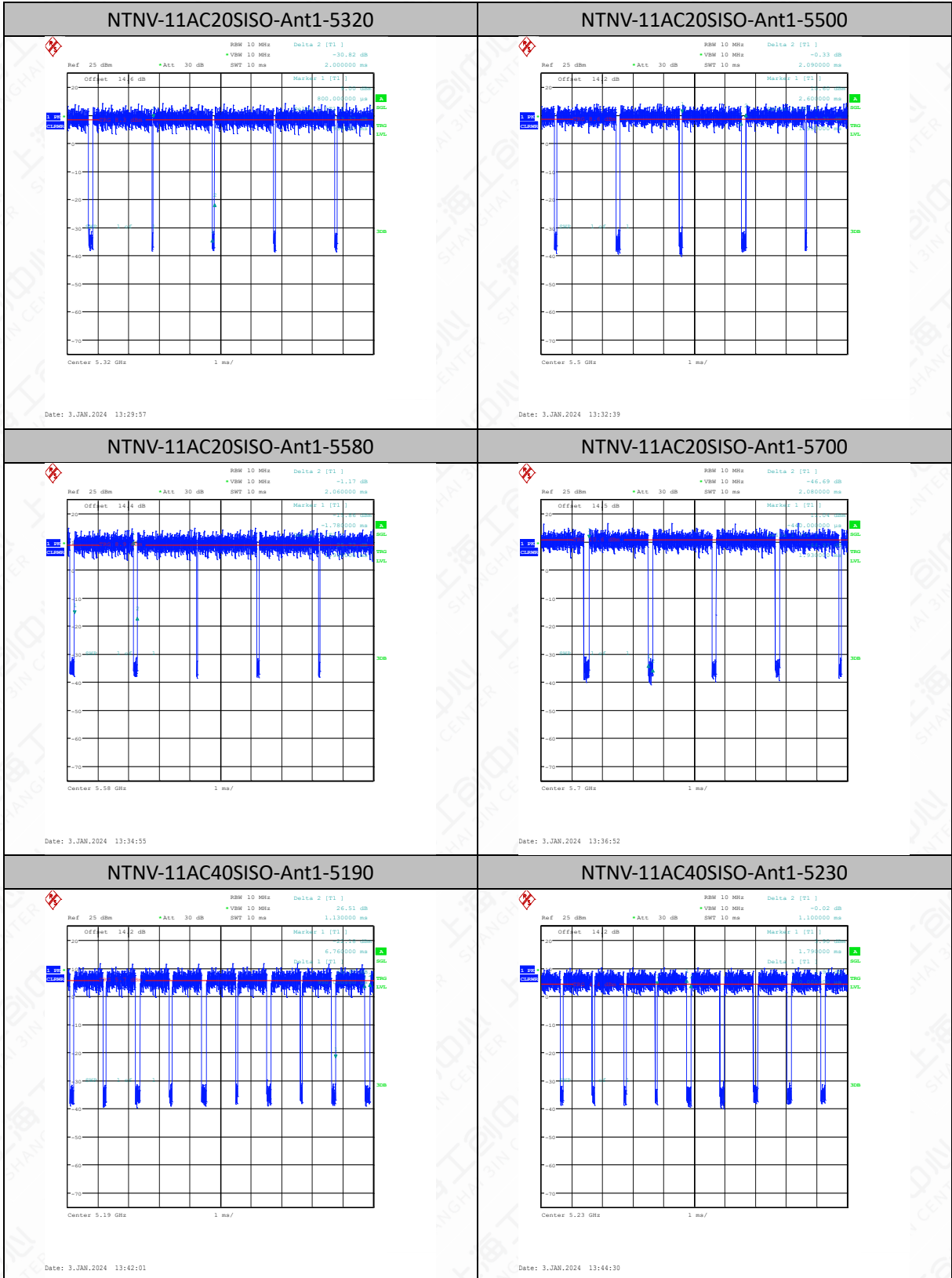


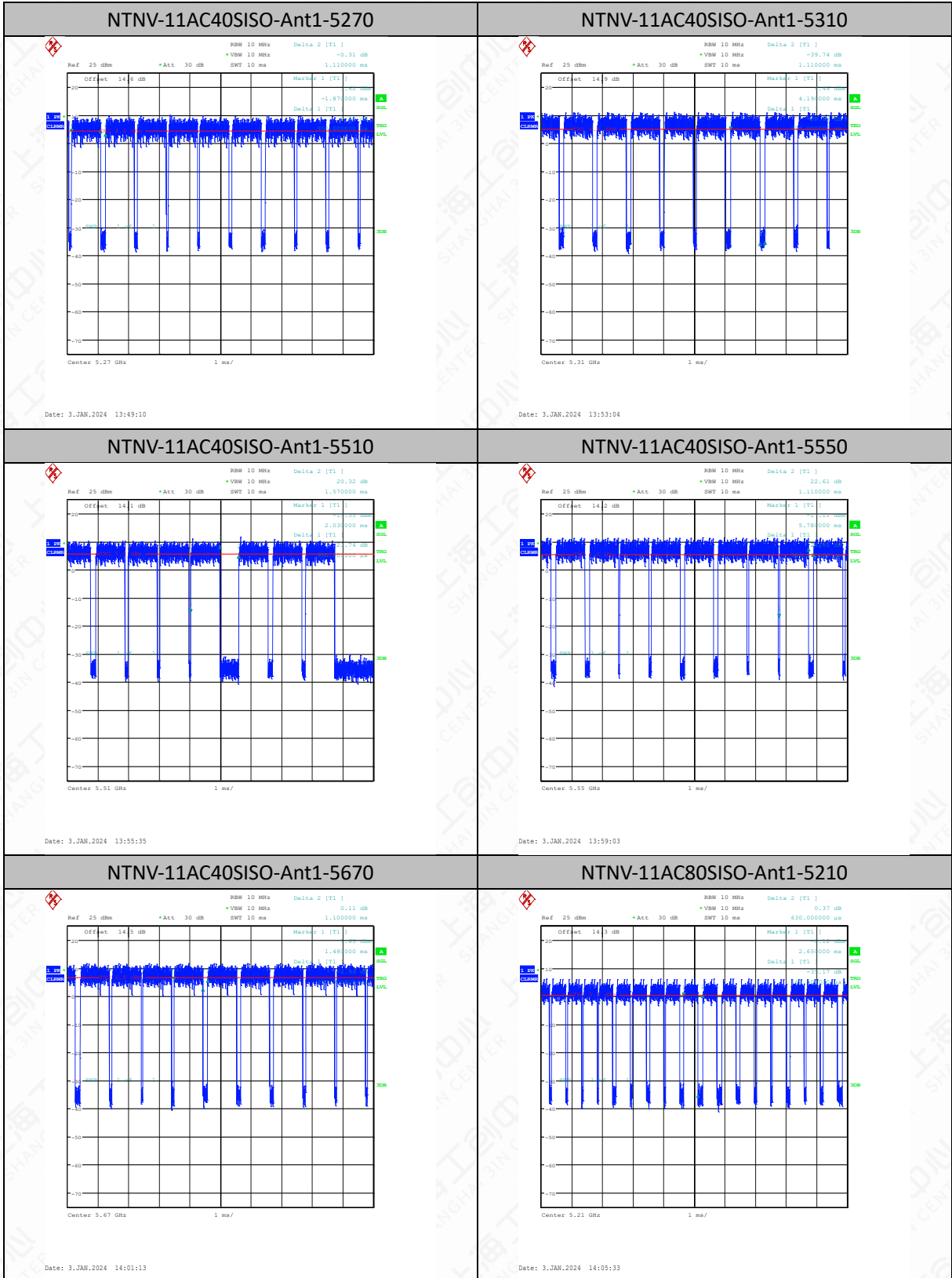


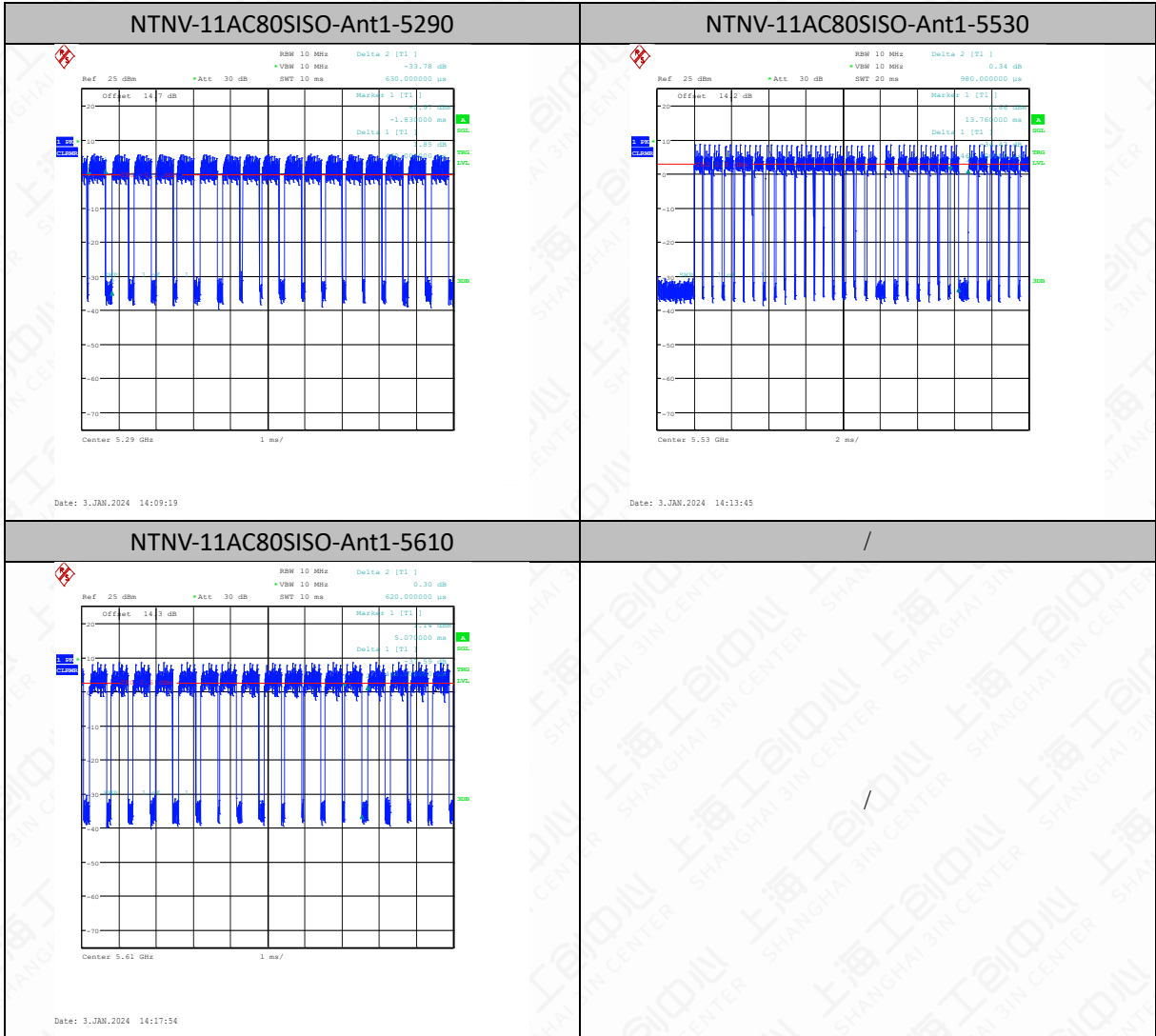












6.2. Maximum Output Power-Conducted

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. For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
RSS-247 6.2	5150-5250 MHz: For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band. 5250-5350 MHz: The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. 5470-5600 MHz and 5650-5725 MHz: The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum

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).

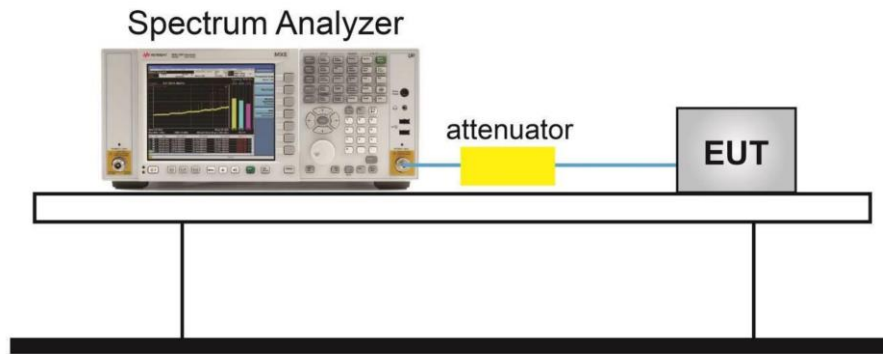
1. Measure the duty cycle, x, of the transmitter output signal as described in II.B.
2. Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
3. Set RBW = 1 MHz. (iv) Set VBW ≥ 3 MHz.
4. Number of points in sweep ≥ 2 × span / RBW. (This ensures that bin-to-bin 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.

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 Results

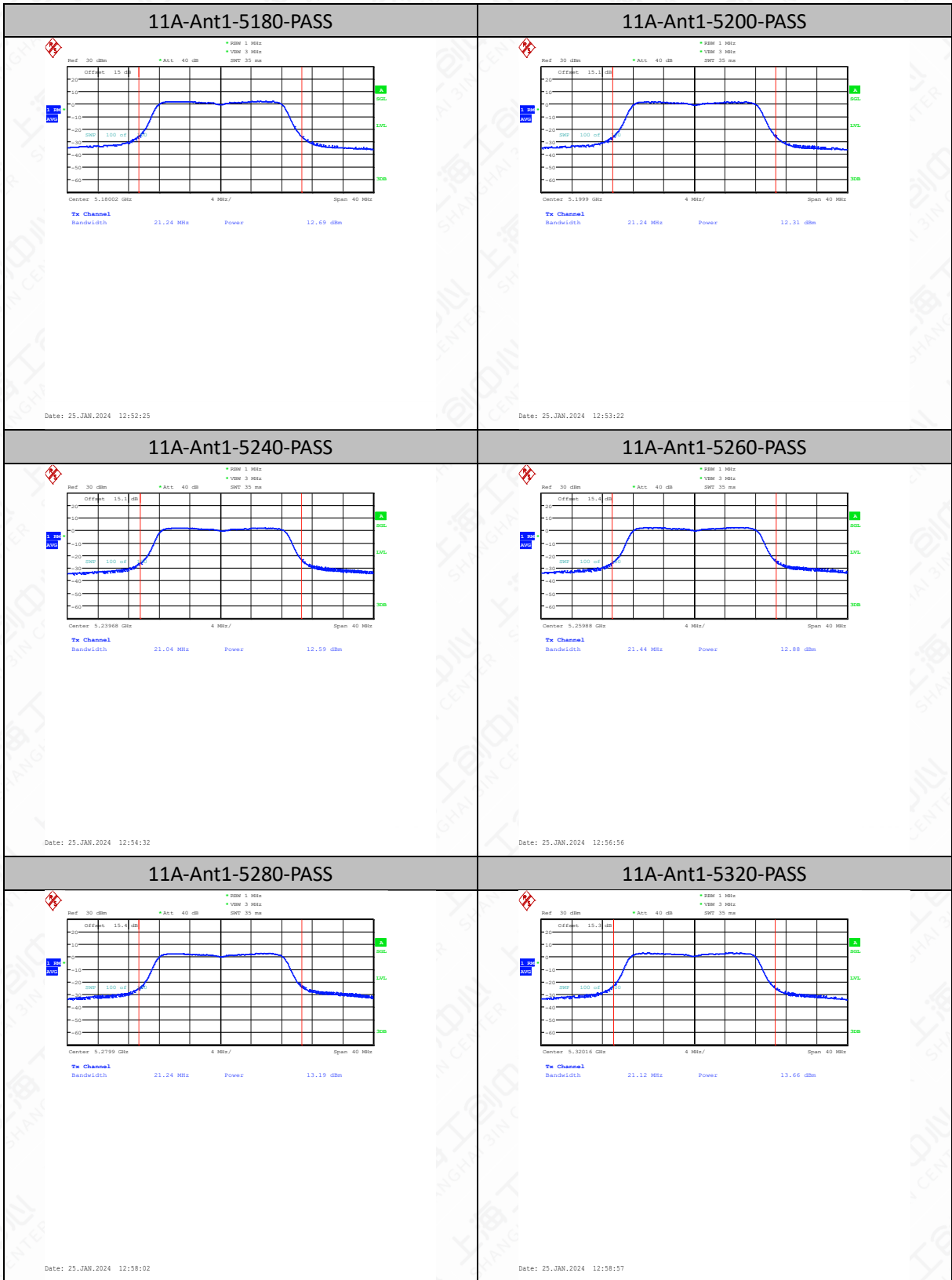
Test Mode	Frequency [MHz]	Set Power	Channel Power [dBm]	Duty Cycle [%]	DC Factor [dBm]	Result [dBm]	Limit [dBm]	Gain [dBi]	EIRP [dBm]
11A	5180	49	12.44	94.50	0.25	12.69	≤23.98	0.78	13.47
11A	5200	49	11.99	92.79	0.32	12.31	≤23.98	0.78	13.09
11A	5240	49	12.23	91.96	0.36	12.59	≤23.98	0.78	13.37
11A	5260	49	12.62	94.09	0.26	12.88	≤23.98	0.88	13.76
11A	5280	49	12.85	92.41	0.34	13.19	≤23.98	0.88	14.07
11A	5320	49	13.45	95.37	0.21	13.66	≤23.98	0.88	14.54
11A	5500	44	11.19	94.06	0.27	11.46	≤23.98	0.93	12.39
11A	5580	44	11.73	93.67	0.28	12.01	≤23.98	0.93	12.94
11A	5700	37	9.12	93.21	0.31	9.43	≤23.98	0.93	10.36
11N20SISO	5180	47	11.21	93.20	0.31	11.52	≤23.98	0.78	12.3
11N20SISO	5200	47	12.12	92.31	0.35	12.47	≤23.98	0.78	13.25
11N20SISO	5240	47	11.30	91.43	0.39	11.69	≤23.98	0.78	12.47
11N20SISO	5260	47	11.62	93.66	0.28	11.90	≤23.98	0.88	12.78
11N20SISO	5280	47	11.91	92.75	0.33	12.24	≤23.98	0.88	13.12
11N20SISO	5320	47	12.43	93.20	0.31	12.74	≤23.98	0.88	13.62

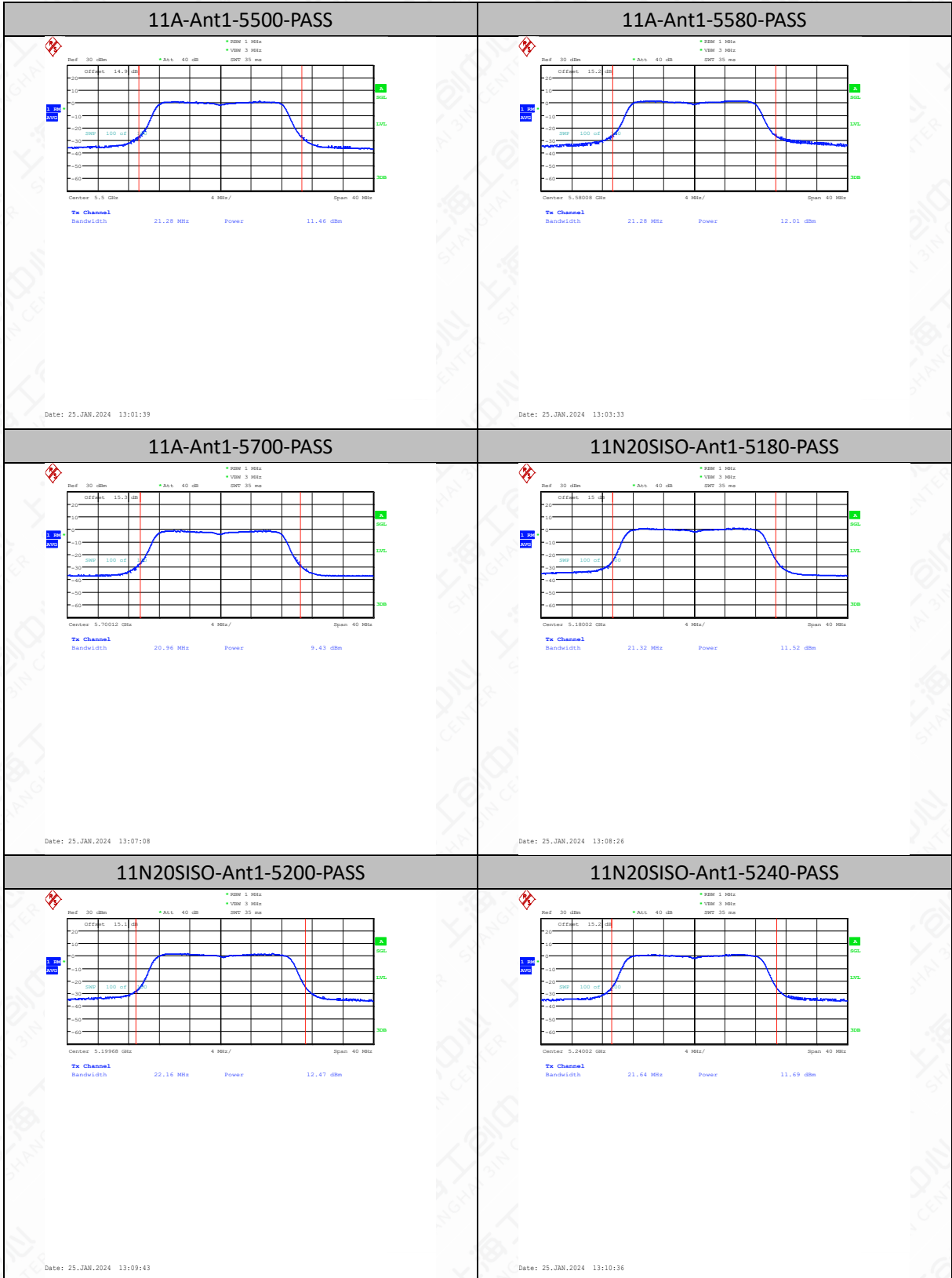
11N20SISO	5500	42	10.16	92.75	0.33	10.49	≤23.98	0.93	11.42
11N20SISO	5580	42	10.43	92.31	0.35	10.78	≤23.98	0.93	11.71
11N20SISO	5700	38	9.66	93.66	0.28	9.94	≤23.98	0.93	10.87
11N40SISO	5190	45	10.56	85.59	0.68	11.24	≤23.98	0.78	12.02
11N40SISO	5230	46	11.58	86.24	0.64	12.22	≤23.98	0.78	13
11N40SISO	5270	46	12.43	84.82	0.72	13.15	≤23.98	0.88	14.03
11N40SISO	5310	43	11.49	84.68	0.72	12.21	≤23.98	0.88	13.09
11N40SISO	5510	31	4.30	86.24	0.64	4.94	≤23.98	0.93	5.87
11N40SISO	5550	41	9.46	84.68	0.72	10.18	≤23.98	0.93	11.11
11N40SISO	5670	38	9.34	86.24	0.64	9.98	≤23.98	0.93	10.91
11AC20SISO	5180	45	10.38	92.79	0.32	10.70	≤23.98	0.78	11.48
11AC20SISO	5200	45	10.20	91.94	0.36	10.56	≤23.98	0.78	11.34
11AC20SISO	5240	45	10.13	91.90	0.37	10.50	≤23.98	0.78	11.28
11AC20SISO	5260	45	10.61	92.34	0.35	10.96	≤23.98	0.88	11.84
11AC20SISO	5280	45	10.72	93.72	0.28	11.00	≤23.98	0.88	11.88
11AC20SISO	5320	45	12.21	96.50	0.15	12.36	≤23.98	0.88	13.24
11AC20SISO	5500	40	9.00	92.34	0.35	9.35	≤23.98	0.93	10.28
11AC20SISO	5580	40	9.46	93.69	0.28	9.74	≤23.98	0.93	10.67
11AC20SISO	5700	37	9.22	92.79	0.32	9.54	≤23.98	0.93	10.47
11AC40SISO	5190	42	9.03	84.07	0.75	9.78	≤23.98	0.78	10.56
11AC40SISO	5230	42	8.63	86.36	0.64	9.27	≤23.98	0.78	10.05
11AC40SISO	5270	42	9.42	85.59	0.68	10.10	≤23.98	0.88	10.98
11AC40SISO	5310	42	10.46	85.59	0.68	11.14	≤23.98	0.88	12.02
11AC40SISO	5510	32	4.65	60.51	2.18	6.83	≤23.98	0.93	7.76
11AC40SISO	5550	40	8.23	85.59	0.68	8.91	≤23.98	0.93	9.84
11AC40SISO	5670	39	10.56	86.36	0.64	11.20	≤23.98	0.93	12.13
11AC80SISO	5210	42	8.79	73.02	1.37	10.16	≤23.98	0.78	10.94
11AC80SISO	5290	42	9.84	73.02	1.37	11.21	≤23.98	0.88	12.09
11AC80SISO	5530	31	4.33	46.94	3.28	7.61	≤23.98	0.93	8.54
11AC80SISO	5610	39	8.51	74.19	1.30	9.81	≤23.98	0.93	10.74

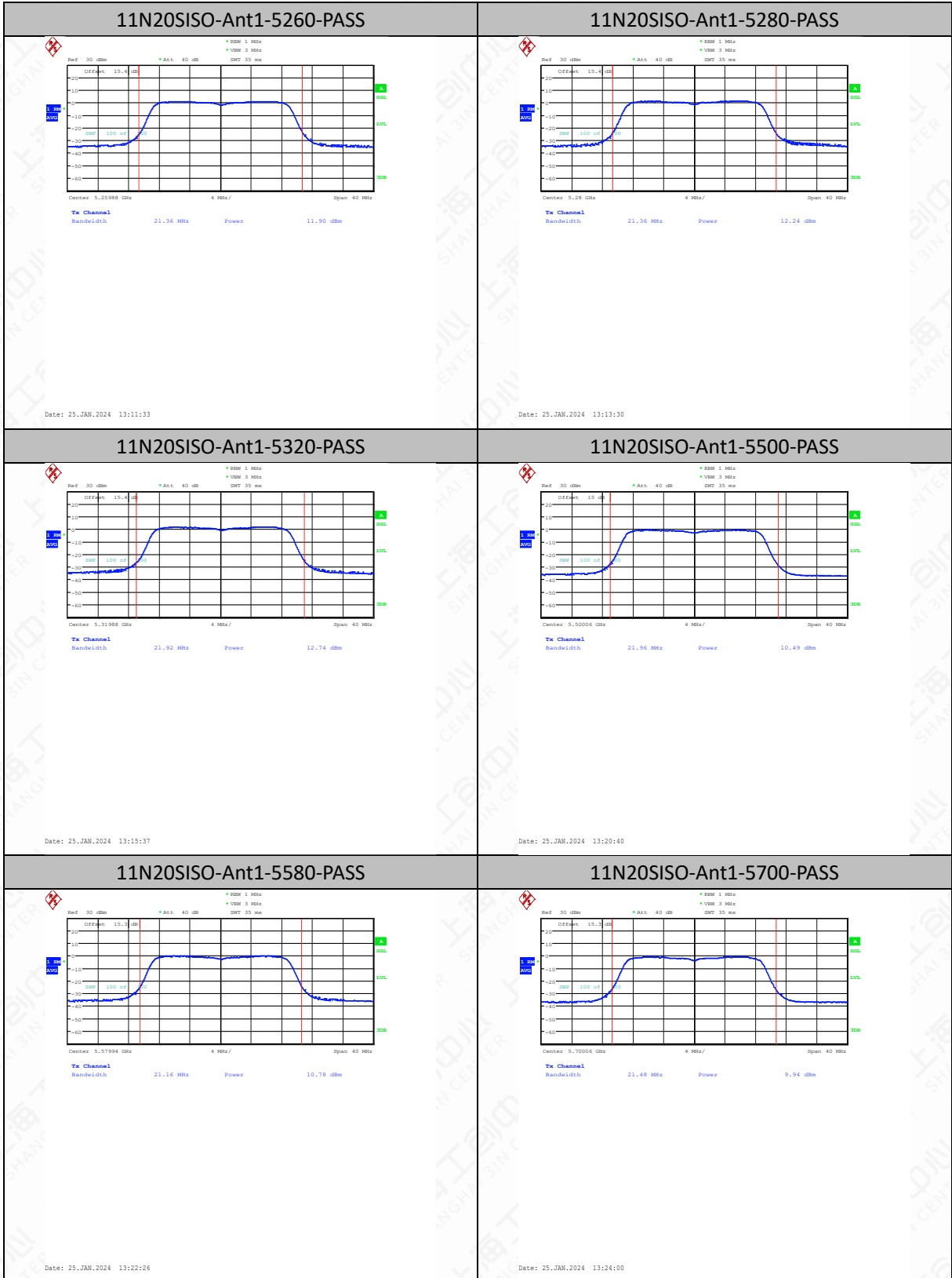
Note:

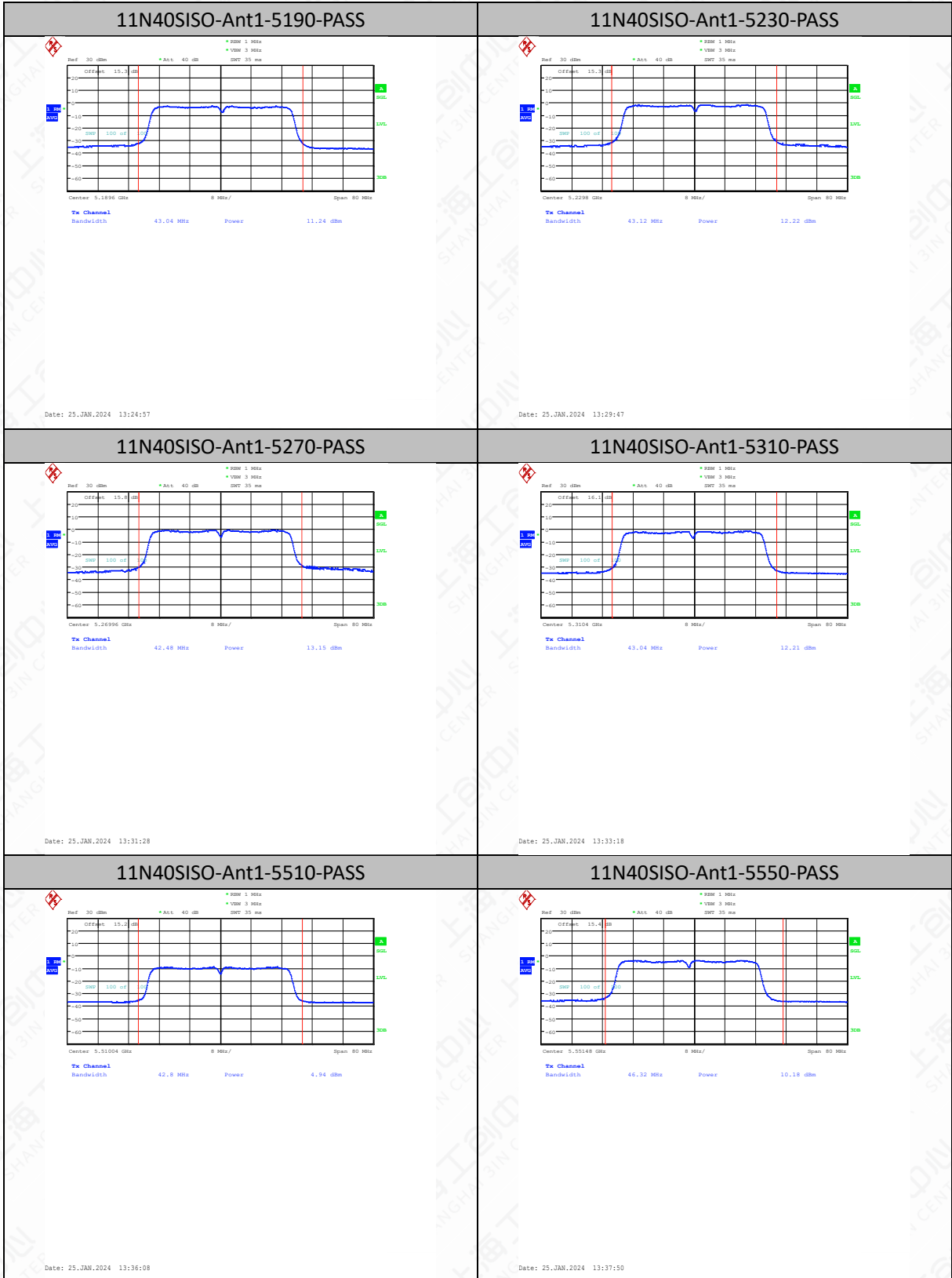
- 1.The Duty Cycle Factor is compensated in the graph.
2. In the graph, the Center frequency = (Low frequency of 26dB OBW + High frequency of 26dB OBW) /2.
- 3.The 11a data rate 6Mbps is selected as worse condition, 11n/11ac data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.
4. For client devices in the 5.15–5.25 GHz band, Limit =250mW; For the 5.25–5.35 GHz and 5.47–5.725 GHz bands: Limit = Min (250mW, 11dBm+10log B), B is the 26 dB emission bandwidth in megahertz.

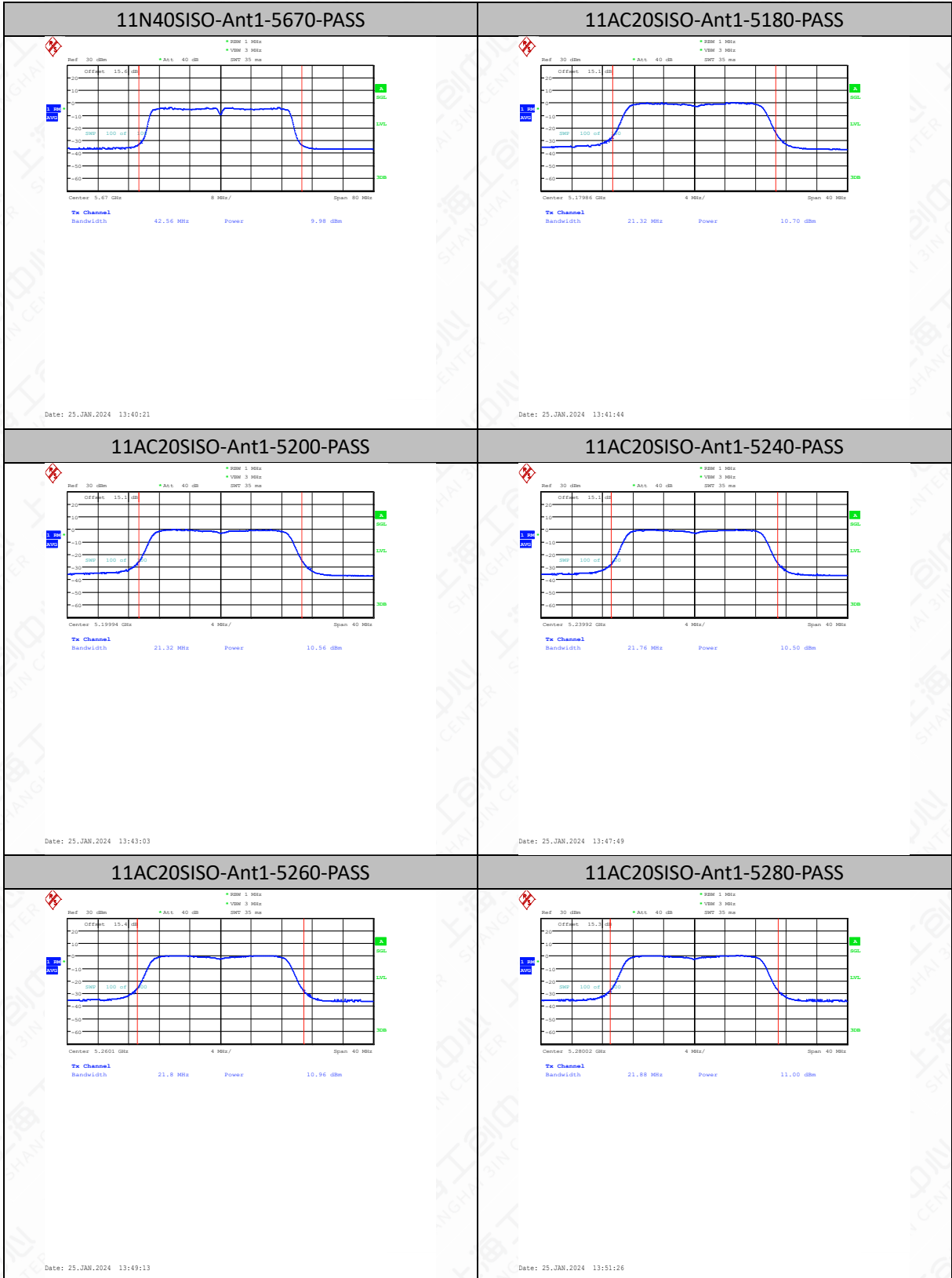
Test graphs

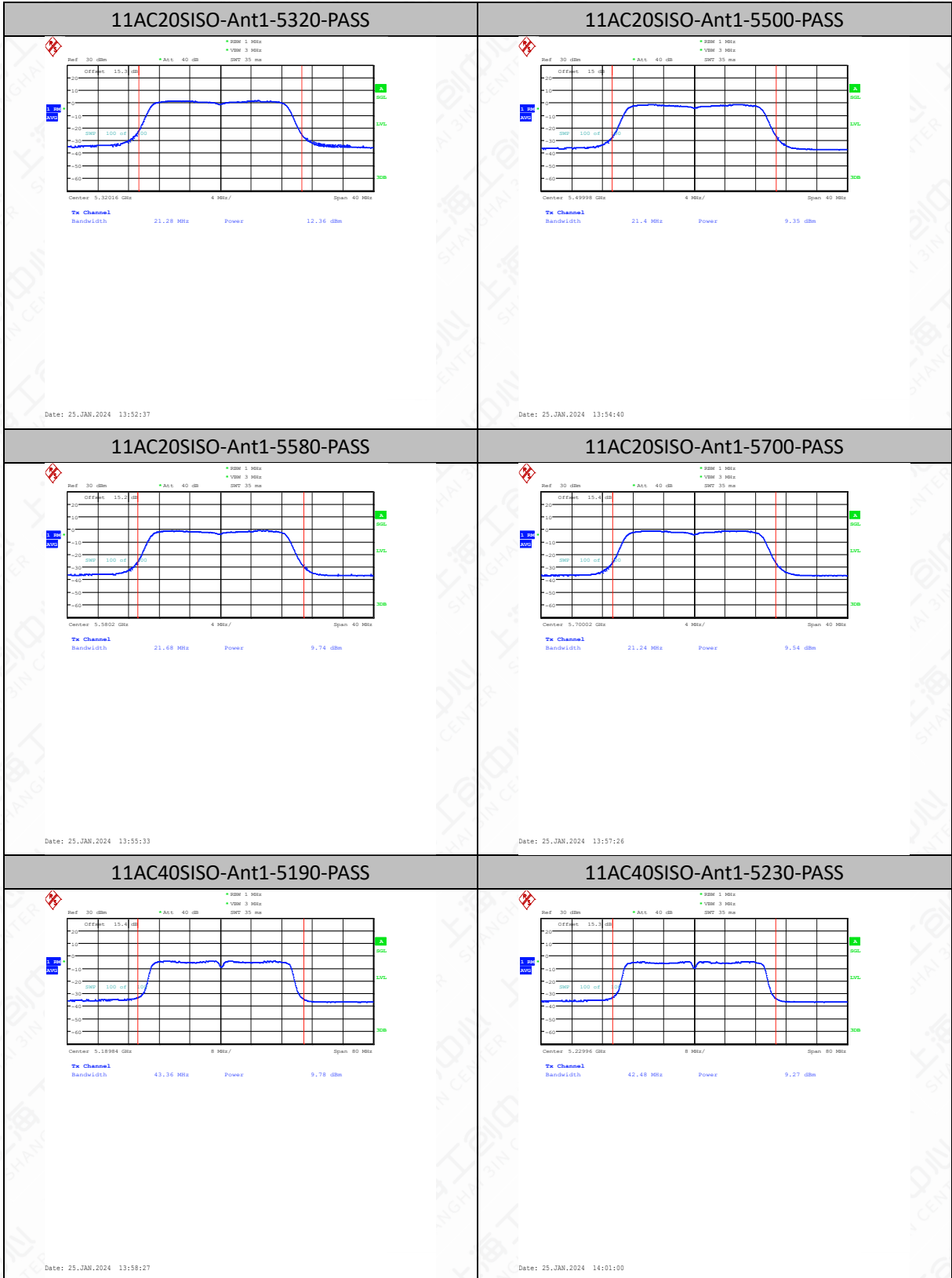


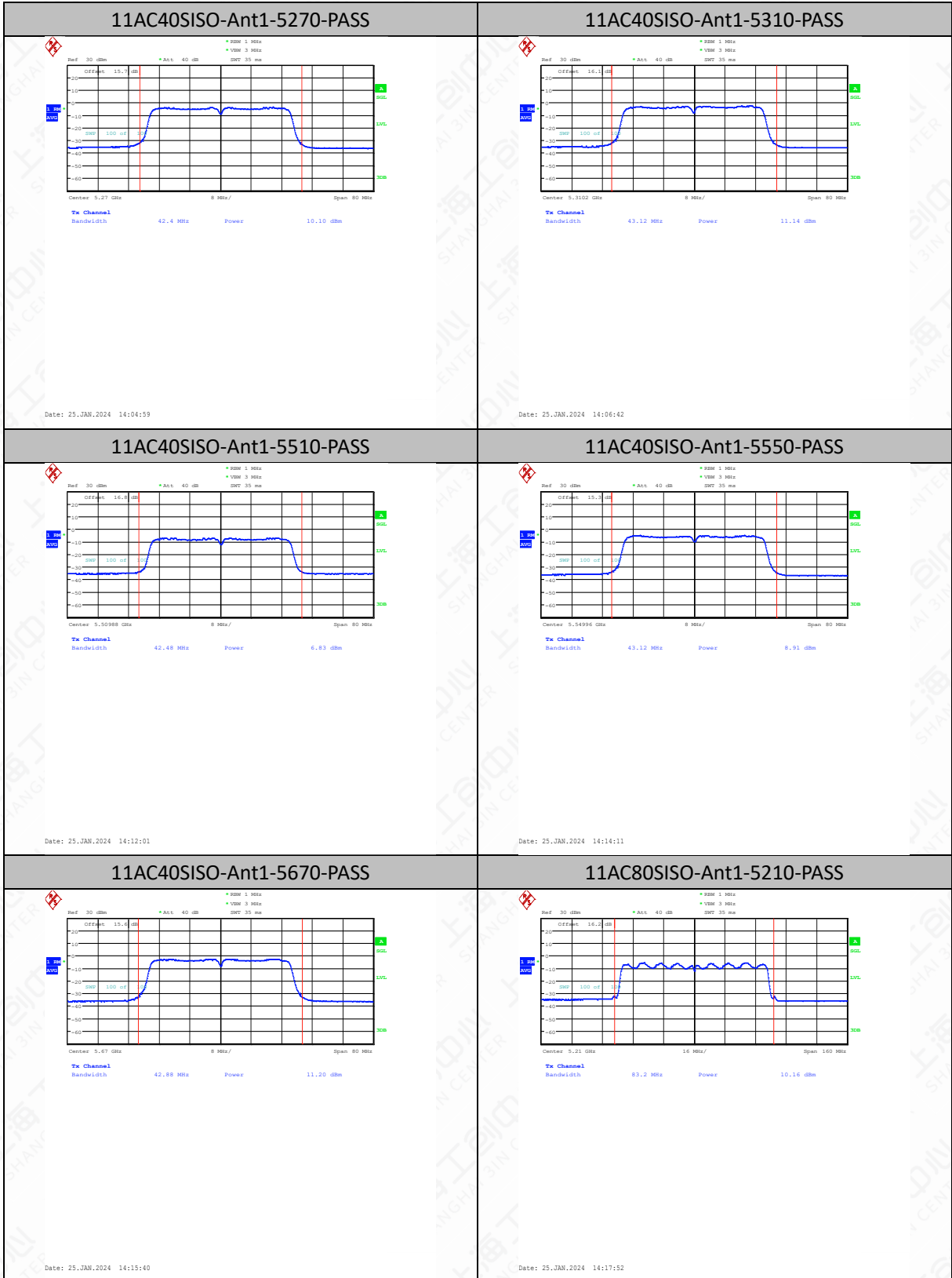












11AC80SISO-Ant1-5290-PASS	11AC80SISO-Ant1-5530-PASS
<p>Center: 5.29024 GHz 16 MHz/ Span: 160 MHz</p> <p>Tx Channel Bandwidth: 83.36 MHz Power: 11.21 dBm</p> <p>Date: 25.JAN.2024 14:20:15</p>	<p>Center: 5.53008 GHz 16 MHz/ Span: 160 MHz</p> <p>Tx Channel Bandwidth: 82.4 MHz Power: 7.61 dBm</p> <p>Date: 25.JAN.2024 14:22:14</p>
11AC80SISO-Ant1-5610-PASS	/
<p>Center: 5.61032 GHz 16 MHz/ Span: 160 MHz</p> <p>Tx Channel Bandwidth: 82.88 MHz Power: 9.81 dBm</p> <p>Date: 25.JAN.2024 14:23:52</p>	<p>/</p>

6.3. Peak Power Spectral Density

6.3.1. Measurement Limit

Standard	Limit (dBm)
FCC 47 CFR Part 15.407(a)(1)(iv)	≤11
RSS-247 6.2	5150-5250 MHz: The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band. 5250-5350 MHz: The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. 5470-5600 MHz and 5650-5725 MHz: The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

6.3.2. Test Procedure

The measurement method is made according to KDB 789033 F

1. Create an average power spectrum for the EUT operating mode being tested by following the instructions in II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, "Compute power...." (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)
2. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
3. Make the following adjustments to the peak value of the spectrum, if applicable:
 - a) If Method SA-2 or SA-2 Alternative was used, add $10 \log(1/x)$, where x is the duty cycle, to the peak of the spectrum.
 - b) If Method SA-3 Alternative was used and the linear mode was used in step II.E.2.g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.
4. The result is the Maximum PSD over 1 MHz reference bandwidth.
5. For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in Section 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, "provided that the measured power is integrated over the full reference bandwidth" to show the total power over the

specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:

a) Set $RBW \geq 1/T$, where T is defined in II.B.I.a).

b) Set $VBW \geq 3 RBW$.

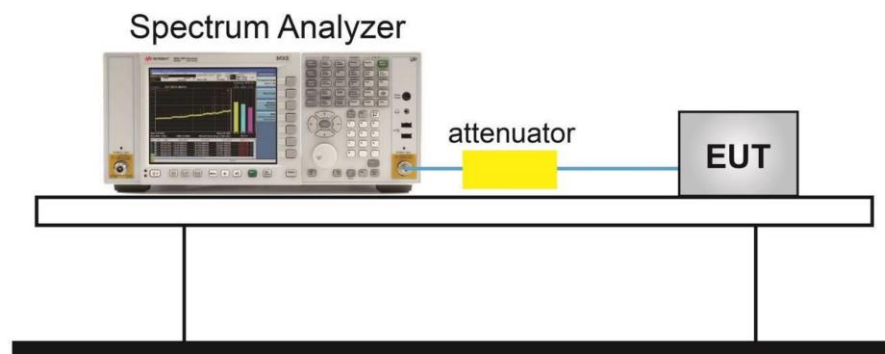
c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10 \log(500 \text{ kHz}/RBW)$ to the measured result, whereas $RBW (< 500 \text{ kHz})$ is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add $10 \log(1\text{MHz}/RBW)$ to the measured result, whereas $RBW (< 1 \text{ MHz})$ is the reduced resolution bandwidth of spectrum analyzer set during measurement.

e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for steps 5.c) and 5.d) above, since $RBW=100 \text{ KHZ}$ is available on nearly all spectrum analyzers.

6.3.3. Test setup



6.3.4. Measurement Results

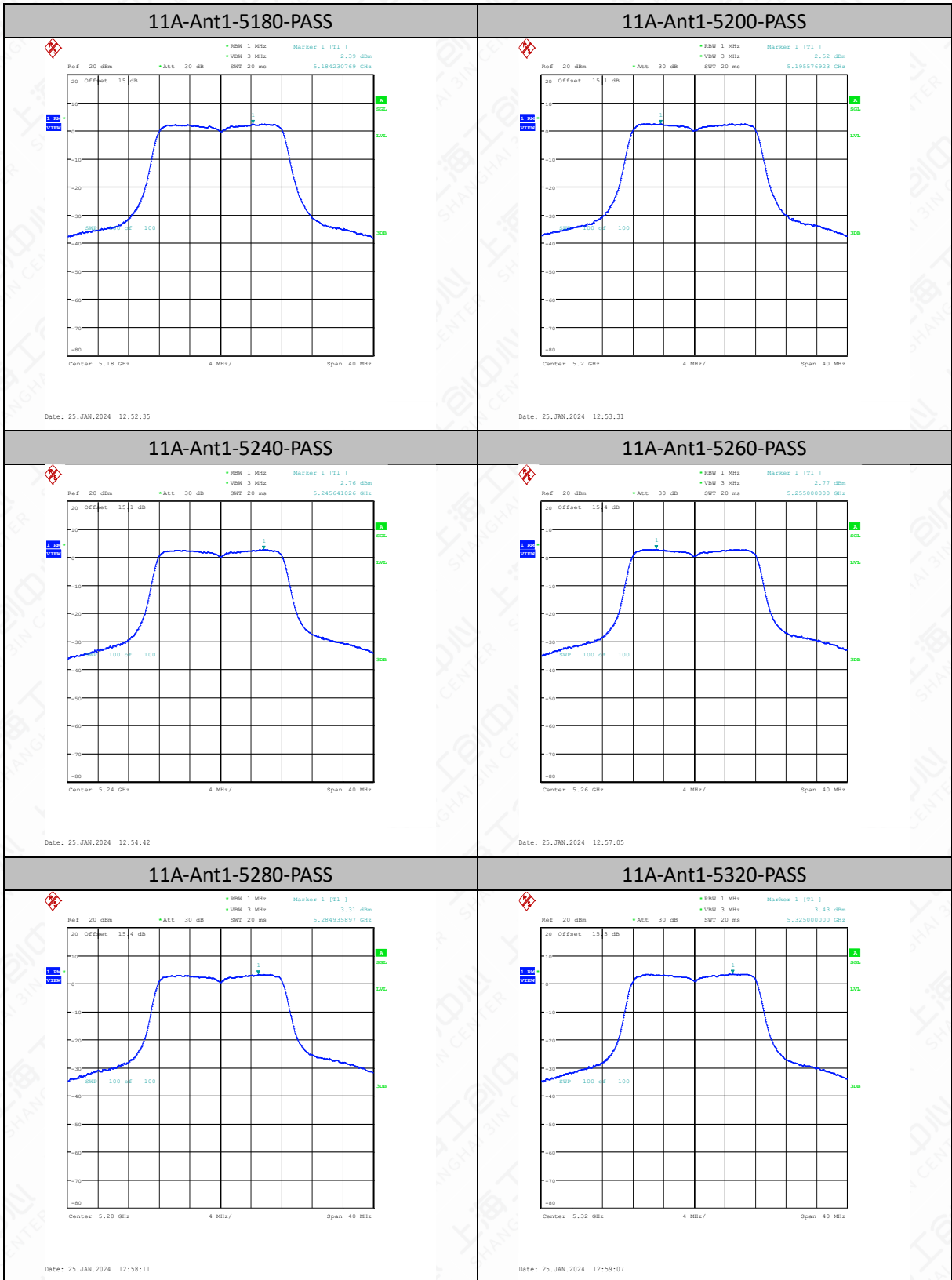
TestMode	Antenna	Frequency[MHz]	Result [dBm/MHz]	Limit[dBm/MHz]	Verdict
11A	Ant1	5180	2.39	≤11.00	PASS
11A	Ant1	5200	2.52	≤11.00	PASS
11A	Ant1	5240	2.76	≤11.00	PASS
11A	Ant1	5260	2.77	≤11.00	PASS
11A	Ant1	5280	3.31	≤11.00	PASS
11A	Ant1	5320	3.43	≤11.00	PASS
11A	Ant1	5500	1.48	≤11.00	PASS
11A	Ant1	5580	1.32	≤11.00	PASS

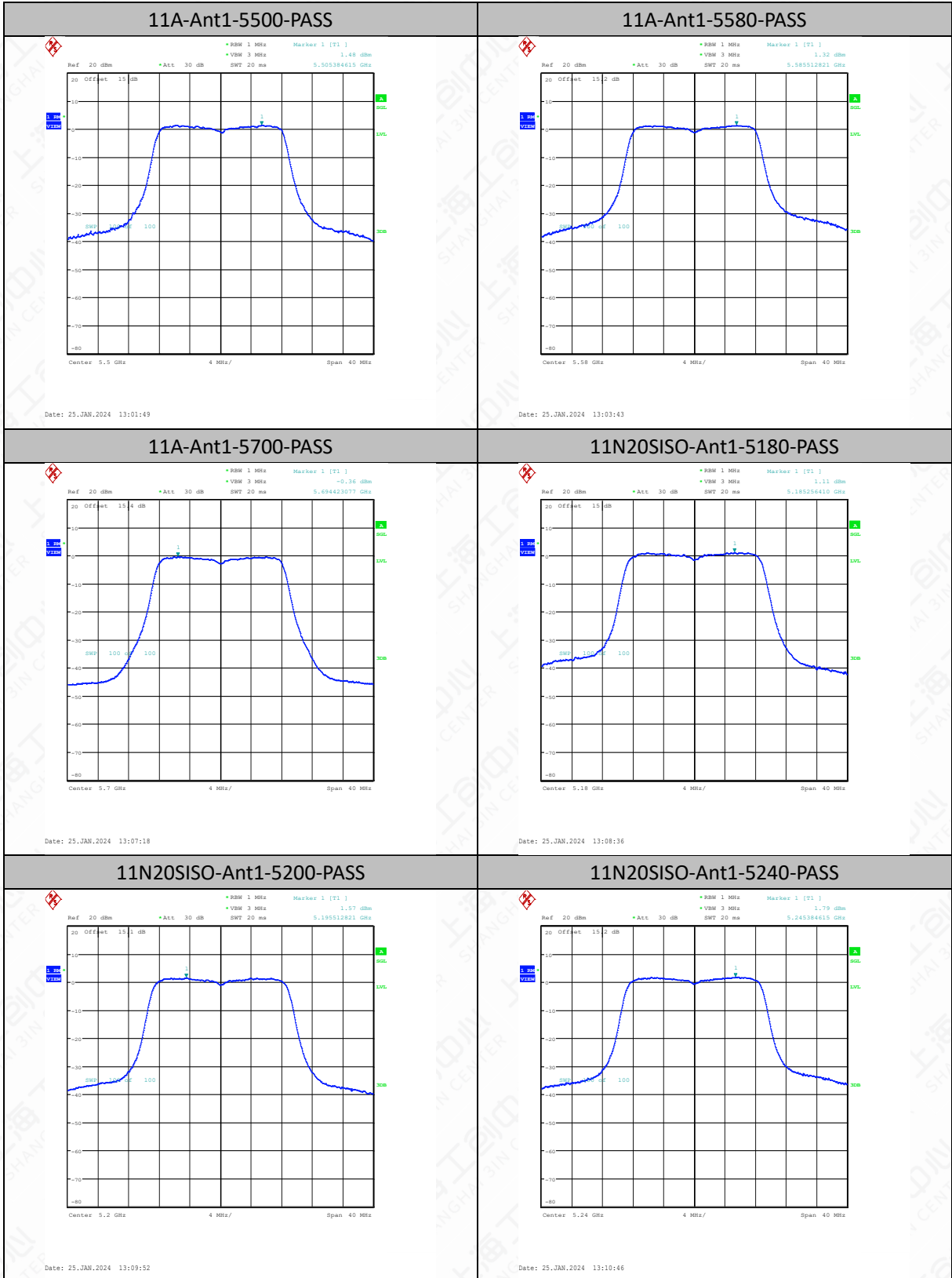
11A	Ant1	5700	-0.36	≤11.00	PASS
11N20SISO	Ant1	5180	1.11	≤11.00	PASS
11N20SISO	Ant1	5200	1.57	≤11.00	PASS
11N20SISO	Ant1	5240	1.79	≤11.00	PASS
11N20SISO	Ant1	5260	1.89	≤11.00	PASS
11N20SISO	Ant1	5280	2.17	≤11.00	PASS
11N20SISO	Ant1	5320	2.38	≤11.00	PASS
11N20SISO	Ant1	5500	-0.07	≤11.00	PASS
11N20SISO	Ant1	5580	-0.15	≤11.00	PASS
11N20SISO	Ant1	5700	-0.60	≤11.00	PASS
11N40SISO	Ant1	5190	-1.89	≤11.00	PASS
11N40SISO	Ant1	5230	-2.02	≤11.00	PASS
11N40SISO	Ant1	5270	-0.98	≤11.00	PASS
11N40SISO	Ant1	5310	-1.09	≤11.00	PASS
11N40SISO	Ant1	5510	-8.28	≤11.00	PASS
11N40SISO	Ant1	5550	-3.82	≤11.00	PASS
11N40SISO	Ant1	5670	-3.17	≤11.00	PASS
11AC20SISO	Ant1	5180	0.36	≤11.00	PASS
11AC20SISO	Ant1	5200	0.40	≤11.00	PASS
11AC20SISO	Ant1	5240	0.66	≤11.00	PASS
11AC20SISO	Ant1	5260	0.90	≤11.00	PASS
11AC20SISO	Ant1	5280	1.12	≤11.00	PASS
11AC20SISO	Ant1	5320	1.52	≤11.00	PASS
11AC20SISO	Ant1	5500	-1.57	≤11.00	PASS
11AC20SISO	Ant1	5580	-1.59	≤11.00	PASS
11AC20SISO	Ant1	5700	-0.94	≤11.00	PASS
11AC40SISO	Ant1	5190	-3.85	≤11.00	PASS
11AC40SISO	Ant1	5230	-3.80	≤11.00	PASS
11AC40SISO	Ant1	5270	-3.41	≤11.00	PASS
11AC40SISO	Ant1	5310	-2.08	≤11.00	PASS
11AC40SISO	Ant1	5510	-6.37	≤11.00	PASS
11AC40SISO	Ant1	5550	-4.42	≤11.00	PASS
11AC40SISO	Ant1	5670	-2.60	≤11.00	PASS
11AC80SISO	Ant1	5210	-5.03	≤11.00	PASS
11AC80SISO	Ant1	5290	-3.66	≤11.00	PASS
11AC80SISO	Ant1	5530	-8.32	≤11.00	PASS
11AC80SISO	Ant1	5610	-5.33	≤11.00	PASS

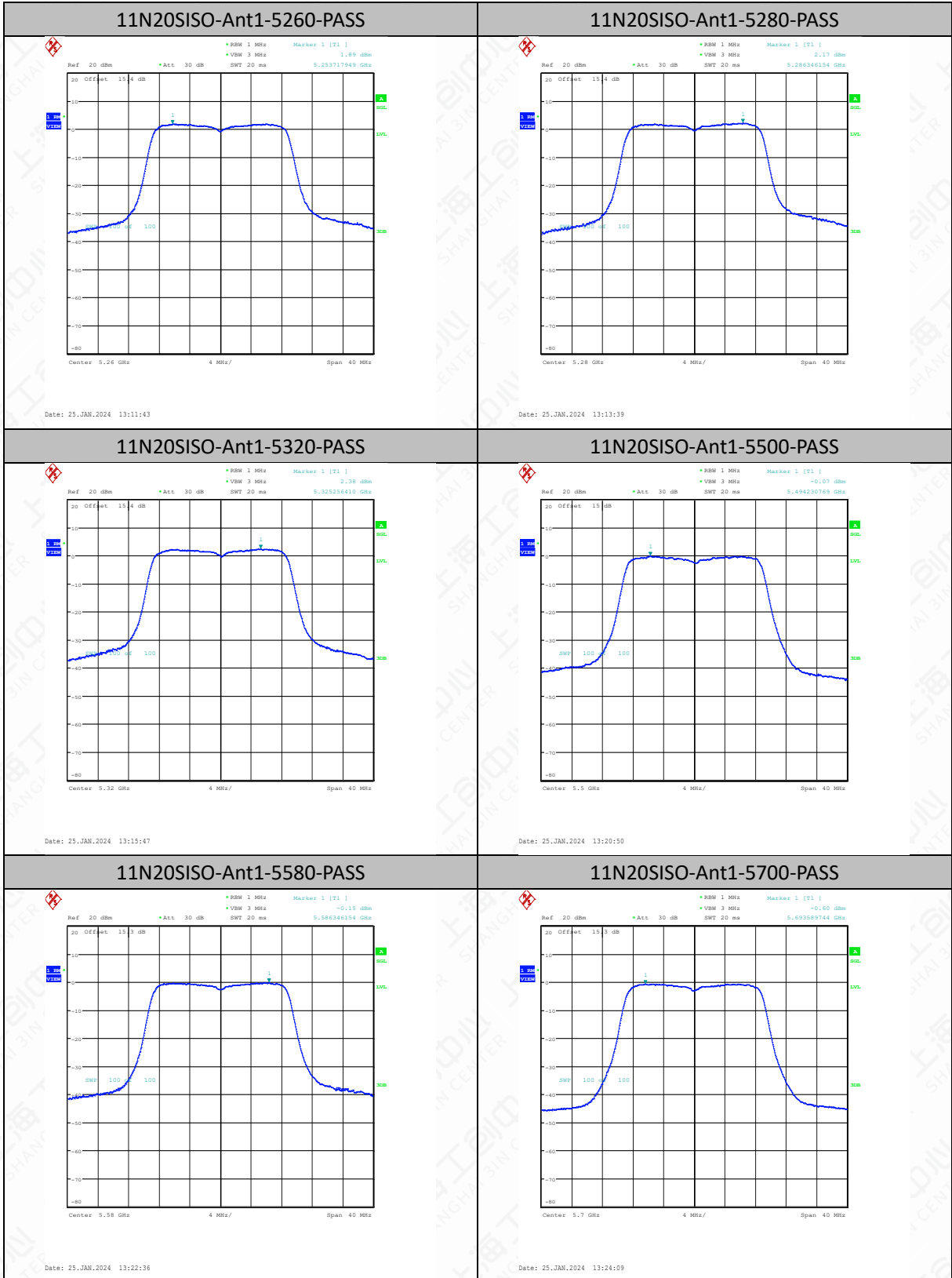
Note:

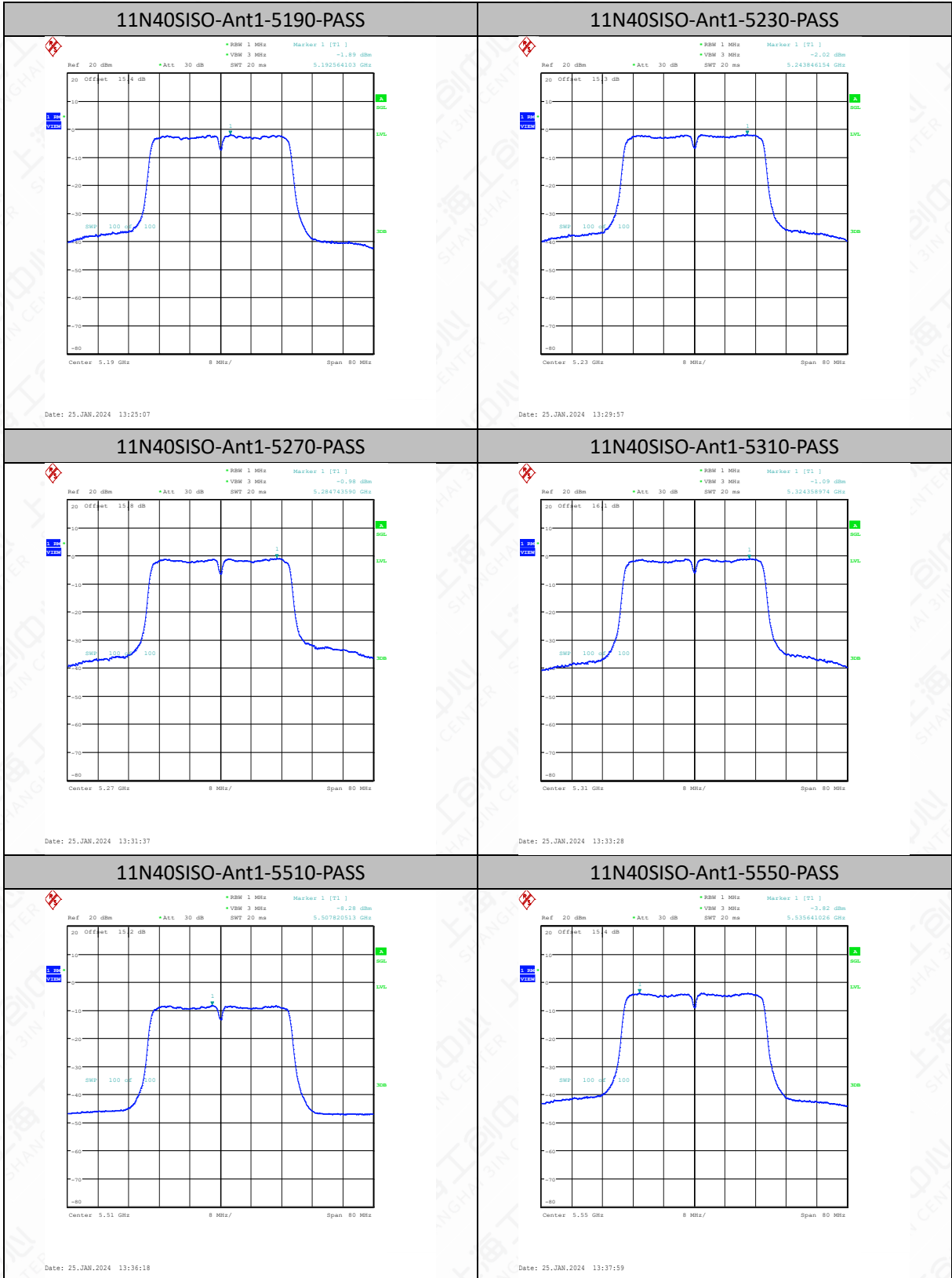
1. EIRP= Power Spectral Density(dBm/MHz)+Antenna gain(dBi)
2. The Duty Cycle Factor is compensated in the graph.

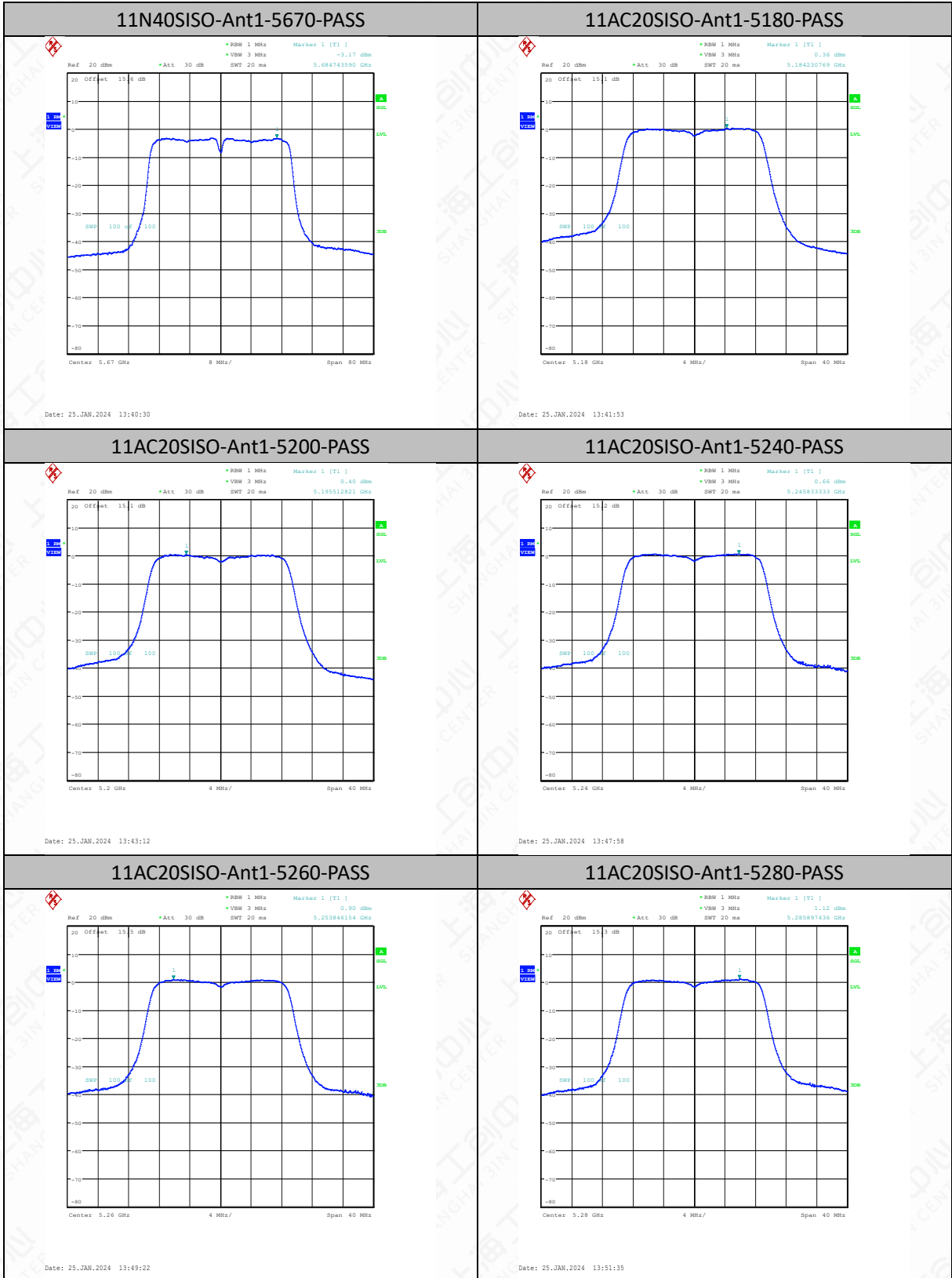
Test Graphs

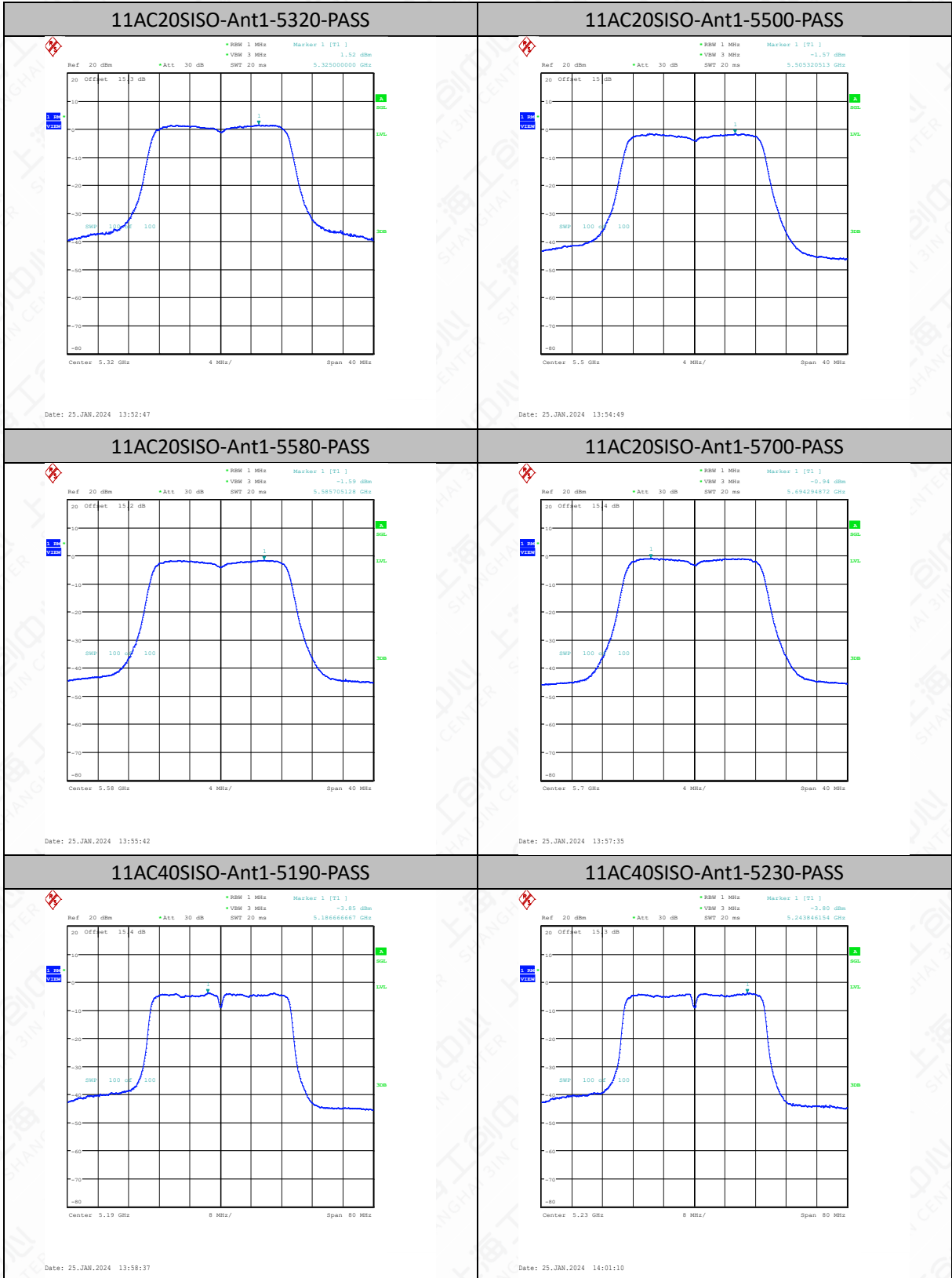


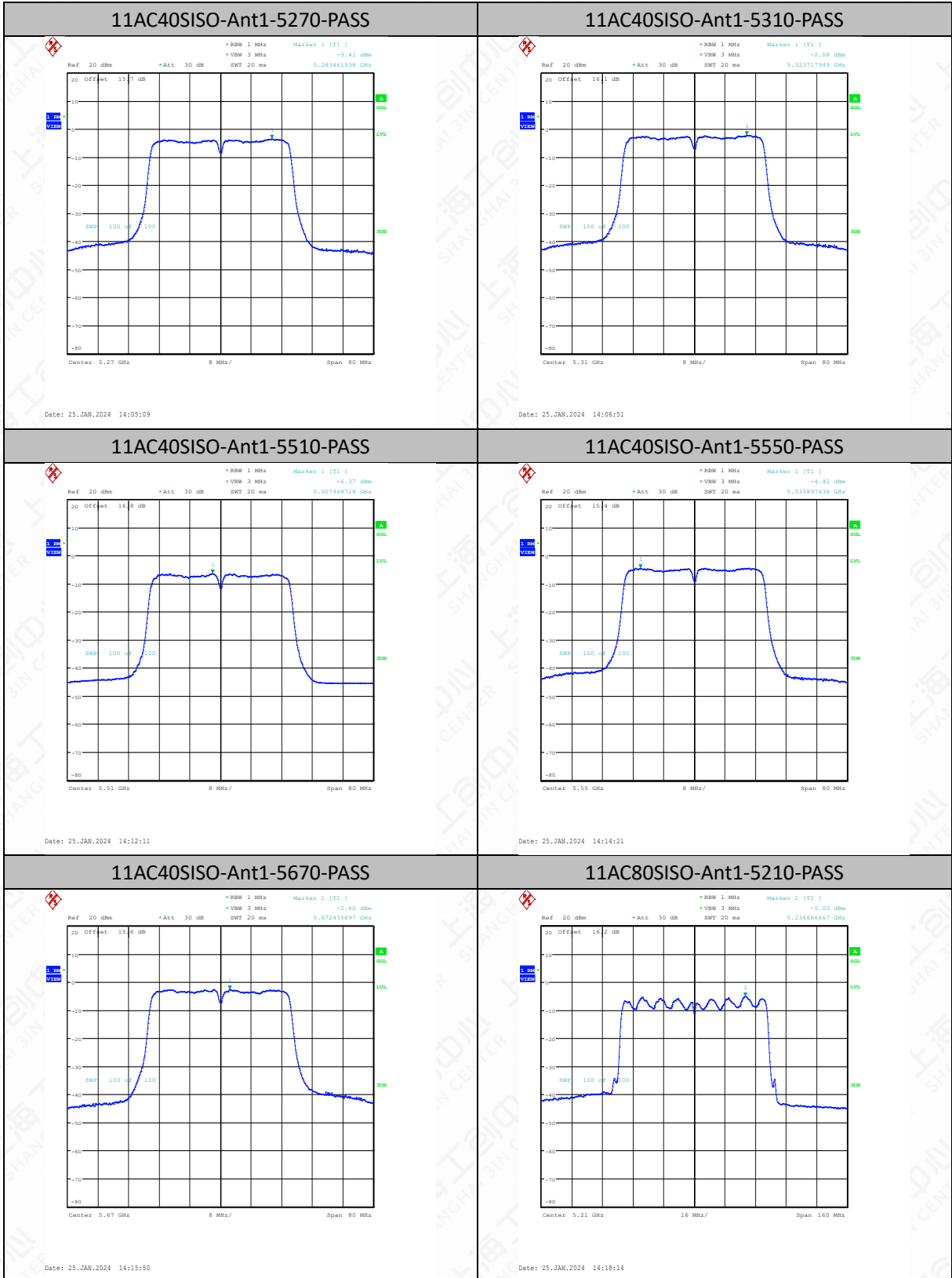


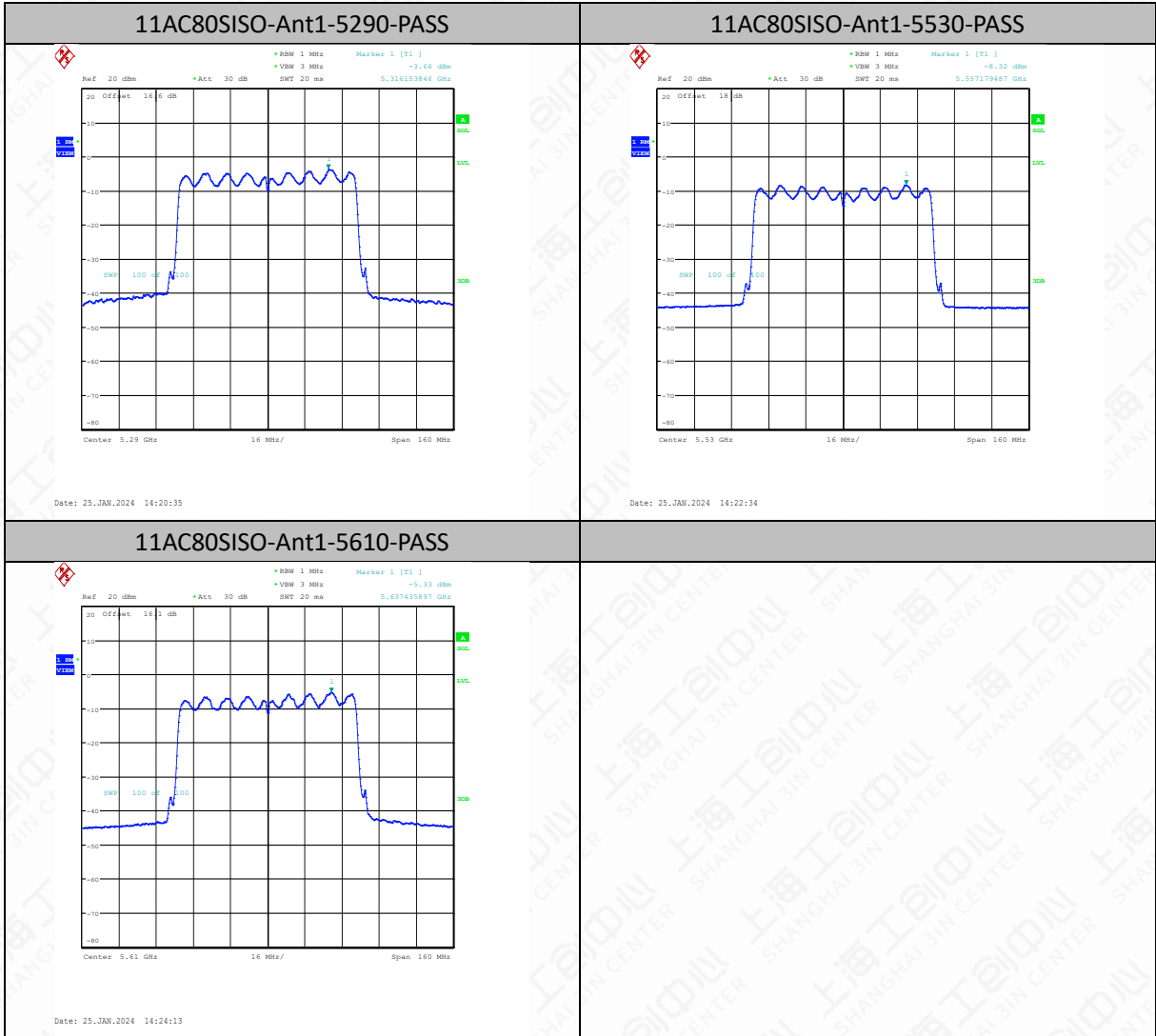












6.4. Occupied 26dB Bandwidth(conducted)

6.4.1 Measurement Limit

Standard	Limit(MHz)
FCC 47 CFR Part 15.407(a)	N/A
RSS-247 6.2	N/A

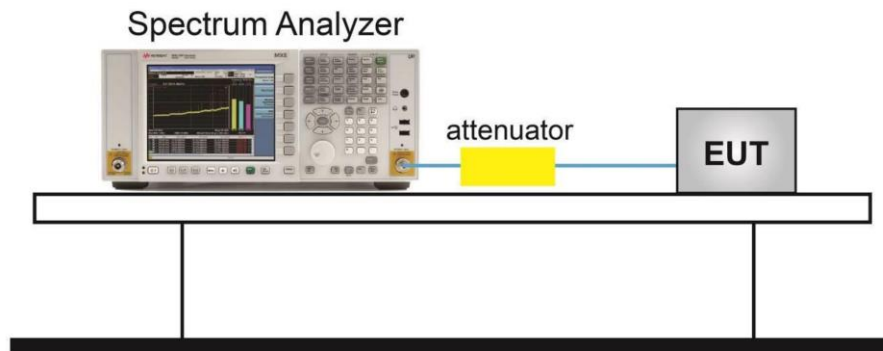
6.4.2 Test Procedure

The measurement method is made according to KDB 789033 C

1. Set RBW = approximately 1% of the emission bandwidth
2. Set the VBW > RBW
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the maximum of the emission.

Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

6.4.3 Test Setup



6.4.4 Measurement Results

TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	21.24	5169.40	5190.64	---	---
11A	Ant1	5200	21.24	5189.28	5210.52	---	---
11A	Ant1	5240	21.04	5229.16	5250.20	---	---
11A	Ant1	5260	21.44	5249.16	5270.60	---	---
11A	Ant1	5280	21.24	5269.28	5290.52	---	---
11A	Ant1	5320	21.12	5309.60	5330.72	---	---
11A	Ant1	5500	21.28	5489.36	5510.64	---	---
11A	Ant1	5580	21.28	5569.44	5590.72	---	---

11A	Ant1	5700	20.96	5689.64	5710.60	---	---
11N20SISO	Ant1	5180	21.32	5169.36	5190.68	---	---
11N20SISO	Ant1	5200	22.16	5188.60	5210.76	---	---
11N20SISO	Ant1	5240	21.64	5229.20	5250.84	---	---
11N20SISO	Ant1	5260	21.36	5249.20	5270.56	---	---
11N20SISO	Ant1	5280	21.36	5269.32	5290.68	---	---
11N20SISO	Ant1	5320	21.92	5308.92	5330.84	---	---
11N20SISO	Ant1	5500	21.96	5489.08	5511.04	---	---
11N20SISO	Ant1	5580	21.16	5569.36	5590.52	---	---
11N20SISO	Ant1	5700	21.48	5689.32	5710.80	---	---
11N40SISO	Ant1	5190	43.04	5168.08	5211.12	---	---
11N40SISO	Ant1	5230	43.12	5208.24	5251.36	---	---
11N40SISO	Ant1	5270	42.48	5248.72	5291.20	---	---
11N40SISO	Ant1	5310	43.04	5288.88	5331.92	---	---
11N40SISO	Ant1	5510	42.80	5488.64	5531.44	---	---
11N40SISO	Ant1	5550	46.32	5528.32	5574.64	---	---
11N40SISO	Ant1	5670	42.56	5648.72	5691.28	---	---
11AC20SISO	Ant1	5180	21.32	5169.20	5190.52	---	---
11AC20SISO	Ant1	5200	21.32	5189.28	5210.60	---	---
11AC20SISO	Ant1	5240	21.76	5229.04	5250.80	---	---
11AC20SISO	Ant1	5260	21.80	5249.20	5271.00	---	---
11AC20SISO	Ant1	5280	21.88	5269.08	5290.96	---	---
11AC20SISO	Ant1	5320	21.28	5309.52	5330.80	---	---
11AC20SISO	Ant1	5500	21.40	5489.28	5510.68	---	---
11AC20SISO	Ant1	5580	21.68	5569.36	5591.04	---	---
11AC20SISO	Ant1	5700	21.24	5689.40	5710.64	---	---
11AC40SISO	Ant1	5190	43.36	5168.16	5211.52	---	---
11AC40SISO	Ant1	5230	42.48	5208.72	5251.20	---	---
11AC40SISO	Ant1	5270	42.40	5248.80	5291.20	---	---
11AC40SISO	Ant1	5310	43.12	5288.64	5331.76	---	---
11AC40SISO	Ant1	5510	42.48	5488.64	5531.12	---	---
11AC40SISO	Ant1	5550	43.12	5528.40	5571.52	---	---
11AC40SISO	Ant1	5670	42.88	5648.56	5691.44	---	---
11AC80SISO	Ant1	5210	83.20	5168.40	5251.60	---	---
11AC80SISO	Ant1	5290	83.36	5248.56	5331.92	---	---
11AC80SISO	Ant1	5530	82.40	5488.88	5571.28	---	---
11AC80SISO	Ant1	5610	82.88	5568.88	5651.76	---	---

Test Graphs

