

# TEST REPORT

**Product Name : Smart Identification Terminal**  
**Model Number : SpeedPalm-V5L**  
**FCC ID : 2AJ9T-10202**

Prepared for : ZKTECO CO., LTD.  
Address : No.32, Pingshan Industrial Avenue, Tangxia Town,  
Dongguan City, Guangdong Province, China 523728

Prepared by : EMTEK (SHENZHEN) CO., LTD.  
Address : Building 69, Majialong Industry Zone, Nanshan District,  
Shenzhen, Guangdong, China

Tel: (0755) 26954280  
Fax: (0755) 26954282

Report Number : ENS2505260366W00503R  
Date(s) of Tests : May 28, 2025 to August 28, 2025  
Date of issue : August 29, 2025

## 1 TEST RESULT CERTIFICATION

Applicant : ZKTECO CO., LTD.  
 Address : No.32, Pingshan Industrial Avenue, Tangxia Town, Dongguan City, Guangdong Province, China 523728  
 Manufacturer : ZKTECO CO., LTD.  
 Address : No.32, Pingshan Industrial Avenue, Tangxia Town, Dongguan City, Guangdong Province, China 523728  
 EUT : Smart Identification Terminal  
 Model Name : SpeedPalm-V5L  
 Trademark : N/A

Measurement Procedure Used:

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 2, Subpart J	
FCC 47 CFR Part 15, Subpart E	PASS

The above equipment was tested by EMTEK (SHENZHEN) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the above table standards requirement.

The test results of this report relate only to the tested sample identified in this report.

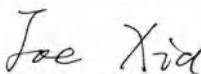
Date of Test : May 28, 2025 to August 28, 2025

Prepared by :



Una Yu/Editor

Reviewer :



Joe Xia /Supervisor

Approve & Authorized Signer :



Lisa Wang/Manager



## Modified History

Version	Report No.	Revision Date	Summary
V1.0	ENS2505260366W00503R	/	Original Report



## TABLE OF CONTENTS

<b>1 TEST RESULT CERTIFICATION .....</b>	<b>2</b>
<b>2 EUT TECHNICAL DESCRIPTION .....</b>	<b>5</b>
<b>3 SUMMARY OF TEST RESULT .....</b>	<b>7</b>
<b>4 TEST METHODOLOGY .....</b>	<b>8</b>
4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS .....	8
4.2 MEASUREMENT EQUIPMENT USED .....	8
4.3 DESCRIPTION OF TEST MODES .....	9
<b>5 FACILITIES AND ACCREDITATIONS .....</b>	<b>13</b>
5.1 FACILITIES .....	13
5.2 LABORATORY ACCREDITATIONS AND LISTINGS .....	13
<b>6 TEST SYSTEM UNCERTAINTY .....</b>	<b>14</b>
<b>7 SETUP OF EQUIPMENT UNDER TEST .....</b>	<b>15</b>
7.1 RADIO FREQUENCY TEST SETUP .....	15
7.2 RADIO FREQUENCY TEST SETUP .....	15
7.3 CONDUCTED EMISSION TEST SETUP .....	17
7.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM .....	18
7.5 SUPPORT EQUIPMENT .....	18
<b>8 TEST REQUIREMENTS .....</b>	<b>19</b>
8.1 BANDWIDTH MEASUREMENT .....	19
8.2 MAXIMUM CONDUCTED OUTPUT POWER .....	93
8.3 MAXIMUM PEAK POWER DENSITY .....	127
8.4 UNDESIRABLE RADIATED SPURIOUS EMISSION .....	161
8.5 POWER LINE CONDUCTED EMISSIONS .....	190
8.6 ANTENNA APPLICATION .....	193

## 2 EUT TECHNICAL DESCRIPTION

Characteristics	Description	
<b>Product</b>	Smart Identification Terminal	
<b>Model Number</b>	SpeedPalm-V5L	
<b>Wifi Type</b>	UNII-1: 5150MHz-5250MHz Band UNII-2A: 5250MHz-5350MHz Band UNII-2C: 5470MHz-5725MHz Band UNII-3: 5725MHz-5850MHz Band	
<b>WLAN Supported</b>	IEEE 802.11a IEEE 802.11n(20MHz channel bandwidth) IEEE 802.11n(40MHz channel bandwidth) IEEE 802.11ac(20MHz channel bandwidth) IEEE 802.11ac(40MHz channel bandwidth) IEEE 802.11ac(80MHz channel bandwidth)	
<b>Modulation</b>	OFDM	
<b>Frequency Range:</b>	UNII-1: 5150MHz-5250MHz Band 5180-5240MHz for 802.11a/n(HT20)/ac(VHT20) 5190-5230MHz for 802.11n(HT40)/ac(VHT40) 5210MHz for 802.11ac(VHT80)	
	UNII-2A: 5250MHz-5350MHz Band 5260-5320MHz for 802.11a/n(HT20)/ac(VHT20) 5270-5310MHz for 802.11n(HT40)/ac(VHT40) 5290MHz for 802.11ac(VHT80)	
	UNII-2C: 5470MHz-5725MHz Band 5500-5700MHz for 802.11a/n(HT20)/ac(VHT20) 5510-5670MHz for 802.11n(HT40)/ac(VHT40) 5530-5610MHz for 802.11ac(VHT80)	
	UNII-3 with 5725MHz-5850MHz Band 5745-5825MHz for 802.11a/n(HT20)/ac(VHT20) 5755-5795MHz for 802.11n(HT40)/ac(VHT40) 5775MHz for 802.11ac(VHT80);	
<b>TPC Function</b>	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> Not Applicable
<b>Antenna Type</b>	FPC Antenna	
<b>Antenna Gain</b>	Ant1:3.82 dBi Note: The antenna information provided by the manufacturer will have a certain impact on the test results.	
<b>Test Voltage:</b>	AC 100-240V~, 50Hz/60Hz	
<b>Power Supply</b>	DC 12V from adapter	
<b>Adapter</b>	MODEL:ADS-40SI-12-3 12036E INPUT: AC100-240V, 50Hz/60Hz,1.0A max. OUTPUT:12.0V,3A,.36.0W	
<b>Temperature Range</b>	0°C ~ +45°C	

**Note:** for more details, please refer to the User's manual of the EUT.



### 3 SUMMARY OF TEST RESULT

FCC Part Clause	Test Parameter	Verdict	Remark
15.407 (a)	99% , 6dB and 26dB Bandwidth	PASS	
15.407 (e)			
15.407 (a)	Maximum Conducted Output Power	PASS	
15.407 (a)	Peak Power Spectral Density	PASS	
15.407 (b)	Radiated Spurious Emission	PASS	
15.407 (b)(6)			
15.207	Power Line Conducted Emission	PASS	
15.407(a)			
15.203	Antenna Application	PASS	
NOTE1:N/A (Not Applicable)			
NOTE2:According to FCC OET KDB 789033, the report use radiated measurements in the restricted frequency bands. In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits.			

#### RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for FCC ID: 2AJ9T-10202 filing to comply with Section 15.407 of the FCC Part 15, Subpart E Rules.

## 4 TEST METHODOLOGY

### 4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:

FCC 47 CFR Part 15, Subpart E

### 4.2 MEASUREMENT EQUIPMENT USED

#### 4.2.1 Conducted Emission Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LASTCAL.
EMI Test Receiver	Rohde & Schwarz	ESCI	101045	2025/5/9
AMN	Schwarzbeck	NNLK 8129	8129203	2025/5/9
Pulse Limiter	Schwarzbeck	VTSD 9561 F-B	00955	2025/5/9
High Voltage Probe	SCHWARZBECK	TK9422	9422-130	2025/5/9
AMN	Rohde & Schwarz	ESH3-Z5	100191	2025/5/9

#### 4.2.2 Radiated Emission Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.
EMI Test Receiver	Rohde & Schwarz	ESU 26	100154	2025/5/9
Pre-Amplifier	HP	8447F	2944A07999	2025/5/9
Bilog Antenna	Schwarzbeck	VULB9163	141	2024/6/15
Loop Antenna	Schwarzbeck	FMZB1519	1519-012	2025/5/13
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1177	2025/5/17
Horn Antenna	Schwarzbeck	BBHA9170	9170-399	2025/5/13
Cable	Schwarzbeck	AK9513	ACRX1	2025/5/9
Cable	Rosenberger	N/A	FP2RX2	2025/5/9
Cable	Schwarzbeck	AK9513	CRPX1	2025/5/9
Cable	Schwarzbeck	AK9513	CRRX2	2025/5/9

#### 4.2.3 Radio Frequency Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LASTCAL.
Signal Analyzer	Agilent	N9010A	MY53470879	2025/5/10
Vector Signal Generator	Agilent	N5182B	MY53050878	2025/5/10
Analog Signal Generator	Agilent	N5171B	MY53050553	2025/5/10
RF Control Unit(Power Meter)	Tonscend	JS0806-2	\	2025/5/10
Temperature&Humidity Chamber	ESPEC	EL-02KA	12107166	2025/5/10

**Remark:** Each piece of equipment is scheduled for calibration once a year.

### 4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Wifi 5G with U-NII - 1

Frequency and Channel list for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220		
40	5200	48	5240		

Frequency and Channel list for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	46	5230		

Frequency and Channel list for 802.11ac (VHT80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210				

Test Frequency and Channel for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	40	5200	48	5240

Test Frequency and channel for 802.11n (HT40), 802.11ac (VHT40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	N/A	N/A	46	5230

Test Frequency and channel for 802.11ac (VHT80):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210	N/A	N/A	N/A	N/A

Wifi 5G with U-NII -2A

Frequency and Channel list 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	60	5300		
56	5280	64	5320		

Frequency and Channel list for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
54	5270				
62	5310				

Frequency and Channel list for 802.11ac (VHT80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
58	5290				

Test Frequency and Channel for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	56	5280	64	5320

Test Frequency and channel for 802.11n (HT40), 802.11ac (VHT40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
54	5270	N/A	N/A	62	5310

Test Frequency and channel for 802.11ac (VHT80):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
58	5290				

Wifi 5G with U-NII -2C

Frequency and Channel list for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	116	5580	132	5660
104	5520	120	5600	136	5680
108	5540	124	5620	140	5700
112	5560	128	5640		

Frequency and Channel list for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
102	5510	118	5590	134	5670
110	5550	126	5630		

Frequency and Channel list for 802.11ac (VHT80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
106	5530	122	5610		

Test Frequency and Channel for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	116	5580	140	5700

Test Frequency and channel for 802.11n (HT40), 802.11ac (VHT40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
102	5510	110	5550	134	5670

Test Frequency and channel for 802.11ac (VHT80):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
106	5530			122	5610

Wifi 5G with U-NII -3

Frequency and Channel list for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785	165	5825
153	5765	161	5805		

Frequency and Channel list for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795		

Frequency and Channel list for 802.11ac (VHT80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775				

Test Frequency and Channel for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785	165	5825

Test Frequency and channel for 802.11n (HT40), 802.11ac (VHT40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	N/A	N/A	159	5795

Test Frequency and channel for 802.11ac (VHT80):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775				

## 5 FACILITIES AND ACCREDITATIONS

### 5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at Building 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

### 5.2 LABORATORY ACCREDITATIONS AND LISTINGS

#### Site Description

EMC Lab. : **Accredited by CNAS**  
The Certificate Registration Number is L2291  
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01 (identical to ISO/IEC 17025:2017)

#### **Accredited by FCC**

Designation Number: CN1204  
Test Firm Registration Number: 882943

#### **Accredited by A2LA**

The Certificate Number is 4321.01

#### **Accredited by Industry Canada**

The Conformity Assessment Body Identifier is CN0008

#### Name of Firm

: EMTEK (SHENZHEN) CO., LTD.

#### Site Location

: Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

## 6 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

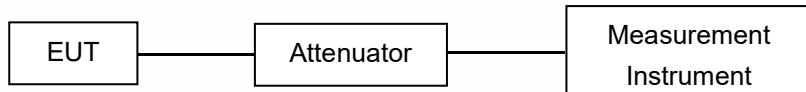
Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-5}$
Maximum Peak Output Power Test	$\pm 1.0 \text{dB}$
Conducted Emissions Test	$\pm 2.0 \text{dB}$
Radiated Emission Test	$\pm 2.0 \text{dB}$
Power Density	$\pm 2.0 \text{dB}$
Occupied Bandwidth Test	$\pm 1.0 \text{dB}$
Band Edge Test	$\pm 3 \text{dB}$
All emission, radiated	$\pm 3 \text{dB}$
Antenna Port Emission	$\pm 3 \text{dB}$
Temperature	$\pm 0.5^\circ\text{C}$
Humidity	$\pm 3\%$

Measurement Uncertainty for a level of Confidence of 95%

## 7 SETUP OF EQUIPMENT UNDER TEST

### 7.1 RADIO FREQUENCY TEST SETUP

The WLAN component's antenna port(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



### 7.2 RADIO FREQUENCY TEST SETUP

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

Below 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

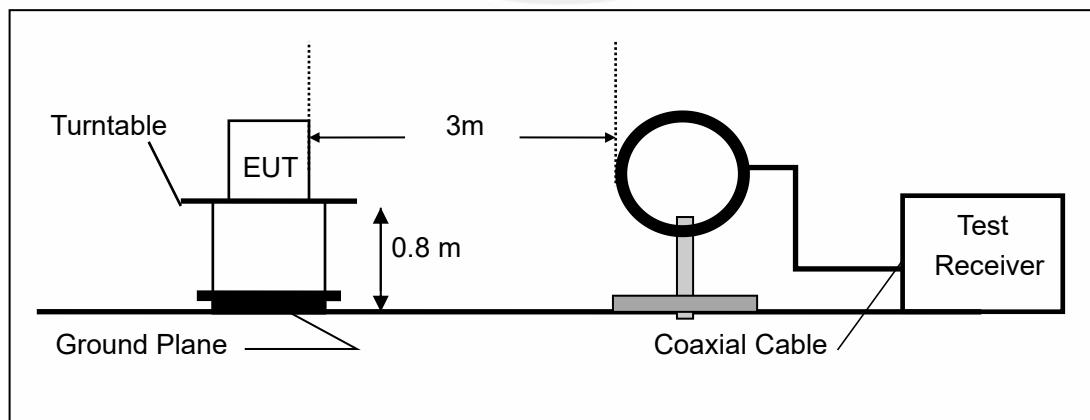
Above 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

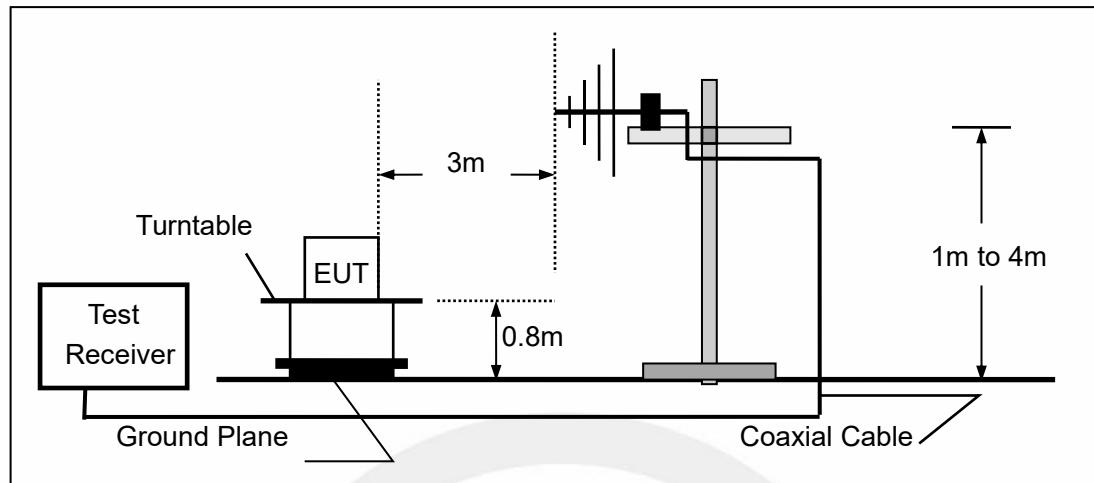
Above 1GHz:

(Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.)  
 The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

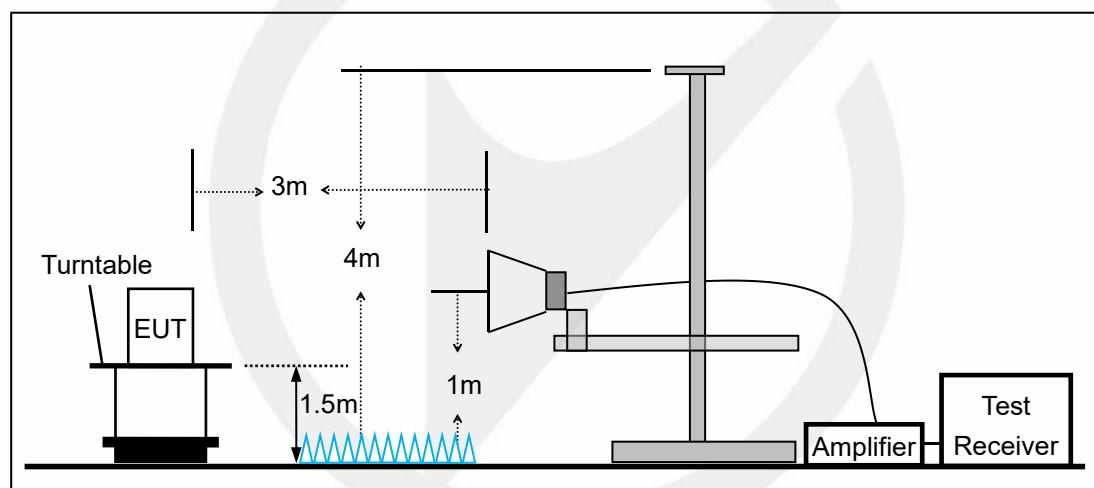
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(c) Radiated Emission Test Set-Up, Frequency above 1000MHz

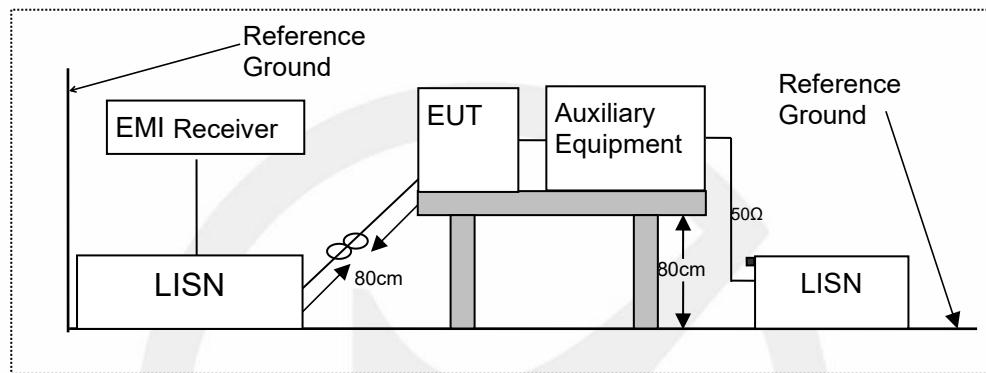


### 7.3 CONDUCTED EMISSION TEST SETUP

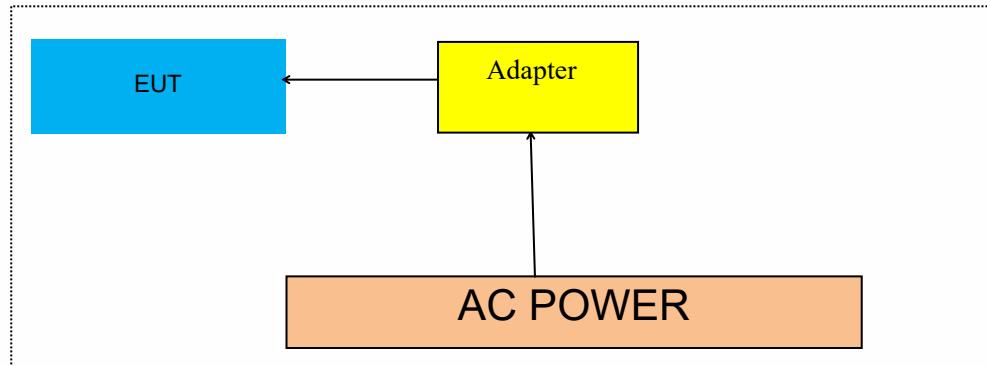
The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.



## 7.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



## 7.5 SUPPORT EQUIPMENT

### EUT Cable List and Details

Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

### Auxiliary Cable List and Details

Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

### Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
/	/	/	/

#### Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

## 8 TEST REQUIREMENTS

### 8.1 BANDWIDTH MEASUREMENT

#### 8.1.1 Applicable Standard

- According to FCC Part 15.407(a)(1) for UNII Band I
- According to FCC Part 15.407(a)(2) for UNII Band II-A and UNII Band II-C
- According to FCC Part 15.407(a)(3) for UNII Band III
- According to FCC Part 15.407(e) for UNII Band III
- According to 789033 D02 Section II(C)
- According to 789033 D02 Section II(D)

#### 8.1.2 Conformance Limit

- (1) For the band 5.15-5.25 GHz.
- (iv) For mobile and portable 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. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
- (2) 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. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
- (3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.
- (e) Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

#### 8.1.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

#### 8.1.4 Test Procedure

According to 789033 D02 v02r01 section C&D, the following is the measurement procedure.

1. Emission Bandwidth (EBW)
  - a) Set RBW = approximately 1% of the emission bandwidth.
  - b) Set the VBW > RBW.
  - c) Detector = Peak.
  - d) Trace mode = max hold.
  - e) 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%.

## 2. Minimum Emission Bandwidth for the band 5.725-5.85 GHz

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

## D. 99 Percent Occupied Bandwidth

The 99-percent occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission. Measurement of the 99-percent occupied bandwidth is required only as a condition for using the optional band-edge measurement techniques described in section II.G.3.d). Measurements of 99-percent occupied bandwidth may also optionally be used in lieu of the EBW to 789033 D02 v01r02 General UNII Test Procedures New Rules v01 define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in section II.E. However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW  $\geq 3 \cdot$  RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

### 8.1.5 Test Results

#### Emission Bandwidth

TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	23.880	5167.160	5191.040	---	---
11A	Ant1	5200	24.480	5186.840	5211.320	---	---
11A	Ant1	5240	31.680	5221.120	5252.800	---	---
11A	Ant1	5260	25.040	5246.840	5271.880	---	---
11A	Ant1	5280	22.120	5269.800	5291.920	---	---
11A	Ant1	5320	26.400	5306.840	5333.240	---	---
11A	Ant1	5500	20.840	5490.200	5511.040	---	---
11A	Ant1	5580	20.320	5570.280	5590.600	---	---
11A	Ant1	5700	19.480	5690.320	5709.800	---	---
11A	Ant1	5745	19.720	5735.280	5755.000	---	---
11A	Ant1	5785	25.120	5771.360	5796.480	---	---
11A	Ant1	5825	28.640	5809.600	5838.240	---	---
11N20SISO	Ant1	5180	32.680	5161.600	5194.280	---	---
11N20SISO	Ant1	5200	32.560	5182.360	5214.920	---	---
11N20SISO	Ant1	5240	30.680	5223.840	5254.520	---	---
11N20SISO	Ant1	5260	34.920	5242.960	5277.880	---	---
11N20SISO	Ant1	5280	31.360	5264.680	5296.040	---	---
11N20SISO	Ant1	5320	26.480	5306.840	5333.320	---	---
11N20SISO	Ant1	5500	27.480	5485.720	5513.200	---	---
11N20SISO	Ant1	5580	25.480	5568.200	5593.680	---	---
11N20SISO	Ant1	5700	22.480	5687.880	5710.360	---	---
11N20SISO	Ant1	5745	25.960	5733.000	5758.960	---	---
11N20SISO	Ant1	5785	27.400	5770.520	5797.920	---	---
11N20SISO	Ant1	5825	32.160	5806.440	5838.600	---	---
11N40SISO	Ant1	5190	64.240	5153.200	5217.440	---	---
11N40SISO	Ant1	5230	74.960	5194.960	5269.920	---	---
11N40SISO	Ant1	5270	69.920	5235.440	5305.360	---	---
11N40SISO	Ant1	5310	68.080	5277.600	5345.680	---	---
11N40SISO	Ant1	5510	55.280	5481.920	5537.200	---	---
11N40SISO	Ant1	5550	47.680	5527.520	5575.200	---	---
11N40SISO	Ant1	5670	55.200	5642.080	5697.280	---	---
11N40SISO	Ant1	5755	48.480	5729.000	5777.480	---	---
11N40SISO	Ant1	5795	58.880	5763.800	5822.680	---	---
11AC20SISO	Ant1	5180	32.440	5165.720	5198.160	---	---
11AC20SISO	Ant1	5200	31.320	5183.400	5214.720	---	---
11AC20SISO	Ant1	5240	32.720	5223.320	5256.040	---	---
11AC20SISO	Ant1	5260	34.920	5241.480	5276.400	---	---
11AC20SISO	Ant1	5280	31.360	5264.320	5295.680	---	---
11AC20SISO	Ant1	5320	28.720	5304.680	5333.400	---	---
11AC20SISO	Ant1	5500	23.840	5487.680	5511.520	---	---
11AC20SISO	Ant1	5580	21.280	5569.280	5590.560	---	---
11AC20SISO	Ant1	5700	23.520	5688.560	5712.080	---	---
11AC20SISO	Ant1	5745	31.200	5729.760	5760.960	---	---
11AC20SISO	Ant1	5785	27.760	5772.000	5799.760	---	---
11AC20SISO	Ant1	5825	34.920	5808.600	5843.520	---	---
11AC40SISO	Ant1	5190	73.840	5151.200	5225.040	---	---
11AC40SISO	Ant1	5230	78.160	5191.440	5269.600	---	---
11AC40SISO	Ant1	5270	67.920	5236.880	5304.800	---	---
11AC40SISO	Ant1	5310	68.640	5276.640	5345.280	---	---
11AC40SISO	Ant1	5510	43.920	5486.240	5530.160	---	---

11AC40SISO	Ant1	5550	59.040	5516.320	5575.360	---	---
11AC40SISO	Ant1	5670	49.760	5640.640	5690.400	---	---
11AC40SISO	Ant1	5755	52.400	5727.880	5780.280	---	---
11AC40SISO	Ant1	5795	67.920	5759.320	5827.240	---	---
11AC80SISO	Ant1	5210	159.360	5130.160	5289.520	---	---
11AC80SISO	Ant1	5290	159.360	5210.640	5370.000	---	---
11AC80SISO	Ant1	5530	155.360	5454.480	5609.840	---	---
11AC80SISO	Ant1	5610	156.640	5532.400	5689.040	---	---
11AC80SISO	Ant1	5775	146.880	5699.480	5846.360	---	---



## Occupied channel bandwidth

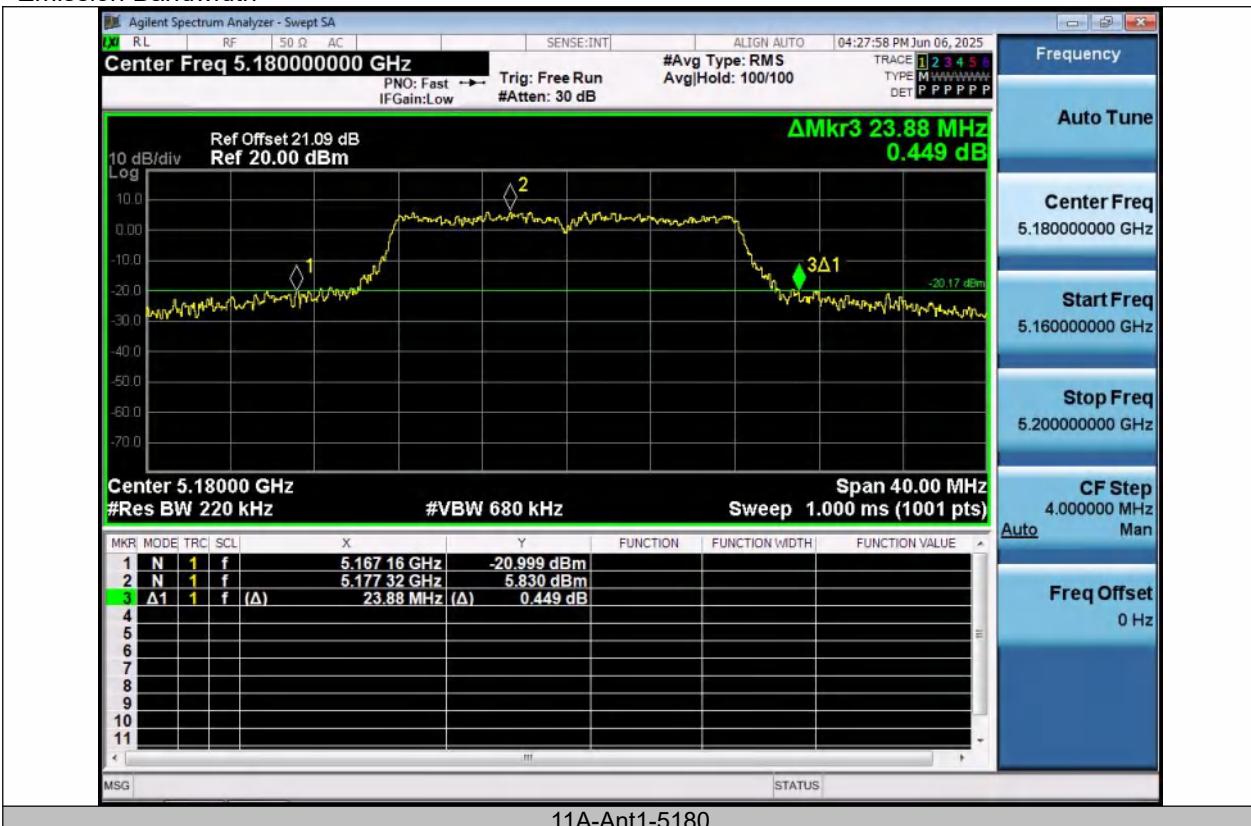
TestMode	Antenna	Frequency [MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	17.341	5171.2927	5188.6337	---	---
11A	Ant1	5200	17.439	5191.2068	5208.6458	---	---
11A	Ant1	5240	17.461	5231.2398	5248.7008	---	---
11A	Ant1	5260	17.371	5251.2915	5268.6625	---	---
11A	Ant1	5280	17.386	5271.2853	5288.6713	---	---
11A	Ant1	5320	17.443	5311.2702	5328.7132	---	---
11A	Ant1	5500	17.206	5491.3846	5508.5906	---	---
11A	Ant1	5580	17.193	5571.4033	5588.5963	---	---
11A	Ant1	5700	17.225	5691.3882	5708.6132	---	---
11A	Ant1	5745	17.240	5736.3885	5753.6285	---	---
11A	Ant1	5785	17.283	5776.3221	5793.6051	---	---
11A	Ant1	5825	17.390	5816.3043	5833.6943	---	---
11N20SISO	Ant1	5180	18.347	5170.7797	5189.1267	---	---
11N20SISO	Ant1	5200	18.450	5190.7262	5209.1762	---	---
11N20SISO	Ant1	5240	18.407	5230.7699	5249.1769	---	---
11N20SISO	Ant1	5260	18.373	5250.8163	5269.1893	---	---
11N20SISO	Ant1	5280	18.359	5270.8177	5289.1767	---	---
11N20SISO	Ant1	5320	18.421	5310.8019	5329.2229	---	---
11N20SISO	Ant1	5500	18.094	5490.9502	5509.0442	---	---
11N20SISO	Ant1	5580	18.126	5570.9453	5589.0713	---	---
11N20SISO	Ant1	5700	18.090	5690.9456	5709.0356	---	---
11N20SISO	Ant1	5745	18.177	5735.9029	5754.0799	---	---
11N20SISO	Ant1	5785	18.194	5775.8759	5794.0699	---	---
11N20SISO	Ant1	5825	18.336	5815.8361	5834.1721	---	---
11N40SISO	Ant1	5190	37.147	5171.3592	5208.5062	---	---
11N40SISO	Ant1	5230	37.205	5211.3699	5248.5749	---	---
11N40SISO	Ant1	5270	37.194	5251.4143	5288.6083	---	---
11N40SISO	Ant1	5310	37.136	5291.4225	5328.5585	---	---
11N40SISO	Ant1	5510	36.855	5491.5769	5528.4319	---	---
11N40SISO	Ant1	5550	36.889	5531.5490	5568.4380	---	---
11N40SISO	Ant1	5670	36.848	5651.5437	5688.3917	---	---
11N40SISO	Ant1	5755	36.909	5736.5438	5773.4528	---	---
11N40SISO	Ant1	5795	37.073	5776.4199	5813.4929	---	---
11AC20SISO	Ant1	5180	18.328	5170.7995	5189.1275	---	---
11AC20SISO	Ant1	5200	18.475	5190.7068	5209.1818	---	---
11AC20SISO	Ant1	5240	18.449	5230.7410	5249.1900	---	---
11AC20SISO	Ant1	5260	18.372	5250.8349	5269.2069	---	---
11AC20SISO	Ant1	5280	18.370	5270.8195	5289.1895	---	---
11AC20SISO	Ant1	5320	18.307	5310.8474	5329.1544	---	---
11AC20SISO	Ant1	5500	18.111	5490.9376	5509.0486	---	---
11AC20SISO	Ant1	5580	18.081	5570.9594	5589.0404	---	---
11AC20SISO	Ant1	5700	18.120	5690.9397	5709.0597	---	---
11AC20SISO	Ant1	5745	18.172	5735.9203	5754.0923	---	---
11AC20SISO	Ant1	5785	18.244	5775.8588	5794.1028	---	---
11AC20SISO	Ant1	5825	18.314	5815.8346	5834.1486	---	---
11AC40SISO	Ant1	5190	37.240	5171.3061	5208.5461	---	---
11AC40SISO	Ant1	5230	37.235	5211.3511	5248.5861	---	---
11AC40SISO	Ant1	5270	37.143	5251.4490	5288.5920	---	---
11AC40SISO	Ant1	5310	37.278	5291.3613	5328.6393	---	---
11AC40SISO	Ant1	5510	36.921	5491.5647	5528.4857	---	---
11AC40SISO	Ant1	5550	36.831	5531.6133	5568.4443	---	---

11AC40SISO	Ant1	5670	36.848	5651.5291	5688.3771	---	---
11AC40SISO	Ant1	5755	37.049	5736.5306	5773.5796	---	---
11AC40SISO	Ant1	5795	37.042	5776.4511	5813.4931	---	---
11AC80SISO	Ant1	5210	77.851	5170.9047	5248.7557	---	---
11AC80SISO	Ant1	5290	77.794	5251.2043	5328.9983	---	---
11AC80SISO	Ant1	5530	77.034	5491.6092	5568.6432	---	---
11AC80SISO	Ant1	5610	76.949	5571.3770	5648.3260	---	---
11AC80SISO	Ant1	5775	77.307	5736.3074	5813.6144	---	---

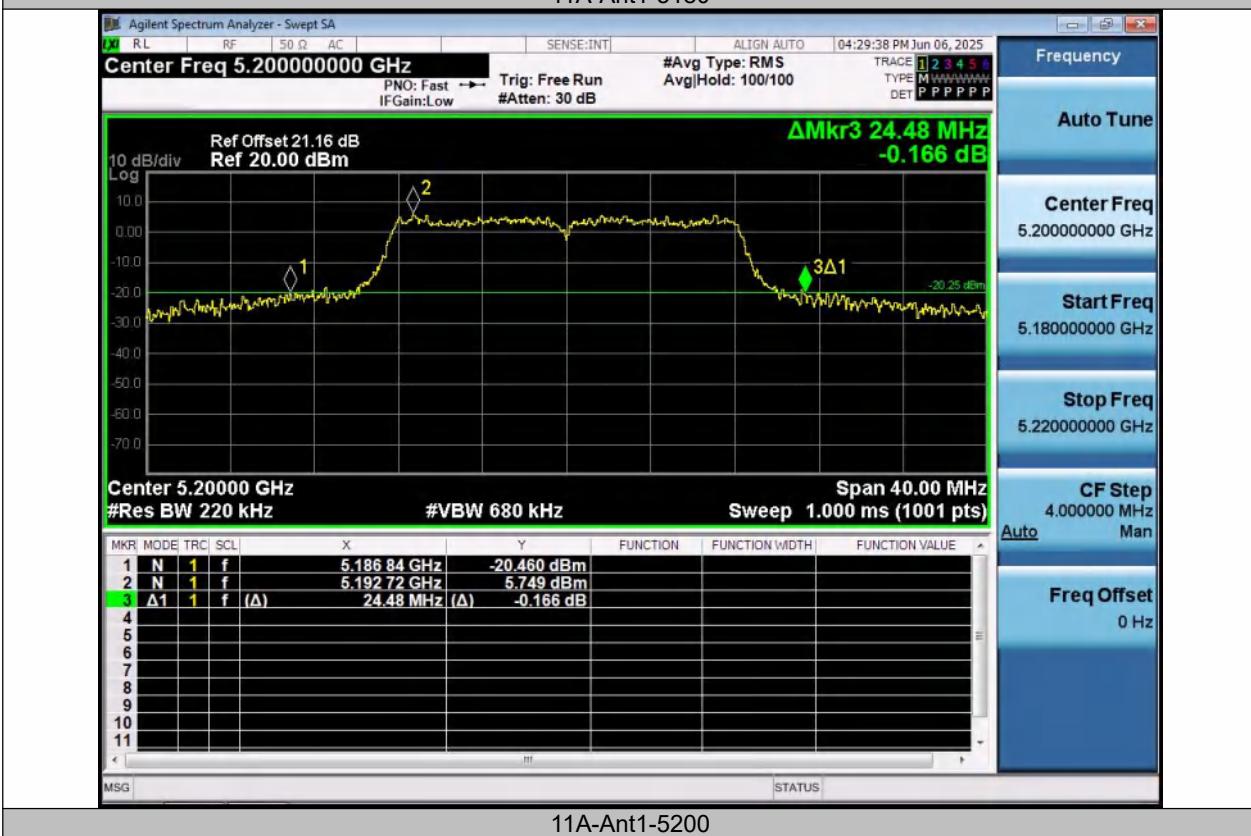
Min emission bandwidth

TestMode	Antenna	Frequency [MHz]	6db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5745	16.440	5736.760	5753.200	0.5	PASS
11A	Ant1	5785	16.480	5776.720	5793.200	0.5	PASS
11A	Ant1	5825	16.360	5816.800	5833.160	0.5	PASS
11N20SISO	Ant1	5745	17.560	5736.200	5753.760	0.5	PASS
11N20SISO	Ant1	5785	17.560	5776.200	5793.760	0.5	PASS
11N20SISO	Ant1	5825	17.560	5816.200	5833.760	0.5	PASS
11N40SISO	Ant1	5755	35.440	5737.400	5772.840	0.5	PASS
11N40SISO	Ant1	5795	35.840	5777.000	5812.840	0.5	PASS
11AC20SISO	Ant1	5745	17.600	5736.160	5753.760	0.5	PASS
11AC20SISO	Ant1	5785	17.680	5776.160	5793.840	0.5	PASS
11AC20SISO	Ant1	5825	17.640	5816.160	5833.800	0.5	PASS
11AC40SISO	Ant1	5755	35.760	5737.080	5772.840	0.5	PASS
11AC40SISO	Ant1	5795	35.840	5777.080	5812.920	0.5	PASS
11AC80SISO	Ant1	5610	75.520	5572.240	5647.760	0.5	PASS
11AC80SISO	Ant1	5775	75.680	5737.080	5812.760	0.5	PASS

## Emission Bandwidth



11A-Ant1-5180



11A-Ant1-5200

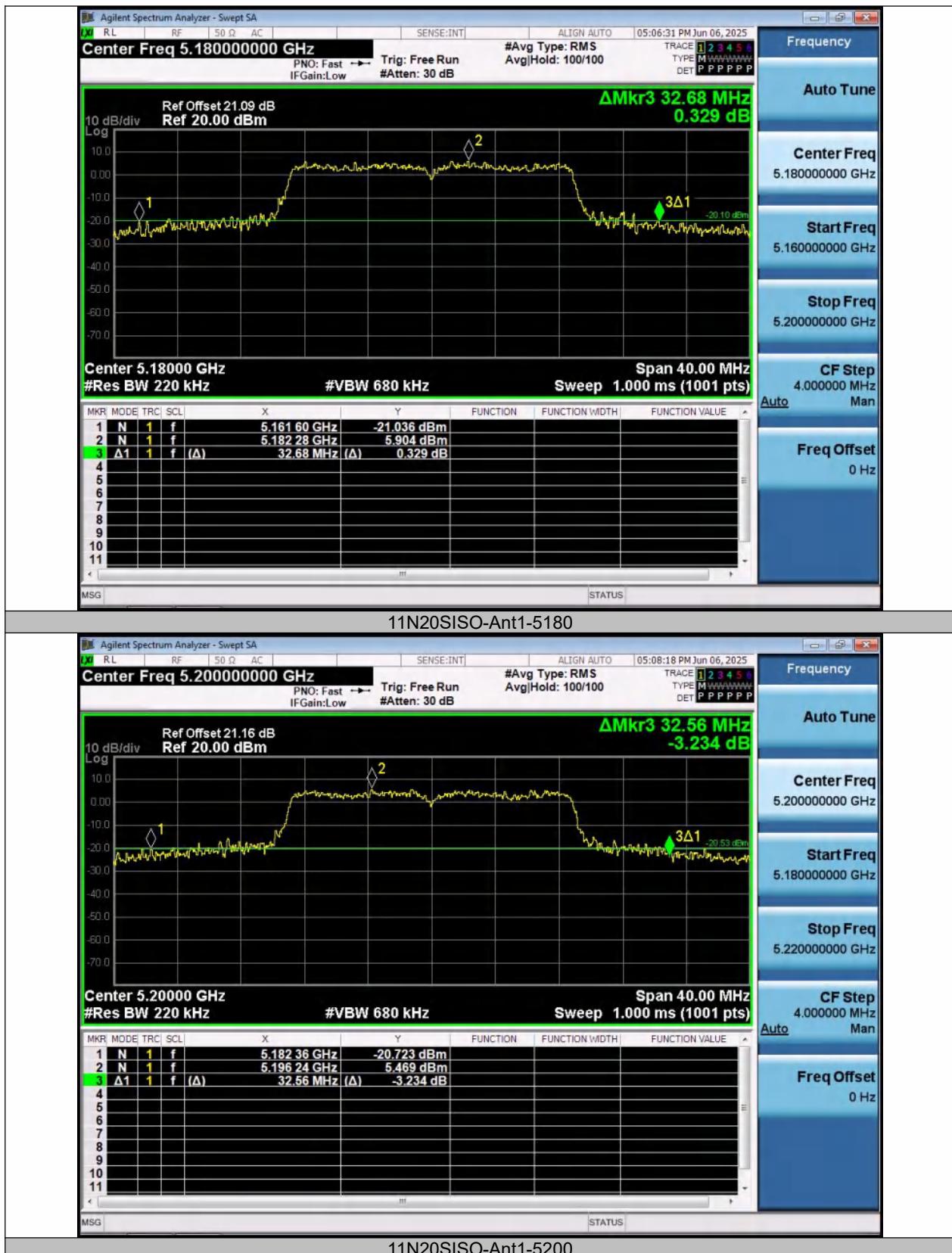


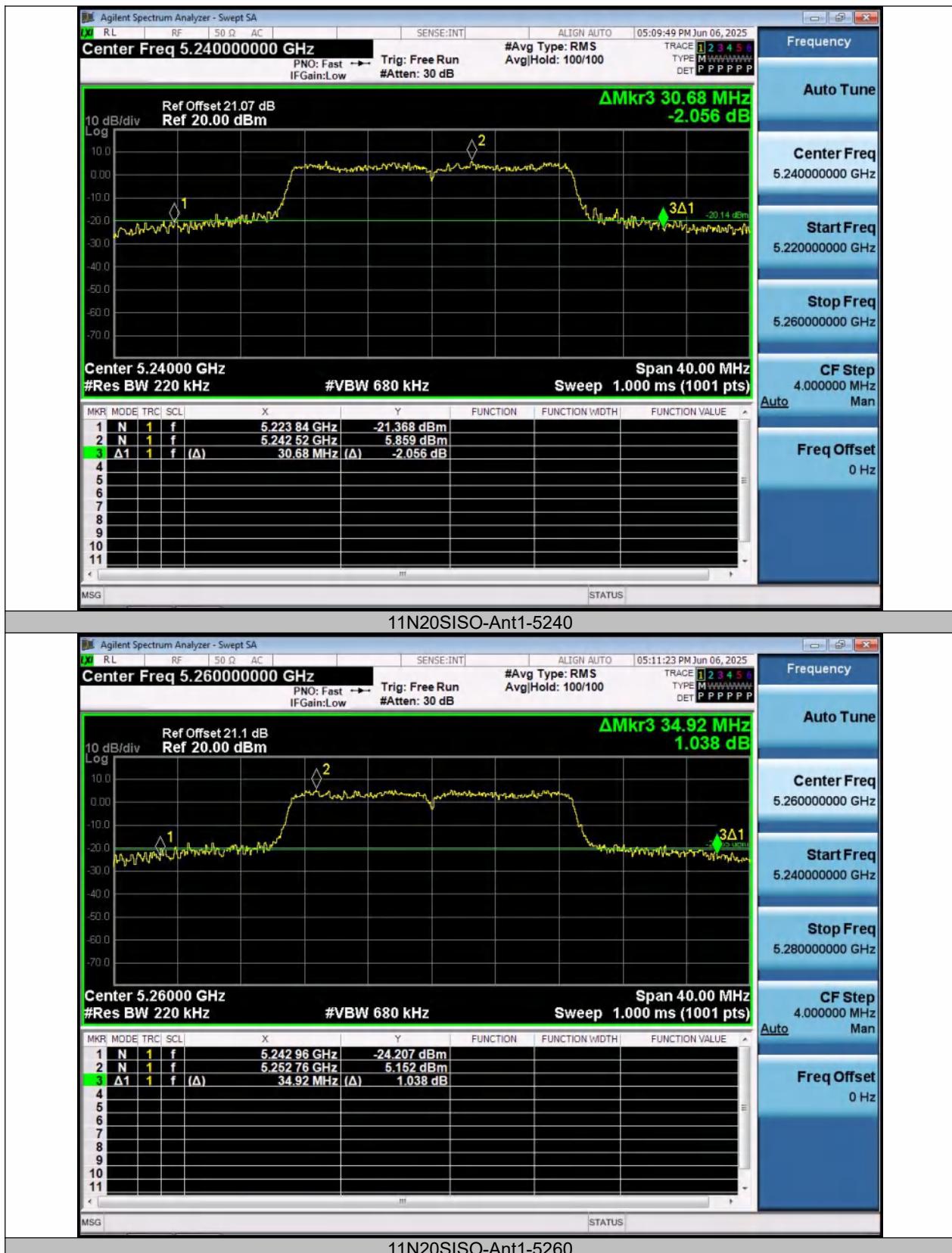


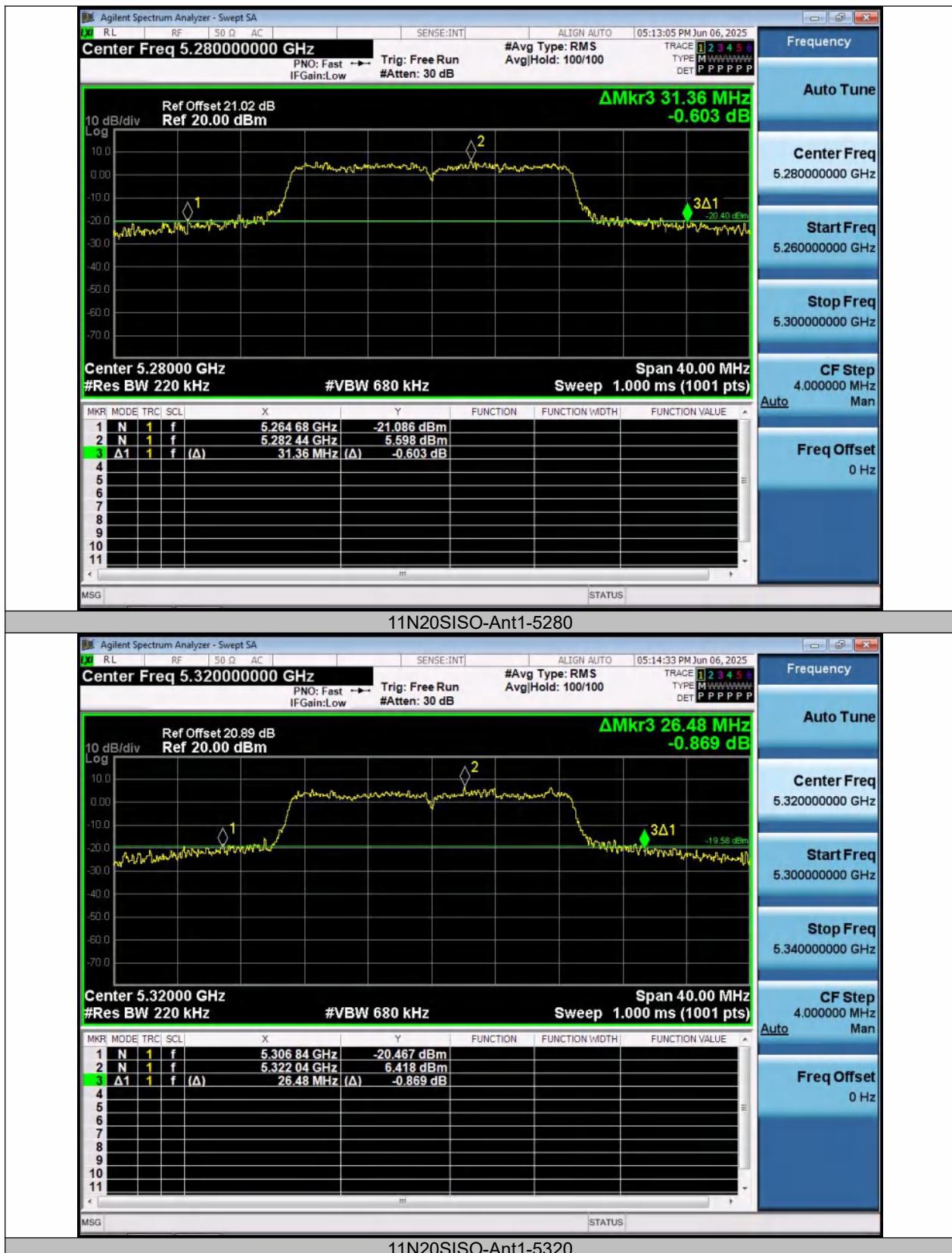








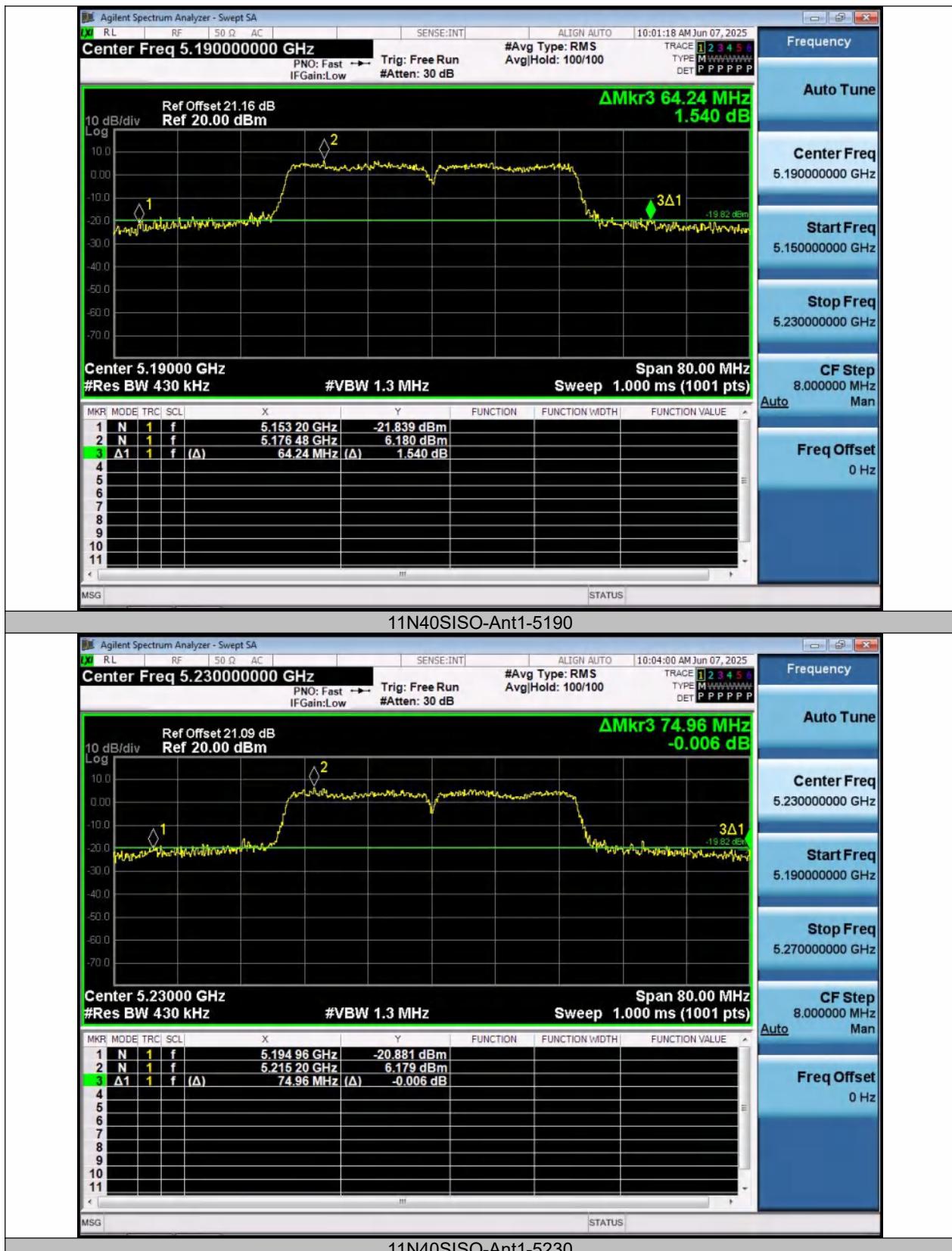


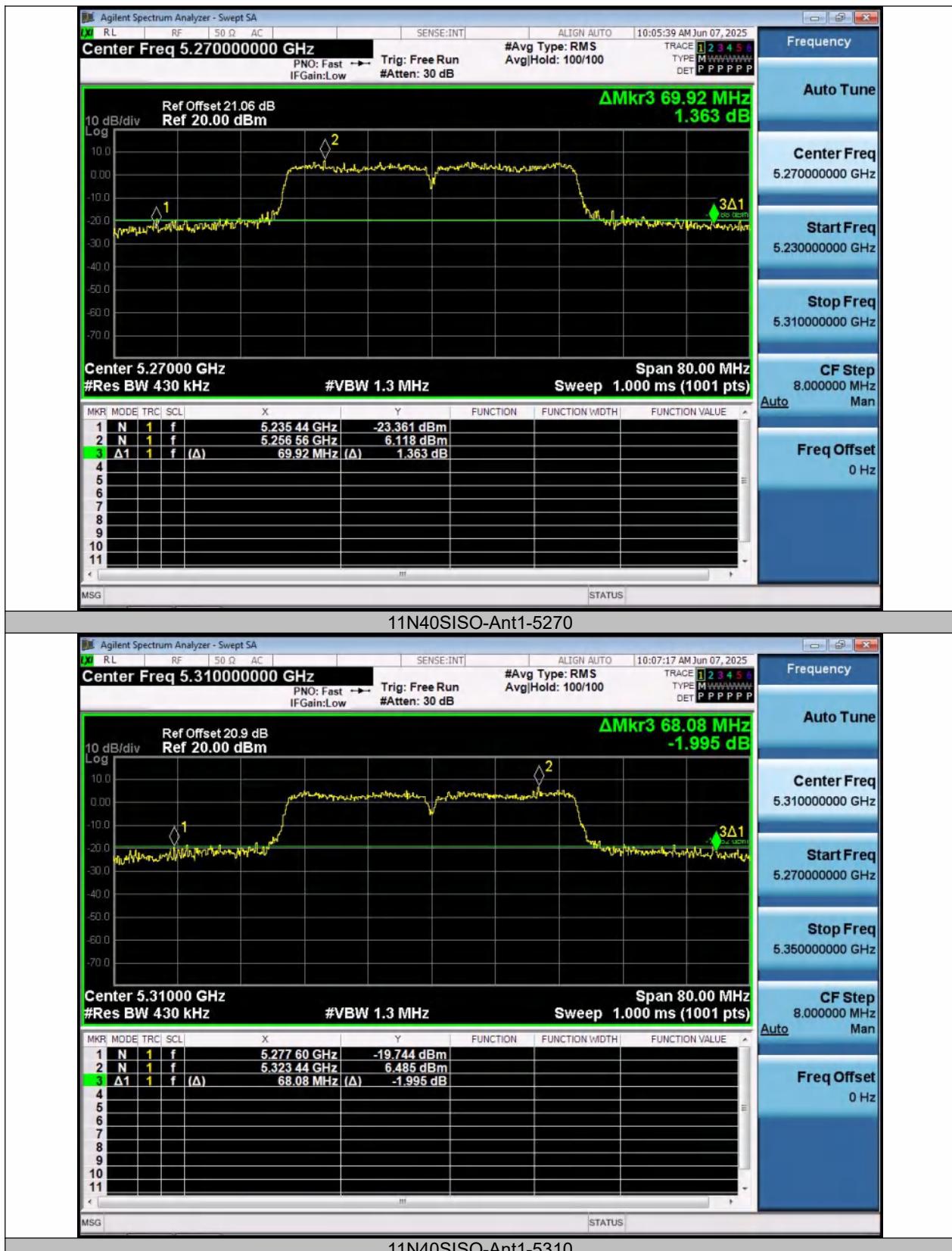


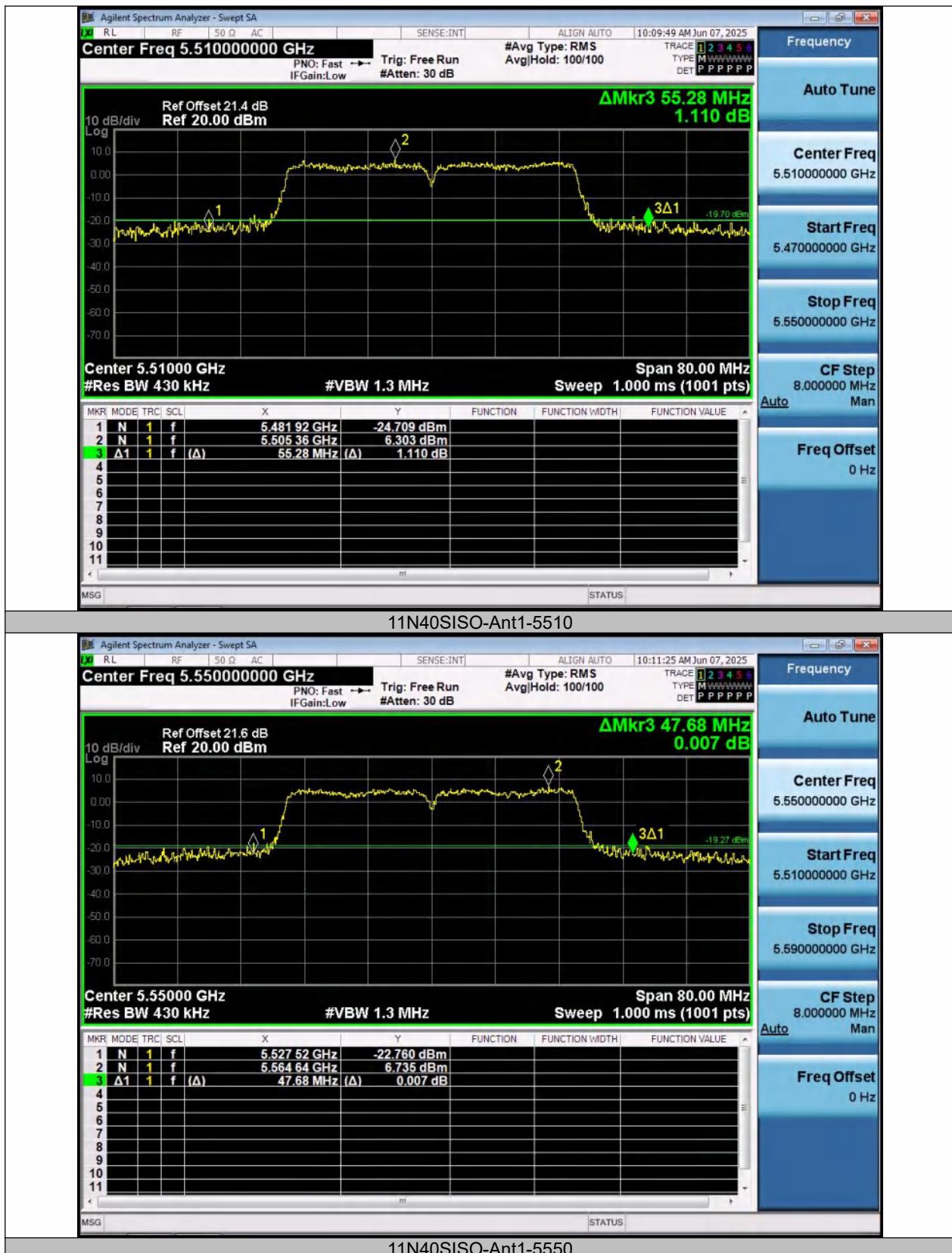




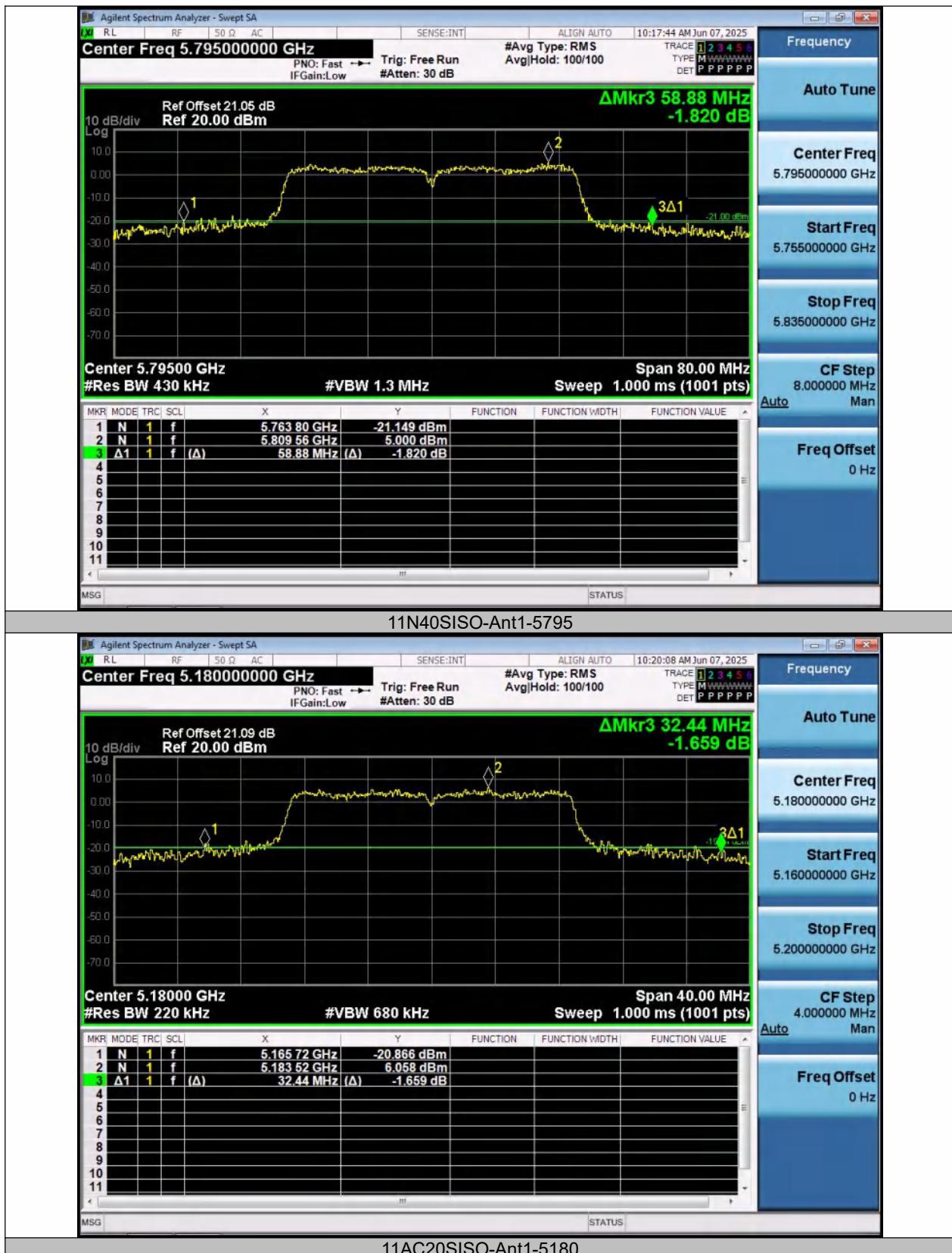


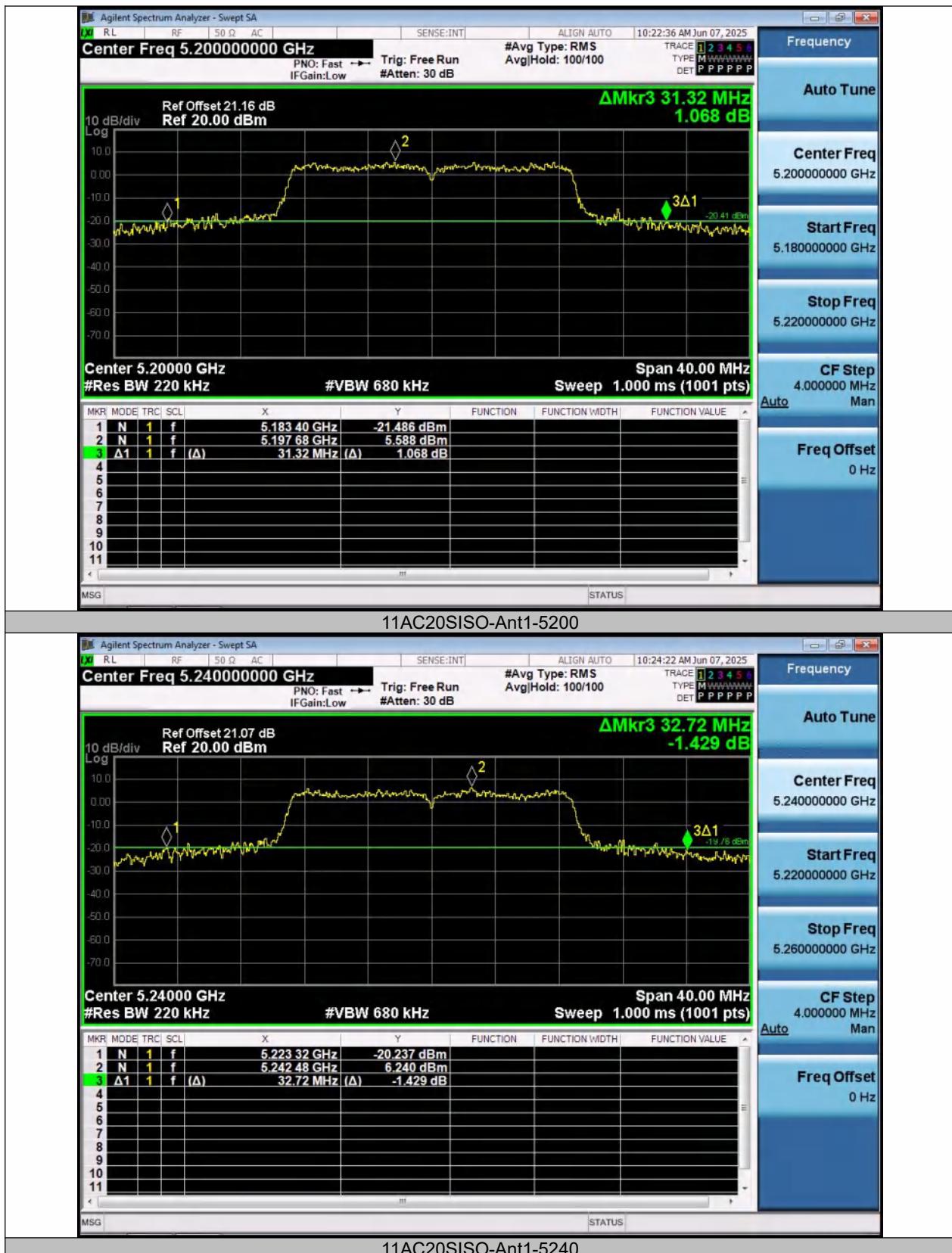


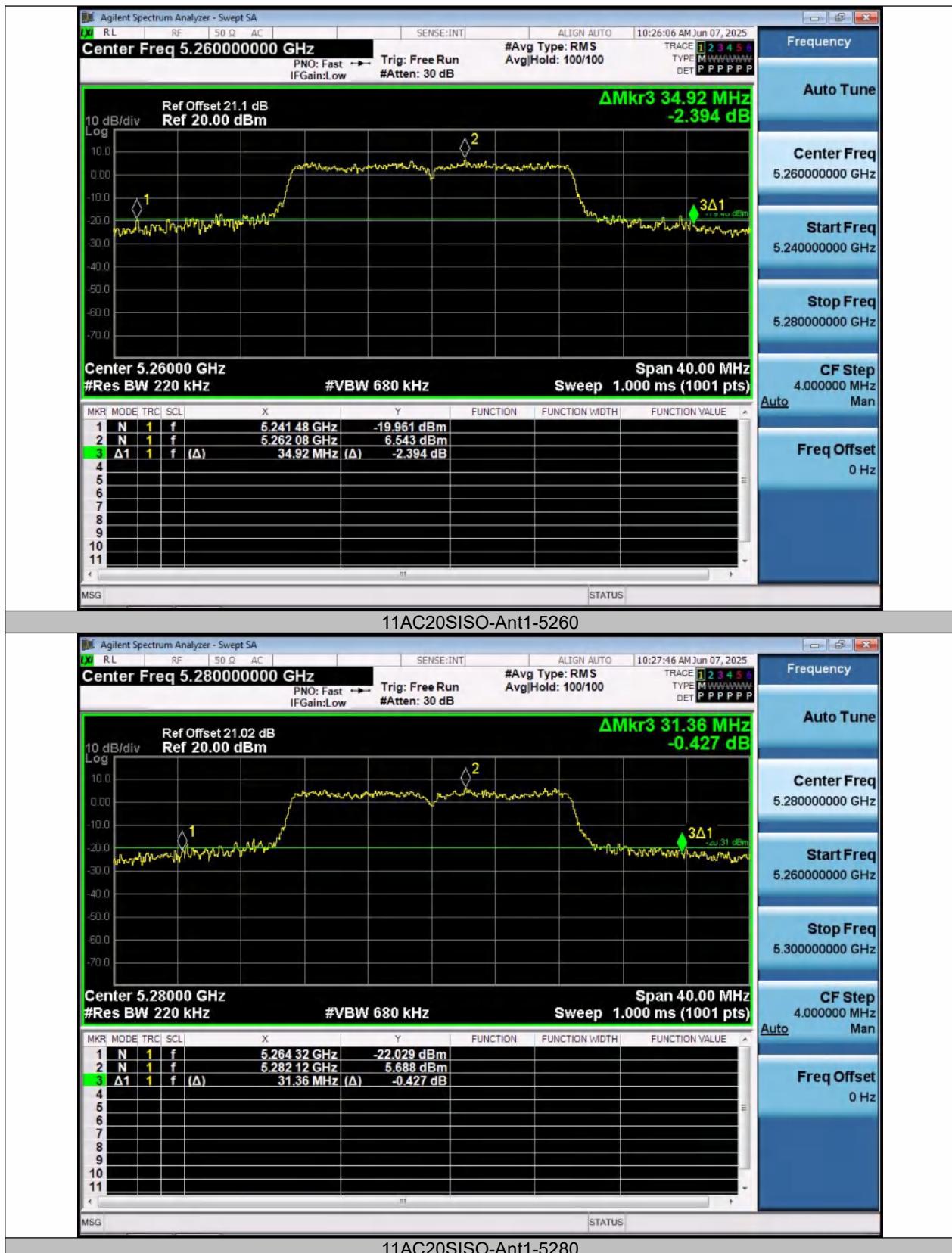








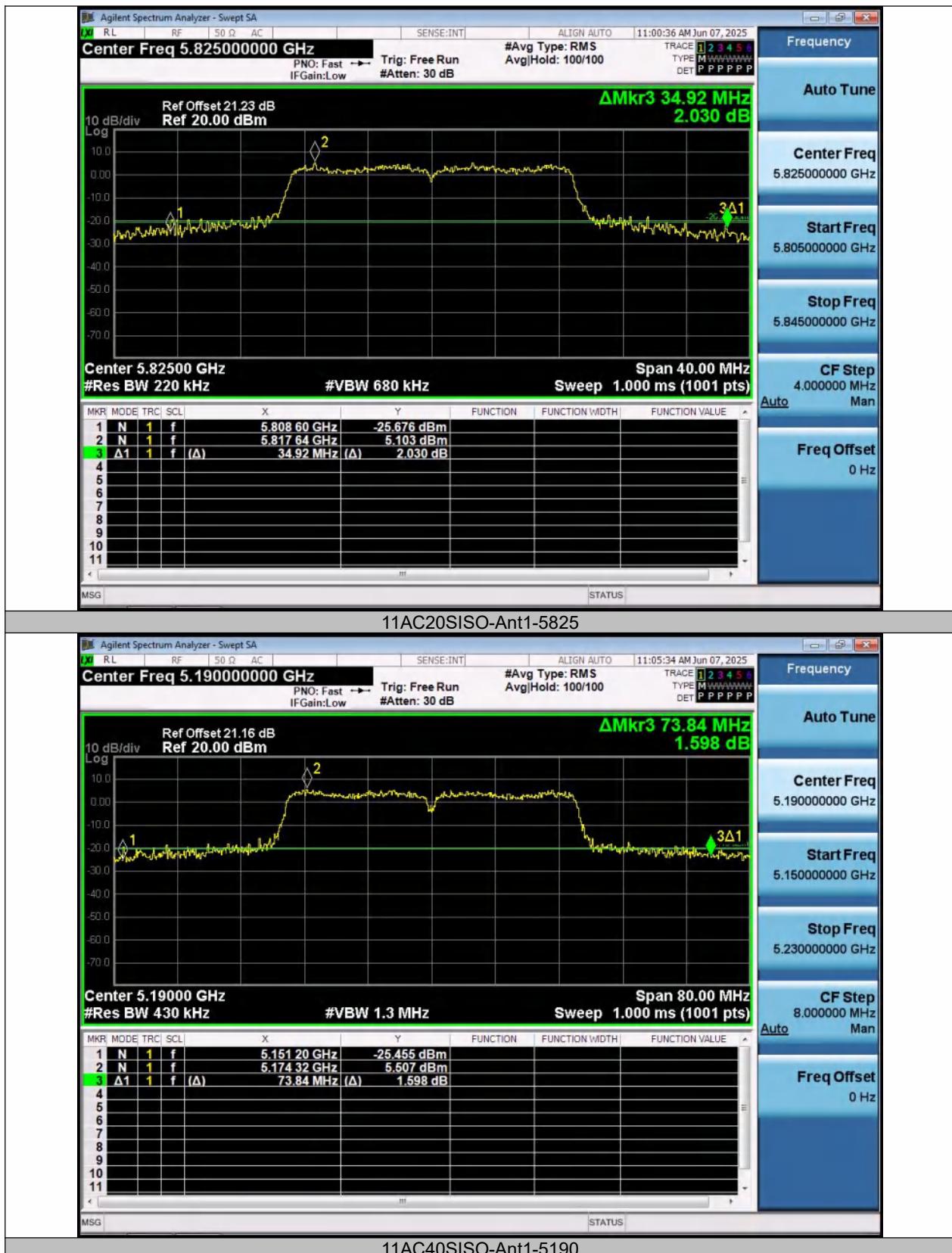


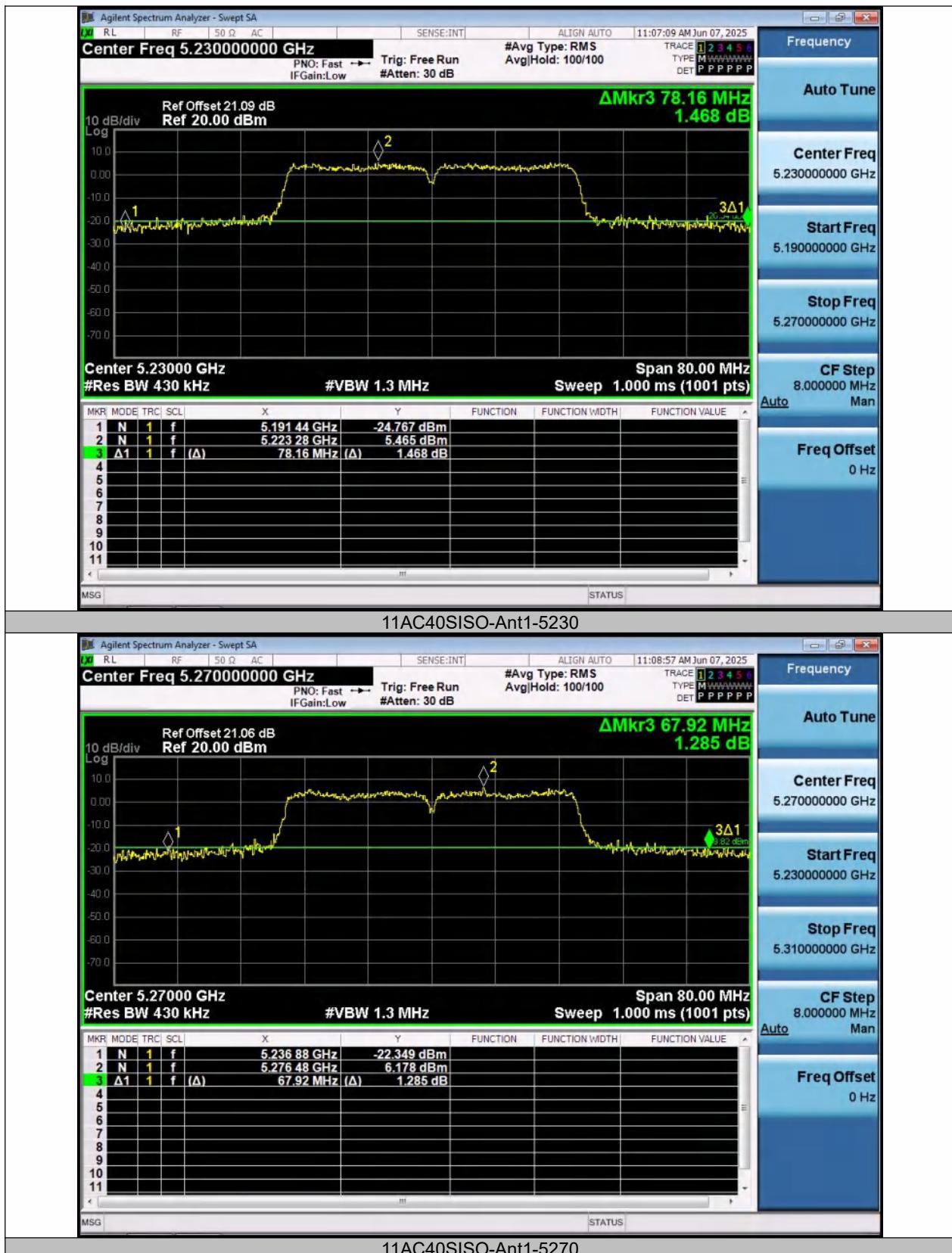


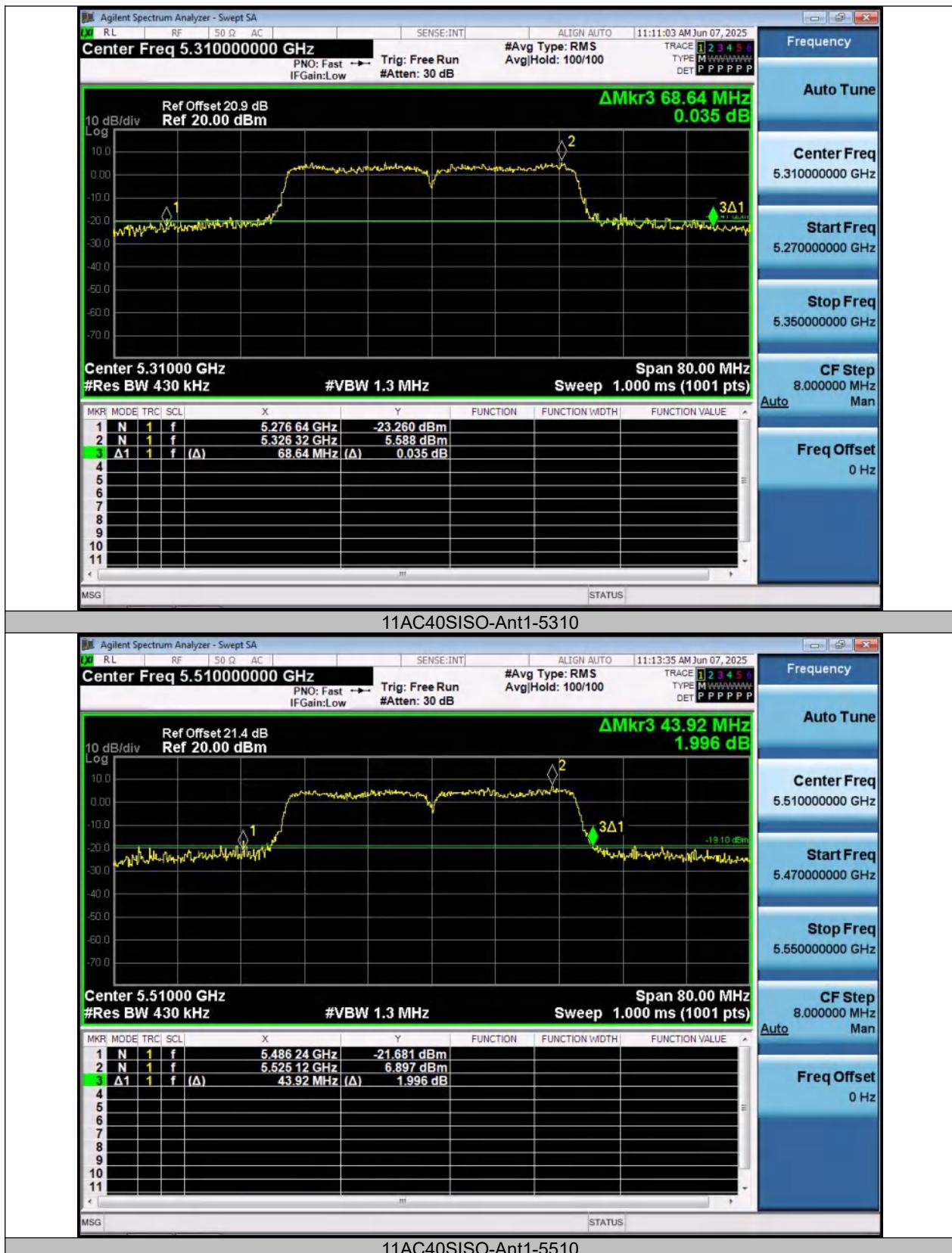






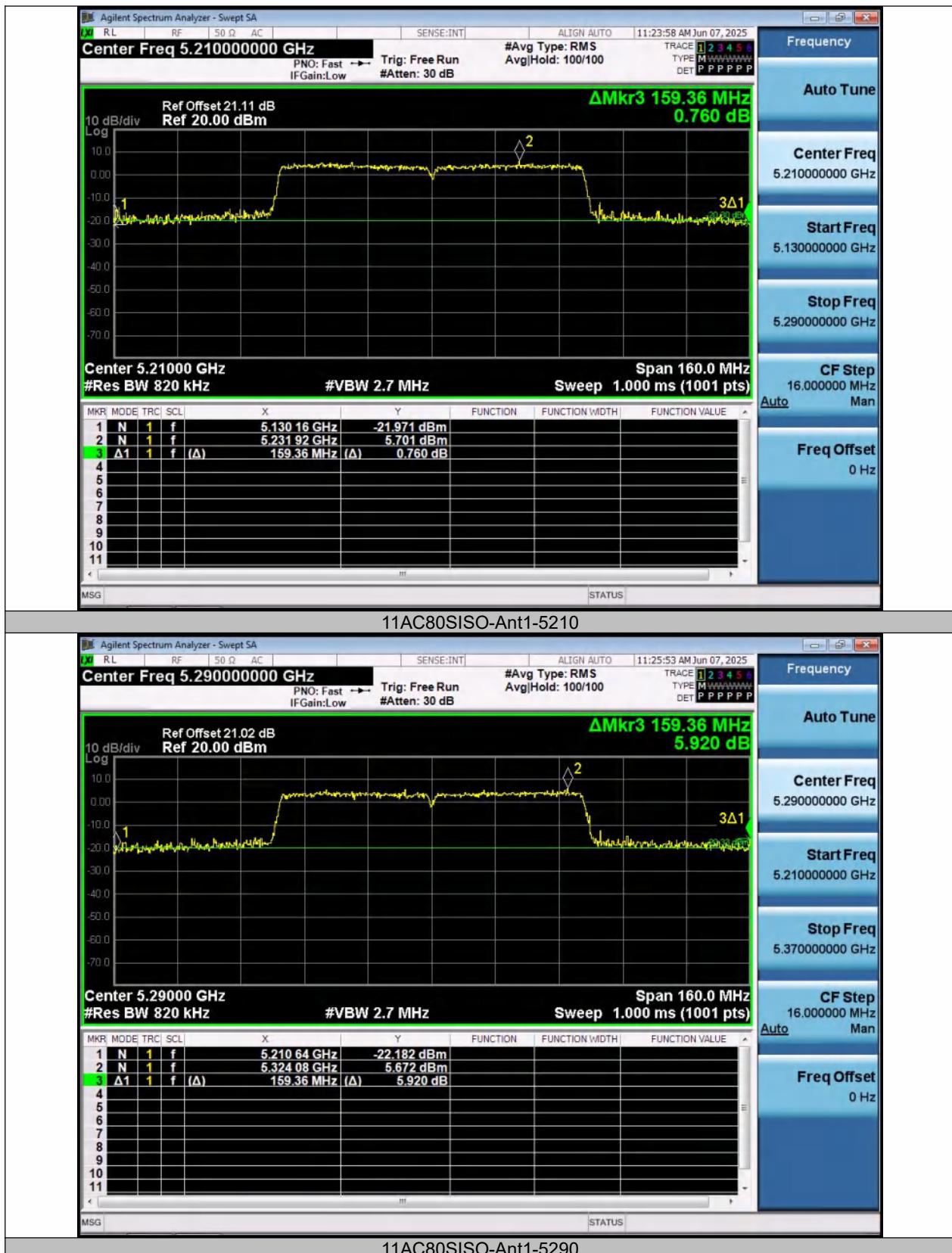


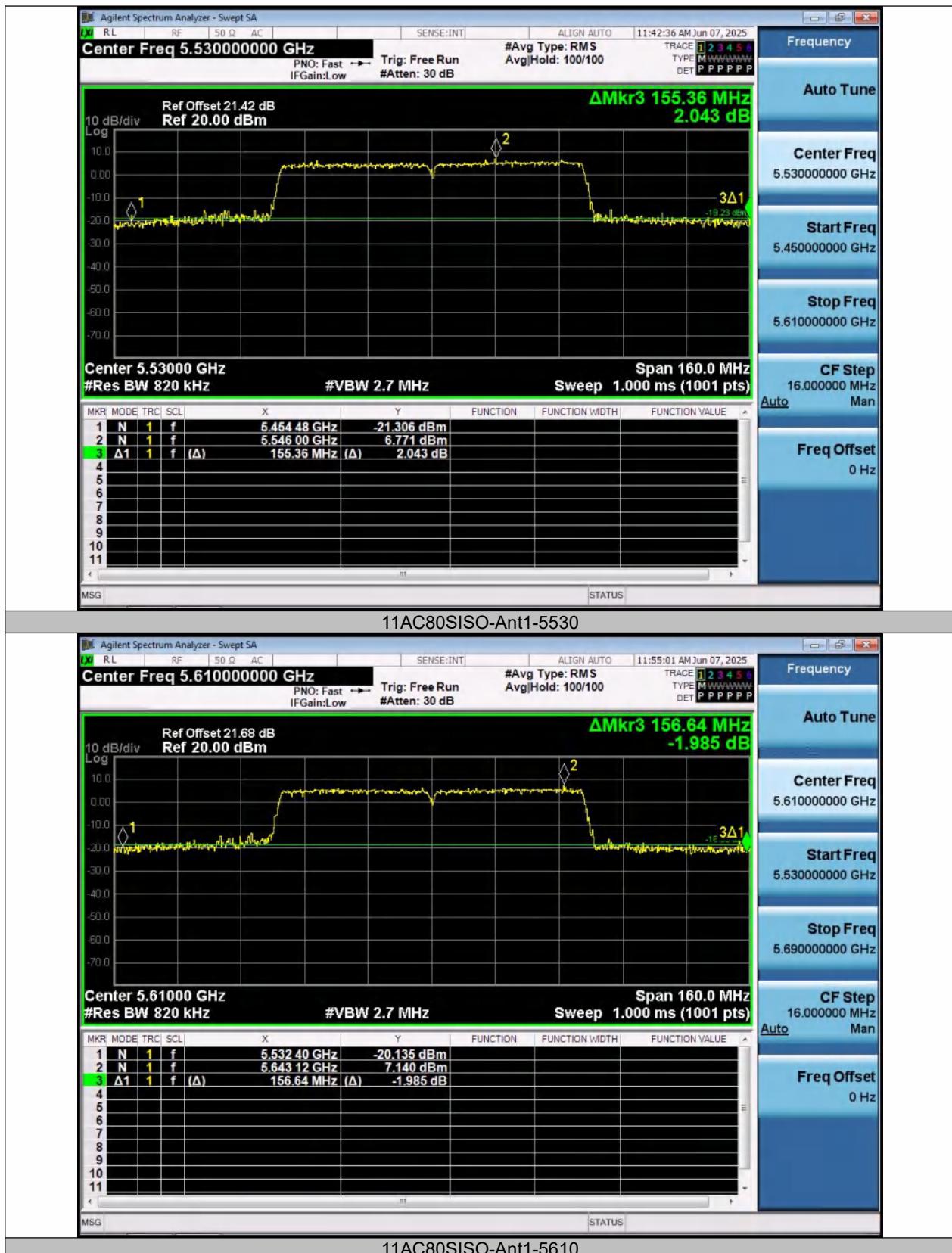


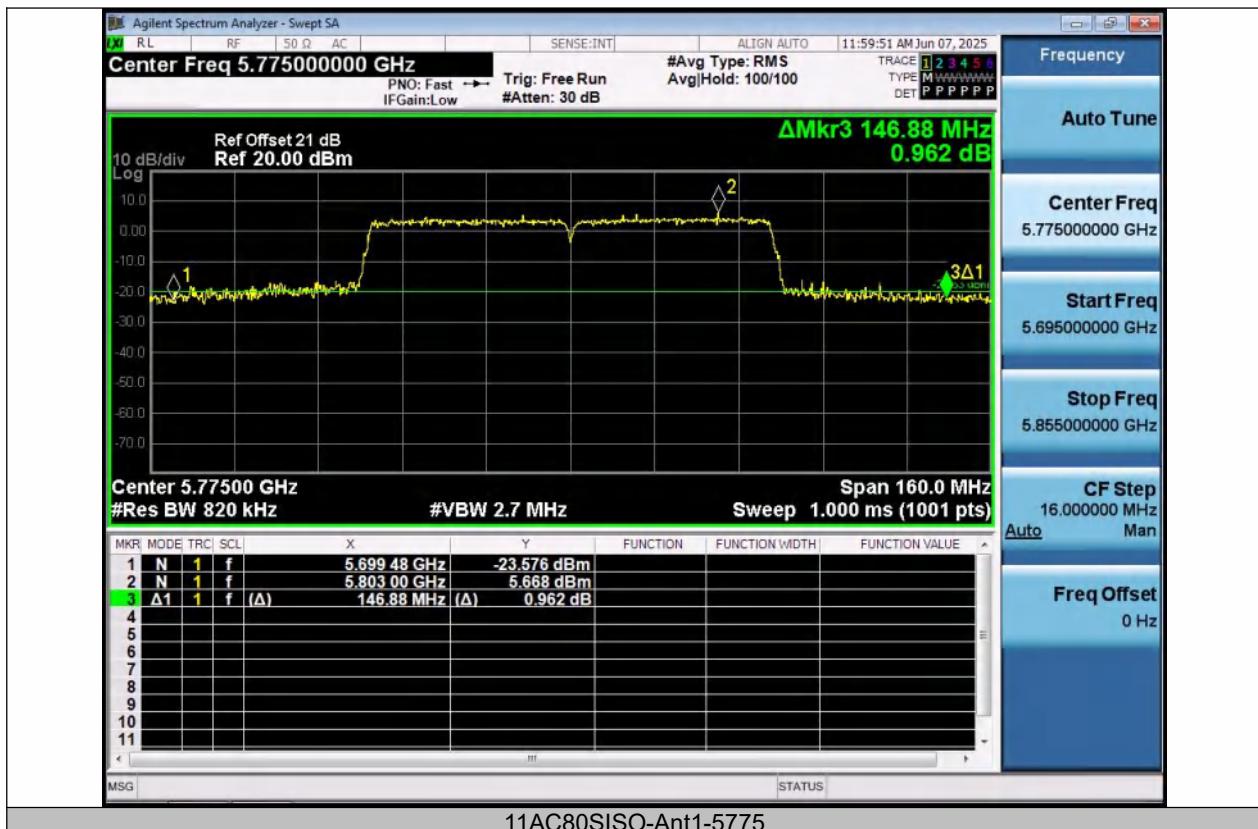








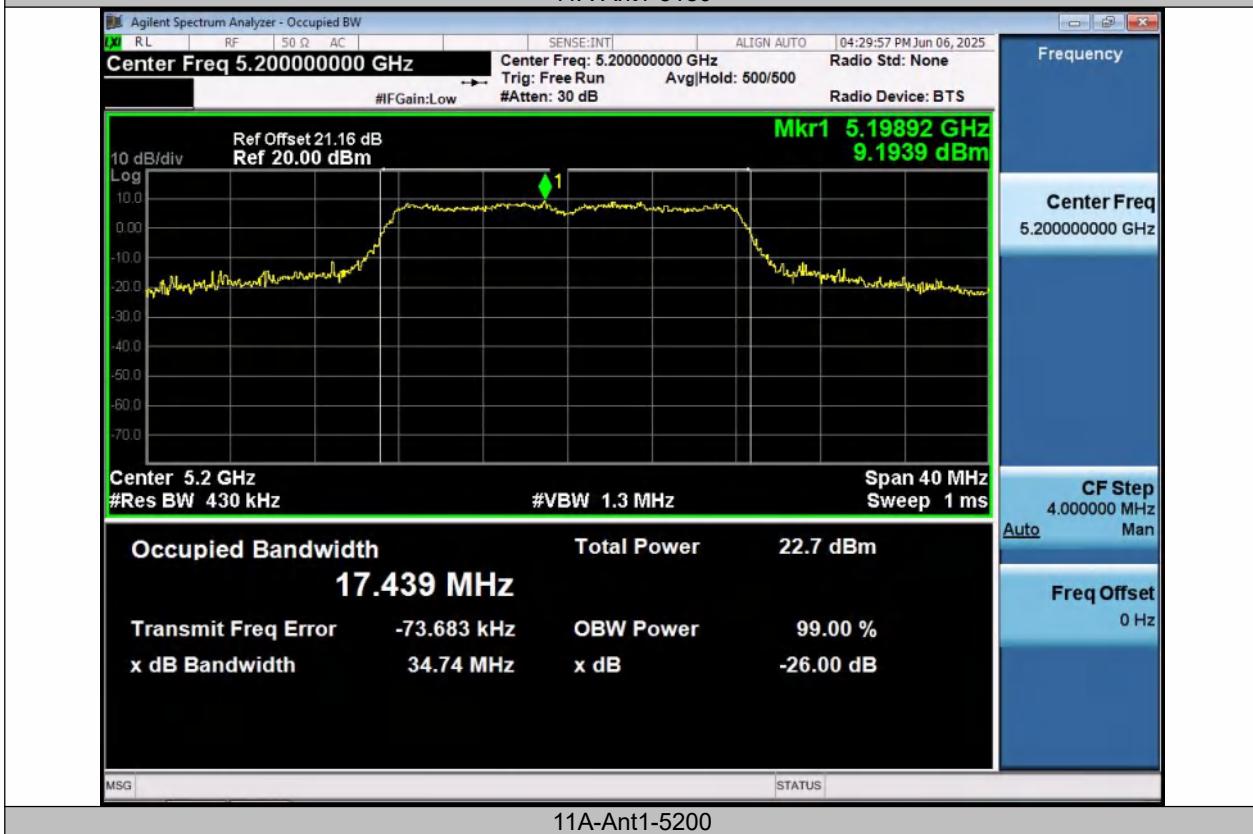




## Occupied channel bandwidth



11A-Ant1-5180



11A-Ant1-5200

