

ETSI EN 301 893 V2.1.1 (2017-05)

**TEST REPORT**

For

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**Tested Model: KINGKONG 7**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Smartphone
<b>Report Number:</b> SZ1210506-15265E-22I	
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## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

Product	Tablet PC
Tested Model	KINGKONG 7
Trade mark	CUBOT
Frequency Range	5G Wi-Fi: 5150-5250 MHz
Maximum Transmit Power (EIRP)	5G Wi-Fi: 5150-5250 MHz 10.84dBm (802.11a), 10.83dBm(802.11n20), 10.77dBm(802.11n40), 10.50dBm (802.11ac20), 10.56dBm (802.11ac40), 10.18dBm (802.11ac80)
Modulation Technique	OFDM
Antenna Specification	FPC Antenna: 1.11dBi(It is provided by the manufacturer)
Voltage Range	DC3.85V from battery or DC 5.0V from adapter
Date of Test	2021-06-08
Sample serial number	SZ1210506-15265E-RF-S1
Received date	2021-05-06
Sample/EUT Status	Good condition
Adapter 1 information	Model: HJ-0502000W2-EU Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5V, 2.0A
Adapter 2 information	Model: HJ-0502000-UK Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5V, 2.0A

### Objective

This report is prepared in accordance with ETSI EN 301 893 V2.1.1 (2017-05), 5 GHz RLAN; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU.

The objective is to determine the compliance of EUT with ETSI EN 301 893 V2.1.1 (2017-05).

### Related Submittal(s)/Grant(s)

No Related Submittals.

### Test Methodology

Parameter		Uncertainty
Spurious Emissions, Radiated	9k-30MHz	±2.66dB
	30MHz-1000MHz	±4.28dB
	1GHz-18GHz	±4.98dB
	18GHz-26.5GHz	±5.06dB

*Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.*

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user).

### EUT Exercise Software

No software was used to test.

Frequency Range (MHz)	Mode	Data rate	Power Level*		
			Low Channel	Middle Channel	High Channel
5150-5250	802.11a	6Mbps	10	10	10
	802.11n20	MCS0	10	10	10
	802.11n40	MCS0	10	10	10
	802.11 ac20	MCS0	10	10	10
	802.11 ac40	MCS0	10	10	10
	802.11 ac80	MCS0	10	10	10

Note: The above data rate was the worst case according to the output power test.

### Equipment Modifications

No modifications were made to the EUT.

### Special Accessories

No special accessory.

### Equipment Modifications

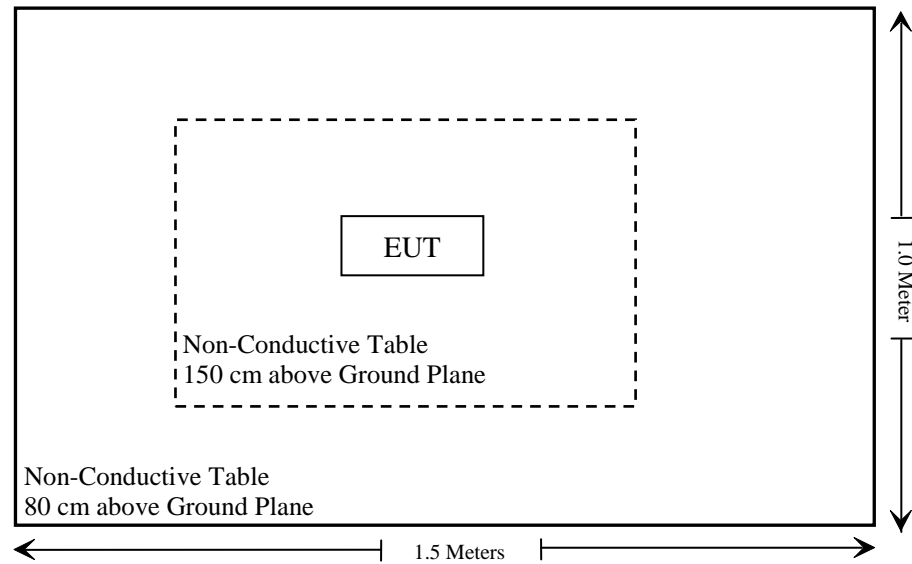
No modification was made to the EUT.

### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

### External I/O Cable

Cable Description	Length (m)	From Port	To
/	/	/	/

**Block Diagram of Test Setup**

**SUMMARY OF TEST RESULTS**

ETSI EN 301 893 V2.1.1 (2017-05)	Description of Test	Test Result
§ 4.2.1	Centre Frequencies	Compliance
§ 4.2.2	Nominal Channel Bandwidth and Occupied Channel Bandwidth	Compliance
§ 4.2.3	RF output power	Compliance
§ 4.2.3	Transmit Power Control (TPC)	Not Applicable
§ 4.2.3	Power Density	Compliance
§ 4.2.4.1	Transmitter unwanted emissions outside the 5 GHz RLAN bands	Compliance
§ 4.2.4.2	Transmitter unwanted emissions within the 5 GHz RLAN bands	Compliance
§ 4.2.5	Receiver spurious emissions	Compliance
§ 4.2.6	Dynamic Frequency Selection (DFS)	Not Applicable
§ 4.2.7	Adaptivity (Channel Access Mechanism)	Compliance
§ 4.2.8	Receiver Blocking	Compliance
§ 4.2.9	User Access Restrictions	Compliance*
§ 4.2.10	Geo-location capability	Not Applicable*

Compliance\*: Please refer to the product information declared by the manufacturer.

Not Applicable: The device has no TPC function, and only supports 5150-5250MHz band.

Not Applicable\*: The supplier declared that the equipment has no this function.

**TEST EQUIPMENT LIST**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
<b>Radiated Emission Test</b>					
Rohde & Schwarz	Test Receiver	ESR	101817	2020/12/24	2021/12/23
SONOMA INSTRUMENT	Amplifier	310 N	186131	2020/12/25	2021/12/24
Schwarzbeck	Bilog Antenna	VULB9163	9163-194	2020/01/05	2023/01/04
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2020/01/05	2023/01/04
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-655	2020/01/05	2023/01/04
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2020/01/05	2021/01/04
Rohde & Schwarz	Spectrum Analyzer	FSV-40	101495	2020/12/24	2021/12/23
A.H. Systems, inc.	Preamplifier	PAM-0118P	531	2020/07/08	2021/07/07
PASTERNAK	Horn Antenn	PE9852/2F-20	1120	2020/01/05	2023/01/04
PASTERNAK	Horn Antenn	PE9852/2F-20	1120	2020/01/05	2023/01/04
Quinstar	Amplifier	QLW-184055 36-J0	15964001002	2020/11/28	2021/11/27
Anritsu	Signal Generator	68369B	004114	2020/7/31	2021/7/30
Radiated Emission Test Software: EZ EMC V1.1.4.2					
<b>RF Conducted test</b>					
Rohde & Schwarz	Spectrum Analyzer	FSV-40	101495	2020/12/24	2021/12/23
Rohde & Schwarz	Vector Signal Generator	SMBV100A	260434	2020/12/24	2021/12/23
Rohde & Schwarz	Signal Generator	SMB100A	108362	2020/12/24	2021/12/23
Rohde & Schwarz	Open Switch and Control Unit	OSP120 + OSP-B157	101244 + 100866	2020/12/24	2021/12/23
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	154606	2020/12/25	2021/12/24
Gongwen	Temp. & Humid. Chamber	JB913R	GZ-WS004	2020/12/25	2021/12/24

**\* Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).



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**ETSI EN 301 893 V2.1.1 (2017-05) §4.2.1- CENTRE FREQUENCIES**

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**Definition**

The centre frequency is the centre of the channel declared by the manufacturer as part of the declared channel plan(s).

**Limits**

The actual centre frequency for any given channel declared by the manufacturer shall be maintained within the range  $f_c \pm 20$  ppm.

**Test Procedure****Test conditions**

These measurements shall be performed under both normal and extreme test conditions (see clause 5.1).

The channels on which the conformance requirements in clause 4.2.1 shall be verified are defined in clause 5.3.2.

The UUT shall be configured to operate at a normal RF Output Power level. In addition, the UUT shall be configured to operate on a single channel.

For a UUT with antenna connector(s) and using dedicated external antenna(s), or for a UUT with integral antenna(s) but with a temporary antenna connector(s) provided, conducted measurements shall be used.

In case of conducted measurements on smart antenna systems (devices with multiple transmit chains) the measurements shall be performed on only one of the active transmit chains.

For a UUT with integral antenna(s) and without a temporary antenna connector(s), radiated measurements shall be used.

**Test method****Conducted measurement****1. Equipment operating without modulation**

This test method requires that the UUT can be operated in an unmodulated test mode.

The UUT shall be connected to a suitable frequency measuring device (e.g. a frequency counter or a spectrum analyser) and operated in an unmodulated mode. The result shall be recorded.

**2. Equipment operating with modulation**

This method is an alternative to the above method in case the UUT cannot be operated in an un-modulated mode.

The UUT shall be connected to spectrum analyser.

Max Hold shall be selected and the centre frequency adjusted to that of the UUT.

The peak value of the power envelope shall be measured and noted. The span shall be reduced and the marker moved in a positive frequency increment until the upper, (relative to the centre frequency), -10 dBc point is reached. This value shall be noted as f1.

The marker shall then be moved in a negative frequency increment until the lower, (relative to the centre frequency), -10 dBc point is reached. This value shall be noted as f2.

The centre frequency is calculated as  $(f1 + f2) / 2$ .

### **Radiated measurement**

The test set up as described in annex B shall be used with a spectrum analyser of sufficient accuracy attached to the test antenna.

The test procedure is as described under clause 5.4.2.2.1.

### **Test Data**

#### **Environmental Conditions**

<b>Temperature:</b>	23~25 °C
<b>Relative Humidity:</b>	50~51 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Black Ding on 2021-06-08.*

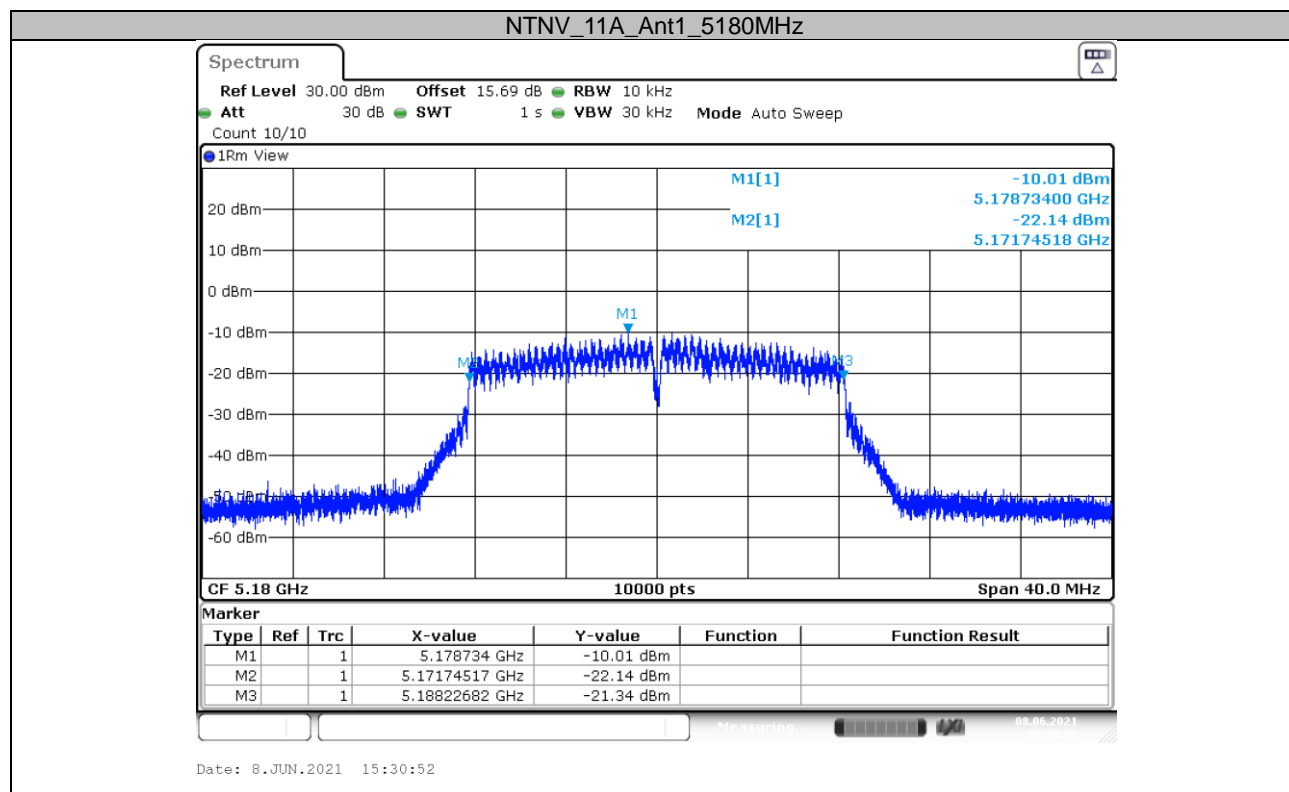
*Test Mode: Transmitting*

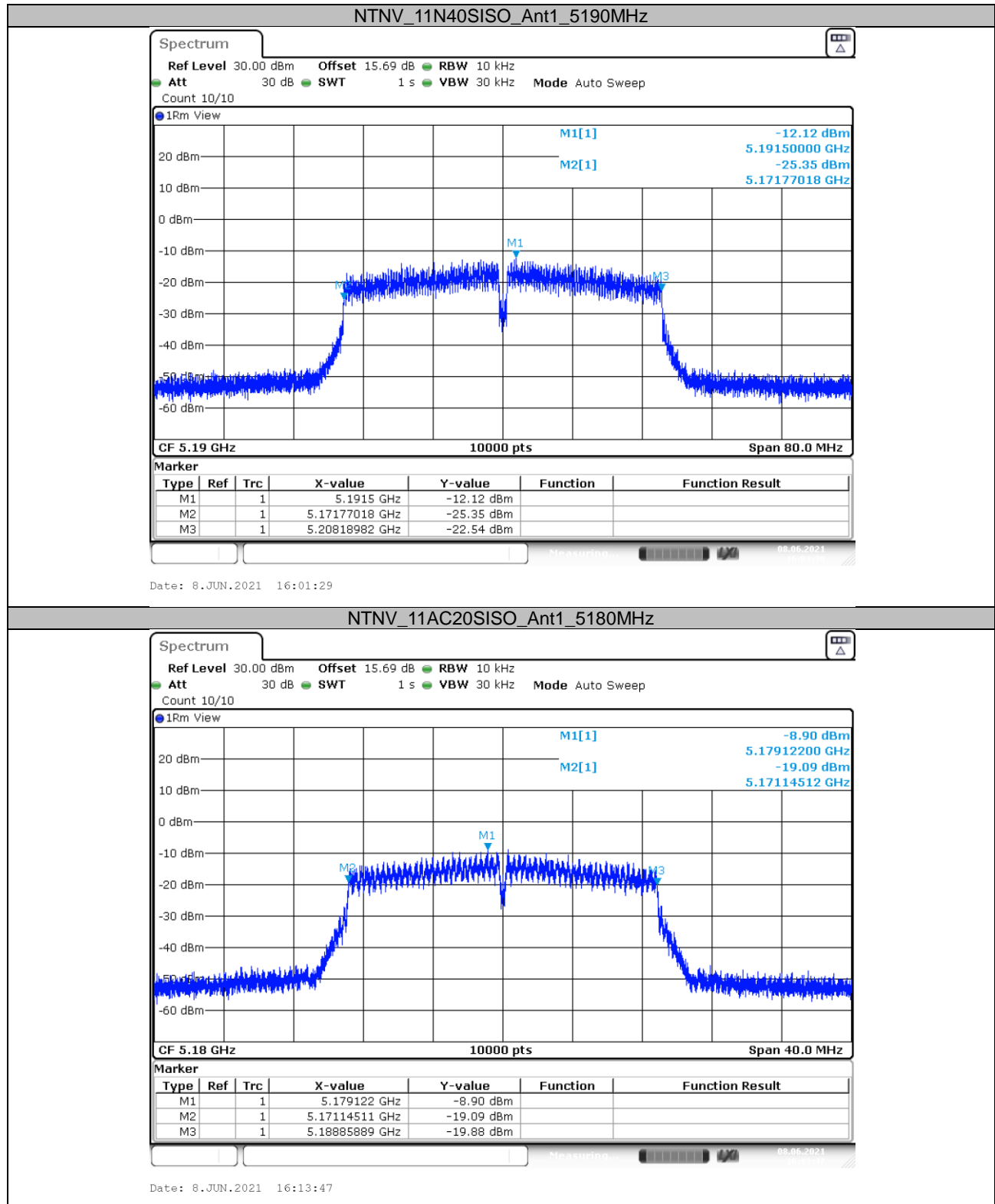
**Test Result:** Compliant.

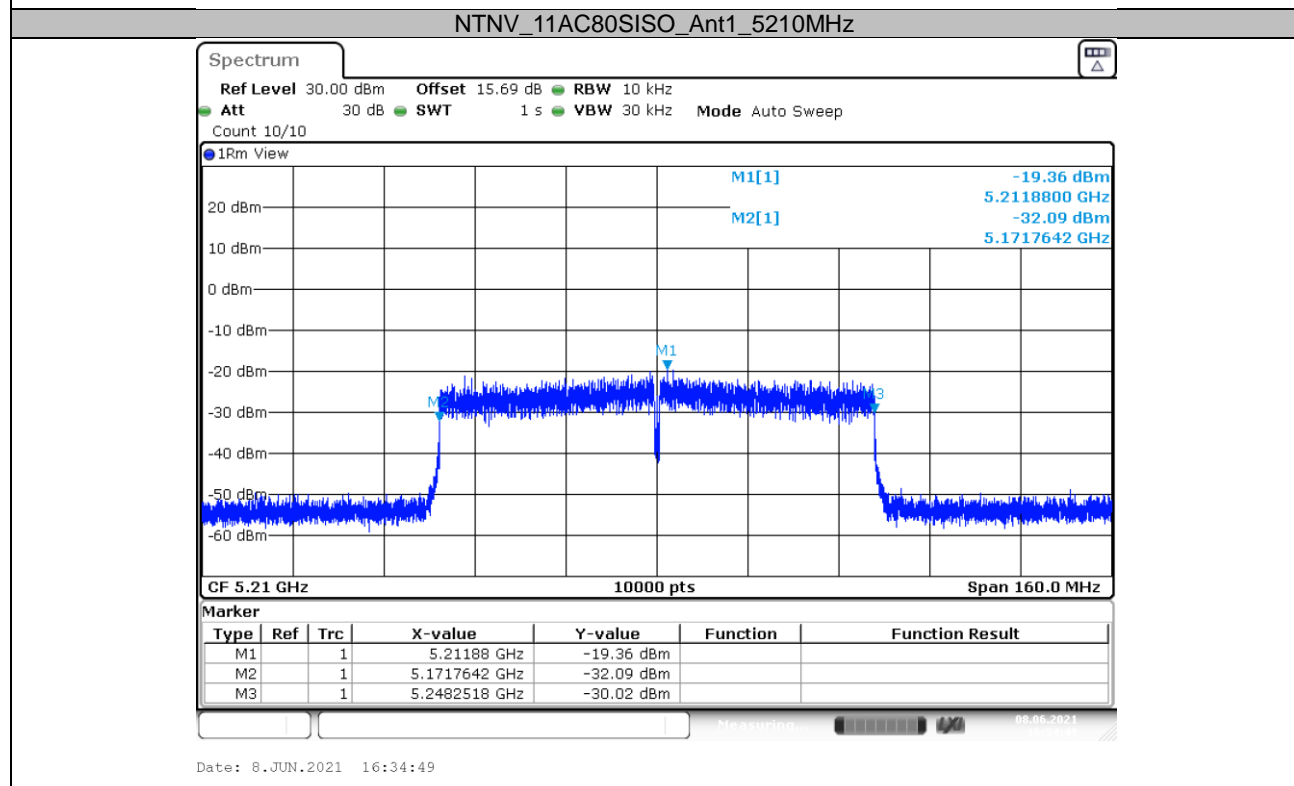
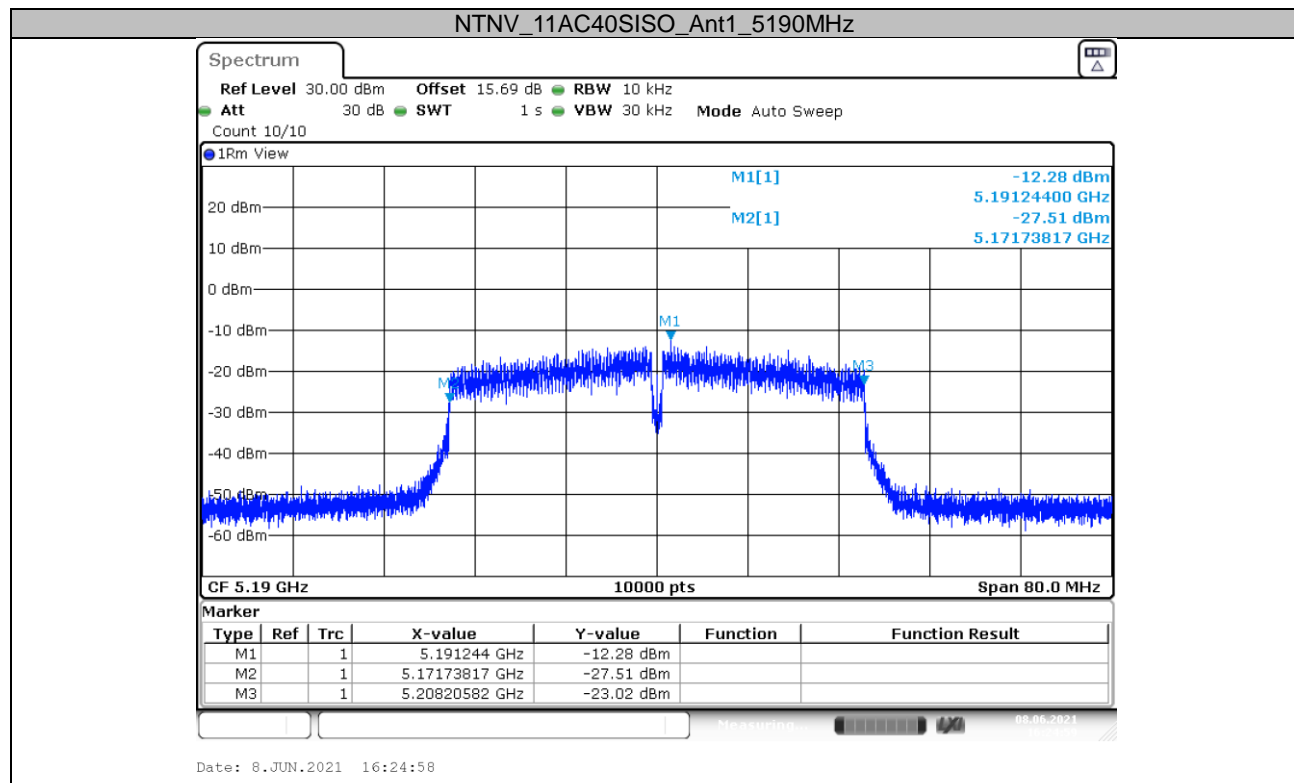
Please refer to following tables.

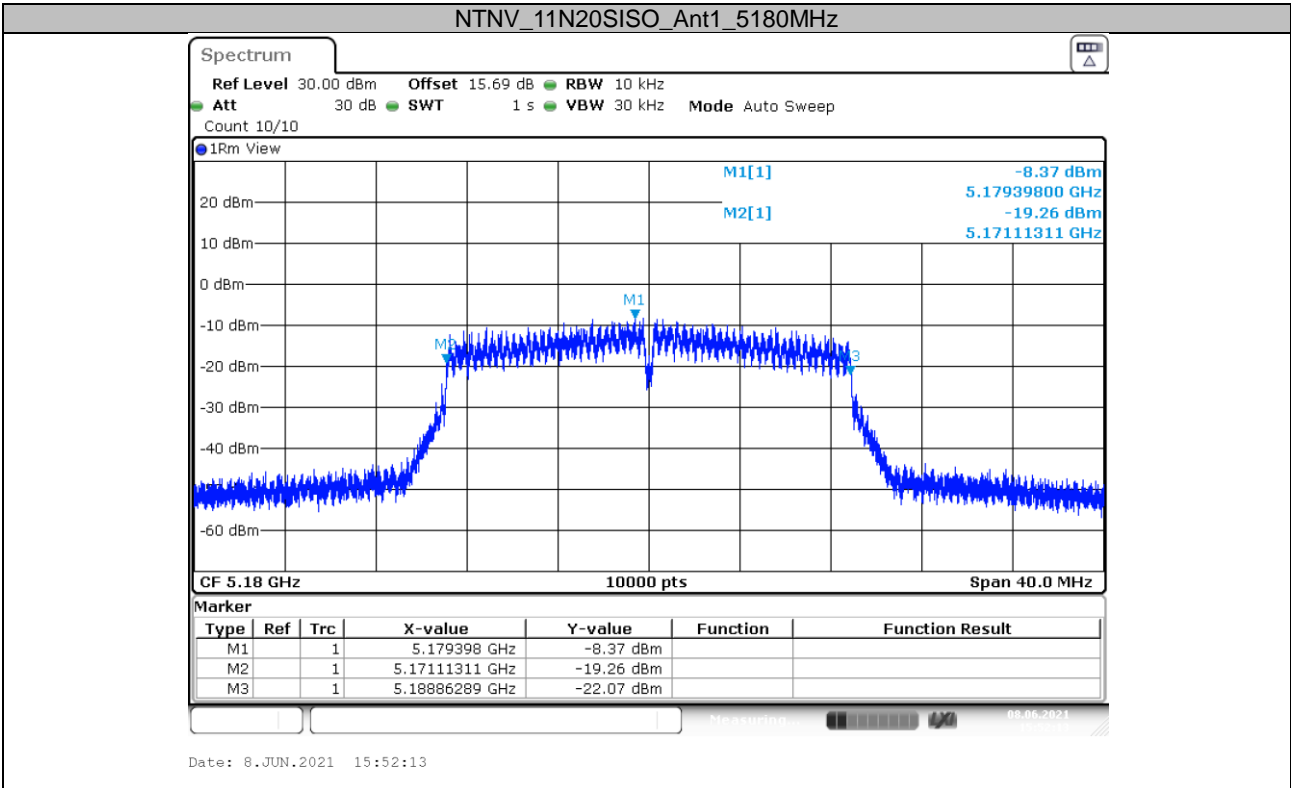
5150-5250 MHz

Test Condition	TestMode	Antenna	Channel	Result[ppm]	Limit[ppm]	Verdict
NTNV	11A	Ant1	5180	-2.70297	±20	PASS
	11N40SISO	Ant1	5190	-3.85395	±20	PASS
	11AC20SISO	Ant1	5180	0.38614	±20	PASS
	11AC40SISO	Ant1	5190	-5.39553	±20	PASS
	11AC80SISO	Ant1	5210	1.53566	±20	PASS
	11N20SISO	Ant1	5180	-2.31683	±20	PASS
LTV	11A	Ant1	5180	1.15842	±20	PASS
	11N40SISO	Ant1	5190	6.16632	±20	PASS
	11AC20SISO	Ant1	5180	-1.93070	±20	PASS
	11AC40SISO	Ant1	5190	-3.85395	±20	PASS
	11AC80SISO	Ant1	5210	1.53566	±20	PASS
	11N20SISO	Ant1	5180	-3.08911	±20	PASS
HTNV	11A	Ant1	5180	-3.86139	±20	PASS
	11N40SISO	Ant1	5190	4.62474	±20	PASS
	11AC20SISO	Ant1	5180	0.77228	±20	PASS
	11AC40SISO	Ant1	5190	0.77079	±20	PASS
	11AC80SISO	Ant1	5210	-1.53566	±20	PASS
	11N20SISO	Ant1	5180	-5.01981	±20	PASS









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**ETSI EN 301 893 V2.1.1 (2017-05) § 4.2.2- NOMINAL CHANNEL BANDWIDTH AND OCCUPIED CHANNEL BANDWIDTH**

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**Definition**

The Nominal Channel Bandwidth is the widest band of frequencies, inclusive of guard bands, assigned to a single channel.

The Occupied Channel Bandwidth is the bandwidth containing 99 % of the power of the signal.

A device is permitted to operate in one or more adjacent or non-adjacent channels simultaneously.

When equipment has simultaneous transmissions in adjacent channels, these transmissions may be considered as one signal with an actual Nominal Channel Bandwidth of "n" times the individual Nominal Channel Bandwidth where "n" is the number of adjacent channels. When equipment has simultaneous transmissions in non-adjacent channels, each power envelope shall be considered separately.

**Limits**

The Nominal Channel Bandwidth shall be at least 5 MHz at all times.

The Occupied Channel Bandwidth shall be between 80 % and 100 % of the declared Nominal Channel Bandwidth. In case of smart antenna systems (devices with multiple transmit chains) each of the transmit chains shall meet this requirement.

During an established communication, the device is allowed to operate temporarily with an Occupied Channel Bandwidth below 80 % of its Nominal Channel Bandwidth with a minimum of 4 MHz.

**Test Procedure****Test conditions**

The conformance requirements in clause 4.2.2 shall be verified only under normal operating conditions, and on those channels and channel bandwidths defined in clause 5.3.2.

The measurements shall be performed using normal operation of the equipment with the test signal applied (see clause 5.3.1.1).

The UUT shall be configured to operate at a typical RF power output level used for normal operation.

When equipment has simultaneous transmissions in adjacent channels, these transmissions may be considered as one signal with an actual Nominal Channel Bandwidth of "n" times the individual Nominal Channel Bandwidth where "n" is the number of adjacent channels. When equipment has simultaneous transmissions in non-adjacent channels, each power envelope shall be considered separately.

For a UUT with antenna connector(s) and using dedicated external antenna(s), or for a UUT with integral antenna(s) but with a temporary antenna connector(s) provided, conducted measurements shall be used. In case of conducted measurements on smart antenna systems (devices with multiple transmit chains) measurements need only to be performed on one of the active transmit chains (antenna outputs).

For a UUT with integral antenna(s) and without a temporary antenna connector(s), radiated measurements shall be used.

## Test method

### Conducted measurement

The measurement procedure shall be as follows:

#### Step 1:

- Connect the UUT to the spectrum analyser and use the following settings:
  - Centre Frequency: The centre frequency of the channel under test
  - Resolution Bandwidth: 100 kHz
  - Video Bandwidth: 300 kHz
  - Frequency Span:  $2 \times$  Nominal Bandwidth (e.g. 40 MHz for a 20 MHz channel)
  - Sweep time:  $> 1$  s; for larger Nominal Bandwidths, the sweep time may be increased until a value where the sweep time has no impact on the RMS value of the signal
  - Detector Mode: RMS
  - Trace Mode: Max Hold

#### Step 2:

- Wait for the trace to stabilize.

#### Step 3:

- Make sure that the power envelope is sufficiently above the noise floor of the analyser to avoid the noise signals left and right from the power envelope being taken into account by this measurement.
- Use the 99 % bandwidth function of the spectrum analyser to measure the Occupied Channel Bandwidth of the UUT. This value shall be recorded.

The measurement described in step 1 to step 3 above shall be repeated in case of simultaneous transmissions in non-adjacent channels.

### Radiated measurement

The test set up as described in annex B and the applicable measurement procedures described in annex C shall be used.

The test procedure is as described under clause 5.4.3.2.1.



**Test Data****Environmental Conditions**

<b>Temperature:</b>	23~25 °C
<b>Relative Humidity:</b>	50~51 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Black Ding on 2021-06-08.*

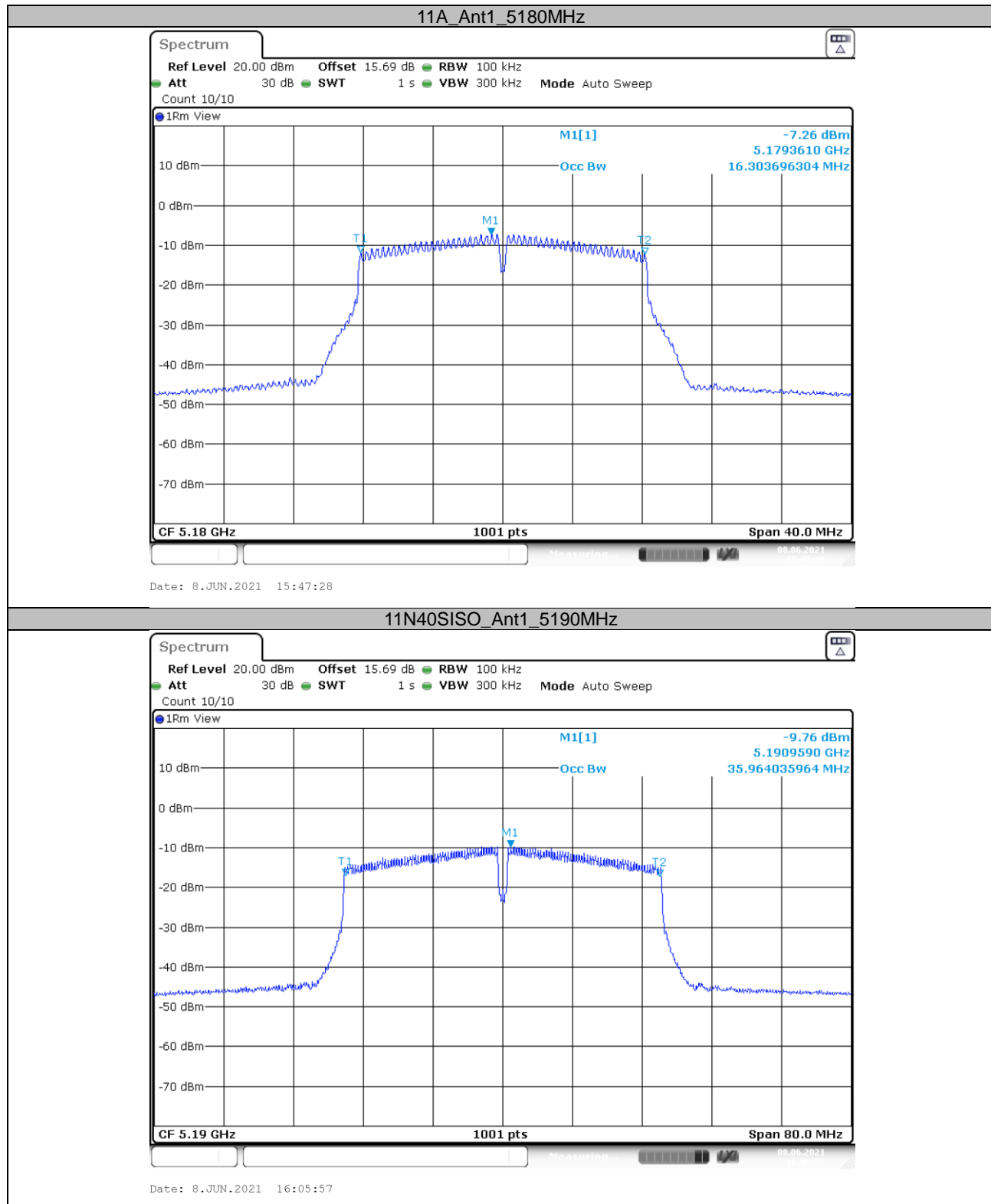
*Test Mode: Transmitting*

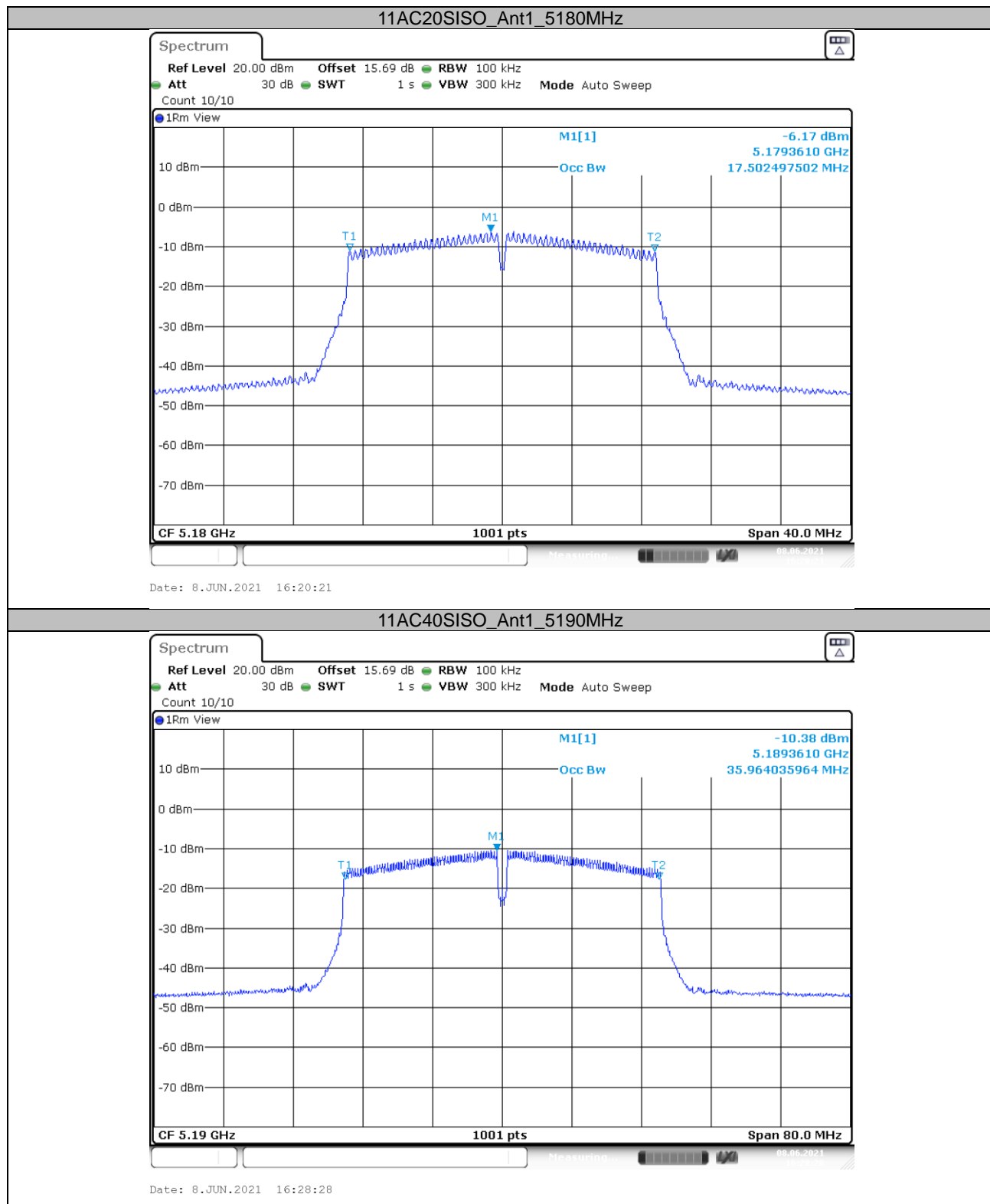
**Test Result:** Compliant.

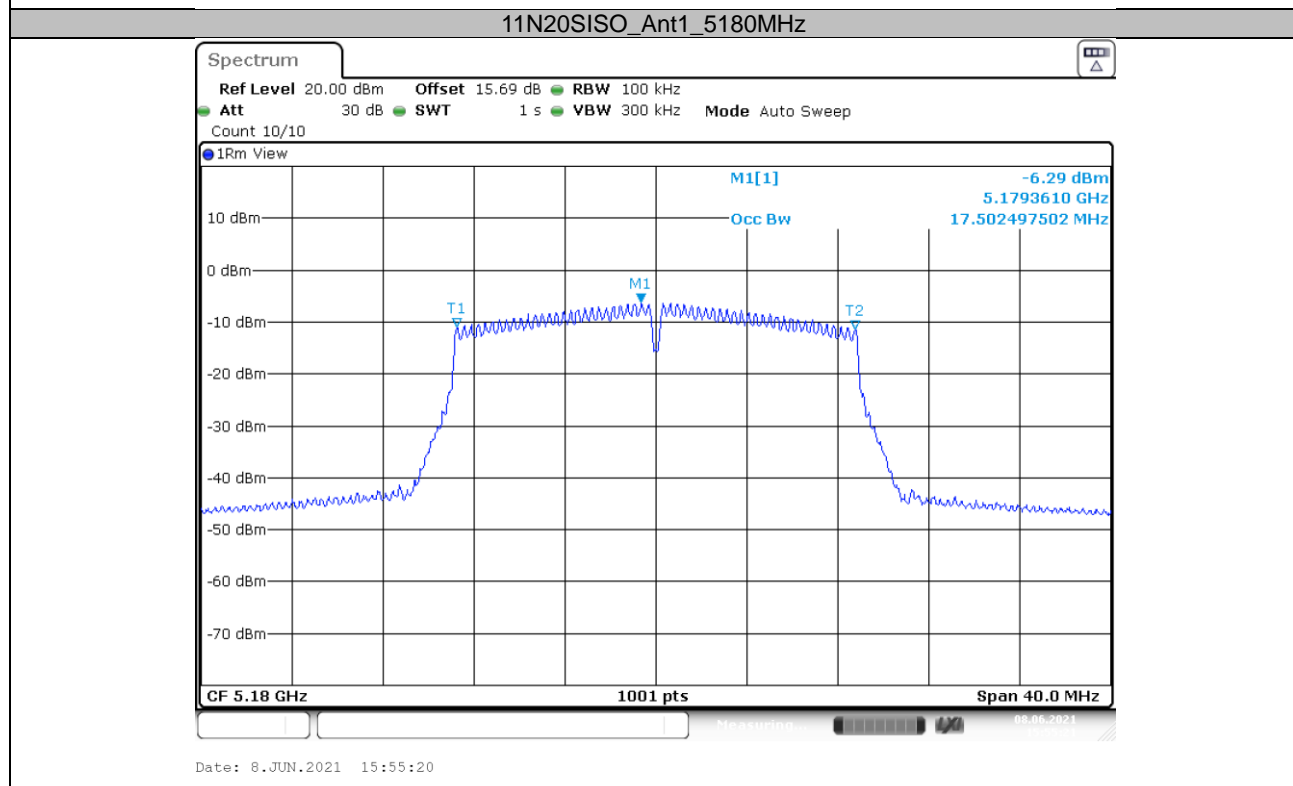
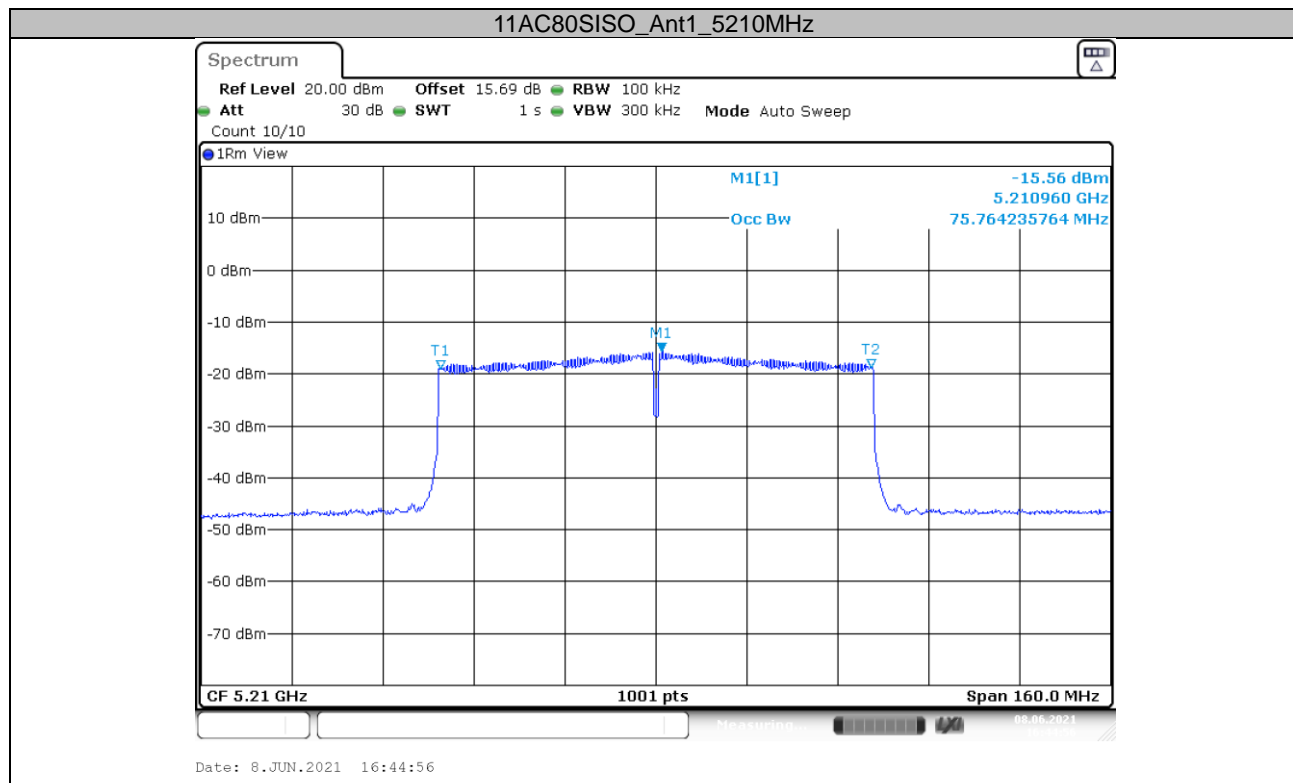
*Please refer to following table and plots.*

**5150-5250MHz:**

<b>Mode</b>	<b>Frequency (MHz)</b>	<b>Declared Bandwidth (MHz)</b>	<b>99% Occupied Bandwidth (MHz)</b>	<b>Limit (MHz)</b>	<b>Result</b>
11A	5180	20	16.304	16 to 20	Pass
11N20SISO	5180	20	17.502	16 to 20	Pass
11N40SISO	5190	40	35.964	32 to 40	Pass
11AC20SISO	5180	20	17.502	16 to 20	Pass
11AC40SISO	5190	40	35.964	32 to 40	Pass
11AC80SISO	5210	80	75.764	64 to 80	Pass







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**ETSI EN 301 893 V2.1.1 (2017-05) § 4.2.3 - RF OUTPUT POWER,  
TRANSMIT POWER CONTROL (WITHOUT TPC) AND POWER  
DENSITY**

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**Definition****RF Output Power:**

The RF Output Power is the mean equivalent isotropically radiated power (e.i.r.p.) during a transmission burst.

**Transmit Power Control (TPC):**

Transmit Power Control (TPC) is a mechanism to be used by the RLAN device to ensure a mitigation factor of at least 3 dB on the aggregate power from a large number of devices. This requires the RLAN device to have a TPC range from which the lowest value is at least 6 dB below the values for mean e.i.r.p. given in table 2 for devices with TPC.

**Power Density:**

The Power Density is the mean equivalent isotropically radiated power (e.i.r.p.) density during a transmission burst.

**Limits****General**

The limits below are applicable to the system as a whole and in any possible configuration. This includes smart antenna systems (devices with multiple transmit chains).

In case of multiple (adjacent or non-adjacent) channels within the same sub-band, the total RF output power of all channels in that sub-band shall not exceed the limits defined below.

In case of multiple, non-adjacent channels operating in separate sub-bands, the total RF output power in each of the sub-bands shall not exceed the limits defined below.

**RF output power and power density at the highest power level**

TPC is not required for channels whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz.

For devices with TPC, the RF output power and the power density when configured to operate at the highest stated power level of the TPC range shall not exceed the levels given in table 2.

Devices are allowed to operate without TPC. See table 2 for the applicable limits in this case.

**Table 2: Mean e.i.r.p. limits for RF output power and power density at the highest power level**

Frequency range [MHz]	Mean e.i.r.p. limit [dBm]		Mean e.i.r.p. density limit [dBm/MHz]	
	with TPC	without TPC	with TPC	without TPC
5 150 to 5 350	23	20/23 (see note 1)	10	7/10 (see note 2)
5 470 to 5 725	30 (see note 3)	27 (see note 3)	17 (see note 3)	14 (see note 3)
NOTE 1: The applicable limit is 20 dBm, except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 23 dBm.				
NOTE 2: The applicable limit is 7 dBm/MHz, except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 10 dBm/MHz.				
NOTE 3: Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5 250 MHz to 5 350 MHz.				

**RF output power at the lowest power level of the TPC range**

For devices using TPC, the RF output power during a transmission burst when configured to operate at the lowest stated power level of the TPC range shall not exceed the levels given in table 3. For devices without TPC, the limits in table 3 do not apply.

**Table 3: Mean e.i.r.p. limits for RF output power at the lowest power level of the TPC range**

Frequency range	Mean e.i.r.p. [dBm]
5 250 MHz to 5 350 MHz	17
5 470 MHz to 5 725 MHz	24 (see note)
NOTE: Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5 250 MHz to 5 350 MHz.	

**Test Procedure**

According to ETSI EN 301 893 V2.1.1 (2017-05) §5.4.4

**Test Data****Environmental Conditions**

<b>Temperature:</b>	23~25 °C
<b>Relative Humidity:</b>	50~51 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Black Ding from 2021-06-08 to 2021-06-30.*

*Test Mode: Transmitting*

**Test Result:** Compliant.

Please refer to following data tables and plots.

**RF Output Power****5150-5250MHz:**

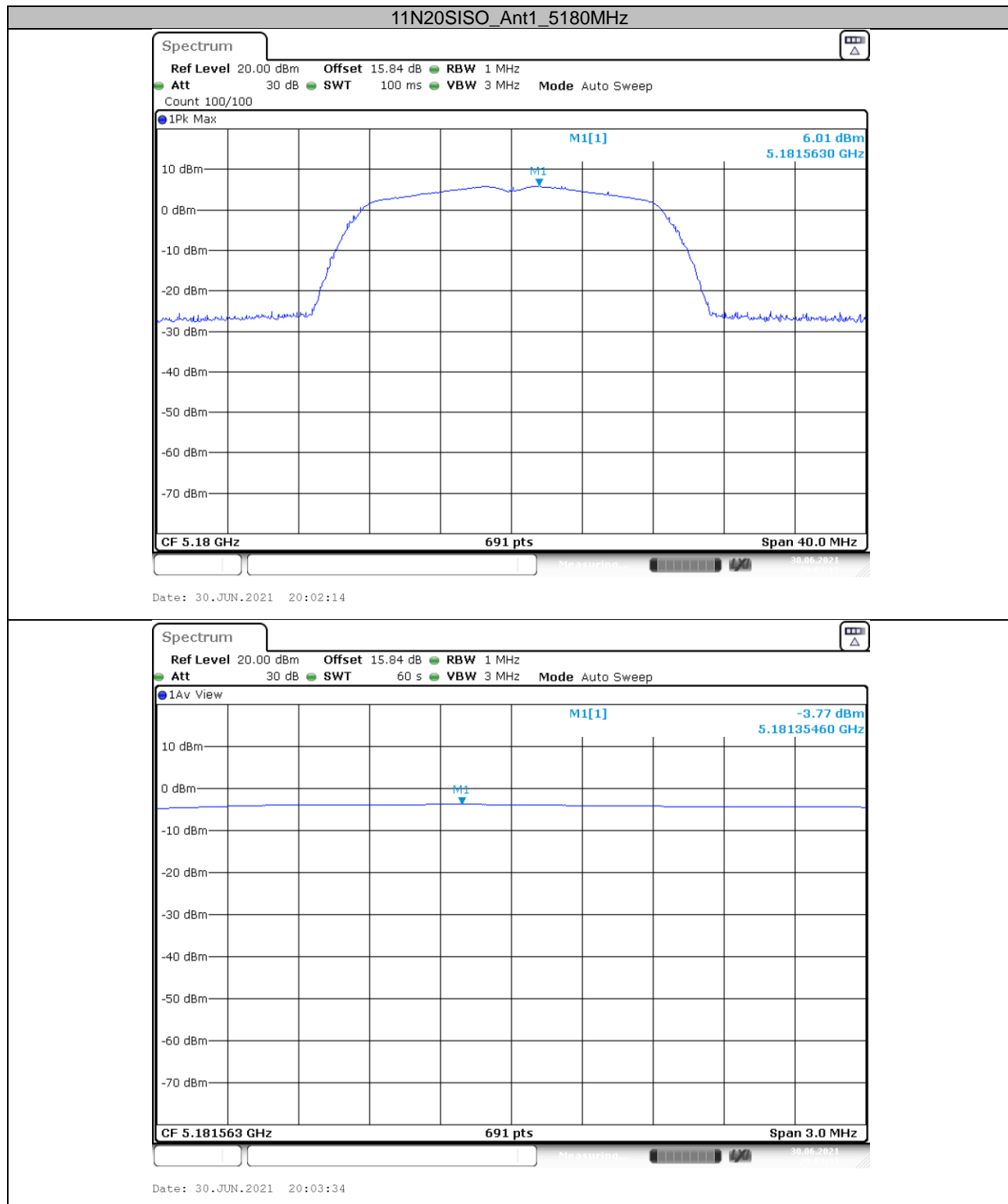
Test Condition	TestMode	TPC	Antenna	Channel	EIRP[dBm]	Limit[dBm]	Verdict
NTNV	11A	NA	Ant1	5180	10.84	23	PASS
	11N40SISO	NA	Ant1	5190	10.77	23	PASS
	11AC20SISO	NA	Ant1	5180	10.50	23	PASS
	11AC40SISO	NA	Ant1	5190	10.56	23	PASS
	11AC80SISO	NA	Ant1	5210	10.18	23	PASS
	11N20SISO	NA	Ant1	5180	10.83	23	PASS
LTNV	11A	NA	Ant1	5180	10.75	23	PASS
	11N40SISO	NA	Ant1	5190	10.59	23	PASS
	11AC20SISO	NA	Ant1	5180	10.47	23	PASS
	11AC40SISO	NA	Ant1	5190	10.36	23	PASS
	11AC80SISO	NA	Ant1	5210	10.12	23	PASS
	11N20SISO	NA	Ant1	5180	10.77	23	PASS
HTNV	11A	NA	Ant1	5180	10.81	23	PASS
	11N40SISO	NA	Ant1	5190	10.64	23	PASS
	11AC20SISO	NA	Ant1	5180	10.48	23	PASS
	11AC40SISO	NA	Ant1	5190	10.55	23	PASS
	11AC80SISO	NA	Ant1	5210	10.16	23	PASS
	11N20SISO	NA	Ant1	5180	10.72	23	PASS

**Power Density:**

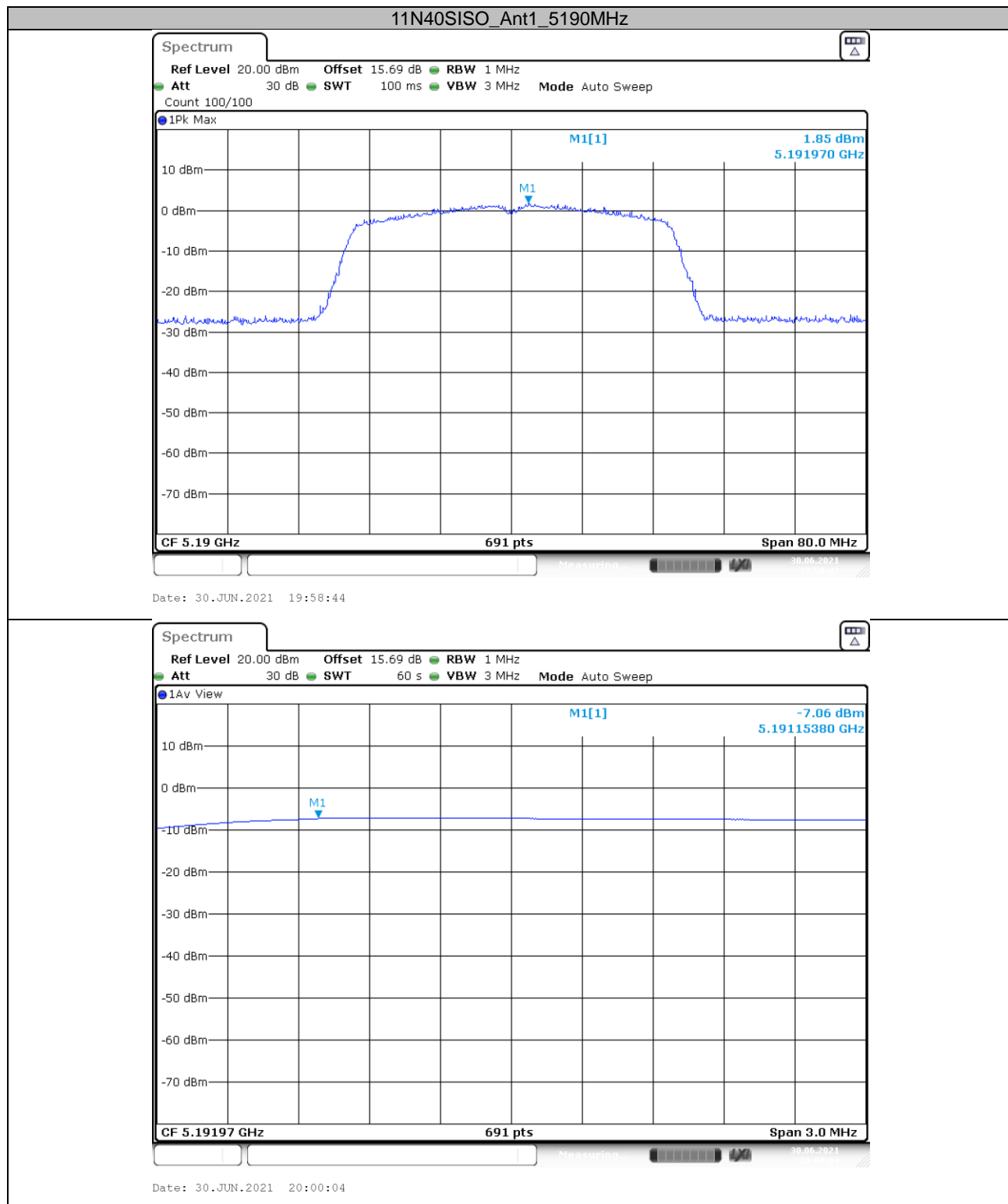
Mode	Frequency (MHz)	Antenna Port	PSD (dBm/MHz)	Limit (dBm/MHz)	Result
11A	5180	1	-3.77	10	PASS
11N20SISO	5180	1	-4.31	10	PASS
11N40SISO	5190	1	-7.06	10	PASS
11AC20SISO	5180	1	-4.02	10	PASS
11AC40SISO	5190	1	-6.47	10	PASS
11AC80SISO	5210	1	-10.05	10	PASS

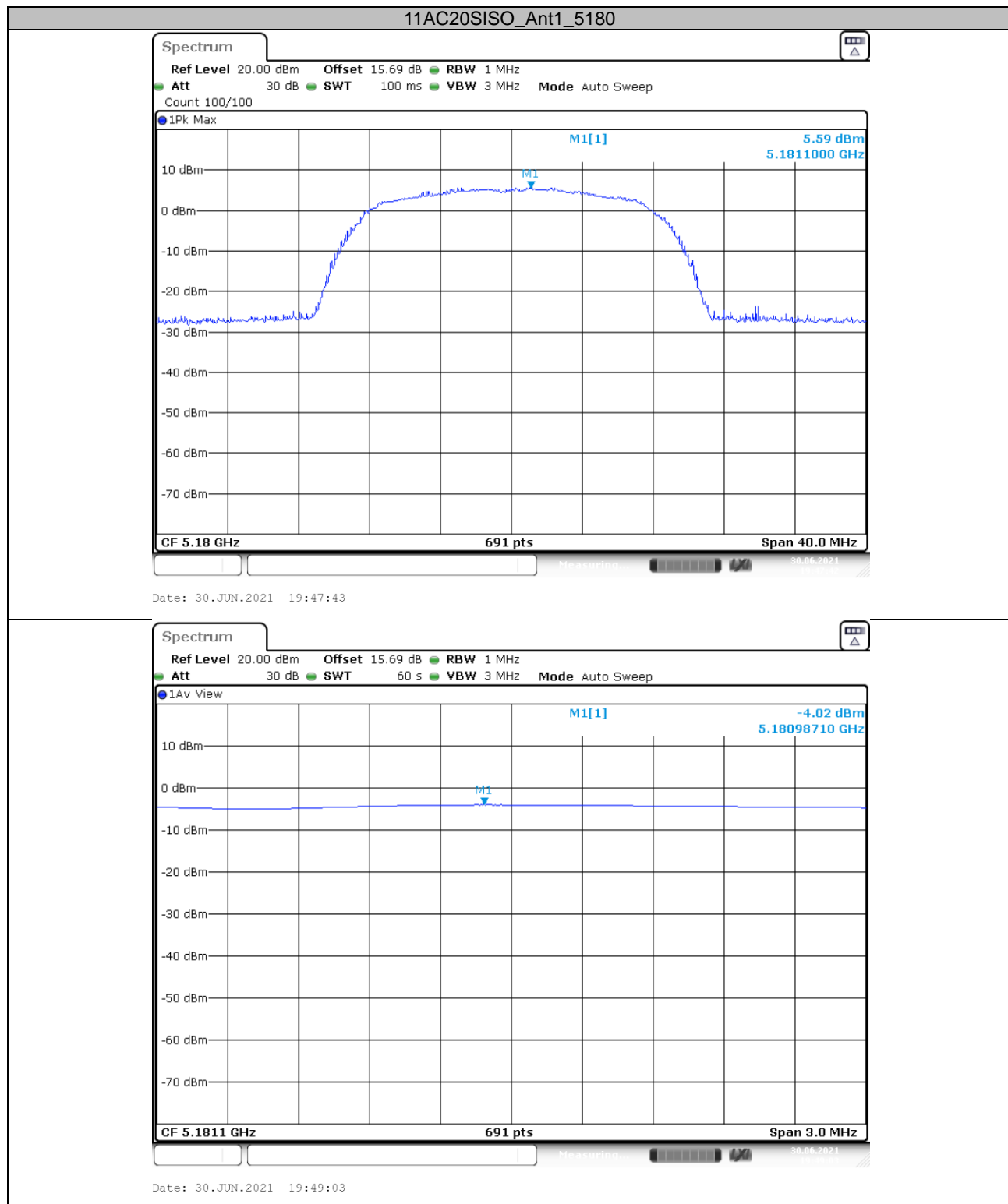
Note 1: EUT without TPC function.

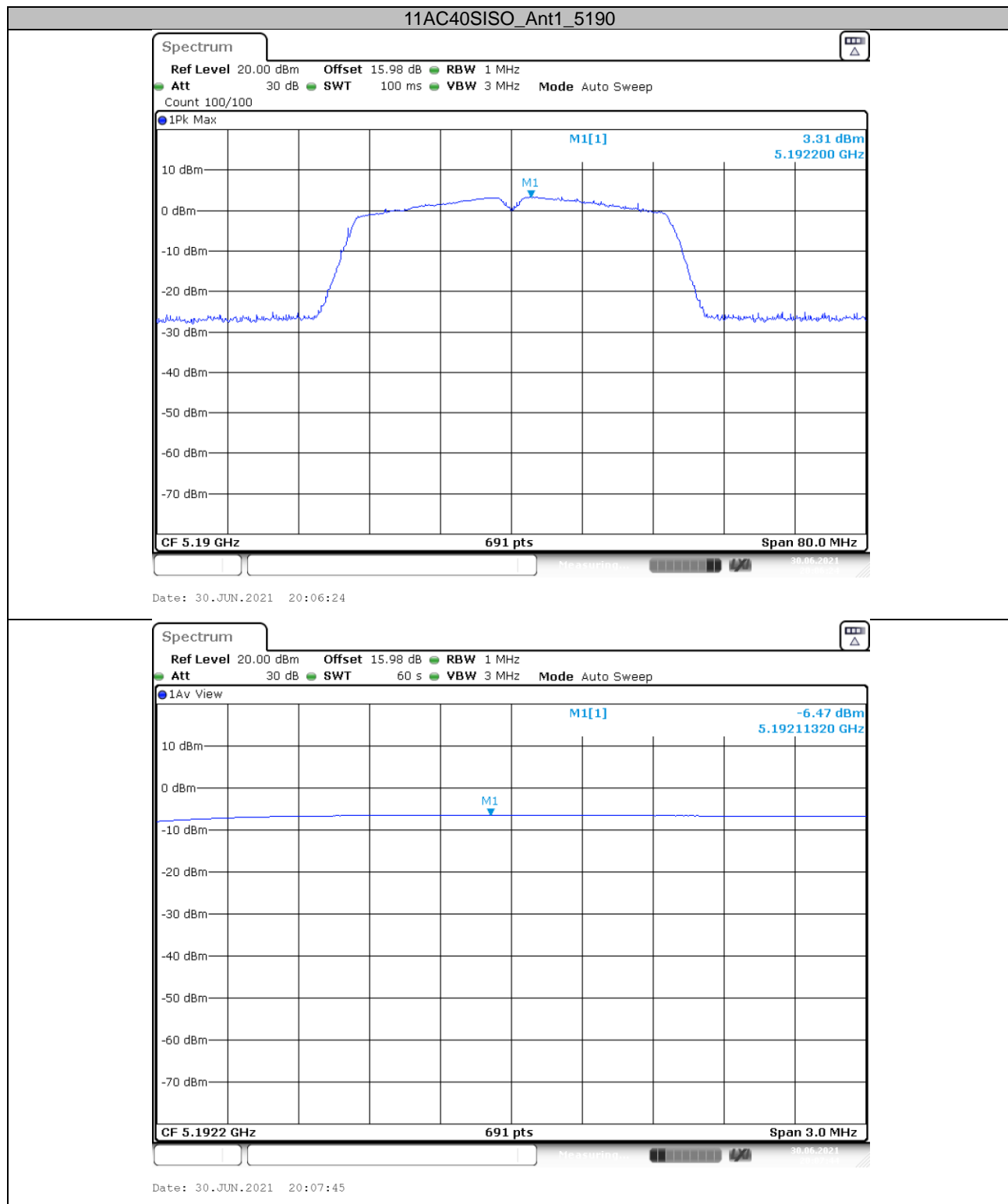
Note 2: Antenna gain and duty cycle factor had been added into test result.

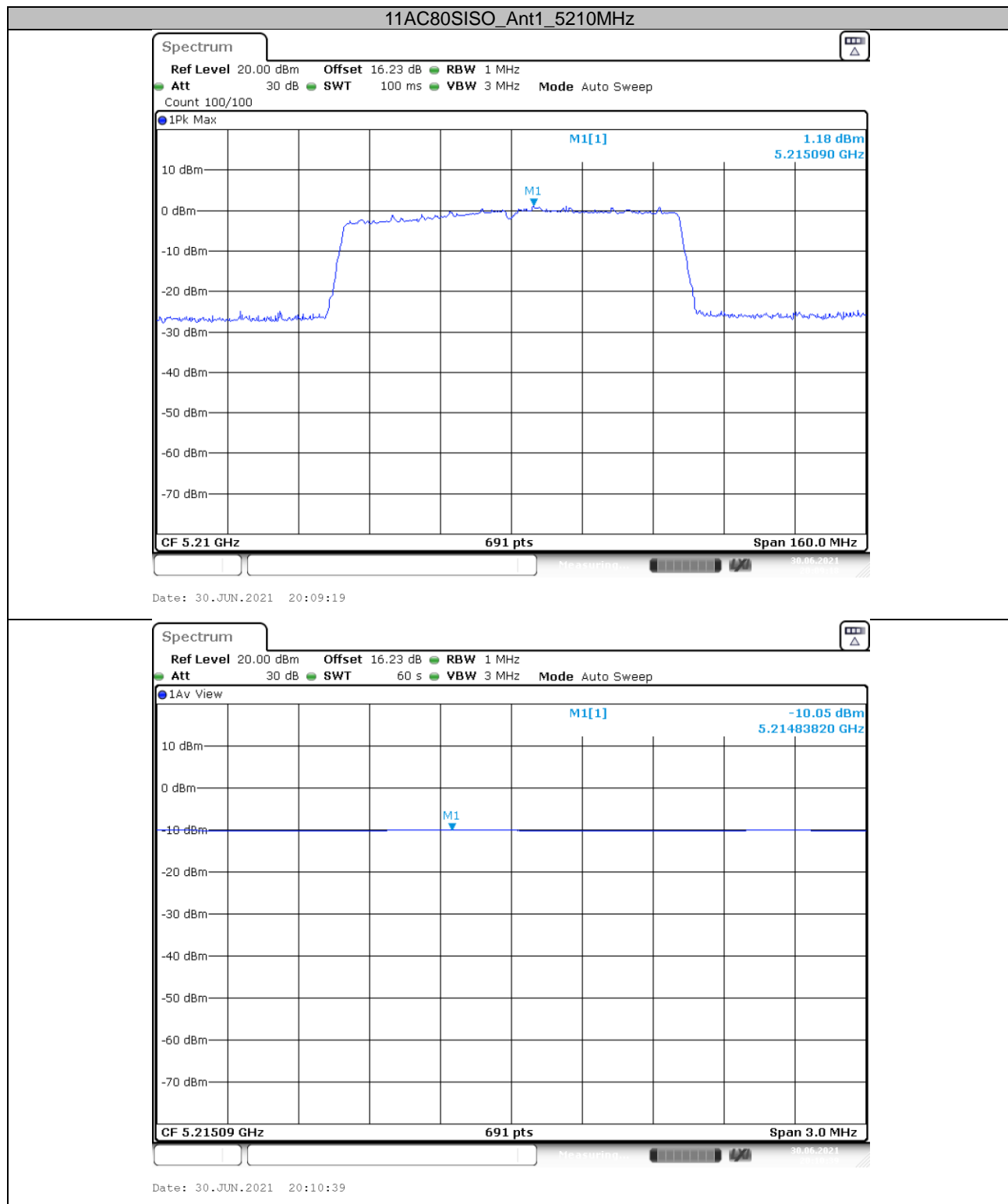


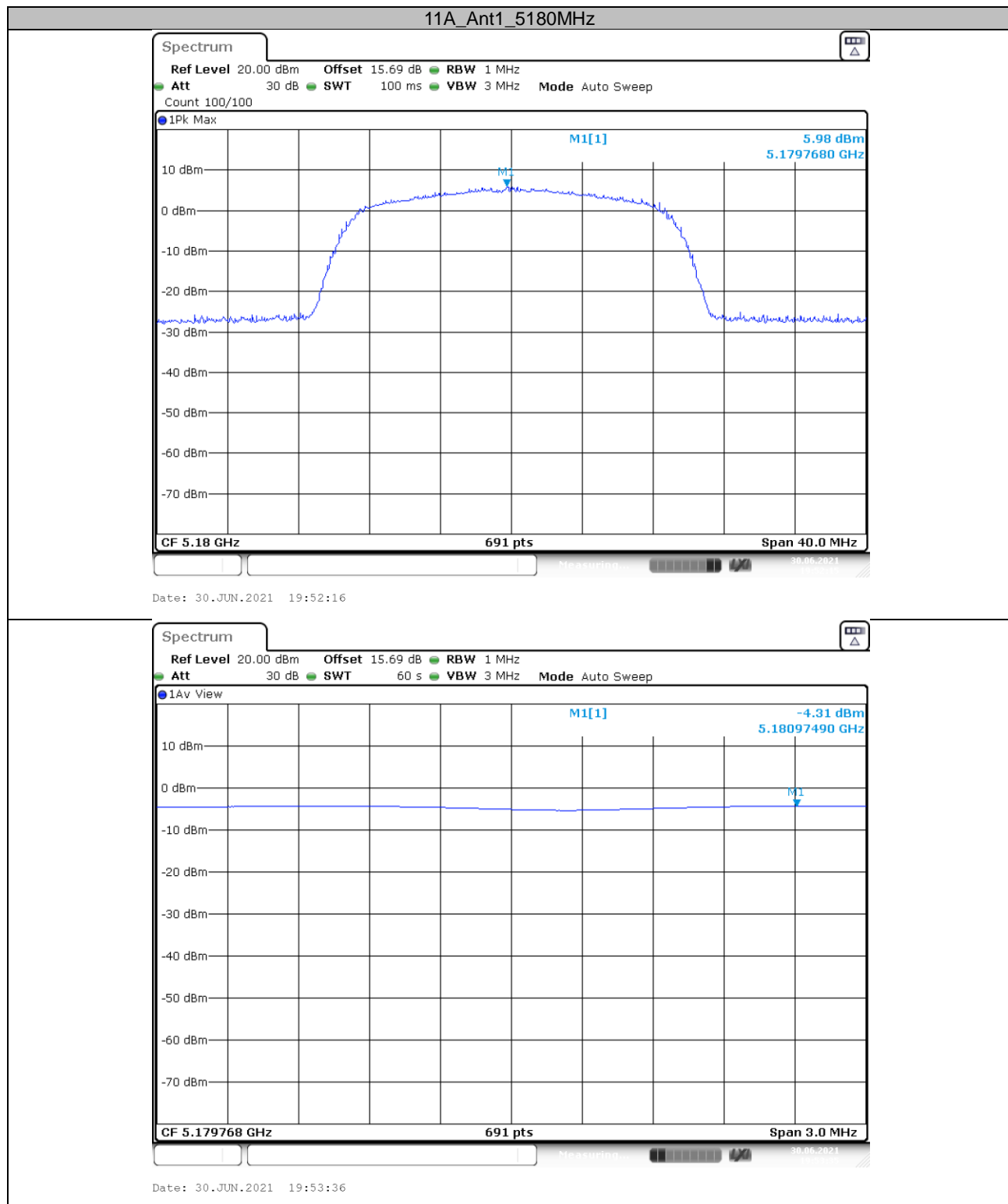












## ETSI EN 301 893 V2.1.1 (2017-05) 4.2.4.1 - TRANSMITTER UNWANTED EMISSIONS OUTSIDE THE 5 GHZ RLAN BANDS

### Definition

Transmitter unwanted emissions outside the 5 GHz RLAN bands are radio frequency emissions outside the 5 GHz RLAN bands defined in clause 3.1.

### Limits

The level of transmitter unwanted emissions outside the 5 GHz RLAN bands shall not exceed the limits given in table 4.

In case of equipment with antenna connectors, these limits apply to emissions at the antenna port (conducted) and to the emissions radiated by the cabinet. In case of integral antenna equipment (without temporary antenna connectors), these limits apply to emissions radiated by the equipment.

**Table 4: Transmitter unwanted emission limits outside the 5 GHz RLAN bands**

Frequency range	Maximum power	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz
118 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 862 MHz	-54 dBm	100 kHz
862 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 5,15 GHz	-30 dBm	1 MHz
5,35 GHz to 5,47 GHz	-30 dBm	1 MHz
5,725 GHz to 26 GHz	-30 dBm	1 MHz

### Test Procedure

According to ETSI EN 301 893 V2.1.1 (2017-05) §5.4.5

### Test Data

#### Environmental Conditions

<b>Temperature:</b>	23~25 °C
<b>Relative Humidity:</b>	50~52 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Black Ding on 2021-06-08.*

*Test Mode: Transmitting*

**Test Result:** Compliant.

Please refer to following table.

## 30MHz-26GHz

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
11A								
182.14	-63.01	85	1.10	H	-5.53	-68.54	-54.00	14.54
183.19	-66.03	166	1.30	V	-2.34	-68.37	-54.00	14.37
10360.00	-60.02	23	1.80	H	16.06	-43.96	-30.00	13.96
10360.00	-61.38	167	2.00	V	17.53	-43.85	-30.00	13.85
11N20								
182.14	-63.12	142	1.10	H	-5.53	-68.65	-54.00	14.65
183.19	-66.17	290	1.20	V	-2.34	-68.51	-54.00	14.51
10360.00	-60.22	136	1.50	H	16.06	-44.16	-30.00	14.16
10360.00	-61.35	12	1.70	V	17.53	-43.82	-30.00	13.82
11AC20								
182.14	-63.14	337	1.10	H	-5.53	-68.67	-54.00	14.67
183.19	-66.19	248	1.30	V	-2.34	-68.53	-54.00	14.53
10360.00	-60.16	259	1.50	H	16.06	-44.10	-30.00	14.10
10360.00	-61.42	130	1.90	V	17.53	-43.89	-30.00	13.89
11N40								
182.14	-63.18	127	1.30	H	-5.53	-68.71	-54.00	14.71
183.19	-66.24	21	1.20	V	-2.34	-68.58	-54.00	14.58
10380.00	-60.68	217	1.50	H	16.07	-44.61	-30.00	14.61
10380.00	-61.34	136	1.60	V	17.57	-43.77	-30.00	13.77
11AC40								
182.14	-63.16	237	1.00	H	-5.53	-68.69	-54.00	14.69
183.19	-66.21	148	1.30	V	-2.34	-68.55	-54.00	14.55
10380.00	-60.35	291	1.70	H	16.07	-44.28	-30.00	14.28
10380.00	-61.26	283	2.10	V	17.57	-43.69	-30.00	13.69
11AC80								
182.14	-63.22	126	1.20	H	-5.53	-68.75	-54.00	14.75
183.19	-66.28	208	1.10	V	-2.34	-68.62	-54.00	14.62
10420.00	-60.54	302	1.50	H	16.09	-44.45	-30.00	14.45
10420.00	-61.42	157	1.80	V	17.61	-43.81	-30.00	13.81

Note:

Absolute Level = Reading Level + Substituted Factor

Substituted Factor contains: SG Level - Cable loss+ Antenna Gain

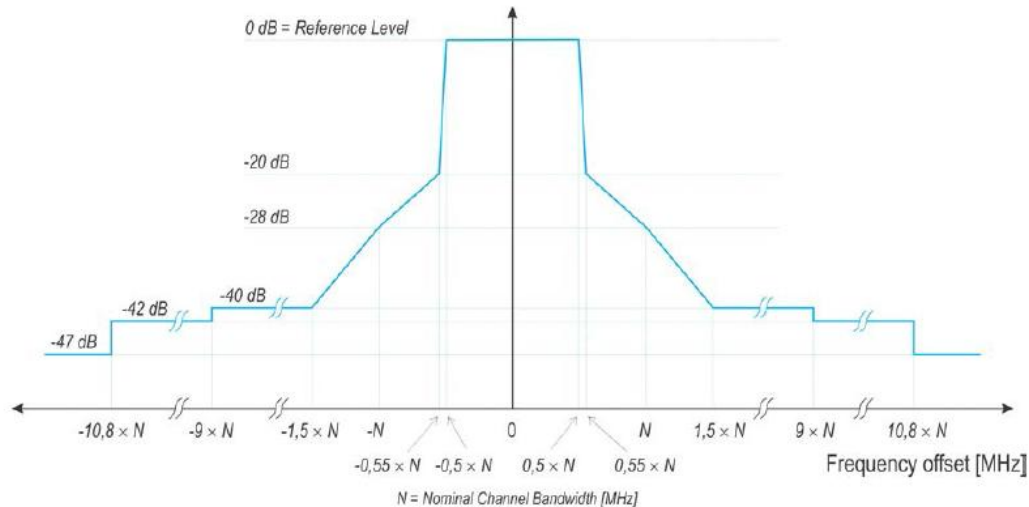
Margin = Limit - Absolute Level

## ETSI EN 301 893 V2.1.1 (2017-05) §4.2.4.2 –TRANSMITTER UNWANTED EMISSIONS WITHIN THE 5 GHZ RLAN BANDS

### Definition

Transmitter unwanted emissions within the 5 GHz RLAN bands are radio frequency emissions within the 5 GHz RLAN bands defined in clause 3.1.

### Limits



NOTE: dBc is the spectral density relative to the maximum spectral power density of the transmitted signal.

**Figure 1: Transmit spectral power mask**

The average level of transmitter unwanted emissions within the 5 GHz RLAN bands shall not exceed the limit of the mask provided in figure 1 or the limit for unwanted emissions provided in table 4, whichever is the higher.

The mask is only applicable within the band of operation. Beyond the band edges the requirements of clause 4.2.4.1 apply.

In case of smart antenna systems (devices with multiple transmit chains) each of the transmit chains shall meet this requirement.

For transmitter unwanted emissions within the 5 GHz RLAN bands, simultaneous transmissions in adjacent channels may be considered as one signal with an actual Nominal Channel Bandwidth of "n" times the individual Nominal Channel Bandwidth where "n" is the number of adjacent channels used simultaneously.

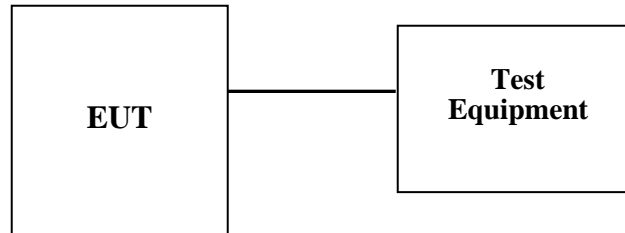
For simultaneous transmissions in multiple non-adjacent channels, the overall transmit spectral power mask is constructed in the following manner. First, a mask as provided in figure 1 is applied to each of the channels. Then, for each frequency point, the highest value from the spectral masks of all the channels assessed shall be taken as the overall spectral mask requirement at that frequency.



## Test Procedure

According to ETSI EN 301 893 V2.1.1 (2017-05) §5.4.6.

## Test Set up Block diagram



## Test Data

### Environmental Conditions

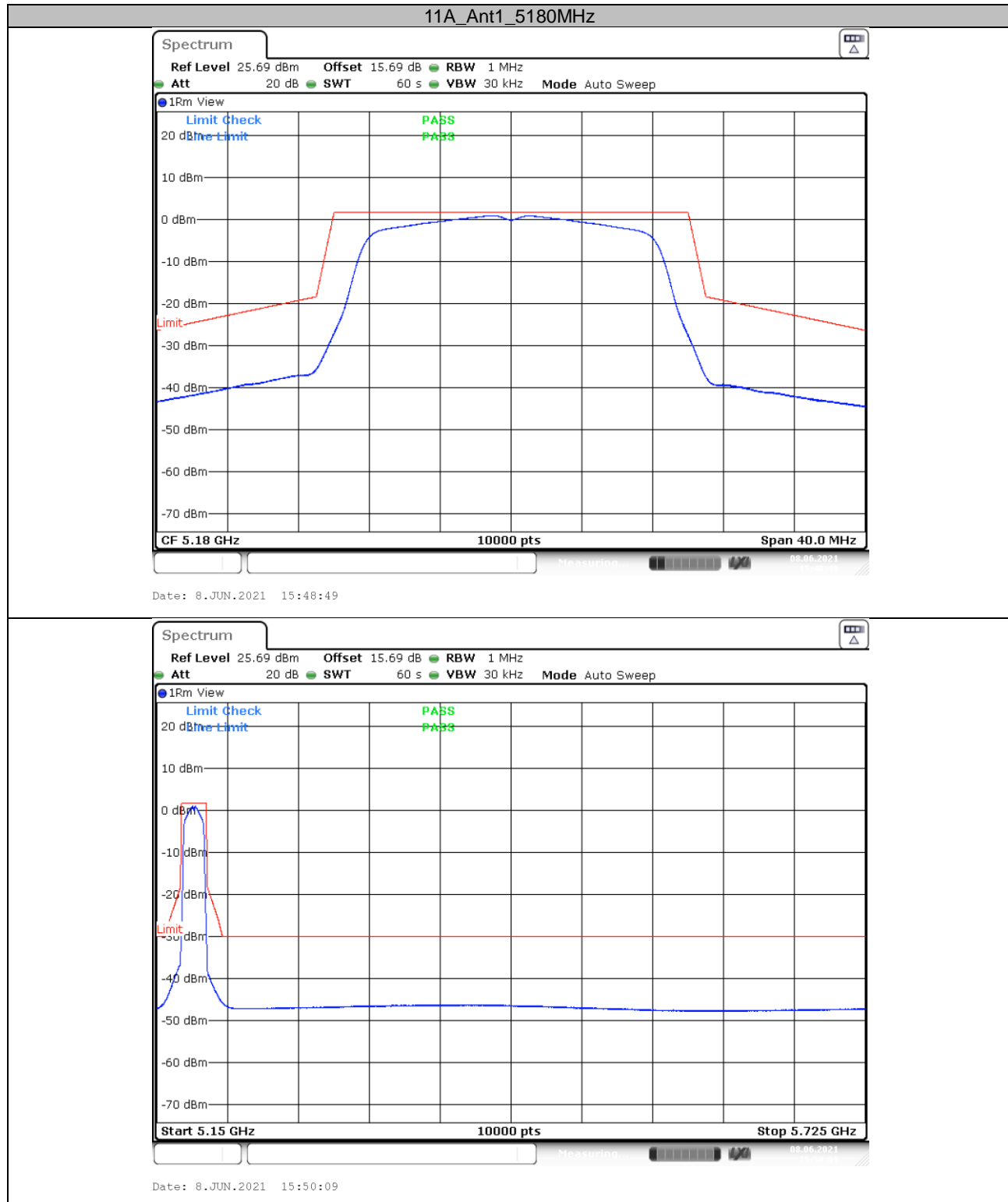
Temperature:	23~25 °C
Relative Humidity:	50~52 %
ATM Pressure:	101.0 kPa

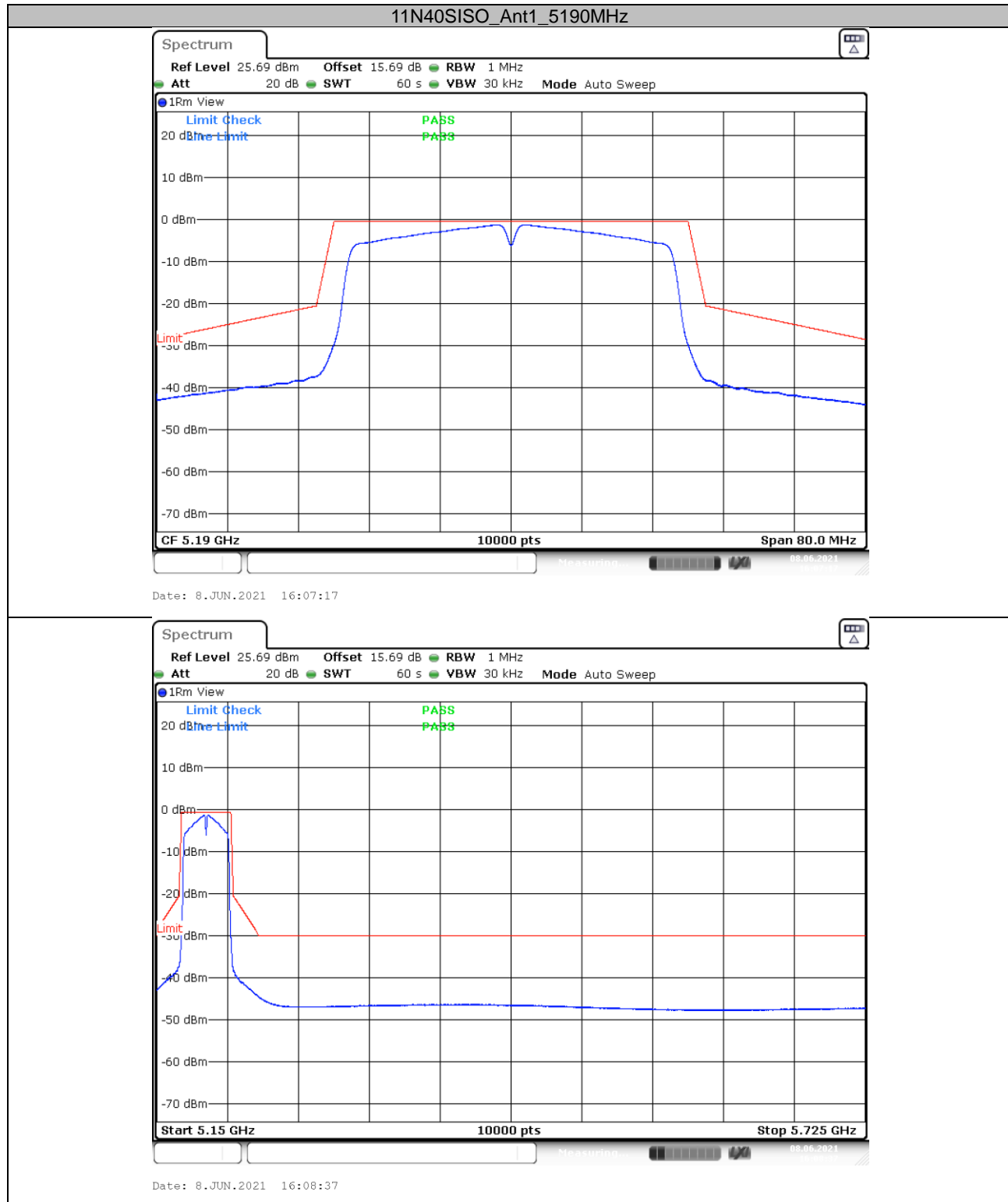
*The testing was performed by Black Ding on 2021-06-08.*

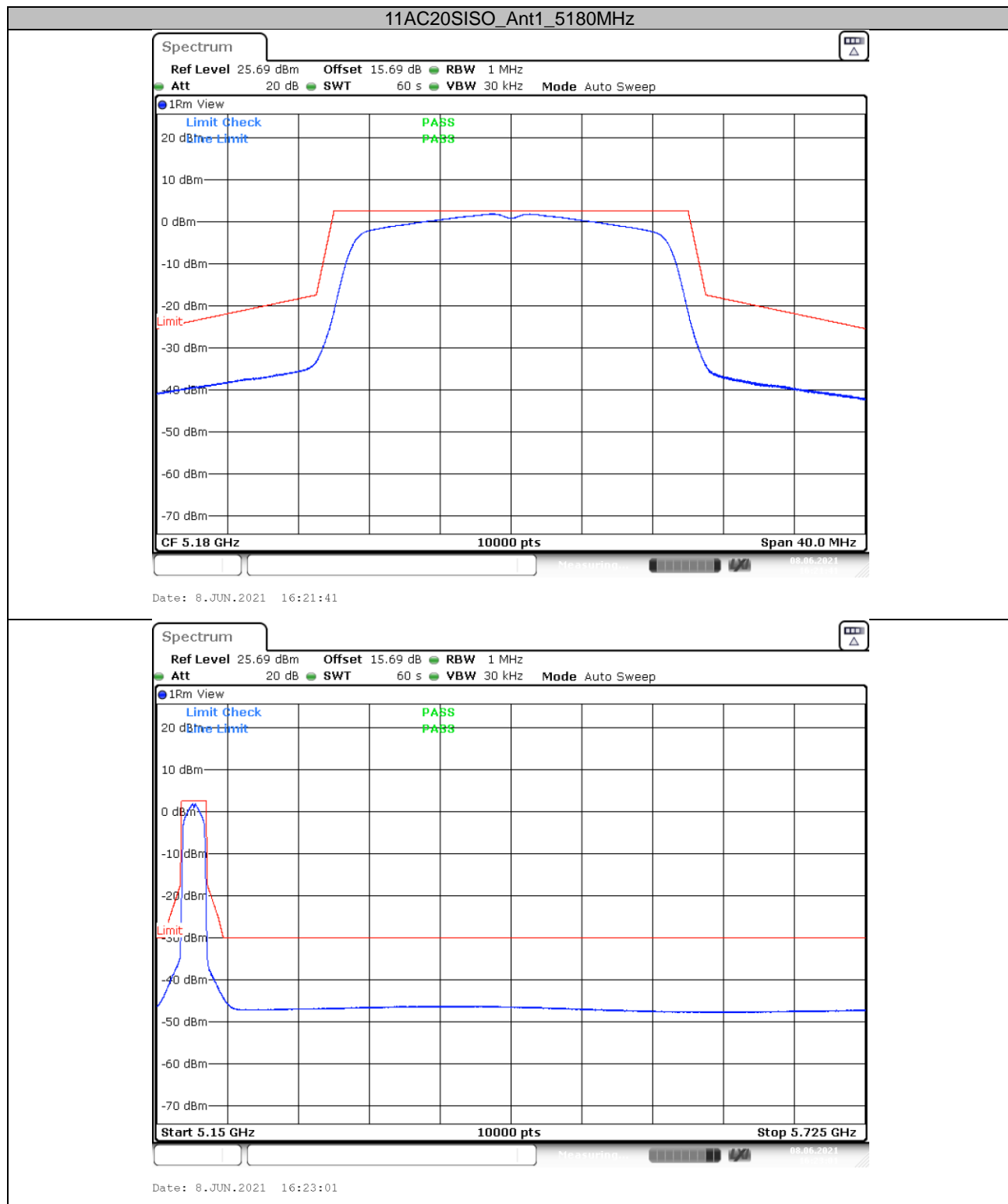
*Test mode: Transmitting*

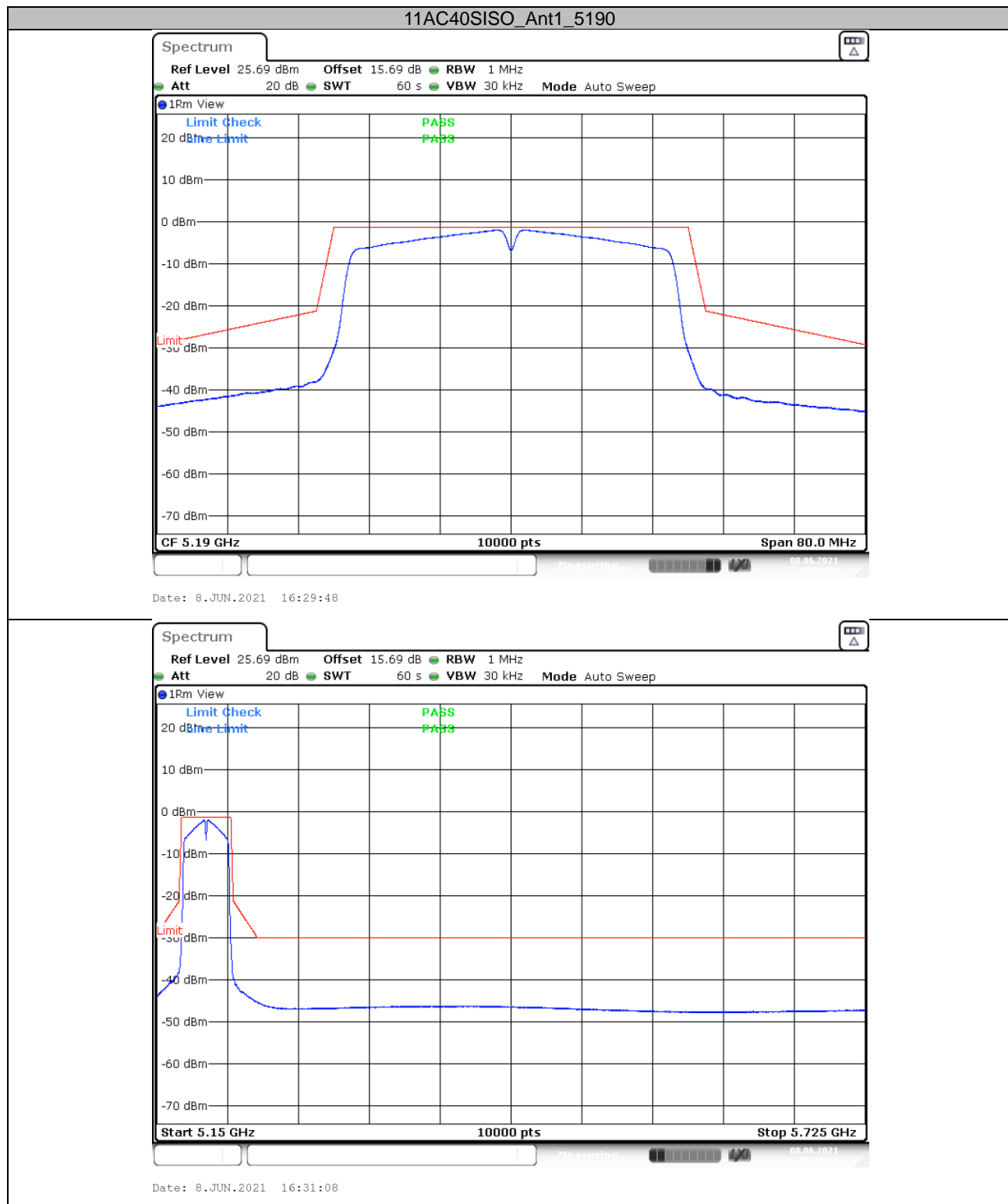
Please refer to following plots.

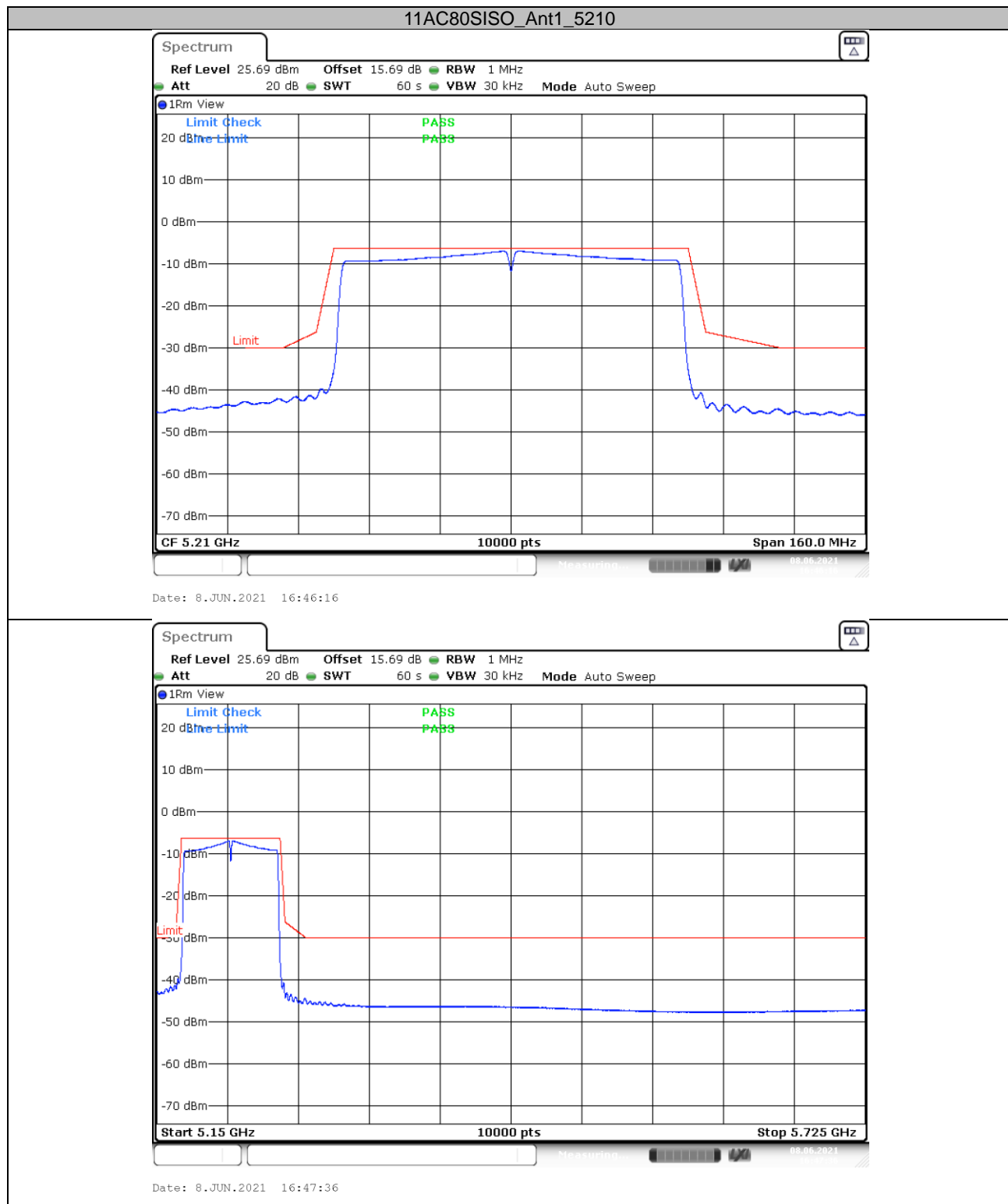
**Test Result:** Compliant.

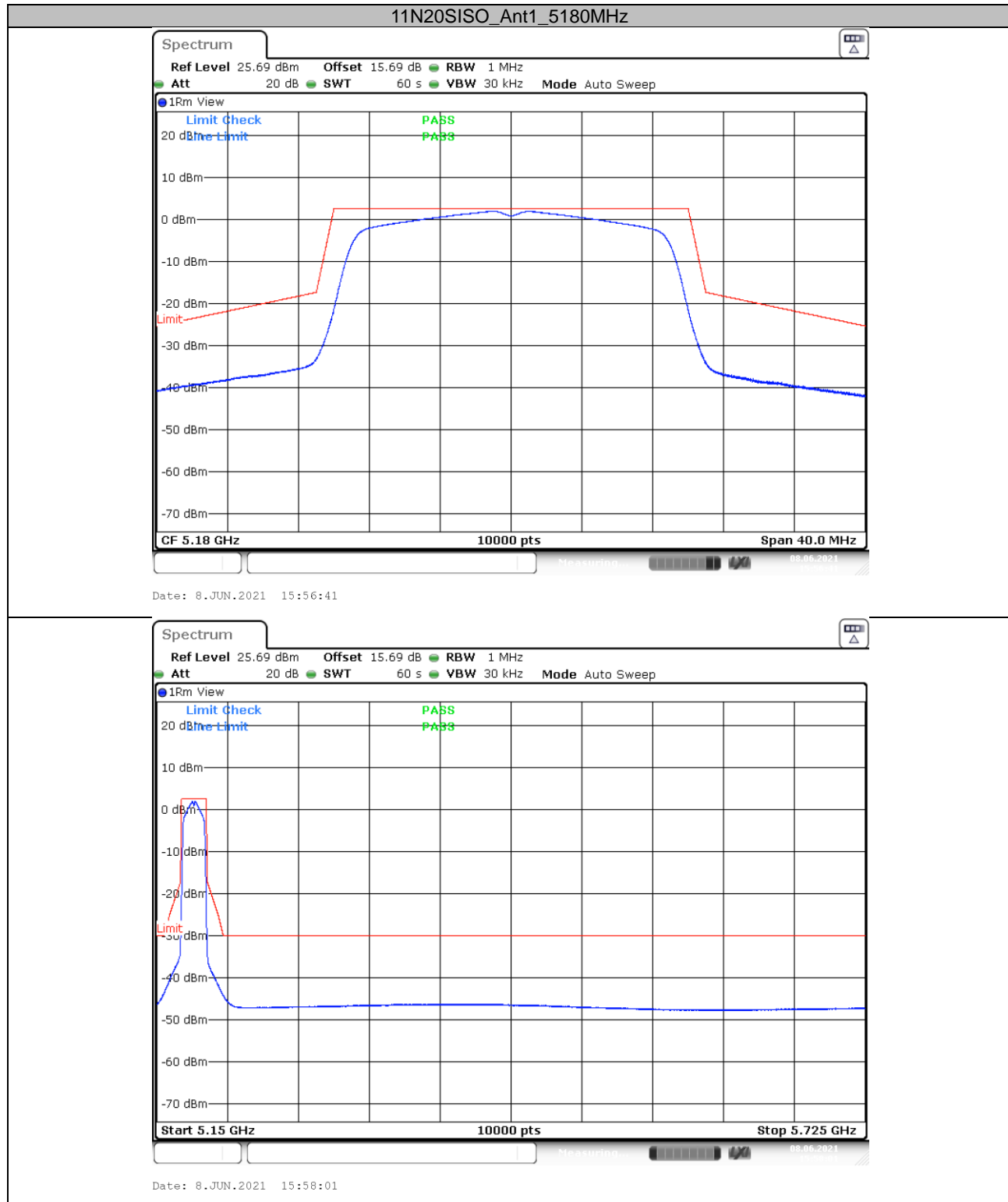
**5150-5250MHz:**











## ETSI EN 301 893 V2.1.1 (2017-05) §4.2.5 – RECEIVER SPURIOUS EMISSIONS

### Definition

Receiver spurious emissions are emissions at any frequency when the equipment is in receive mode.

### Limits

The spurious emissions of the receiver shall not exceed the limits given in table 5.

In case of equipment with antenna connectors, these limits apply to emissions at the antenna port (conducted) and to the emissions radiated by the cabinet. In case of integral antenna equipment (without temporary antenna connectors), these limits apply to emissions radiated by the equipment.

**Table 5: Spurious radiated emission limits**

Frequency range	Maximum power	Measurement bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 26 GHz	-47 dBm	1 MHz

### Test Procedure

According to ETSI EN 301 893 V2.1.1 (2017-05) §5.4.7.

### Test Data

#### Environmental Conditions

<b>Temperature:</b>	23~25 °C
<b>Relative Humidity:</b>	50~52 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Black Ding on 2021-06-08.*

*Test mode: Receiver (worst case as below)*

*Note: Pretest with 802.11a, 802.11n20, 802.11n40, 802.11ac20, 802.11ac40, 802.11ac80, the worst case was 802.11a mode.*

**Test Result:** Compliant.



30MHz – 26GHz:

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
802.11A, Low Channel								
182.14	-63.45	115	1.70	H	-5.53	-68.98	-57.00	11.98
31.40	-60.49	200	1.20	V	-4.62	-65.11	-57.00	8.11
4908.55	-70.31	37	1.70	H	8.31	-62.00	-47.00	15.00
4908.55	-71.69	143	1.60	V	9.41	-62.28	-47.00	15.28

Note:

Absolute Level = Reading Level + Substituted Factor

Substituted Factor contains: SG Level - Cable loss+ Antenna Gain

Margin = Limit - Absolute Level

## ETSI EN 301 893 V2.1.1 (2017-05) §4.2.7 – ADAPTIVITY (CHANNEL ACCESS MECHANISM)

### Definition

Adaptivity is an automatic channel access mechanism by which a device avoids transmissions in a channel in the presence of transmissions from other RLAN devices in that channel.

Adaptivity is not intended to be used as an alternative to DFS to detect radar transmissions, but to detect transmissions from other RLAN devices operating in the band. DFS requirements are covered by clause 4.2.6.

### Limit

This requirement applies to all equipment within the scope of the present document.

The present document defines 2 types of Adaptive equipment: Frame Based Equipment and Load Based Equipment.

Whilst the mechanisms described in this clause define conditions under which the equipment may transmit, transmissions are only allowed providing they are not prohibited by any of the DFS requirements in clause 4.2.6.

### Test Procedure

According to ETSI EN 301 893 V2.1.1 (2017-05) §5.4.9.

### Test Setup Block diagram

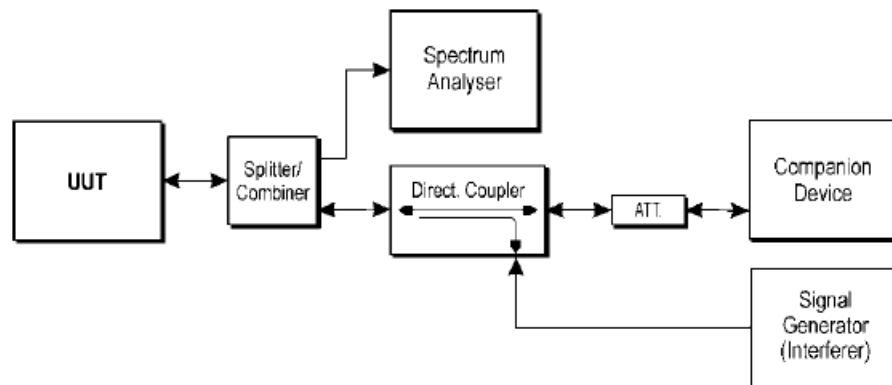


Figure 13: Example Test Set-up for verifying the adaptivity of an equipment

## Test Data

### Environmental Conditions

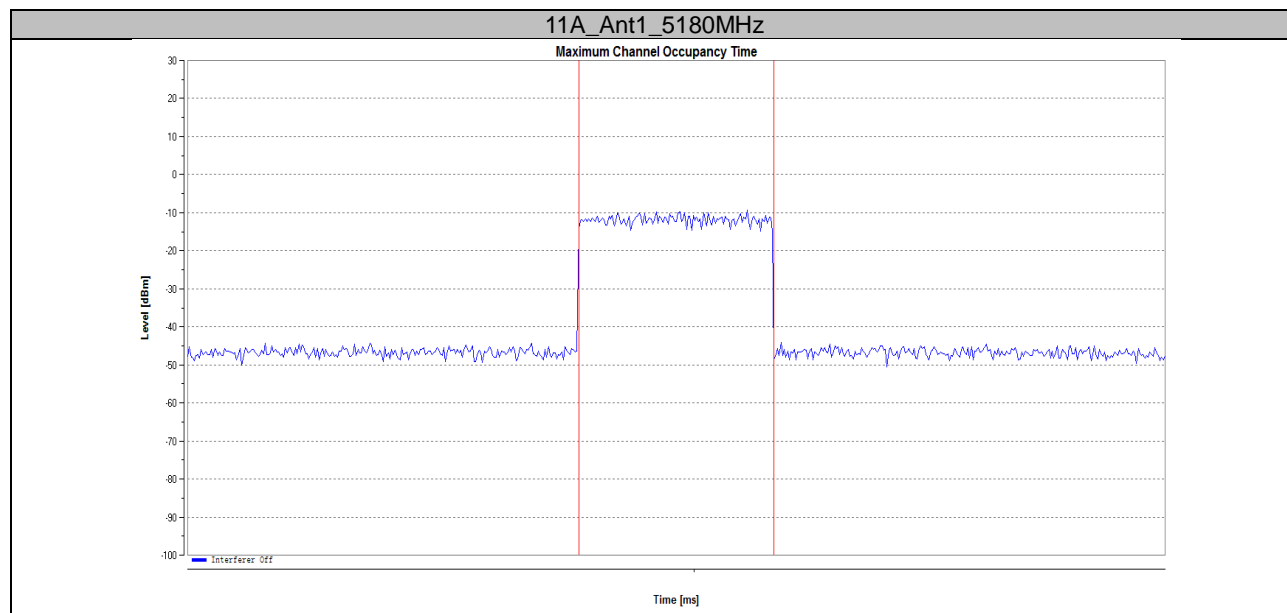
Temperature:	25 °C
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

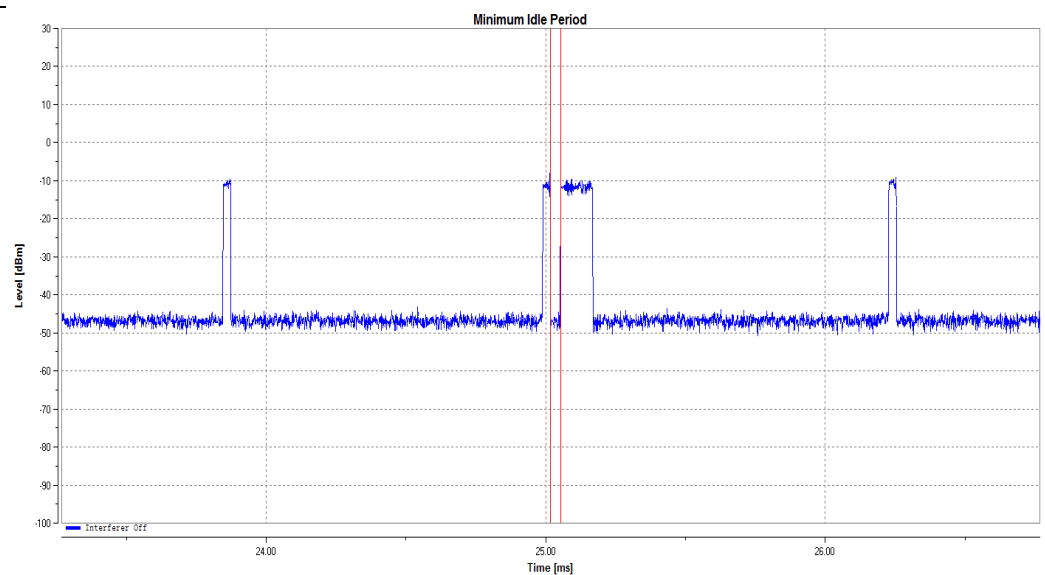
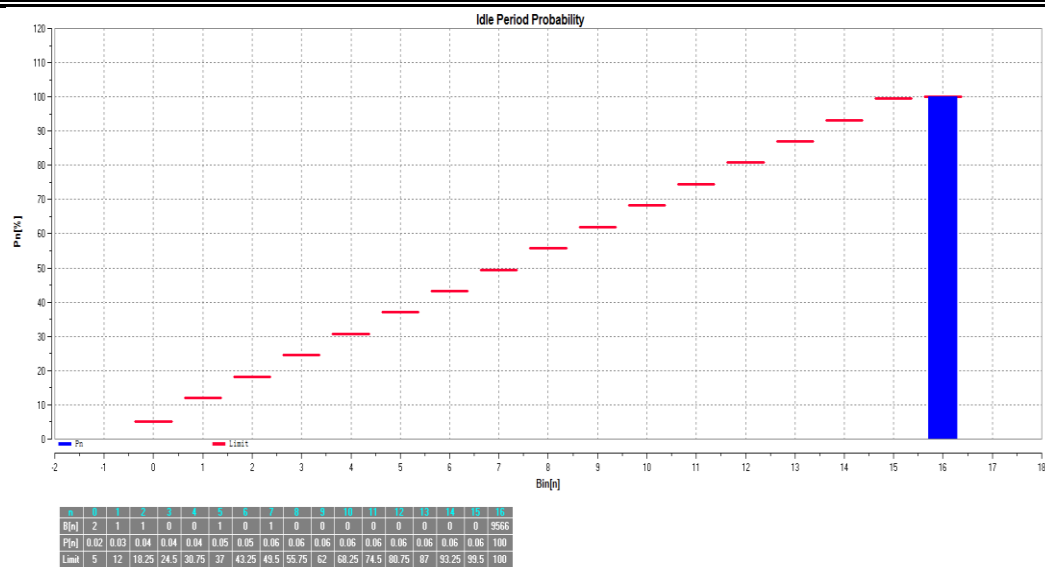
The testing was performed by Black Ding on 2021-06-08.

Test Result: Compliant, please refer to following plots.

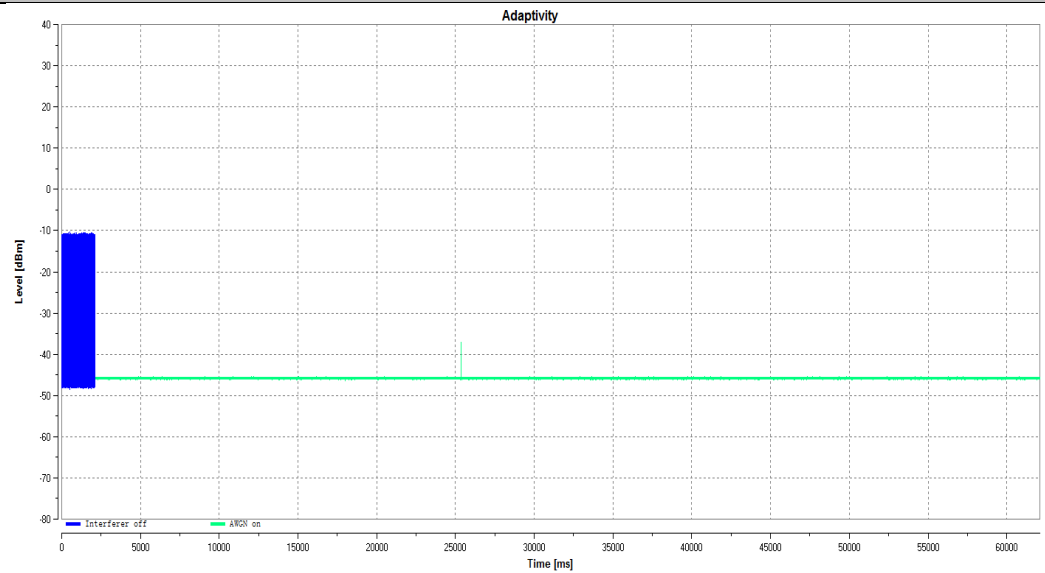
Test Mode	Antenna	Channel	Priority Class	COT Num [n]	Max. COT [ms]	Limit [ms]	Min.Idel Time[ms]	Limit [ms]	Verdict
11A	Ant1	5180	2	10025	0.116	6.000	0.035	0.027	PASS

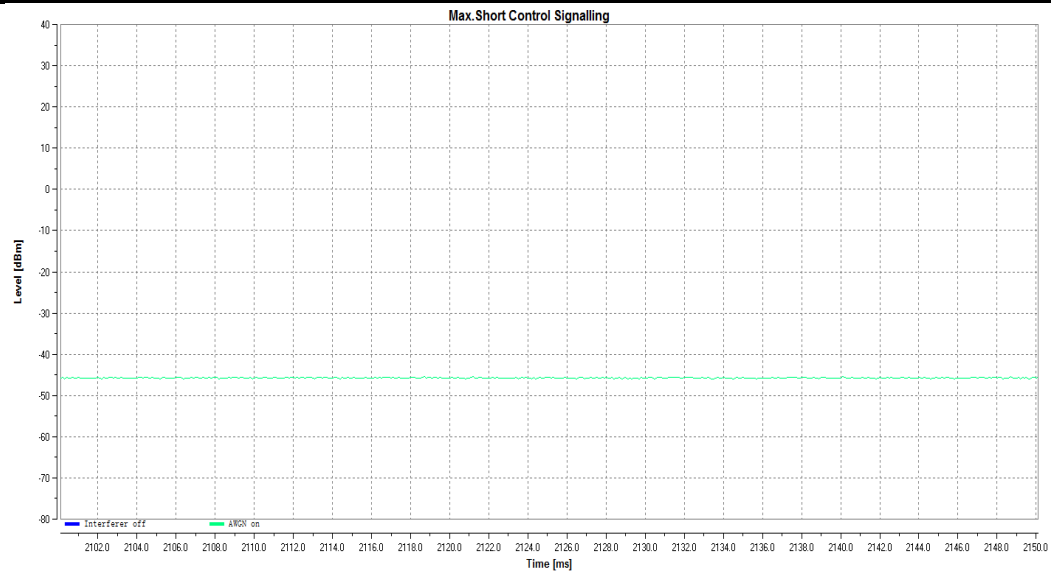
Test Mode	Antenna	Channel	Interference Type	Add interference Time [ms]	Interference Level [dBm/MHz]	Max. Short Control number [n]	Limit [n]	Max. Short Control Time [ms]	Limit [ms]	Verdict
11A	Ant 1	5180	AWGN	2100	-75	0	50	0.00	2.5	PASS
			OFDM	2100	-75	0	50	0.00	2.5	PASS
			LTE	2100	-75	0	50	0.00	2.5	PASS



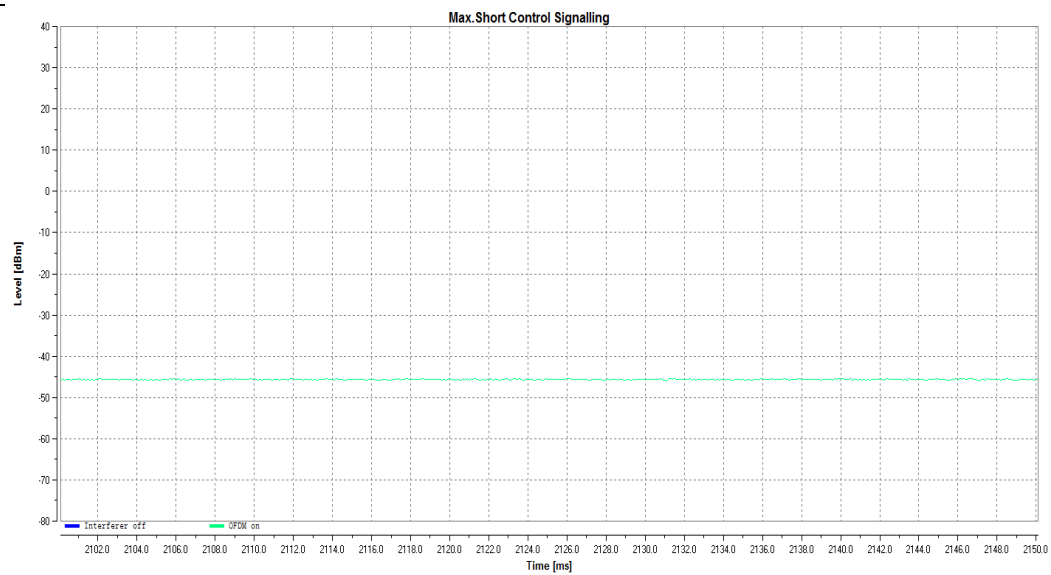
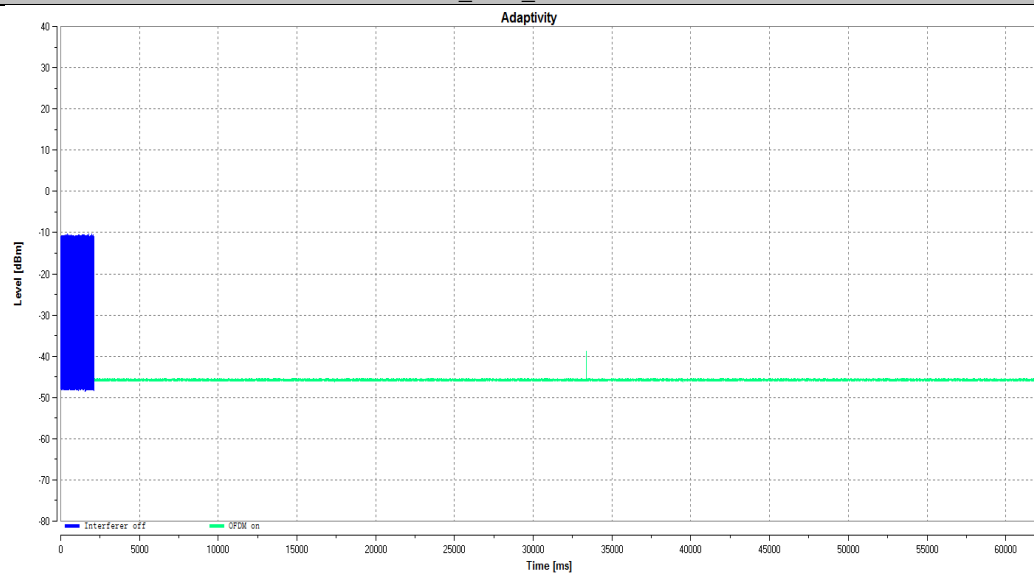


11A\_Ant1\_5180

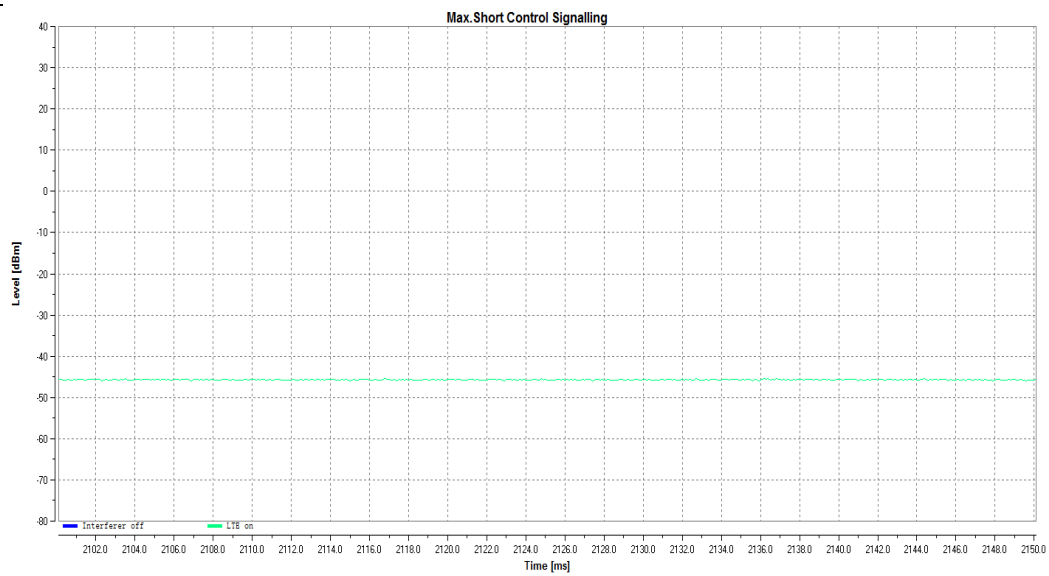
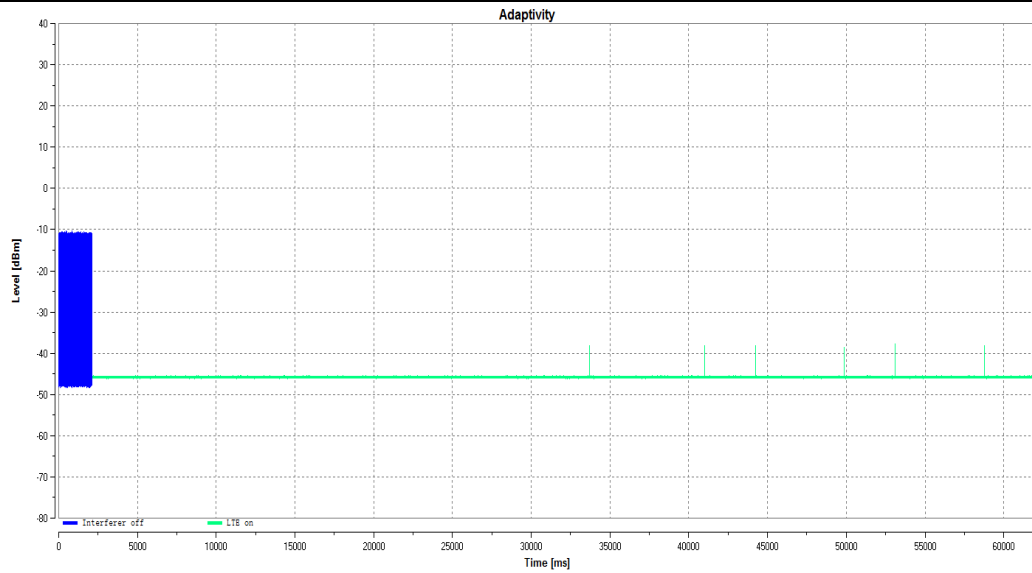




## 11A\_Ant1\_5180MHz



## 11A\_Ant1\_5180MHz



## ETSI EN 301 893 V2.1.1 (2017-05) §4.2.8 –RECEIVER BLOCKING

### Definition

Receiver blocking is a measure of the capability of the equipment to receive a wanted signal on its operating channel without exceeding a given degradation due to the presence of an unwanted input signal (blocking signal) on frequencies other than those of the operating bands provided in table 1.

**Table 1: Service frequency bands**

	Service frequency bands
Transmit	5 150 MHz to 5 350 MHz
Receive	5 150 MHz to 5 350 MHz
Transmit	5 470 MHz to 5 725 MHz
Receive	5 470 MHz to 5 725 MHz

### Limit

The minimum performance criterion shall be a PER of less than or equal to 10 %. The manufacturer may declare alternative performance criteria as long as that is appropriate for the intended use of the equipment (see clause 5.4.1, item s)).

While maintaining the minimum performance criteria as defined in clause 4.2.8.3, the blocking levels at specified frequency offsets shall be equal to or greater than the limits defined in table 7.

**Table 7: Receiver Blocking parameters**

Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 2)		Type of blocking signal
		Master or Slave with radar detection (see table D.2, note 2)	Slave without radar detection (see table D.2, note 2)	
P <sub>min</sub> + 6 dB	5 100	-53	-59	Continuous Wave
P <sub>min</sub> + 6 dB	4 900 5 000 5 975	-47	-53	Continuous Wave
NOTE 1: P <sub>min</sub> is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined clause 4.2.8.3 in the absence of any blocking signal.				
NOTE 2: The levels specified are levels in front of the UUT antenna. In case of conducted measurements, the same levels should be used at the antenna connector irrespective of antenna gain.				

### Test Procedure

#### Conducted measurements

For systems using multiple receive chains only one chain need to be tested. All other receiver inputs shall be terminated.

Figure 14 shows the test set-up which can be used for performing the receiver blocking test. The companion device may require appropriate shielding or may need to be put in a shielded room to prevent it may have a negative impact on the measurement.

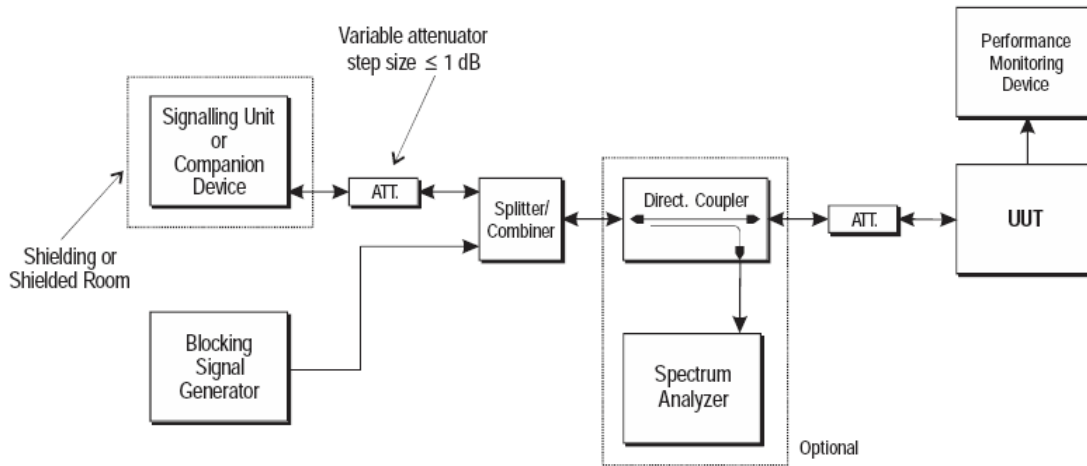


Figure 14: Test Set-up for receiver blocking

The steps below define the procedure to verify the receiver blocking requirement as described in clause 4.2.8.

**Step 1:**

- The UUT shall be set to the first operating frequency to be tested (see clause 5.3.2).

**Step 2:**

- The blocking signal generator is set to the first frequency as defined in table 7.

**Step 3:**

- With the blocking signal generator switched off a communication link is set up between the UUT and the associated companion device using the test setup shown in figure 14. The attenuation of the variable attenuator shall be increased in 1 dB steps to a value at which the minimum performance criteria as specified in clause 4.2.8.3 is still met. The resulting level for the wanted signal at the input of the UUT is  $P_{min}$ .

- This signal level ( $P_{min}$ ) is increased by 6 dB resulting in a new level ( $P_{min} + 6$  dB) of the wanted signal at the UUT receiver input.

**Step 4:**

- The level of the blocking signal at the UUT input is set to the level provided in table 7. It shall be verified and recorded in the test report that the performance criteria as specified in clause 4.2.8.3 are met.
- If the performance criteria as specified in clause 4.2.8.3 are met, the level of the blocking signal at the UUT may be further increased (e.g. in steps of 1 dB) until the level whereby the performance criteria as specified in clause 4.2.8.3 are no longer met. The highest level at which the performance criteria are met is recorded in the test report.

**Step 5:**

- Repeat step 4 for each remaining combination of frequency and level as specified in table 7.

**Step 6:**

- Repeat step 2 to step 5 with the UUT operating at the other operating frequencies at which the blocking test has to be performed. See clause 5.3.2.



**Radiated measurements**

When performing radiated measurements on equipment with dedicated antennas, measurements shall be repeated for each alternative dedicated antenna.

A test site as described in annex B and applicable measurement procedures as described in annex C shall be used.

The test procedure is further as described under clause 5.4.10.2.1.

The level of the blocking signal at the UUT referred to in step 4 is assumed to be the level in front of the UUT antenna(s). The UUT shall be positioned with its main beam pointing towards the antenna radiating the blocking signal.

The position recorded in clause 5.4.4.2.2 can be used.

**Test Data****Environmental Conditions**

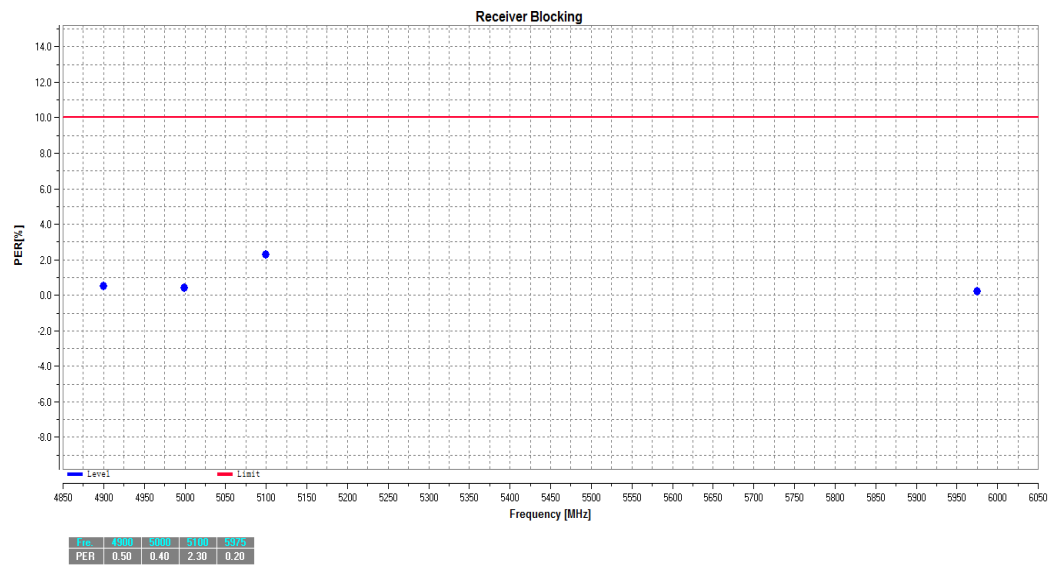
<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	52 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Black Ding on 2021-06-08.*

*EUT operation mode: Receiving*

Test Mode	Antenna	Channel	Freq.[MHz]	PER[%]	Limit[%]	Verdict
11a	Ant 1	5180	4900	0.50	<=10	PASS
			5000	0.40	<=10	PASS
			5100	2.30	<=10	PASS
			5975	0.20	<= 10	PASS

11A\_Ant1\_5180MHz



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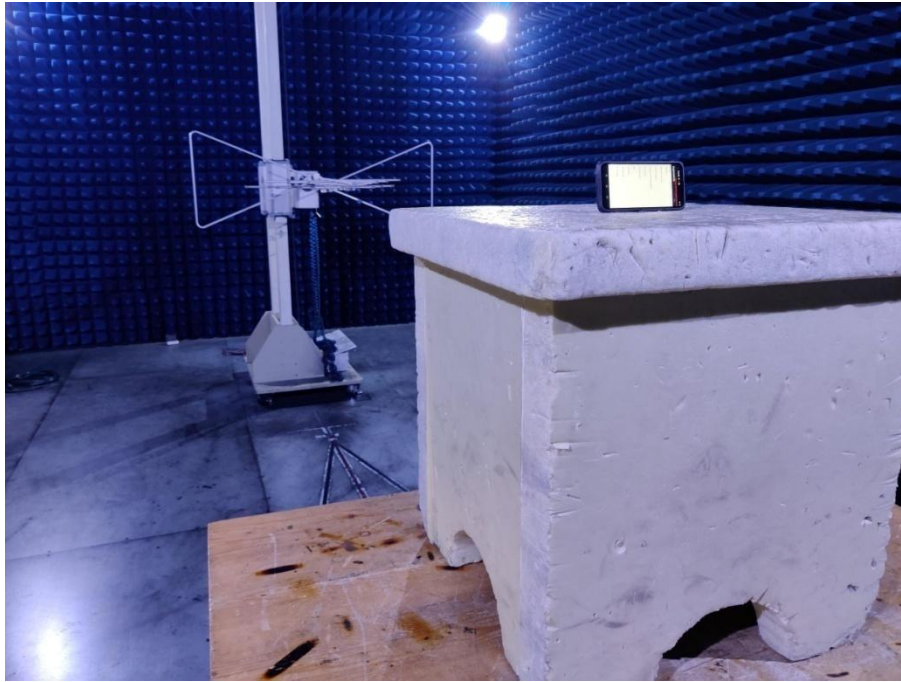
## **EXHIBIT A - EUT PHOTOGRAPHS**

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Please refer to the Attachment.

## **EXHIBIT B - TEST SETUP PHOTOGRAPHS**

**Radiated Spurious Emissions Test View (Below 1GHz)**



**Radiated Spurious Emissions Test View (Above 1GHz)**





**\*\*\*\*\* END OF REPORT \*\*\*\*\***