

TEST REPORT

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Test Report Number: SKT-RFC-260004

Date of issue: 2026.1.9

Applicant:

Samsung Electronics Co., Ltd.

Model:

NP960XRD

Add Model:

NP964XRD

FCC ID:

A3LNP960XRD

Project number:

SKTEU25-1464

Date of Testing

2025.11.27 ~ 2026.1.9

Applied standards:

ANSI C63.10-2020

558074 D01 15.247 Meas Guidance v05r02

Rule parts:

Part 15 Subpart C (15.247)

Equipment Class:

Part 15 Spread Spectrum Transmitter (DSS)

The above equipment has been tested by SK Tech Co., Ltd., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product or system, which was tested.



MinJae Song / **Testing Engineer**



JungWoo Kim / **Technical Manager**

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Revision History of Test Report

Rev.	Revisions	Effect page	Approved by	Date
-	Initial issue	All	Jungwoo Kim	2026.1.9



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1 Summary of Test Results

The EUT has been tested according to the following specifications

Applied Standard : FCC Part 15, Subpart C 15.247 (DSS)					
FCC Part Section(s)	Test Description	Limit	Test Condition	Test Result	Reference
15.247(a)	20 dB Bandwidth	NA	Conducted	PASS	Section 3.2
15.247(b)	Peka Transmitter Output Power	< 1 Watt >= 75 non-overlapping channels used		PASS	Section 3.3
15.247(a)	Carrier Frequency Separation	2/3 of 20 dB BW for system with output power < 125mW		PASS	Section 3.4
15.247(a)	Time of Occupancy	< 0.4 sec		PASS	Section 3.5
15.247(a)	Number of Channels	> 15 Channels		PASS	Section 3.6
15.247(d)	Conducted Spurious Emissions	> 20 dBc		PASS	Section 3.7
15.205 15.209	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209	Radiated	PASS	Section 3.8
15.207	AC Conducted Emissions (150 kHz – 30 MHz)	< FCC 15.207 limits	AC Line Conducted	PASS	Section 3.9
15.203	Antenna Requirement	FCC 15.203	-	PASS	Section 3.1

NOTES

- 1) The general test methods used to test on this devices are ANSI C63.10.



1.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2

Measurement Items	Frequency Range	Expanded Uncertainty $U = kU_c (k = 2)$
Radiated Spurious Emissions	< 1 GHz	3.08
	> 1 GHz	5.06
	> 18 GHz	5.39
Measurement Items		Expanded Uncertainty $U = kU_c (k = 2)$
Conducted	Maximum Output Power	1.28
Measurement Items	Frequency Range	Expanded Uncertainty $U = kU_c (k = 2)$
AC Conducted Emissions	150 kHz ~ 30 MHz	3.34

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of $k = 2$.

2 General Information

2.1 General Description of EUT

Equipment Class	Part 15 Spread Spectrum Transmitter (DSS)		
EUT Type	Portable Computing Device		
FCC ID	A3LNP960XRD		
Model	NP960XRD		
Additional model name	NP964XRD		
Operating Frequency	Bluetooth 1DH5 : 2 400 MHz to 2 483.5 MHz (FHSS) 2DH5 : 2 400 MHz to 2 483.5 MHz (FHSS) 3DH5 : 2 400 MHz to 2 483.5 MHz (FHSS)		
Antenna Gain	ANT 1 (Main)	ANT 2 (Aux)	Direction gain NOTE3
	1.14 dBi	1.11 dBi	4.14 dBi
H/W Version	REV1.0		
S/W Version	NP960XRD		
EUT Capabilities	802.11b/g/a/n/ac/ax/be WLAN, Bluetooth (BDR, EDR, LE)		

NOTE 1: For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

NOTE 2: For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

NOTE 3: Directional gain (completely uncorrelated signal with unequal antenna gain and equal transmit power)
 $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] \text{ dBi}$

2.2 Antenna Configurations

Antenna Configurations		SISO		MIMO	
		ANT1	ANT2	ANT1	ANT2
Bluetooth	GFSK	Support	Support	Support	Support
	$\pi/4$ -DQPSK	Support	Support	Support	Support
	8DPSK	Support	Support	Support	Support



2.3 Tested sample and Tested companion device information

Type	Model	Note
Test sample (Conducted)	NP960XRD	S/N: LVVE930YA00240X
Test sample (Radiated)	NP960XRD	S/N: LVVE930YA00217Y
Test sample (Radiated)	NP960XRD	S/N: LVVE930YA00075V

2.4 Description of Test Mode

The EUT has been tested with all modes of operating conditions to determine the worst case emission characteristics.

[Test Mode & Frequency]

Bluetooth	Mode	Tested Frequency (MHz)		
GFSK	1DH5	2402	2441	2480
$\pi/4$ -DQPSK	2DH5	2402	2441	2480
8DPSK	3DH5	2402	2441	2480

2.5 INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

2.6 EUT CONFIGURATION

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

2.7 General Description of Applied Standards

Generally the tests were performed according to the specifications of the standard, it must comply with the requirements of the following standards.

FCC CFR 47 Part 15, Subpart C (§15.247)

ANSI C63.10-2020

558074 D01 15.247 Meas Guidance v05r02

All test items in this test report have been performed and recorded as per the above standards.



2.8 Information of the Testing Laboratories

Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

Test Firm Name : SK Tech Co., LTD.

Address : 88, Geulgaeul-ro 81beon-gil, wabu-eup Namyangju-si, Gyeonggi-do, 12203, Rep. of Korea

FCC

Designation Number : KR0007

Test Firm Registration Number : 938639

ISED

Designation Number : KR0007

Test Firm Registration Number : 5429A



2.9 Test Equipment

Test Equipment is traceable to the National Institute of Standards and Technology (NIST). Measurement antenna used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal. Date
Spectrum Analyzer	Keysight Technologies	N9020B	MY63471160	2026-10-31
Spectrum Analyzer	Keysight Technologies	N9020B	MY63471163	2026-11-26
EMC Analyzer	Agilent	E7405A	US40240203	2026-03-10
EMI TEST RECEIVER	R & S	ESR 26	101441	2026-07-07
Vector Signal Generator	R & S	SMBV100B	101179	2026-03-13
Signal Generator	R & S	SMB100A	180704	2026-11-13
Power Meter	Agilent	E4418B	US39402176	2026-06-11
Power Meter	Agilent	E4417A	MY45100426	2026-03-12
Power Sensor	HP	8485A	3318A13916	2026-03-12
Power Sensor	Agilent	E9327A	MY44420696	2026-03-12
Attenuator	JFW	50HFAR-006-2.9MM	N/A	2026-06-12
Attenuator	JFW	50HFAR-006-2.9MM	N/A	2026-06-12
Attenuator	JFW	50HFAR-010-2.9MM	N/A	2026-06-12
Attenuator	JFW	50HFAR-010-2.9MM	N/A	2026-06-12
Attenuator	JFW	50HFAR-020-2.9MM	N/A	2026-06-12
TRILOG-Broadband Antenna	Schwarzbeck	ULB9168	9168-230	2027-05-12
Double Ridged guide Horn Antenna	ETS-LINDGREN	3117	00205960	2026-05-16
Horn Antenna	FLANN MICROWAVE	20240-20	273364	2026-10-19
Horn Antenna	FLANN MICROWAVE	22240-20	274186	2026-10-19
Low Noise Pre-Amplifier	TSJ	MLA-0118-J01-40	14879	2026-03-11
Preamplifier	TSJ	MLA-1840-A01-50	2610050	2026-03-13
Pre-Amplifier	TSJ	MLA-10K01-B01-27	2005350	2026-03-11
High Pass Filter	Wainwright	WHKX 3.0/18G-12SS	8	2026-03-12
High Pass Filter	Wainwright	WHKX10-5850-6500-18000-40SS	36	2026-06-11
High Pass Filter	Mini-Circuits	ZHFW-K7000+	2540	2026-12-01
High Pass Filter	Wainwright	WHKX10-3698-4300-18000-60SS	1	2026-06-11
EMI RECEIVER	Narda	PMM9010F	020WW40105	2026-11-12
Two-Line V-Network	R & S	ENV 216	102047	2026-01-22
Pulse Limiter	R & S	ESH3-Z2	100604	2026-11-12



3 Test Results

3.1 Antenna Requirement

Except from §15.203 of the FCC Rules/Regulations:

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of the section.

- The antenna of the EUT is attached to the inside.

Result

The EUT complies with the requirement of §15.203

3.2 20 dB Bandwidth & 99 % Bandwidth

3.2.1 Regulation

Part. 15.247(a)

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

3.2.2 20 dB Bandwidth Test Procedure

The transmitter output is connected to the Spectrum Analyzer and used following test procedure of ANSI C63.10-2020

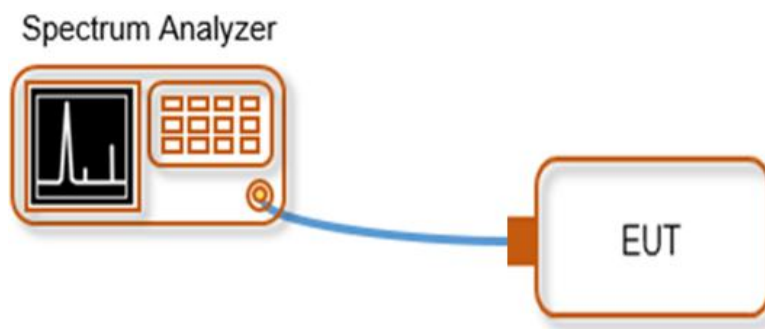
1. Set resolution bandwidth (RBW) = approximately 1 % ~ 5 % of the EBW.
2. Set the video bandwidth (VBW) > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 20 dB down from the peak of the emission. Compare this with the RBW setting of the instrument. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is in the range of 1% to 5%.

3.2.3 99 % Bandwidth Test Procedure

The transmitter output is connected to the Spectrum Analyzer and used following test procedure of ANSI C63.10-2020

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 $\geq 3 \times$ 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).

3.2.4 Test Setup





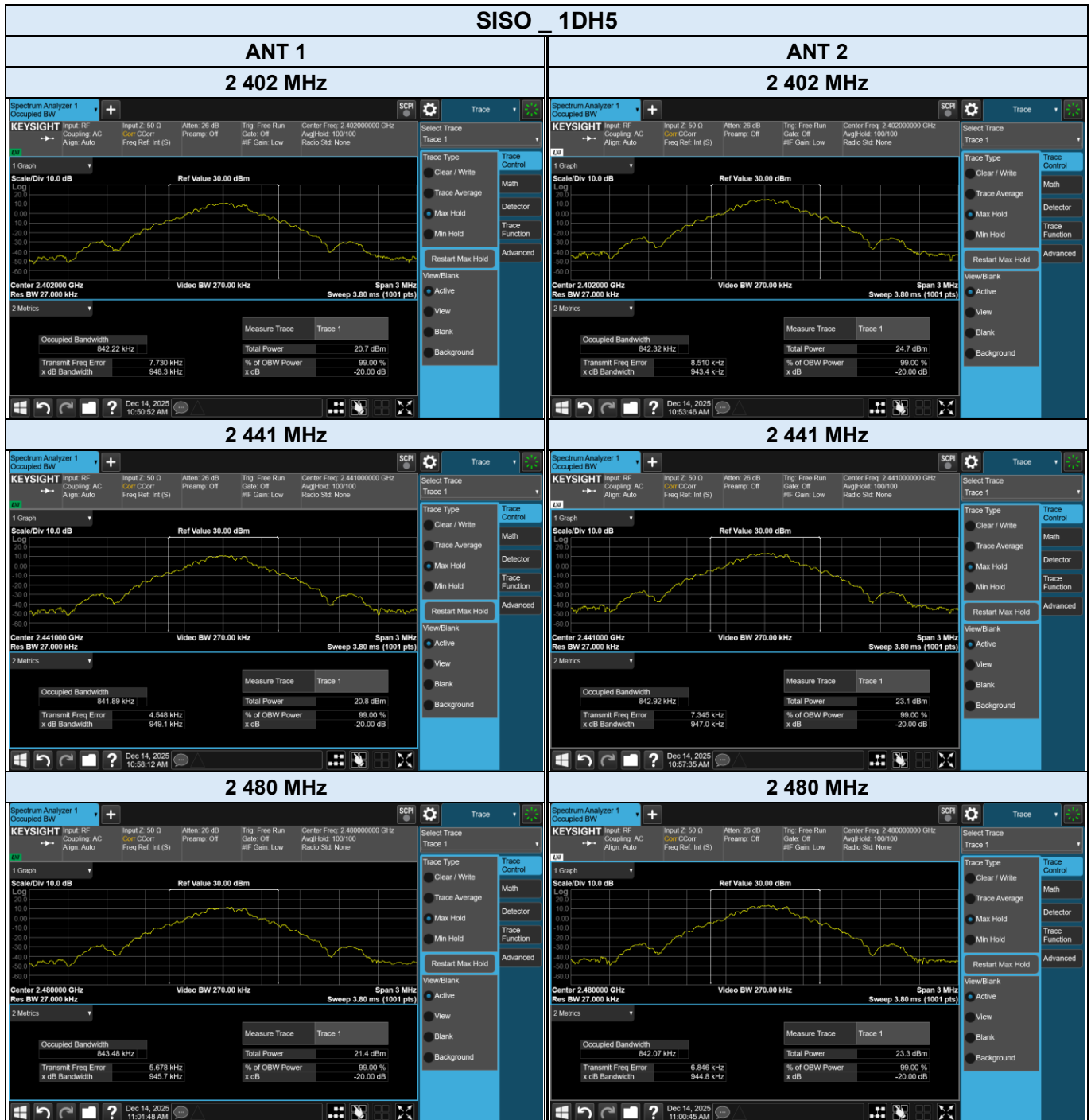
3.2.6 Test Result

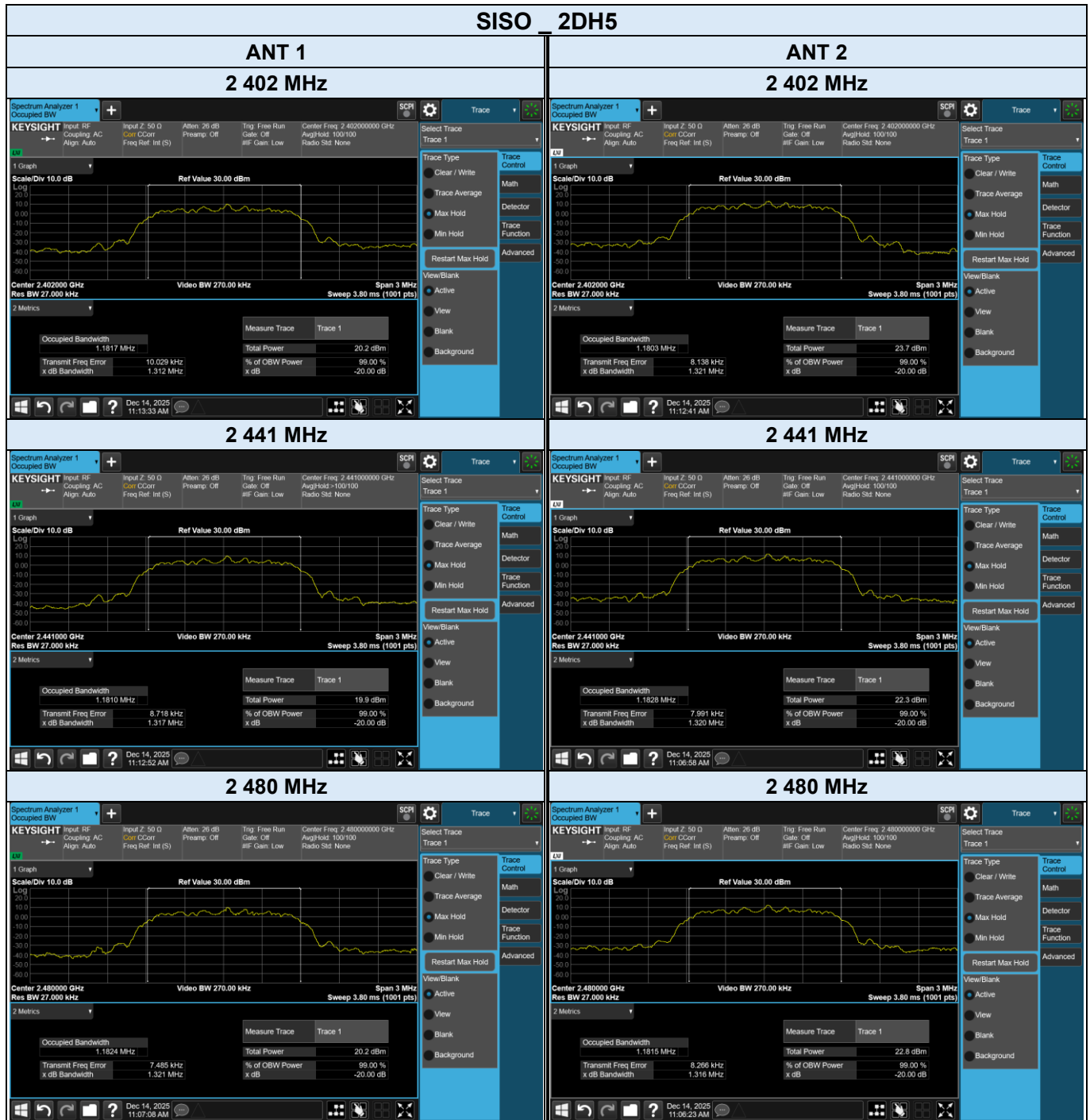
[Test Data of 20 dB Bandwidth & 99 % Bandwidth]

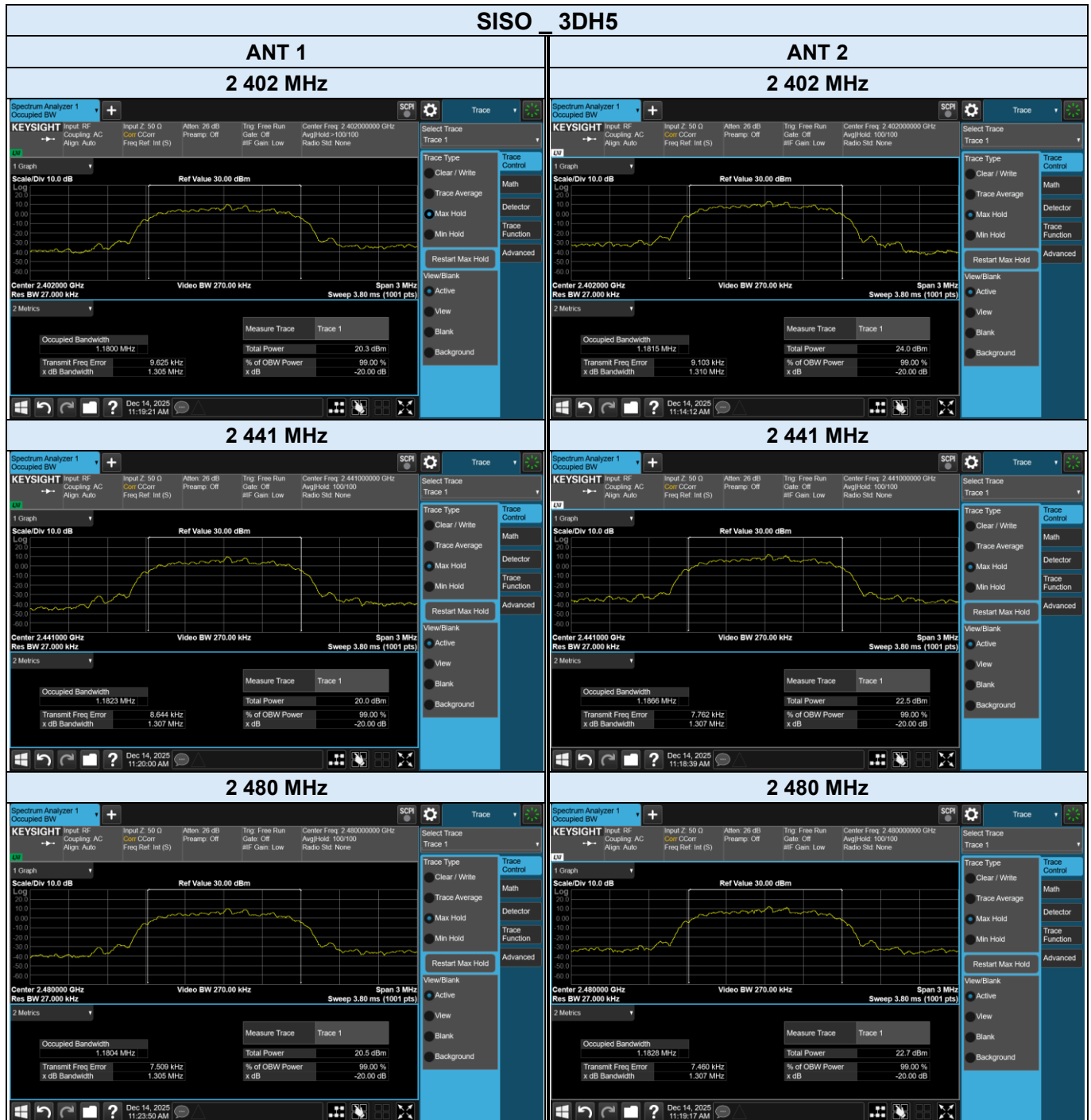
Antenna Configurations	Test Mode	Tested Frequency [MHz]	20 dB Bandwidth [MHz]		99 % Bandwidth [MHz]	
			ANT1	ANT2	ANT1	ANT2
SISO	GFSK (1DH5)	2402	0.948	0.943	0.842	0.842
		2441	0.949	0.947	0.842	0.843
		2480	0.946	0.945	0.843	0.842
	$\pi/4$ -DQPSK (2DH5)	2402	1.312	1.321	1.182	1.180
		2441	1.317	1.320	1.181	1.183
		2480	1.321	1.316	1.182	1.182
	8DPSK (3DH5)	2402	1.305	1.310	1.180	1.182
		2441	1.307	1.307	1.182	1.187
		2480	1.305	1.307	1.180	1.183
MIMO	GFSK (1DH5)	2402	0.947	0.947	0.840	0.840
		2441	0.947	0.946	0.843	0.842
		2480	0.946	0.944	0.846	0.841
	$\pi/4$ -DQPSK (2DH5)	2402	1.319	1.317	1.185	1.199
		2441	1.322	1.318	1.185	1.184
		2480	1.319	1.320	1.185	1.188
	8DPSK (3DH5)	2402	1.308	1.307	1.192	1.193
		2441	1.310	1.308	1.193	1.187
		2480	1.310	1.313	1.194	1.195

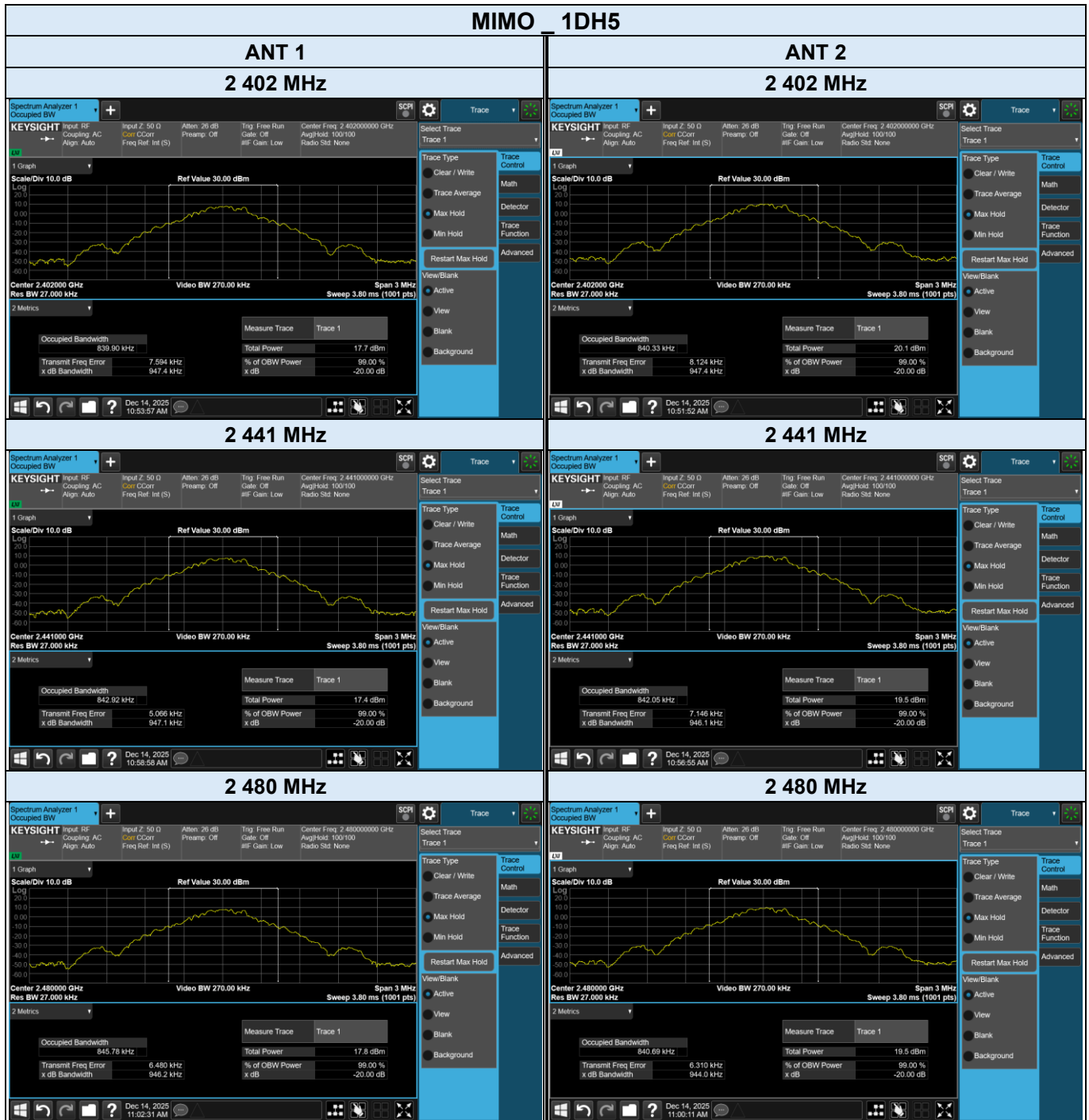


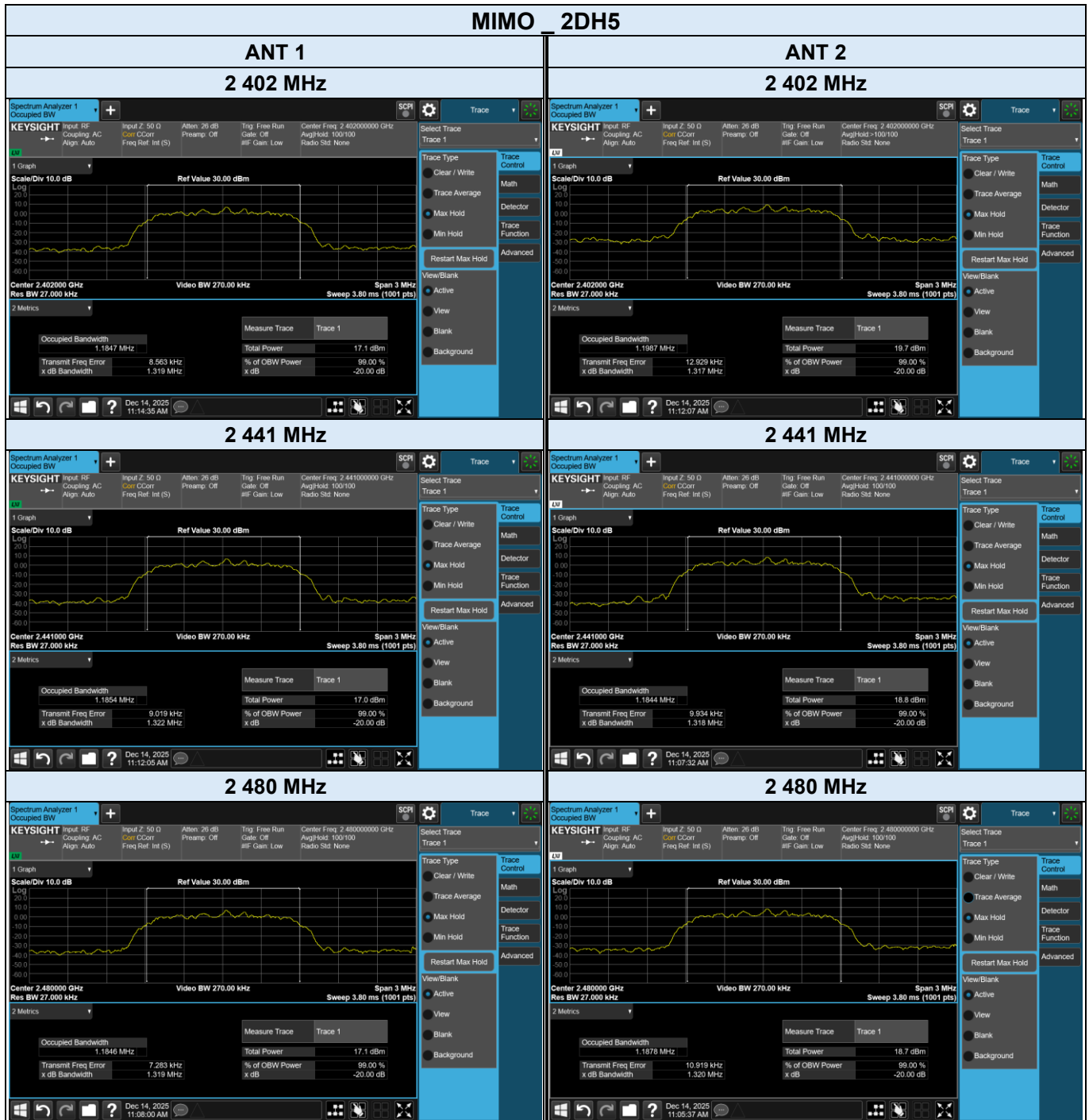
[Test Plot of 20 dB Bandwidth & 99 % Bandwidth]

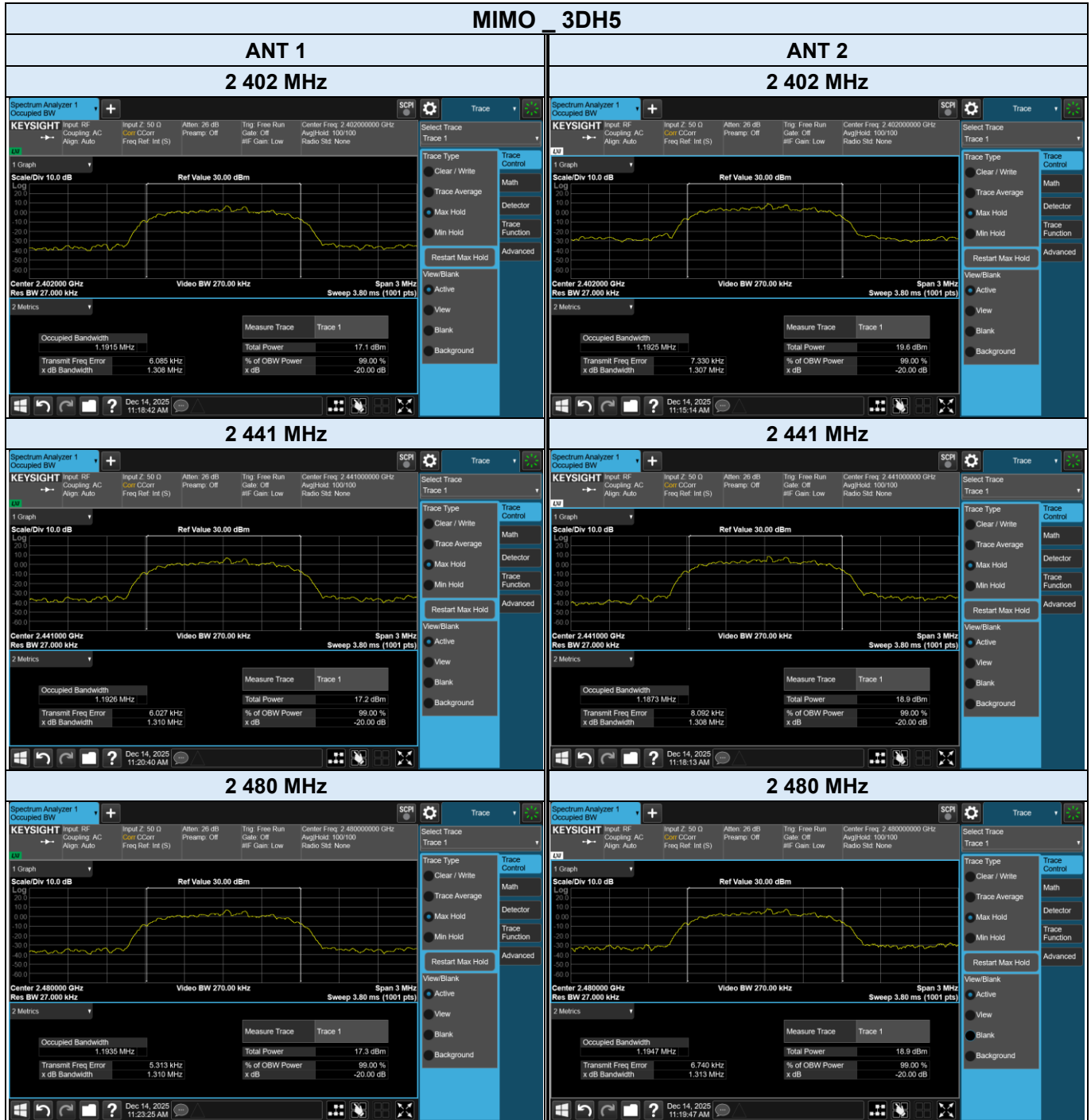














3.3 Peak Transmitter Output Power

3.3.1 Regulation

Part. 15.247(b)

(1) **For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels**, and all frequency hopping systems in the 5725-5850 MHz band: **1 watt**. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts

3.3.2 Test Procedure

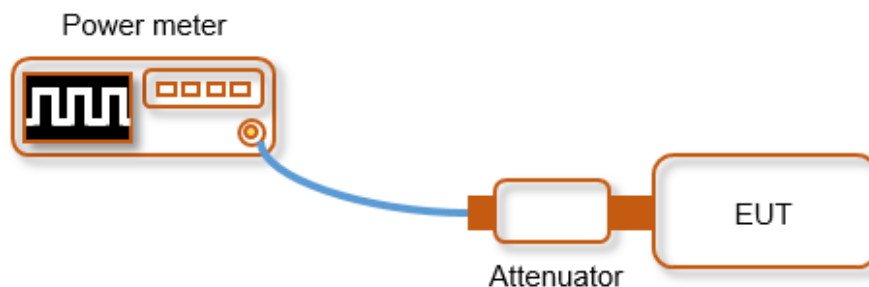
PKPM1 Peak power meter method of ANSI C63.10-2020

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast responding diode detector.

Method PM-G of ANSI C63.10-2020

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Because the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

3.3.3 Test Setup





3.3.4 Test Result

[Test Result of Maximum Output Power]

Antenna Configurations	Test Mode	frequency [MHz]	Average power [dBm]			Peak power [dBm]		
			ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
SISO	GFSK (1DH5)	2402	13.28	14.93	NA	13.54	15.23	NA
		2441	13.01	13.48	NA	13.31	13.84	NA
		2480	13.67	13.81	NA	14.05	14.23	NA
	$\pi/4$ -DQPSK (2DH5)	2402	13.23	14.56	NA	15.88	17.14	NA
		2441	12.62	12.89	NA	15.21	15.35	NA
		2480	13.51	13.44	NA	16.17	16.29	NA
	8DPSK (3DH5)	2402	13.19	14.53	NA	16.24	17.38	NA
		2441	12.58	13.07	NA	15.42	15.78	NA
		2480	13.47	13.49	NA	16.22	16.54	NA
MIMO	GFSK (1DH5)	2402	12.3	12.68	15.50	12.54	12.64	15.60
		2441	12.01	12.12	15.08	12.15	12.19	15.18
		2480	12.4	12.31	15.37	12.61	12.52	15.58
	$\pi/4$ -DQPSK (2DH5)	2402	11.59	11.98	14.80	13.79	15.24	17.59
		2441	11.36	11.02	14.20	13.27	13.62	16.46
		2480	11.57	11.23	14.41	13.46	13.65	16.57
	8DPSK (3DH5)	2402	11.6	11.99	14.81	14.01	15.27	17.70
		2441	11.43	11.01	14.24	13.58	13.75	16.68
		2480	11.59	11.08	14.35	13.69	13.51	16.61



3.4 Carrier Frequency Separation

3.4.1 Regulation

Part. 15.247(a)

(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

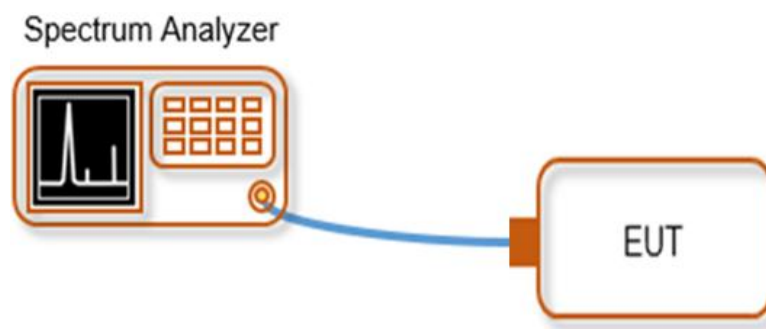
3.4.2 Test Procedure

The transmitter output is connected to the Spectrum Analyzer and used following test procedure of ANSI C63.10-2020

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span: Wide enough to capture the peaks of two adjacent channels.
2. RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
3. Video (or average) bandwidth (VBW) $\geq$ RBW
4. Sweep: No faster than coupled (auto) time.
5. Detector function: Peak.
6. Trace: Max-hold.
7. Allow the trace to stabilize.

3.4.3 Test Setup



3.4.4 Test Result

[Test Result of Carrier Frequency Separation]

Antenna Configurations	Test Mode	Tested Frequency	Carrier Frequency Separation	
			Result [MHz]	Min. Channel Separation [MHz]
SISO	GFSK (1DH5)	Hopping	1.00	0.630
MIMO	GFSK (1DH5)	Hopping	1.00	0.629

[Test Plot of Carrier Frequency Separation]





3.5 Time of Occupancy

3.5.1 Regulation

Part. 15.247(a)

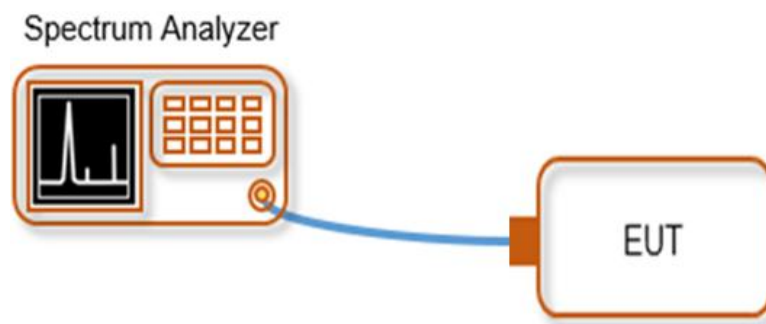
(1) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

3.5.2 Test Procedure

The transmitter output is connected to the Spectrum Analyzer and used following test procedure of ANSI C63.10-2020

1. Span: Zero span, centered on a hopping channel.
2. RBW shall be $\leq$ channel spacing and where possible RBW should be set $\gg 1 / T$, where T is the expected transmission time per hop.
3. Sweep time: Set so that the start of the first transmission and end of the last transmission for the hop are clearly captured. Setting the sweep time to be slightly longer than the hopping period per channel (hopping period = $1/\text{hopping rate}$) should achieve this.
4. Use a video trigger, where possible with a trigger delay, so that the start of the transmission is clearly observed. The trigger level might need adjustment to reduce the chance of triggering when the system hops on an adjacent channel.
5. Detector function: Peak.
6. Trace: Clear-write, single sweep.
7. Place markers at the start of the first transmission on the channel and at the end of the last transmission. The dwell time per hop is the time between these two markers.

3.5.2 Test Setup





3.5.4 Test Result

[Number of Hopping channels = 79]

Hopping Mode	Test Mode	Number of hopping Channels	Burst ON Time(ms)	Preiod(ms)	Dwell Time(s)
Enable	1DH5	79	2.880	3.744	0.307
	3DH5	79	2.881	3.745	0.307

[Number of Hopping channels = 20 / AFH]

Hopping Mode	Test Mode	Number of hopping Channels	Burst ON Time(ms)	Preiod(ms)	Dwell Time(s)
Enable	1DH5	20	2.880	3.744	0.154
	3DH5	20	2.881	3.745	0.154

Note 1 : Dwell Time = $0.4 \times \text{Hopping channel} \times \text{Burst ON time} \times$

$((\text{Hopping rate} \div \text{Time slots}) \div \text{Hopping channel})$

- Time slots for DH5 = 6 slots (TX = 5 slot / RX = 1 slot)
- Hopping Rate = 1600 for FH mode & 800 for AFH mode



3.6 Number of Channels

3.6.1 Regulation

Part. 15.247(a)

(1) **Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.** The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. **Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.**

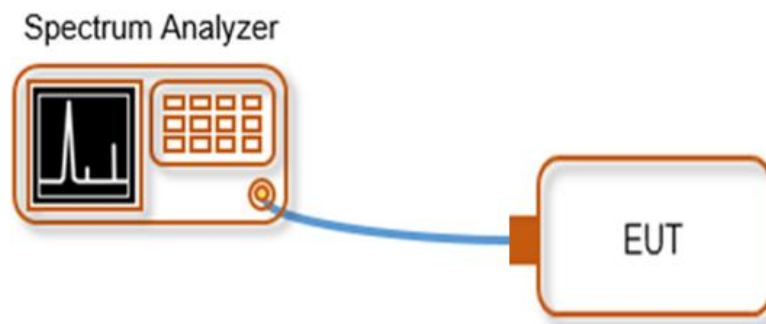
3.6.2 Test Procedure

The transmitter output is connected to the Spectrum Analyzer and used following test procedure of ANSI C63.10-2020

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span: The frequency band of operation. Depending on the number of channels the device supports, it could be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
2. RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
3. VBW $\geq$ RBW.
4. Sweep: No faster than coupled (auto) time.
5. Detector function: Peak.
6. Trace: Max-hold.
7. Allow the trace to stabilize.

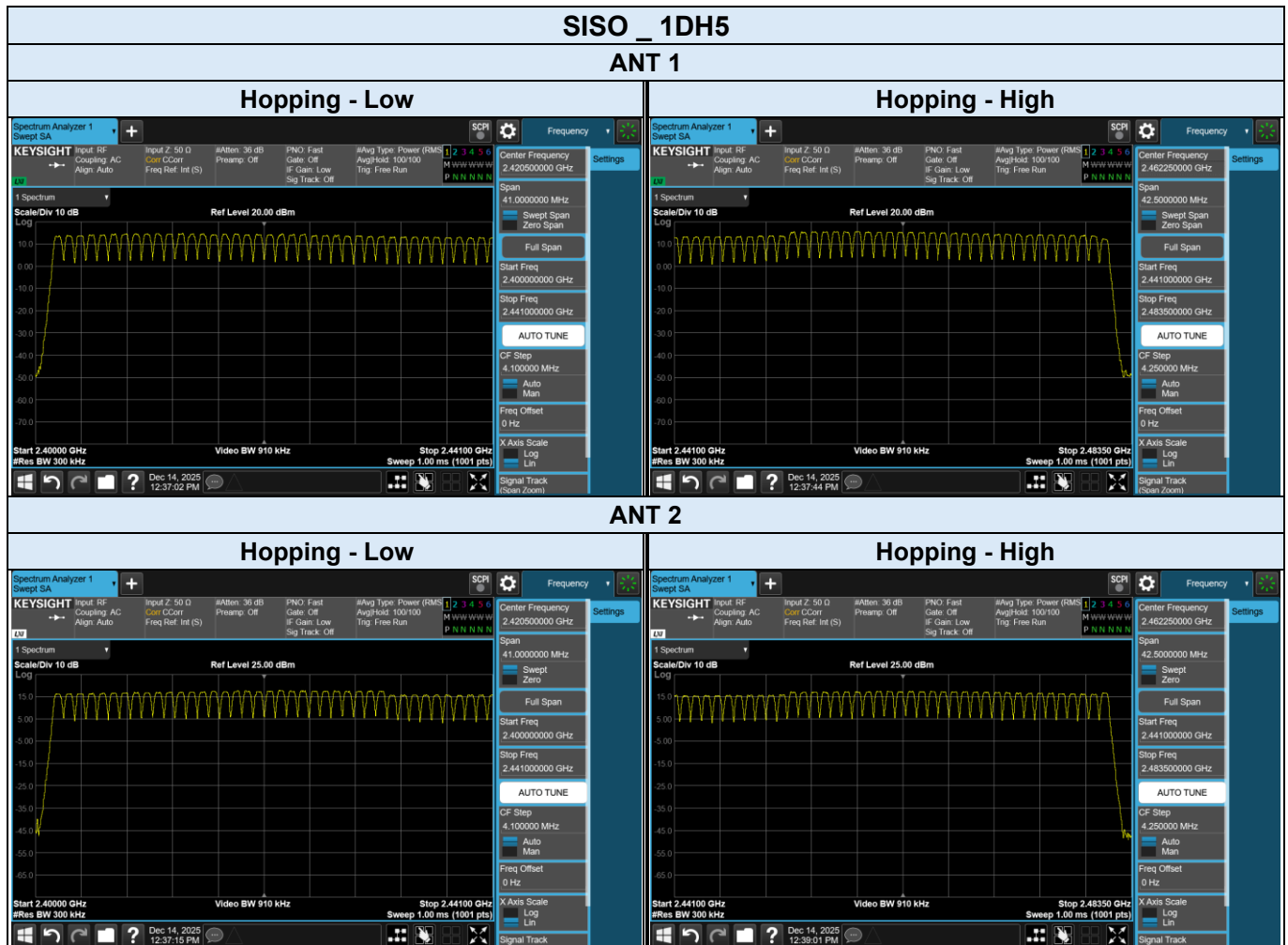
3.6.3 Test Setup





3.6.4 Test Result

[Test Plot of Carrier Frequency Separation]







3.7 Conducted Spurious Emissions

3.7.1 Regulation

Part. 15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

3.7.2 Conducted Band edge Test Procedure

The transmitter output is connected to the Spectrum Analyzer and used following test procedure of ANSI C63.10-2020

1. Start and stop frequency were set such that the band edge would be placed in the center of the polot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. Set RBW = 100 kHz
4. Set VBW $\geq 3 \times$ RBW
5. Detector = Peak
6. Number of sweep points $\geq 2 \times$ SPAN/RBW
7. Trace Mode = max hold

3.7.3 Conducted Band edge Test Procedure

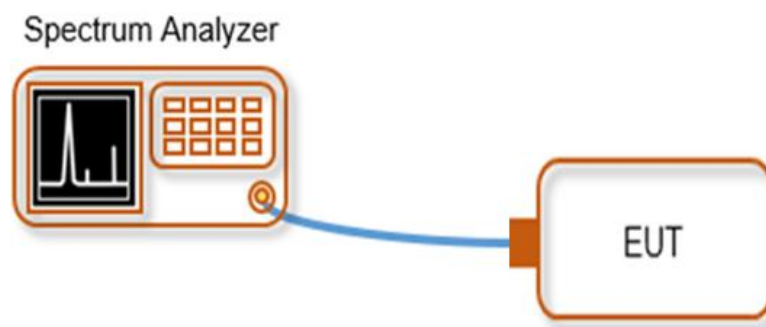
The transmitter output is connected to the Spectrum Analyzer and used following test procedure of ANSI c63.10-2020

1. Start was set to 30 MHz and stop was set to 25GHz.
2. Set RBW = 1 MHz
3. Set VBW $\geq 3 \times$ RBW
4. Detector = Peak
5. Number of sweep points $\geq 2 \times$ SPAN/RBW
6. Trace Mode = max hold

Out-of-band conducted spurious emissions were investigated for all data rates. However, the traces in the following plots are measured with a 1MHz RBW to reduce test time, so the display line may not necessarily appear to be 20dB below the level of the fundamental in a 1MHz bandwidth.

If there is no margin or non-conformity occurs, lower RBW to 100 kHz to proceed with the re-measurement.

3.7.4 Test Setup





3.7.5 Test Result

[Test Plot of Band Edge]

