

TEST REPORT N°: KSK-ESH-P24071264B-5

EN 301 893 RF Test Report

Applicant:	K-tronics (Suzhou) Technology Co., Ltd.
Address:	No.1088, Dajing Road, Economic and Technological Development Zone, Wujiang District, Suzhou, Jiangsu Province, 215200, P.R. China
Manufacturer:	i3-TECHNOLOGIES NV
Address:	Nijverheidslaan 60, 8540 Deerlijk, BELGIUM
This document includes : 217 pages	

Product Name:	Interactive Flat Panel	
Model Number:	i3TOUCH V-ONE 86, i3TOUCH V-ONE 86xxxxxxxx (x=0-9, A-Z, a-z, +, - (hyphen), /, \ or blank)	
Brand:	i3TOUCH	
Rated Voltage/Power	100-240V~, 50/60Hz, 4.3A	
Received Date:	Jul.15, 2024	
Test Date:	Jul.15 to Sep.03, 2024	
Applicable Standards:	EN 301 893 V2.1.1 (2017-05)	
Clause Examined :	All Clauses Relevant	

Test Location: Building C, No. 829, Xin Zhuan Road, Shanghai, CHINA

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Test done by:	Approved by:
	
Name: Yuan ZHANG	Name: Sean YU
Title: Project Engineer	Title: RF Supervisor
Date: Sep.06, 2024	Date: Sep.06, 2024

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Bureau Veritas ADT (ShangHai) Corporation 必维诚硕科技(上海)有限公司	No.829,Xin Zhuan Road,Song Jiang District,Shanghai,China	Tel: +86 21 6195 7000 Fax: +86 21 6195 7001 Email: contact@cn.bureauveritas.com
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Release Control Record

Issue No.	Description	Date Issued
KSK-ESH-P24071264B-5	Original release	Sep.06, 2024



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1 Summary of Test Results

The EUT has been tested according to the following specifications:

EN 301 893 V2.1.1		
Clause	Test Parameter	Result
4.2.1	Carrier Frequencies	Pass
4.2.2	Nominal, and Occupied, Channel Bandwidth	Pass
4.2.3	RF Output Power	Pass
4.2.3	Power Density	Pass
4.2.4.1	Transmitter unwanted emissions outside the 5 GHz RLAN bands	Pass
4.2.4.2	Transmitter unwanted emissions within the 5 GHz RLAN bands	Pass
4.2.5	Receiver Spurious Emissions	Pass
4.2.6.2	Dynamic Frequency Selection	Pass(Note)
4.2.7	Adaptivity	Pass
4.2.8	Receiver Blocking	Pass
4.2.9	User Access Restrictions	Pass
4.2.10	Geo-location capability	NA

Note: The "Dynamic Frequency Selection measurement" results refer to report KSK-ESH-P24071264B-8.

Special Comments: None.



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1.1 Test Instruments

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Double Ridged Broadband Horn (30MHz-1.5GHz)	Schwarzbeck	VULB9168	E1A1012	Aug.17,23	Aug.16,25
Horn Antenna (1GHz -18GHz)	Schwarzbeck	BBHA9120D	E1A1041	Apr.11,23	Apr.10,25
Pre-Amplifier(9kHz-1GHz)	Tonscend	TAP9K3G40	E1A2012	Apr.19,23	Apr.18,25
Pre-Amplifier(1GHz-18GHz)	Tonscend	TAP01018050	E1A2013	Mar.01,24	Feb.28,25
Pre-Amplifier(18GHz-40GHz)	Tonscend	TAP18040048	E1A2014	May.24,24	May.23,25
Pre-Amplifier(9kHz-1GHz)	SONOMA	11909A(310)	E1A2007	Feb.18,24	Feb.17,25
Pre-Amplifier(1GHz-26.5GHz)	Agilent	8449B	E1A2002	Feb.18,24	Feb.17,25
Signal Generator	Keysight	N5171B	E1S9016	Feb.19,24	Feb.18,25
Signal Generator	Keysight	N5182B	E1S9017	Feb.19,24	Feb.18,25
Wireless Connectivity Tester	R&S	CMW270	E1S9021	Oct.28,22	Oct.26,24
Spectrum Analyzer	R&S	FSQ	E1S1005	Aug.12,24	Aug.11,25
Spectrum Analyzer	Keysight	N9030B	E1S1003	Sep.14,23	Sep.13,24
Spectrum Analyzer	Keysight	N9020A	E1S1004	Mar.01,24	Feb.28,25
RF Control Unit	Toscend	JS0806-2	E1C5003	NCR	NCR
DC Power supply	Chroma	62024p-80-60	S1S1009	Mar.21,24	Mar.20,25
Humidity&Temp Programmable Tester	ESPEC	SE TH-Z-042U	C1TH002	Jun.06,24	Jun.05,25
Test Software	Toscend	JS1120-3	N/A	N/A	N/A
Test Software	Toscend	JS36-RSE	N/A	N/A	N/A



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1.2 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:

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

Parameter	Uncertainty
RF frequency	$\pm 1.132 \times 10^{-6}$
RF power conducted	$\pm 1.207 \text{ dB}$
RF power radiated	$\pm 4.925 \text{ dB}$
Spurious emissions, conducted	$\pm 3 \text{ dB}$
Spurious emissions, radiated	$\pm 4.925 \text{ dB}$
Humidity	$\pm 5 \%$
Temperature	$\pm 0.6^\circ \text{C}$
Time	$\pm 5 \%$

1.3 Maximum Measurement Uncertainty

For the test methods, according to ETSI EN 301 893 standard, the measurement uncertainty figures shall be calculated in accordance with ETSI TR 100 028-1 [2] and ETSI TR 100 028-2 [3] and shall correspond to an expansion factor (coverage factor) $k = 1.96$ or $k = 2$ (which provide confidence levels of respectively 95 % and 95.45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Maximum measurement uncertainty

Parameter	Uncertainty
RF frequency	$\pm 1 \times 10^{-5}$
RF power conducted	$\pm 1,5 \text{ dB}$
RF power radiated	$\pm 6 \text{ dB}$
Spurious emissions, conducted	$\pm 3 \text{ dB}$
Spurious emissions, radiated	$\pm 6 \text{ dB}$
Humidity	$\pm 5 \%$
Temperature	$\pm 1^\circ \text{C}$
Time	$\pm 10 \%$

1.4 Modification Record

There were no modifications required for compliance.



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2 General Information

2.1 General Description of EUT

Product	Interactive Flat Panel
Brand	i3TOUCH
Model	i3TOUCH V-ONE 86, i3TOUCH V-ONE 86xxxxxxxx (x=0-9, A-Z, a-z, +, - (hyphen), /, \ or blank)
Model difference	All models are identical to each other except for different model name.
Nominal Voltage	100-240V~, 50/60Hz, 4.8A
Temperature Operating Range	+0deg.c to +40deg.c
Modulation Type	OFDM
Modulation Technology	802.11a: OFDM (QPSK, BPSK, 16QAM, 64QAM) 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (QPSK, BPSK, 16QAM, 64QAM, 256QAM) for Wireless Module(WCT1DR2201D) 802.11a: OFDM (QPSK, BPSK, 16QAM, 64QAM) 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (QPSK, BPSK, 16QAM, 64QAM, 256QAM) for Wireless Module(WC0NR2201)
Operating Frequency	5150MHz~5350MHz, 5470MHz~5725MHz
Number of Channel	See section 2.2
EIRP Power (Measured Max. Average)	19.27dBm for Wireless Module(WCT1DR2201D) 13.31dBm for Wireless Module(WC0NR2201)
Antenna Type	External Antenna for Wireless Module(WCT1DR2201D, WC0NR2201)
Antenna Gain	Ant1:3.28dBi, Ant2: 3.28dBi for Wireless Module(WCT1DR2201D) Ant1: 3.28dBi, Ant2: 3.28dBi Wireless Module(WC0NR2201)
Data Cable Supplied	NA

Note:

1. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.
2. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
3. The EUT contains two wireless modules.

The wireless module of model WCT1DR2201D supports BT/WIFI function.

The wireless module of model WC0NR2201 supports WIFI function.

The wireless module of model WC0NR2201 works as Hotspot mode only, the wireless module of model WCT1DR2201D works as Client mode only. The two wireless modules can work at the same time.



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2.2 Description of Test Modes

For 5180 ~ 5320MHz

8 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
36	5180MHz	52	5260 MHz
40	5200MHz	56	5280 MHz
44	5220MHz	60	5300 MHz
48	5240MHz	64	5320 MHz

4 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
38	5190MHz	54	5270 MHz
46	5230MHz	62	5310 MHz

2 channels are provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
42	5210MHz	58	5290 MHz

For 5500 ~ 5700MHz

11 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

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

5 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

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

2 channels are provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
106	5530MHz	122	5610 MHz

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2.2.1 Test Mode Applicability and Tested Channel Detail

EUT configure mode	Applicable to										Description
	CF	OB	ROP	TPC	PD	AD	SE<1G	SE≥1G	SSM	RB	
A	√	√	√	--	√	√	√	√	√	√	Ant set 1

Where CF: Carrier frequencies OB: Occupied channel bandwidth measurement
 ROP: RF output power TPC: Transmit Power Control
 PD: Power Density AD: Adaptivity (Channel Access Mechanism)
 SE<1G: Spurious Emissions below 1GHz SE≥1G: Spurious Emissions above 1GHz
 SSM: Signal under Spectrum Power Mask RB: Receiver Blocking

Note: 1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
 2. "--" means no effect.

Carrier Frequencies and Channelization (Frequency Stability):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11a	36 to 64	36, 64	OFDM	BPSK	6.0
		100 to 140	100, 140	OFDM	BPSK	6.0
	802.11n/ac(20MHz)	36 to 64	36, 64	OFDM	BPSK	MCS0
		100 to 140	100, 140	OFDM	BPSK	MCS0
	802.11n/ac(40MHz)	38 to 62	38, 62	OFDM	BPSK	MCS0
		102 to 134	102, 134	OFDM	BPSK	MCS0
	802.11ac (80MHz)	42, 58	42, 58	OFDM	BPSK	MCS0
		106, 122	106, 122	OFDM	BPSK	MCS0

Occupied Channel Bandwidth Measurement:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11a	36 to 64	36, 64	OFDM	BPSK	6.0
		100 to 140	100, 140	OFDM	BPSK	6.0
	802.11n/ac(20MHz)	36 to 64	36, 64	OFDM	BPSK	MCS0
		100 to 140	100, 140	OFDM	BPSK	MCS0
	802.11n/ac(40MHz)	38 to 62	38, 62	OFDM	BPSK	MCS0
		102 to 134	102, 134	OFDM	BPSK	MCS0
	802.11ac(80MHz)	42, 58	42, 58	OFDM	BPSK	MCS0
		106, 122	106, 122	OFDM	BPSK	MCS0



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RF Output Power:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11a	36 to 64	36, 64	OFDM	BPSK	6.0
		100 to 140	100, 140	OFDM	BPSK	6.0
	802.11n/ac(20MHz)	36 to 64	36, 64	OFDM	BPSK	MCS0
		100 to 140	100, 140	OFDM	BPSK	MCS0
	802.11n/ac(40MHz)	38 to 62	38, 62	OFDM	BPSK	MCS0
		102 to 134	102, 134	OFDM	BPSK	MCS0
	802.11ac(80MHz)	42, 58	42, 58	OFDM	BPSK	MCS0
		106, 122	106, 122	OFDM	BPSK	MCS0

Power Density:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11a	36 to 64	36, 64	OFDM	BPSK	6.0
		100 to 140	100, 140	OFDM	BPSK	6.0
	802.11n/ac (20MHz)	36 to 64	36, 64	OFDM	BPSK	MCS0
		100 to 140	100, 140	OFDM	BPSK	MCS0
	802.11n/ac(40MHz)	38 to 62	38, 62	OFDM	BPSK	MCS0
		102 to 134	102, 134	OFDM	BPSK	MCS0
	802.11ac(80MHz)	42, 58	42, 58	OFDM	BPSK	MCS0
		106, 122	106, 122	OFDM	BPSK	MCS0

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Adaptivity Test:

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type
A	802.11a	36 to 64	36	OFDM	BPSK
		100 to 140		OFDM	BPSK
	802.11n(40MHz)	38 to 62	38	OFDM	BPSK
		102 to 134		OFDM	BPSK

Spurious Emissions Test (Below 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11a	36 to 64 100 to 140	36	OFDM	BPSK	6.0

Spurious Emissions Test (Above 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11a	36 to 64	36	OFDM	BPSK	6.0
		100 to 140	100	OFDM	BPSK	6.0
	802.11n/ac (20MHz)	36 to 64	36	OFDM	BPSK	MCS0
		100 to 140	100	OFDM	BPSK	MCS0
	802.11n/ac(40MHz)	38 to 62	38	OFDM	BPSK	MCS0
		102 to 134	102	OFDM	BPSK	MCS0
	802.11ac(80MHz)	42, 58	42	OFDM	BPSK	MCS0
		106, 122	106	OFDM	BPSK	MCS0



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Transmitter Unwanted Emissions within the 5GHz RLAN Bands (Signal under Spectrum Mask):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11a	36 to 64	36, 64	OFDM	BPSK	6.0
		100 to 140	100, 140	OFDM	BPSK	6.0
	802.11n/ac(20MHz)	36 to 64	36, 64	OFDM	BPSK	MCS0
		100 to 140	100, 140	OFDM	BPSK	MCS0
	802.11n/ac(40MHz)	38 to 62	38, 62	OFDM	BPSK	MCS0
		102 to 134	102, 134	OFDM	BPSK	MCS0
	802.11ac(80MHz)	42, 58	42, 58	OFDM	BPSK	MCS0
		106, 122	106, 122	OFDM	BPSK	MCS0

Receiver Blocking Test:

- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11a	36 to 64 100 to 140	36	OFDM	BPSK	6.0

Test Condition:

Applicable to	Environmental conditions	INPUT POWER
CF	25deg. C, 60%RH	AC 230V
ROP	25deg. C, 60%RH	AC 230V
OB	25deg. C, 60%RH	AC 230V
TPC	25deg. C, 60%RH	--
PD	25deg. C, 60%RH	AC 230V
AD	25deg. C, 60%RH	AC 230V
SE<1G	20deg. C, 68%RH	AC 230V
SE≥1G	20deg. C, 68%RH	AC 230V
SSM	20deg. C, 68%RH	AC 230V
RB	25deg. C, 60%RH	AC 230V



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2.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND/ Manufacturer	MODEL NO.
1	PC	ThinkPad	L470
2	Network Cable	--	--

2.4 General Description of Applied Standards

The EUT is a RF Product. According to the specification of the EUT declared by the manufacturer, it must comply with the requirements of the following standards:

EN 301 893 V2.1.1 (2017-05)

All test items have been performed and recorded as per the above standard.



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3 Test Procedure and Results

3.1 Carrier Frequencies

3.1.1 Limits of Carrier Frequencies

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

3.1.2 Test Procedures

Refer to EN 301 893 V2.1.1 clause 5.4.2.

3.1.3 Deviation from Test Standard

No deviation

3.1.4 Test Setup

The measurement was performed at normal and extreme environmental conditions. The measurement channels were performed in accordance with EN 301 893 clause 5.3.2. The equipment was configured to operate under its worst case situation with respect to output power. The EUT shall be connected to spectrum analyzer. (In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator.).



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3.1.5 Test Results

WCT1DR2201D

Test Condition	TestMode	Antenna	Freq(MHz)	Result[ppm]	Limit[ppm]	Verdict
NTNV	11A	Ant1	5180	0.00000	±20	PASS
		Ant2	5180	-7.72201	±20	PASS
		Ant1	5320	-7.51880	±20	PASS
		Ant2	5320	-7.51880	±20	PASS
		Ant1	5500	-3.63636	±20	PASS
		Ant2	5500	-3.63636	±20	PASS
	11N20MIMO	Ant1	5180	-3.86100	±20	PASS
		Ant2	5180	0.00000	±20	PASS
		Ant1	5320	-3.75940	±20	PASS
		Ant2	5320	-7.51880	±20	PASS
		Ant1	5500	0.00000	±20	PASS
		Ant2	5500	3.63636	±20	PASS
	11N40MIMO	Ant1	5190	0.00000	±20	PASS
		Ant2	5190	0.00000	±20	PASS
		Ant1	5310	0.00000	±20	PASS
		Ant2	5310	-7.53296	±20	PASS
		Ant1	5510	0.00000	±20	PASS
		Ant2	5510	0.00000	±20	PASS
	11AC20MIMO	Ant1	5180	-3.86100	±20	PASS
		Ant2	5180	-3.86100	±20	PASS
		Ant1	5320	-3.75940	±20	PASS
		Ant2	5320	-7.51880	±20	PASS
		Ant1	5500	-3.63636	±20	PASS
		Ant2	5500	0.00000	±20	PASS
	11AC40MIMO	Ant1	5190	0.00000	±20	PASS
		Ant2	5190	0.00000	±20	PASS
		Ant1	5310	0.00000	±20	PASS
		Ant2	5310	0.00000	±20	PASS
		Ant1	5510	0.00000	±20	PASS
		Ant2	5510	0.00000	±20	PASS
	11AC80MIMO	Ant1	5210	15.35509	±20	PASS
		Ant2	5210	0.00000	±20	PASS
		Ant1	5290	0.00000	±20	PASS
		Ant2	5290	0.00000	±20	PASS
		Ant1	5530	0.00000	±20	PASS
		Ant2	5530	0.00000	±20	PASS
LTNV	11A	Ant1	5180	0.00000	±20	PASS
		Ant2	5180	-7.72201	±20	PASS



TEST REPORT N°: KSK-ESH-P24071264B-5

		Ant1	5320	-7.51880	±20	PASS
		Ant2	5320	-7.51880	±20	PASS
		Ant1	5500	0.00000	±20	PASS
		Ant2	5500	-3.63636	±20	PASS
	11N20MIMO	Ant1	5180	-3.86100	±20	PASS
		Ant2	5180	0.00000	±20	PASS
		Ant1	5320	-3.75940	±20	PASS
		Ant2	5320	-7.51880	±20	PASS
		Ant1	5500	0.00000	±20	PASS
		Ant2	5500	3.63636	±20	PASS
	11N40MIMO	Ant1	5190	0.00000	±20	PASS
		Ant2	5190	0.00000	±20	PASS
		Ant1	5310	-7.53296	±20	PASS
		Ant2	5310	-7.53296	±20	PASS
		Ant1	5510	0.00000	±20	PASS
		Ant2	5510	0.00000	±20	PASS
	11AC20MIMO	Ant1	5180	-3.86100	±20	PASS
		Ant2	5180	-3.86100	±20	PASS
		Ant1	5320	-3.75940	±20	PASS
		Ant2	5320	-7.51880	±20	PASS
		Ant1	5500	-3.63636	±20	PASS
		Ant2	5500	3.63636	±20	PASS
	11AC40MIMO	Ant1	5190	0.00000	±20	PASS
		Ant2	5190	0.00000	±20	PASS
		Ant1	5310	0.00000	±20	PASS
		Ant2	5310	0.00000	±20	PASS
		Ant1	5510	0.00000	±20	PASS
		Ant2	5510	0.00000	±20	PASS
	11AC80MIMO	Ant1	5210	15.35509	±20	PASS
		Ant2	5210	0.00000	±20	PASS
		Ant1	5290	0.00000	±20	PASS
		Ant2	5290	0.00000	±20	PASS
		Ant1	5530	0.00000	±20	PASS
		Ant2	5530	0.00000	±20	PASS
HTNV	11A	Ant1	5180	0.00000	±20	PASS
		Ant2	5180	-7.72201	±20	PASS
		Ant1	5320	-7.51880	±20	PASS
		Ant2	5320	-7.51880	±20	PASS
		Ant1	5500	-3.63636	±20	PASS
		Ant2	5500	-3.63636	±20	PASS
	11N20MIMO	Ant1	5180	-3.86100	±20	PASS



TEST REPORT N°: KSK-ESH-P24071264B-5

		Ant2	5180	0.00000	±20	PASS
		Ant1	5320	-3.75940	±20	PASS
		Ant2	5320	-7.51880	±20	PASS
		Ant1	5500	0.00000	±20	PASS
		Ant2	5500	3.63636	±20	PASS
	11N40MIMO	Ant1	5190	0.00000	±20	PASS
		Ant2	5190	0.00000	±20	PASS
		Ant1	5310	-7.53296	±20	PASS
		Ant2	5310	-7.53296	±20	PASS
		Ant1	5510	0.00000	±20	PASS
		Ant2	5510	0.00000	±20	PASS
	11AC20MIMO	Ant1	5180	-3.86100	±20	PASS
		Ant2	5180	-3.86100	±20	PASS
		Ant1	5320	-3.75940	±20	PASS
		Ant2	5320	-7.51880	±20	PASS
		Ant1	5500	0.00000	±20	PASS
		Ant2	5500	3.63636	±20	PASS
	11AC40MIMO	Ant1	5190	0.00000	±20	PASS
		Ant2	5190	0.00000	±20	PASS
		Ant1	5310	0.00000	±20	PASS
		Ant2	5310	0.00000	±20	PASS
		Ant1	5510	0.00000	±20	PASS
		Ant2	5510	0.00000	±20	PASS
	11AC80MIMO	Ant1	5210	15.35509	±20	PASS
		Ant2	5210	0.00000	±20	PASS
		Ant1	5290	0.00000	±20	PASS
		Ant2	5290	0.00000	±20	PASS
		Ant1	5530	0.00000	±20	PASS
		Ant2	5530	0.00000	±20	PASS



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WC0NR2201

Test Condition	Test Mode	Antenna	Channel[MHz]	Result[ppm]	Limit[ppm]	Verdict
NTNV	11A	Ant1	5180	-3.86100	±20	PASS
		Ant2	5180	-7.72201	±20	PASS
	11N20MIMO	Ant1	5180	-3.86100	±20	PASS
		Ant2	5180	7.72201	±20	PASS
	11N40MIMO	Ant1	5190	0.00000	±20	PASS
		Ant2	5190	15.41426	±20	PASS
	11AC20MIMO	Ant1	5180	3.86100	±20	PASS
		Ant2	5180	7.72201	±20	PASS
	11AC40MIMO	Ant1	5190	7.70713	±20	PASS
		Ant2	5190	15.41426	±20	PASS
	11AC80MIMO	Ant1	5210	15.35509	±20	PASS
		Ant2	5210	15.35509	±20	PASS
LTNV	11A	Ant1	5180	-3.86100	±20	PASS
		Ant2	5180	-3.86100	±20	PASS
	11N20MIMO	Ant1	5180	-3.86100	±20	PASS
		Ant2	5180	7.72201	±20	PASS
	11N40MIMO	Ant1	5190	0.00000	±20	PASS
		Ant2	5190	15.41426	±20	PASS
	11AC20MIMO	Ant1	5180	3.86100	±20	PASS
		Ant2	5180	7.72201	±20	PASS
	11AC40MIMO	Ant1	5190	7.70713	±20	PASS
		Ant2	5190	15.41426	±20	PASS
	11AC80MIMO	Ant1	5210	15.35509	±20	PASS
		Ant2	5210	15.35509	±20	PASS
HTNV	11A	Ant1	5180	-3.86100	±20	PASS
		Ant2	5180	-3.86100	±20	PASS
	11N20MIMO	Ant1	5180	-3.86100	±20	PASS
		Ant2	5180	7.72201	±20	PASS
	11N40MIMO	Ant1	5190	7.70713	±20	PASS
		Ant2	5190	15.41426	±20	PASS
	11AC20MIMO	Ant1	5180	3.86100	±20	PASS
		Ant2	5180	7.72201	±20	PASS
	11AC40MIMO	Ant1	5190	7.70713	±20	PASS
		Ant2	5190	7.70713	±20	PASS
	11AC80MIMO	Ant1	5210	15.35509	±20	PASS
		Ant2	5210	15.35509	±20	PASS

TEST REPORT N°: KSK-ESH-P24071264B-5

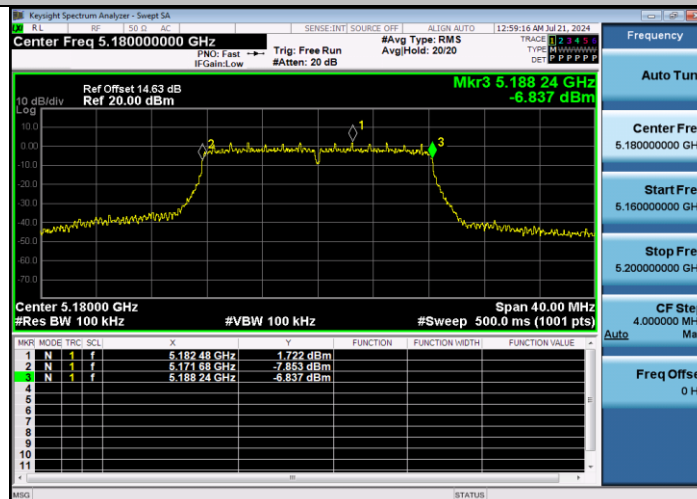
3.1.6 Test Graphs

WCT1DR2201D

NTNV_11A_Ant1_5180



NTNV_11A_Ant2_5180



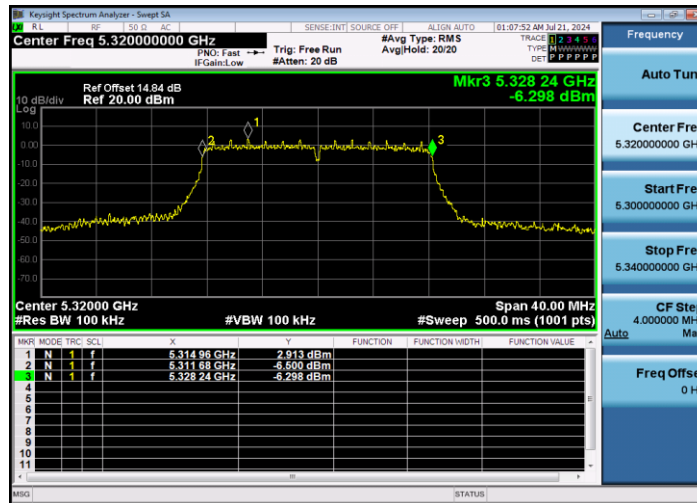
NTNV_11A_Ant1_5320



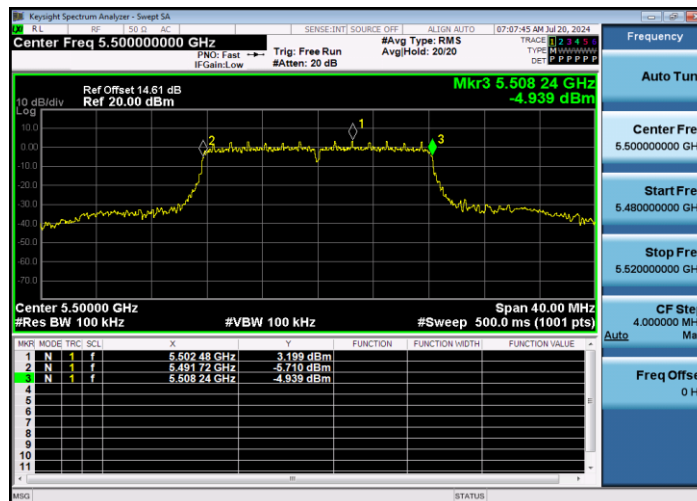


TEST REPORT N°: KSK-ESH-P24071264B-5

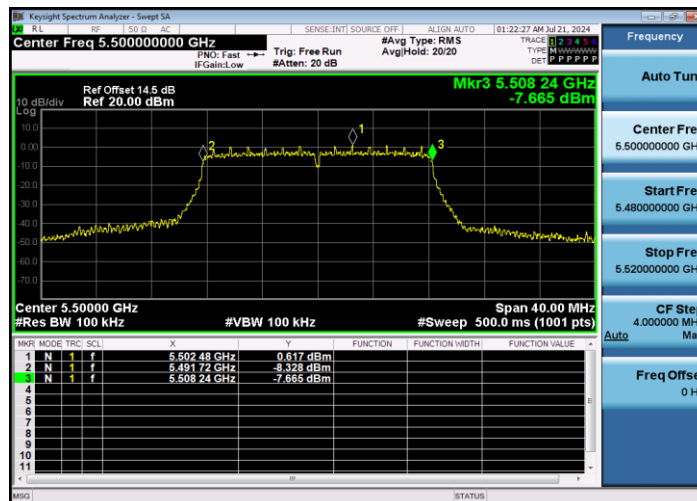
NTNV_11A_Ant2_5320



NTNV_11A_Ant1_5500

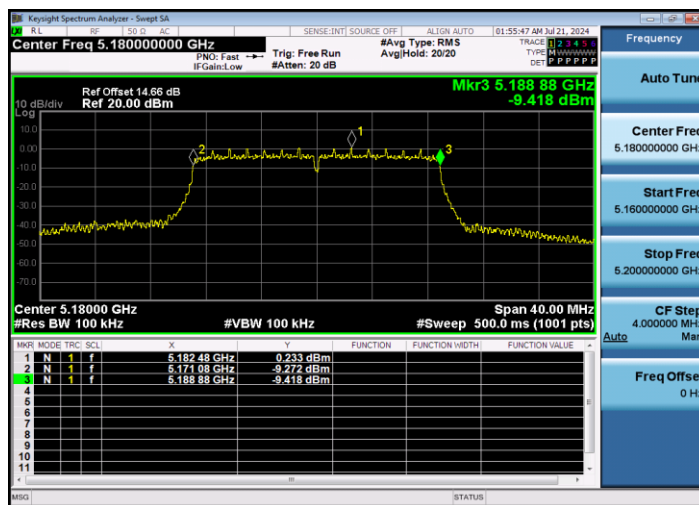


NTNV_11A_Ant2_5500

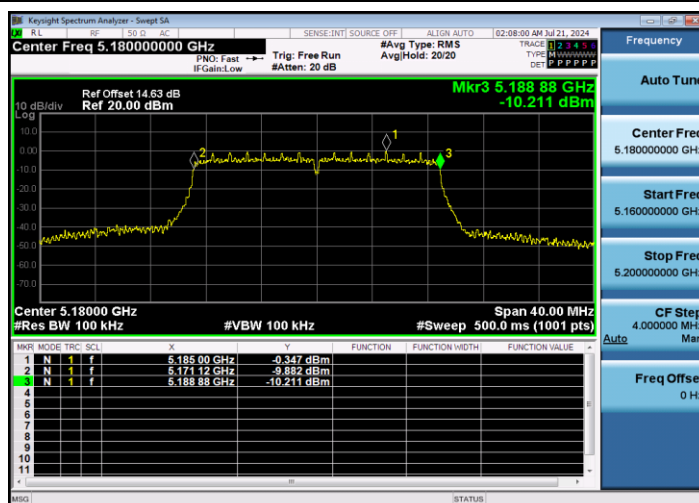


NTNV_11N20MIMO_Ant1_5180

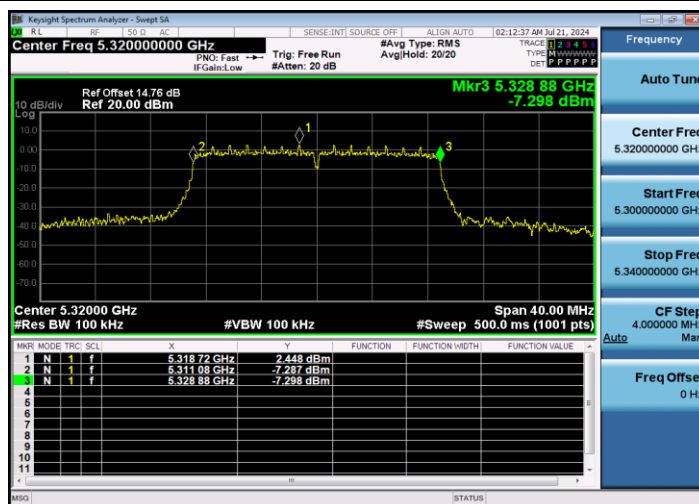
TEST REPORT N°: KSK-ESH-P24071264B-5



NTVN_11N20MIMO_Ant2_5180

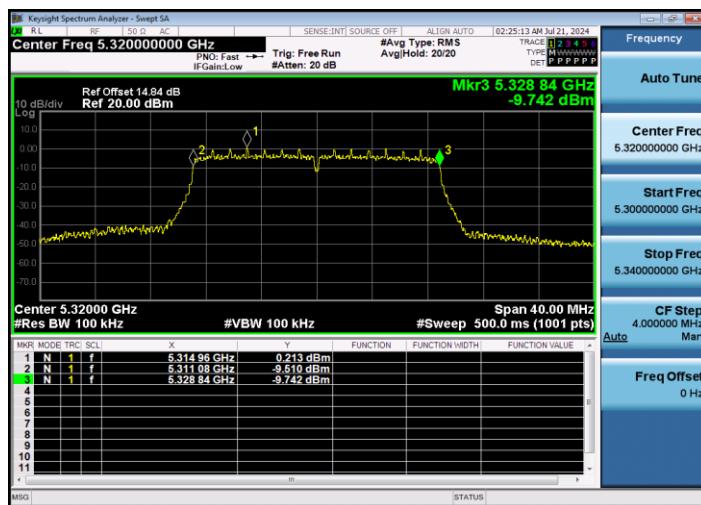


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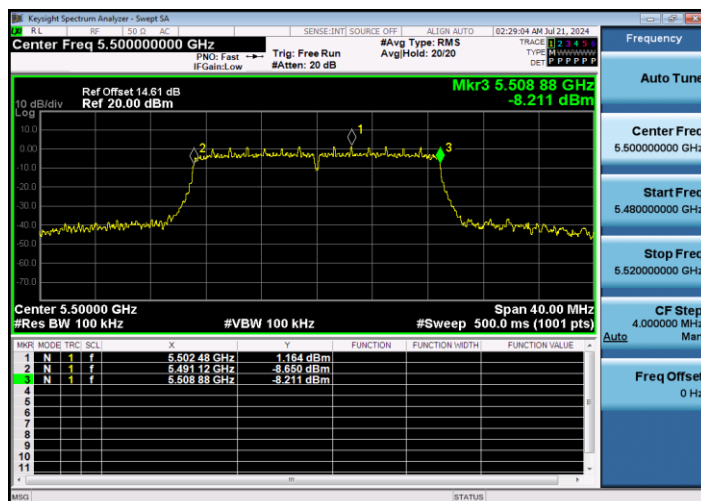


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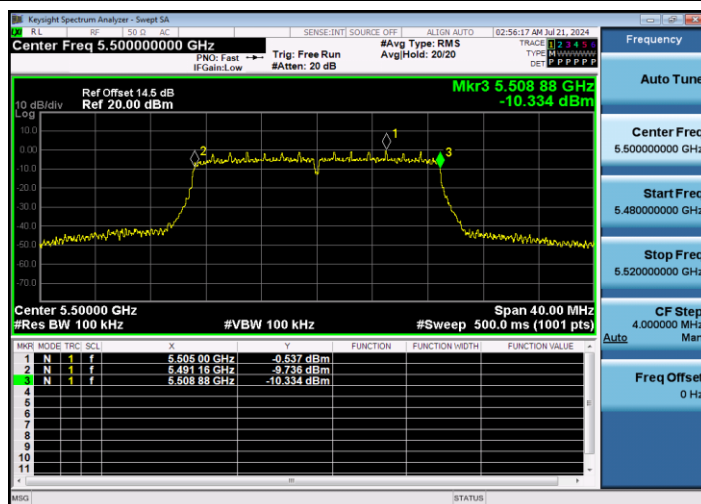
TEST REPORT N°: KSK-ESH-P24071264B-5



NTNV_11N20MIMO_Ant1_5500

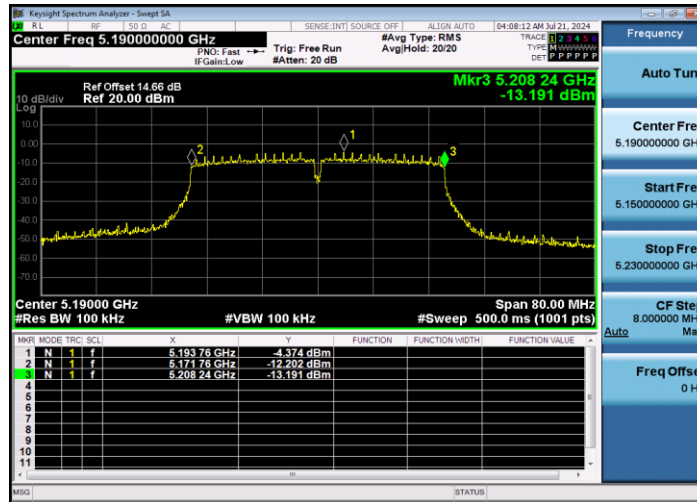


NTNV_11N20MIMO_Ant2_5500

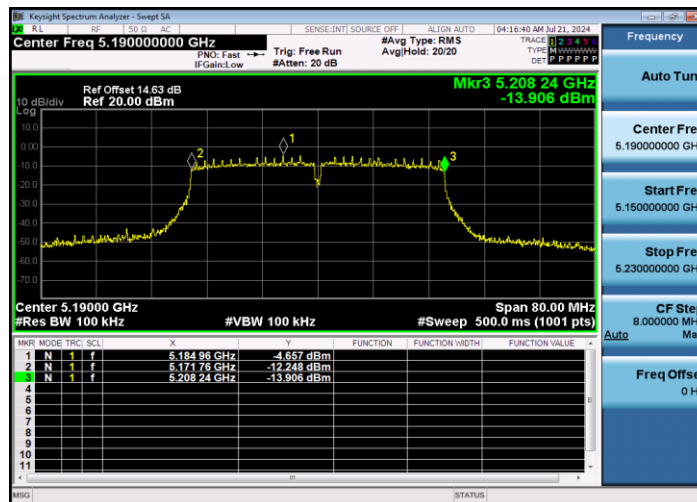


NTNV_11N40MIMO_Ant1_5190

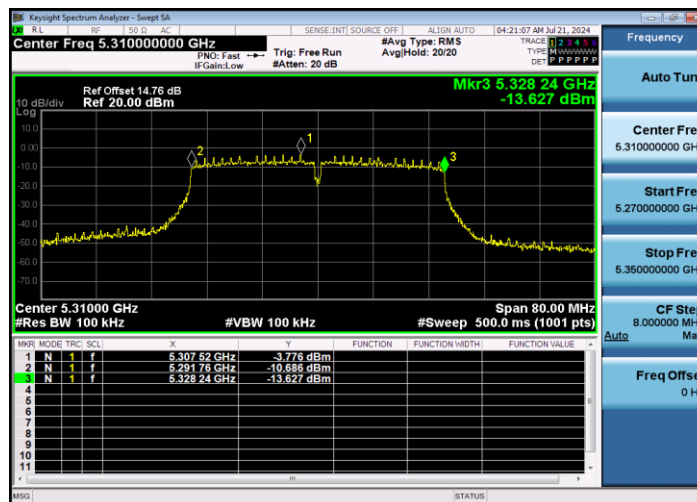
TEST REPORT N°: KSK-ESH-P24071264B-5



NTVN_11N40MIMO_Ant2_5190

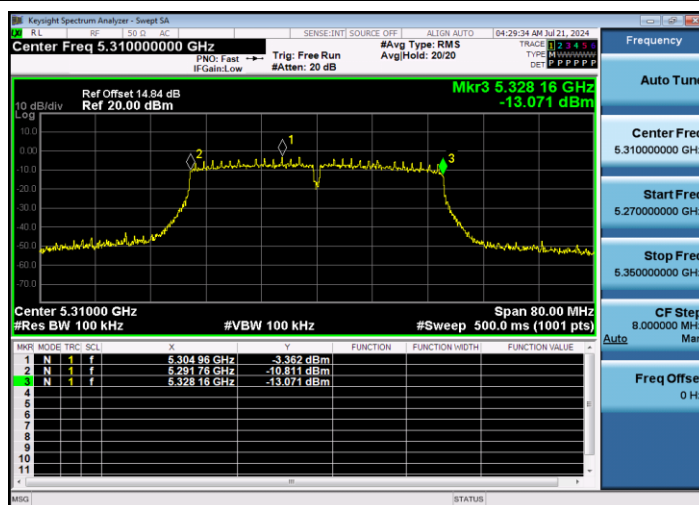


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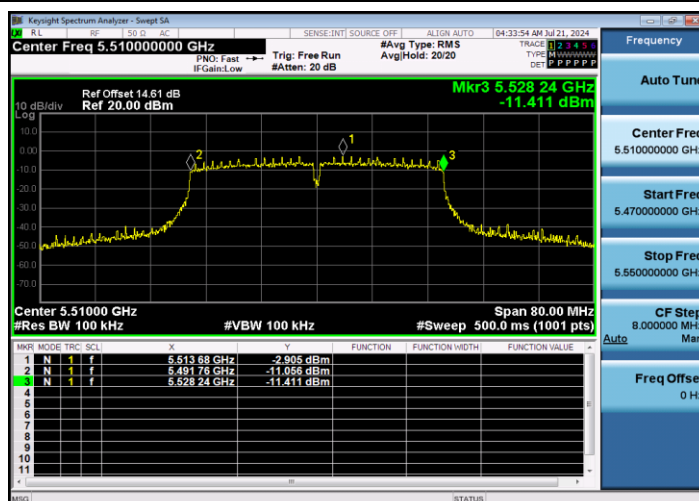


NTVN_11N40MIMO_Ant2_5310

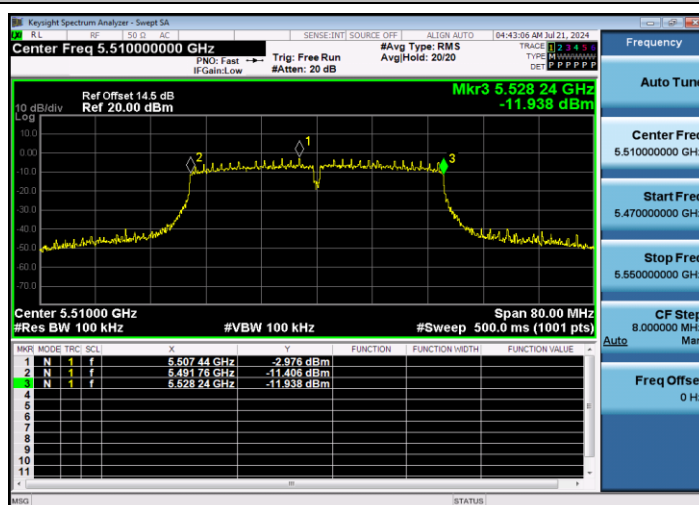
TEST REPORT N°: KSK-ESH-P24071264B-5



NTVN_11N40MIMO_Ant1_5510

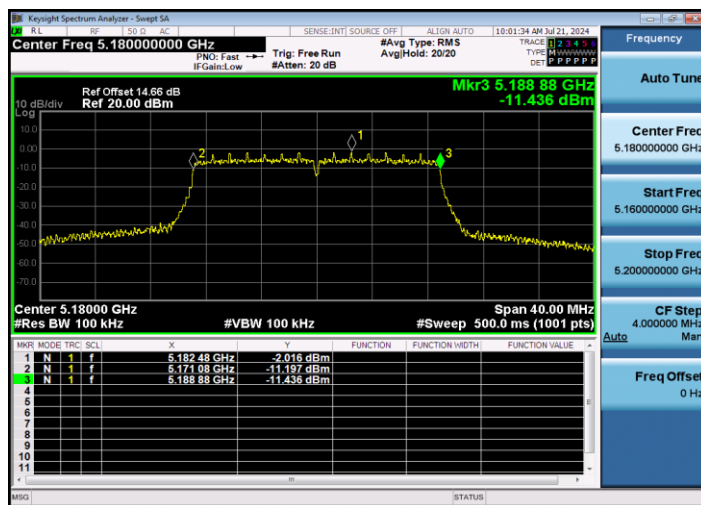


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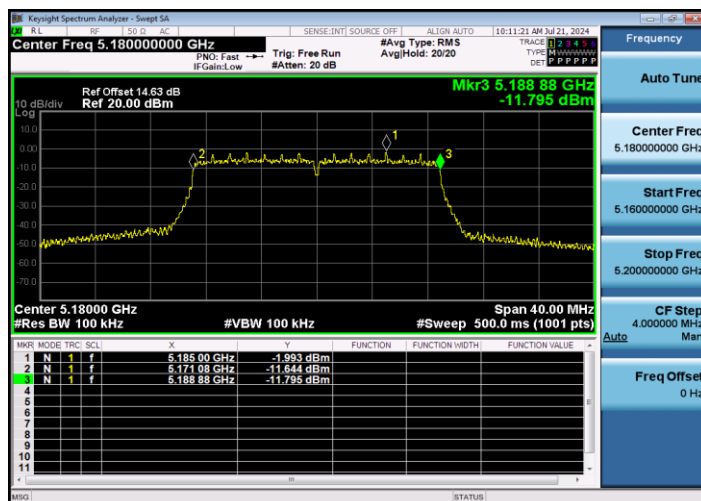


NTVN_11AC20MIMO_Ant1_5180

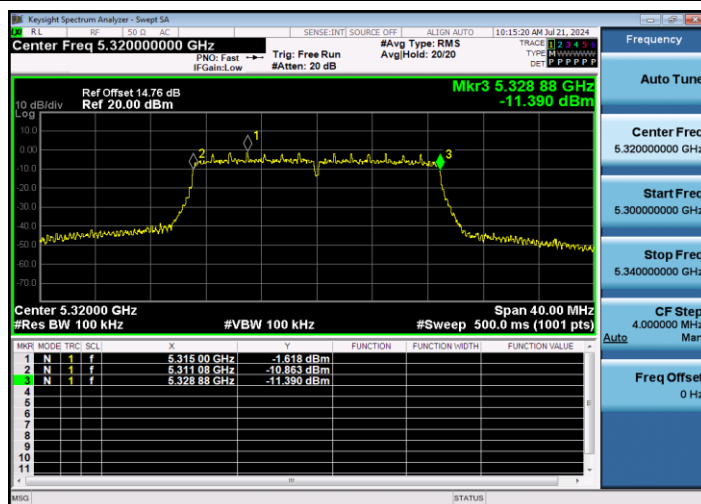
TEST REPORT N°: KSK-ESH-P24071264B-5



NTNV_11AC20MIMO_Ant2_5180

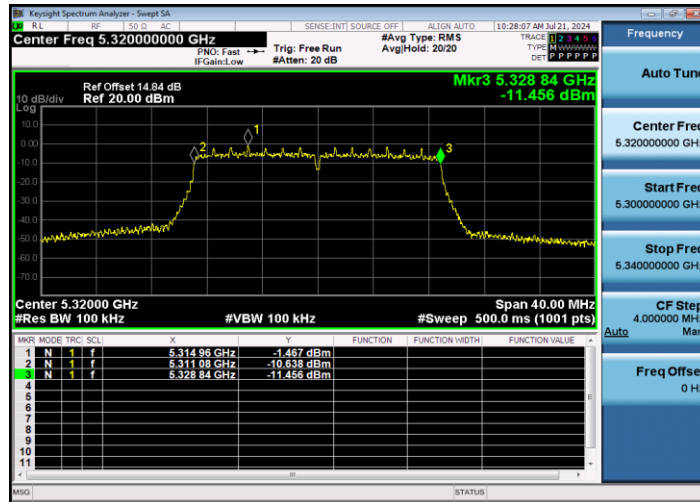


NTNV_11AC20MIMO_Ant1_5320

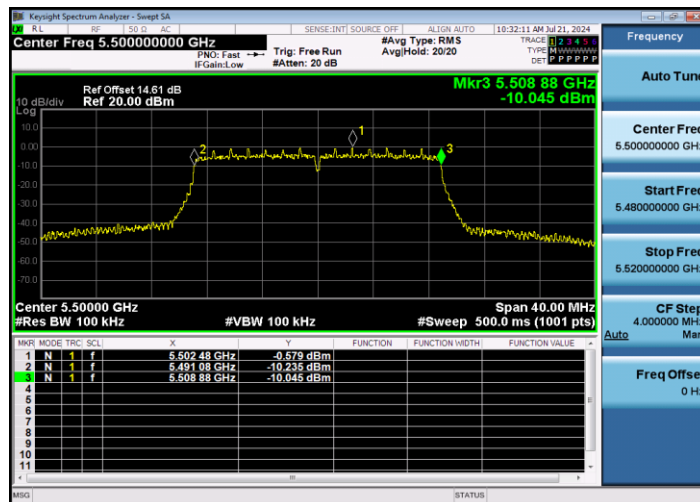


NTNV_11AC20MIMO_Ant2_5320

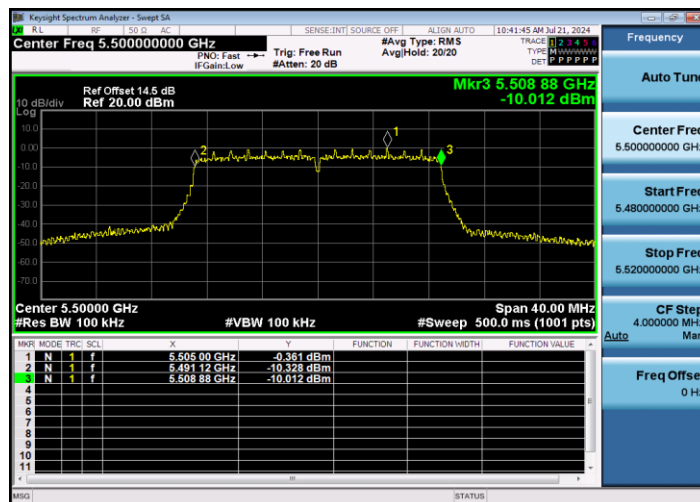
TEST REPORT N°: KSK-ESH-P24071264B-5



NTNV_11AC20MIMO_Ant1_5500

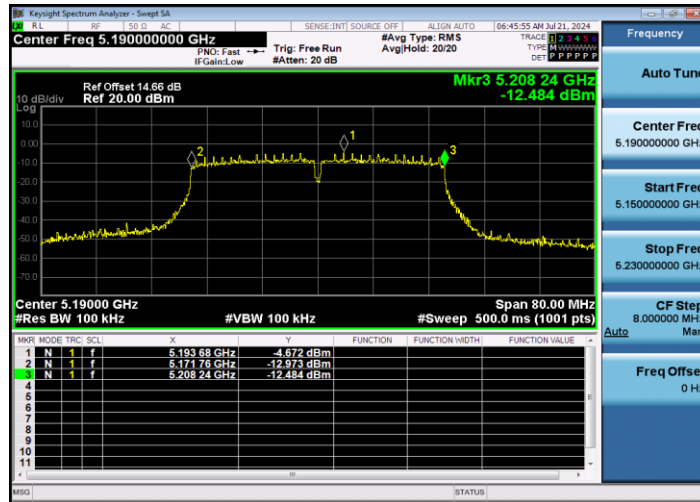


NTNV_11AC20MIMO_Ant2_5500

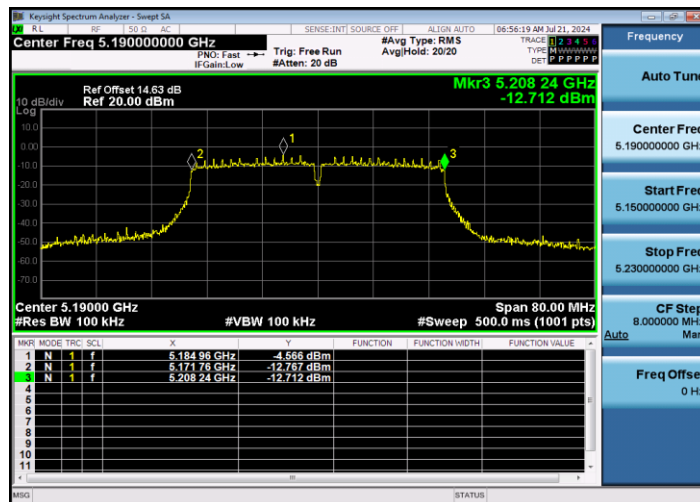


NTNV_11AC40MIMO_Ant1_5190

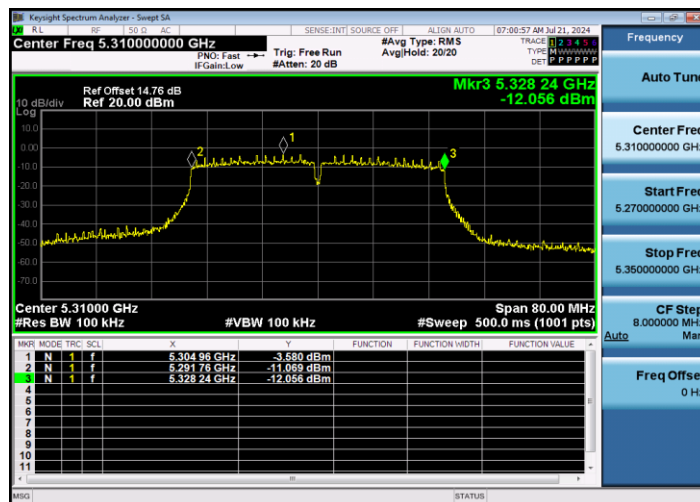
TEST REPORT N°: KSK-ESH-P24071264B-5



NTNV_11AC40MIMO_Ant2_5190

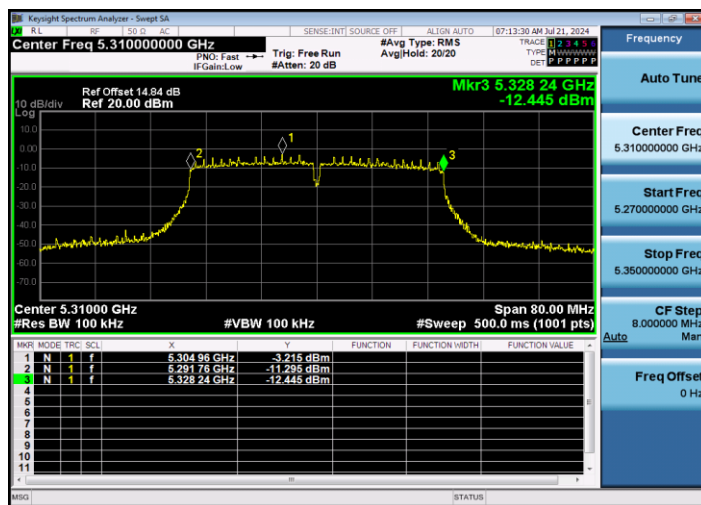


NTNV_11AC40MIMO_Ant1_5310

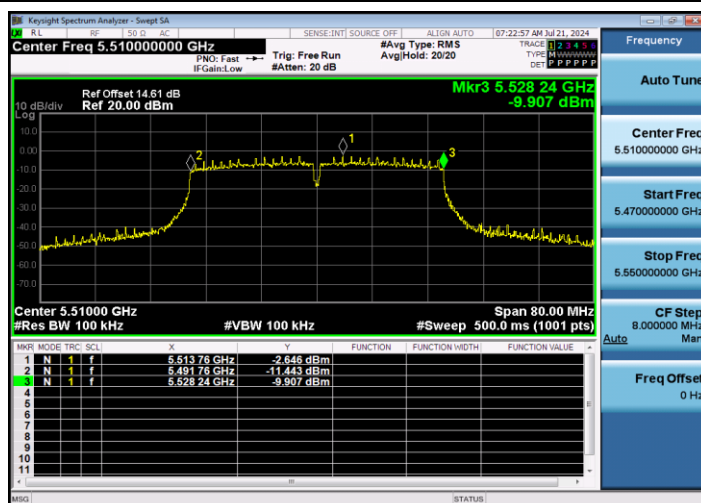


NTNV_11AC40MIMO_Ant2_5310

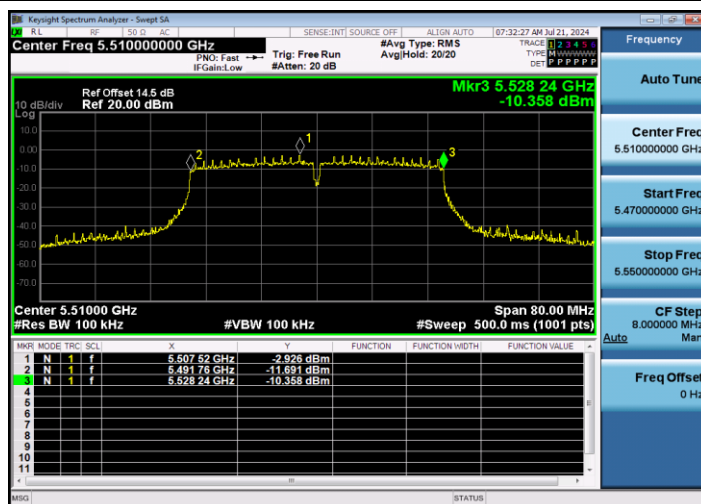
TEST REPORT N°: KSK-ESH-P24071264B-5



NTNV_11AC40MIMO_Ant1_5510

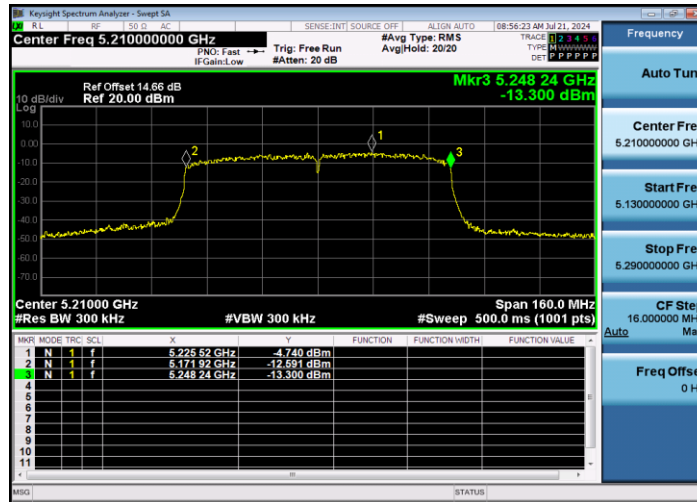


NTNV_11AC40MIMO_Ant2_5510

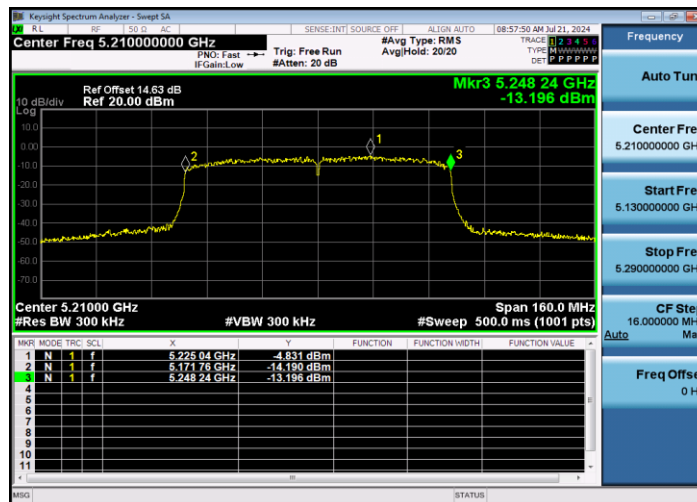


NTNV_11AC80MIMO_Ant1_5210

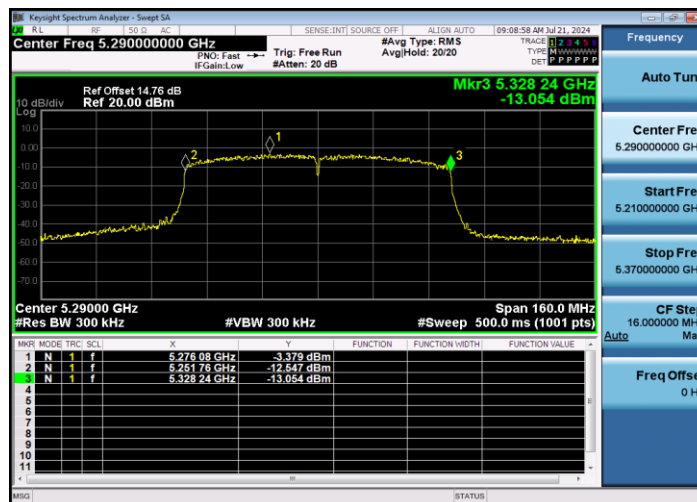
TEST REPORT N°: KSK-ESH-P24071264B-5



NTNV_11AC80MIMO_Ant2_5210

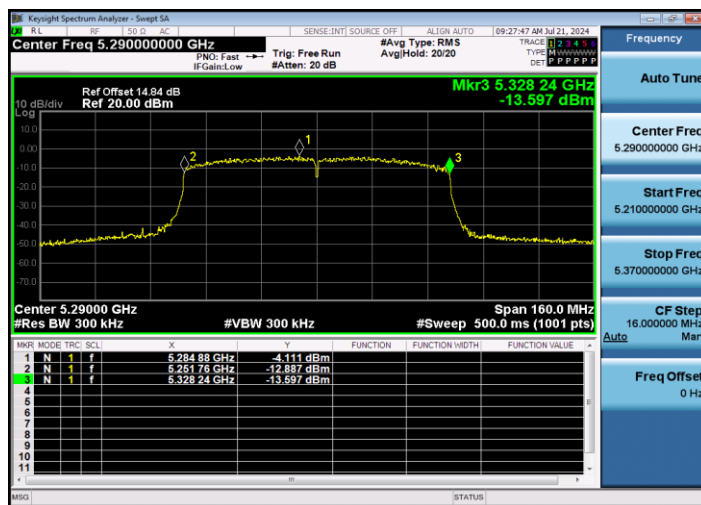


NTNV_11AC80MIMO_Ant1_5290

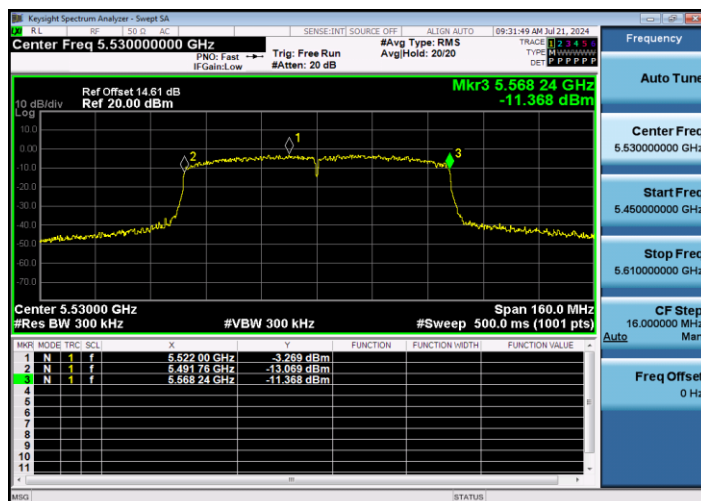


NTNV_11AC80MIMO_Ant2_5290

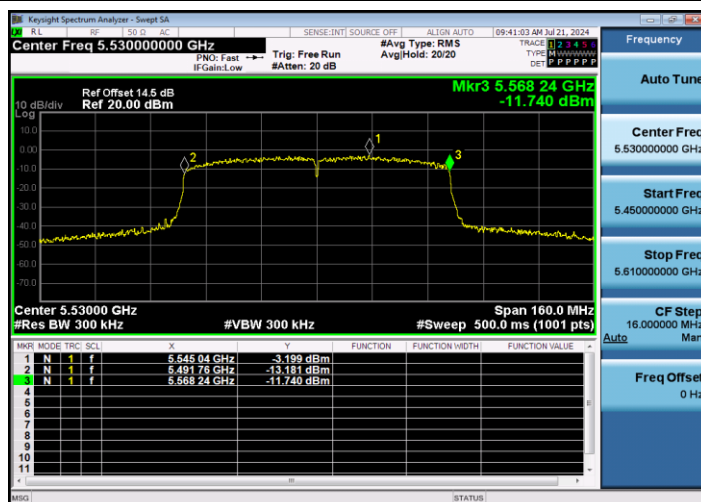
TEST REPORT N°: KSK-ESH-P24071264B-5



NTNV_11AC80MIMO_Ant1_5530

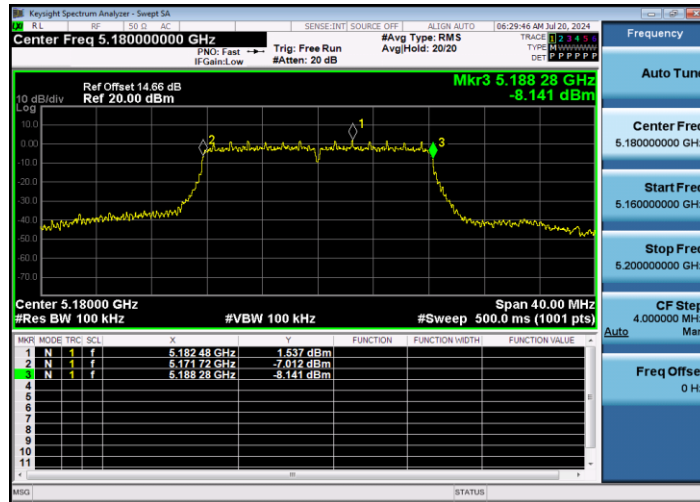


NTNV_11AC80MIMO_Ant2_5530

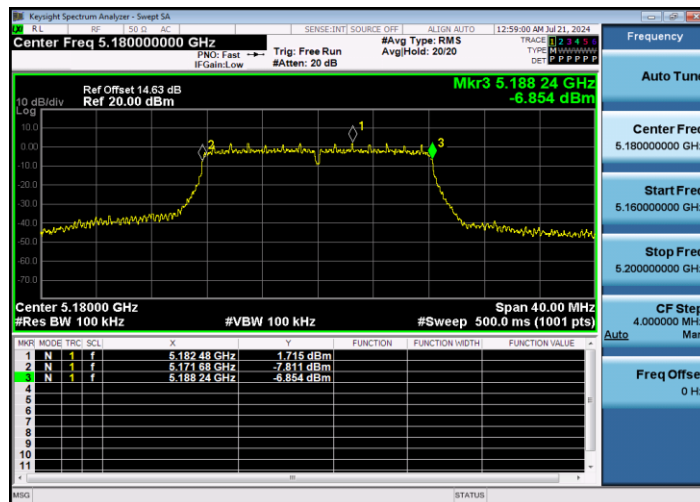


LTNV_11A_Ant1_5180

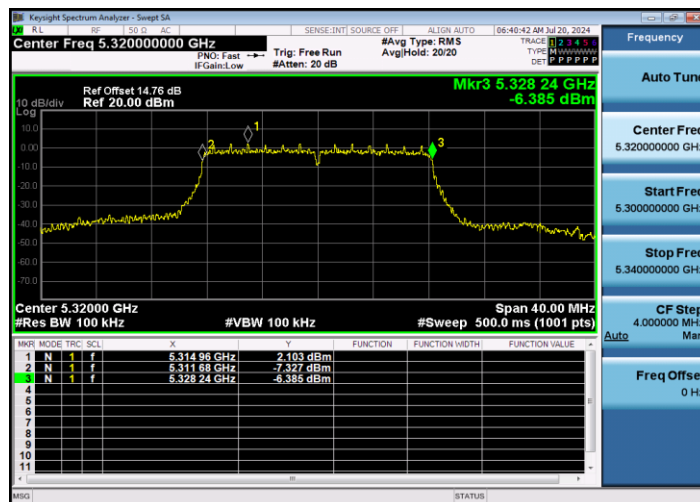
TEST REPORT N°: KSK-ESH-P24071264B-5



LTNV_11A_Ant2_5180

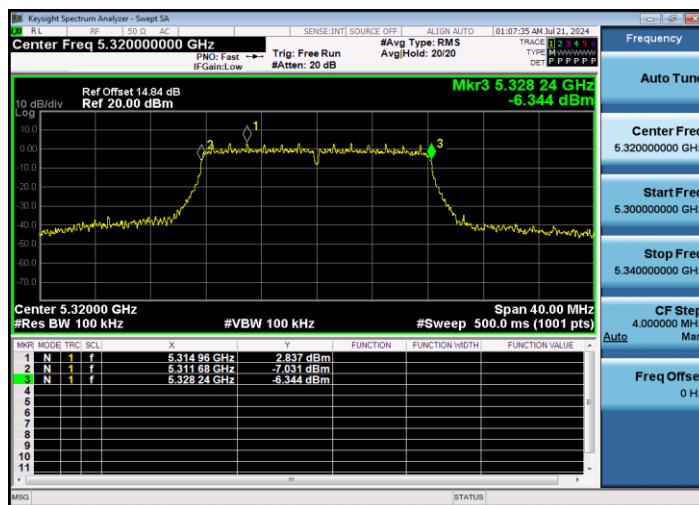


LTNV_11A_Ant1_5320

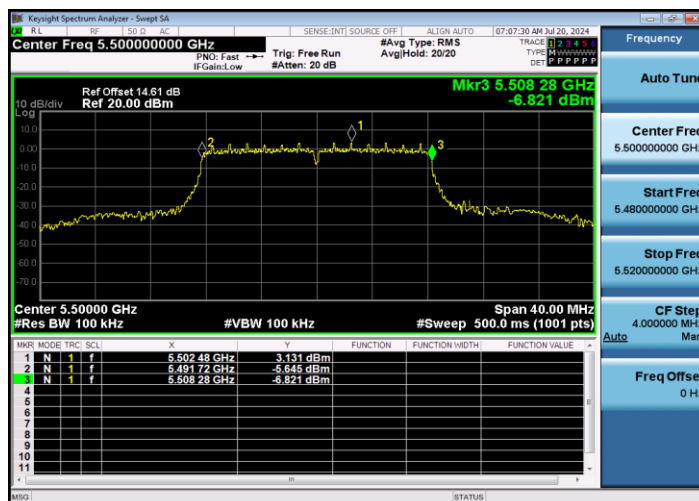


LTNV_11A_Ant2_5320

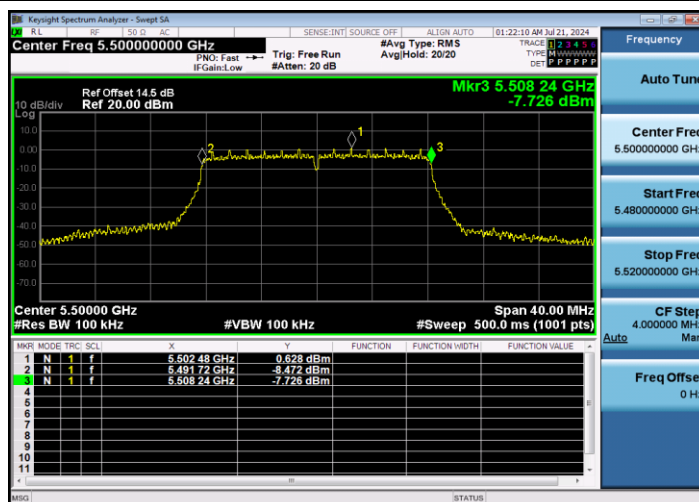
TEST REPORT N°: KSK-ESH-P24071264B-5



LTNV_11A_Ant1_5500

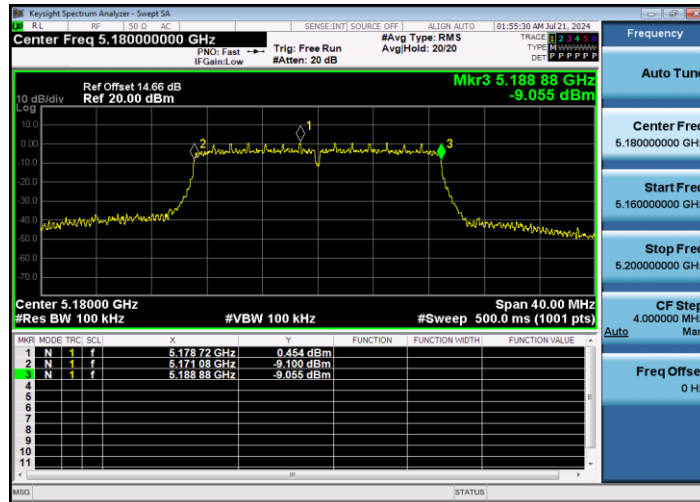


LTNV_11A_Ant2_5500

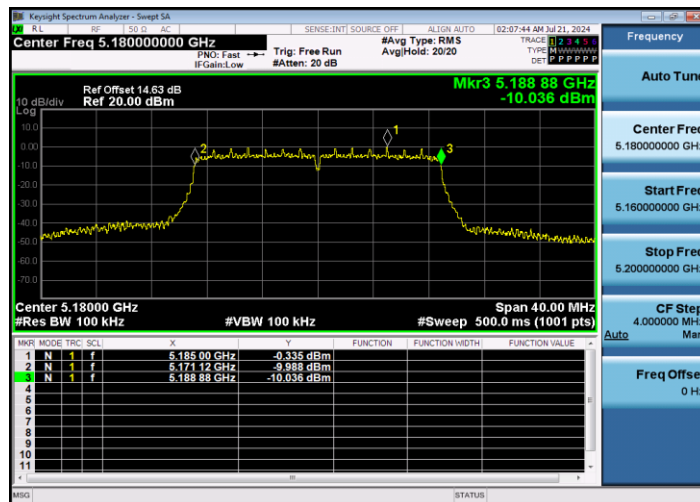


LTNV_11N20MIMO_Ant1_5180

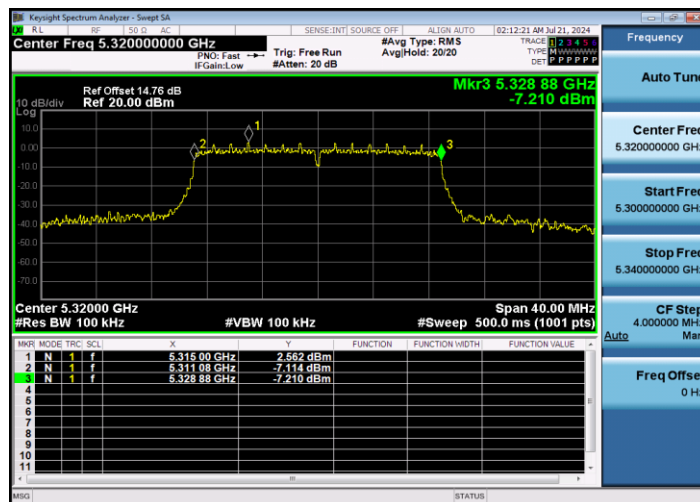
TEST REPORT N°: KSK-ESH-P24071264B-5



LTNV_11N20MIMO_Ant2_5180

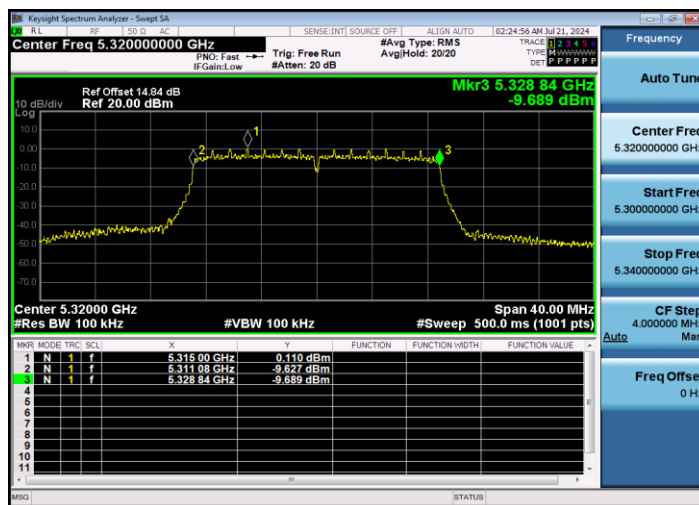


LTNV_11N20MIMO_Ant1_5320

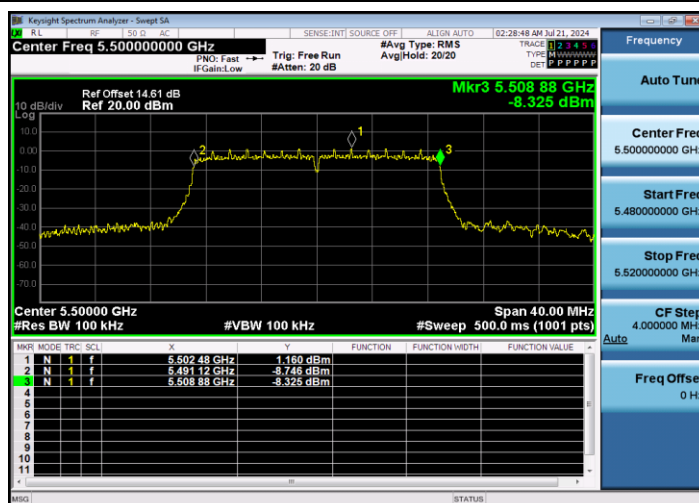


LTNV_11N20MIMO_Ant2_5320

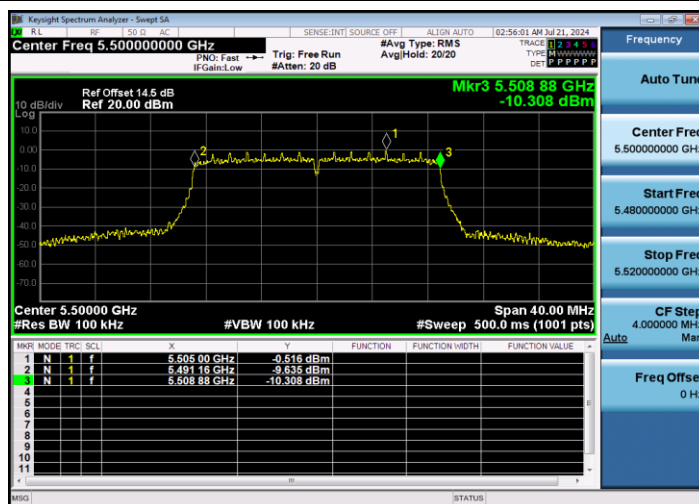
TEST REPORT N°: KSK-ESH-P24071264B-5



LTNV_11N20MIMO_Ant1_5500

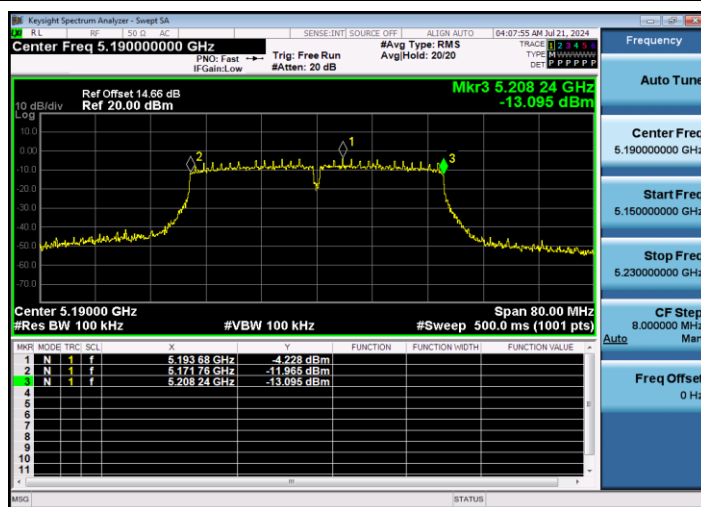


LTNV_11N20MIMO_Ant2_5500

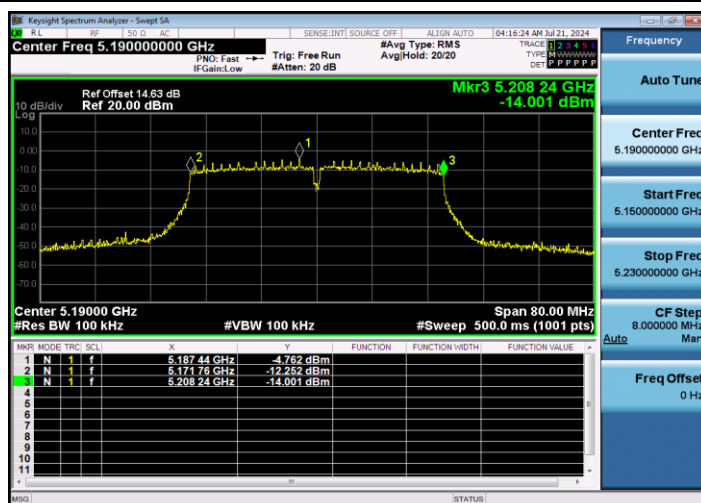


LTNV_11N40MIMO_Ant1_5190

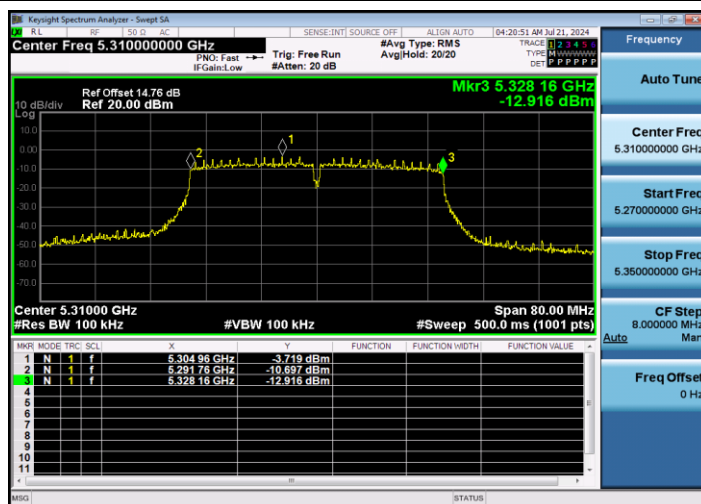
TEST REPORT N°: KSK-ESH-P24071264B-5



LTNV_11N40MIMO_Ant2_5190



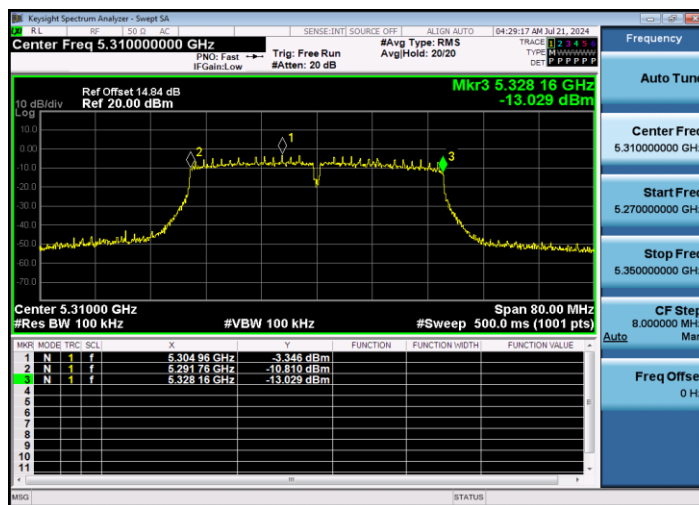
LTNV_11N40MIMO_Ant1_5310



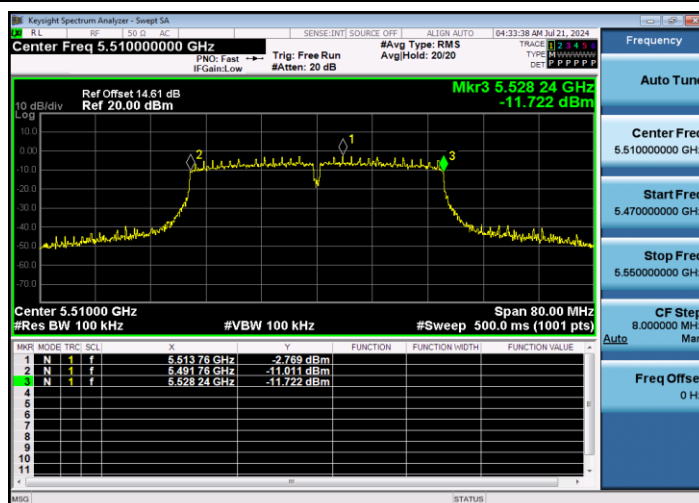
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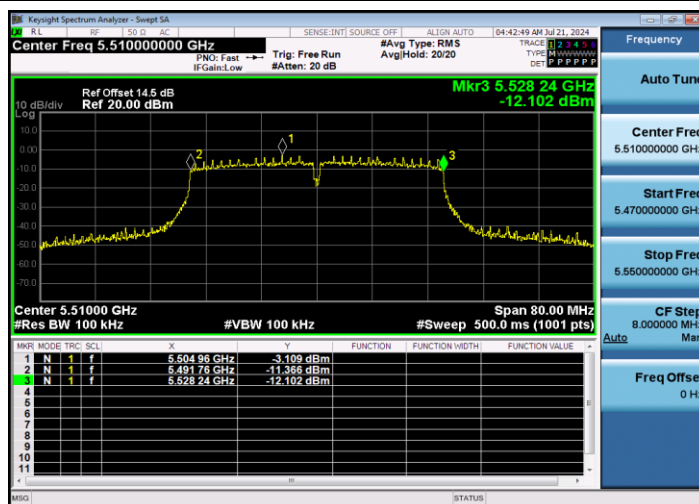
TEST REPORT N°: KSK-ESH-P24071264B-5



LTNV_11N40MIMO_Ant1_5510

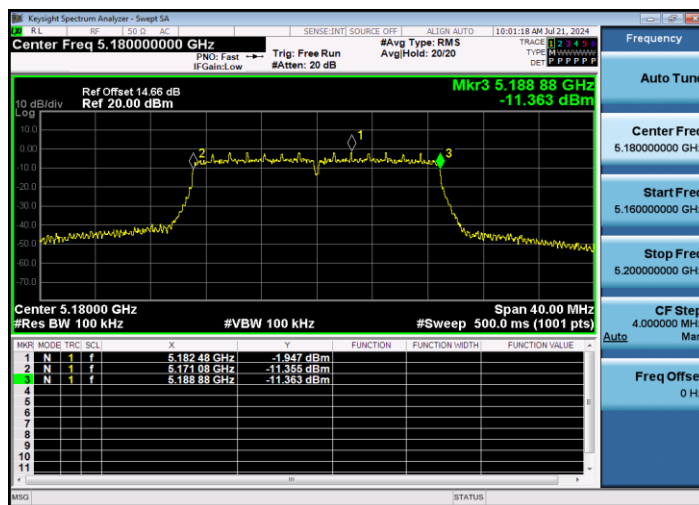


LTNV_11N40MIMO_Ant2_5510

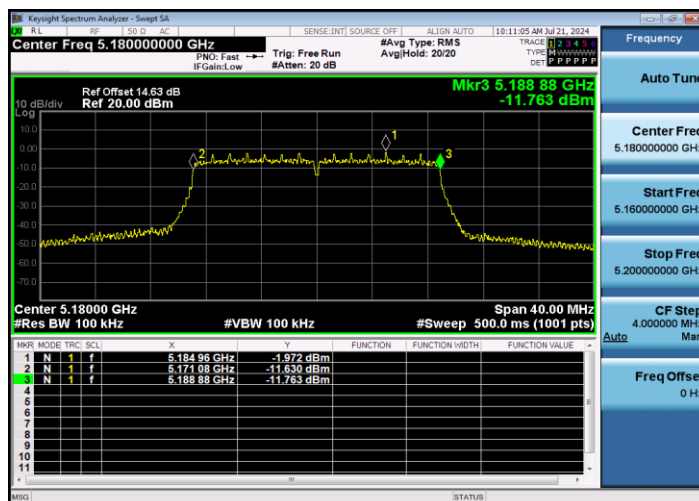


LTNV_11AC20MIMO_Ant1_5180

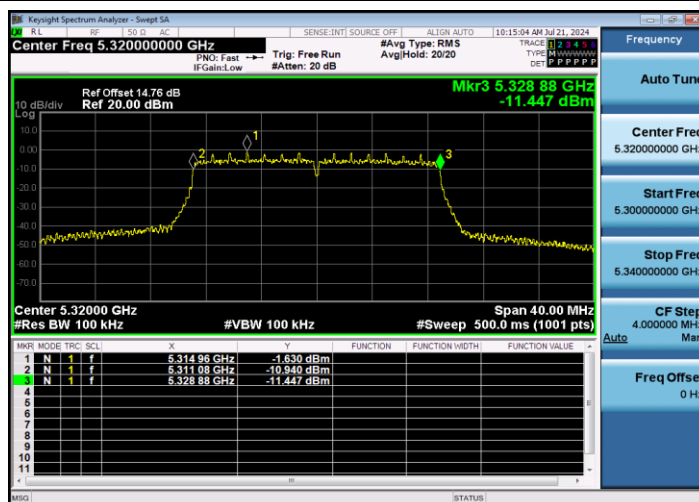
TEST REPORT N°: KSK-ESH-P24071264B-5



LTNV_11AC20MIMO_Ant2_5180

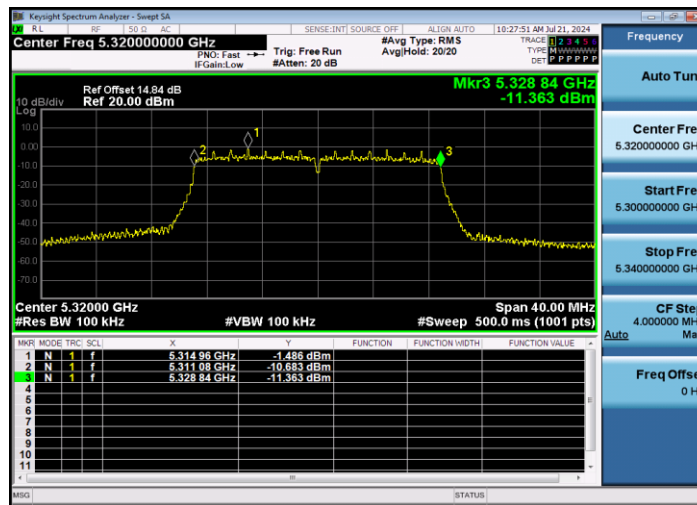


LTNV_11AC20MIMO_Ant1_5320

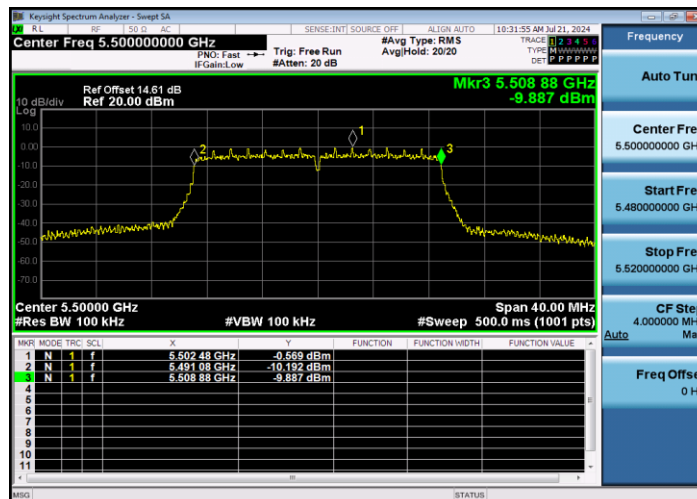


LTNV_11AC20MIMO_Ant2_5320

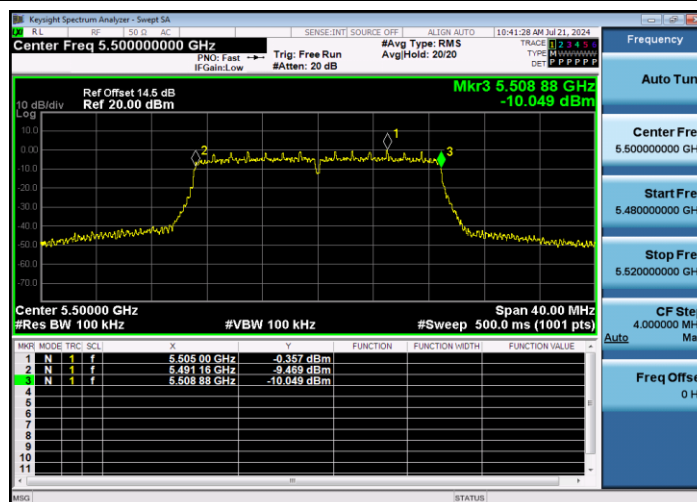
TEST REPORT N°: KSK-ESH-P24071264B-5



LTNV_11AC20MIMO_Ant1_5500



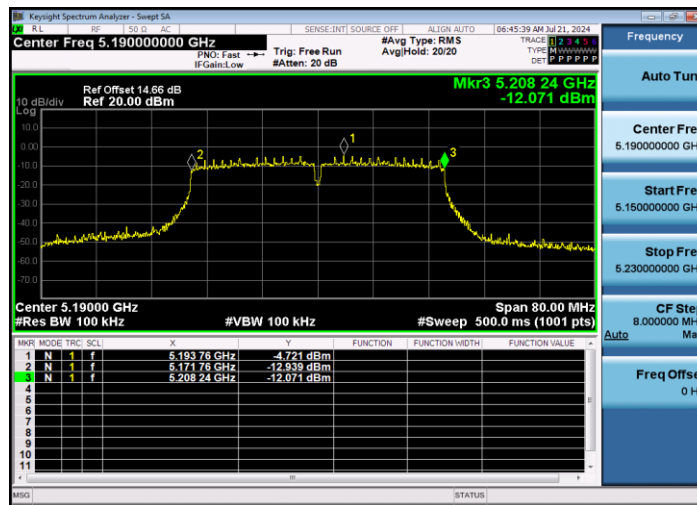
LTNV_11AC20MIMO_Ant2_5500



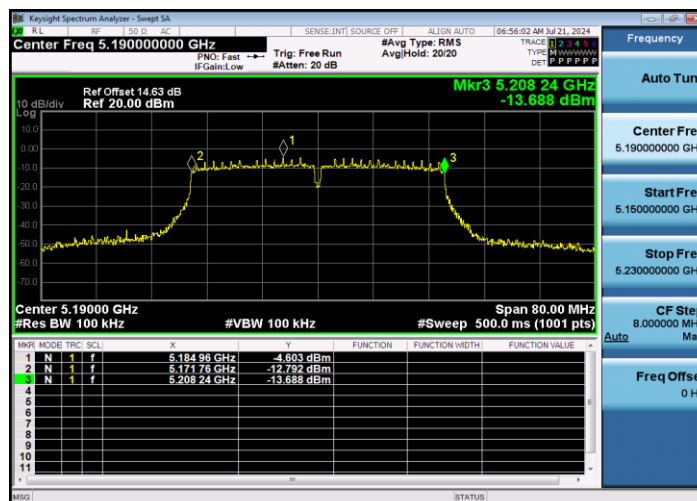
LTNV_11AC40MIMO_Ant1_5190



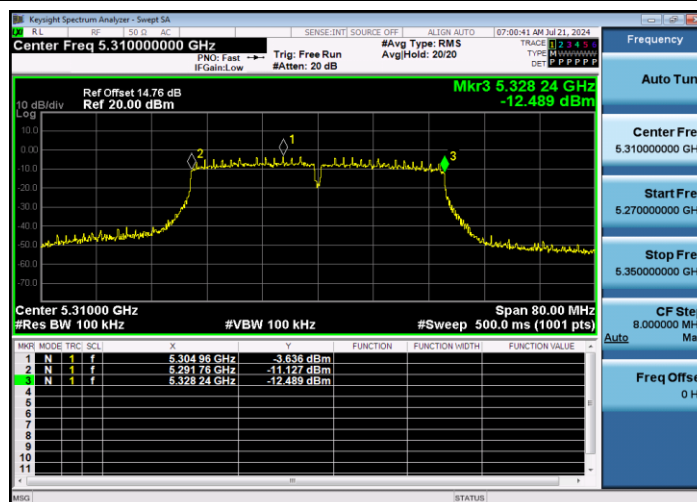
TEST REPORT N°: KSK-ESH-P24071264B-5



LTNV_11AC40MIMO_Ant2_5190

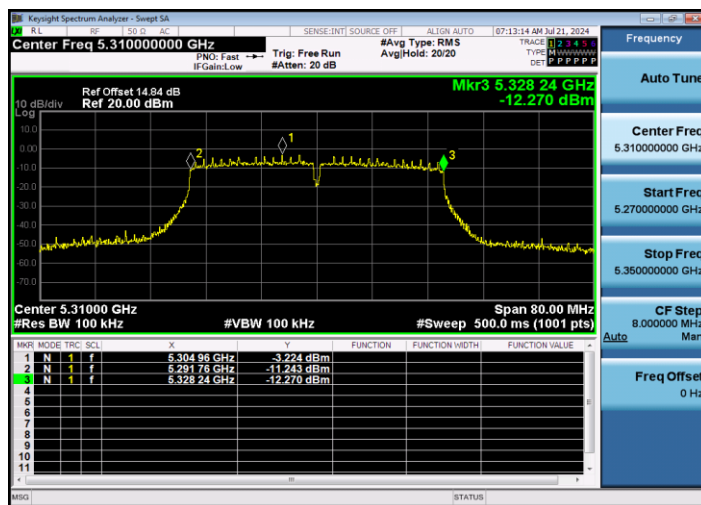


LTNV_11AC40MIMO_Ant1_5310

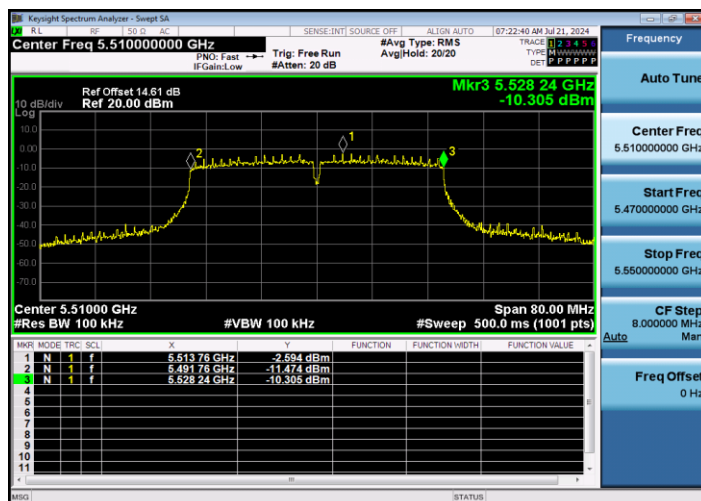


LTNV_11AC40MIMO_Ant2_5310

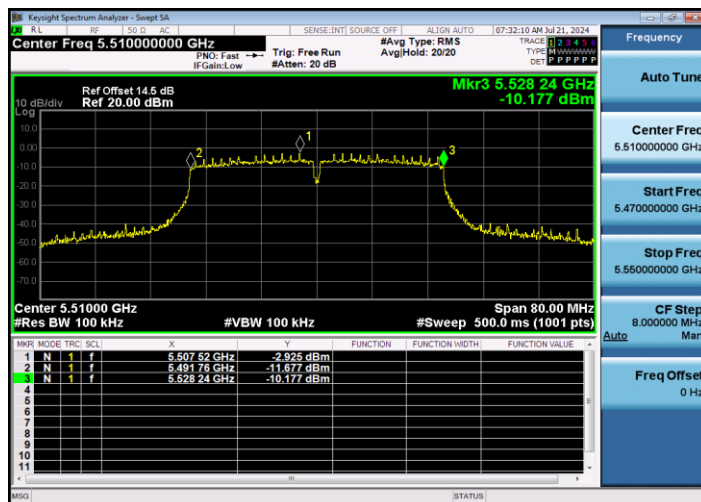
TEST REPORT N°: KSK-ESH-P24071264B-5



LTNV_11AC40MIMO_Ant1_5510

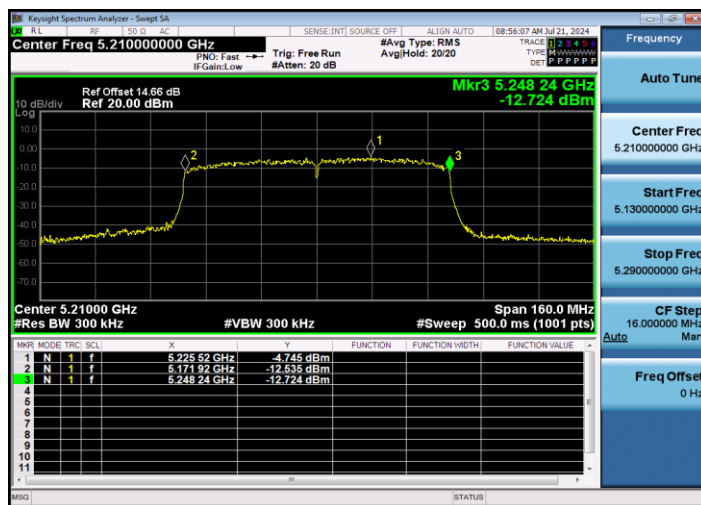


LTNV_11AC40MIMO_Ant2_5510

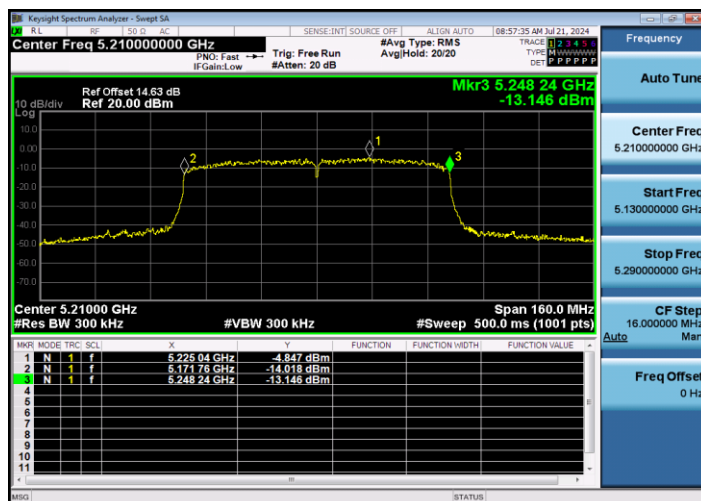


LTNV_11AC80MIMO_Ant1_5210

TEST REPORT N°: KSK-ESH-P24071264B-5



LTNV_11AC80MIMO_Ant2_5210

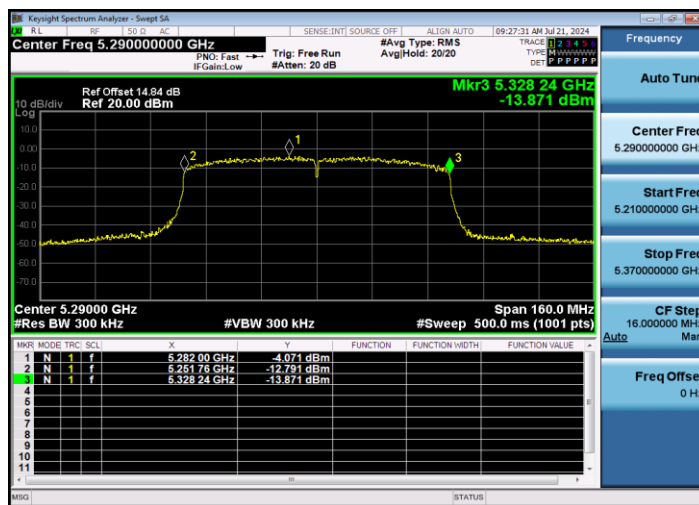


LTNV_11AC80MIMO_Ant1_5290

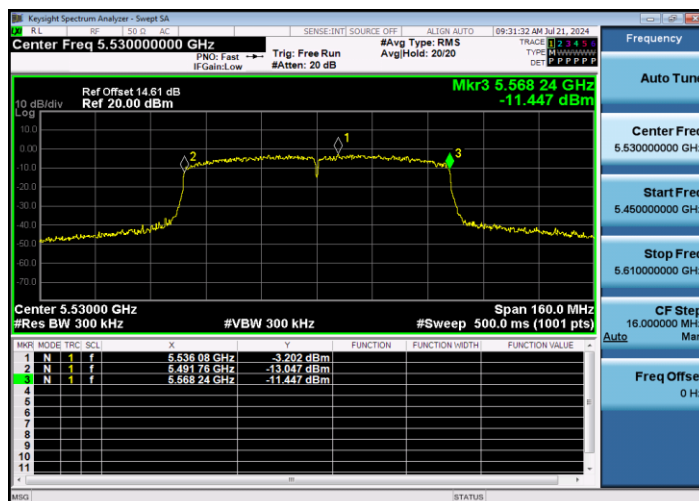


LTNV_11AC80MIMO_Ant2_5290

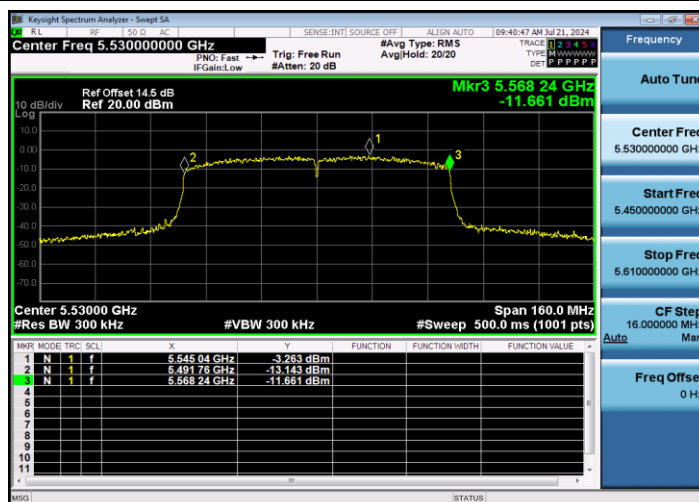
TEST REPORT N°: KSK-ESH-P24071264B-5



LTNV_11AC80MIMO_Ant1_5530



LTNV_11AC80MIMO_Ant2_5530

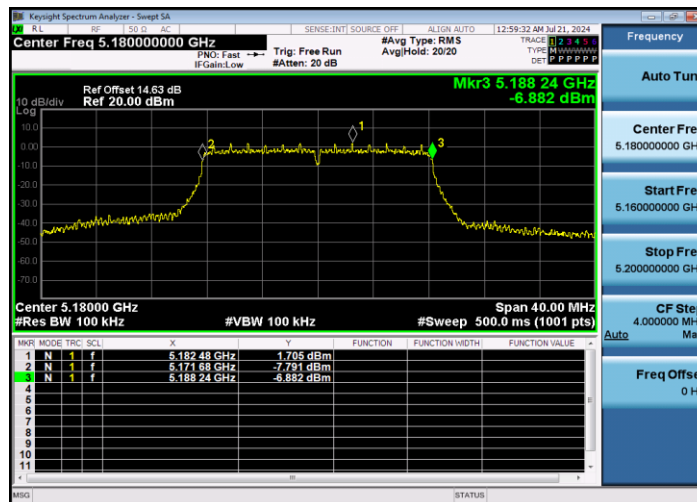


HTNV_11A_Ant1_5180

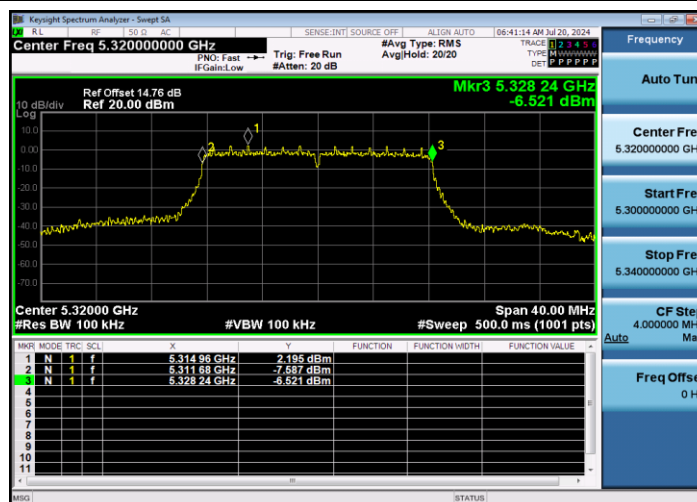
TEST REPORT N°: KSK-ESH-P24071264B-5



HTNV_11A_Ant2_5180



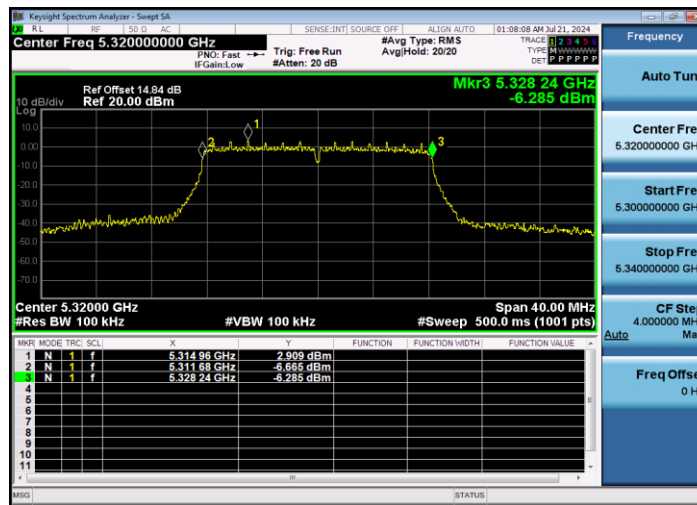
HTNV_11A_Ant1_5320



HTNV_11A_Ant2_5320



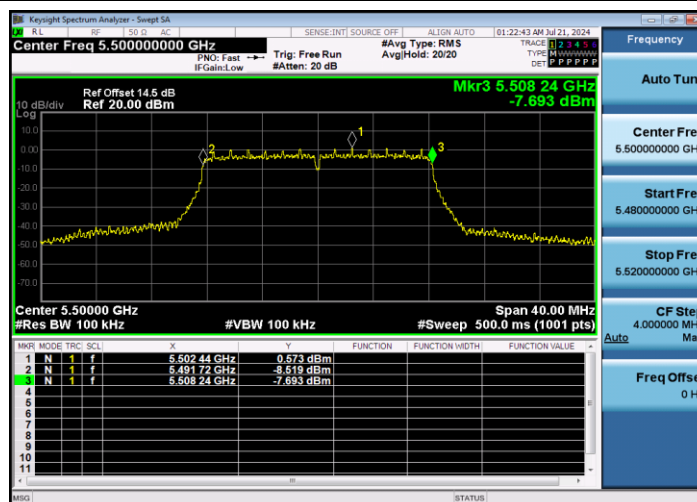
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HTNV_11A_Ant1_5500

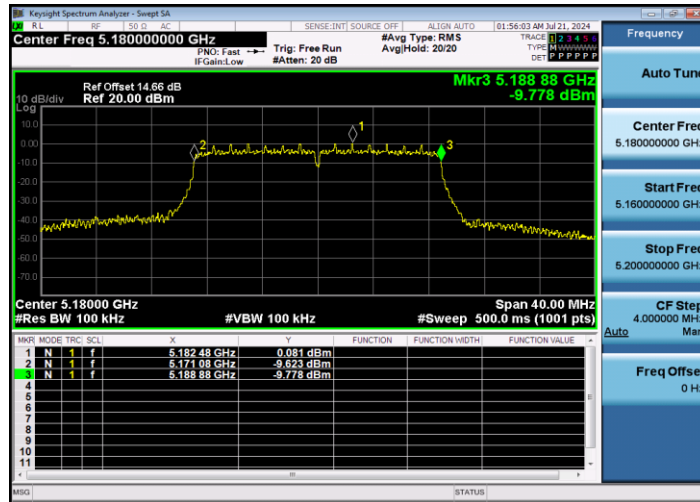


HTNV_11A_Ant2_5500

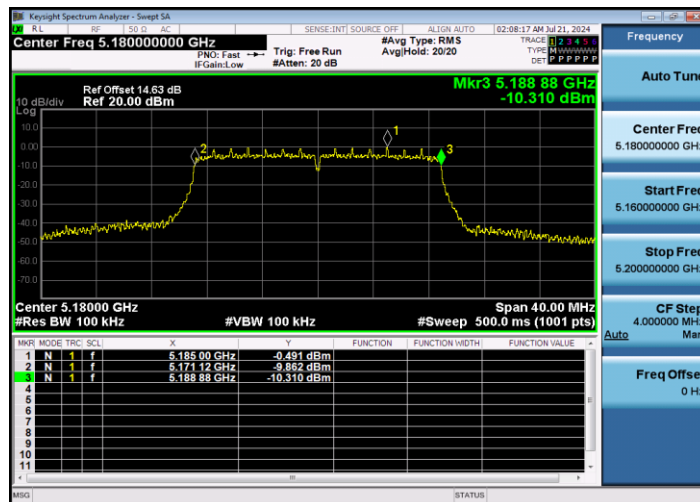


HTNV_11N20MIMO_Ant1_5180

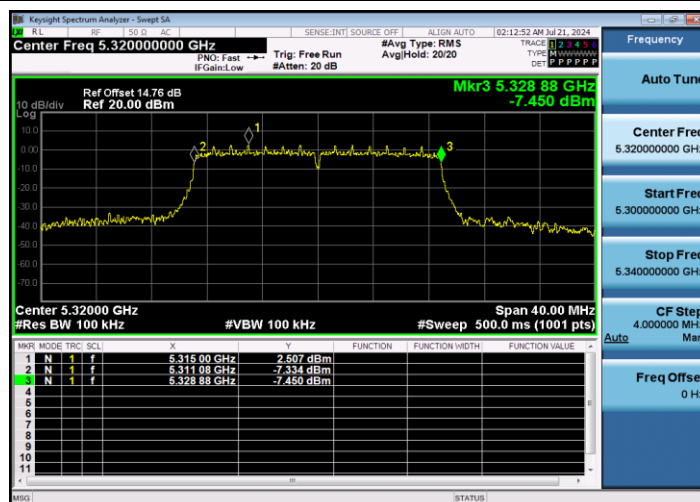
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HTNV_11N20MIMO_Ant2_5180

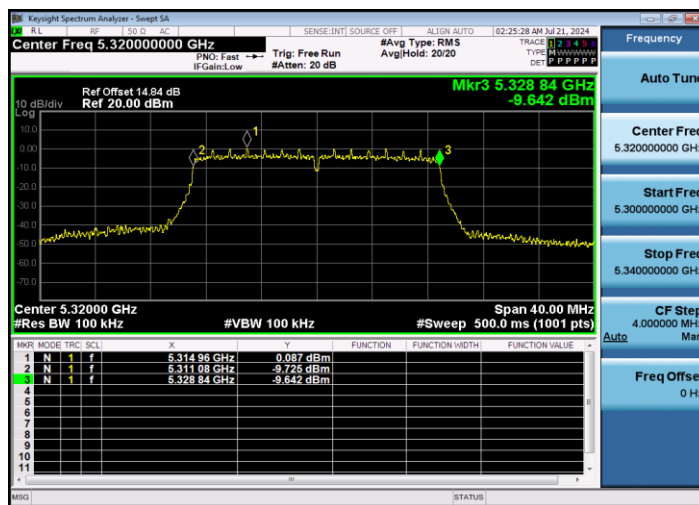


HTNV_11N20MIMO_Ant1_5320

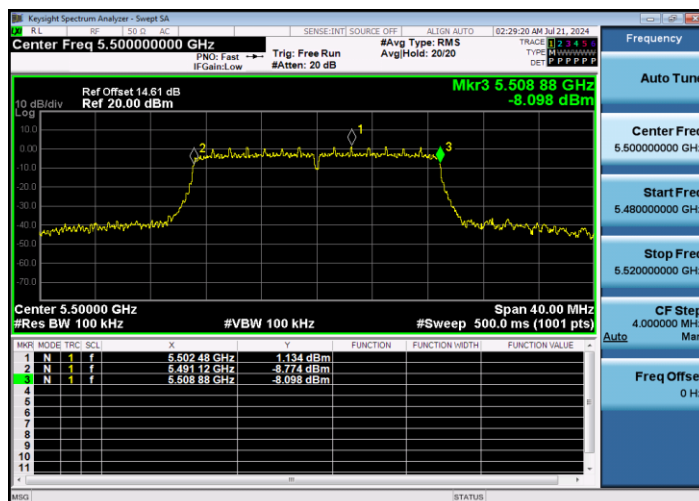


HTNV_11N20MIMO_Ant2_5320

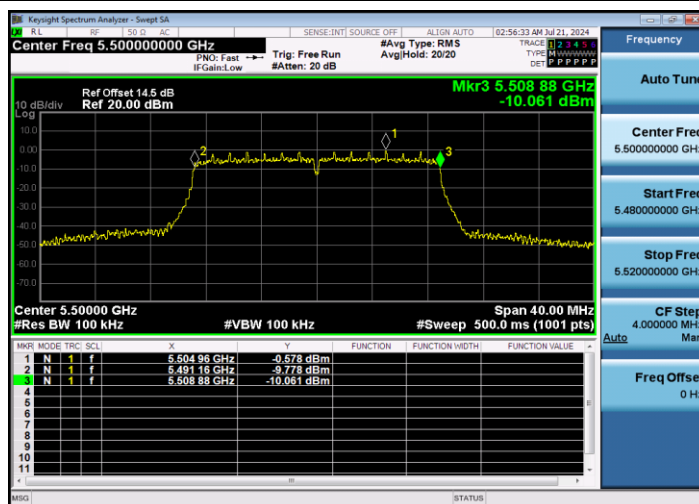
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HTNV_11N20MIMO_Ant1_5500

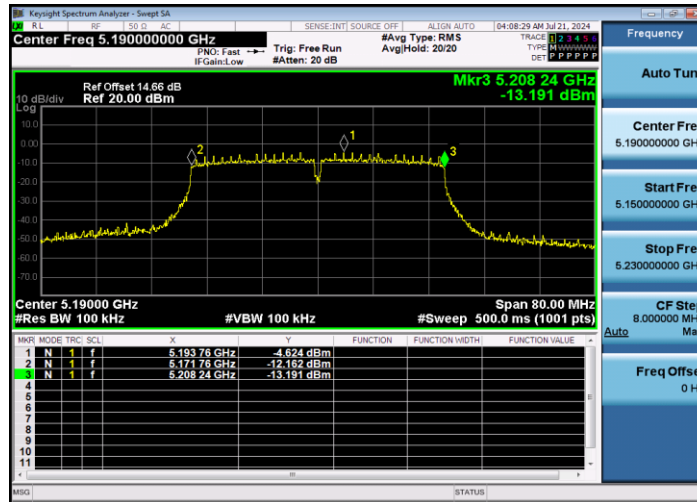


HTNV_11N20MIMO_Ant2_5500

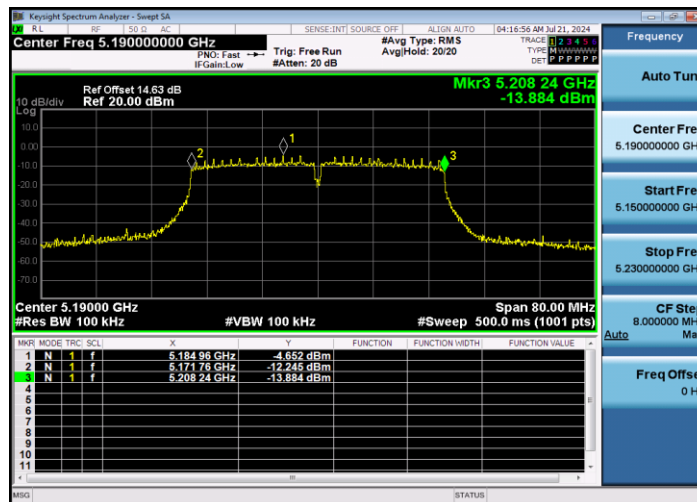


HTNV_11N40MIMO_Ant1_5190

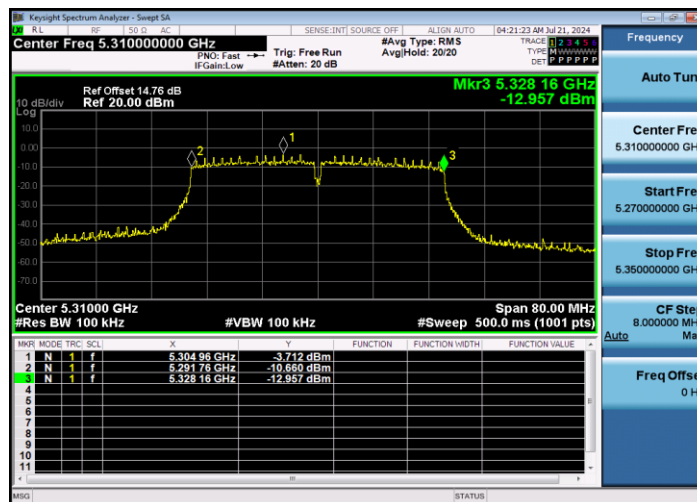
TEST REPORT N°: KSK-ESH-P24071264B-5



HTNV_11N40MIMO_Ant2_5190

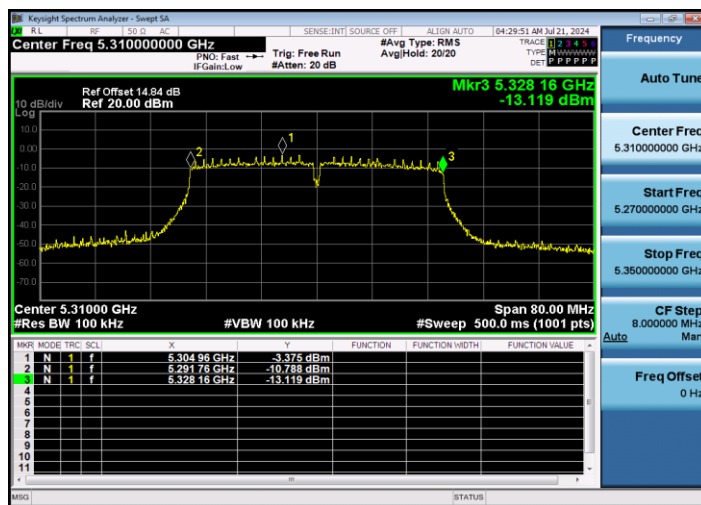


HTNV_11N40MIMO_Ant1_5310

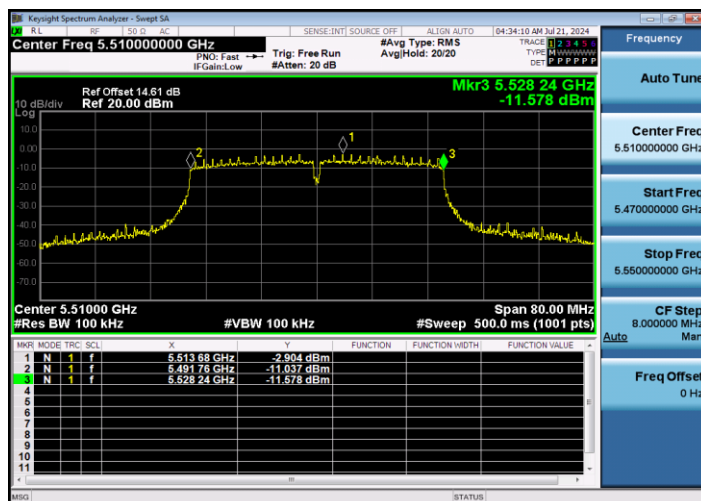


HTNV_11N40MIMO_Ant2_5310

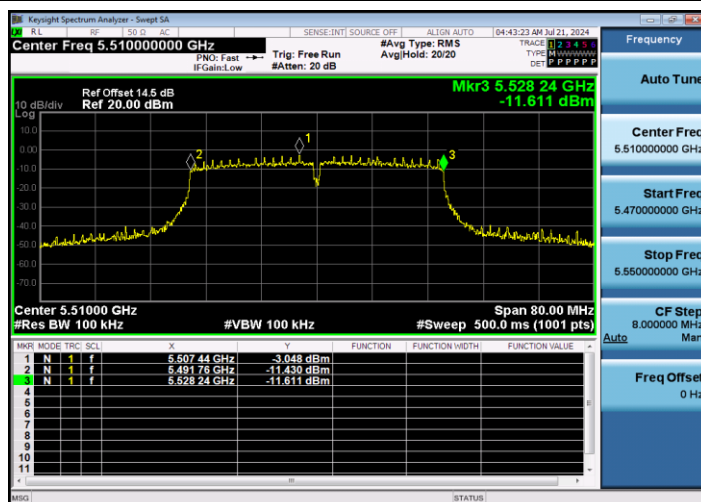
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HTNV_11N40MIMO_Ant1_5510

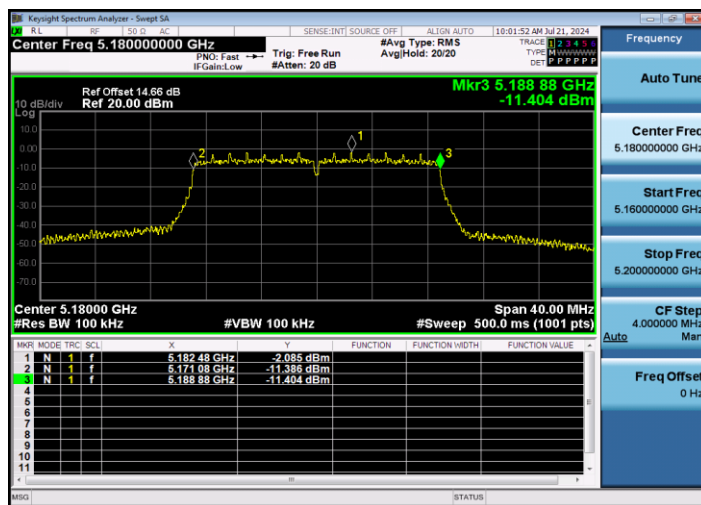


HTNV_11N40MIMO_Ant2_5510

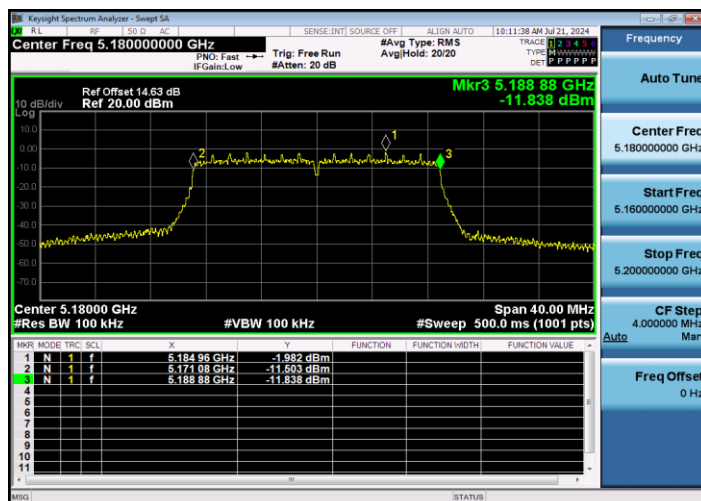


HTNV_11AC20MIMO_Ant1_5180

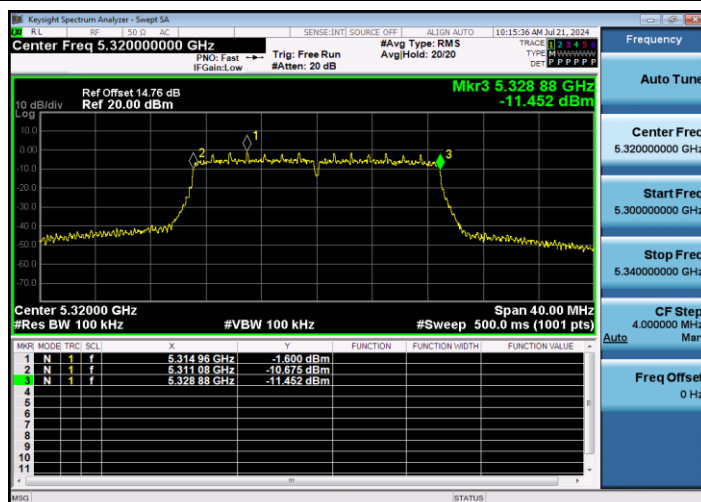
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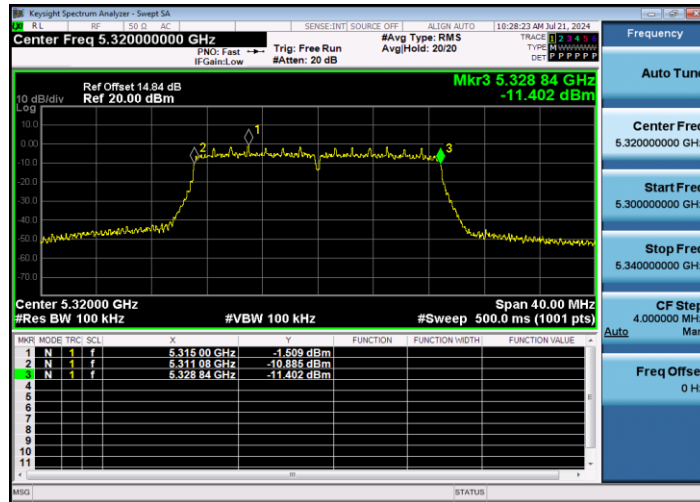


HTNV_11AC20MIMO_Ant1_5320

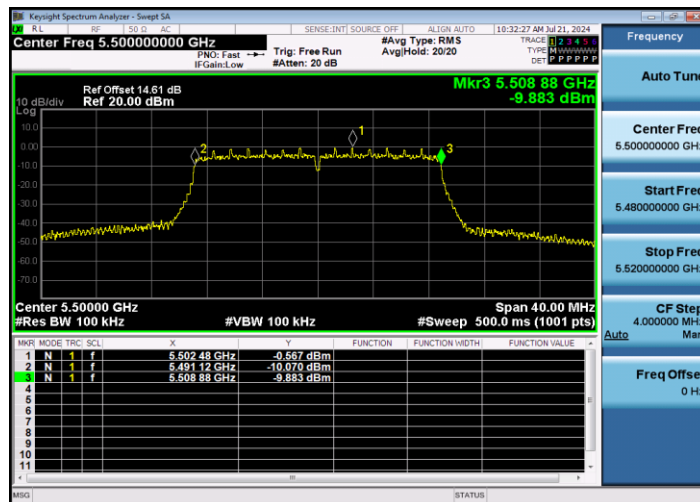


HTNV_11AC20MIMO_Ant2_5320

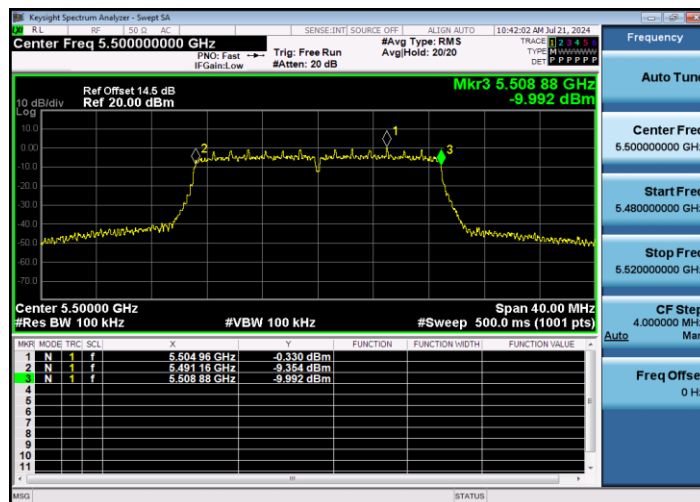
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HTNV_11AC20MIMO_Ant1_5500

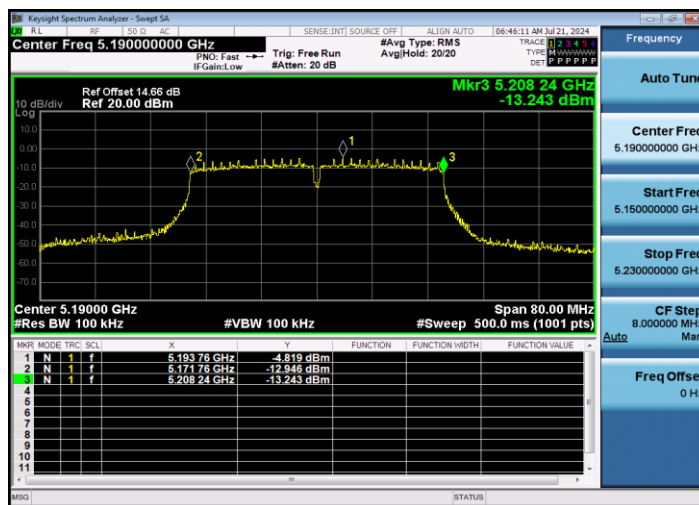


HTNV_11AC20MIMO_Ant2_5500

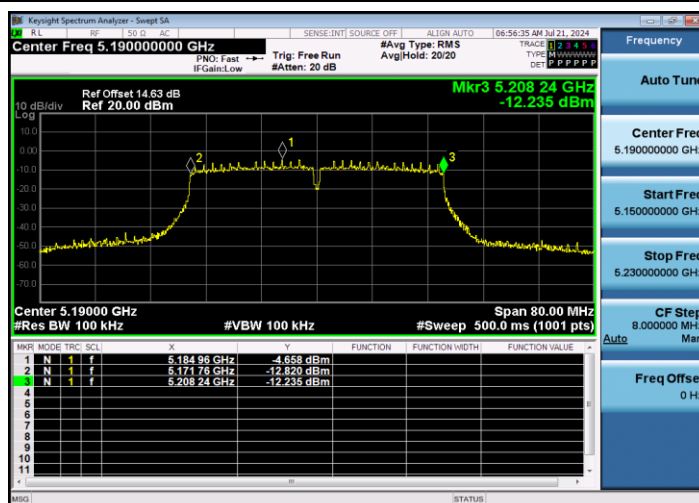


HTNV_11AC40MIMO_Ant1_5190

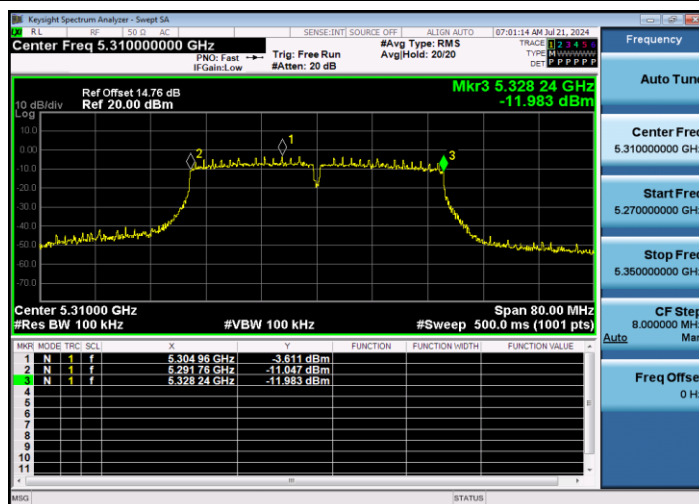
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HTNV_11AC40MIMO_Ant2_5190



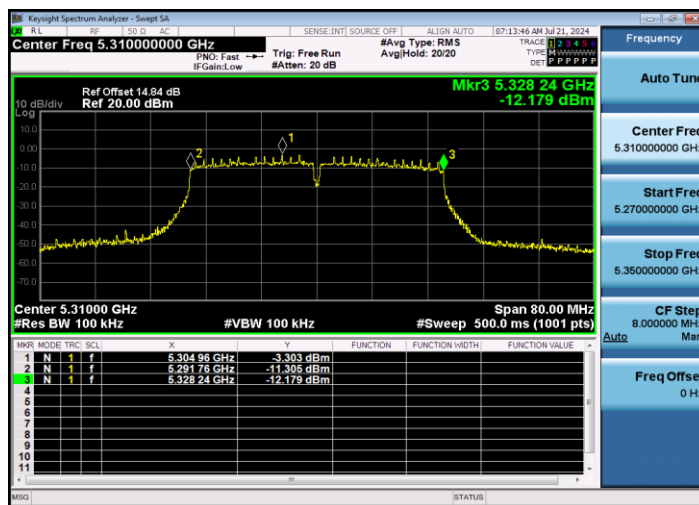
HTNV_11AC40MIMO_Ant1_5310



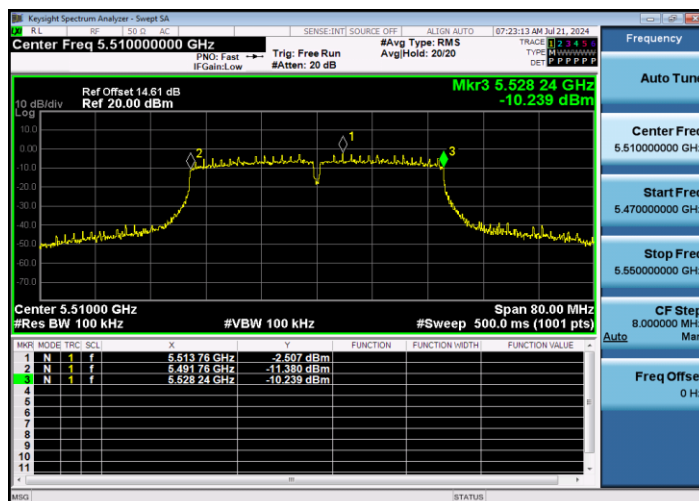
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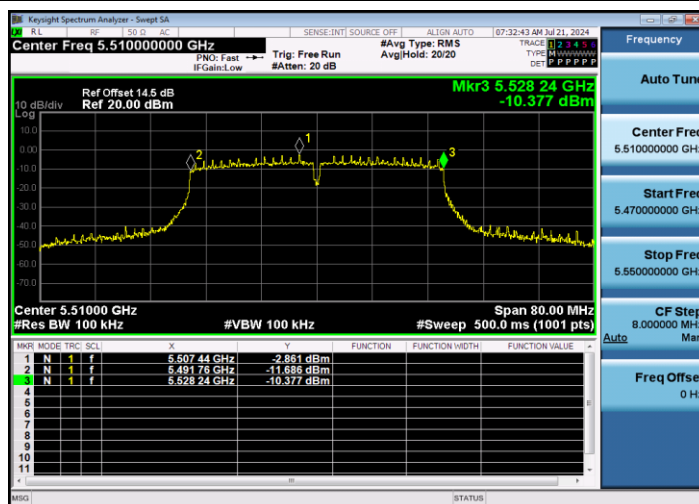
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HTNV_11AC40MIMO_Ant1_5510

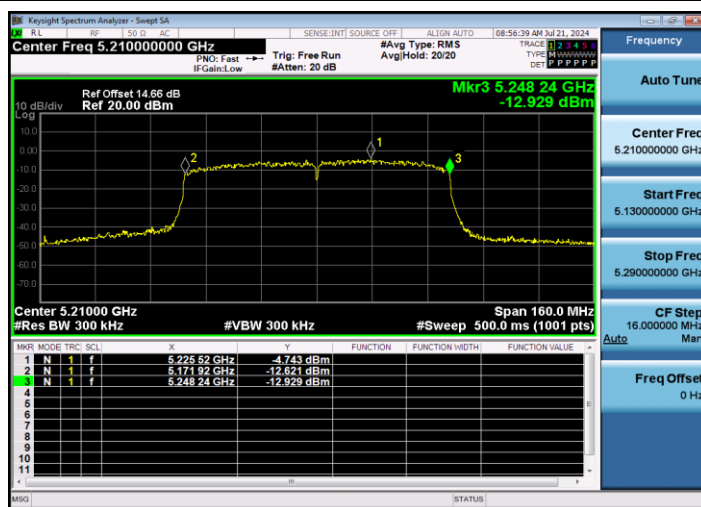


HTNV_11AC40MIMO_Ant2_5510

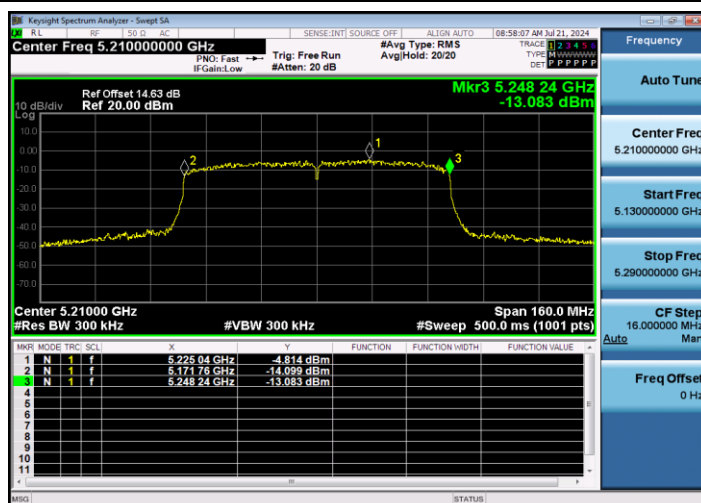


HTNV_11AC80MIMO_Ant1_5210

TEST REPORT N°: KSK-ESH-P24071264B-5



HTNV_11AC80MIMO_Ant2_5210



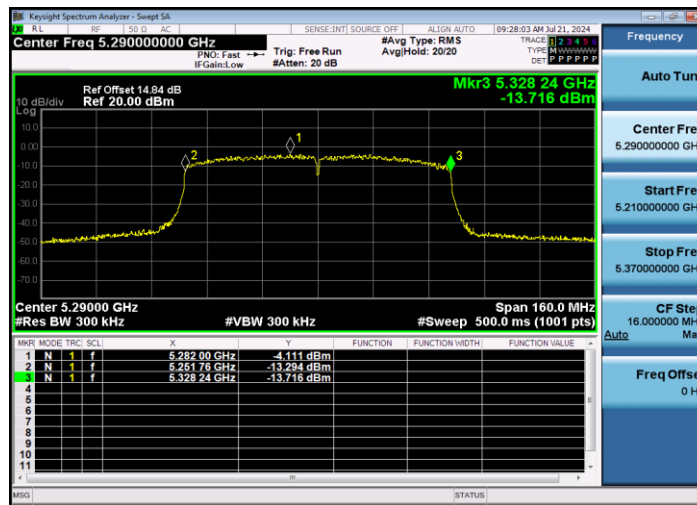
HTNV_11AC80MIMO_Ant1_5290



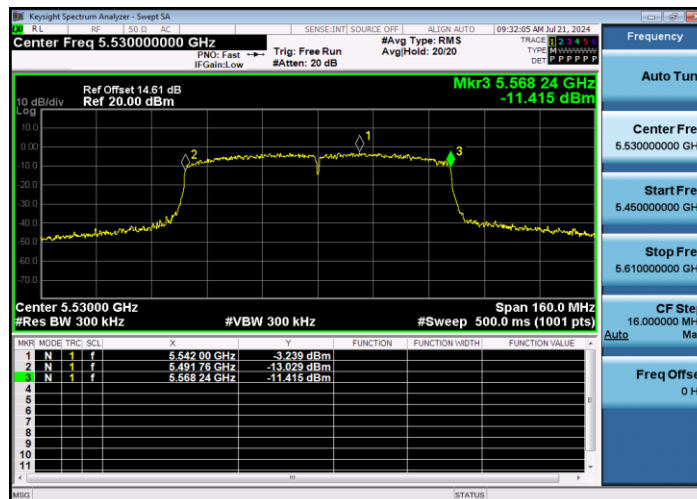
HTNV_11AC80MIMO_Ant2_5290



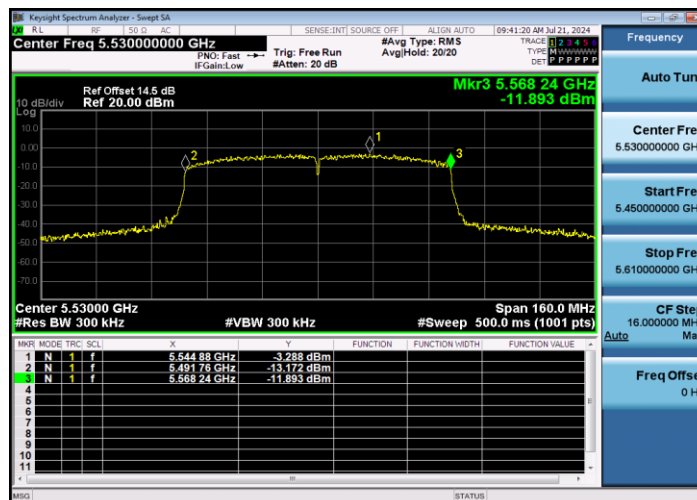
TEST REPORT N°: KSK-ESH-P24071264B-5



HTNV_11AC80MIMO_Ant1_5530



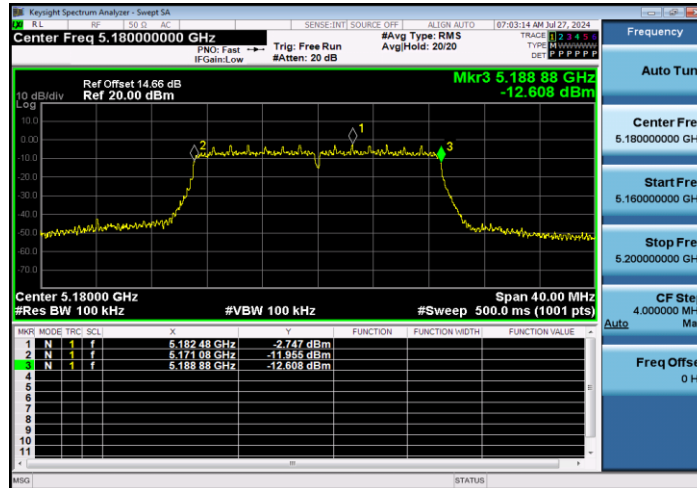
HTNV_11AC80MIMO_Ant2_5530



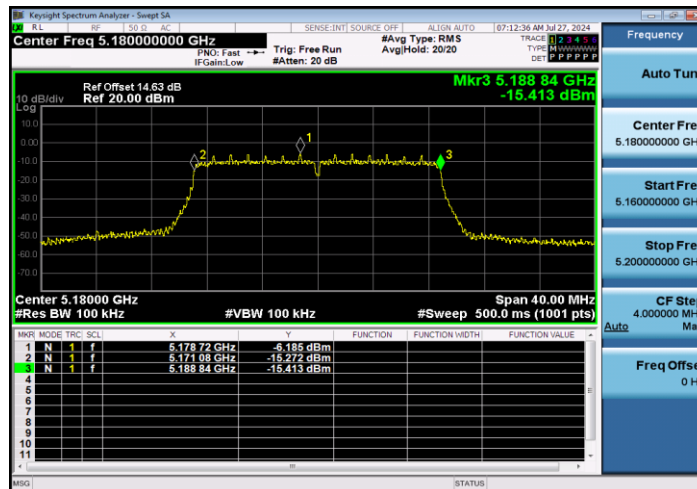
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WC0NR2201

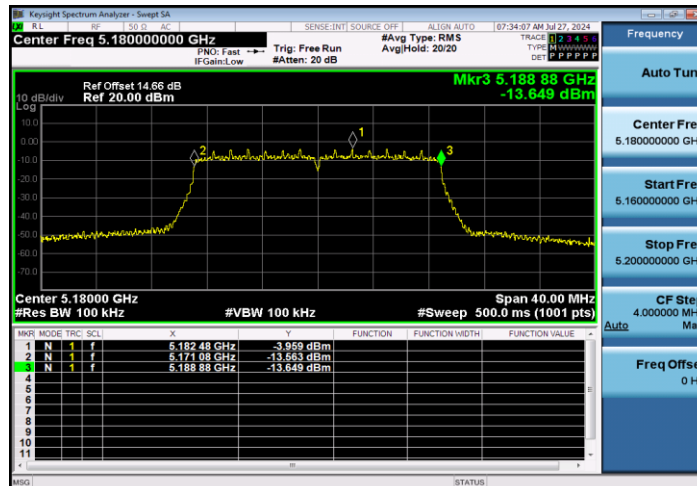
NTNV_11A_Ant1_5180



NTNV_11A_Ant2_5180

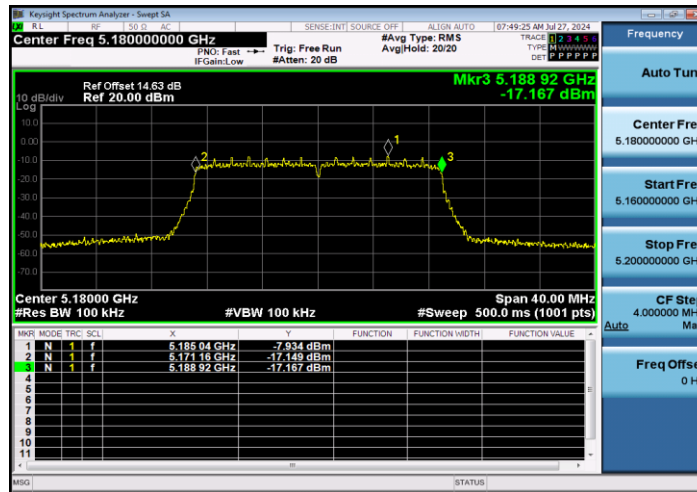


NTNV_11N20MIMO_Ant1_5180

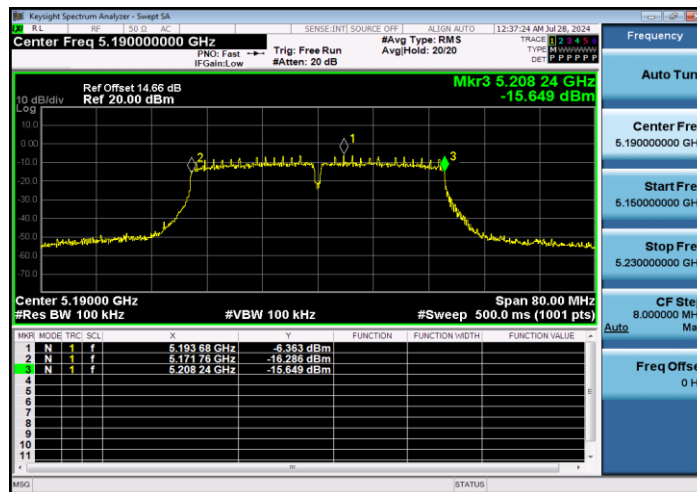


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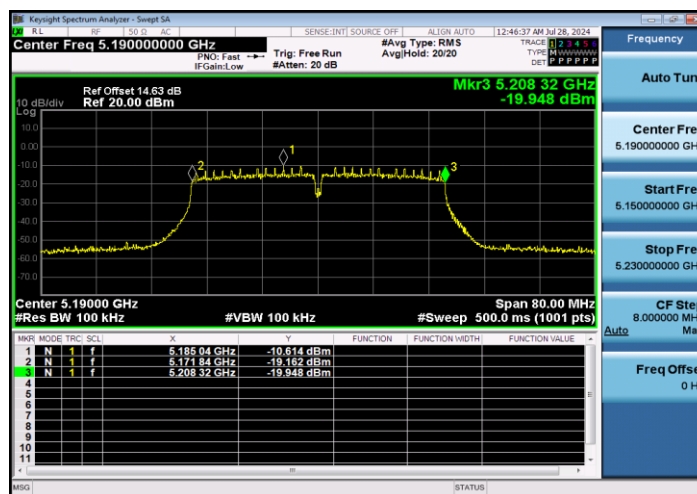
NTNV_11N20MIMO_Ant2_5180



NTNV_11N40MIMO_Ant1_5190



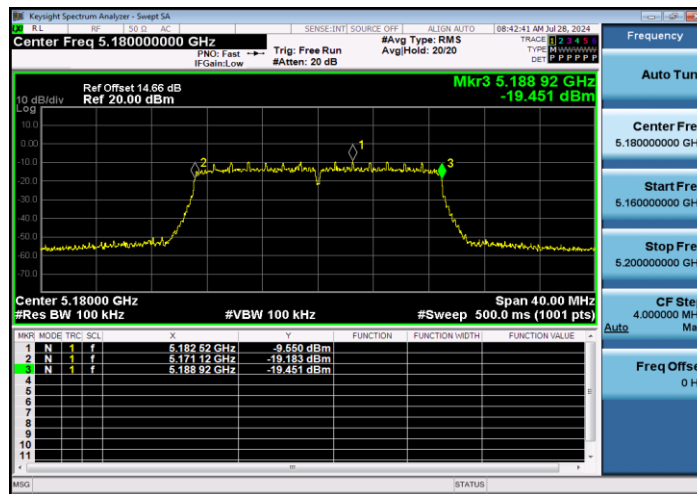
NTNV_11N40MIMO_Ant2_5190



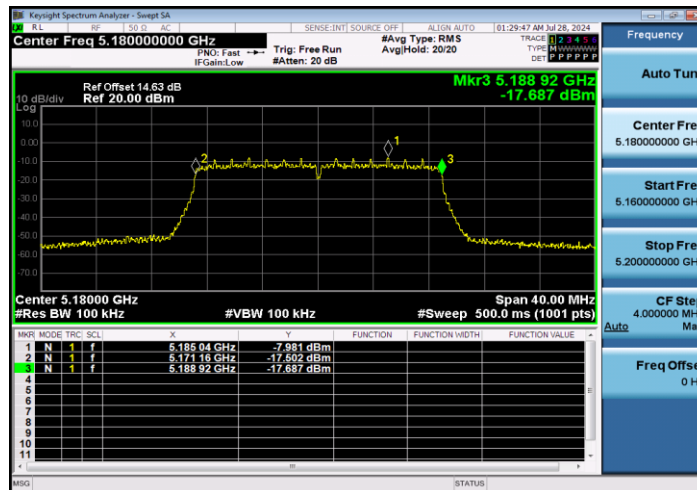
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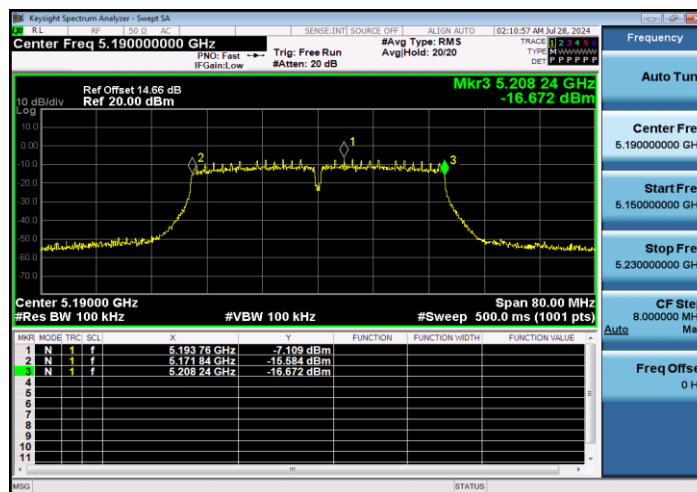
TEST REPORT N°: KSK-ESH-P24071264B-5



NTNV_11AC20MIMO_Ant2_5180



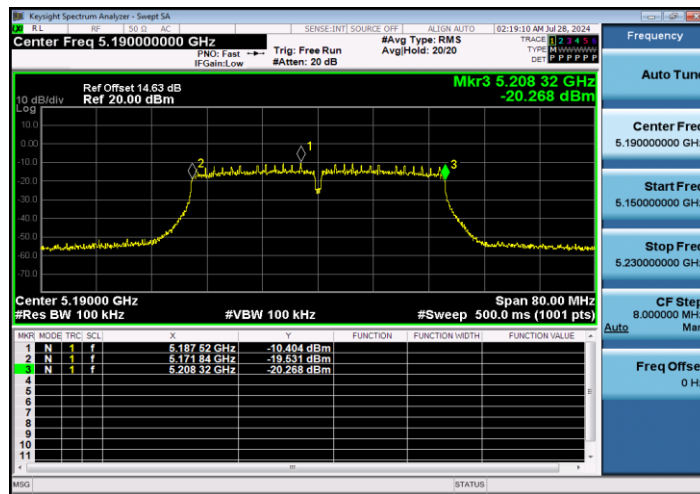
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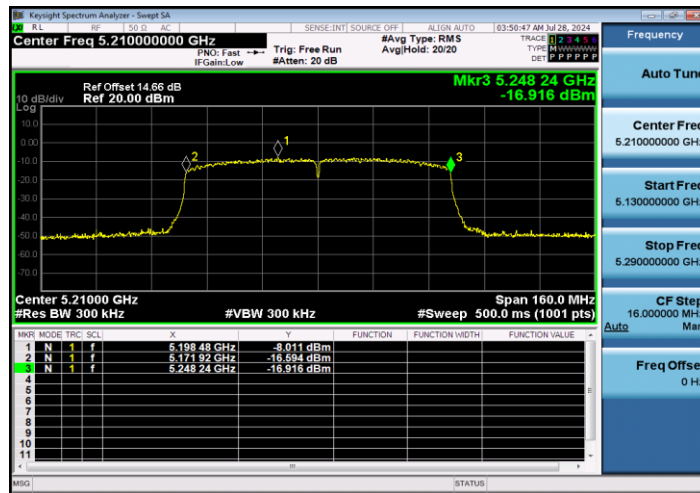
NTNV_11AC40MIMO_Ant2_5190



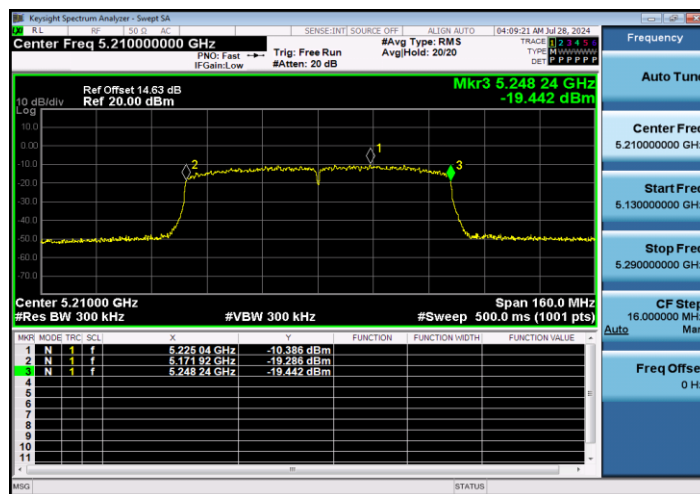
TEST REPORT N°: KSK-ESH-P24071264B-5



NTNV_11AC80MIMO_Ant1_5210



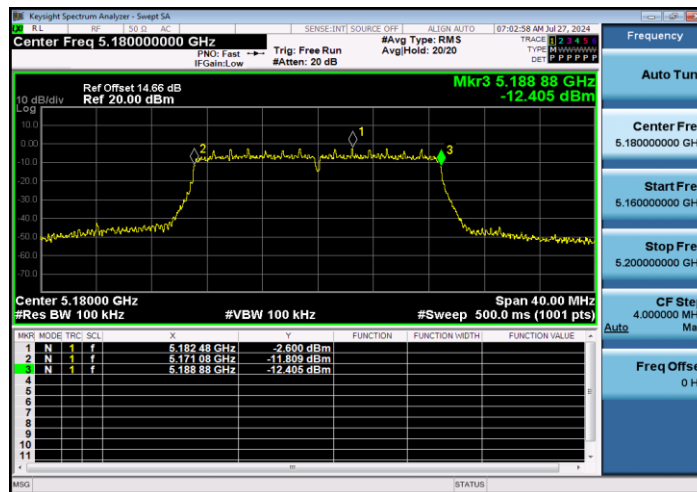
NTNV_11AC80MIMO_Ant2_5210



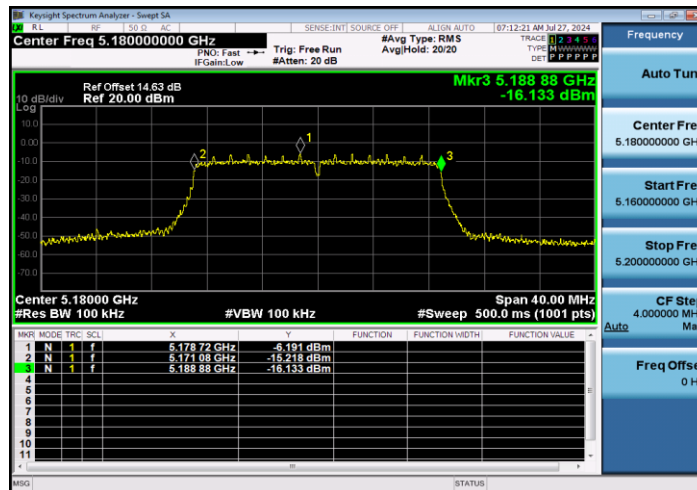
LTNV_11A_Ant1_5180



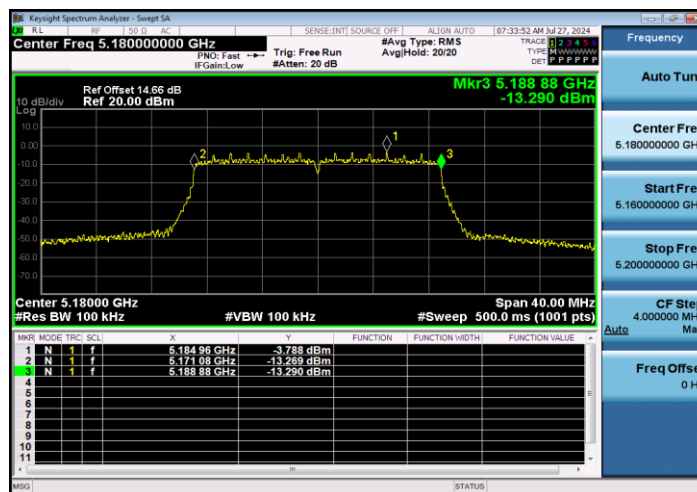
TEST REPORT N°: KSK-ESH-P24071264B-5



LTNV_11A_Ant2_5180



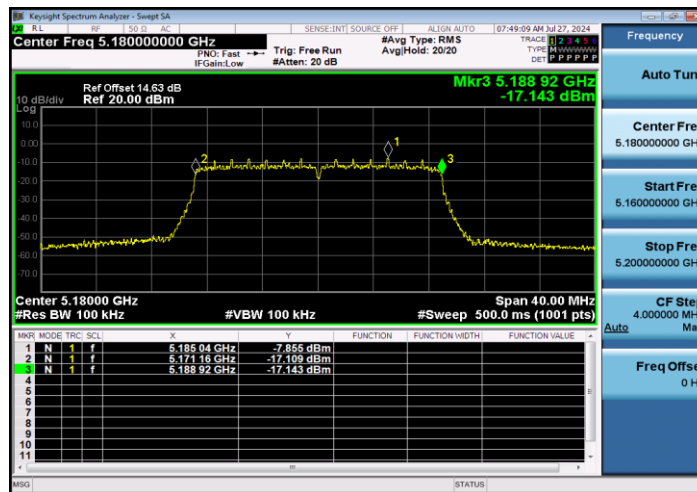
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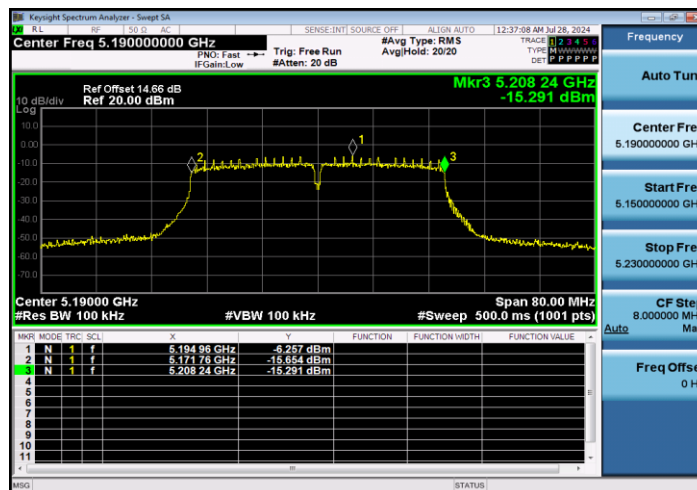
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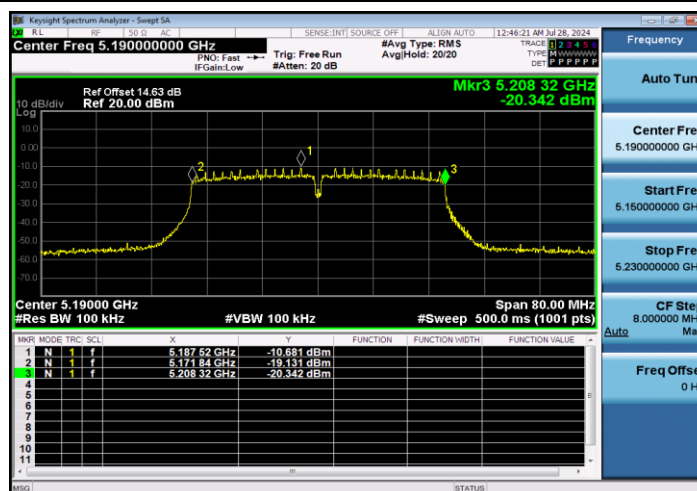
TEST REPORT N°: KSK-ESH-P24071264B-5



LTNV_11N40MIMO_Ant1_5190



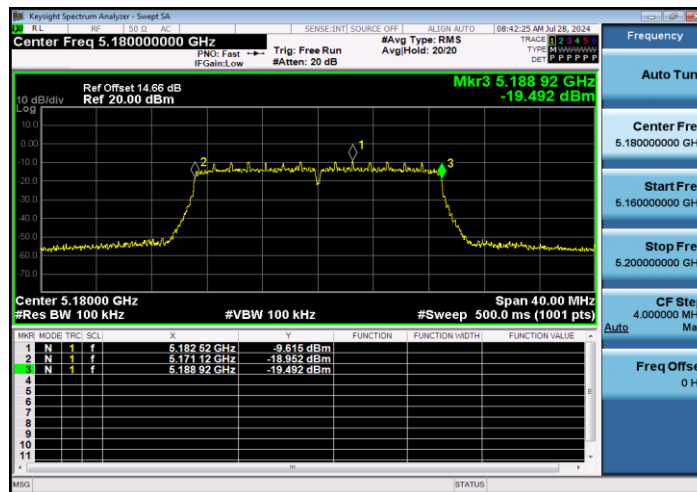
LTNV_11N40MIMO_Ant2_5190



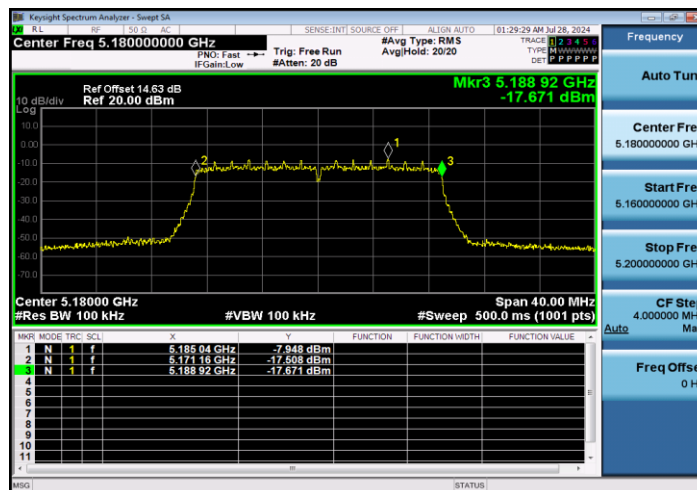
LTNV_11AC20MIMO_Ant1_5180



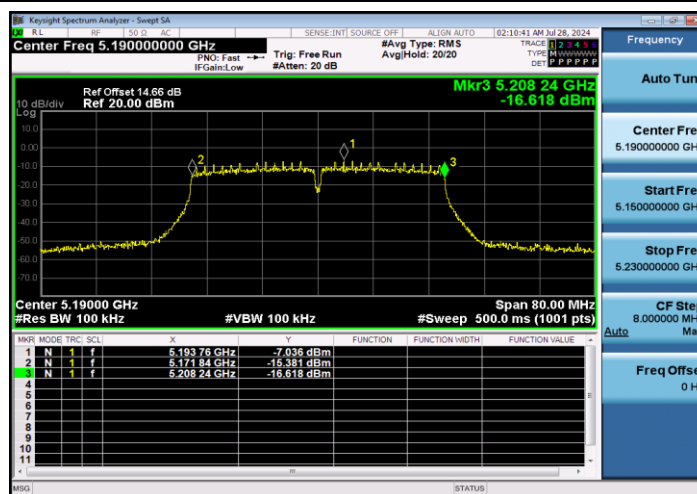
TEST REPORT N°: KSK-ESH-P24071264B-5



LTNV_11AC20MIMO_Ant2_5180



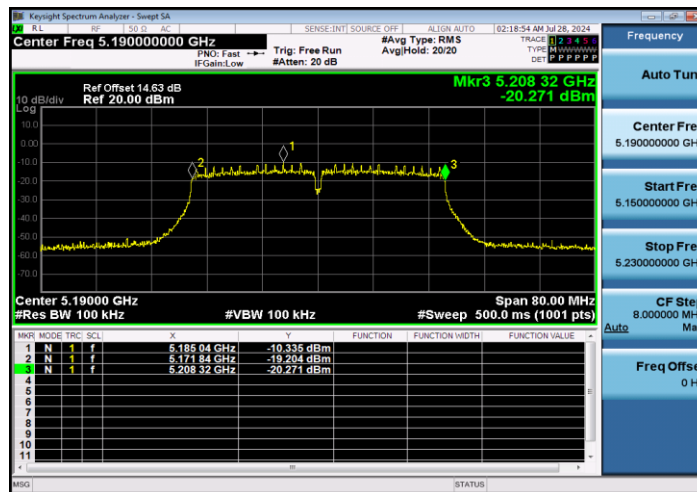
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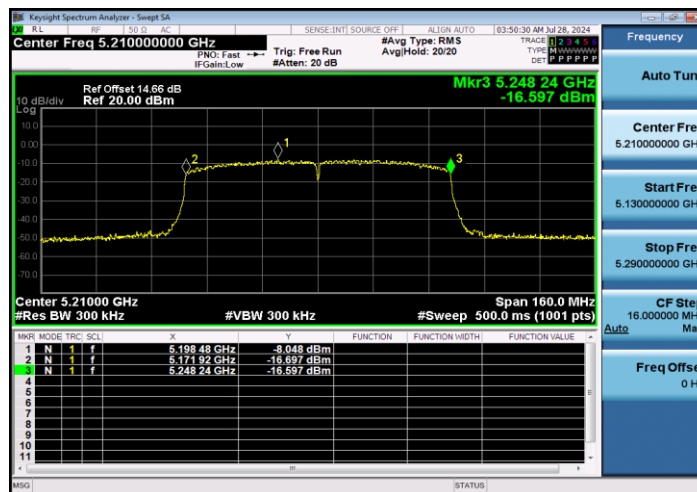
LTNV_11AC40MIMO_Ant2_5190



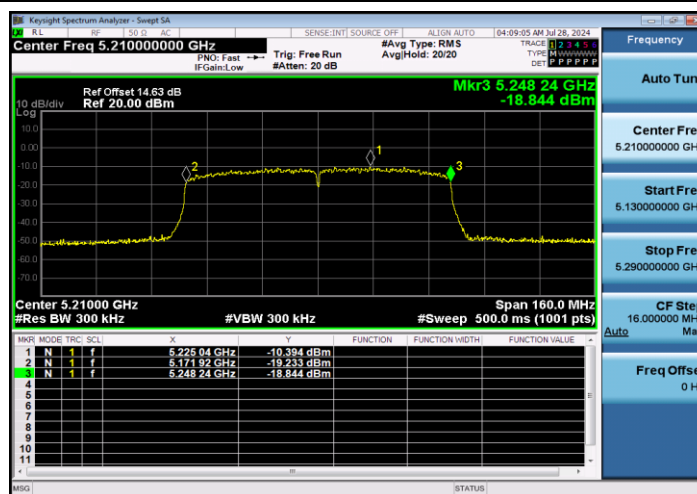
TEST REPORT N°: KSK-ESH-P24071264B-5



LTNV_11AC80MIMO_Ant1_5210



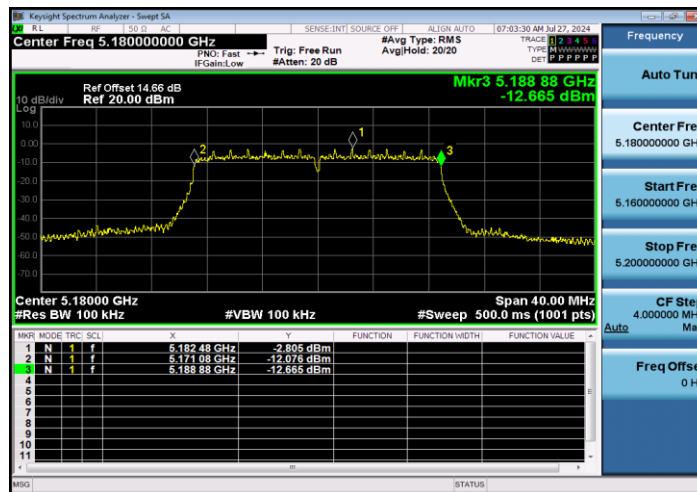
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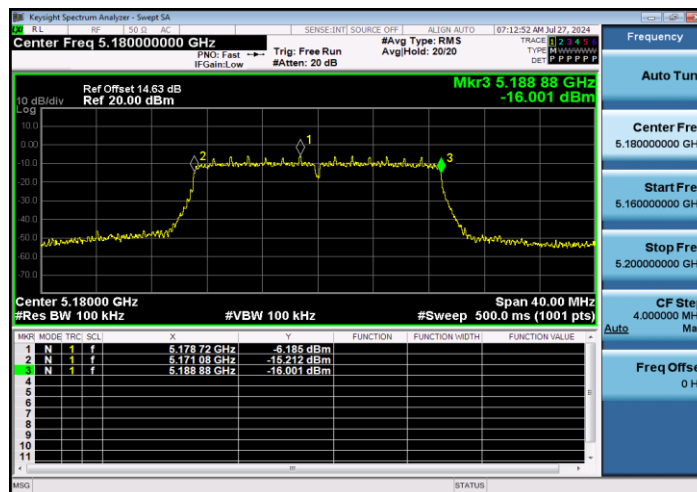
HTNV_11A_Ant1_5180



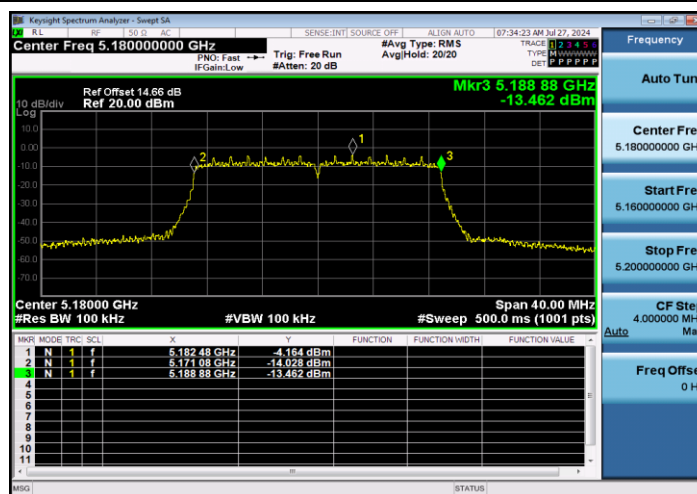
TEST REPORT N°: KSK-ESH-P24071264B-5



HTNV_11A_Ant2_5180

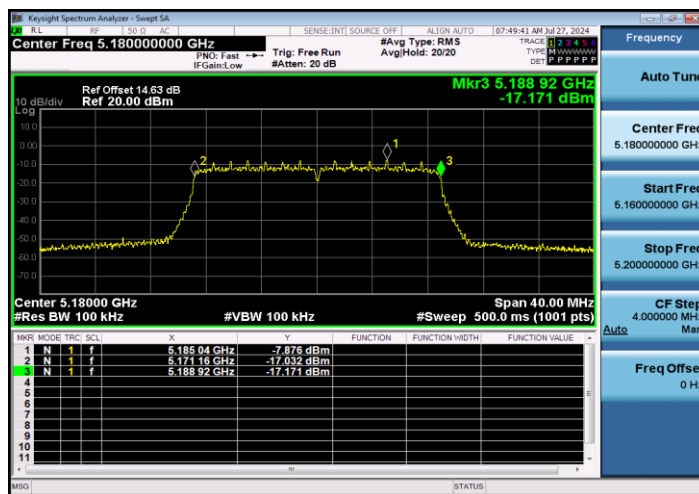


HTNV_11N20MIMO_Ant1_5180

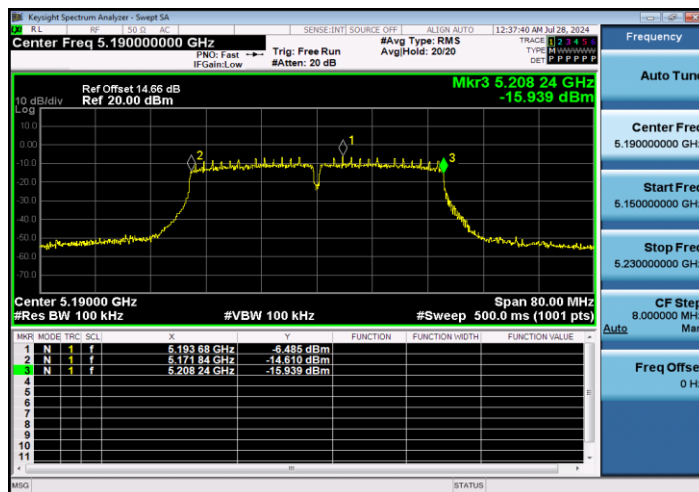


HTNV_11N20MIMO_Ant2_5180

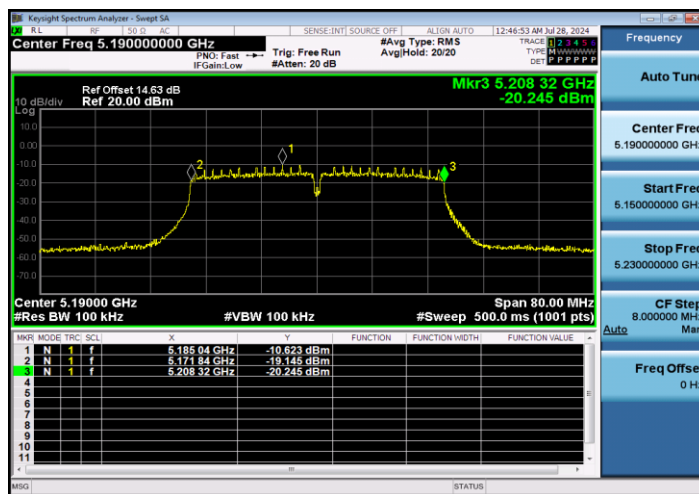
TEST REPORT N°: KSK-ESH-P24071264B-5



HTNV_11N40MIMO_Ant1_5190



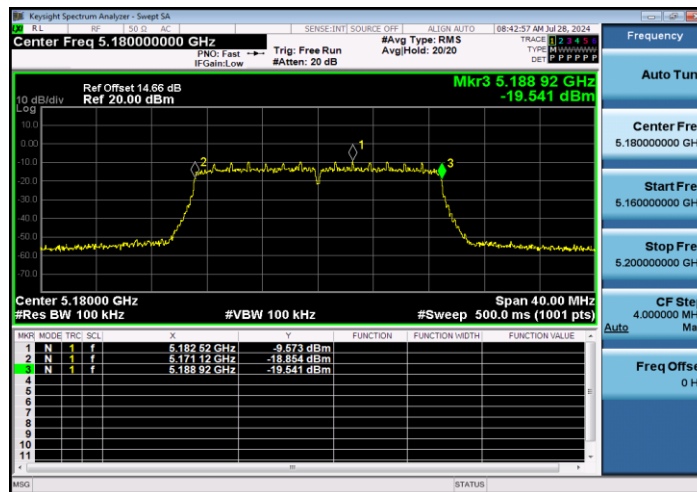
HTNV_11N40MIMO_Ant2_5190



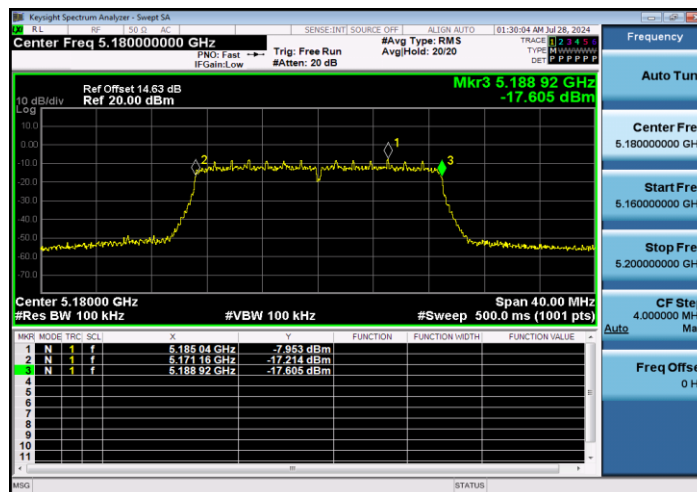
HTNV_11AC20MIMO_Ant1_5180



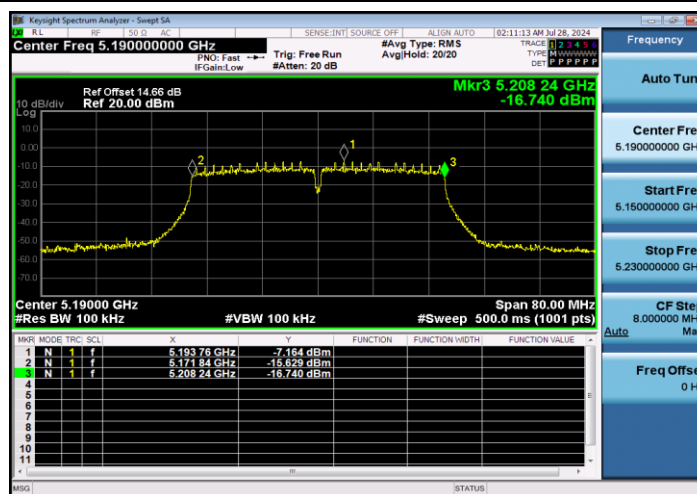
TEST REPORT N°: KSK-ESH-P24071264B-5



HTNV_11AC20MIMO_Ant2_5180



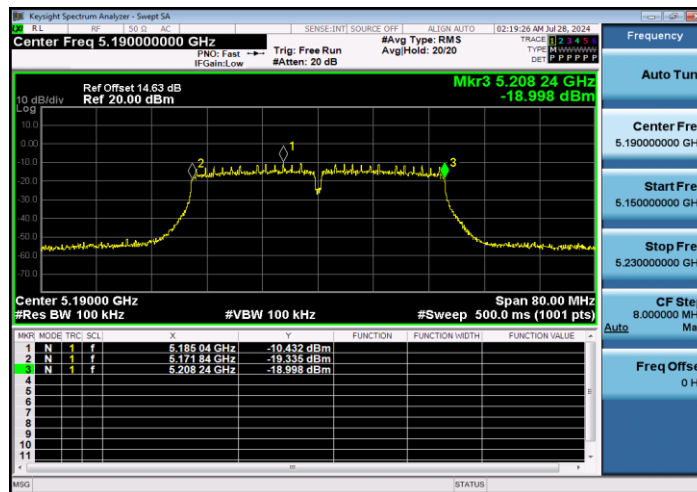
HTNV_11AC40MIMO_Ant1_5190



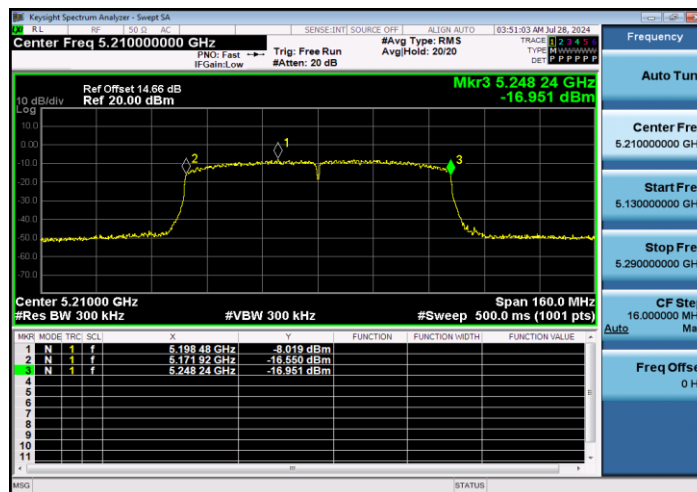
HTNV_11AC40MIMO_Ant2_5190



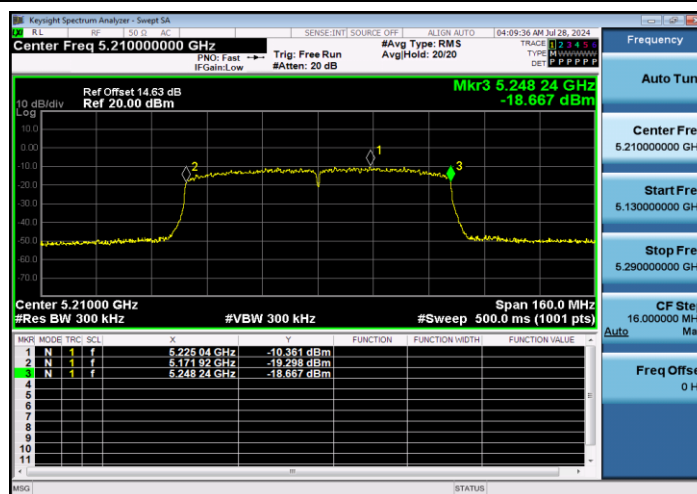
TEST REPORT N°: KSK-ESH-P24071264B-5



HTNV_11AC80MIMO_Ant1_5210



HTNV_11AC80MIMO_Ant2_5210





TEST REPORT N°: KSK-ESH-P24071264B-5

3.2 Nominal and Occupied Channel Bandwidth Measurement

3.2.1 Limit of Nominal and Occupied Channel Bandwidth Measurement

The Nominal Channel Bandwidth for a single Operating Channel shall be 20 MHz. Alternatively, equipment may implement a lower Nominal Channel Bandwidth with a minimum of 5 MHz, providing they still comply with the Nominal Centre Frequencies defined in clause 4.2.1.

The Occupied Channel Bandwidth shall be between 80 % and 100 % of the Nominal Channel Bandwidth. In case of smart antenna systems (devices with multiple transmit chains) each of the transmit chains shall meet this requirement. The Occupied Channel Bandwidth might change with time/payload. During a Channel Occupancy Time (COT), equipment may operate temporarily with an Occupied Channel Bandwidth of less than 80 % of its Nominal Channel Bandwidth with a minimum of 2 MHz.

3.2.2 Test Procedure

Refer to EN 301 893 V2.1.1 clause 5.4.3

Measurement Method	
☒ Conducted measurement	☐ Radiated measurement

3.2.3 Deviation from Test Standard

No deviation.

3.2.4 Test Setup

The measurement was performed at normal environmental conditions only. The measurement channels were performed in accordance with EN 301 893 clause 5.3.2. The equipment was configured to operate under its worst case situation with respect to output power. (In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator.) Controlling software ({software}) has been activated to set the EUT on specific status.



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3.2.5 Test Results

WCT1DR2201D

TestMode	Antenna	Freq[MHz]	OCB[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	16.367	16 to 20	PASS
	Ant2	5180	16.360	16 to 20	PASS
	Ant1	5320	16.364	16 to 20	PASS
	Ant2	5320	16.356	16 to 20	PASS
	Ant1	5500	16.365	16 to 20	PASS
	Ant2	5500	16.358	16 to 20	PASS
11N20MIMO	Ant1	5180	17.584	16 to 20	PASS
	Ant2	5180	17.583	16 to 20	PASS
	Ant1	5320	17.583	16 to 20	PASS
	Ant2	5320	17.583	16 to 20	PASS
	Ant1	5500	17.582	16 to 20	PASS
	Ant2	5500	17.579	16 to 20	PASS
11N40MIMO	Ant1	5190	36.054	32 to 40	PASS
	Ant2	5190	36.054	32 to 40	PASS
	Ant1	5310	36.001	32 to 40	PASS
	Ant2	5310	35.982	32 to 40	PASS
	Ant1	5510	36.009	32 to 40	PASS
	Ant2	5510	36.010	32 to 40	PASS
11AC20MIMO	Ant1	5180	17.584	16 to 20	PASS
	Ant2	5180	17.584	16 to 20	PASS
	Ant1	5320	17.586	16 to 20	PASS
	Ant2	5320	17.586	16 to 20	PASS
	Ant1	5500	17.584	16 to 20	PASS
	Ant2	5500	17.582	16 to 20	PASS
11AC40MIMO	Ant1	5190	36.056	32 to 40	PASS
	Ant2	5190	36.056	32 to 40	PASS
	Ant1	5310	36.012	32 to 40	PASS
	Ant2	5310	35.988	32 to 40	PASS
	Ant1	5510	36.010	32 to 40	PASS
	Ant2	5510	36.008	32 to 40	PASS
11AC80MIMO	Ant1	5210	74.765	64 to 80	PASS
	Ant2	5210	74.851	64 to 80	PASS
	Ant1	5290	74.547	64 to 80	PASS
	Ant2	5290	74.538	64 to 80	PASS
	Ant1	5530	74.666	64 to 80	PASS
	Ant2	5530	74.612	64 to 80	PASS



TEST REPORT N°: KSK-ESH-P24071264B-5

WC0NR2201

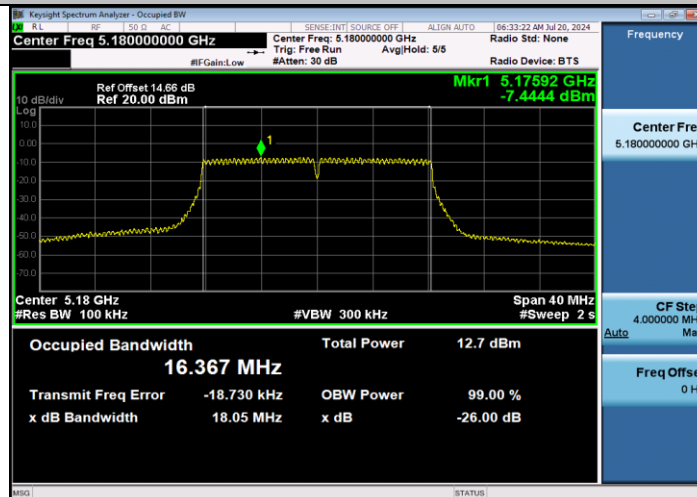
TestMode	Antenna	Freq[MHz]	OCB[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	17.584	16 to 20	PASS
	Ant2	5180	17.584	16 to 20	PASS
11N20MIMO	Ant1	5180	17.582	16 to 20	PASS
	Ant2	5180	17.585	16 to 20	PASS
11N40MIMO	Ant1	5190	36.057	32 to 40	PASS
	Ant2	5190	36.085	32 to 40	PASS
11AC20MIMO	Ant1	5180	17.582	16 to 20	PASS
	Ant2	5180	17.582	16 to 20	PASS
11AC40MIMO	Ant1	5190	36.047	32 to 40	PASS
	Ant2	5190	36.071	32 to 40	PASS
11AC80MIMO	Ant1	5210	74.660	64 to 80	PASS
	Ant2	5210	74.911	64 to 80	PASS

TEST REPORT N°: KSK-ESH-P24071264B-5

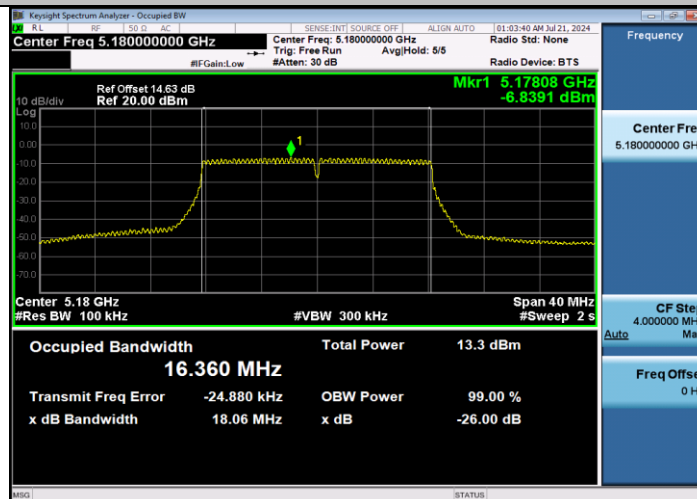
3.2.6 Test Graphs

WCT1DR2201D

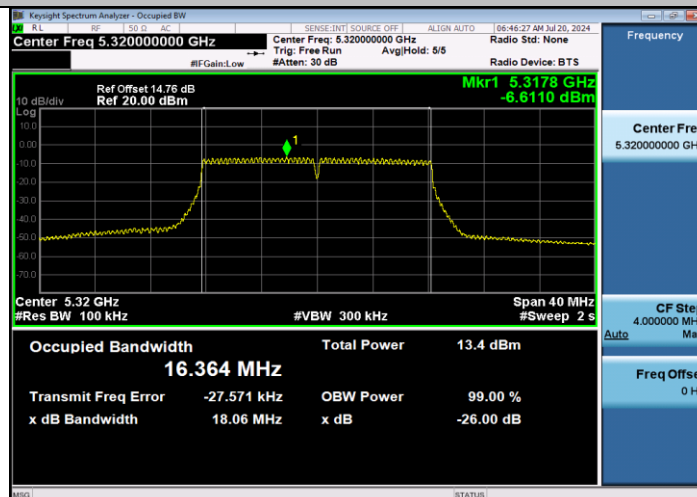
11A_Ant1_5180



11A_Ant2_5180



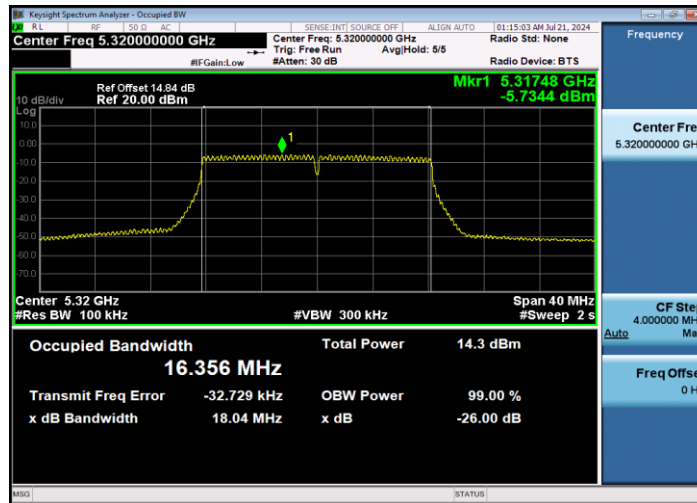
11A_Ant1_5320



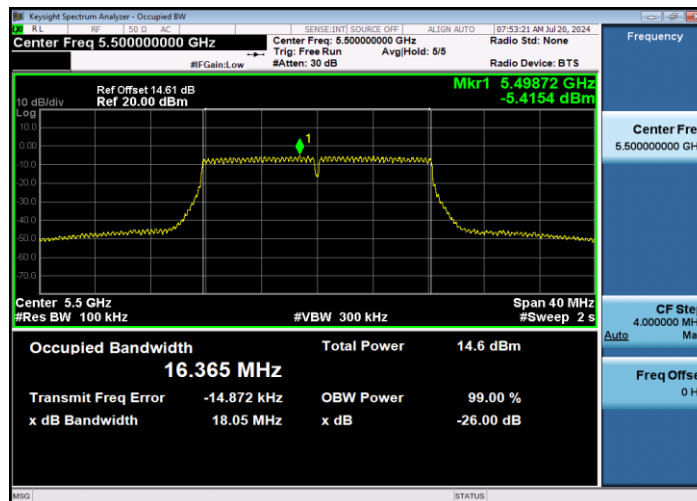


TEST REPORT N°: KSK-ESH-P24071264B-5

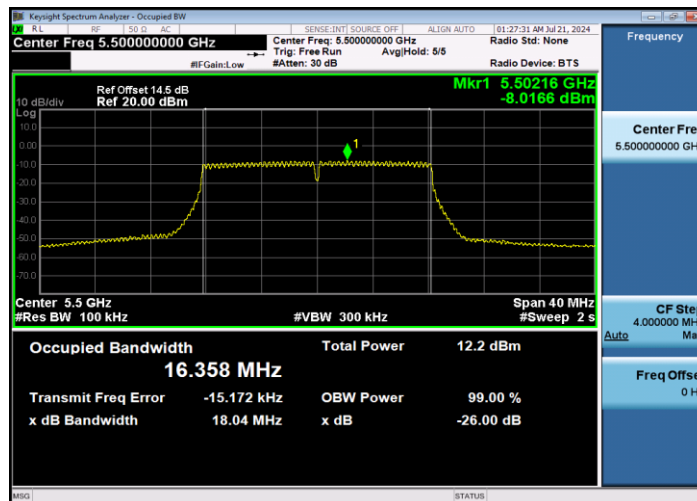
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11A_Ant1_5500



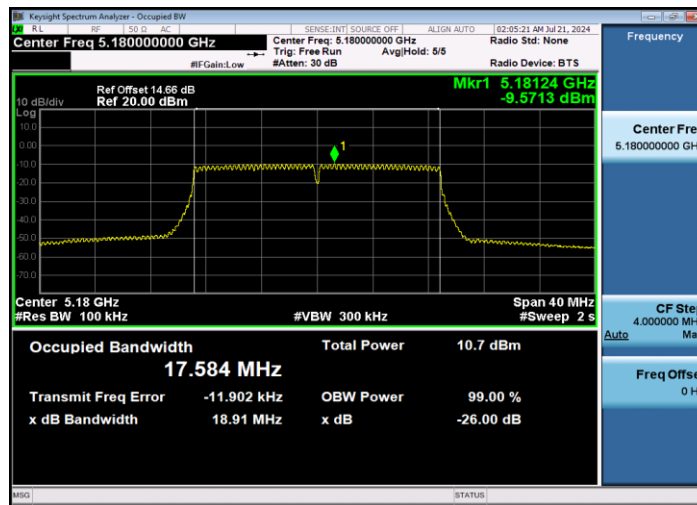
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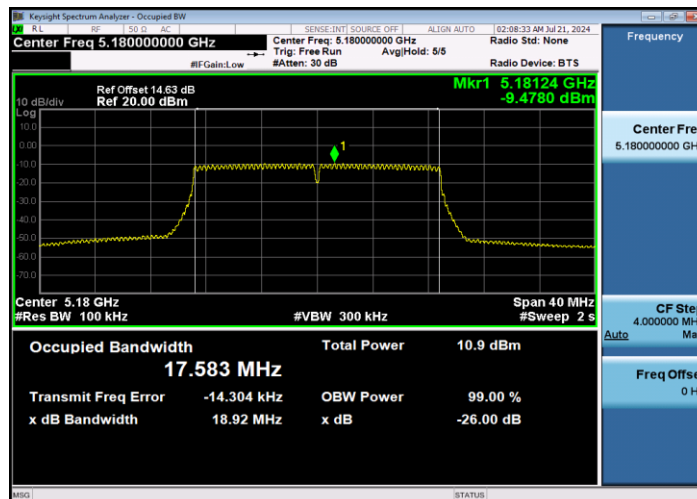
11N20MIMO_Ant1_5180



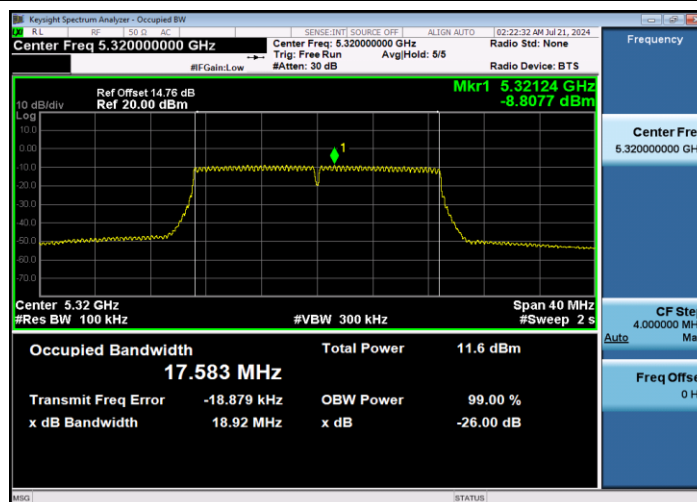
TEST REPORT N°: KSK-ESH-P24071264B-5



11N20MIMO_Ant2_5180

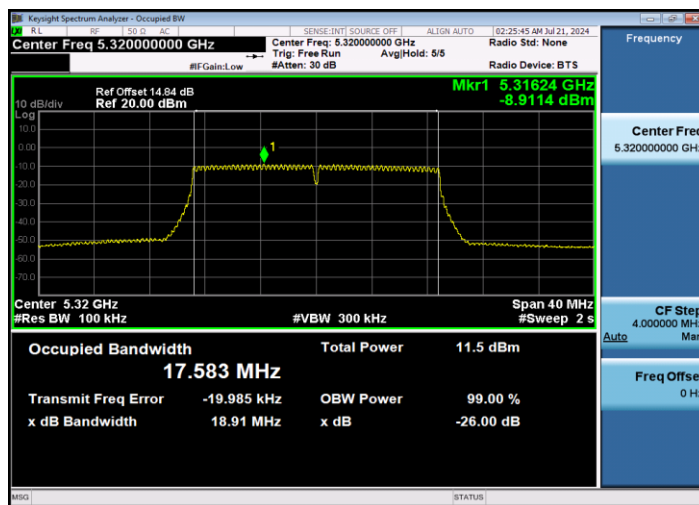


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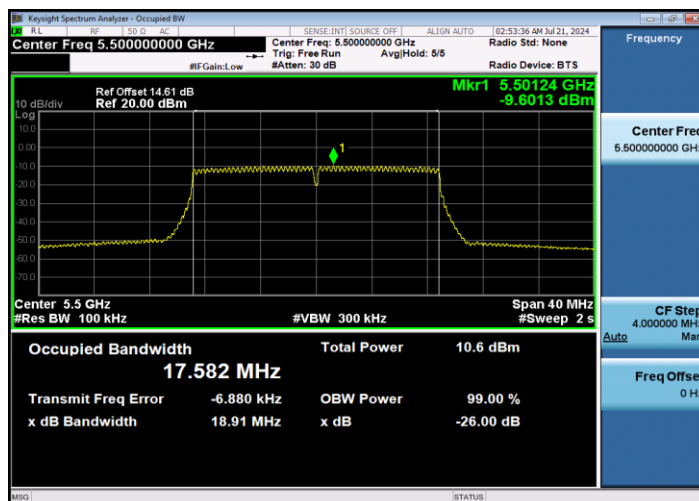


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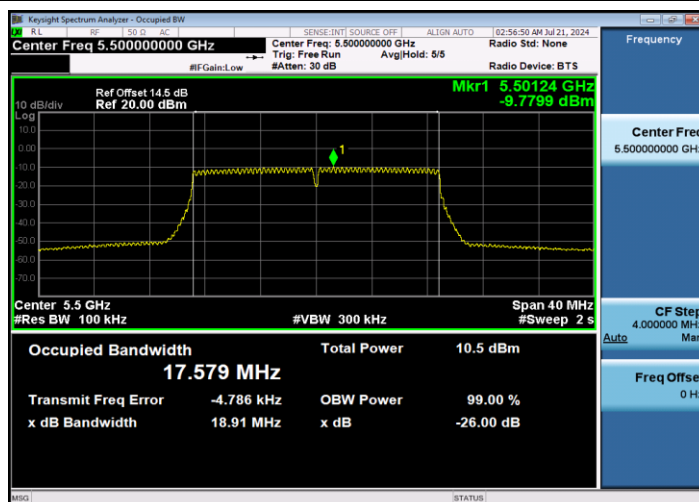
TEST REPORT N°: KSK-ESH-P24071264B-5



11N20MIMO_Ant1_5500



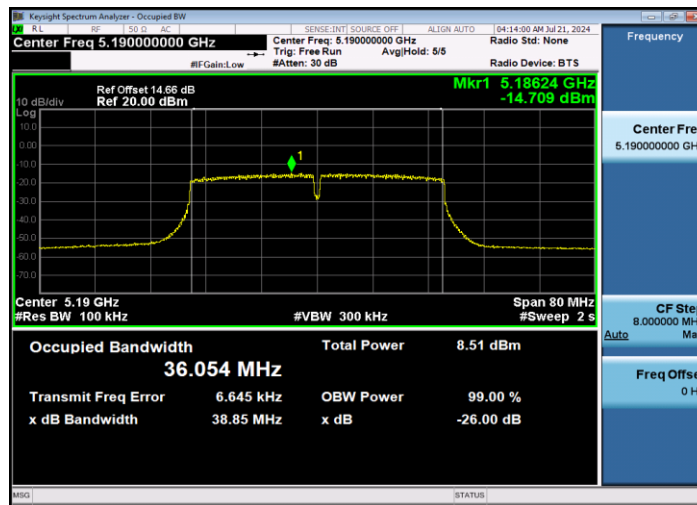
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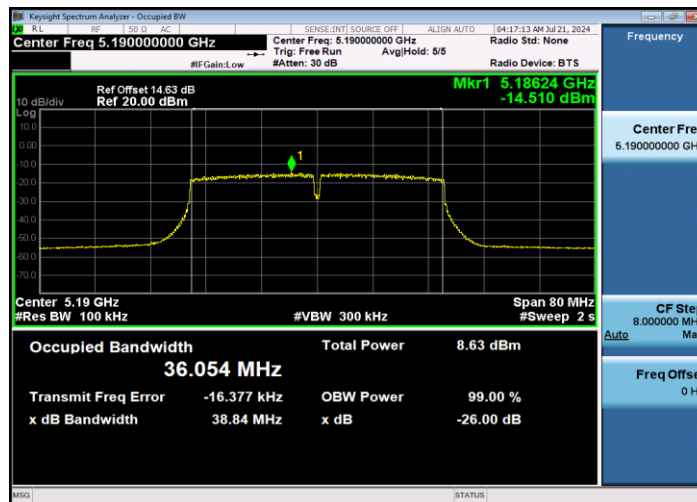
11N40MIMO_Ant1_5190



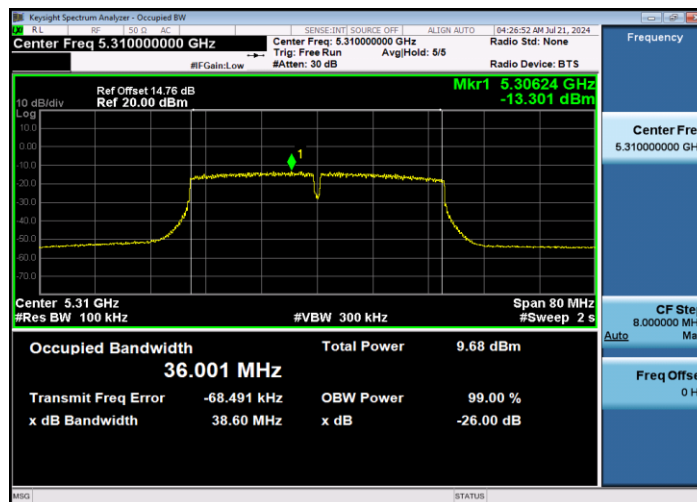
TEST REPORT N°: KSK-ESH-P24071264B-5



11N40MIMO_Ant2_5190



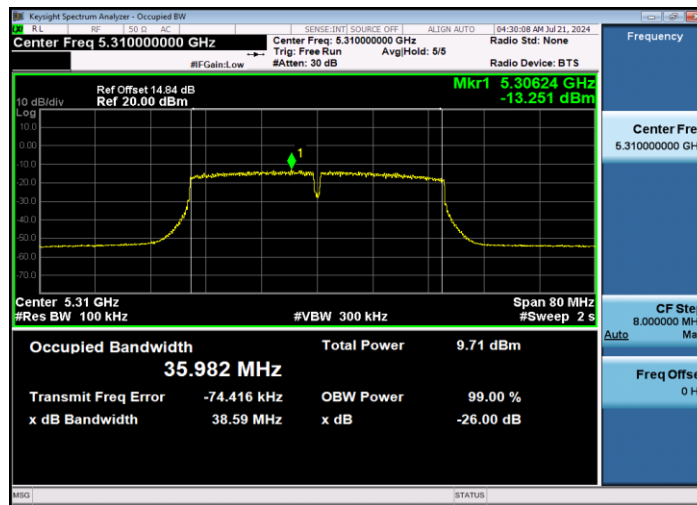
11N40MIMO_Ant1_5310



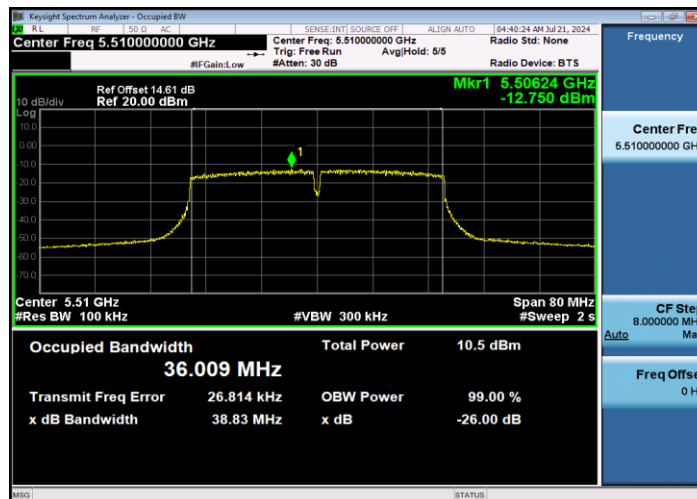
11N40MIMO_Ant2_5310



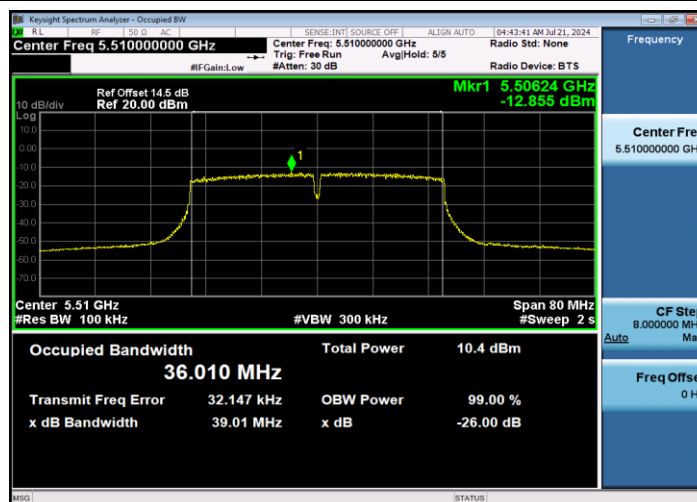
TEST REPORT N°: KSK-ESH-P24071264B-5



11N40MIMO_Ant1_5510



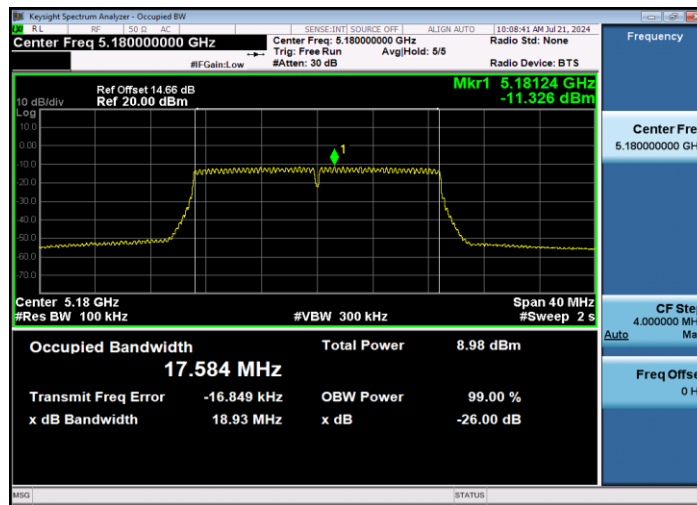
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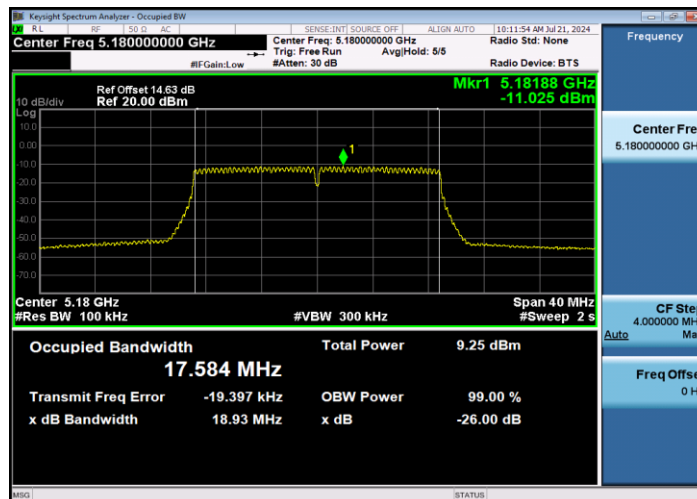
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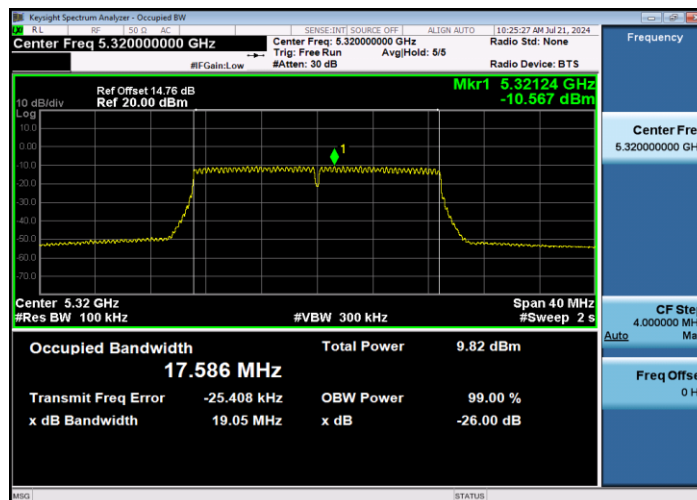
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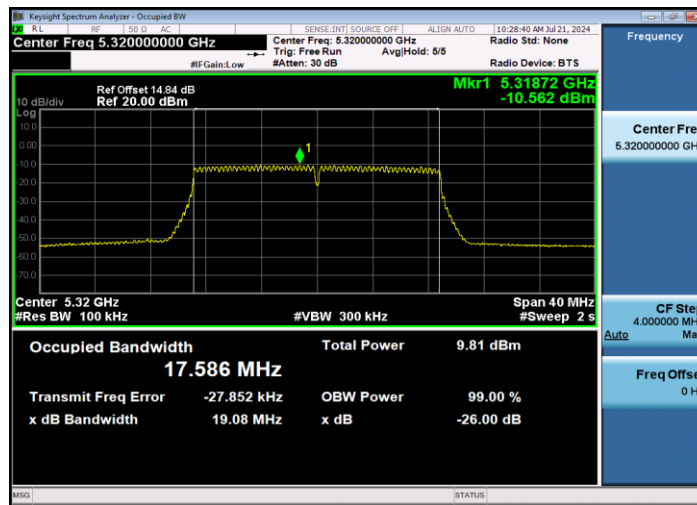
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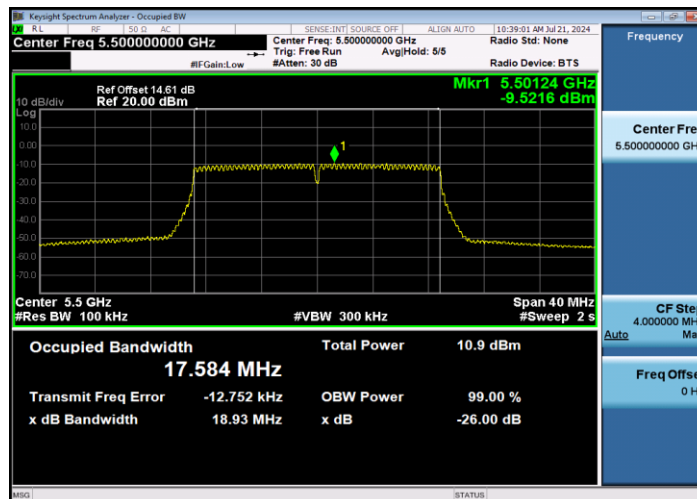
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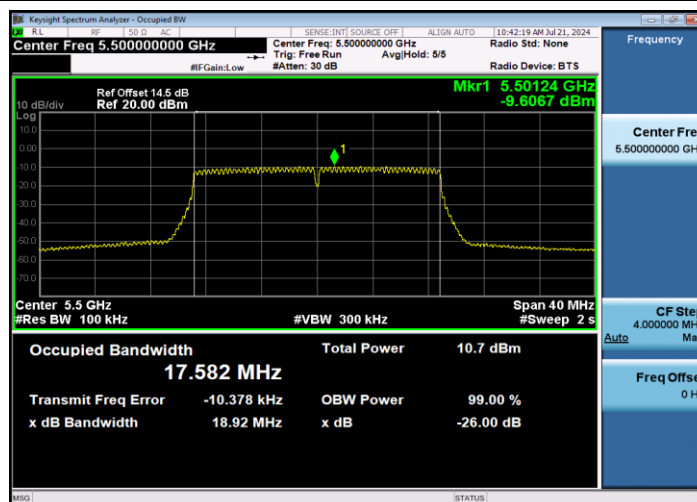
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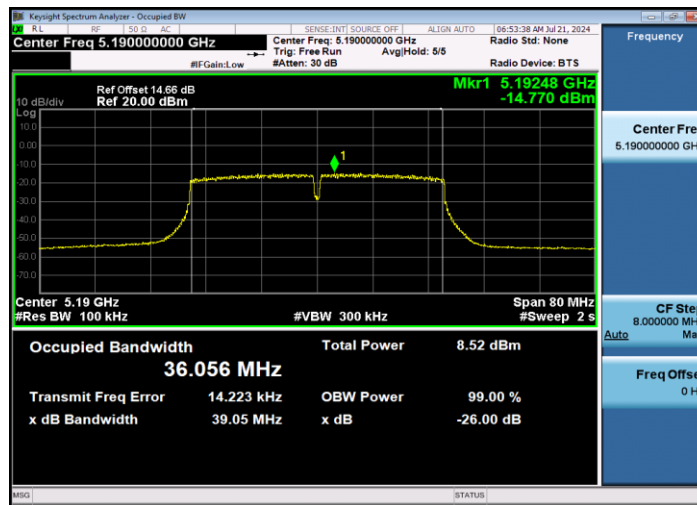
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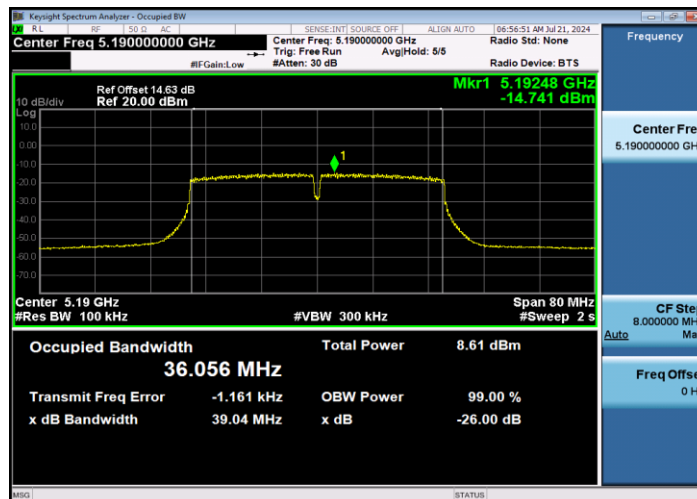
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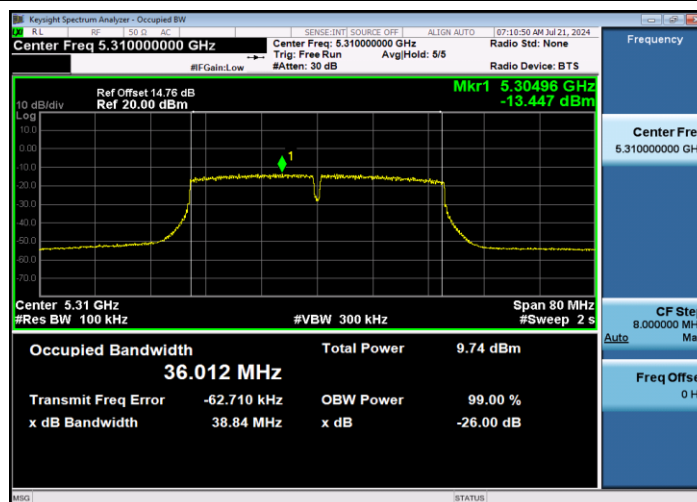
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11AC40MIMO_Ant2_5190



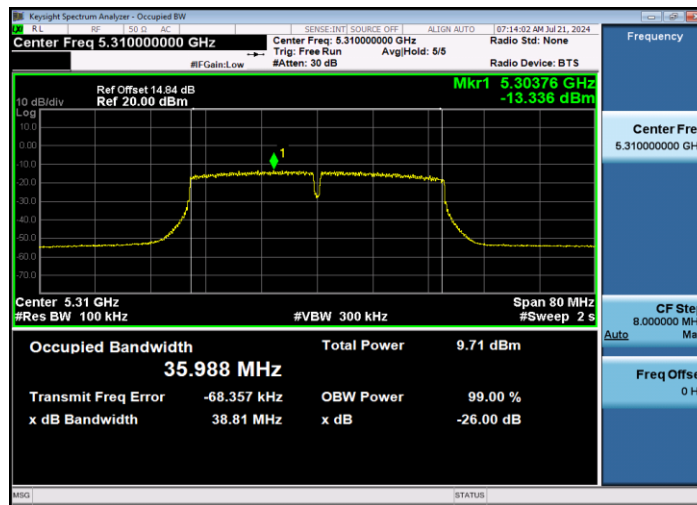
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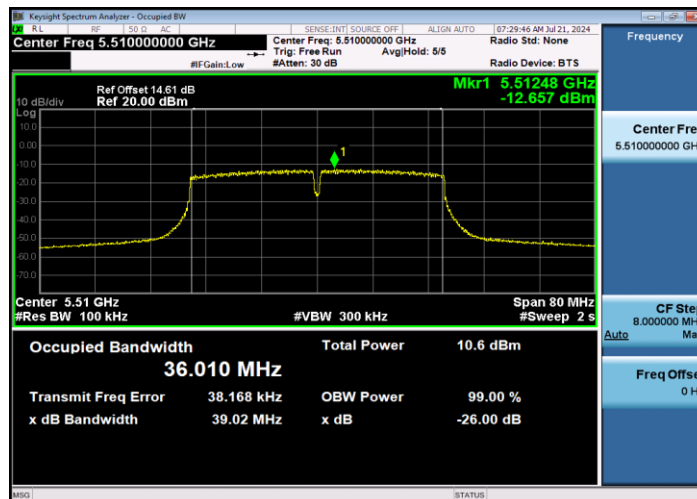
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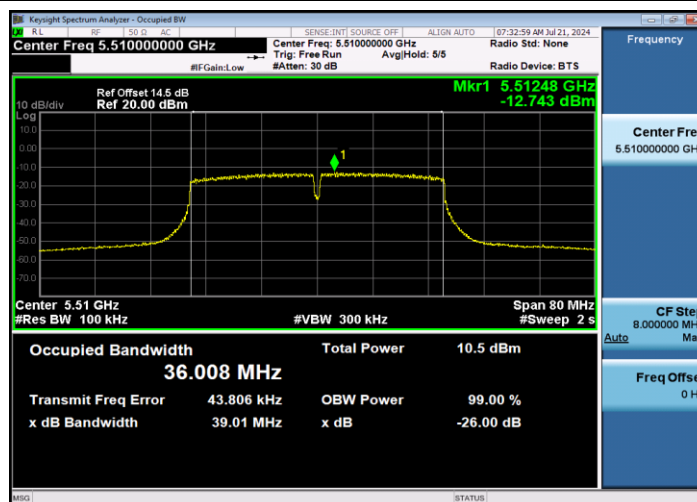
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11AC40MIMO_Ant1_5510



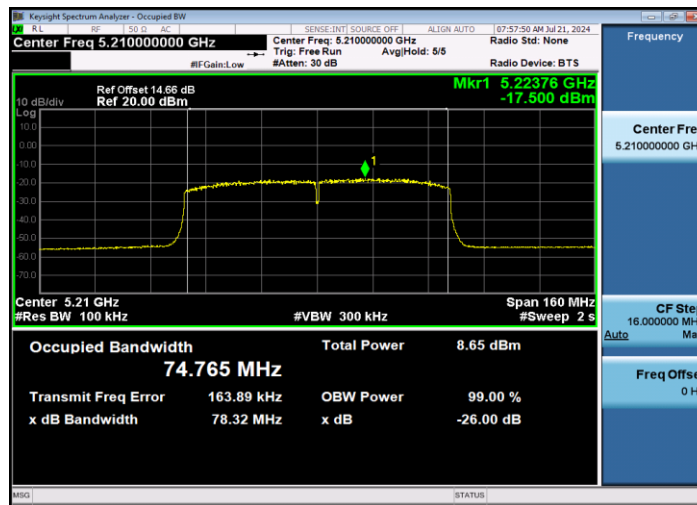
11AC40MIMO_Ant2_5510



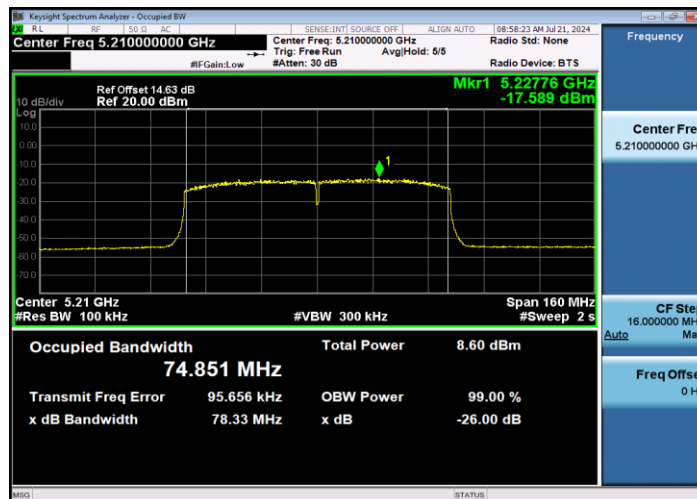
11AC80MIMO_Ant1_5210



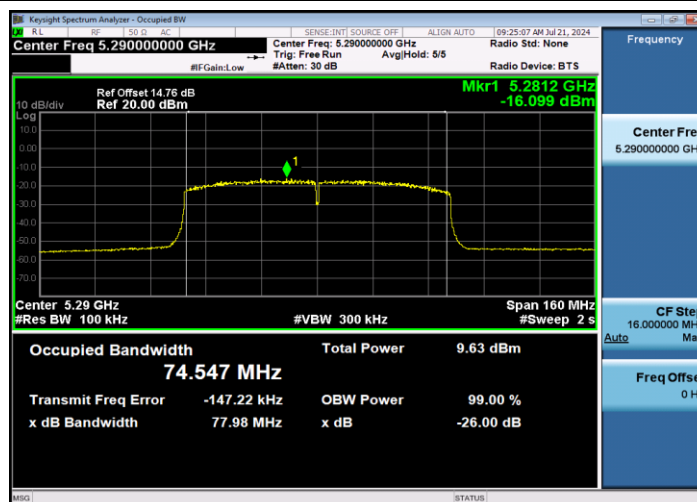
TEST REPORT N°: KSK-ESH-P24071264B-5



11AC80MIMO_Ant2_5210



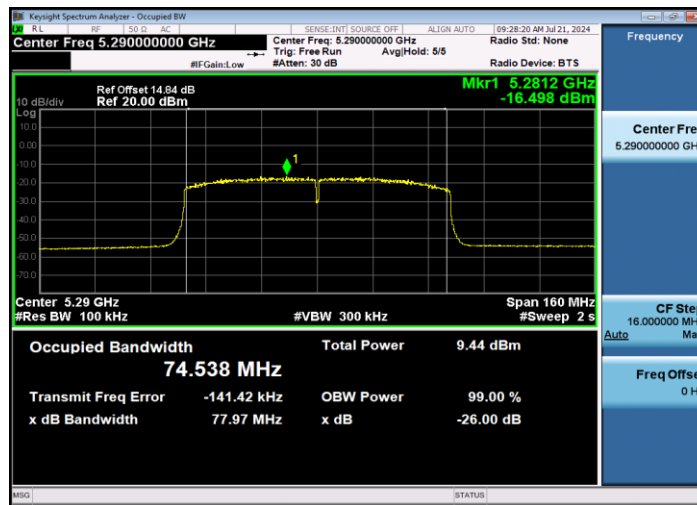
11AC80MIMO_Ant1_5290



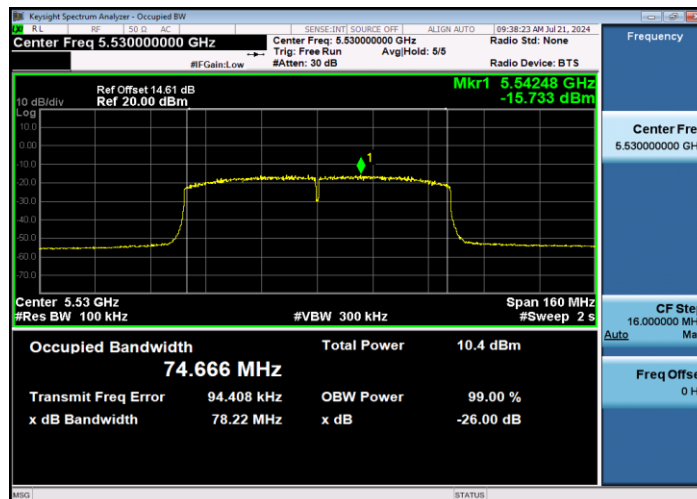
11AC80MIMO_Ant2_5290



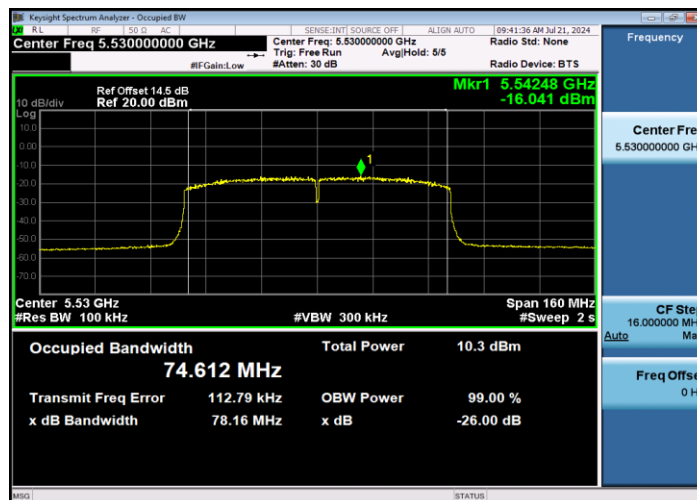
TEST REPORT N°: KSK-ESH-P24071264B-5



11AC80MIMO_Ant1_5530



11AC80MIMO_Ant2_5530

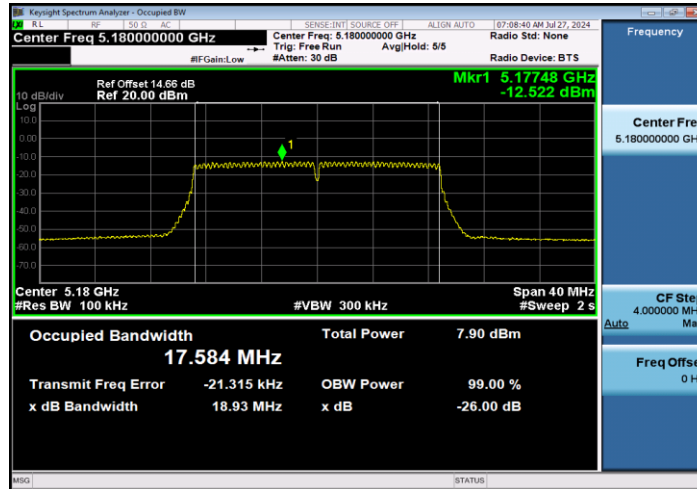




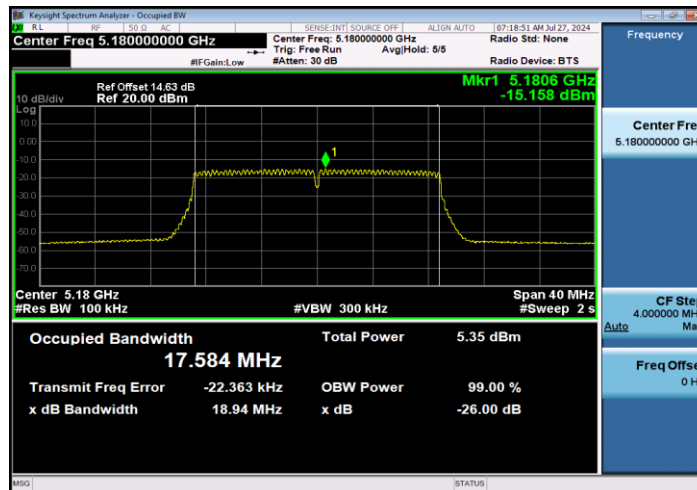
TEST REPORT N°: KSK-ESH-P24071264B-5

WC0NR2201

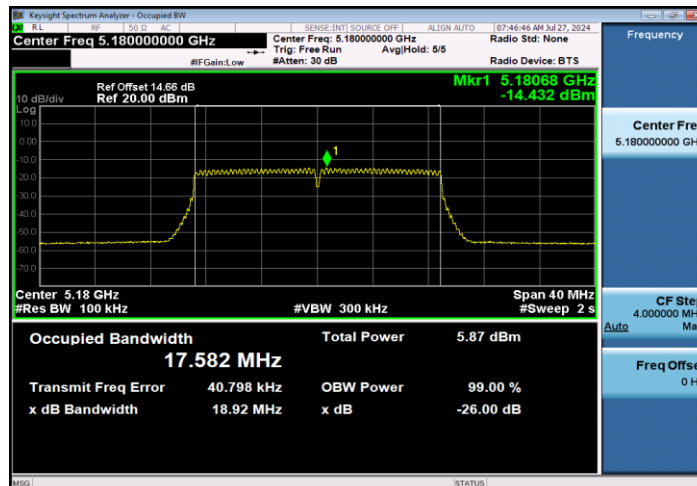
11A_Ant1_5180



11A_Ant2_5180



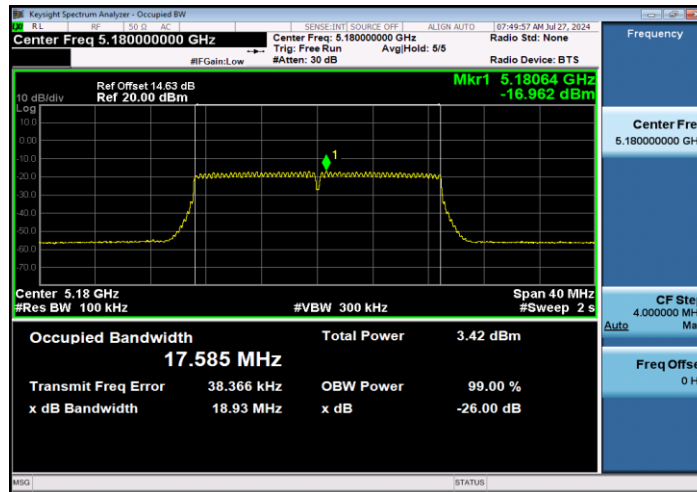
11N20MIMO_Ant1_5180



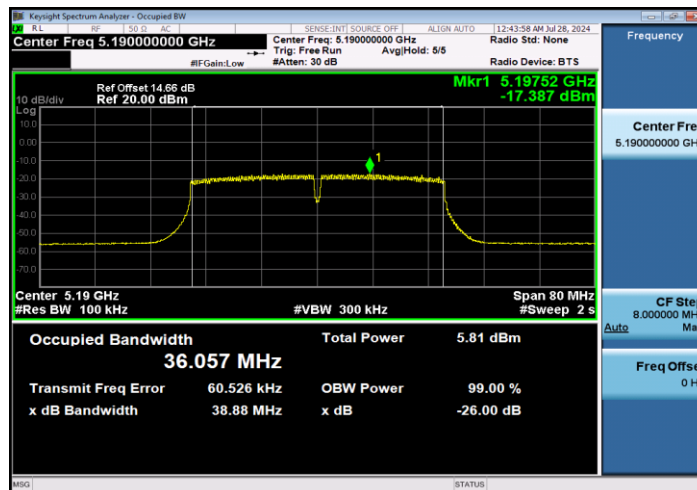


TEST REPORT N°: KSK-ESH-P24071264B-5

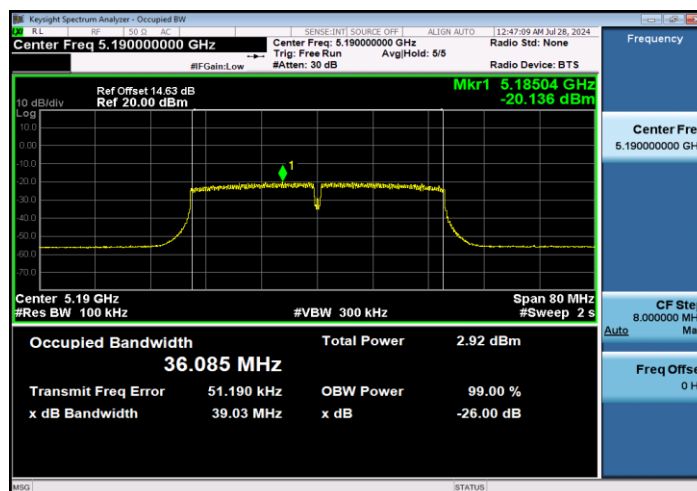
11N20MIMO_Ant2_5180



11N40MIMO_Ant1_5190



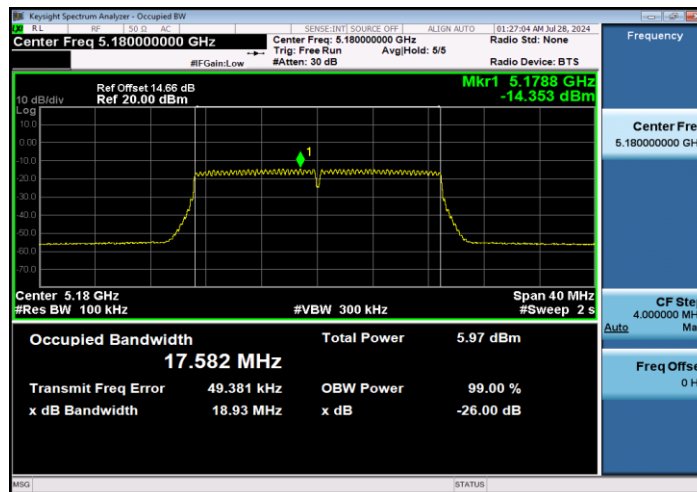
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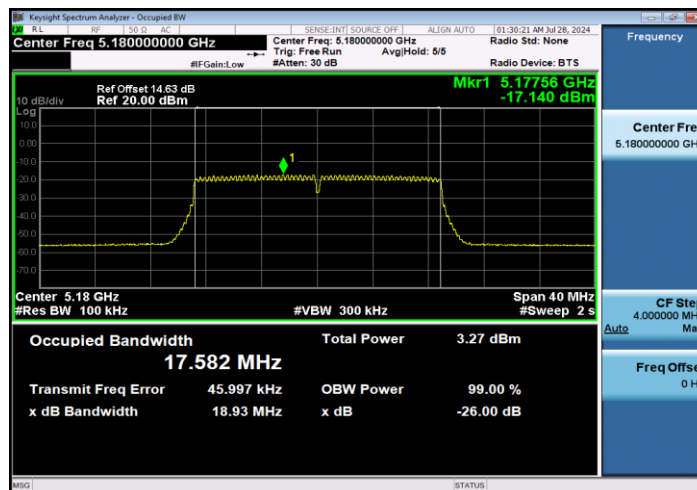
11AC20MIMO_Ant1_5180



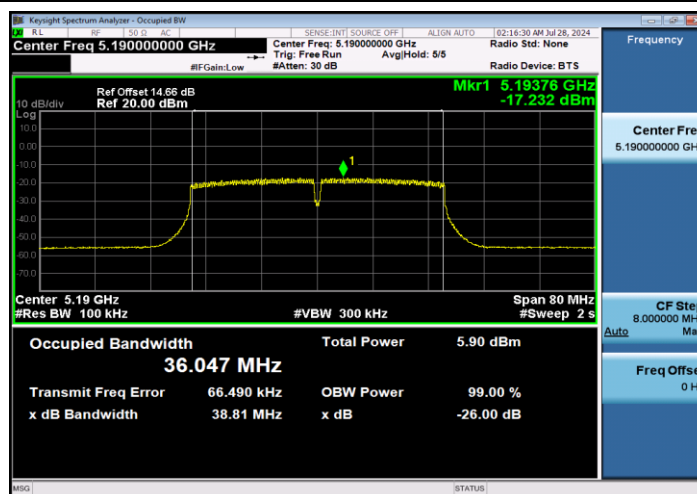
TEST REPORT N°: KSK-ESH-P24071264B-5



11AC20MIMO_Ant2_5180

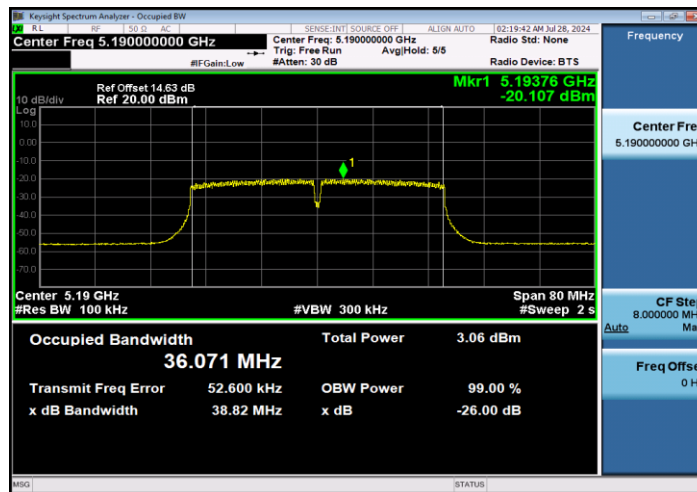


11AC40MIMO_Ant1_5190

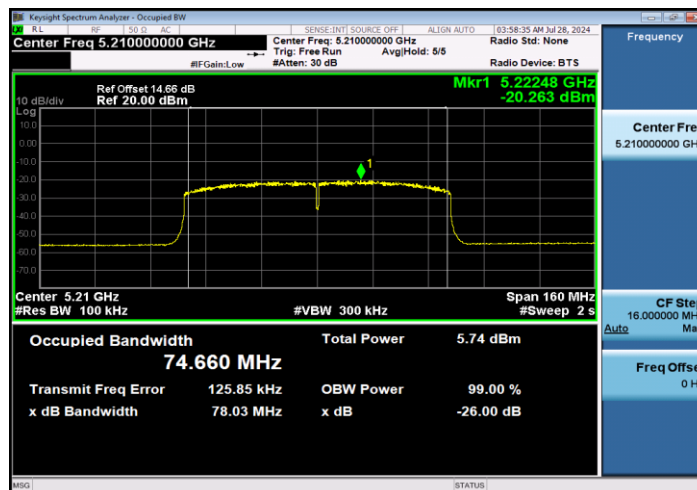


11AC40MIMO_Ant2_5190

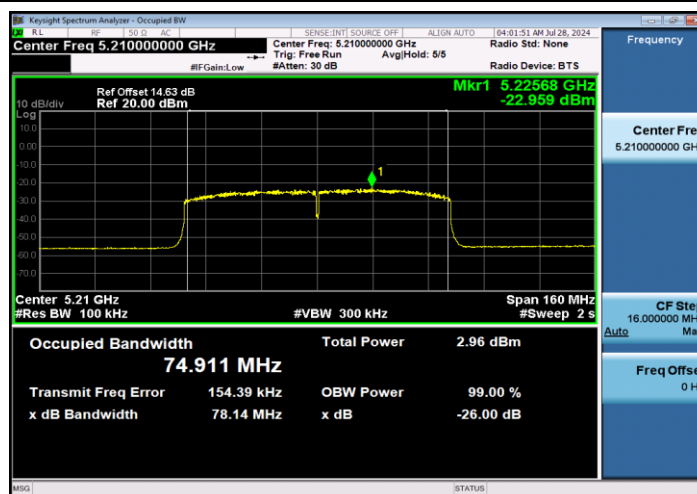
TEST REPORT N°: KSK-ESH-P24071264B-5



11AC80MIMO_Ant1_5210



11AC80MIMO_Ant2_5210



TEST REPORT N°: KSK-ESH-P24071264B-5

3.3 RF Output Power

3.3.1 Limits of RF output power

Frequency Range (MHz)	Mean e.i.r.p. Limit (dBm)	
	☐ With TPC	☒ Without TPC
5150 to 5350	23	20 / 23 (see note 1)
5470 to 5725	30 (see note 2)	27 (see note 2)
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: Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5 250 MHz to 5 350 MHz.		

Remove green part, if device doesn't support TPC

3.3.2 Limits of RF Output Power at Lowest Power Level

Frequency Range (MHz)	Average EIRP (dBm)
5250 to 5350	17
5470 to 5725	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.	

3.3.3 Test Procedure

Refer to EN 301 893 V2.1.1 clause 5.4.4

Measurement	
☒ Conducted measurement	☐ Radiated measurement
☒ Option 1: For equipment with continuous transmission capability or for equipment operating (or with the capability to operate) with a constant duty cycle (e.g. Frame Based equipment).	
☐ Option 2: For equipment without continuous transmission capability and operating (or with the capability to operate) in only one sub-band.	
☐ Option 3: For equipment without continuous transmission capability and having simultaneous transmissions in both sub-bands.	

3.3.4 Deviation from Test Standard

No deviation.

3.3.5 Test Setup

The measurements were performed at both normal environmental conditions and at the extremes of the operating temperature range. The measurement channels were performed in accordance with EN 301 893 clause 5.3.2. The equipment was configured to operate under its worst case situation with respect to output power. (In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator.) The RF power as defined in EN 301 893 clause 4.2.3 shall be measured and recorded. Controlling software ({software}) has been activated to set the EUT on specific status.



TEST REPORT N°: KSK-ESH-P24071264B-5

3.3.6 Test Result

WCT1DR2201D

Test Condition	Test Mode	Antenna	Freq(MHz)	EIRP [dBm]	Limit [dBm]	Verdict
NTNV	11A	Ant1	5745	13.48	13.98	PASS
		Ant2	5745	13.18	13.98	PASS
		Ant1	5785	13.44	13.98	PASS
		Ant2	5785	13.43	13.98	PASS
		Ant1	5825	13.26	13.98	PASS
		Ant2	5825	13.40	13.98	PASS
	11N20 MIMO	Ant1	5745	11.23	13.98	PASS
		Ant2	5745	10.24	13.98	PASS
		total	5745	13.77	13.98	PASS
		Ant1	5785	10.14	13.98	PASS
		Ant2	5785	9.93	13.98	PASS
		total	5785	13.05	13.98	PASS
		Ant1	5825	9.50	13.98	PASS
		Ant2	5825	9.55	13.98	PASS
		total	5825	12.54	13.98	PASS
		Ant1	5755	9.81	13.98	PASS
	11N40 MIMO	Ant2	5755	9.44	13.98	PASS
		total	5755	12.64	13.98	PASS
		Ant1	5795	9.42	13.98	PASS
		Ant2	5795	9.83	13.98	PASS
		total	5795	12.64	13.98	PASS
		Ant1	5745	10.22	13.98	PASS
	11AC20 MIMO	Ant2	5745	9.59	13.98	PASS
		total	5745	12.93	13.98	PASS
		Ant1	5785	10.30	13.98	PASS
		Ant2	5785	10.33	13.98	PASS
		total	5785	13.33	13.98	PASS
		Ant1	5825	9.78	13.98	PASS
		Ant2	5825	10.03	13.98	PASS
		total	5825	12.92	13.98	PASS
	11AC40 MIMO	Ant1	5755	11.04	13.98	PASS
		Ant2	5755	10.39	13.98	PASS
		total	5755	13.74	13.98	PASS
		Ant1	5795	10.29	13.98	PASS
		Ant2	5795	10.61	13.98	PASS
		total	5795	13.46	13.98	PASS
	11AC80 MIMO	Ant1	5775	10.39	13.98	PASS
		Ant2	5775	10.39	13.98	PASS
		total	5775	13.40	13.98	PASS
NTNV	11A	Ant1	5745	13.67	13.98	PASS
		Ant2	5745	13.31	13.98	PASS
		Ant1	5785	13.53	13.98	PASS
		Ant2	5785	13.66	13.98	PASS
		Ant1	5825	13.49	13.98	PASS
		Ant2	5825	13.43	13.98	PASS
	11N20 MIMO	Ant1	5745	11.25	13.98	PASS
		Ant2	5745	10.26	13.98	PASS
		total	5745	13.79	13.98	PASS
		Ant1	5785	10.60	13.98	PASS



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		Ant2	5785	10.30	13.98	PASS
		total	5785	13.46	13.98	PASS
		Ant1	5825	9.46	13.98	PASS
		Ant2	5825	10.27	13.98	PASS
		total	5825	12.89	13.98	PASS
	11N40 MIMO	Ant1	5755	9.82	13.98	PASS
		Ant2	5755	9.46	13.98	PASS
		total	5755	12.65	13.98	PASS
		Ant1	5795	9.48	13.98	PASS
		Ant2	5795	9.79	13.98	PASS
	11AC20 MIMO	total	5795	12.65	13.98	PASS
		Ant1	5745	10.24	13.98	PASS
		Ant2	5745	9.86	13.98	PASS
		total	5745	13.06	13.98	PASS
		Ant1	5785	10.35	13.98	PASS
		Ant2	5785	10.38	13.98	PASS
		total	5785	13.38	13.98	PASS
		Ant1	5825	9.80	13.98	PASS
	11AC40 MIMO	Ant2	5825	10.05	13.98	PASS
		total	5825	12.94	13.98	PASS
		Ant1	5755	11.10	13.98	PASS
		Ant2	5755	10.42	13.98	PASS
		total	5755	13.78	13.98	PASS
	11AC80 MIMO	Ant1	5795	10.42	13.98	PASS
		Ant2	5795	10.62	13.98	PASS
		total	5795	13.53	13.98	PASS
		Ant1	5775	10.41	13.98	PASS
		Ant2	5775	10.43	13.98	PASS
		total	5775	13.43	13.98	PASS
NTNV	11A	Ant1	5745	13.49	13.98	PASS
		Ant2	5745	13.27	13.98	PASS
		Ant1	5785	13.31	13.98	PASS
		Ant2	5785	13.16	13.98	PASS
		Ant1	5825	13.24	13.98	PASS
		Ant2	5825	13.36	13.98	PASS
	11N20 MIMO	Ant1	5745	11.22	13.98	PASS
		Ant2	5745	10.23	13.98	PASS
		total	5745	13.76	13.98	PASS
		Ant1	5785	10.06	13.98	PASS
		Ant2	5785	10.48	13.98	PASS
		total	5785	13.29	13.98	PASS
		Ant1	5825	9.84	13.98	PASS
		Ant2	5825	9.83	13.98	PASS
	11N40 MIMO	total	5825	12.85	13.98	PASS
		Ant1	5755	9.80	13.98	PASS
		Ant2	5755	9.01	13.98	PASS
		total	5755	12.43	13.98	PASS
		Ant1	5795	9.38	13.98	PASS
		Ant2	5795	9.52	13.98	PASS
	11AC20 MIMO	total	5795	12.46	13.98	PASS
		Ant1	5745	9.78	13.98	PASS
		Ant2	5745	9.85	13.98	PASS
		total	5745	12.83	13.98	PASS
		Ant1	5785	10.13	13.98	PASS

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		Ant2	5785	10.14	13.98	PASS
		total	5785	13.15	13.98	PASS
		Ant1	5825	9.31	13.98	PASS
		Ant2	5825	10.04	13.98	PASS
		total	5825	12.70	13.98	PASS
	11AC40 MIMO	Ant1	5755	11.02	13.98	PASS
		Ant2	5755	10.33	13.98	PASS
		total	5755	13.70	13.98	PASS
		Ant1	5795	10.19	13.98	PASS
		Ant2	5795	10.47	13.98	PASS
		total	5795	13.34	13.98	PASS
	11AC80 MIMO	Ant1	5775	10.29	13.98	PASS
		Ant2	5775	10.31	13.98	PASS
		total	5775	13.31	13.98	PASS



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WC0NR2201

Test Condition	Test Mode	Antenna	Freq(MHz)	EIRP [dBm]	Limit [dBm]	Verdict
NTNV	11A	Ant1	5745	13.94	13.98	PASS
		Ant2	5745	11.31	13.98	PASS
		Ant1	5785	12.20	13.98	PASS
		Ant2	5785	11.99	13.98	PASS
		Ant1	5825	11.58	13.98	PASS
		Ant2	5825	11.21	13.98	PASS
	11N20 MIMO	Ant1	5745	10.10	13.98	PASS
		Ant2	5745	8.89	13.98	PASS
		total	5745	12.55	13.98	PASS
		Ant1	5785	9.57	13.98	PASS
		Ant2	5785	9.42	13.98	PASS
		total	5785	12.51	13.98	PASS
		Ant1	5825	8.37	13.98	PASS
		Ant2	5825	8.61	13.98	PASS
		total	5825	11.50	13.98	PASS
	11N40 MIMO	Ant1	5755	11.46	13.98	PASS
		Ant2	5755	9.52	13.98	PASS
		total	5755	13.61	13.98	PASS
		Ant1	5795	8.72	13.98	PASS
		Ant2	5795	8.47	13.98	PASS
		total	5795	11.61	13.98	PASS
	11AC20 MIMO	Ant1	5745	9.82	13.98	PASS
		Ant2	5745	8.11	13.98	PASS
		total	5745	12.06	13.98	PASS
		Ant1	5785	8.88	13.98	PASS
		Ant2	5785	8.82	13.98	PASS
		total	5785	11.86	13.98	PASS
		Ant1	5825	8.52	13.98	PASS
		Ant2	5825	7.89	13.98	PASS
		total	5825	11.23	13.98	PASS
	11AC40 MIMO	Ant1	5755	10.16	13.98	PASS
		Ant2	5755	8.61	13.98	PASS
		total	5755	12.46	13.98	PASS
		Ant1	5795	8.82	13.98	PASS
		Ant2	5795	8.61	13.98	PASS
		total	5795	11.73	13.98	PASS
	11AC80 MIMO	Ant1	5775	10.69	13.98	PASS
		Ant2	5775	10.59	13.98	PASS
		total	5775	13.65	13.98	PASS
LTNV	11A	Ant1	5745	13.96	13.98	PASS
		Ant2	5745	11.54	13.98	PASS
		Ant1	5785	12.12	13.98	PASS
		Ant2	5785	12.30	13.98	PASS
		Ant1	5825	11.74	13.98	PASS
		Ant2	5825	11.67	13.98	PASS
	11N20 MIMO	Ant1	5745	10.22	13.98	PASS
		Ant2	5745	8.81	13.98	PASS
		total	5745	12.58	13.98	PASS
		Ant1	5785	9.65	13.98	PASS
		Ant2	5785	9.62	13.98	PASS
		total	5785	12.65	13.98	PASS



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	11N40 MIMO	Ant1	5825	8.68	13.98	PASS
		Ant2	5825	9.05	13.98	PASS
		total	5825	11.88	13.98	PASS
		Ant1	5755	11.54	13.98	PASS
		Ant2	5755	9.64	13.98	PASS
		total	5755	13.70	13.98	PASS
		Ant1	5795	9.35	13.98	PASS
		Ant2	5795	8.87	13.98	PASS
		total	5795	12.13	13.98	PASS
	11AC20 MIMO	Ant1	5745	10.23	13.98	PASS
		Ant2	5745	8.72	13.98	PASS
		total	5745	12.55	13.98	PASS
		Ant1	5785	9.44	13.98	PASS
		Ant2	5785	8.73	13.98	PASS
		total	5785	12.11	13.98	PASS
		Ant1	5825	8.77	13.98	PASS
		Ant2	5825	8.24	13.98	PASS
		total	5825	11.52	13.98	PASS
	11AC40 MIMO	Ant1	5755	10.49	13.98	PASS
		Ant2	5755	8.87	13.98	PASS
		total	5755	12.77	13.98	PASS
		Ant1	5795	9.25	13.98	PASS
		Ant2	5795	8.51	13.98	PASS
		total	5795	11.91	13.98	PASS
	11AC80 MIMO	Ant1	5775	10.72	13.98	PASS
		Ant2	5775	10.62	13.98	PASS
		total	5775	13.68	13.98	PASS
HTNV	11A	Ant1	5745	13.94	13.98	PASS
		Ant2	5745	11.25	13.98	PASS
		Ant1	5785	12.25	13.98	PASS
		Ant2	5785	12.06	13.98	PASS
		Ant1	5825	11.54	13.98	PASS
		Ant2	5825	11.27	13.98	PASS
	11N20 MIMO	Ant1	5745	10.14	13.98	PASS
		Ant2	5745	8.75	13.98	PASS
		total	5745	12.51	13.98	PASS
		Ant1	5785	9.63	13.98	PASS
		Ant2	5785	9.57	13.98	PASS
		total	5785	12.61	13.98	PASS
		Ant1	5825	8.43	13.98	PASS
		Ant2	5825	8.61	13.98	PASS
	11N40 MIMO	total	5825	11.53	13.98	PASS
		Ant1	5755	11.44	13.98	PASS
		Ant2	5755	9.51	13.98	PASS
		total	5755	13.59	13.98	PASS
		Ant1	5795	8.91	13.98	PASS
		Ant2	5795	8.46	13.98	PASS
	11AC20 MIMO	total	5795	11.70	13.98	PASS
		Ant1	5745	10.14	13.98	PASS
		Ant2	5745	8.25	13.98	PASS
		total	5745	12.31	13.98	PASS
		Ant1	5785	9.13	13.98	PASS
		Ant2	5785	8.64	13.98	PASS
		total	5785	11.90	13.98	PASS



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		Ant1	5825	8.61	13.98	PASS
		Ant2	5825	7.90	13.98	PASS
		total	5825	11.28	13.98	PASS
	11AC40 MIMO	Ant1	5755	10.19	13.98	PASS
		Ant2	5755	8.62	13.98	PASS
		total	5755	12.49	13.98	PASS
		Ant1	5795	8.94	13.98	PASS
		Ant2	5795	8.52	13.98	PASS
		total	5795	11.75	13.98	PASS
	11AC80 MIMO	Ant1	5775	10.68	13.98	PASS
		Ant2	5775	10.61	13.98	PASS
		total	5775	13.66	13.98	PASS



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3.4 Power Density

3.4.1 Limit of Power Density

Frequency Band (MHz)	Mean e.i.r.p. Density Limit (dBm/MHz)	
	☐ With TPC	☒ Without TPC
5150 to 5350	10	7 / 10 (see note 1)
5470 to 5725	17 (see note 2)	14 (see note 2)
Note 1: 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 2: Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5 250 MHz to 5 350 MHz.		

3.4.2 Test Procedure

Refer to EN 301 893 V2.1.1 clause 5.4.4

Measurement	
☒ Conducted measurement	☐ Radiated measurement
☒ Option 1: For equipment with continuous transmission capability or for equipment operating (or with the capability to operate) with a constant duty cycle (e.g. Frame Based equipment)	
☐ Option 2: For equipment without continuous transmission capability and without the capability to transmit with a constant duty cycle	

3.4.3 Deviation from Test Standard

No deviation.

3.4.4 Test Setup

The measurement was performed at normal environmental conditions only. The measurement channels were performed in accordance with EN 301 893 clause 5.3.2. The equipment was configured to operate under its worst case situation with respect to output power. (In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator.). Controlling software ({software}) has been activated to set the EUT on specific status.



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3.4.5 Test Results

WCT1DR2201D

Test Mode	Antenna	Freq[MHz]	PSD [dBm/MHz]	Limit [dBm]	Verdict
11A	Ant1	5180	4.86	10	PASS
	Ant2	5180	5.32	10	PASS
	Ant1	5320	5.48	7	PASS
	Ant2	5320	6.38	7	PASS
	Ant1	5500	6.48	7	PASS
	Ant2	5500	4.28	7	PASS
	Ant1	5700	5.97	7	PASS
	Ant2	5700	6.00	7	PASS
11N20MIMO	Ant1	5180	2.40	10	PASS
	Ant2	5180	2.45	10	PASS
	total	5180	5.44	10	PASS
	Ant1	5320	3.28	7	PASS
	Ant2	5320	3.25	7	PASS
	total	5320	6.28	7	PASS
	Ant1	5500	2.34	7	PASS
	Ant2	5500	1.85	7	PASS
	total	5500	5.11	7	PASS
	Ant1	5700	1.81	7	PASS
	Ant2	5700	1.49	7	PASS
	total	5700	4.66	7	PASS
11N40MIMO	Ant1	5190	-2.16	10	PASS
	Ant2	5190	-1.79	10	PASS
	total	5190	1.04	10	PASS
	Ant1	5310	-0.97	7	PASS
	Ant2	5310	-0.52	7	PASS
	total	5310	2.27	7	PASS
	Ant1	5510	0.37	7	PASS
	Ant2	5510	0.30	7	PASS
	total	5510	3.35	7	PASS
	Ant1	5670	-1.35	7	PASS
	Ant2	5670	-0.74	7	PASS
	total	5670	1.98	7	PASS
11AC20MIMO	Ant1	5180	0.69	10	PASS
	Ant2	5180	0.93	10	PASS
	total	5180	3.82	10	PASS
	Ant1	5320	1.28	7	PASS
	Ant2	5320	1.58	7	PASS
	total	5320	4.44	7	PASS
	Ant1	5500	2.69	7	PASS
	Ant2	5500	2.55	7	PASS
	total	5500	5.63	7	PASS
	Ant1	5700	2.29	7	PASS
	Ant2	5700	2.26	7	PASS
	total	5700	5.29	7	PASS
11AC40MIMO	Ant1	5190	-1.97	10	PASS
	Ant2	5190	-2.25	10	PASS
	total	5190	0.90	10	PASS
	Ant1	5310	-0.84	7	PASS
	Ant2	5310	-0.95	7	PASS



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	total	5310	2.12	7	PASS
	Ant1	5510	0.66	7	PASS
	Ant2	5510	0.44	7	PASS
	total	5510	3.56	7	PASS
	Ant1	5670	-0.74	7	PASS
	Ant2	5670	-0.63	7	PASS
	total	5670	2.33	7	PASS
11AC80MIMO	Ant1	5210	-4.02	10	PASS
	Ant2	5210	-3.84	10	PASS
	total	5210	-0.92	10	PASS
	Ant1	5290	-2.58	7	PASS
	Ant2	5290	-3.26	7	PASS
	total	5290	0.10	7	PASS
	Ant1	5530	-2.76	7	PASS
	Ant2	5530	-2.30	7	PASS
	total	5530	0.49	7	PASS
	Ant1	5610	-3.57	7	PASS
	Ant2	5610	-2.75	7	PASS
	total	5610	-0.13	7	PASS



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WC0NR2201

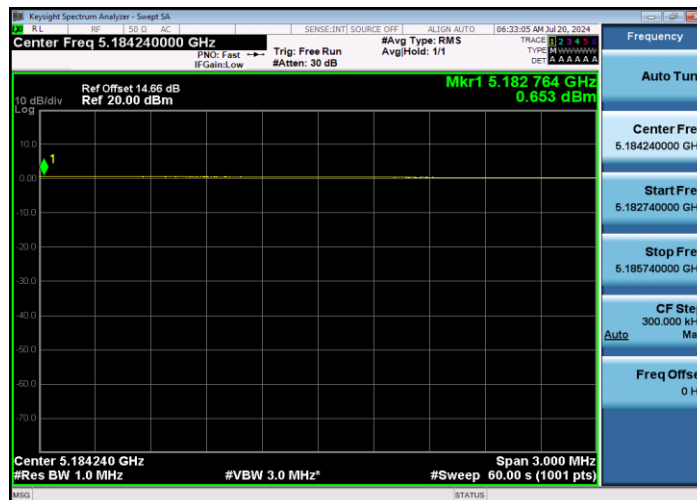
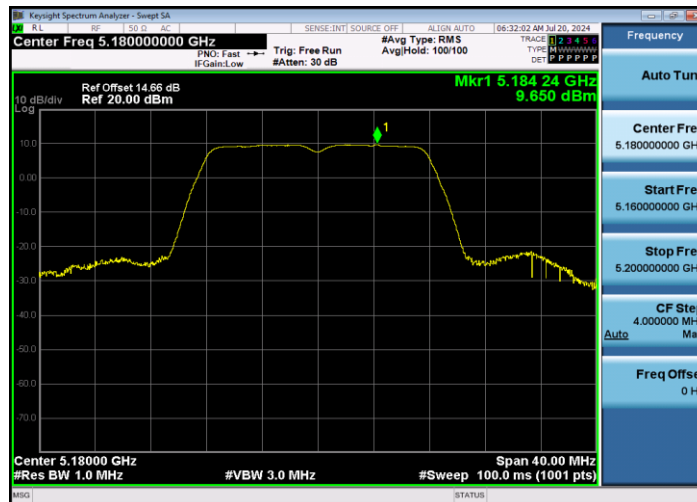
Test Mode	Antenna	Freq[MHz]	PSD [dBm/MHz]	Limit [dBm]	Verdict
11A	Ant1	5180	-0.69	10	PASS
	Ant2	5180	-3.02	10	PASS
11N20MIMO	Ant1	5180	-2.63	10	PASS
	Ant2	5180	-4.95	10	PASS
	total	5180	-0.63	10	PASS
11N40MIMO	Ant1	5190	-5.08	10	PASS
	Ant2	5190	-7.67	10	PASS
	total	5190	-3.17	10	PASS
11AC20MIMO	Ant1	5180	-2.22	10	PASS
	Ant2	5180	-4.86	10	PASS
	total	5180	-0.33	10	PASS
11AC40MIMO	Ant1	5190	-4.94	10	PASS
	Ant2	5190	-7.54	10	PASS
	total	5190	-3.04	10	PASS
11AC80MIMO	Ant1	5210	-7.59	10	PASS
	Ant2	5210	-9.47	10	PASS
	total	5210	-5.42	10	PASS

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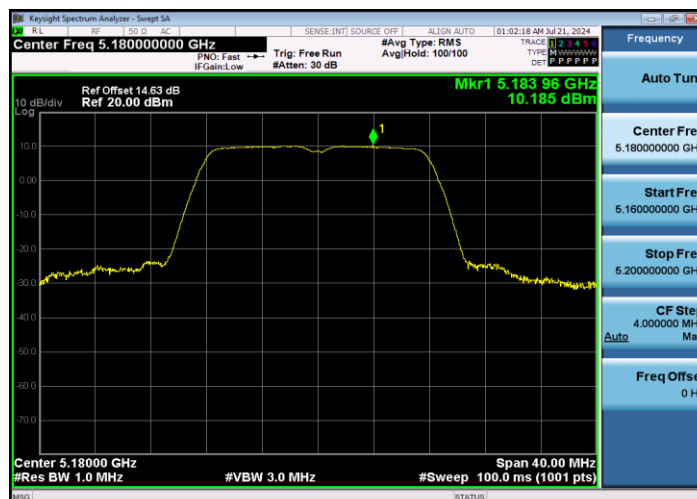
3.4.6 Test Graphs

WCT1DR2201D

11A_Ant1_5180

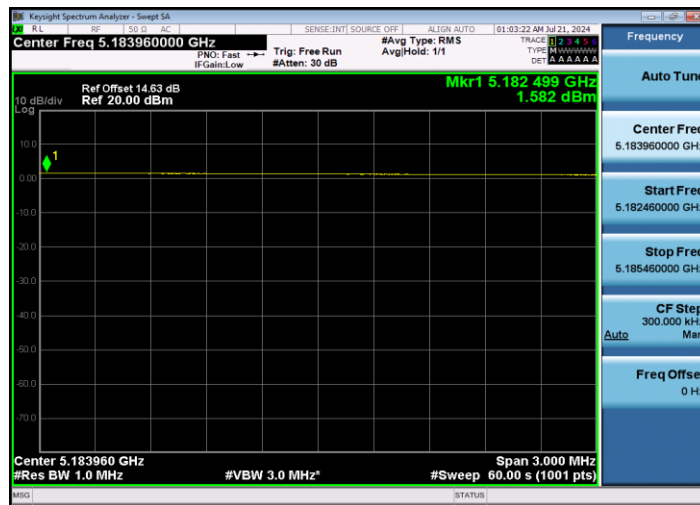


11A_Ant2_5180

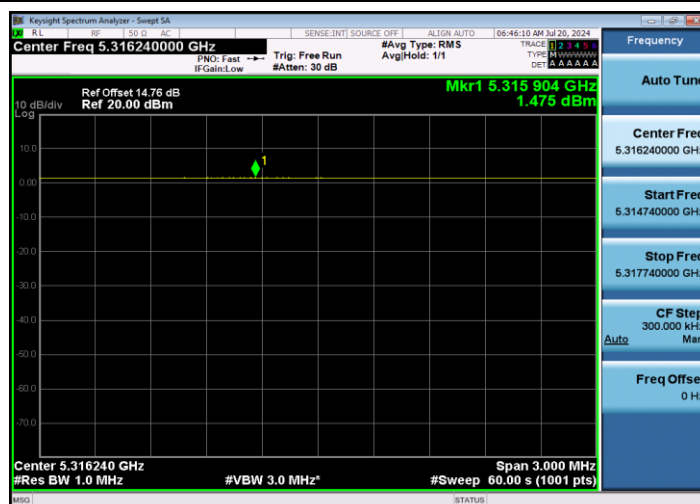
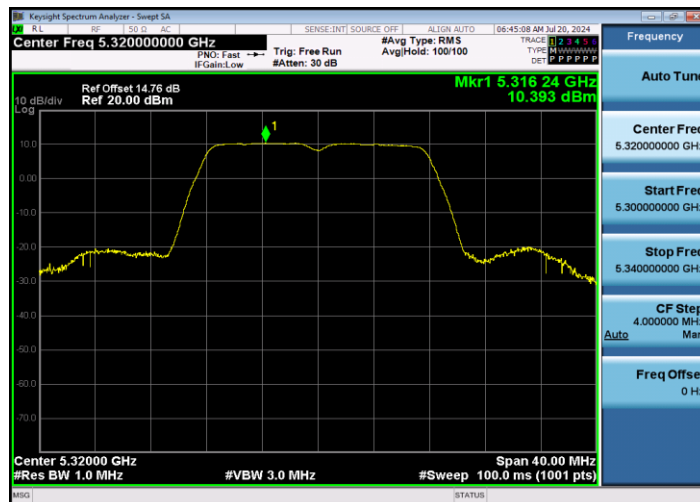




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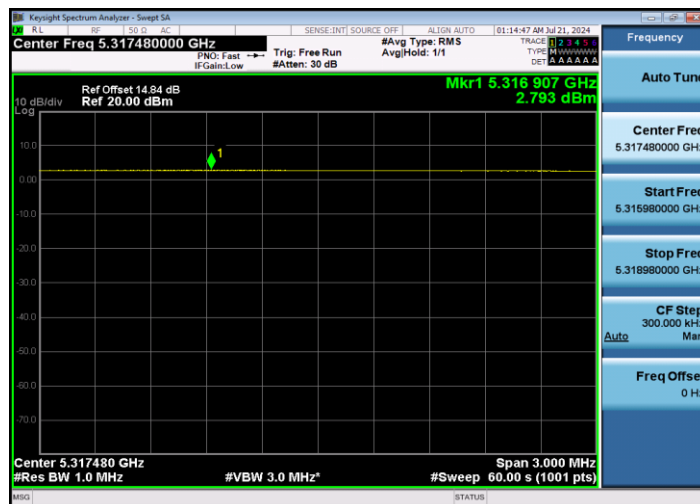
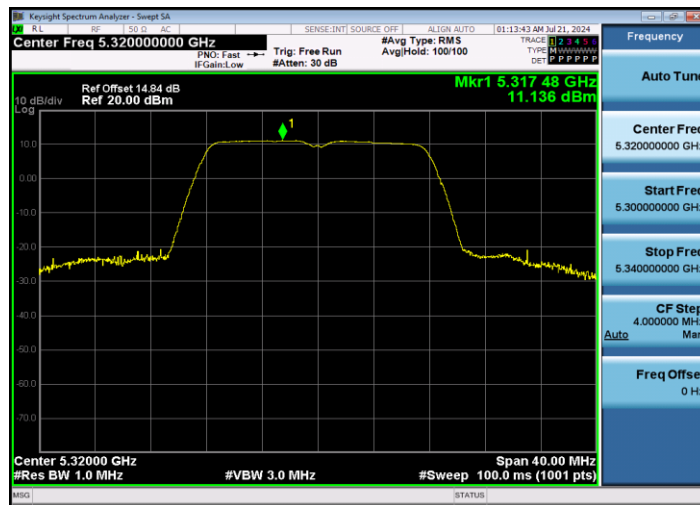


11A_Ant1_5320

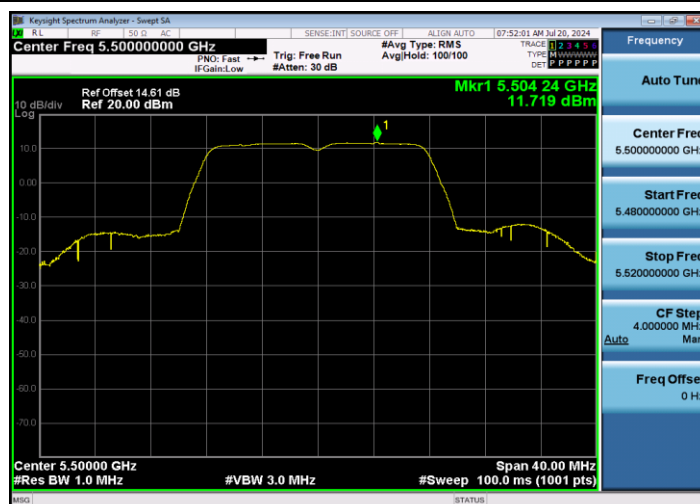


11A_Ant2_5320

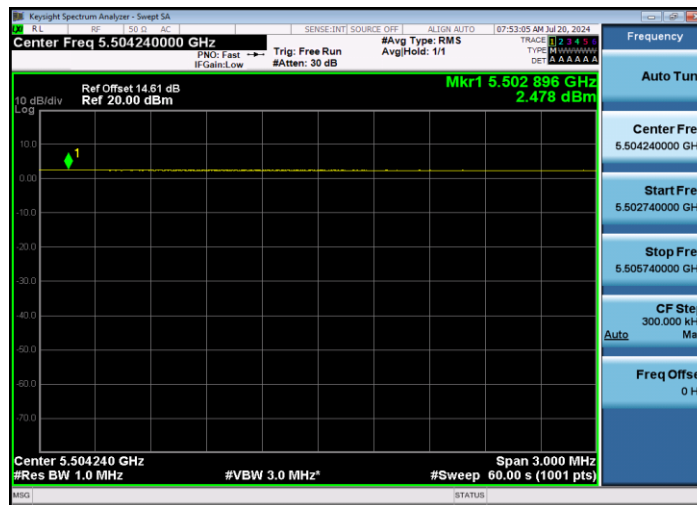
TEST REPORT N°: KSK-ESH-P24071264B-5



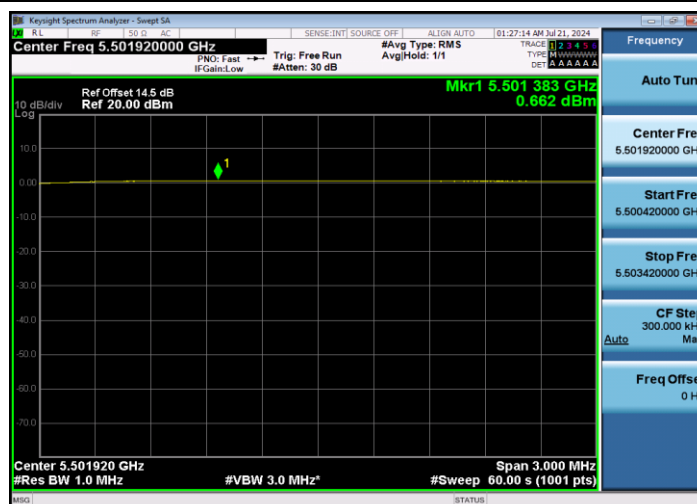
11A_Ant1_5500



TEST REPORT N°: KSK-ESH-P24071264B-5

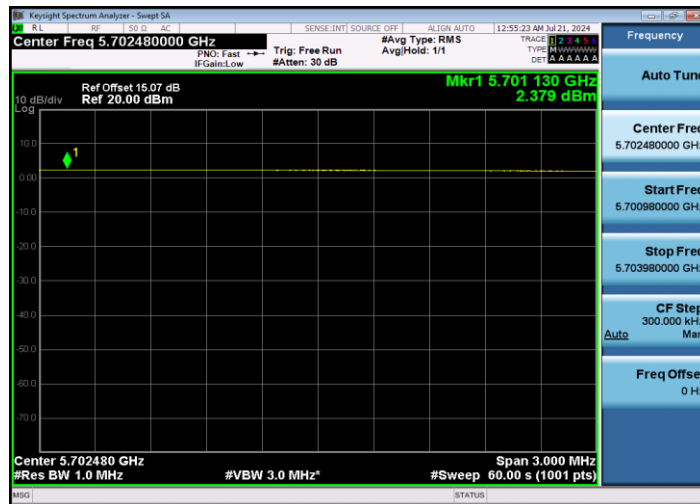


11A_Ant2_5500

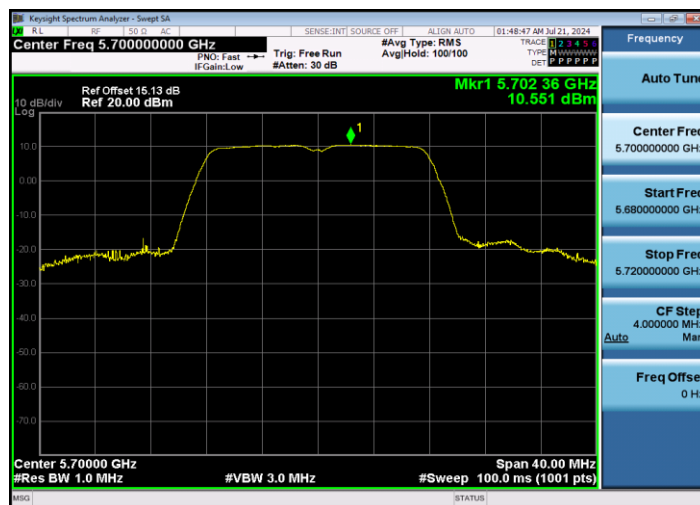


11A_Ant1_5700

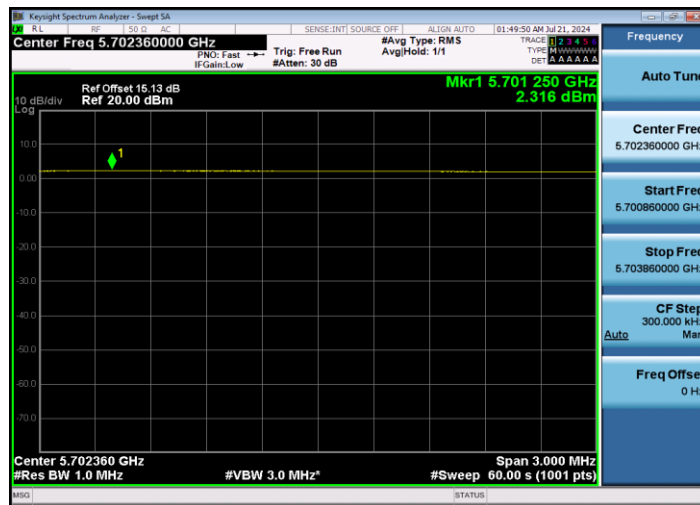
TEST REPORT N°: KSK-ESH-P24071264B-5



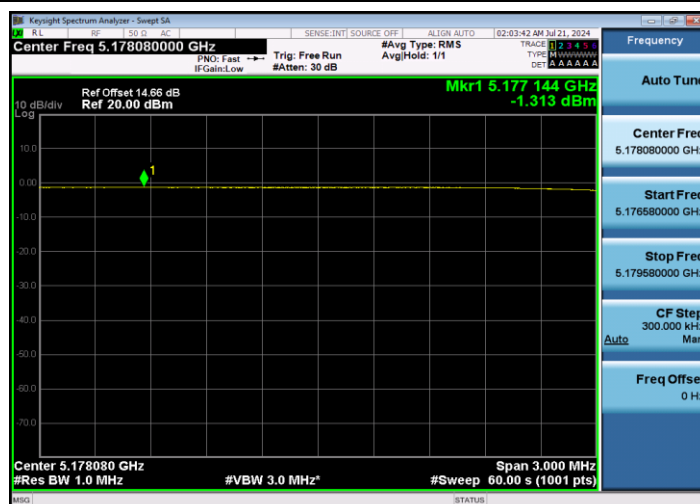
11A_Ant2_5700



TEST REPORT N°: KSK-ESH-P24071264B-5

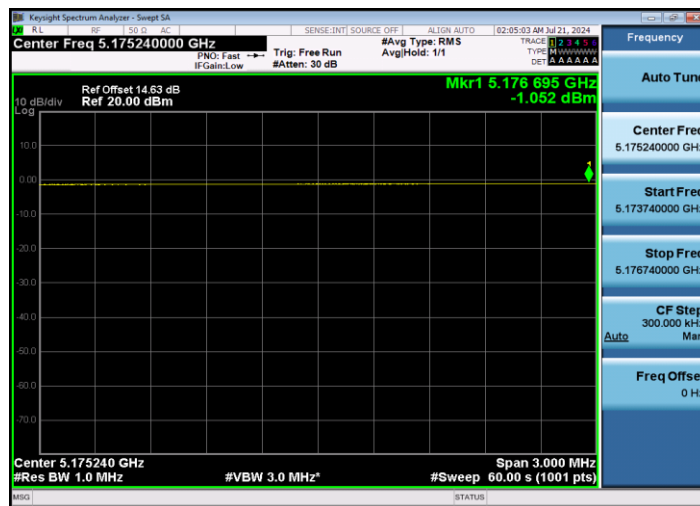
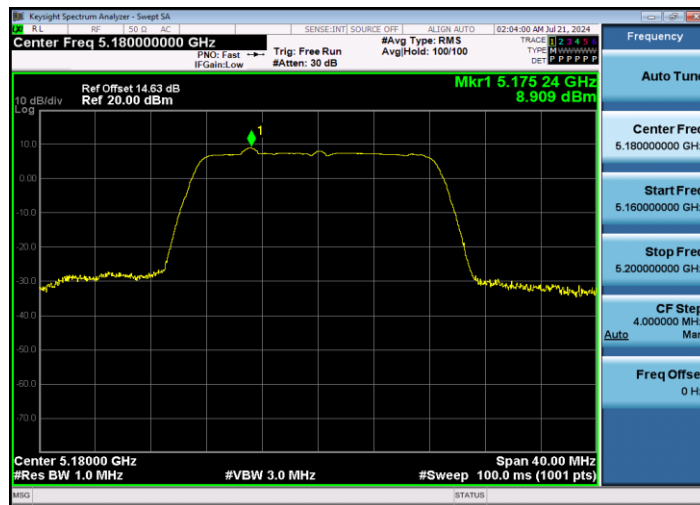


11N20MIMO_Ant1_5180



11N20MIMO_Ant2_5180

TEST REPORT N°: KSK-ESH-P24071264B-5

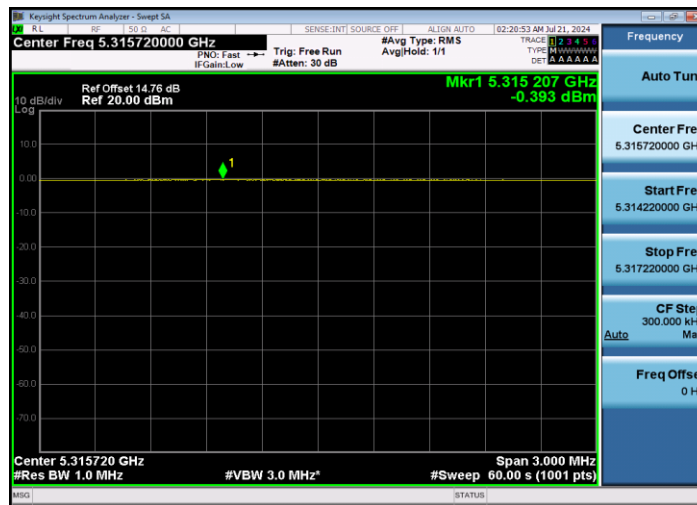


11N20MIMO_Ant1_5320

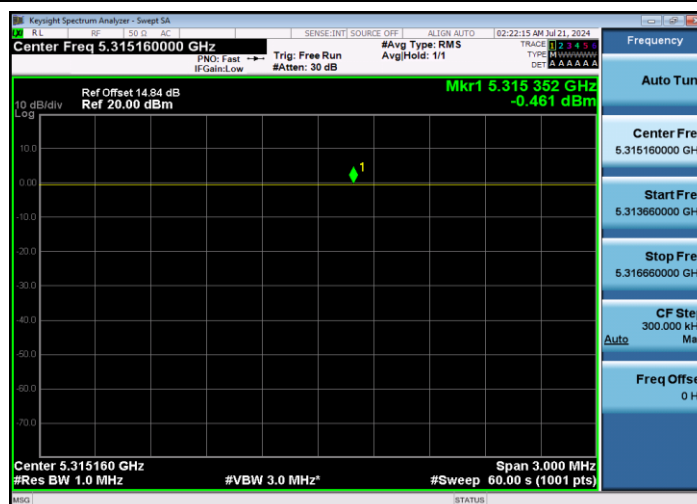




TEST REPORT N°: KSK-ESH-P24071264B-5



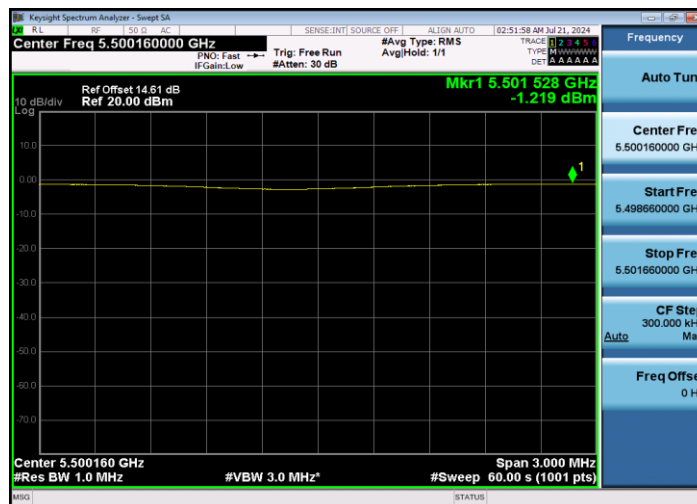
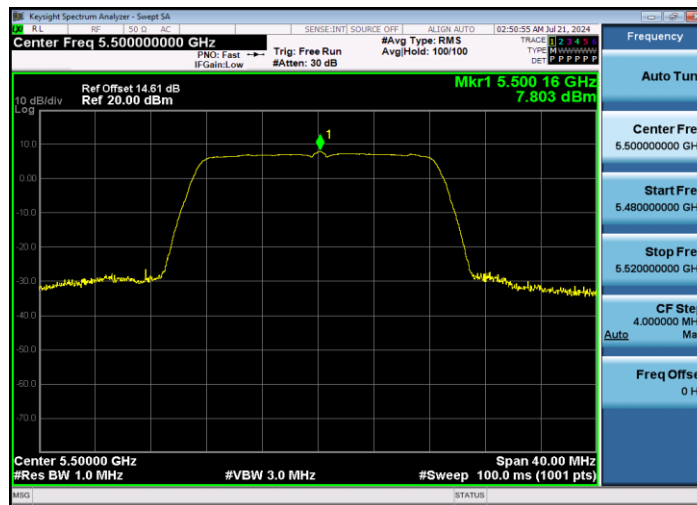
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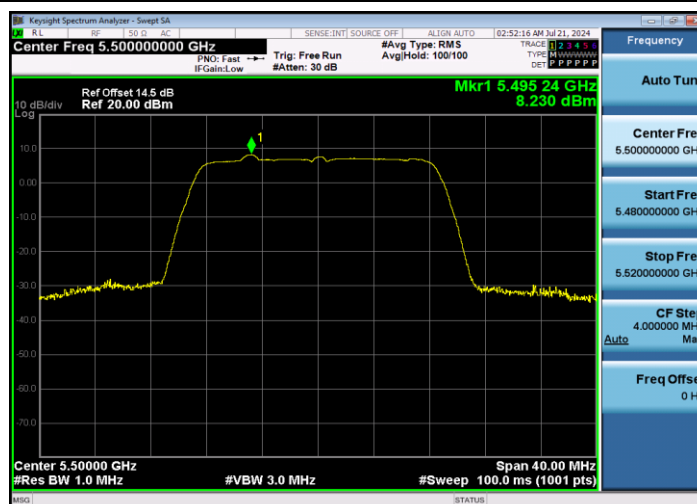
11N20MIMO_Ant1_5500



TEST REPORT N°: KSK-ESH-P24071264B-5

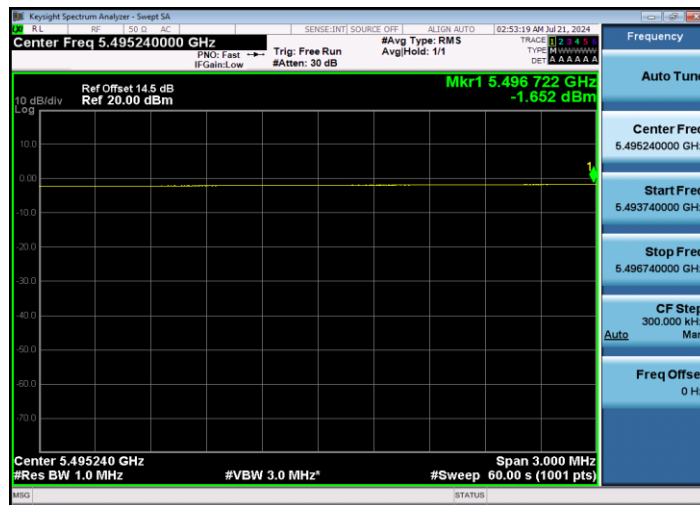


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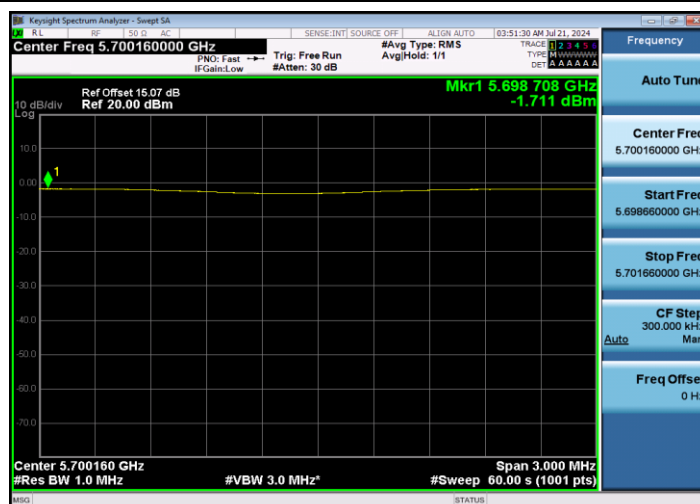
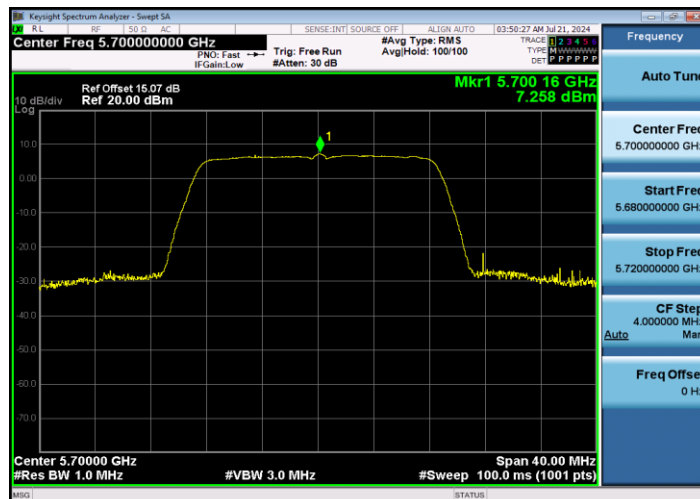




TEST REPORT N°: KSK-ESH-P24071264B-5

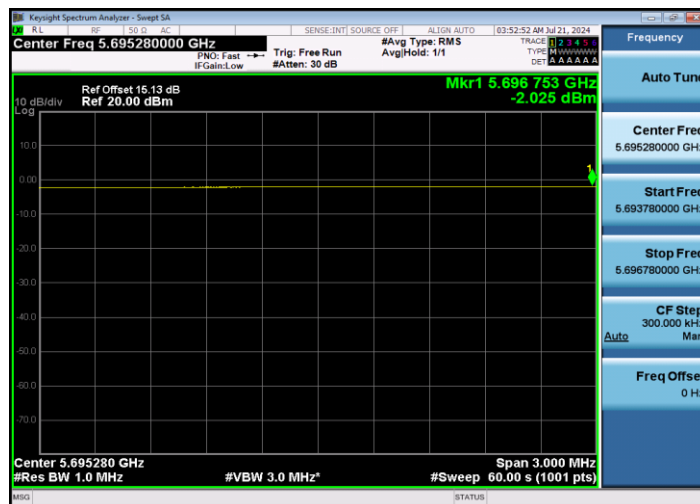
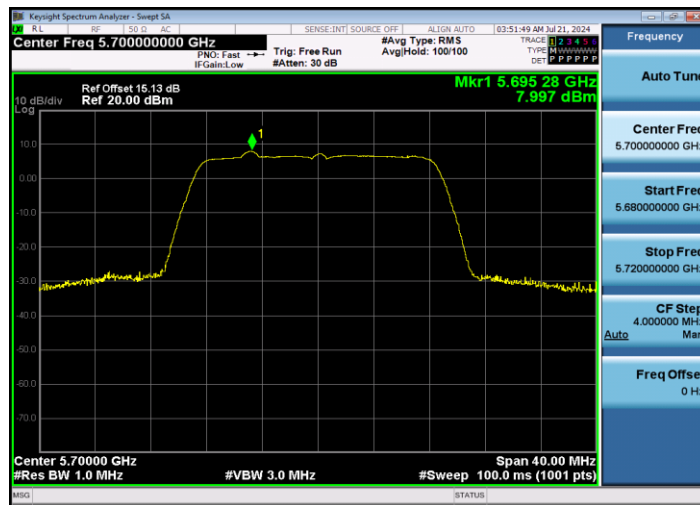


11N20MIMO_Ant1_5700

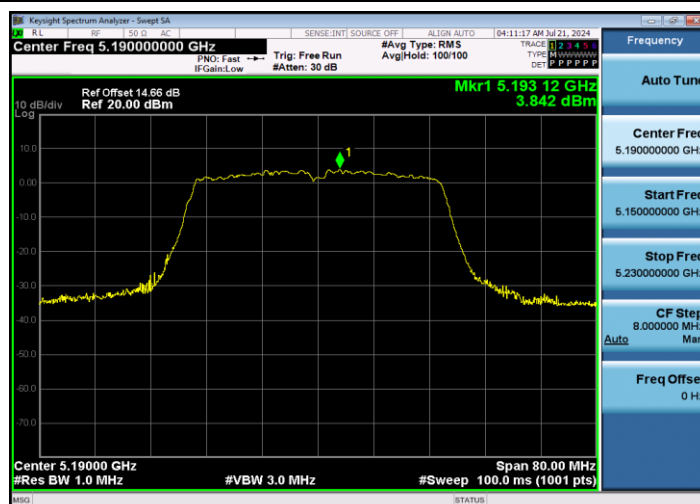


11N20MIMO_Ant2_5700

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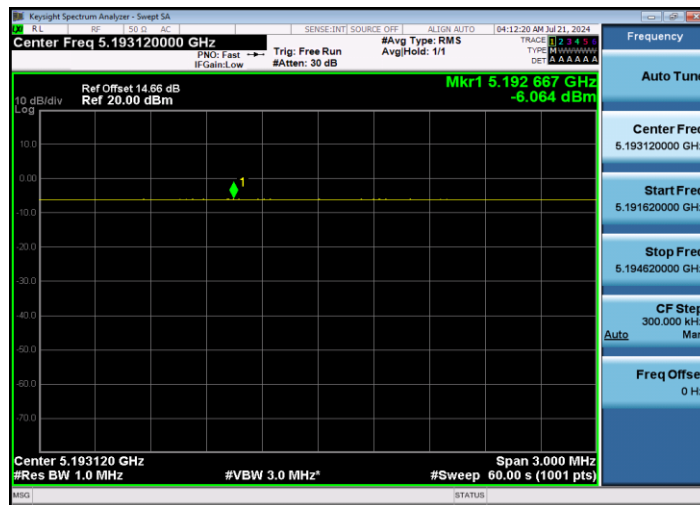


11N40MIMO_Ant1_5190

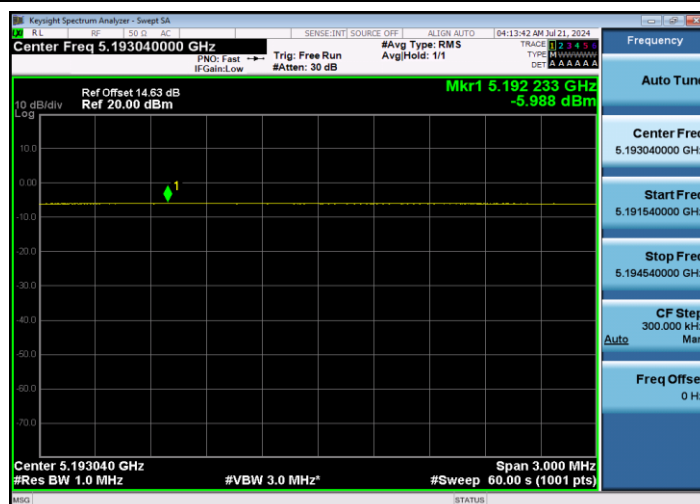
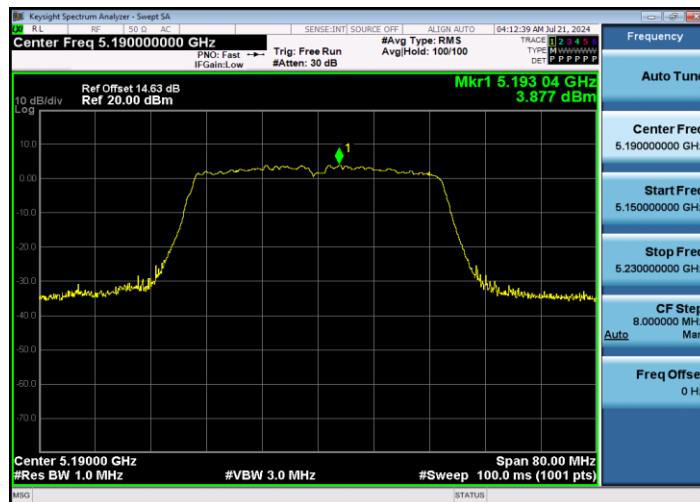




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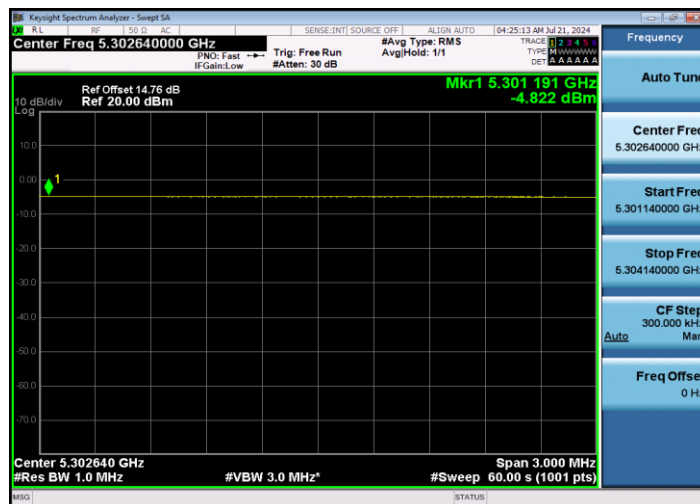


11N40MIMO_Ant2_5190

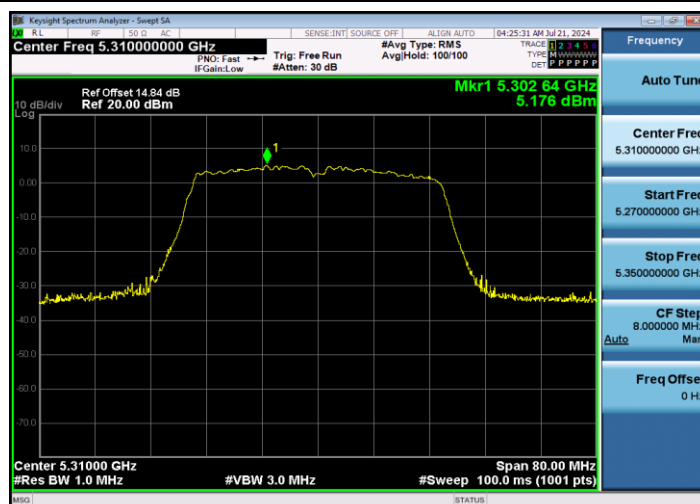


11N40MIMO_Ant1_5310

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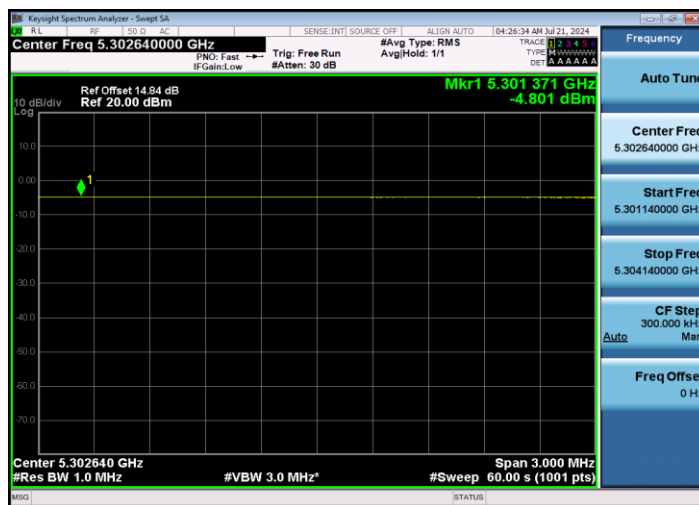


11N40MIMO_Ant2_5310

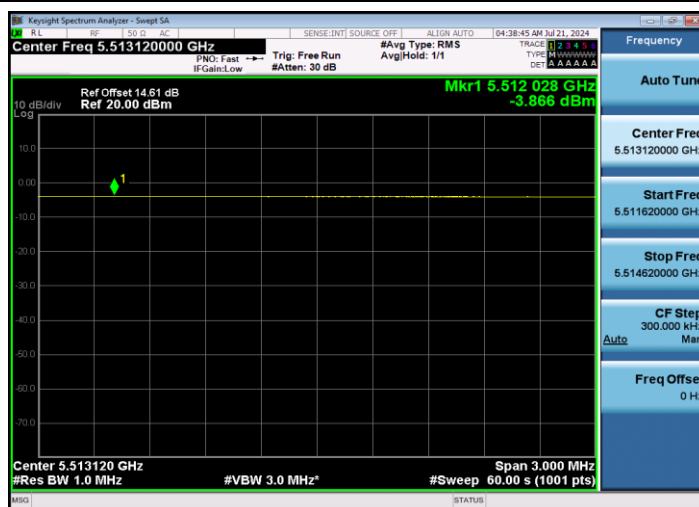
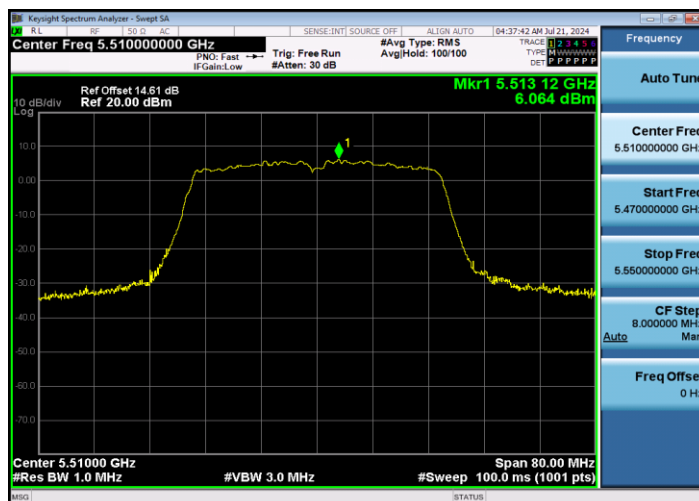




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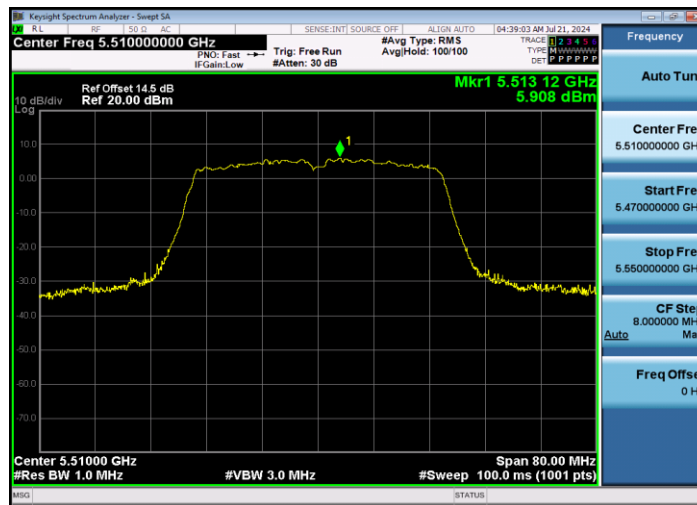
11N40MIMO_Ant1_5510



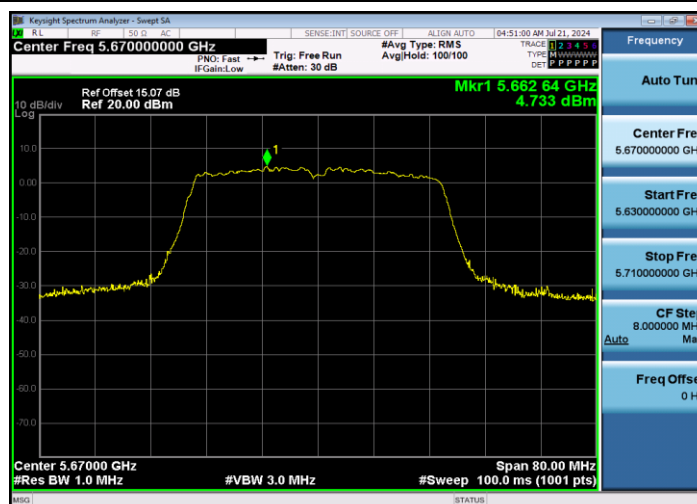
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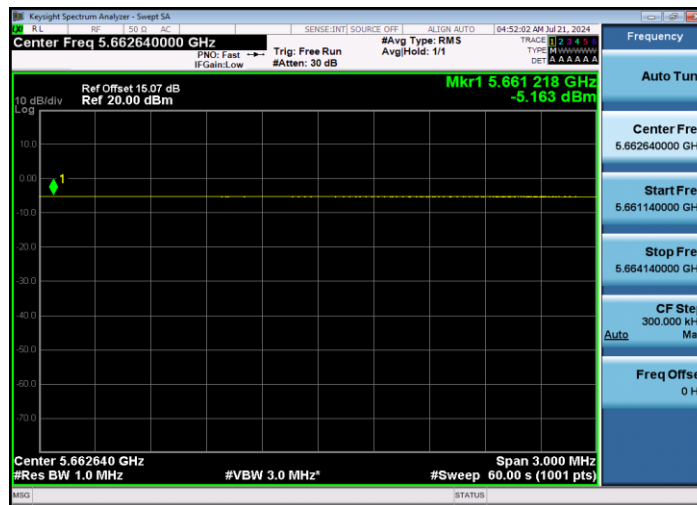


11N40MIMO_Ant1_5670

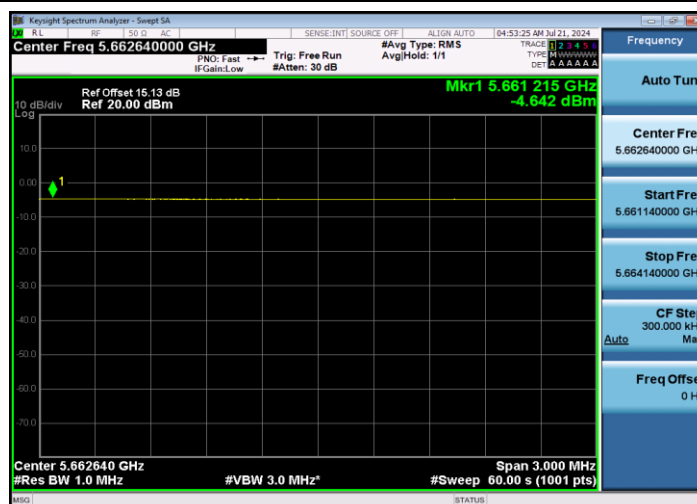




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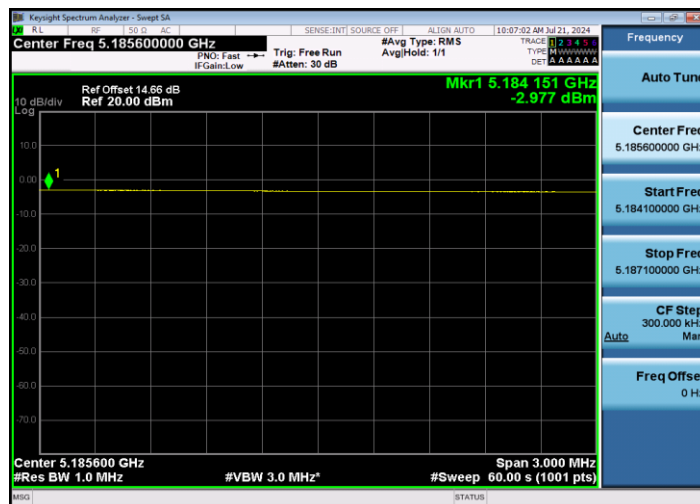
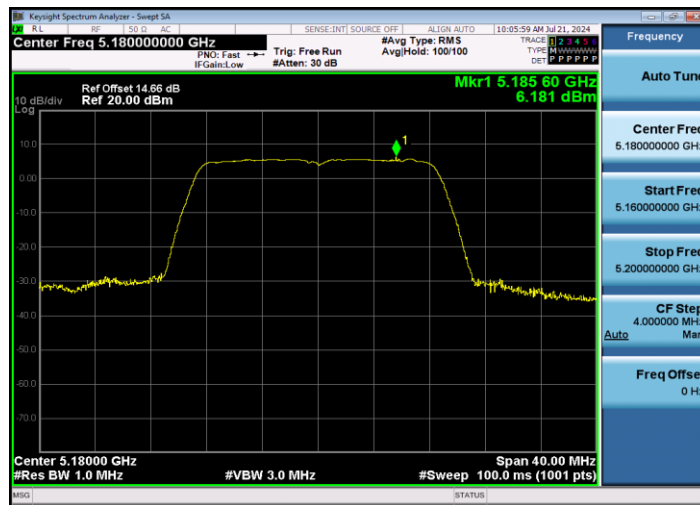
11N40MIMO_Ant2_5670



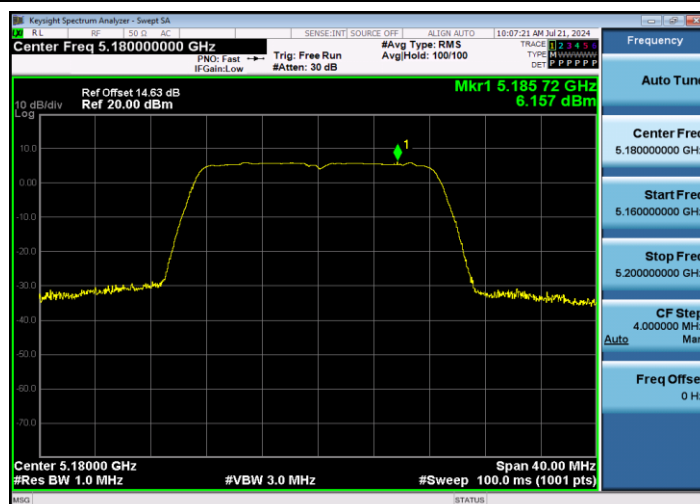
11AC20MIMO_Ant1_5180



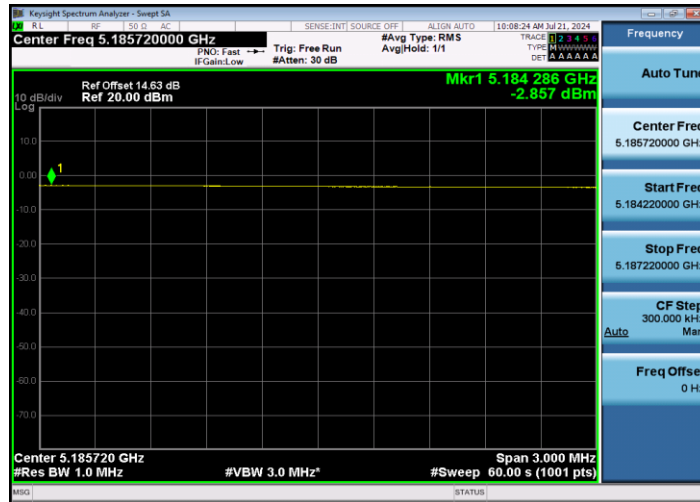
TEST REPORT N°: KSK-ESH-P24071264B-5



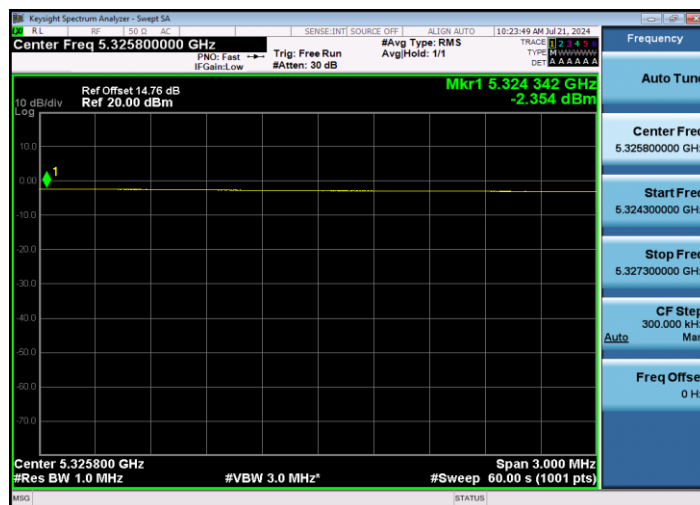
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TEST REPORT N°: KSK-ESH-P24071264B-5

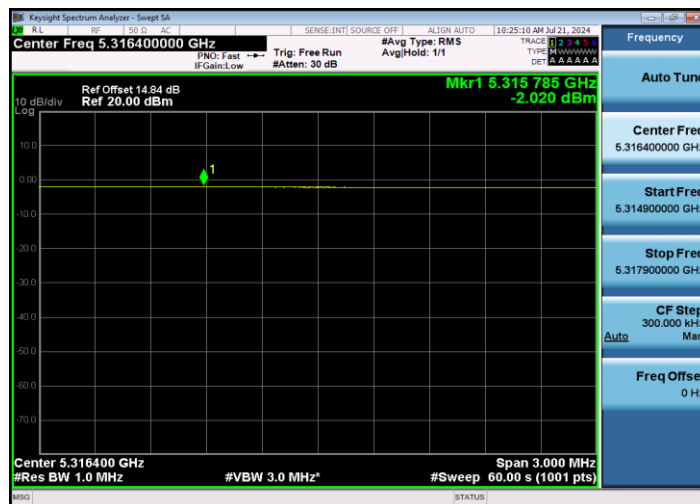
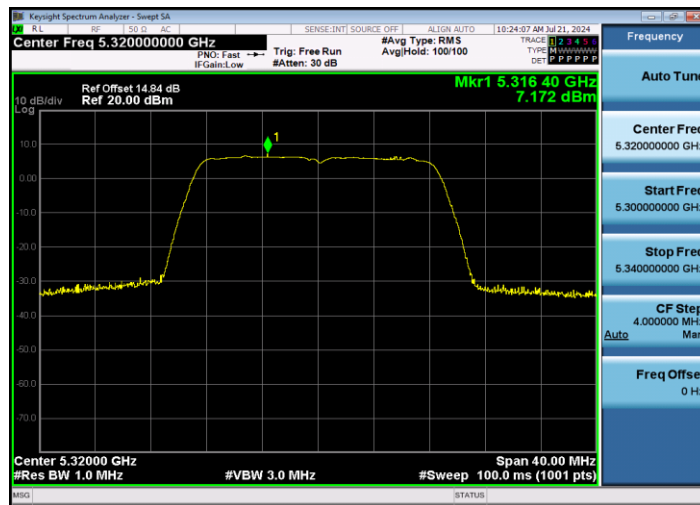


11AC20MIMO_Ant1_5320

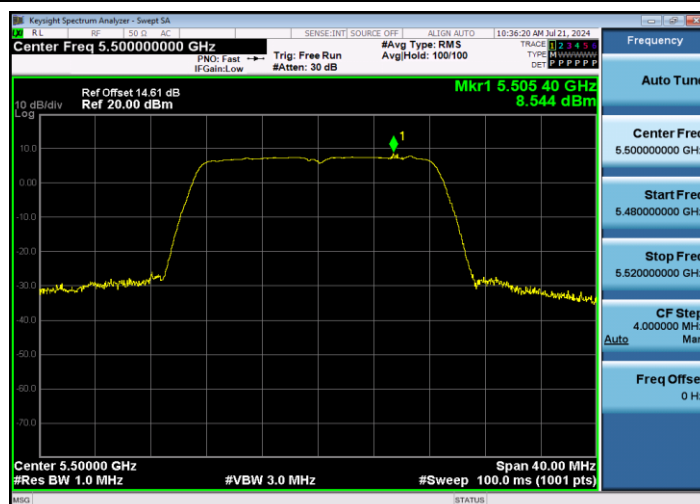


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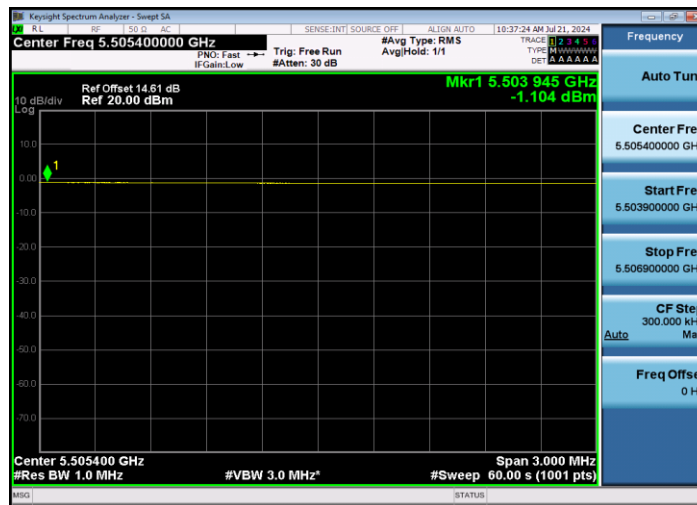


11AC20MIMO_Ant1_5500

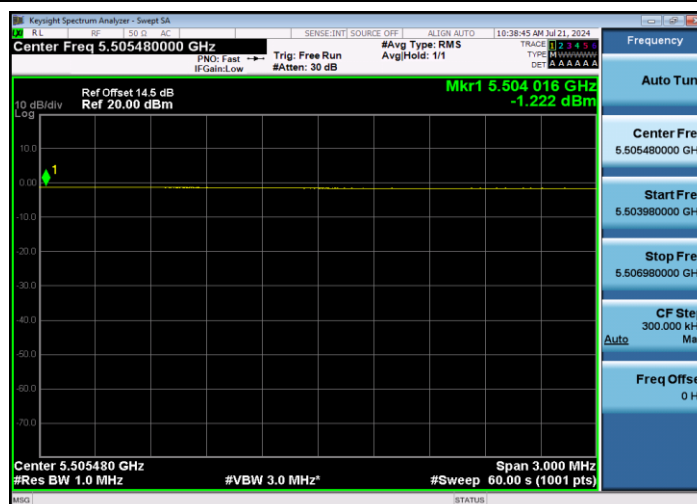
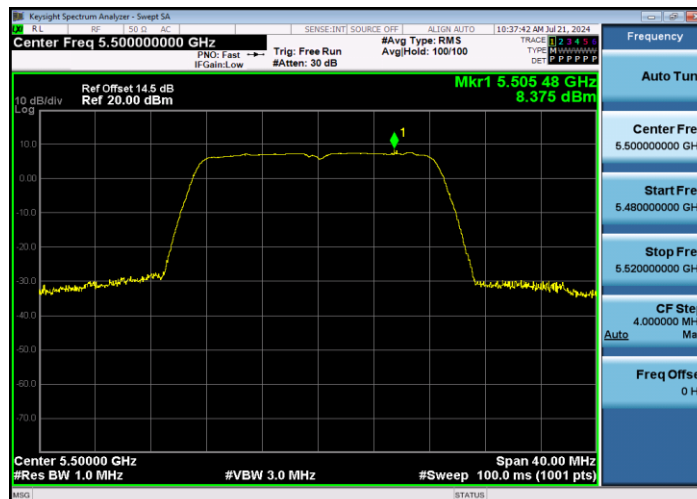




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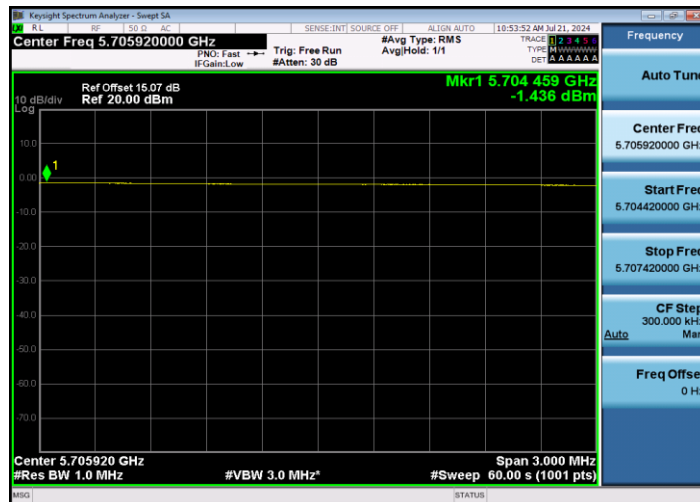


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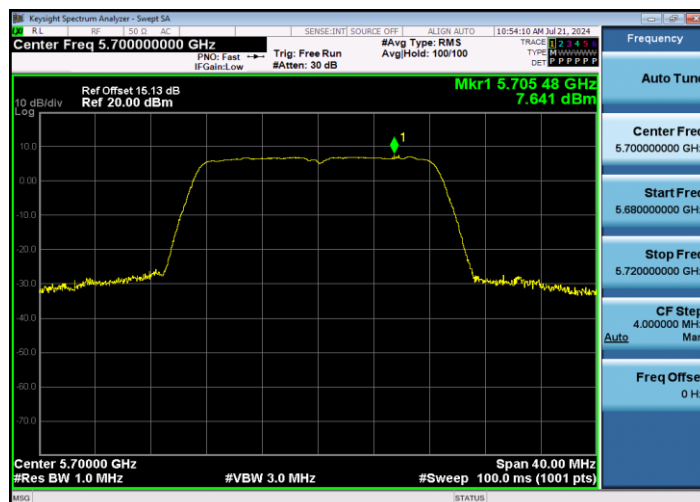


11AC20MIMO_Ant1_5700

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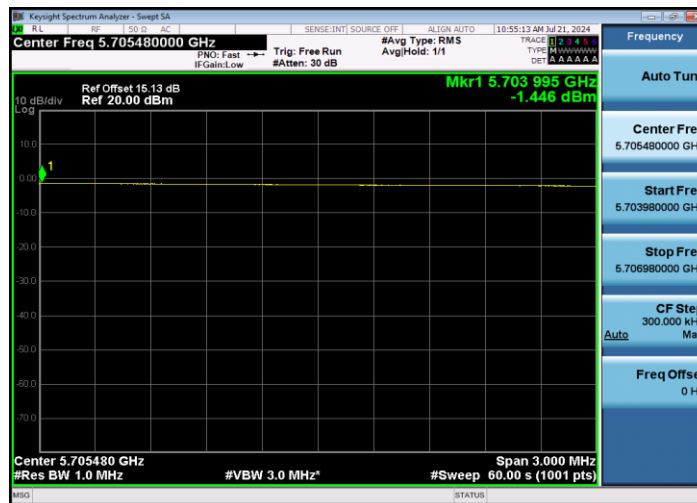


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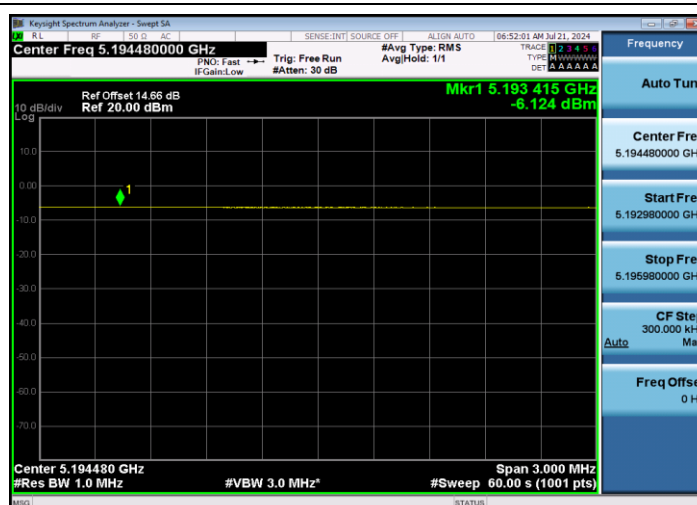
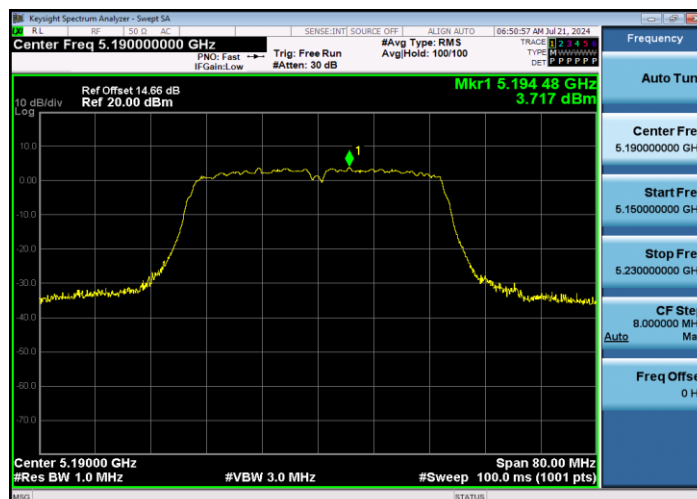




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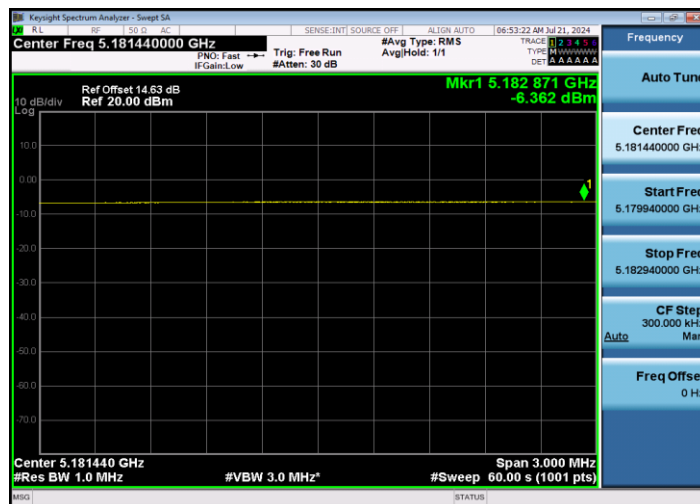
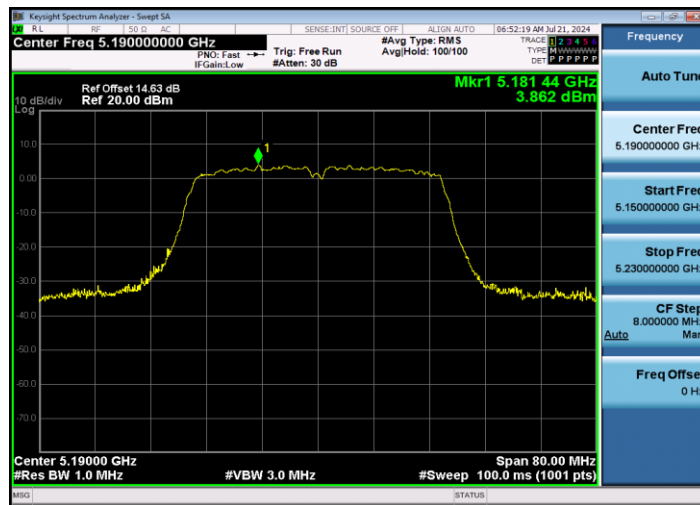


11AC40MIMO_Ant1_5190



11AC40MIMO_Ant2_5190

TEST REPORT N°: KSK-ESH-P24071264B-5



11AC40MIMO_Ant1_5310

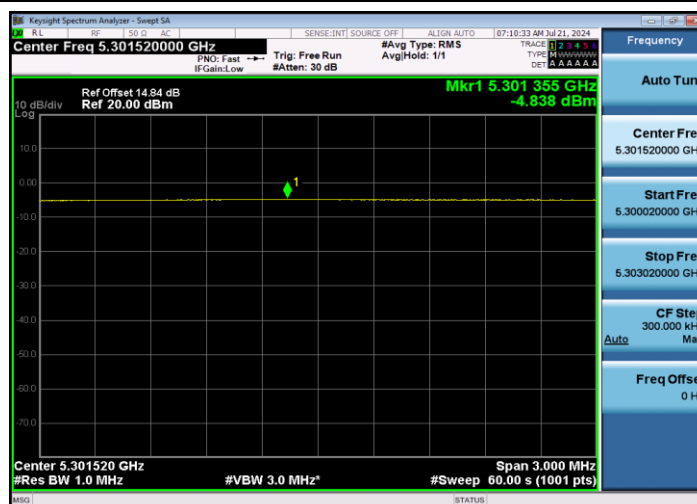




TEST REPORT N°: KSK-ESH-P24071264B-5



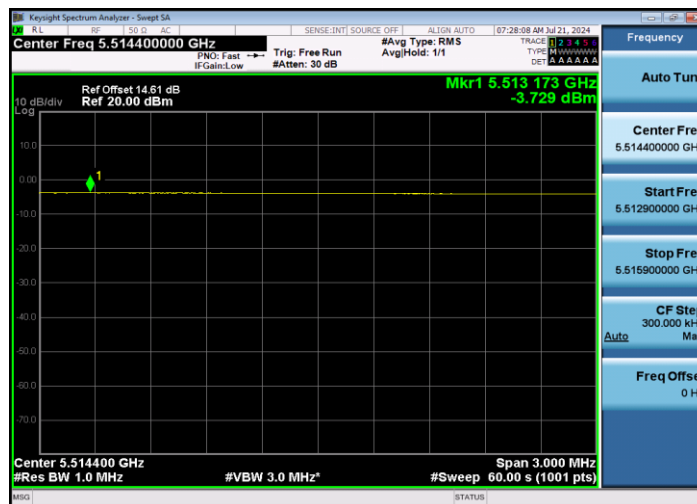
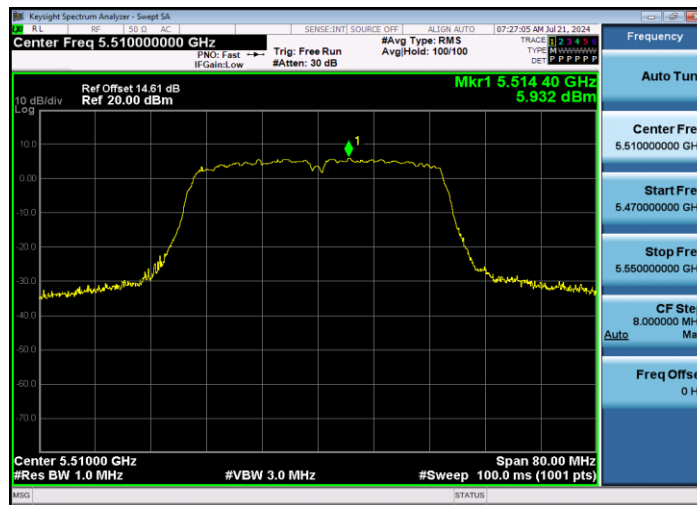
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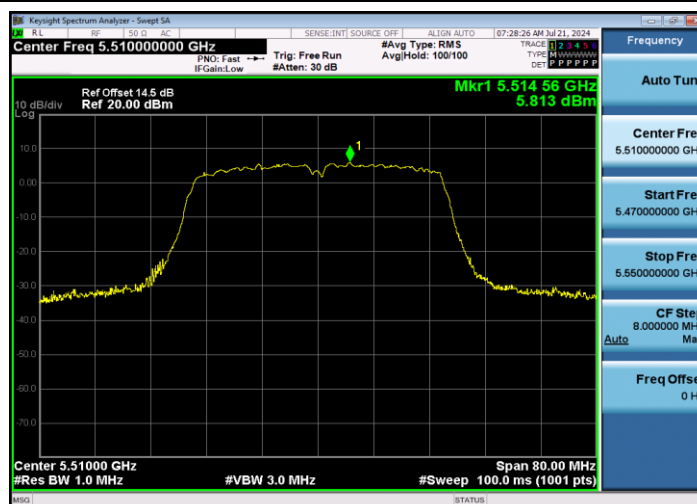
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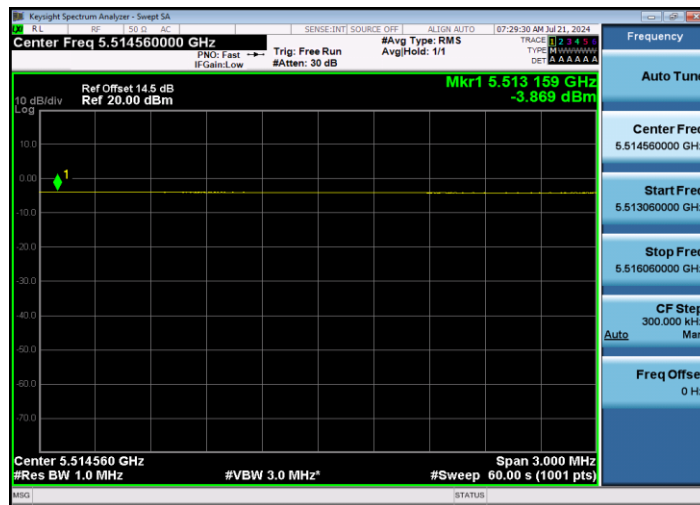


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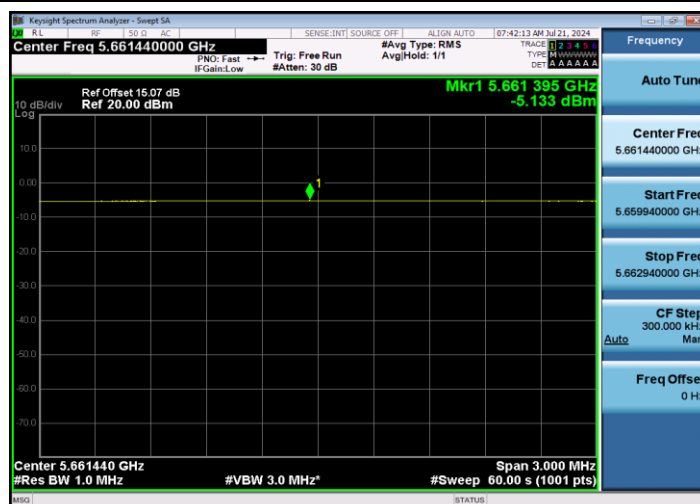




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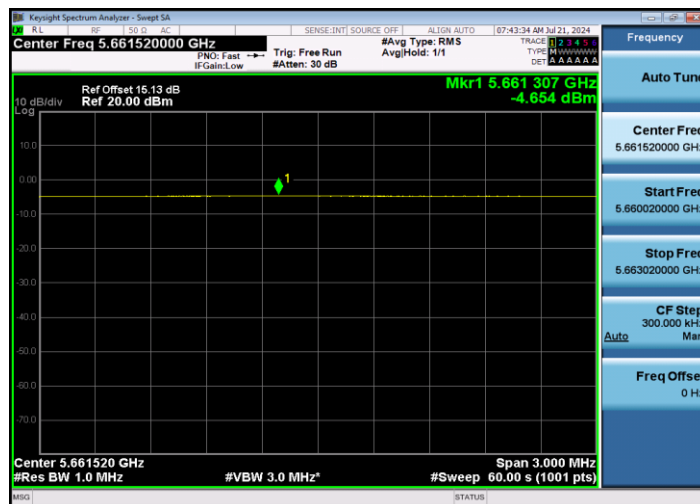


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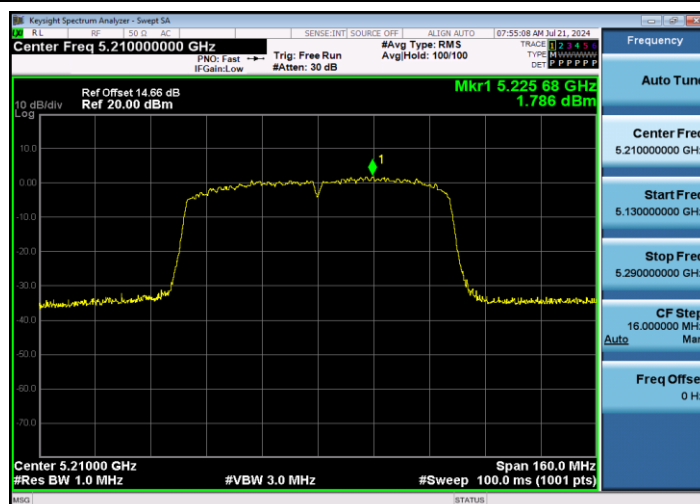


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TEST REPORT N°: KSK-ESH-P24071264B-5

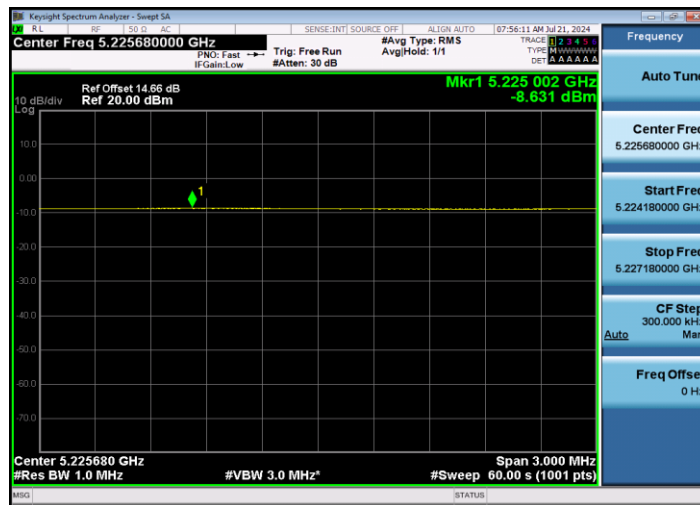


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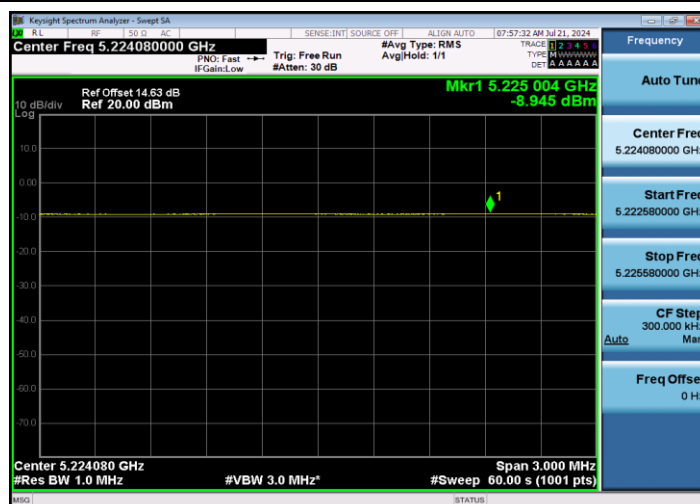
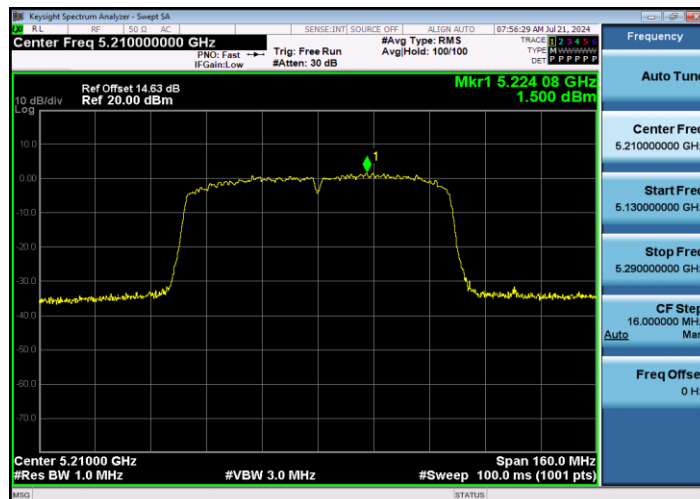




TEST REPORT N°: KSK-ESH-P24071264B-5



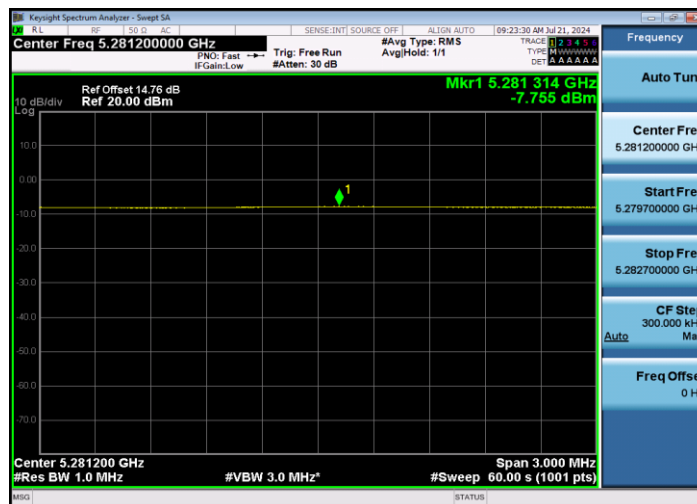
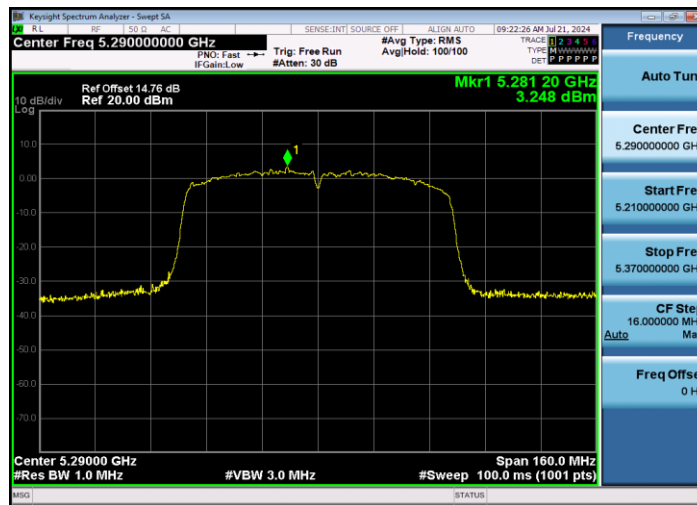
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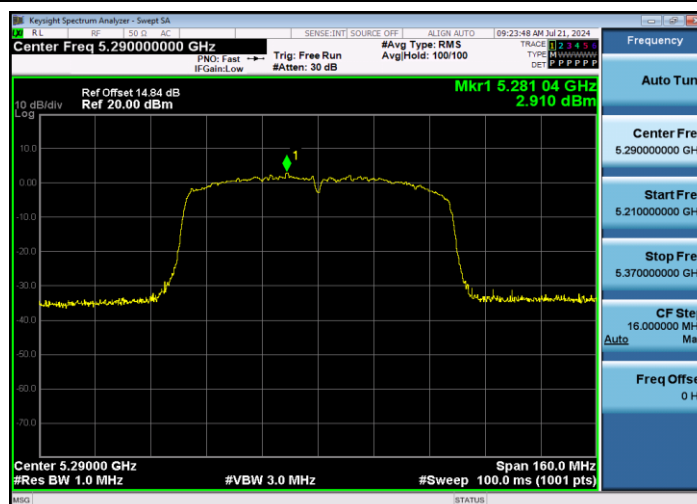
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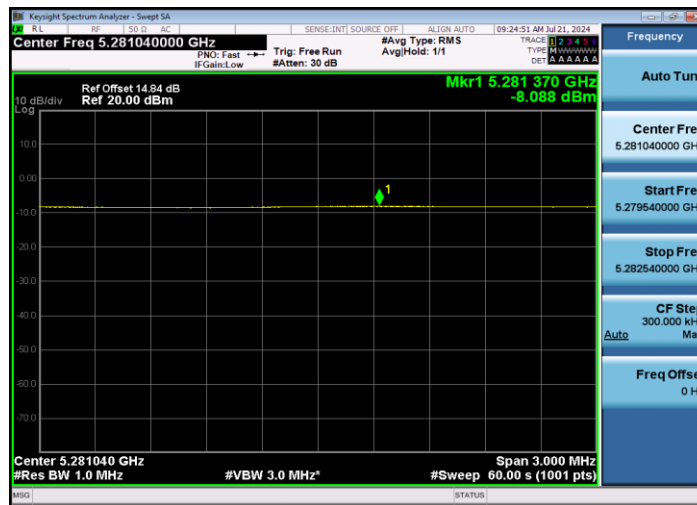


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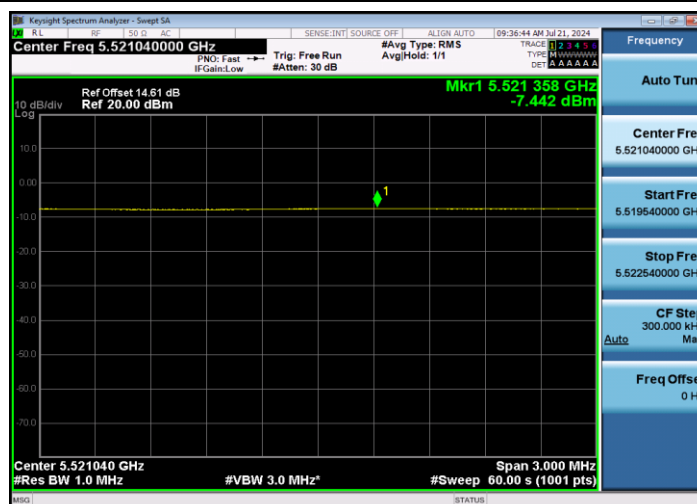
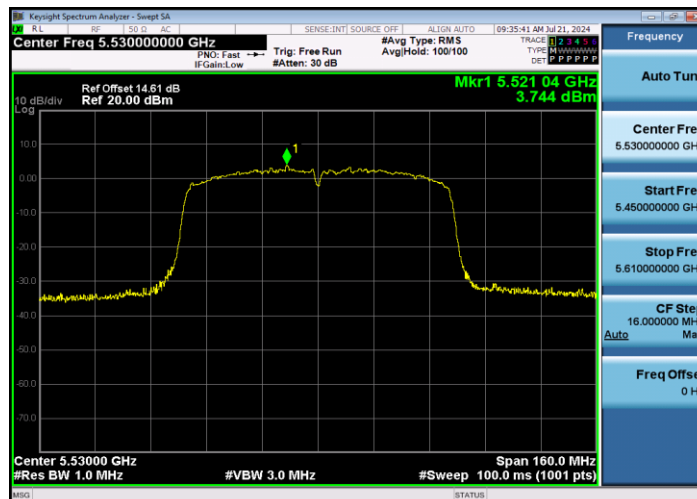




TEST REPORT N°: KSK-ESH-P24071264B-5

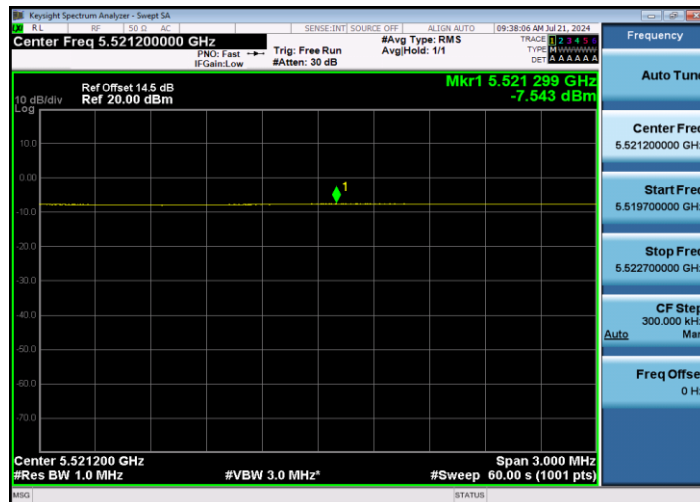
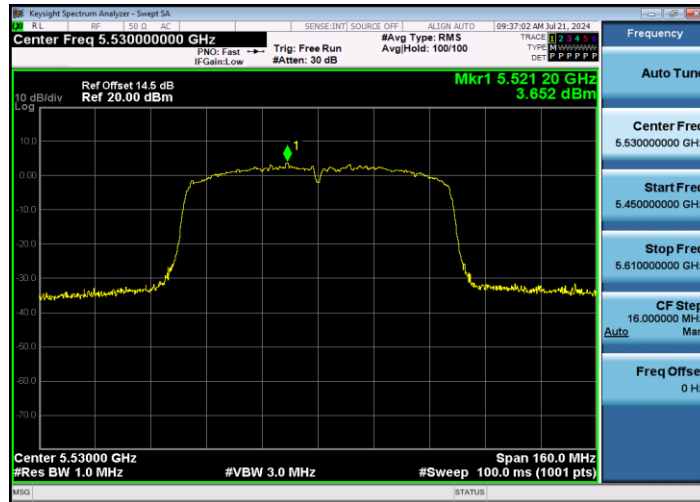


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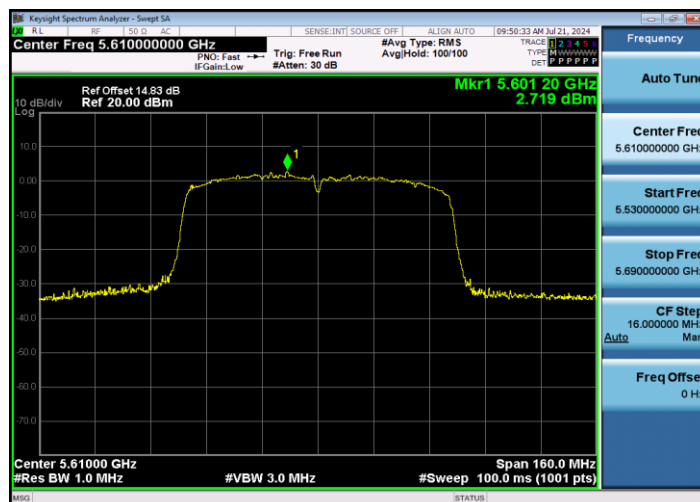


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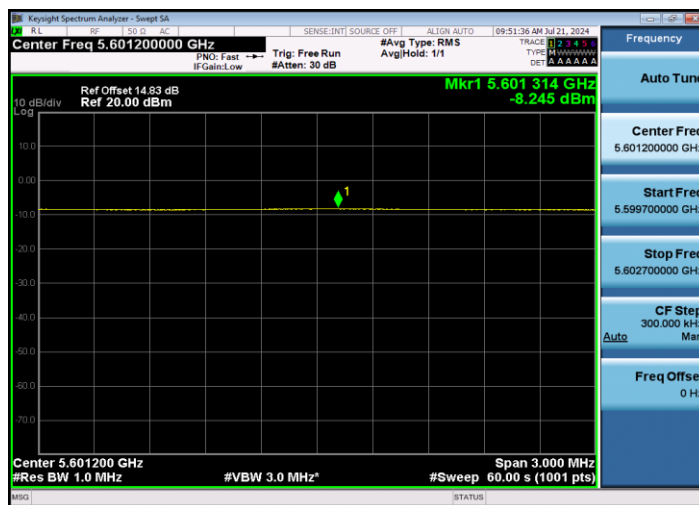
TEST REPORT N°: KSK-ESH-P24071264B-5



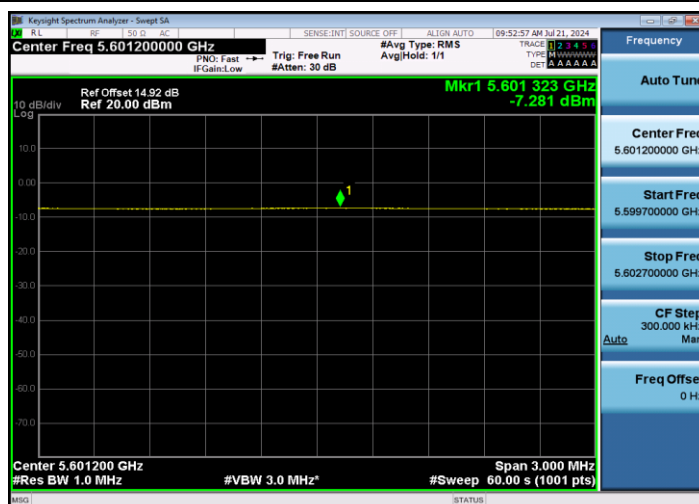
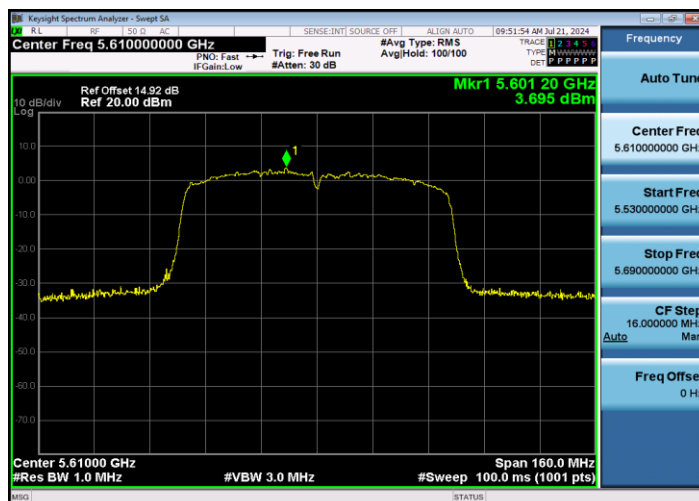
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TEST REPORT N°: KSK-ESH-P24071264B-5



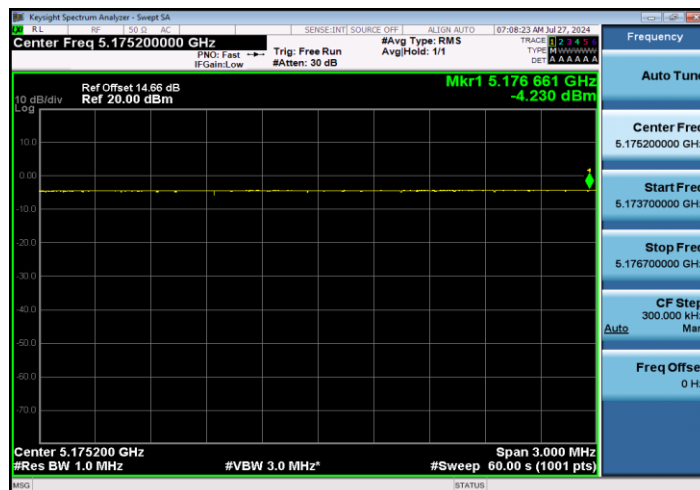
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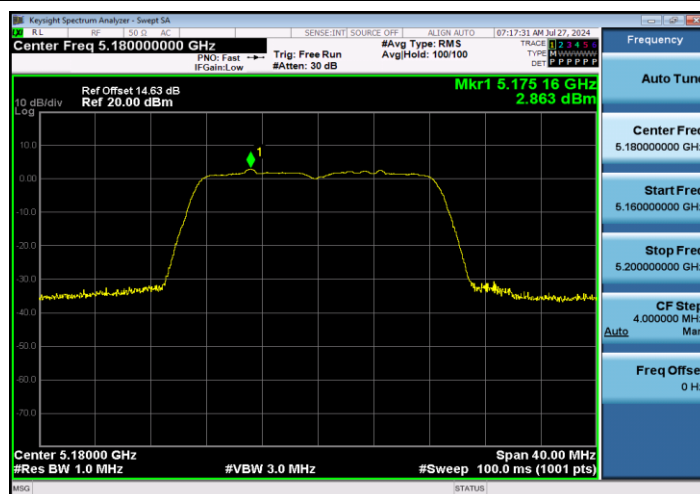
TEST REPORT N°: KSK-ESH-P24071264B-5

WC0NR2201

11A_Ant1_5180

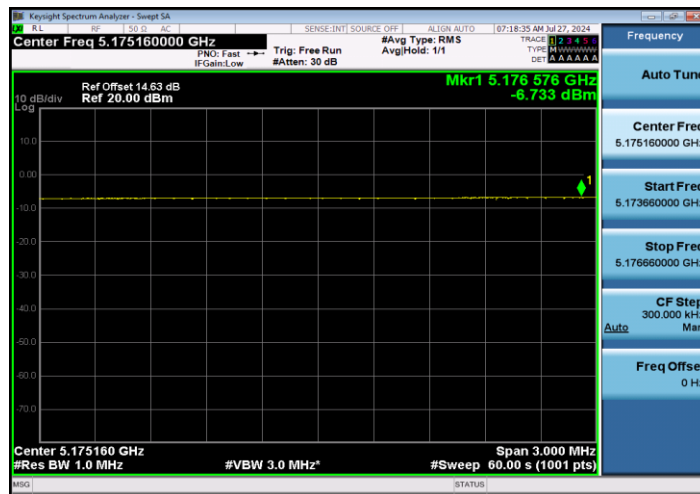


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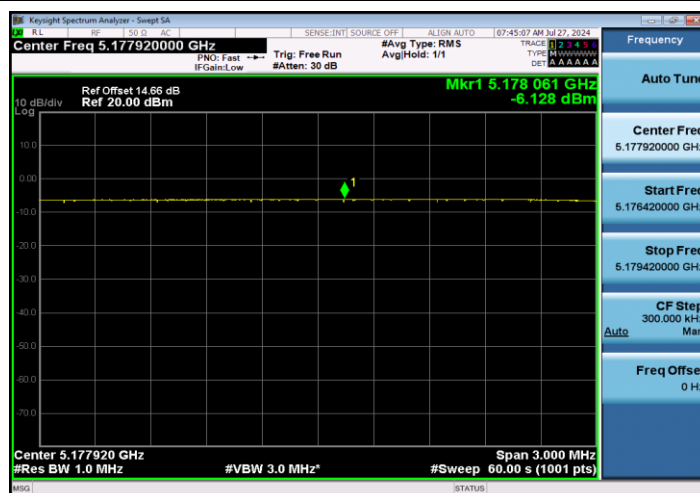




TEST REPORT N°: KSK-ESH-P24071264B-5



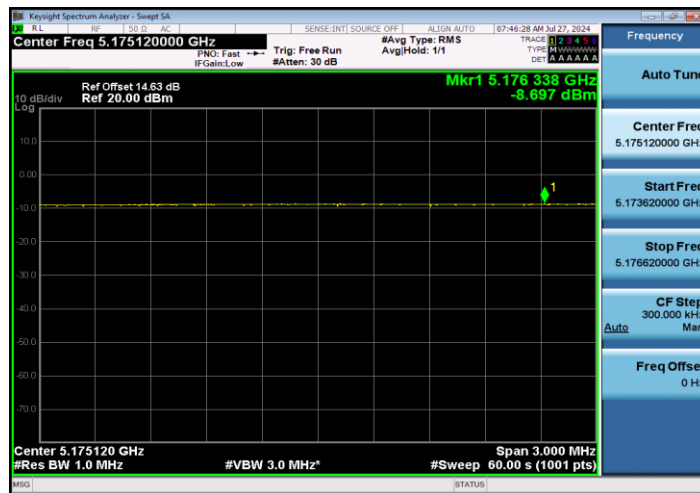
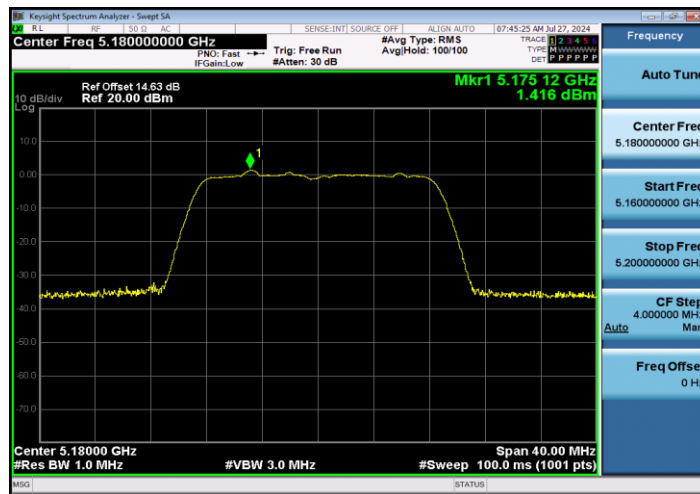
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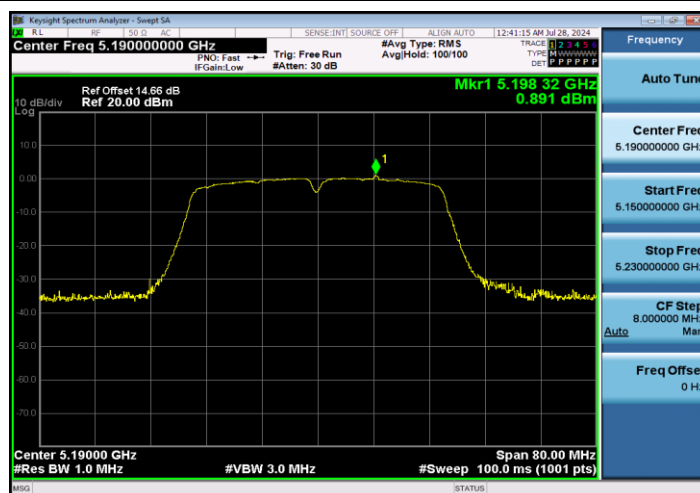
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TEST REPORT N°: KSK-ESH-P24071264B-5

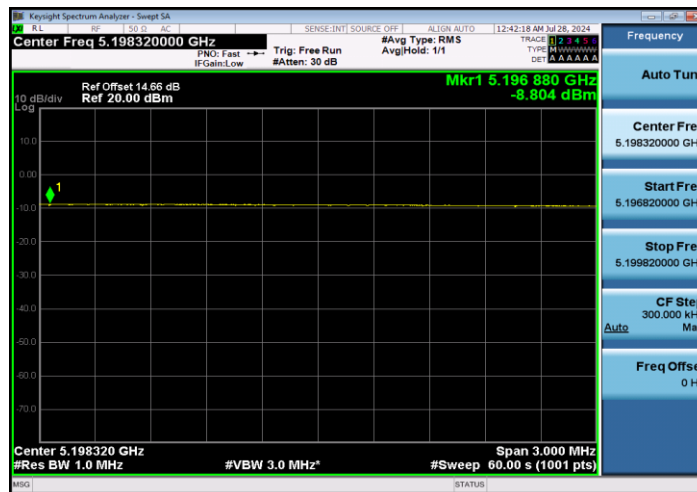


11N40MIMO_Ant1_5190

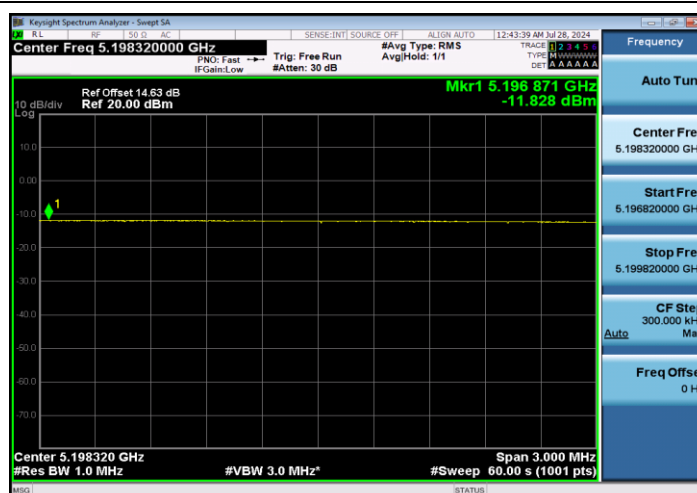
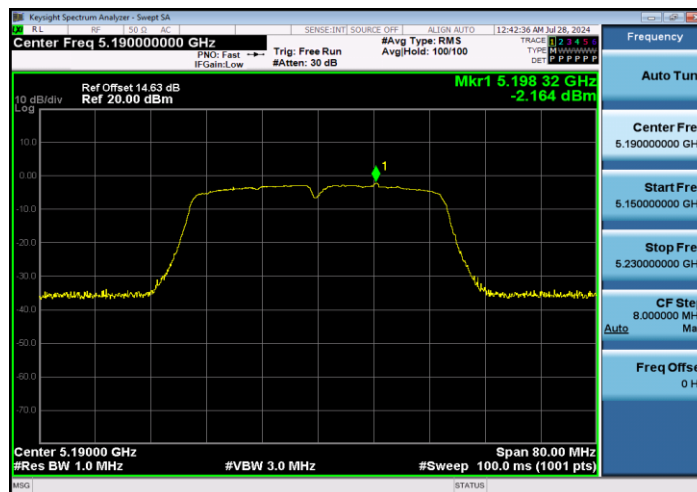




TEST REPORT N°: KSK-ESH-P24071264B-5



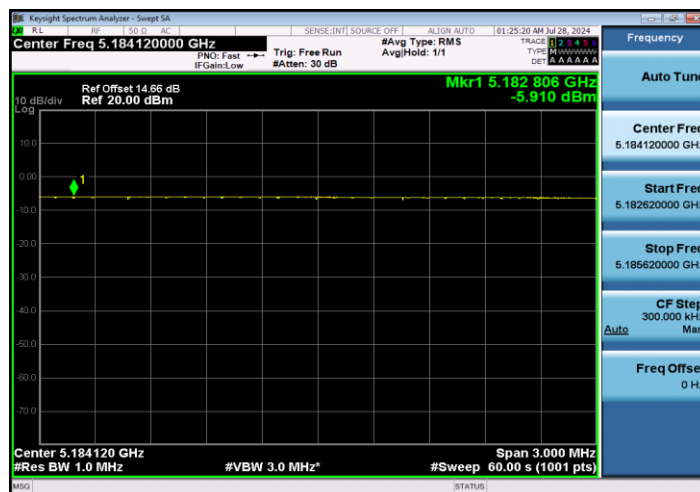
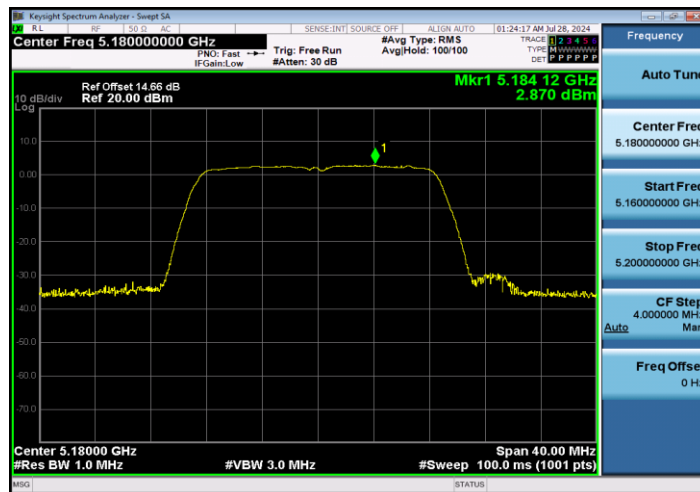
11N40MIMO_Ant2_5190



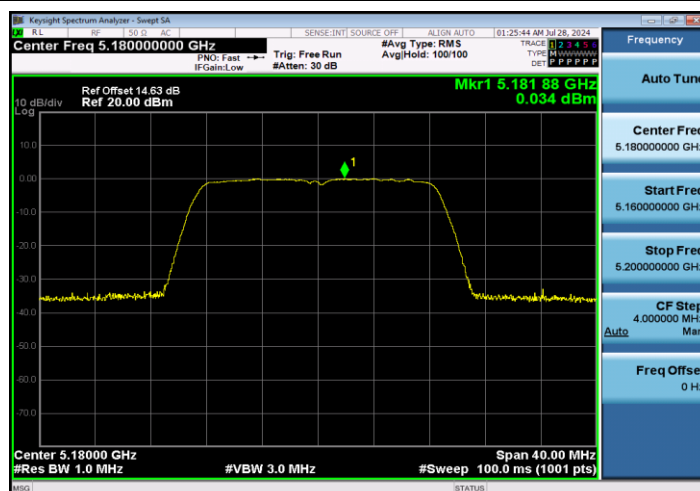
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TEST REPORT N°: KSK-ESH-P24071264B-5

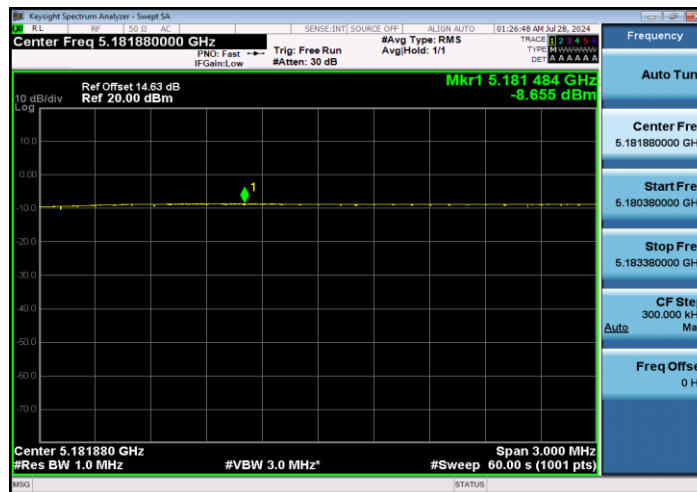


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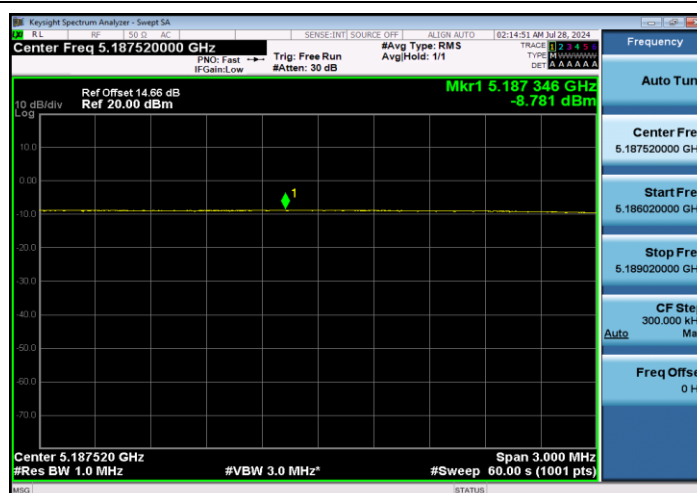
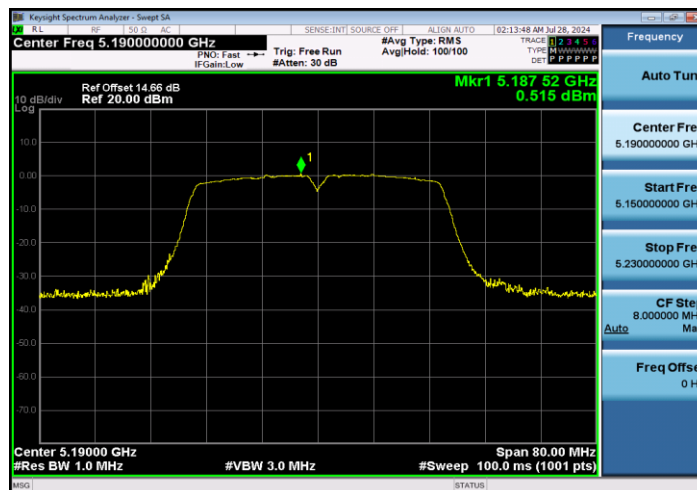




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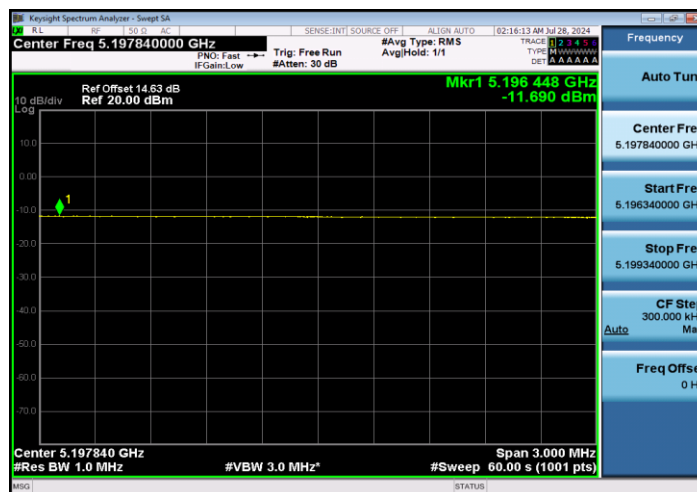
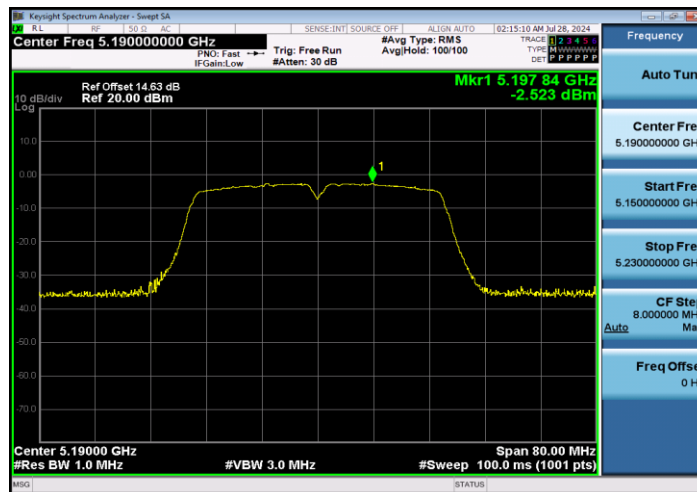


11AC40MIMO_Ant1_5190

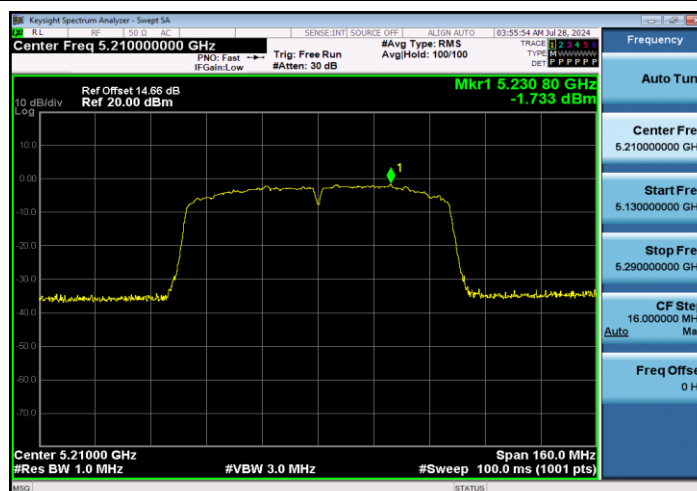


11AC40MIMO_Ant2_5190

TEST REPORT N°: KSK-ESH-P24071264B-5

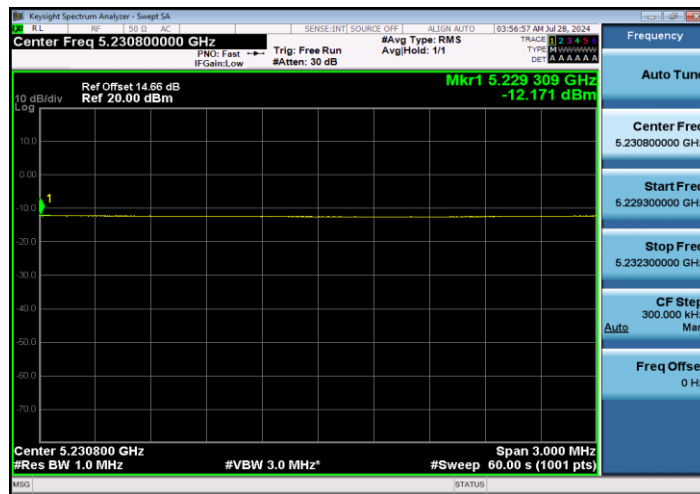


11AC80MIMO_Ant1_5210

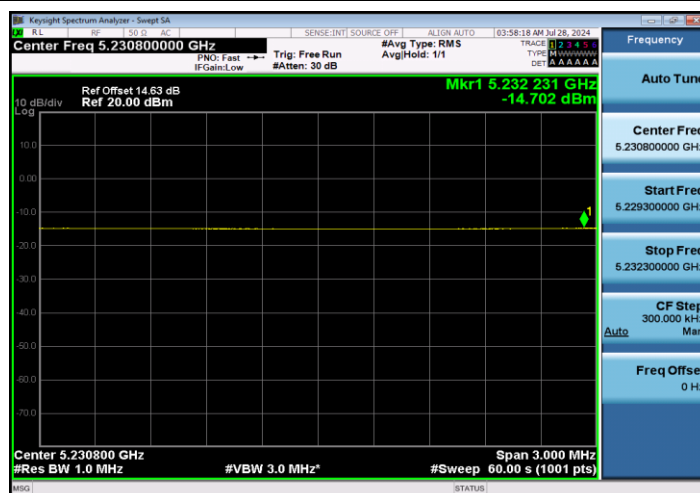




TEST REPORT N°: KSK-ESH-P24071264B-5



11AC80MIMO_Ant2_5210



TEST REPORT N°: KSK-ESH-P24071264B-5
3.5 Transmitter Unwanted Emissions outside the 5 GHz RLAN Bands
3.5.1 Limits of Transmitter Unwanted Emission outside the 5 GHz RLAN Bands

Frequency Range (MHz)	Maximum power, ERP (dBm)	Bandwidth (kHz)
30 to 47	-36	100
47 to 74	-54	100
74 to 87.5	-36	100
87.5 to 118	-54	100
118 to 174	-36	100
174 to 230	-54	100
230 to 470	-36	100
470 to 862	-54	100
862 to 1000	-36	100
Frequency Range (GHz)	Maximum power, EIRP (dBm)	Bandwidth (MHz)
1 to 26	-30	1

3.5.2 Test Procedure

Refer to EN 301 893 V2.1.1 clause 5.4.5

Measurement	
☐ Conducted measurement	☒ Radiated measurement
For Conducted measurement: The level of unwanted emissions shall be measured as their power in a specified load (conducted spurious emissions) and their effective radiated power when radiated by the cabinet or structure of the equipment with the antenna connector(s) terminated by a specified load (cabinet radiation).	
Conducted measurement (For equipment with multiple transmit chains): ☐ Option 1: The results for each of the transmit chains for the corresponding 1 MHz segments shall be added and compared with the limits. ☐ Option 2: The results for each of the transmit chains shall be individually compared with the limits after these limits have been reduced by $10 \times \log_{10}(T_{CH})$ (number of active transmit chains).	

3.5.3 Deviation from Test Standard

No deviation

3.5.4 Test Setup

- For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration).
- The measurement was performed at normal environmental conditions only. Controlling software ({software}) has been activated to set the EUT on specific status.
- The equipment was configured to operate under its worst case situation with respect to output power.
- The measurement channels were performed in accordance with EN 301 893 clause 5.3.2.



TEST REPORT N°: KSK-ESH-P24071264B-5

3.5.5 Test Results

Below 1GHz worst-Case Data:

WCT1DR2201D

Frequency Range	30MHz ~ 1GHz	Operating Channel	Normal operating
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Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
54.64	H	-61.17	-54.00	7.17
89.11	H	-57.74	-54.00	3.74
104.42	H	-59.68	-54.00	5.68
188.31	H	-73.57	-54.00	19.57
500.05	H	-65.15	-54.00	11.15
567.46	H	-67.26	-54.00	13.26
89.71	V	-60.35	-54.00	6.35
101.68	V	-64.13	-54.00	10.13
188.15	V	-71.16	-54.00	17.16
518.24	V	-62.74	-54.00	8.74
573.56	V	-64.76	-54.00	10.76
609.67	V	-65.28	-54.00	11.28

WC0NR2201

Frequency Range	30MHz ~ 1GHz	Operating Channel	Normal operating
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Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
95.59	H	-57.73	-54.00	3.73
192.34	H	-66.27	-54.00	12.27
216.36	H	-68.45	-54.00	14.45
478.12	H	-68.52	-54.00	14.52
573.62	H	-66.58	-54.00	12.58
669.28	H	-67.53	-54.00	13.53
53.64	V	-56.65	-54.00	2.65
68.36	V	-61.38	-54.00	7.38
190.73	V	-64.76	-54.00	10.76
214.68	V	-69.29	-54.00	15.29
484.29	V	-64.63	-54.00	10.63
558.57	V	-64.21	-54.00	10.21

**TEST REPORT N°: KSK-ESH-P24071264B-5**

Above 1GHz worst-Case Data:

WCT1DR2201D

802.11a

Frequency Range	1GHz ~ 26.5GHz	Operating Channel	36
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Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
10360.00	H	-53.68	-30.00	23.68
15440.00	H	-54.67	-30.00	24.67
10360.00	V	-53.54	-30.00	23.54
15440.00	V	-55.24	-30.00	25.24

Frequency Range	1GHz ~ 26.5GHz	Operating Channel	100
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Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
11000.00	H	-55.35	-30.00	25.35
16500.00	H	-57.37	-30.00	27.37
11000.00	V	-55.53	-30.00	25.53
16500.00	V	-60.48	-30.00	30.48

802.11n(HT20)

Frequency Range	1GHz ~ 26.5GHz	Operating Channel	36
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Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
10360.00	H	-55.23	-30.00	25.23
15440.00	H	-53.75	-30.00	23.75
10360.00	V	-54.24	-30.00	24.24
15440.00	V	-57.17	-30.00	27.17

Frequency Range	1GHz ~ 26.5GHz	Operating Channel	100
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Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
11000.00	H	-55.47	-30.00	25.47
16500.00	H	-59.21	-30.00	29.21
11000.00	V	-55.24	-30.00	25.24
16500.00	V	-60.36	-30.00	30.36



TEST REPORT N°: KSK-ESH-P24071264B-5

802.11n(HT40)

Frequency Range	1GHz ~ 26.5GHz	Operating Channel	38
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Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
10380.00	H	-55.58	-30.00	25.58
15570.00	H	-53.62	-30.00	23.62
10380.00	V	-54.37	-30.00	24.37
15570.00	V	-57.25	-30.00	27.25

Frequency Range	1GHz ~ 26.5GHz	Operating Channel	102
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Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
11020.00	H	-55.47	-30.00	25.47
16530.00	H	-59.35	-30.00	29.35
11020.00	V	-55.29	-30.00	25.29
16530.00	V	-60.42	-30.00	30.42

802.11ac (VHT80)

Frequency Range	1GHz ~ 26.5GHz	Operating Channel	42
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Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
10420.00	H	-55.57	-30.00	25.57
15630.00	H	-53.46	-30.00	23.46
10420.00	V	-54.34	-30.00	24.34
15630.00	V	-56.72	-30.00	26.72

Frequency Range	1GHz ~ 26.5GHz	Operating Channel	106
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Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
11220.00	H	-55.27	-30.00	25.27
16830.00	H	-59.31	-30.00	29.31
11220.00	V	-55.16	-30.00	25.16
16830.00	V	-57.41	-30.00	27.41



TEST REPORT N°: KSK-ESH-P24071264B-5

WC0NR2201

802.11a

Frequency Range	1GHz ~ 26.5GHz	Operating Channel	36
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Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
10360.00	H	-53.54	-30.00	23.54
15440.00	H	-54.46	-30.00	24.46
10360.00	V	-53.38	-30.00	23.38
15440.00	V	-55.27	-30.00	25.27

802.11n(HT20)

Frequency Range	1GHz ~ 26.5GHz	Operating Channel	36
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Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
10360.00	H	-55.26	-30.00	25.26
15440.00	H	-53.79	-30.00	23.79
10360.00	V	-54.28	-30.00	24.28
15440.00	V	-57.32	-30.00	27.32

802.11n(HT40)

Frequency Range	1GHz ~ 26.5GHz	Operating Channel	38
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Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
10380.00	H	-55.54	-30.00	25.54
1557000	H	-53.47	-30.00	23.47
10380.00	V	-54.38	-30.00	24.38
1557000	V	-56.64	-30.00	26.64

802.11ac (VHT80)

Frequency Range	1GHz ~ 26.5GHz	Operating Channel	42
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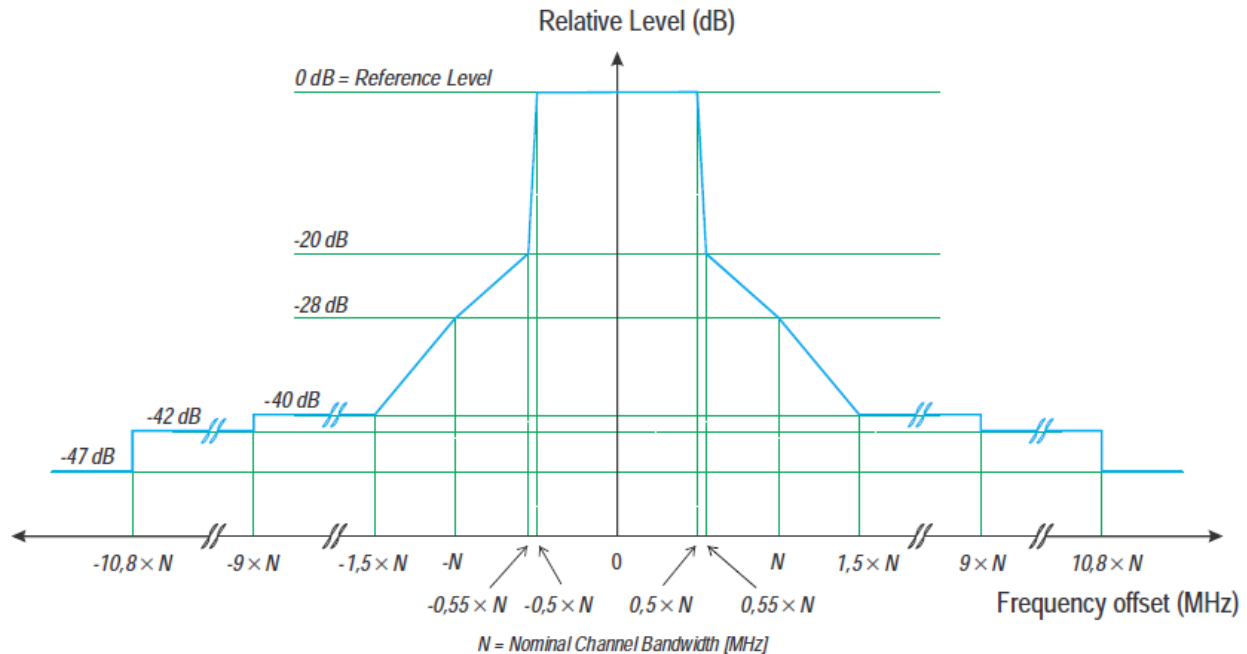
Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
10420.00	H	-55.57	-30.00	25.57
15630.00	H	-53.62	-30.00	23.62
10420.00	V	-54.56	-30.00	24.56
15630.00	V	-56.39	-30.00	26.39

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3.6 Transmitter Unwanted Emissions within the 5 GHz RLAN Bands

3.6.1 Limits of Transmitter Unwanted Emissions within the 5 GHz RLAN Bands

The average level of the transmitted spectrum shall not exceed the limits given in the following figure:



The mean Power Density (measured with a 1 MHz measurement bandwidth) of transmitter unwanted emissions within the 5 GHz RLAN bands shall not exceed the limit of the mask provided above figure or an absolute level of -30 dBm /MHz, whichever is greater.

3.6.2 Test Procedure

Refer to EN 301 893 V2.1.1 clause 5.4.6

Measurement Method	
☒ Conducted measurement	☐ Radiated measurement
☒ Option 1: For equipment with continuous transmission capability	
☐ Option 2: For equipment without continuous transmission capability	

3.6.3 Deviation from Test Standard

No deviation.

3.6.4 Test Setup

The measurement was performed at normal environmental conditions only. The measurement channels were performed in accordance with EN 301 893 clause 5.3.2. The equipment was configured to operate under its worst case situation with respect to output power. (In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator.). Controlling software ({software}) has been activated to set the EUT on specific status.



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3.6.5 Test Results for unwanted emissions within the 5 GHz RLAN bands at the highest level

WCT1DR2201D

Test Mode	Antenna	Channel[MHz]	Result [dBm]	Limit[dBm]	Verdict
11A	Ant1	5180	See test graph	See test graph	PASS
	Ant2	5180	See test graph	See test graph	PASS
	Ant1	5320	See test graph	See test graph	PASS
	Ant2	5320	See test graph	See test graph	PASS
	Ant1	5500	See test graph	See test graph	PASS
	Ant2	5500	See test graph	See test graph	PASS
	Ant1	5700	See test graph	See test graph	PASS
	Ant2	5700	See test graph	See test graph	PASS
11N20MIMO	Ant1	5180	See test graph	See test graph	PASS
	Ant2	5180	See test graph	See test graph	PASS
	Ant1	5320	See test graph	See test graph	PASS
	Ant2	5320	See test graph	See test graph	PASS
	Ant1	5500	See test graph	See test graph	PASS
	Ant2	5500	See test graph	See test graph	PASS
	Ant1	5700	See test graph	See test graph	PASS
	Ant2	5700	See test graph	See test graph	PASS
11N40MIMO	Ant1	5190	See test graph	See test graph	PASS
	Ant2	5190	See test graph	See test graph	PASS
	Ant1	5310	See test graph	See test graph	PASS
	Ant2	5310	See test graph	See test graph	PASS
	Ant1	5510	See test graph	See test graph	PASS
	Ant2	5510	See test graph	See test graph	PASS
	Ant1	5670	See test graph	See test graph	PASS
	Ant2	5670	See test graph	See test graph	PASS
11AC20MIMO	Ant1	5180	See test graph	See test graph	PASS
	Ant2	5180	See test graph	See test graph	PASS
	Ant1	5320	See test graph	See test graph	PASS
	Ant2	5320	See test graph	See test graph	PASS
	Ant1	5500	See test graph	See test graph	PASS
	Ant2	5500	See test graph	See test graph	PASS
	Ant1	5700	See test graph	See test graph	PASS
	Ant2	5700	See test graph	See test graph	PASS
11AC40MIMO	Ant1	5190	See test graph	See test graph	PASS
	Ant2	5190	See test graph	See test graph	PASS
	Ant1	5310	See test graph	See test graph	PASS
	Ant2	5310	See test graph	See test graph	PASS
	Ant1	5510	See test graph	See test graph	PASS
	Ant2	5510	See test graph	See test graph	PASS
	Ant1	5670	See test graph	See test graph	PASS
	Ant2	5670	See test graph	See test graph	PASS
11AC80MIMO	Ant1	5210	See test graph	See test graph	PASS
	Ant2	5210	See test graph	See test graph	PASS
	Ant1	5290	See test graph	See test graph	PASS
	Ant2	5290	See test graph	See test graph	PASS
	Ant1	5530	See test graph	See test graph	PASS
	Ant2	5530	See test graph	See test graph	PASS
	Ant1	5610	See test graph	See test graph	PASS
	Ant2	5610	See test graph	See test graph	PASS



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WC0NR2201

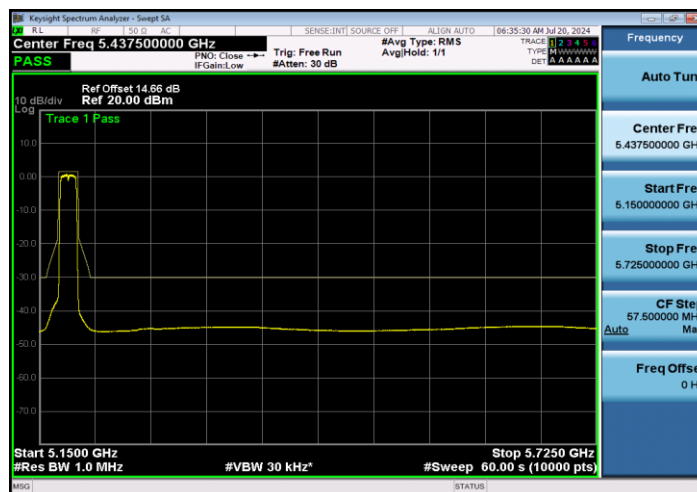
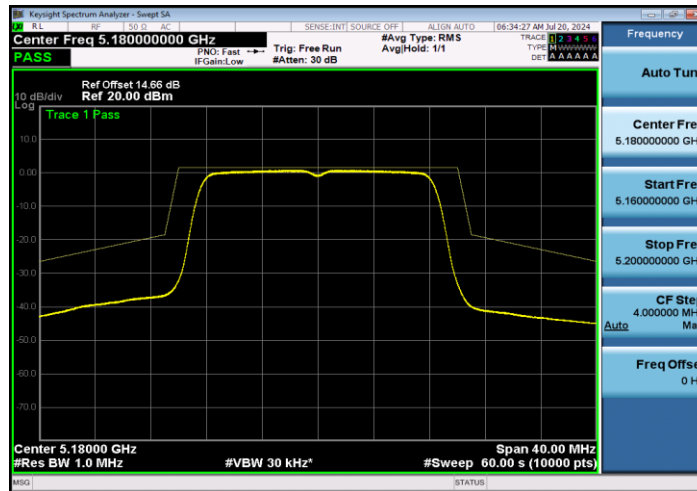
Test Mode	Antenna	Channel[MHz]	Result [dBm]	Limit[dBm]	Verdict
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	Ant2	5180	See test graph	See test graph	PASS
11N20MIMO	Ant1	5180	See test graph	See test graph	PASS
	Ant2	5180	See test graph	See test graph	PASS
11N40MIMO	Ant1	5190	See test graph	See test graph	PASS
	Ant2	5190	See test graph	See test graph	PASS
11AC20MIMO	Ant1	5180	See test graph	See test graph	PASS
	Ant2	5180	See test graph	See test graph	PASS
11AC40MIMO	Ant1	5190	See test graph	See test graph	PASS
	Ant2	5190	See test graph	See test graph	PASS
11AC80MIMO	Ant1	5210	See test graph	See test graph	PASS
	Ant2	5210	See test graph	See test graph	PASS

TEST REPORT N°: KSK-ESH-P24071264B-5

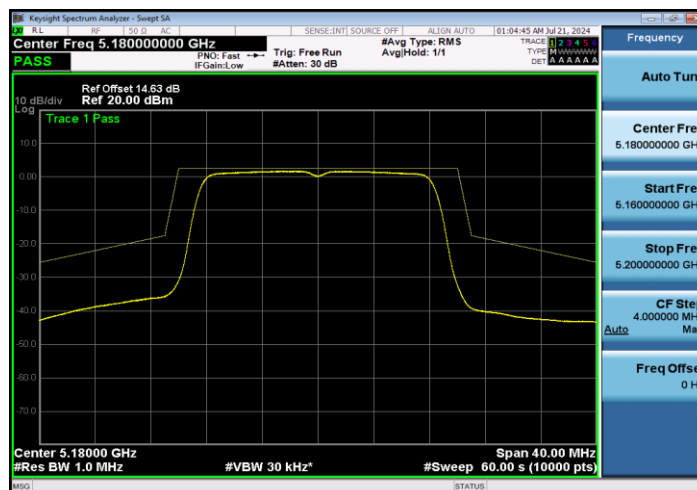
3.6.6 Test Graphs

WCT1DR2201D

11A_Ant1_5180

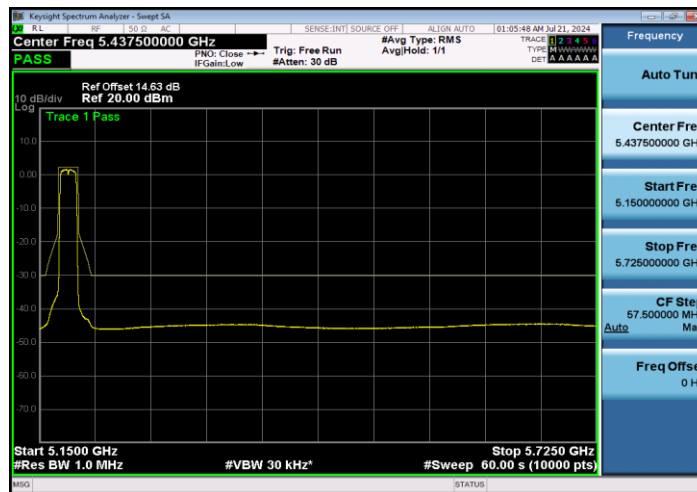


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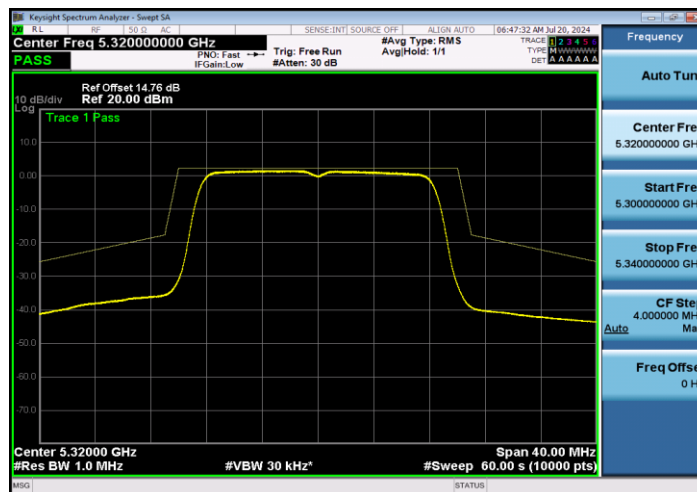




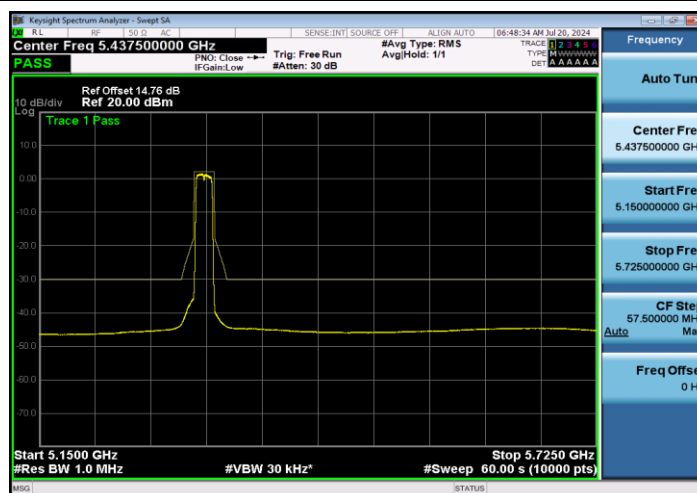
TEST REPORT N°: KSK-ESH-P24071264B-5



11A_Ant1_5320



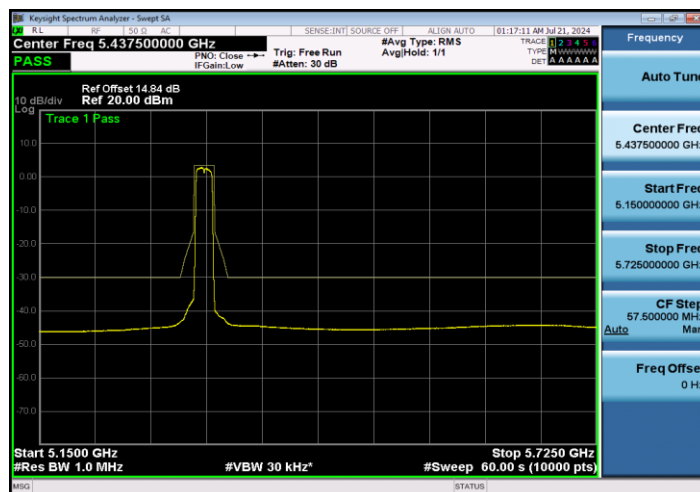
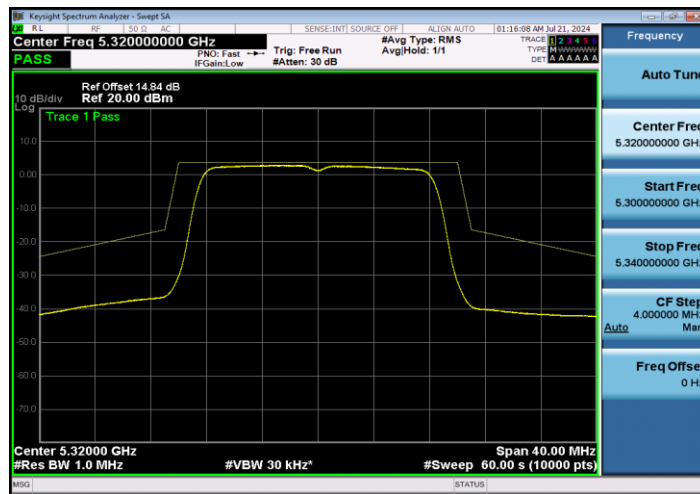
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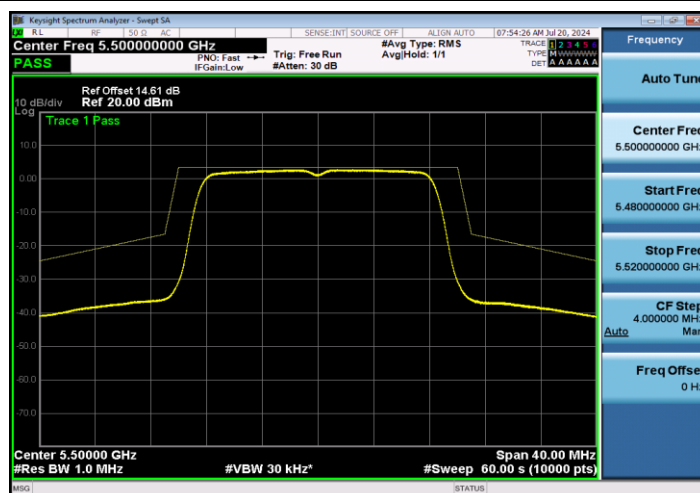
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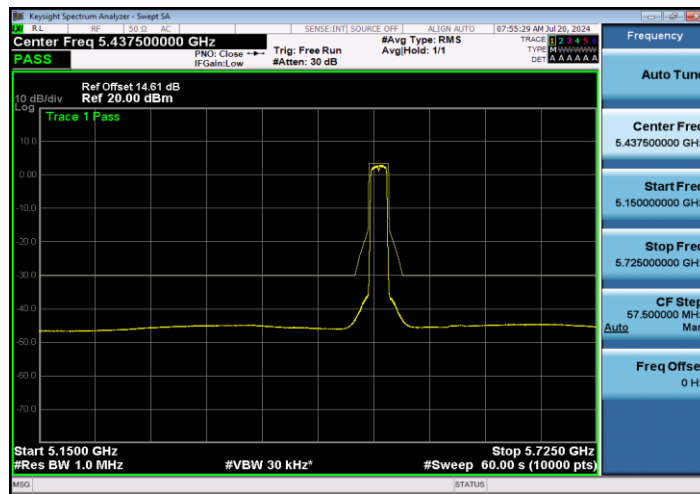


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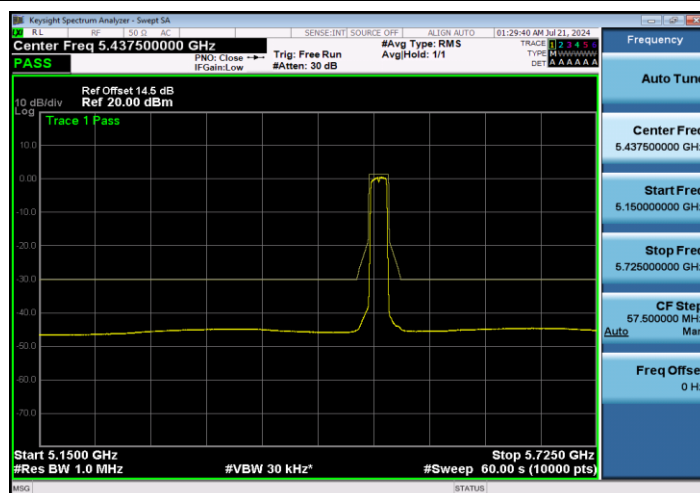
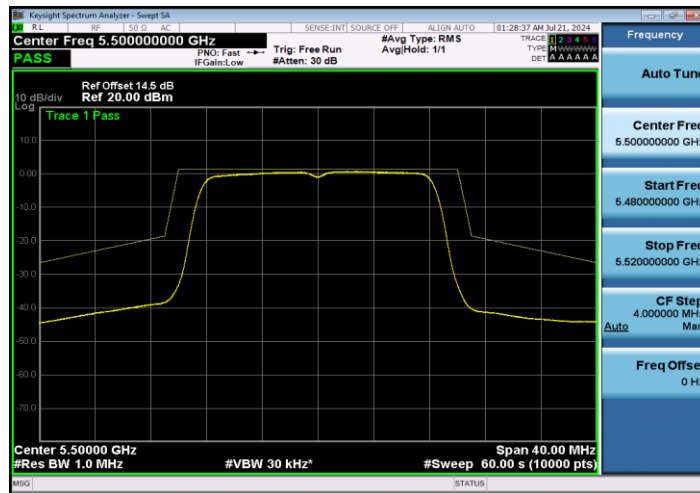




TEST REPORT N°: KSK-ESH-P24071264B-5



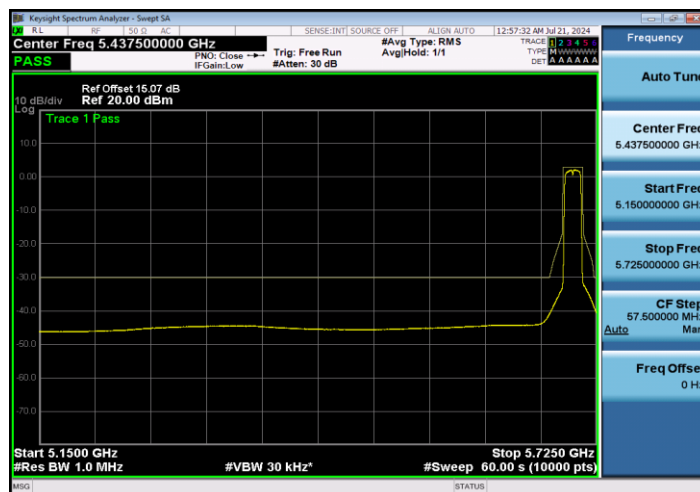
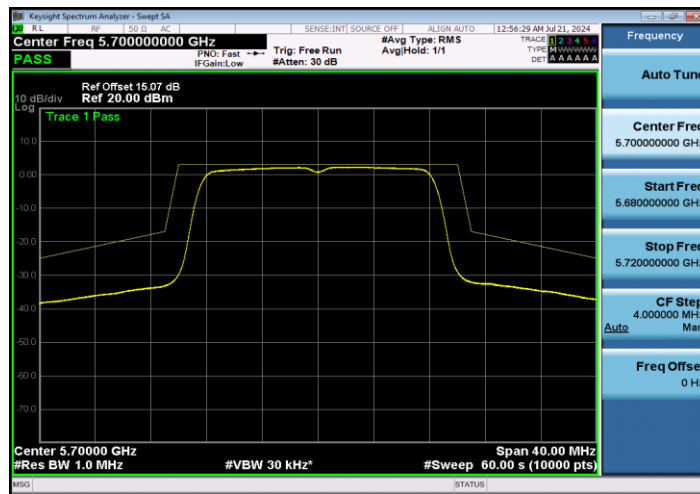
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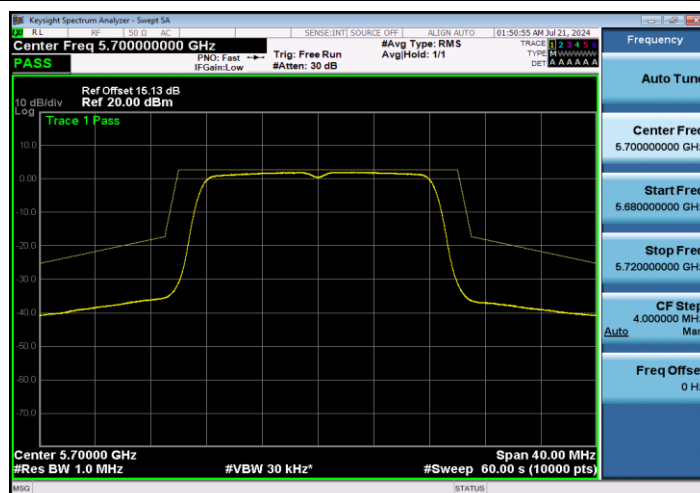
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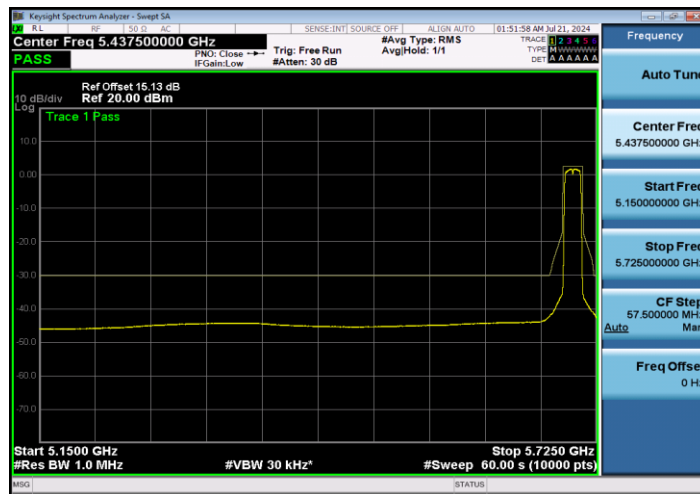


11A_Ant2_5700

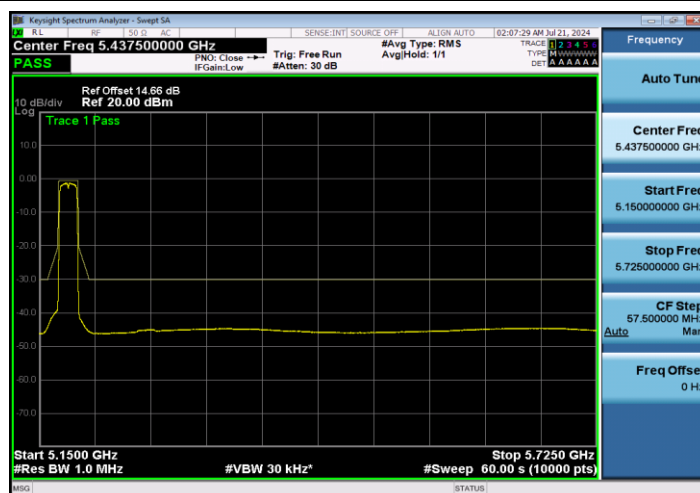
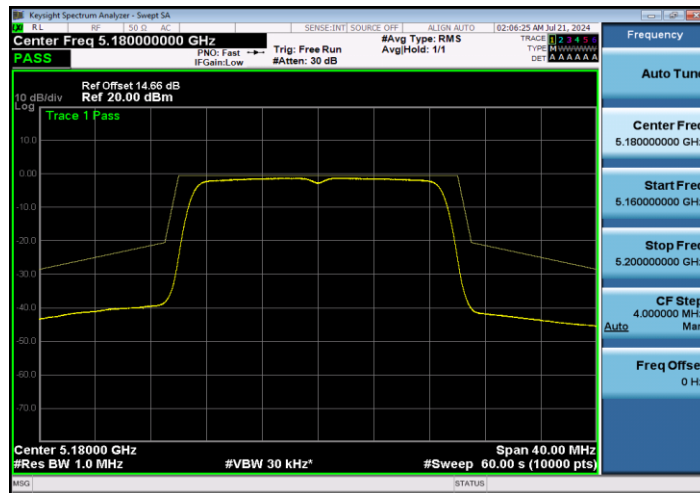




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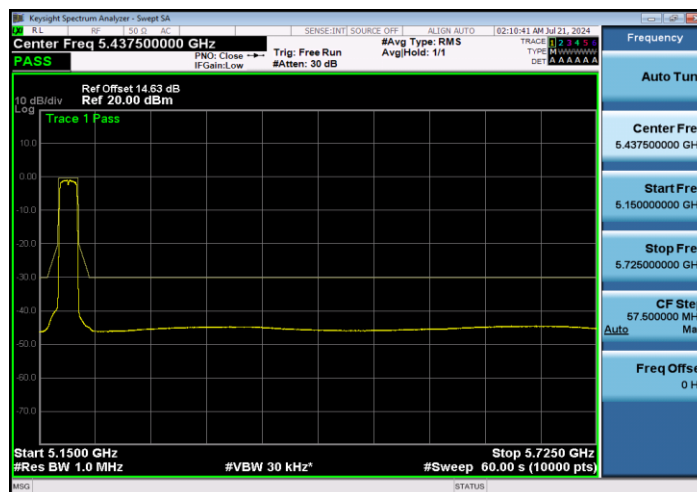
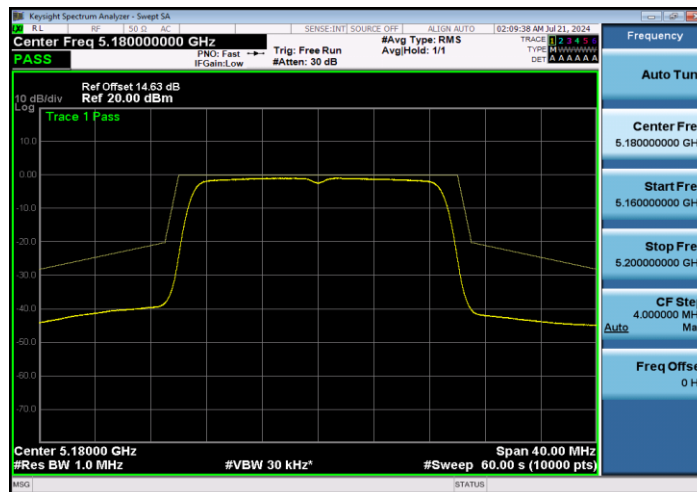
11N20MIMO_Ant1_5180



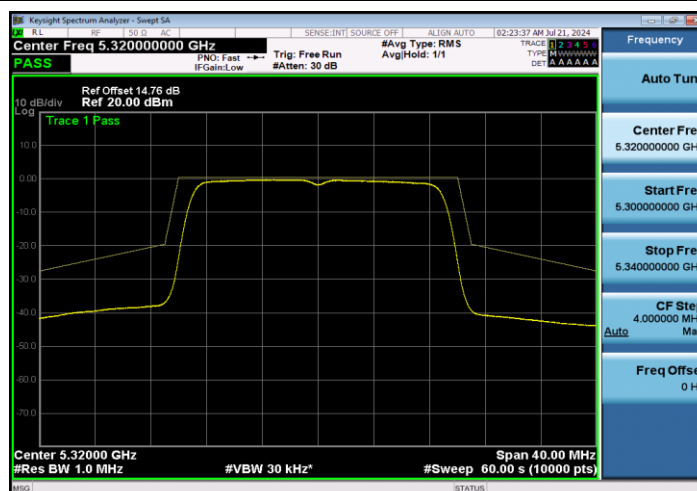
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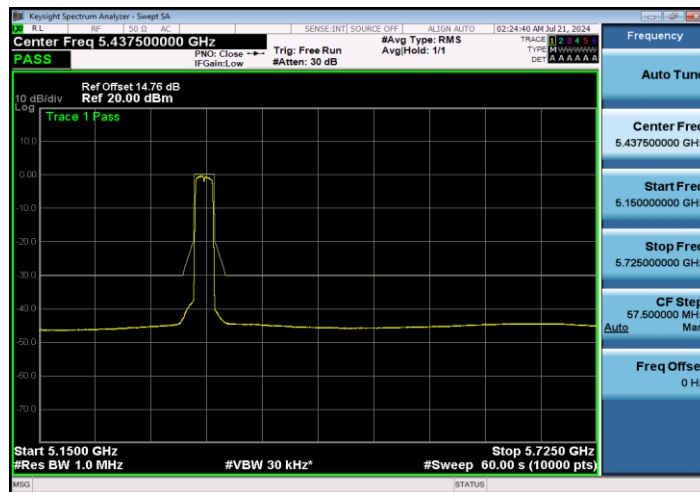


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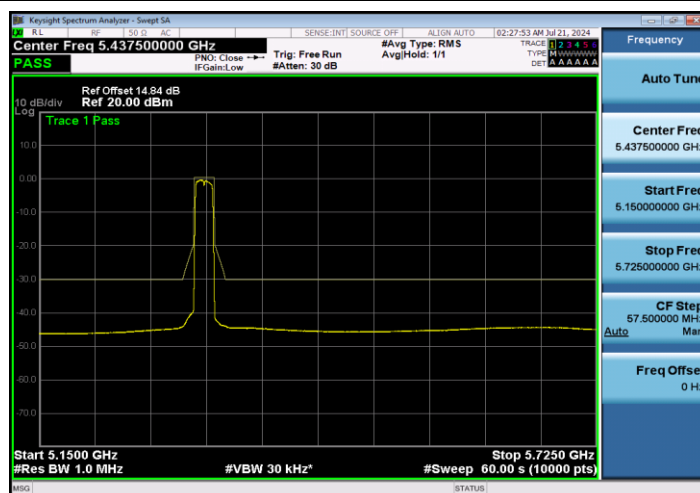
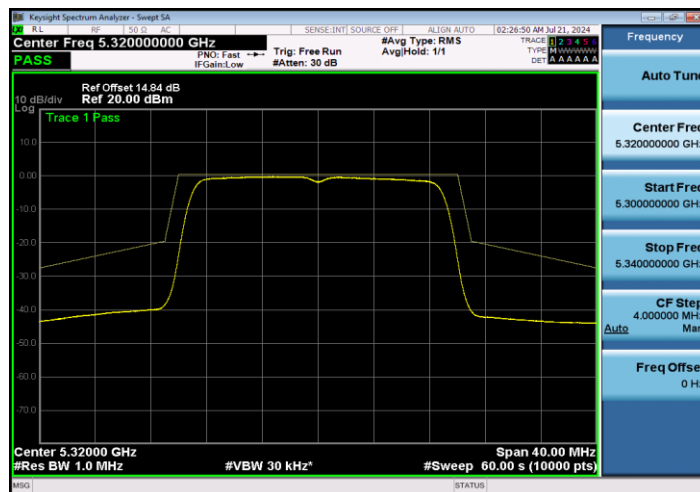




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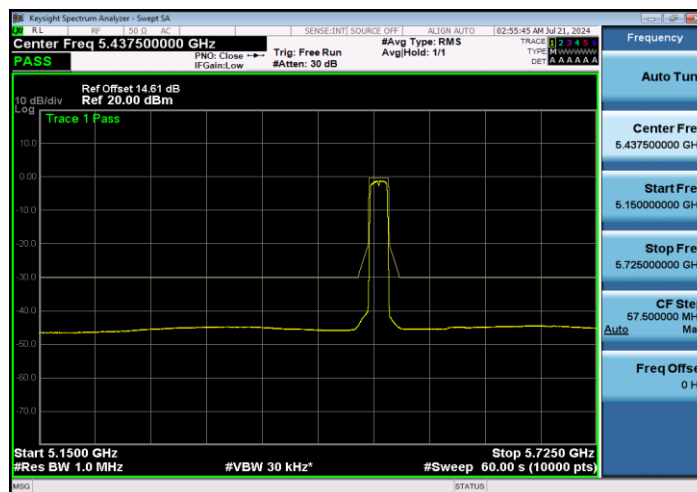
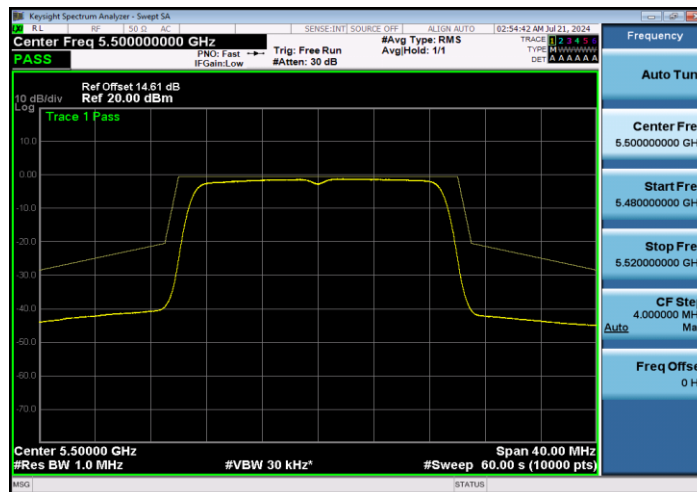
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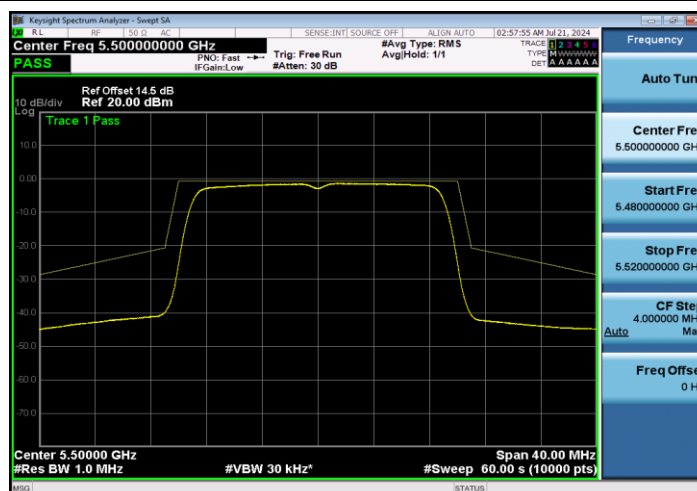
11N20MIMO_Ant1_5500



TEST REPORT N°: KSK-ESH-P24071264B-5

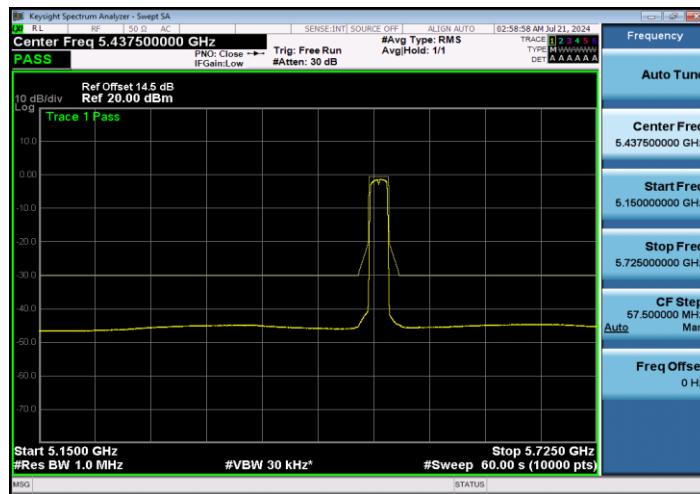


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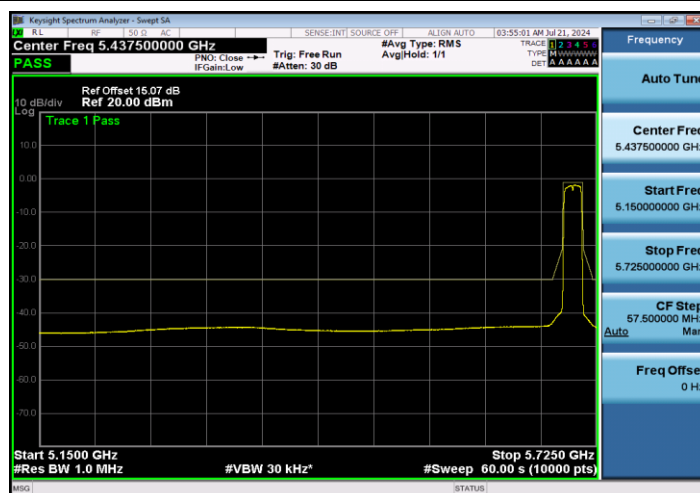
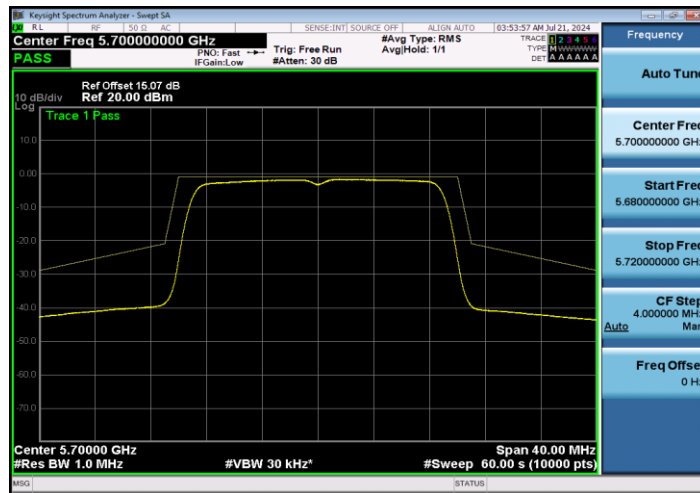




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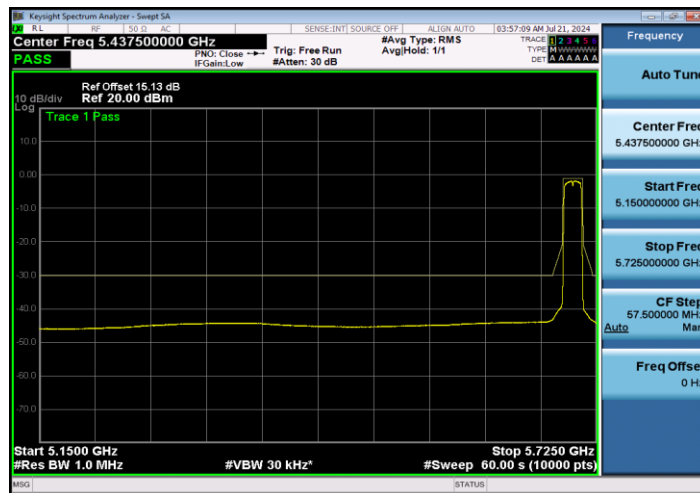
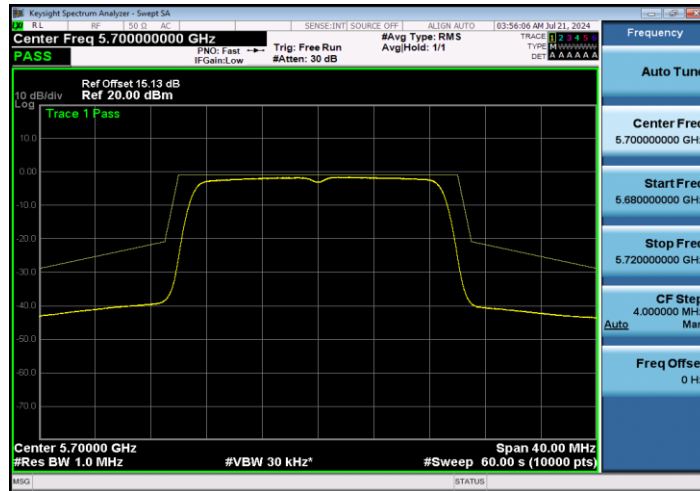


11N20MIMO_Ant1_5700



11N20MIMO_Ant2_5700

TEST REPORT N°: KSK-ESH-P24071264B-5

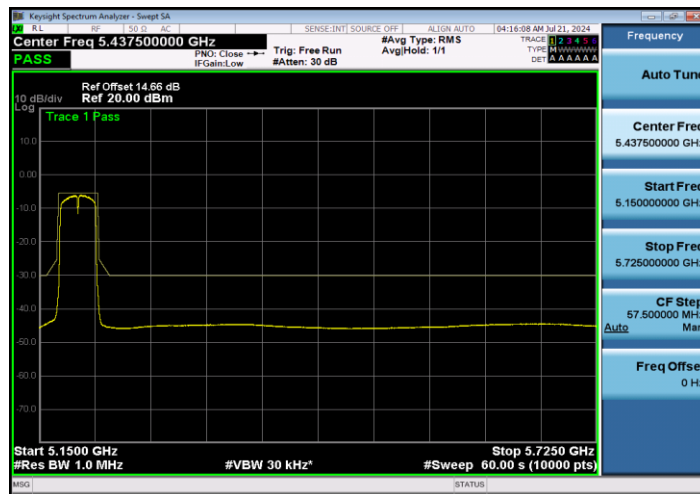


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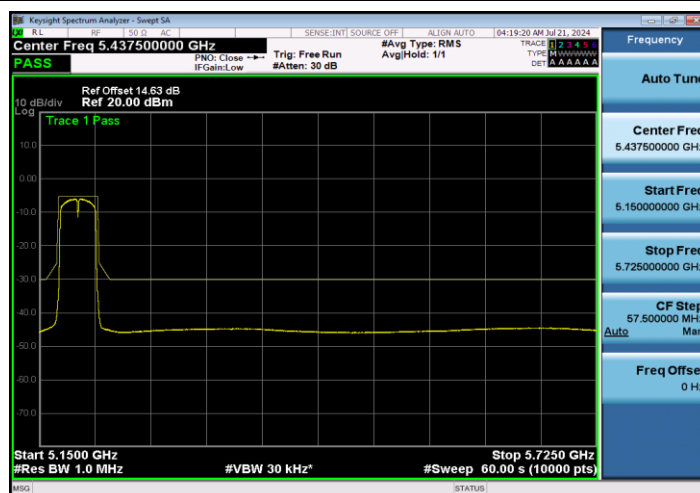




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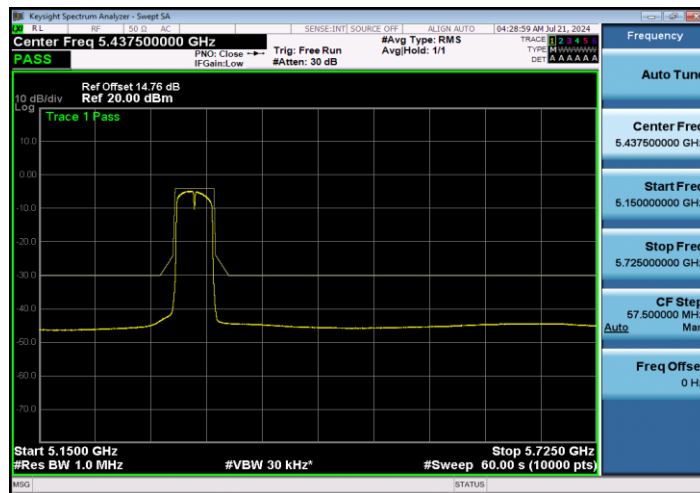
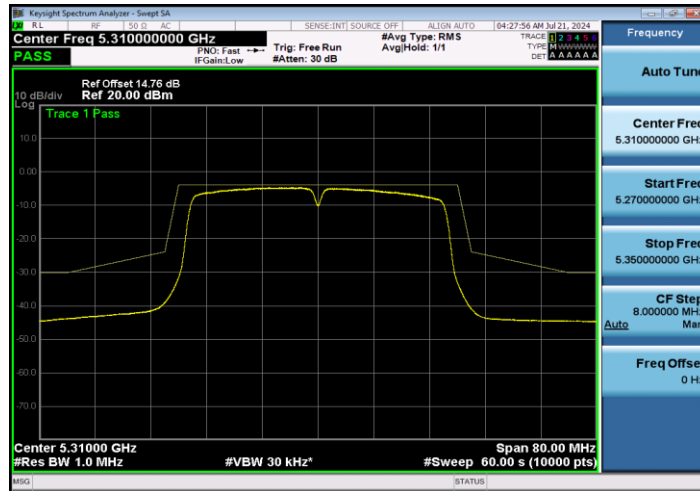


11N40MIMO_Ant2_5190



11N40MIMO_Ant1_5310

TEST REPORT N°: KSK-ESH-P24071264B-5

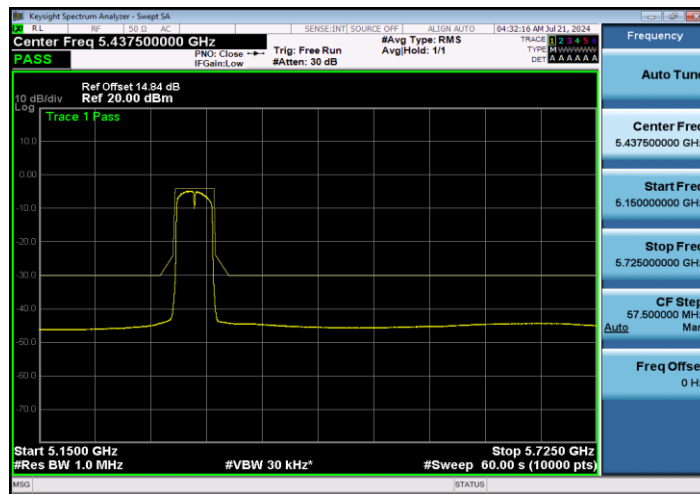


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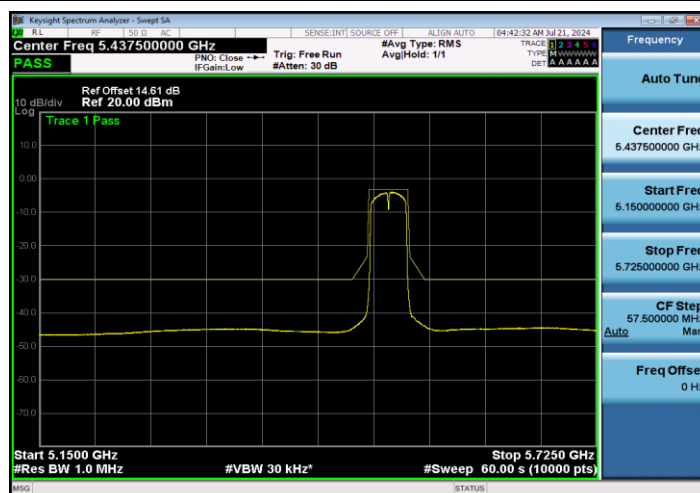
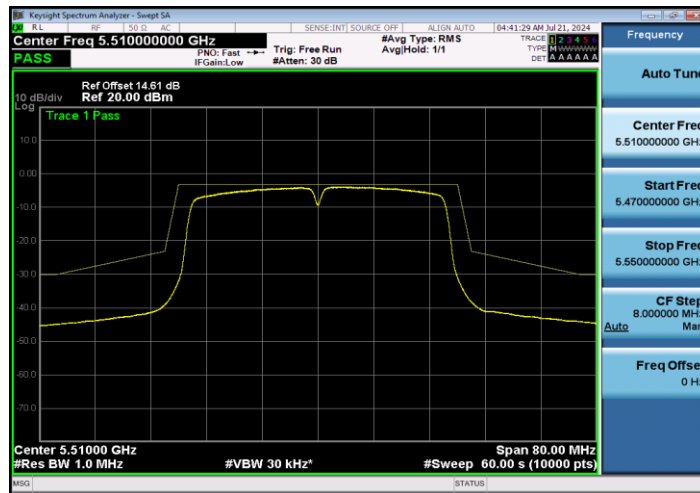




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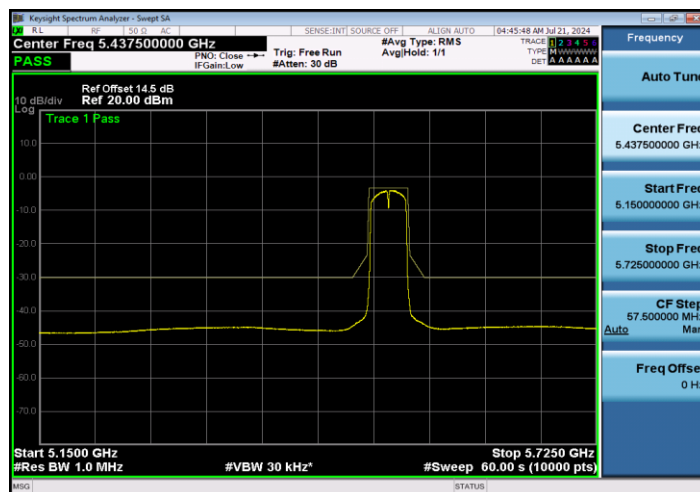
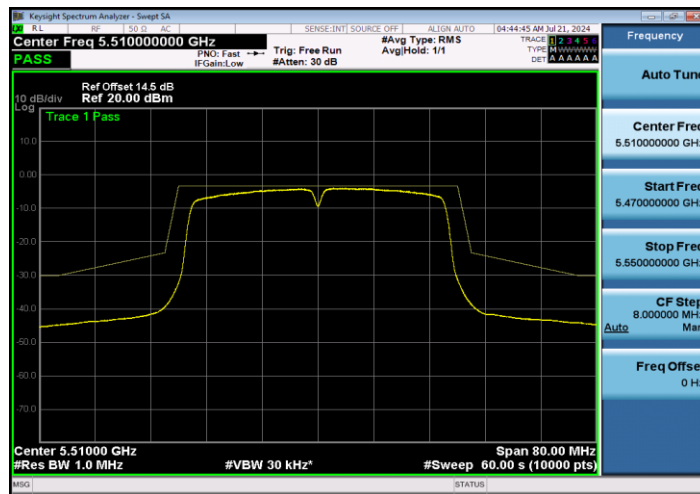
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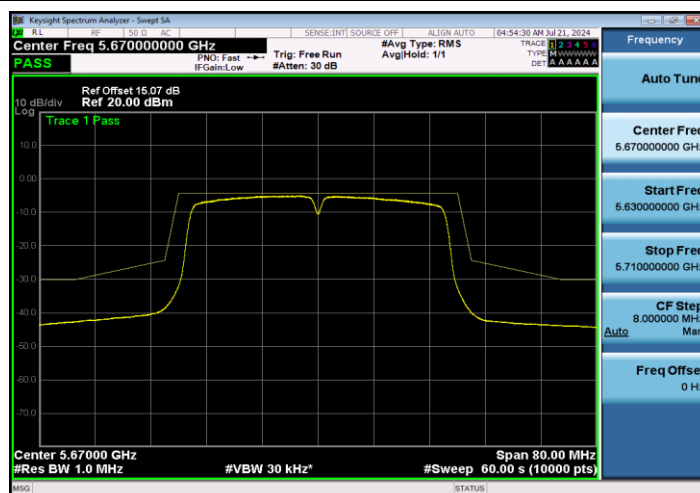
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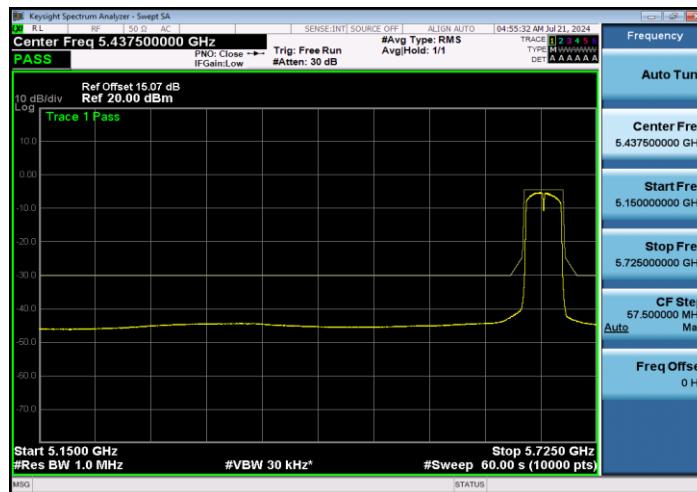


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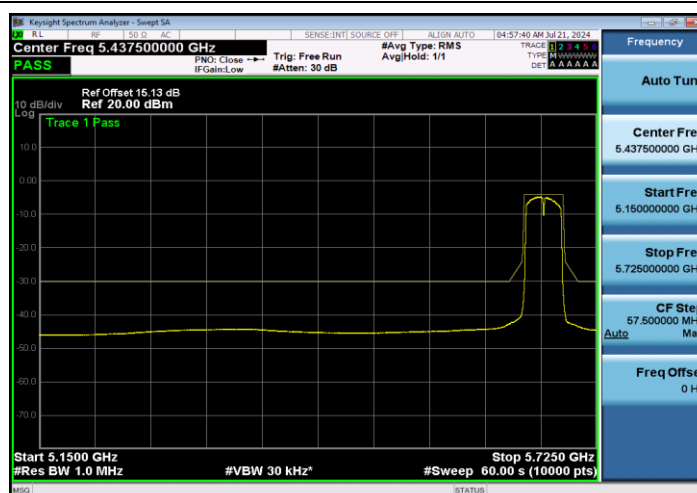
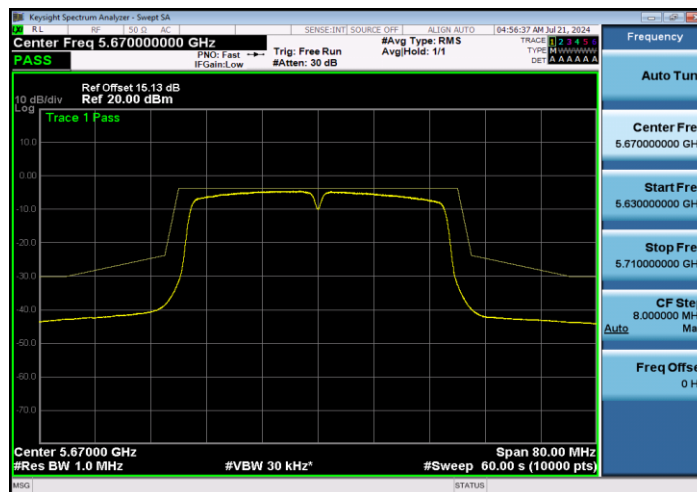




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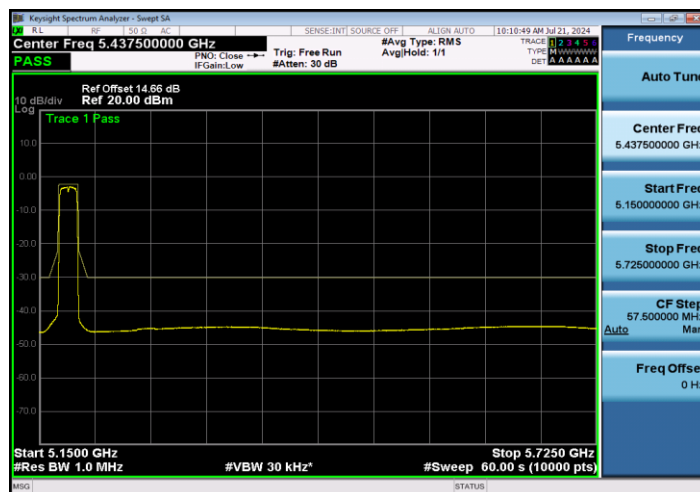
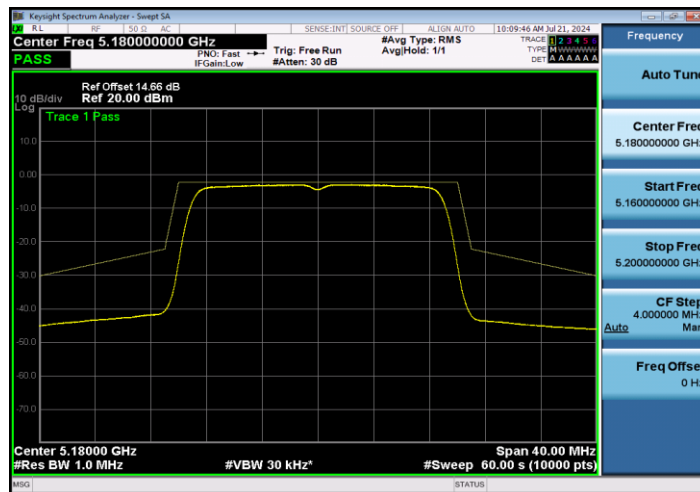
11N40MIMO_Ant2_5670



11AC20MIMO_Ant1_5180



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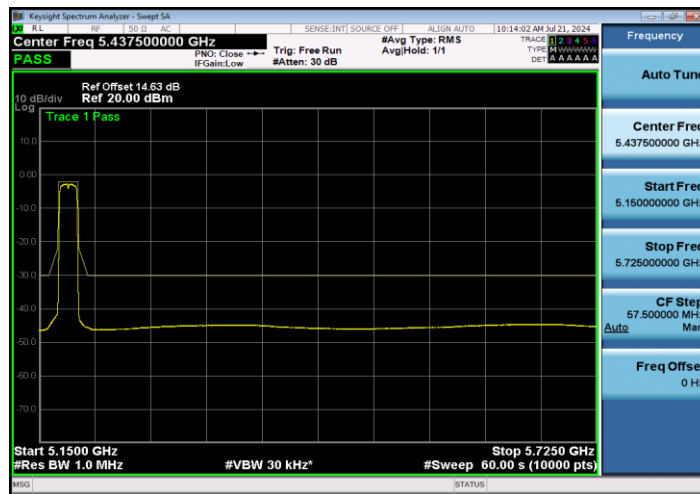


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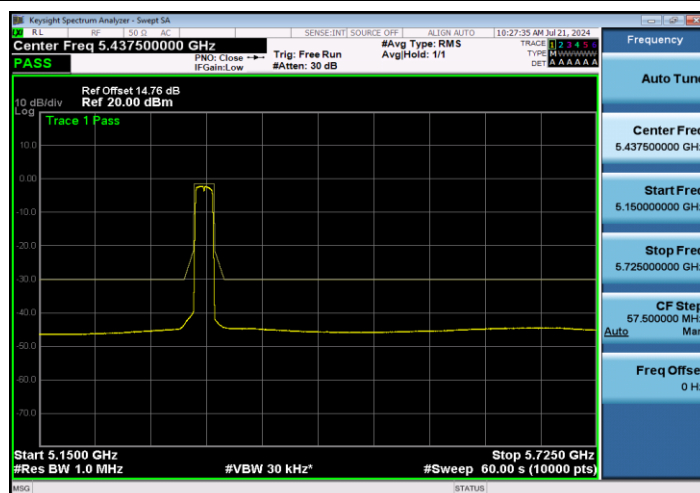




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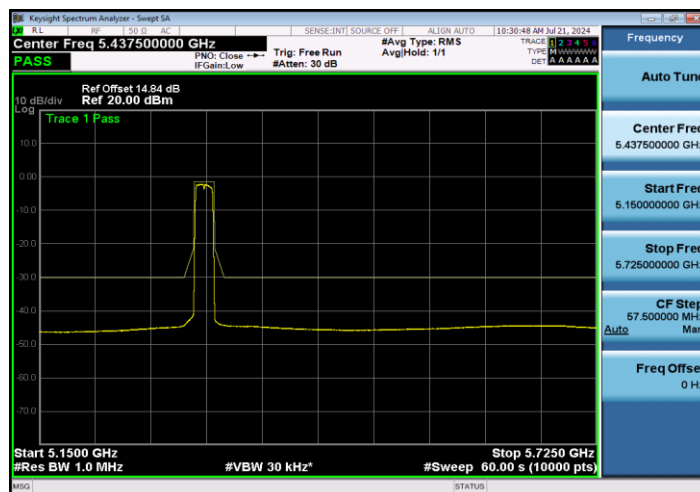
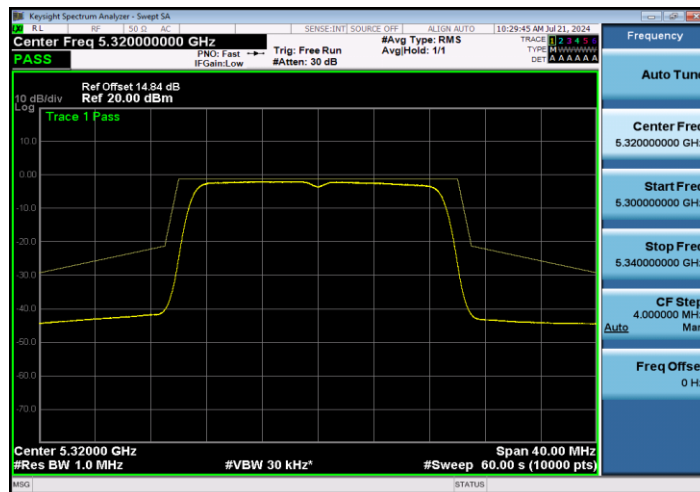
11AC20MIMO_Ant1_5320



11AC20MIMO_Ant2_5320



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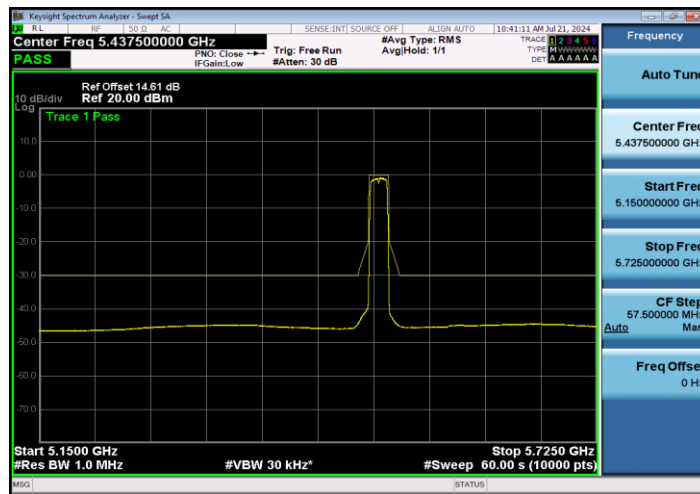


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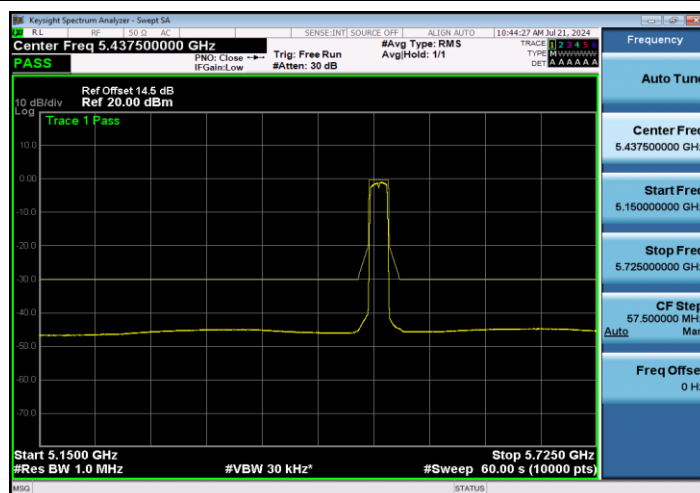
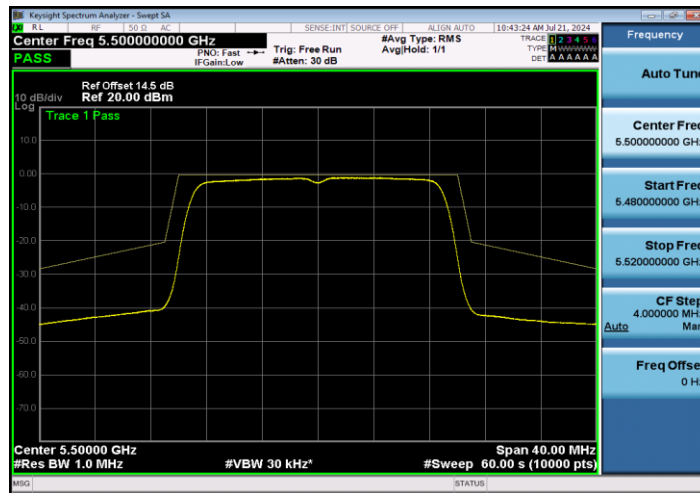




TEST REPORT N°: KSK-ESH-P24071264B-5



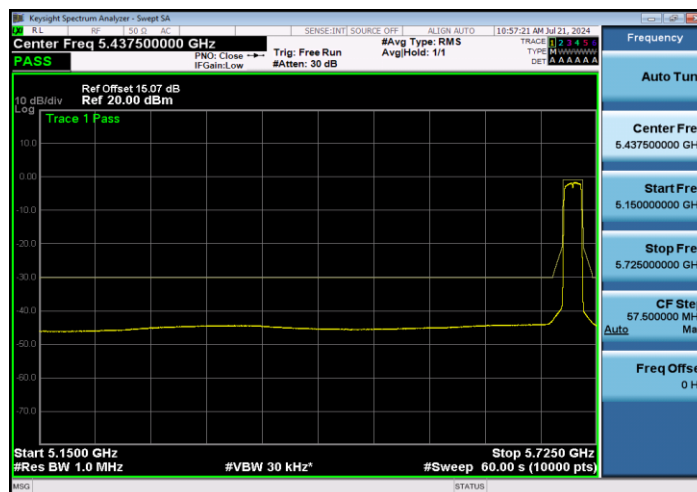
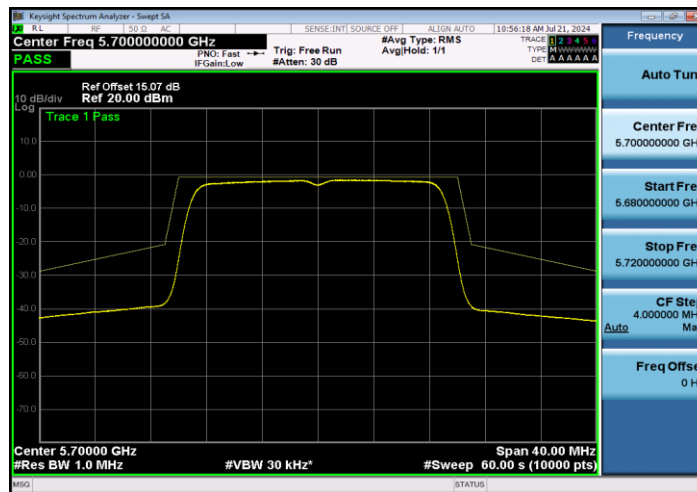
11AC20MIMO_Ant2_5500



11AC20MIMO_Ant1_5700



TEST REPORT N°: KSK-ESH-P24071264B-5

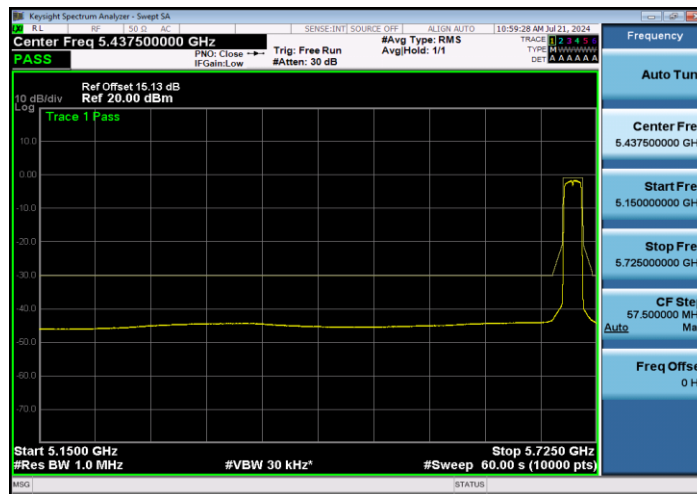


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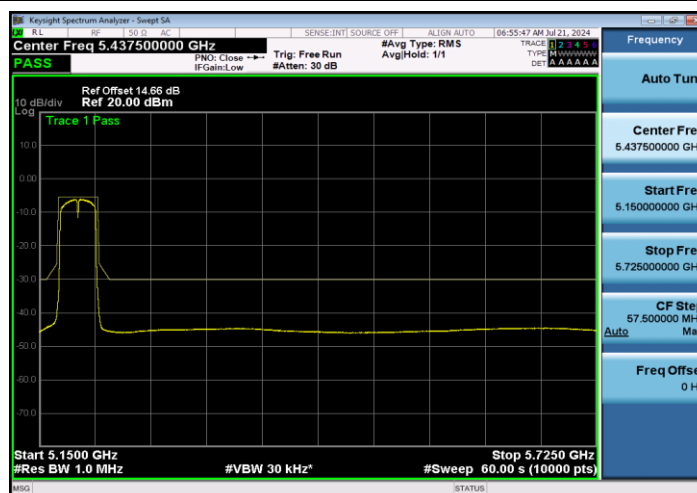
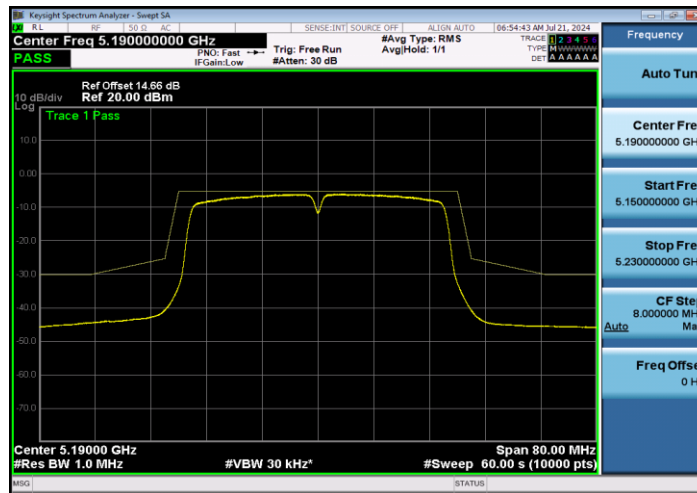




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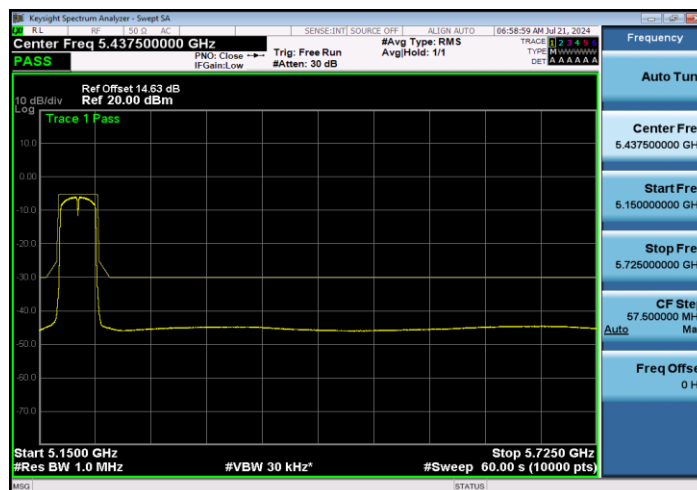
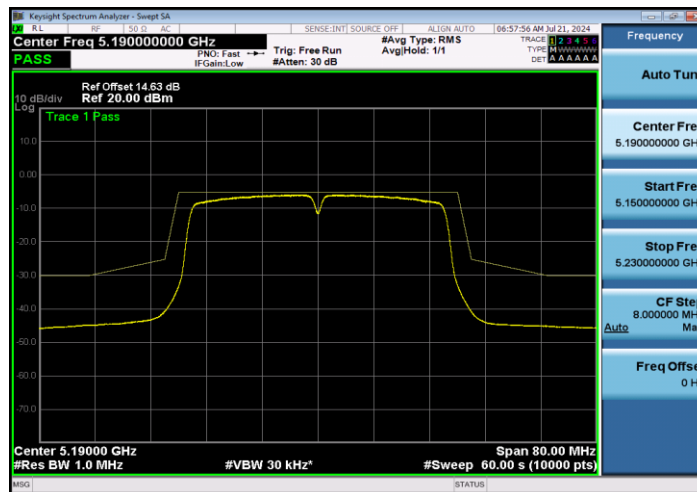
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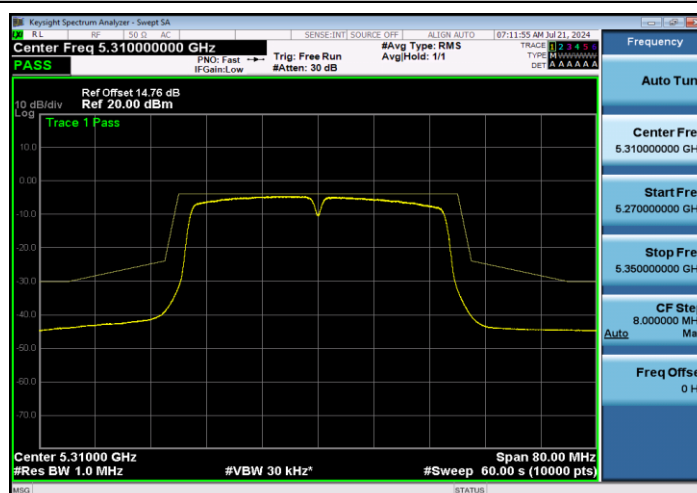
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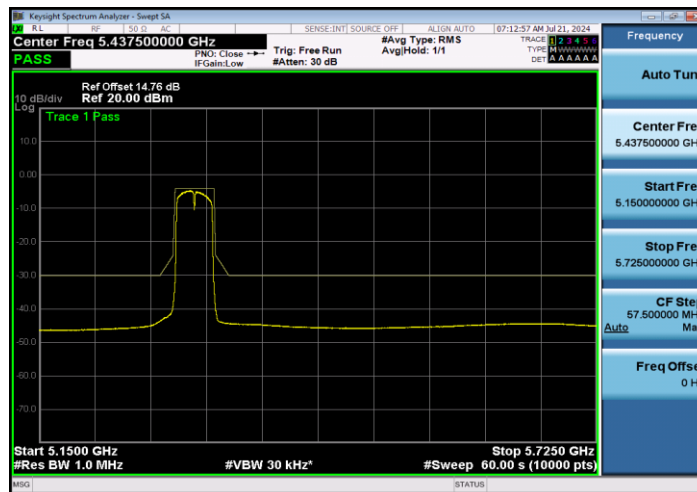


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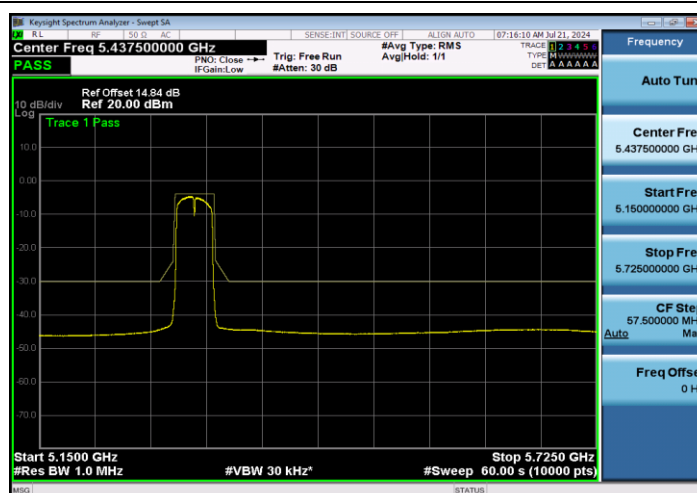
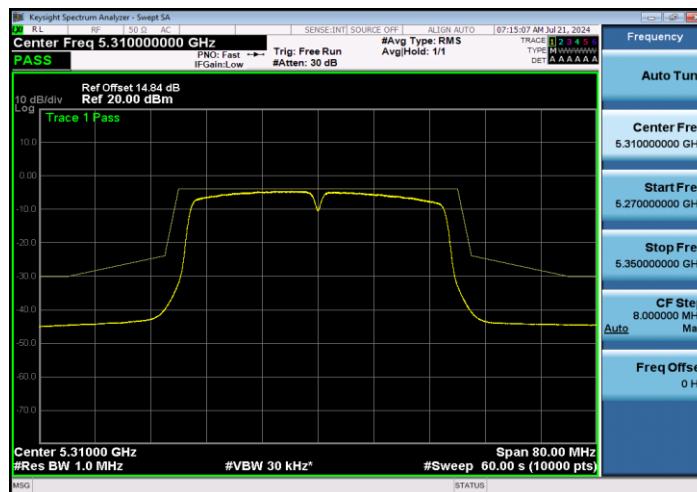




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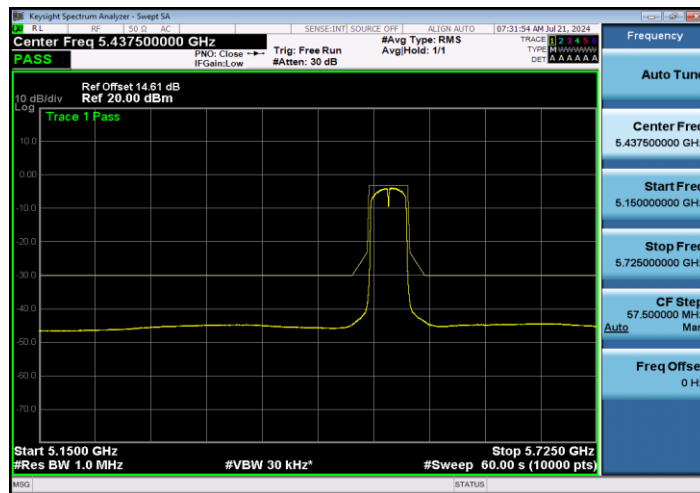
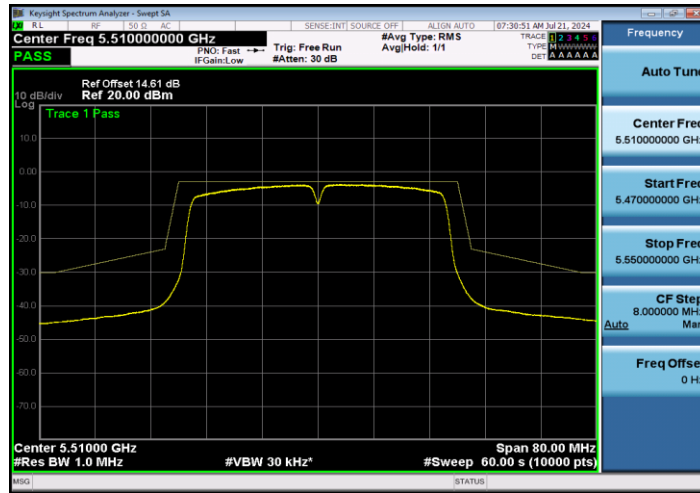


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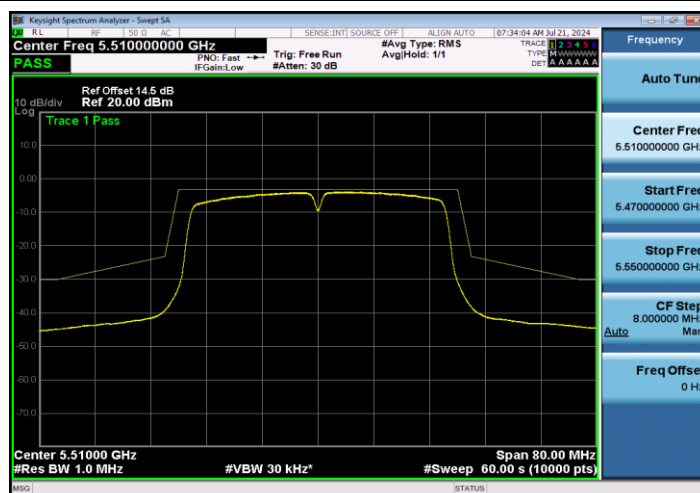


11AC40MIMO_Ant1_5510

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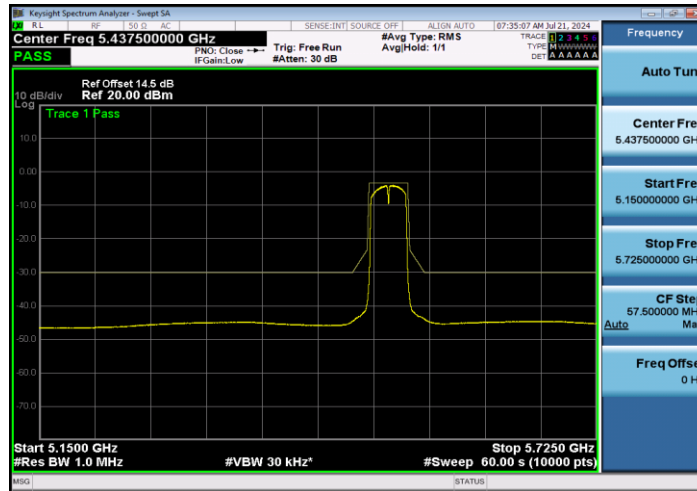


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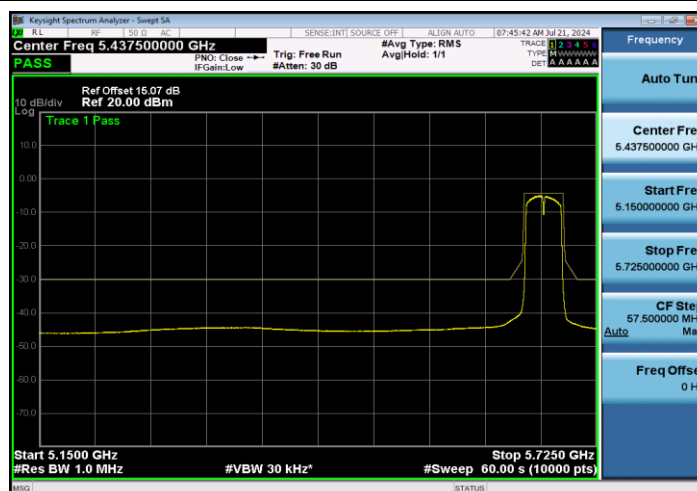
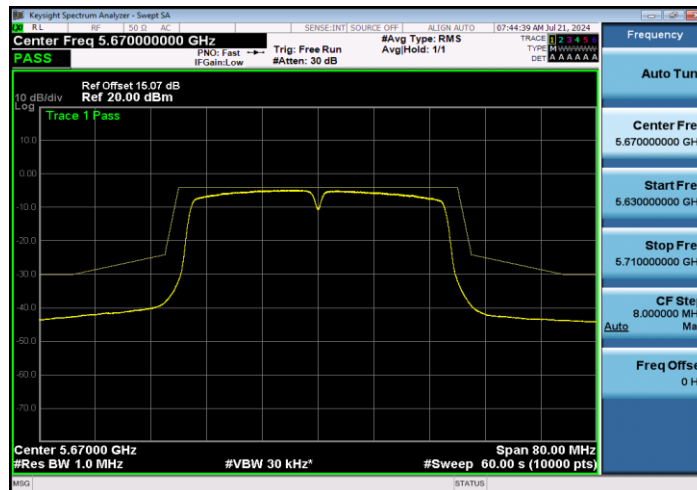




TEST REPORT N°: KSK-ESH-P24071264B-5



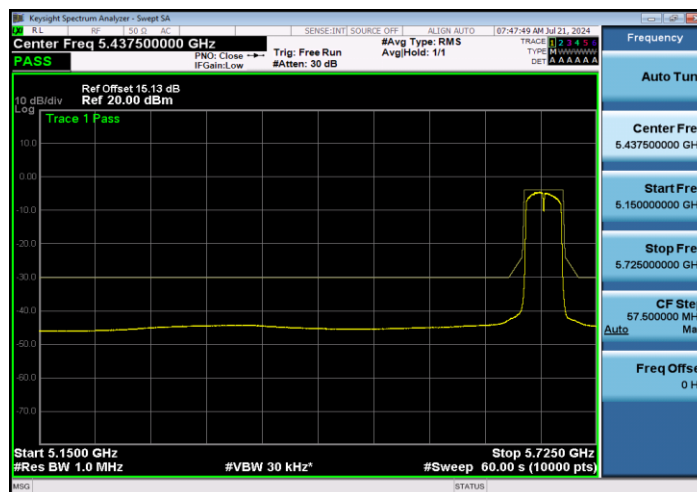
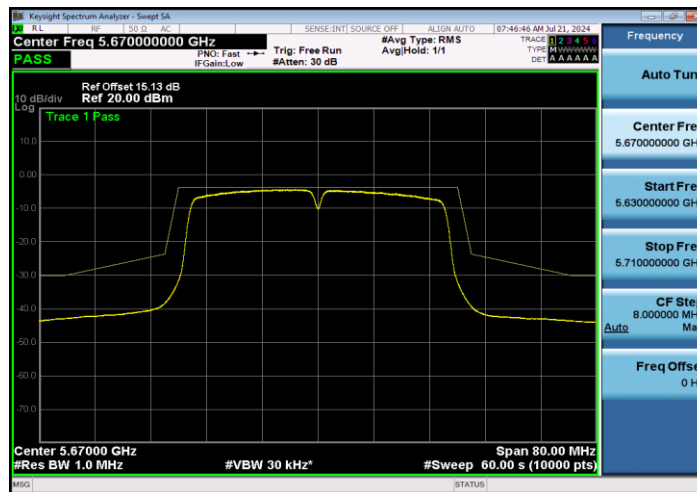
11AC40MIMO_Ant1_5670



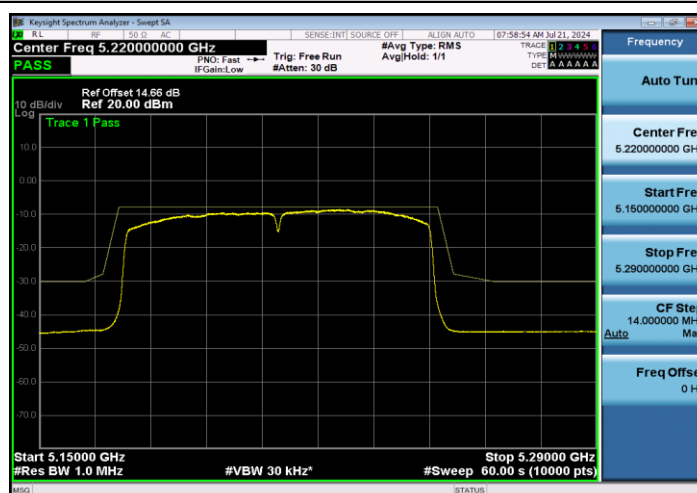
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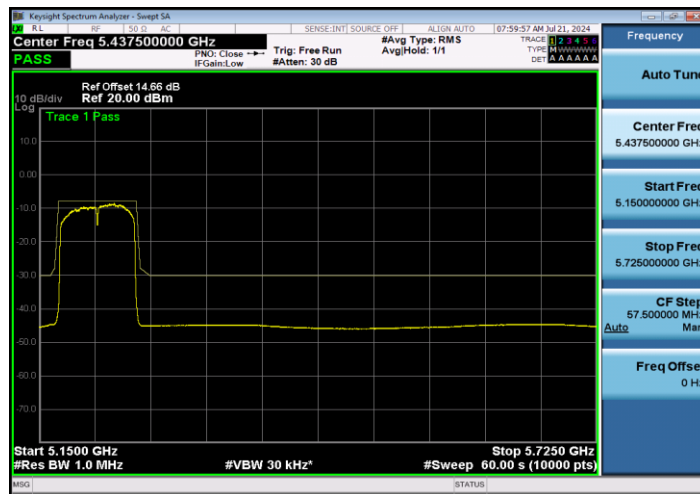


11AC80MIMO_Ant1_5210

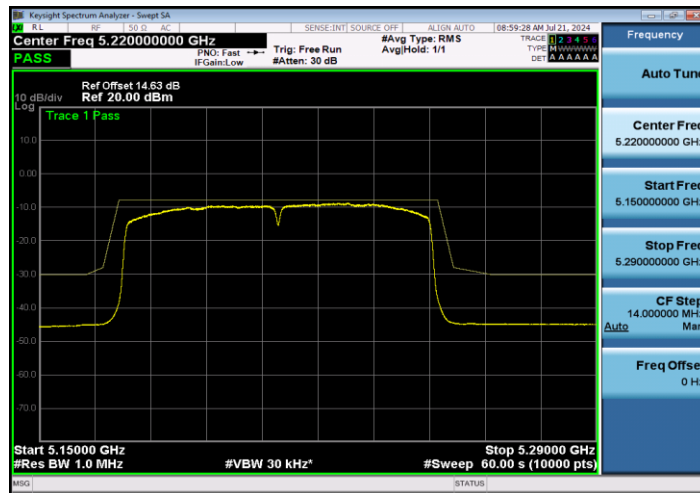




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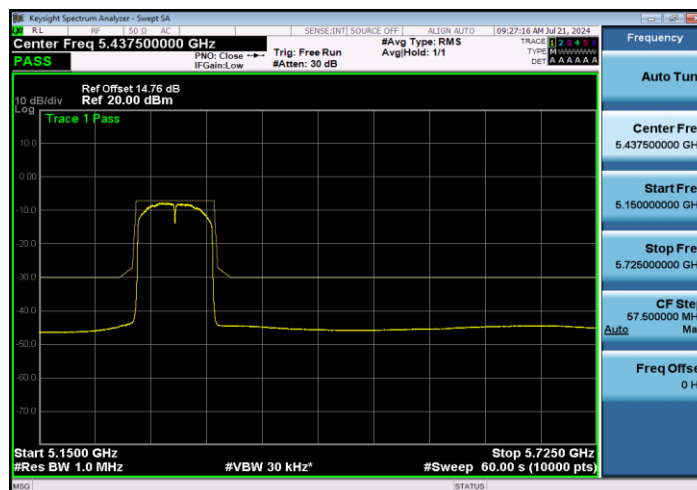
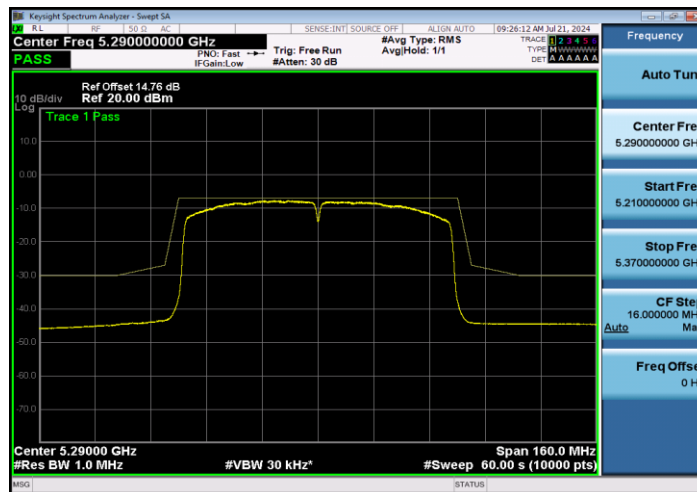
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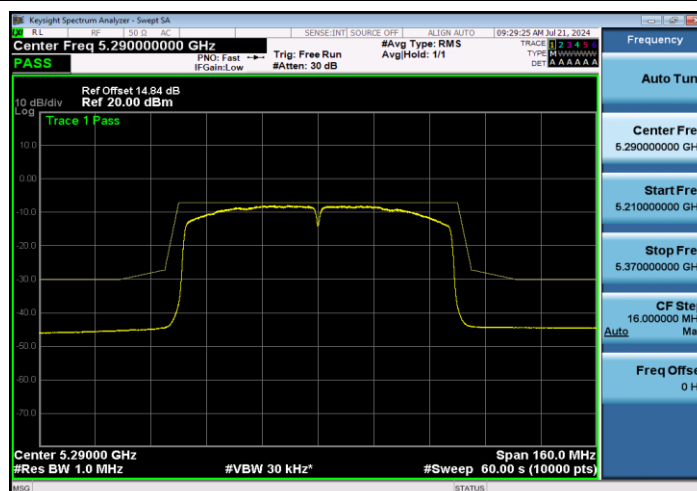
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TEST REPORT N°: KSK-ESH-P24071264B-5

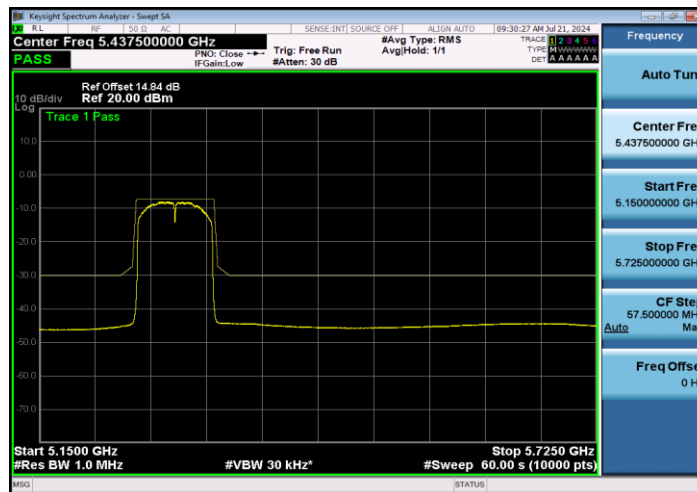


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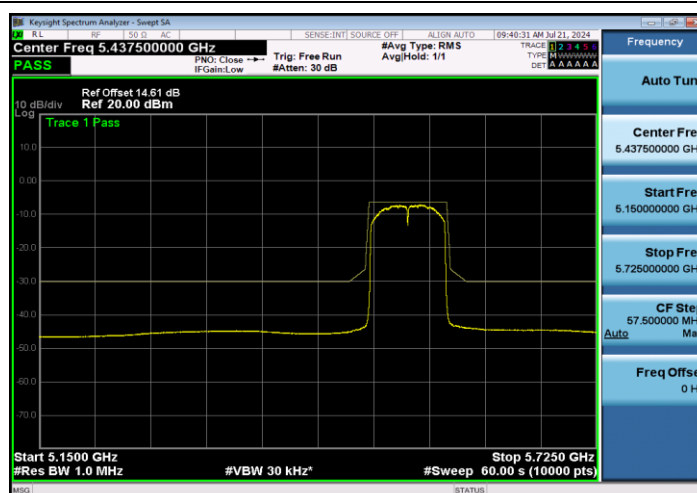
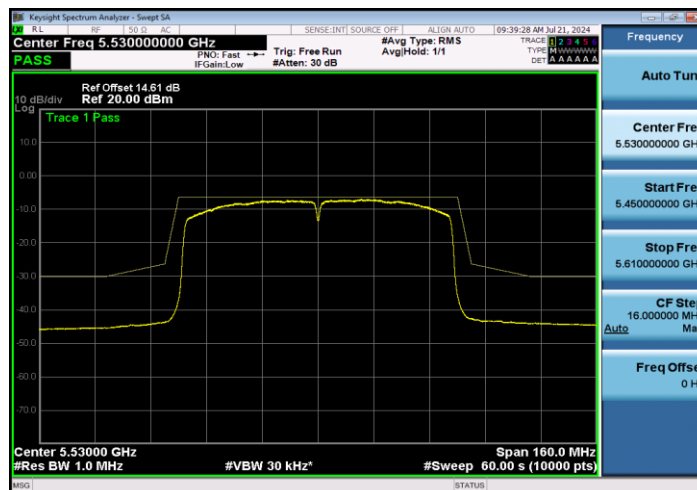




TEST REPORT N°: KSK-ESH-P24071264B-5



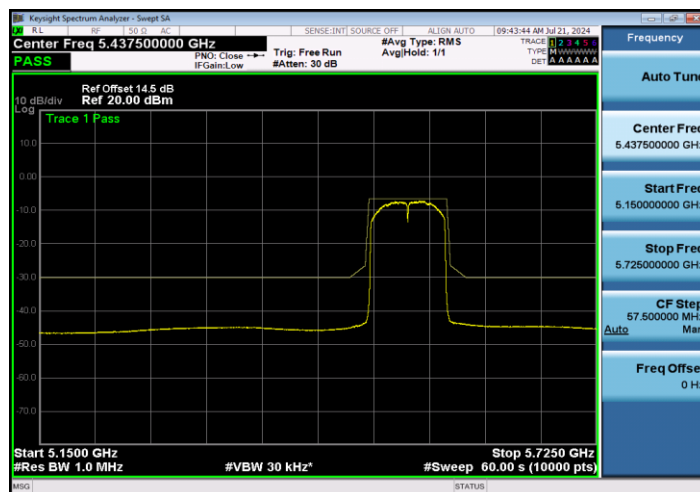
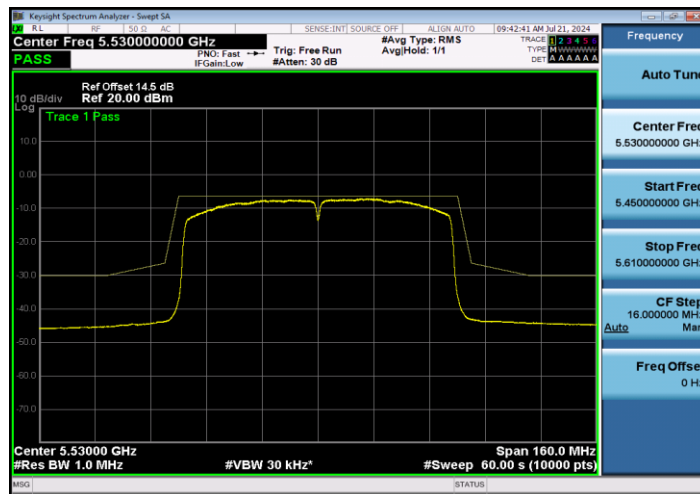
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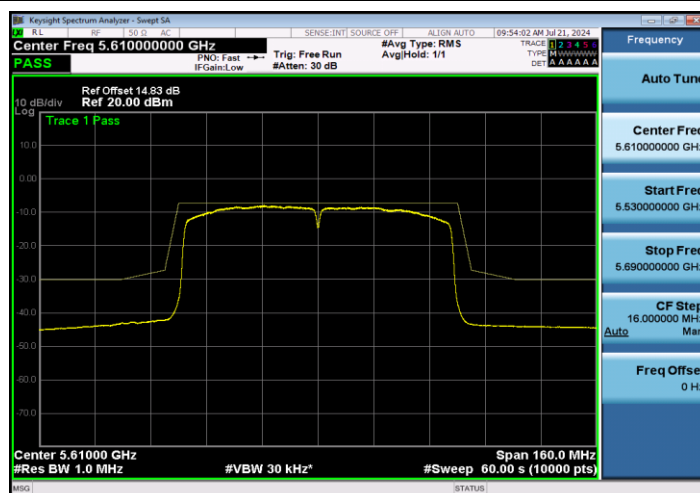
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TEST REPORT N°: KSK-ESH-P24071264B-5

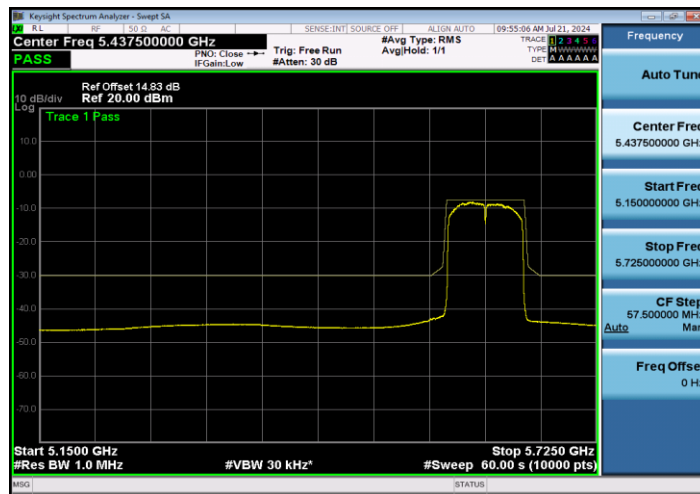


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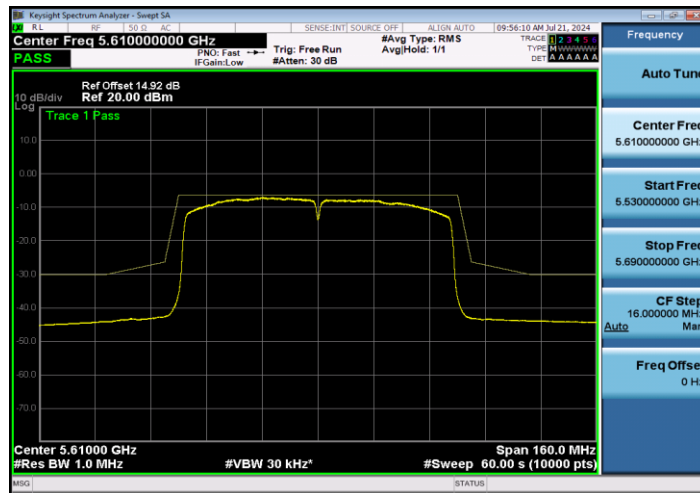




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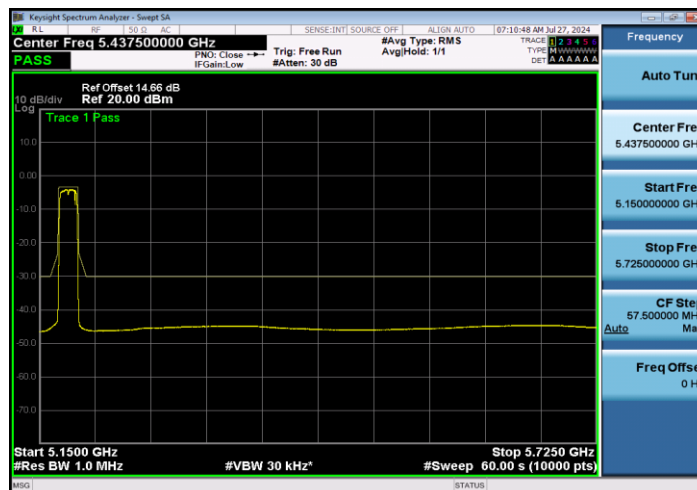
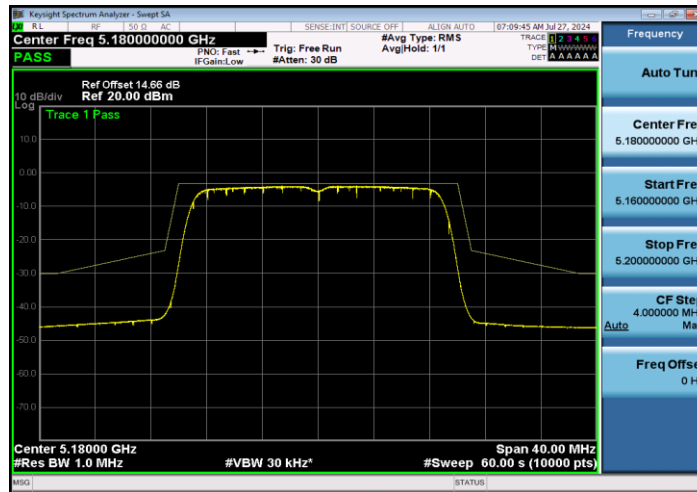
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TEST REPORT N°: KSK-ESH-P24071264B-5

WC0NR2201

11A_Ant1_5180

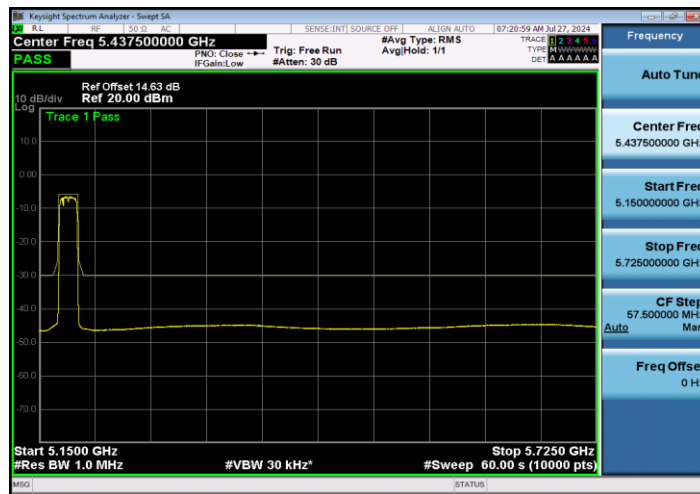


11A_Ant2_5180





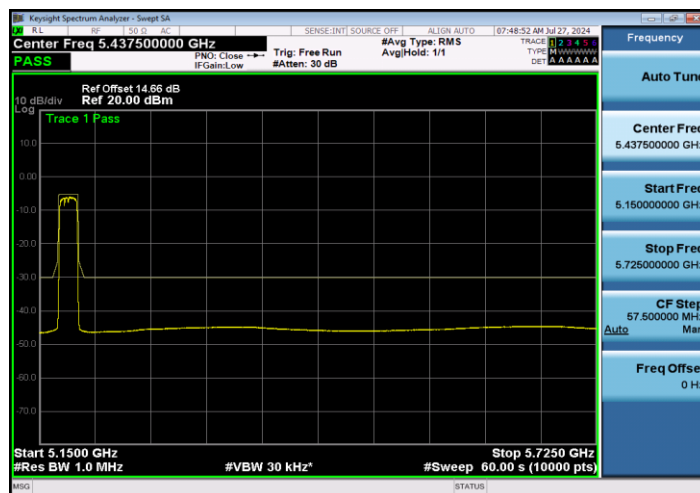
TEST REPORT N°: KSK-ESH-P24071264B-5



11N20MIMO_Ant1_5180



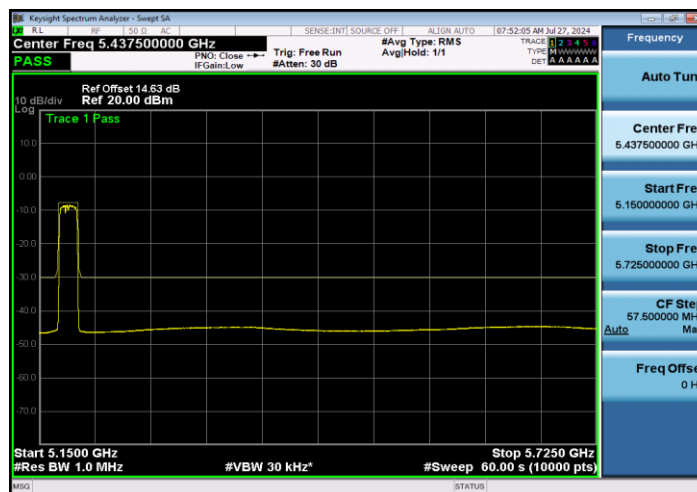
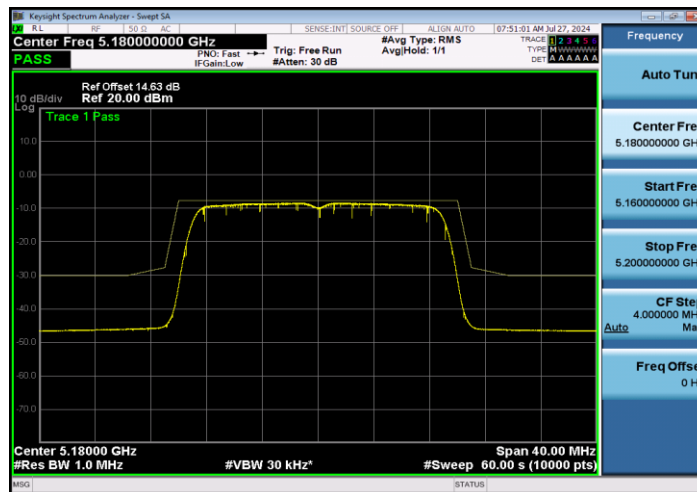
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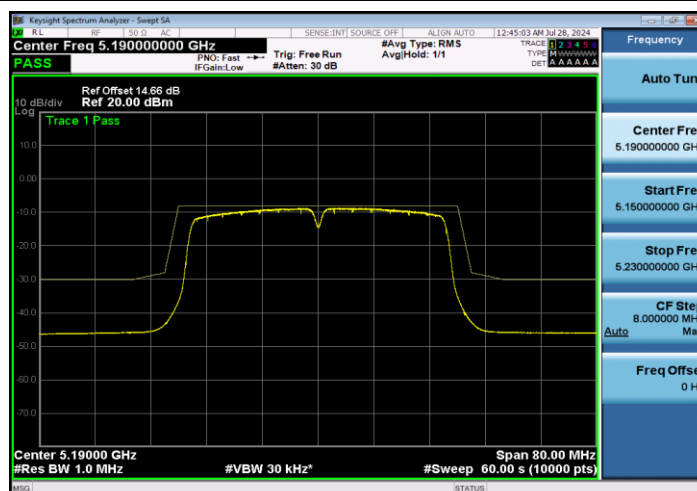
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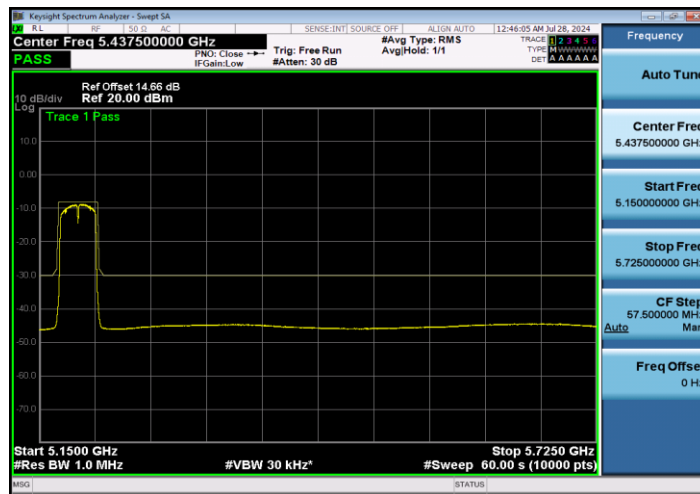


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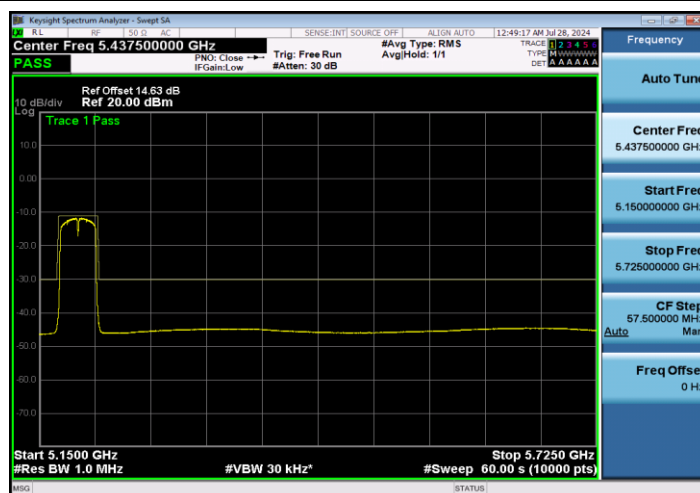
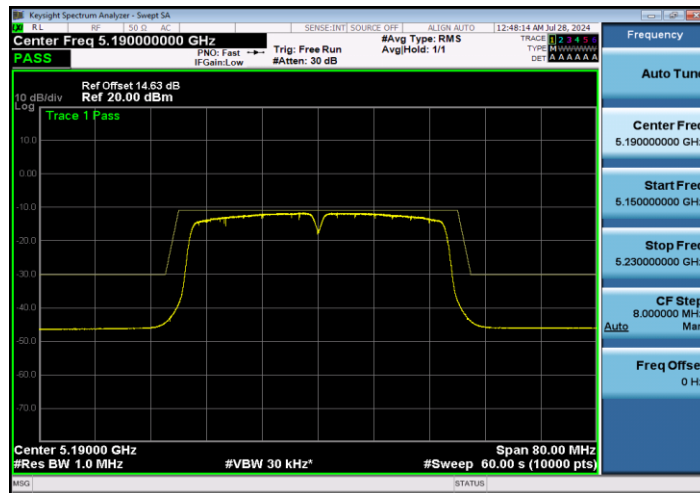




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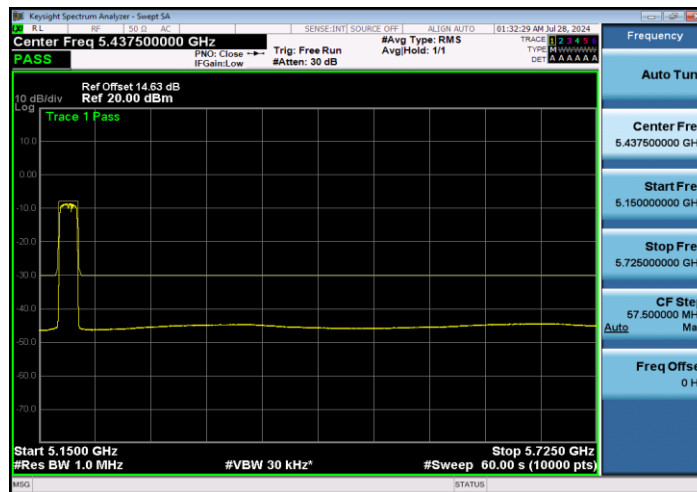
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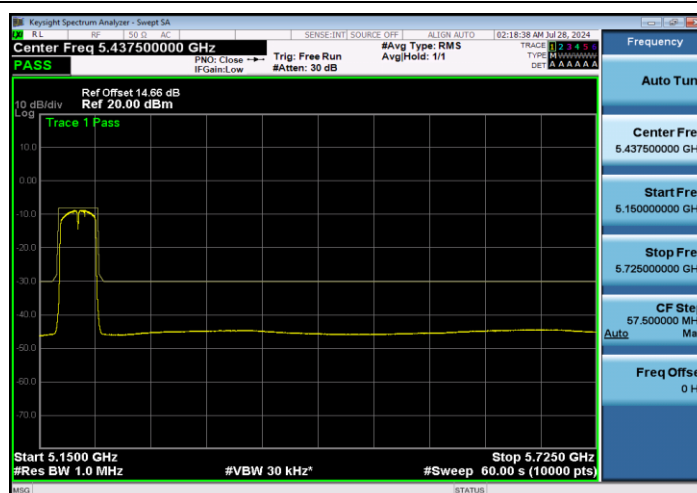
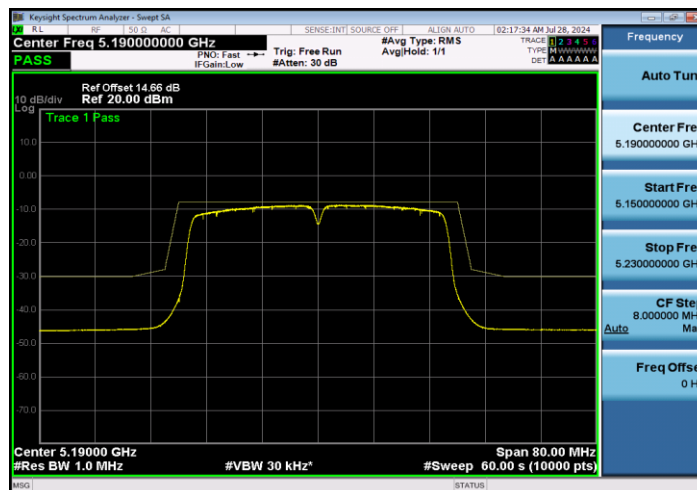
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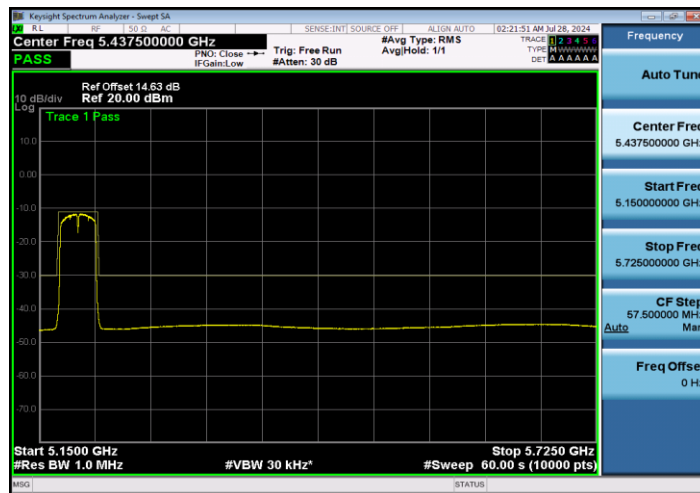
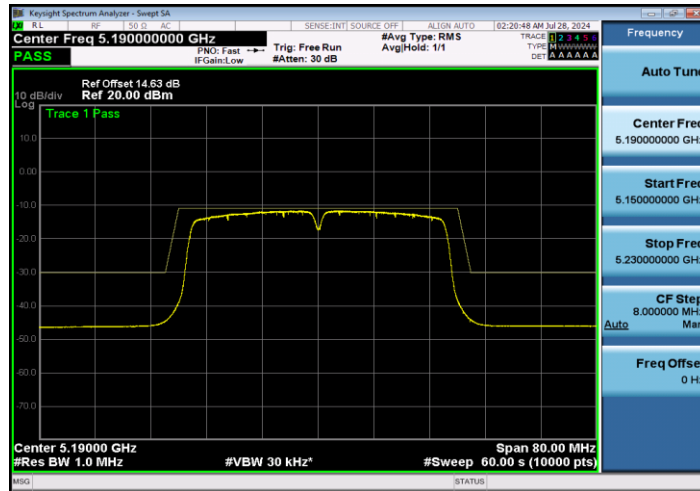


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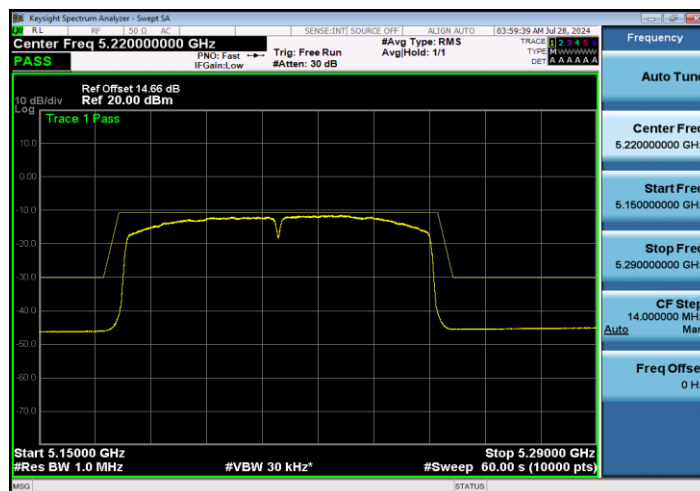


11AC40MIMO_Ant2_5190

TEST REPORT N°: KSK-ESH-P24071264B-5

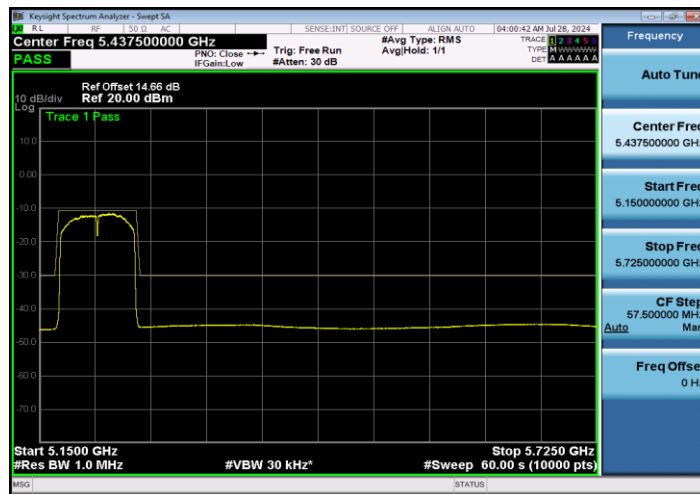


11AC80MIMO_Ant1_5210

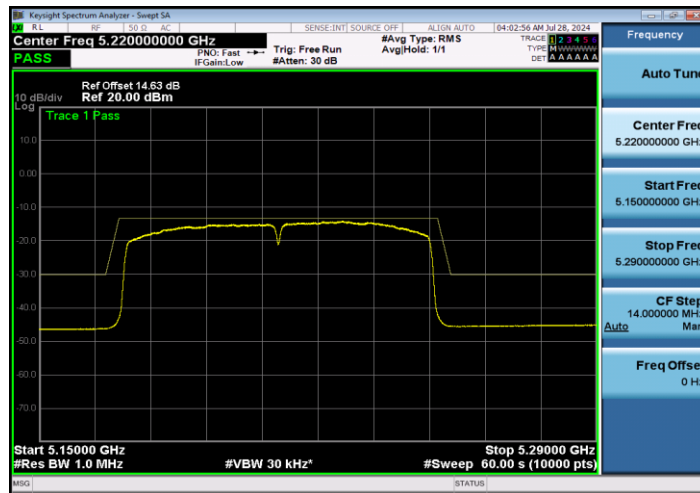




TEST REPORT N°: KSK-ESH-P24071264B-5



11AC80MIMO_Ant2_5210





TEST REPORT N°: KSK-ESH-P24071264B-5

3.7 Receiver Spurious Radiation

3.7.1 Limit of Receiver Spurious Radiation

Frequency Range	Maximum Power Limit ERP (≤ 1 GHz) EIRP (>1 GHz)	Measurement Bandwidth
30 MHz ~ 1 GHz	-57dBm	100 kHz
1 GHz ~ 26 GHz	-47dBm	1 MHz

3.7.2 Test Procedure

Refer to EN 301 893 V2.1.1 clause 5.4.7

Measurement Method	
☐ Conducted measurement	☒ Radiated measurement
<u>For Conducted measurement:</u> The level of unwanted emissions shall be measured as their power in a specified load (conducted spurious emissions) and their effective radiated power when radiated by the cabinet or structure of the equipment with the antenna connector(s) terminated by a specified load (cabinet radiation).	
<u>Conducted measurement (For equipment with multiple transmit chains):</u> ☐ Option 1: The results for each of the transmit chains for the corresponding 1MHz segments shall be added and compared with the limits. ☐ Option 2: The results for each of the transmit chains shall be individually compared with the limits after these limits have been reduced by $10 \times \log(N)$ (number of active transmit chains)	

3.7.3 Deviation from Test Standard

No deviation.

3.7.4 Test Setup

- For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration).
- Testing was performed when the equipment was in a receive-only mode.
- The measurement was performed at normal environmental conditions only. Controlling software ({software}) has been activated to set the EUT on specific status.
- The measurement channels were performed in accordance with EN 301 893 clause 5.3.2.



TEST REPORT N°: KSK-ESH-P24071264B-5

3.7.5 Test Results

Below 1GHz worst-Case Data:

WCT1DR2201D

802.11a

Frequency Range	30MHz ~ 1GHz	Operating Channel	Receiver mode
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Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
120.42	H	-61.67	-57.00	4.67
143.18	H	-59.33	-57.00	2.33
165.98	H	-58.58	-57.00	1.58
259.45	H	-66.57	-57.00	9.57
322.23	H	-65.52	-57.00	8.52
453.52	H	-61.56	-57.00	4.56
103.12	V	-58.67	-57.00	1.67
120.66	V	-61.23	-57.00	4.23
249.93	V	-67.72	-57.00	10.72
313.75	V	-65.68	-57.00	8.68
447.05	V	-63.83	-57.00	6.83
500.72	V	-64.18	-57.00	7.18

WC0NR2201

802.11a

Frequency Range	30MHz ~ 1GHz	Operating Channel	Receiver mode
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Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
45.24	H	-62.76	-57.00	5.76
67.52	H	-59.54	-57.00	2.54
115.31	H	-66.19	-57.00	9.19
154.89	H	-59.47	-57.00	2.47
211.67	H	-65.52	-57.00	8.52
276.74	H	-65.38	-57.00	8.38
123.39	V	-63.25	-57.00	6.25
181.64	V	-65.17	-57.00	8.17
252.57	V	-64.14	-57.00	7.14
317.26	V	-66.22	-57.00	9.22
398.58	V	-64.18	-57.00	7.18
642.93	V	-65.23	-57.00	8.23



TEST REPORT N°: KSK-ESH-P24071264B-5

Above 1GHz worst-Case Data:

WCT1DR2201D

802.11a

Frequency Range	1GHz ~ 26.5GHz	Operating Channel	Receiver mode
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Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
1872.40	H	-69.34	-47.00	22.34
2415.70	H	-65.46	-47.00	18.46
4498.60	H	-64.67	-47.00	17.67
6548.55	H	-60.54	-47.00	13.54
11518.60	H	-54.18	-47.00	7.18
12126.30	H	-54.27	-47.00	7.27
1325.45	V	-73.45	-47.00	26.45
2430.00	V	-65.22	-47.00	18.22
5496.25	V	-62.54	-47.00	15.54
8765.05	V	-57.49	-47.00	10.49
11498.65	V	-54.67	-47.00	7.67
14360.75	V	-54.52	-47.00	7.52

WC0NR2201

802.11a

Frequency Range	1GHz ~ 26.5GHz	Operating Channel	Receiver mode
-----------------	----------------	-------------------	---------------

Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
1876.50	H	-64.73	-47.00	17.73
2436.79	H	-61.22	-47.00	14.22
4497.60	H	-58.55	-47.00	11.55
6540.65	H	-55.43	-47.00	8.43
11530.70	H	-53.21	-47.00	6.21
12175.80	H	-49.37	-47.00	2.37
1343.65	V	-59.62	-47.00	12.62
2450.00	V	-57.11	-47.00	10.11
5489.65	V	-55.26	-47.00	8.26
8760.75	V	-54.64	-47.00	7.64
11478.25	V	-54.28	-47.00	7.28
14300.50	V	-50.36	-47.00	3.36



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3.8 Adaptivity

3.8.1 Product information for Adaptivity (Channel Access Mechanism)

Adaptivity (Channel Access Mechanism)	
☐ Frame Based Equipment	☐ The Frame Based Equipment operates as an Initiating Device
	☐ The Frame Based Equipment operates as an Responding Device
	☐ The Frame Based Equipment can operate as an Initiating Device and as a Responding Device
☒ Load Based Equipment	☐ The Load Based Equipment operates as a Supervising Device
	☒ The Load Based Equipment operates as a Supervised Device
	☐ The Load Based Equipment can operate as a Supervising and as a Supervised Device

Priority Classes implemented by the Load Based Equipment	
☐ Operating as a Supervising Device	☐ Priority Class 4 (Highest priority)
	☐ Priority Class 3
	☐ Priority Class 2 ☐ Note 1 ☐ Note 2
	☐ Priority Class 1 (Lowest priority) ☐ Note 1
☒ Operating as a Supervised Device	☐ Priority Class 4 (Highest priority)
	☐ Priority Class 3
	☒ Priority Class 2 ☐ Note 1
	☐ Priority Class 1 (Lowest priority) ☐ Note 1

Energy Detection Threshold Level(TL)	
☐ Frame Based Equipment	For $P_H \leq 13$ dBm : TL = -75 dBm/MHz For $13 \text{ dBm} < P_H < 23 \text{ dBm}$: TL = -85 dBm/MHz + (23 dBm - P_H) For $P_H \geq 23$ dBm : TL = -85 dBm/MHz (assumes a 0 dBi receive antenna and P_H to be specified in dBm e.i.r.p)
☒ Load Based Equipment	☒ Option 1: TL = -75 dBm/MHz (assumes a 0 dBi receive antenna)
	☐ Option 2: For $P_H \leq 13$ dBm : TL = -75 dBm/MHz For $13 \text{ dBm} < P_H < 23 \text{ dBm}$: TL = -85 dBm/MHz + (23 dBm - P_H) For $P_H \geq 23$ dBm : TL = -85 dBm/MHz (assumes a 0 dBi receive antenna and P_H to be specified in dBm e.i.r.p)



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3.8.2 Requirements and Limits of Adaptive

Channel Access Mechanism		
Requirement	Frame Based Equipment	Load Based Equipment
Minimum Clear Channel Assessment (CCA) Time	9 μs	9 μs
Maximum Channel Occupancy (COT) Time	95 % of the Fixed Frame Period (Note 1)	2 ~ 10 ms(See Table 1 & 2)
Minimum Idle Period	5% COT, with a min of 100 μs	25μs
Extended CCA check	NA	NA
Short Control Signalling Transmissions	Maximum duty cycle of 5 % within an observation period of 50 ms	
Note 1: The Fixed Frame Periods supported by the equipment shall be declared by the manufacturer and shall be within the range of 1 ms to 10 ms.		

Table 1: Priority Class dependent Channel Access parameters for Supervising Devices

Class #	p_0	CW_{min}	CW_{max}	maximum Channel Occupancy Time (COT)
4	1	3	7	2 ms
3	1	7	15	4 ms
2	3	15	63	6 ms (see note 1 and note 2)
1	7	15	1 023	6 ms (see note 1)
NOTE 1: The maximum <i>Channel Occupancy Time</i> (COT) of 6 ms may be increased to 8 ms by inserting one or more pauses. The minimum duration of a pause shall be 100 μ s. The maximum duration (Channel Occupancy) before including any such pause shall be 6 ms. Pause duration is not included in the channel occupancy time.				
NOTE 2: The maximum Channel Occupancy Time (COT) of 6 ms may be increased to 10 ms by extending CW to $CW \times 2 + 1$ when selecting the random number q for any backoff(s) that precede the Channel Occupancy that may exceed 6 ms or which follow the Channel Occupancy that exceeded 6 ms. The choice between preceding or following a Channel Occupancy shall remain unchanged during the operation time of the device.				
NOTE 3: The values for p_0 , CW_{min} , CW_{max} are minimum values. Greater values are allowed.				

Table 2: Priority Class dependent Channel Access parameters for Supervised Devices



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Class #	p ₀	CW _{min}	CW _{max}	Maximum Channel Occupancy Time (COT)
4	2	3	7	2 ms
3	2	7	15	4 ms
2	3	15	1 023	6 ms (see note 1)
1	7	15	1 023	6 ms (see note 1)

NOTE 1: The maximum *Channel Occupancy Time* (COT) of 6 ms may be increased to 8 ms by inserting one or more pauses. The minimum duration of a pause shall be 100 μs. The maximum duration (Channel Occupancy) before including any such pause shall be 6 ms. Pause duration is not included in the channel occupancy time.

NOTE 2: The values for p₀, CW_{min}, CW_{max} are minimum values. Greater values are allowed.

Table 3: Classification of Idle Periods dependent Priority Class for Supervising Devices

Class #	Idle Periods Classification
4	$B_n = \begin{cases} [0, 23[\mu s, & n = 0 \\ [23 + 9 \times (n - 1), 23 + 9 \times n[\mu s, & 1 \leq n \leq 3 \\ [50, \infty[\mu s, & n = 4 \end{cases}$
3	$B_n = \begin{cases} [0, 23[\mu s, & n = 0 \\ [23 + 9 \times (n - 1), 23 + 9 \times n[\mu s, & 1 \leq n \leq 7 \\ [86, \infty[\mu s, & n = 8 \end{cases}$
2	$B_n = \begin{cases} [0, 41[\mu s, & n = 0 \\ [41 + 9 \times (n - 1), 41 + 9 \times n[\mu s, & 1 \leq n \leq 31 \text{ (use of note 2 in table 1)} \\ [320, \infty[\mu s, & n = 32 \end{cases}$ $B_n = \begin{cases} [0, 41[\mu s, & n = 0 \\ [41 + 9 \times (n - 1), 41 + 9 \times n[\mu s, & 1 \leq n \leq 15 \text{ (not use of note 2 in table 1)} \\ [176, \infty[\mu s, & n = 16 \end{cases}$
1	$B_n = \begin{cases} [0, 77[\mu s, & n = 0 \\ [77 + 9 \times (n - 1), 77 + 9 \times n[\mu s, & 1 \leq n \leq 15 \\ [212, \infty[\mu s, & n = 16 \end{cases}$

Table 4: Classification of Idle Periods dependent Priority Class for Supervised Devices

Class #	Idle Periods Classification
4	$B_n = \begin{cases} [0, 32[\mu s, & n = 0 \\ [32 + 9 \times (n - 1), 32 + 9 \times n[\mu s, & 1 \leq n \leq 3 \\ [59, \infty[\mu s, & n = 4 \end{cases}$
3	$B_n = \begin{cases} [0, 32[\mu s, & n = 0 \\ [32 + 9 \times (n - 1), 32 + 9 \times n[\mu s, & 1 \leq n \leq 7 \\ [95, \infty[\mu s, & n = 8 \end{cases}$
2	$B_n = \begin{cases} [0, 41[\mu s, & n = 0 \\ [41 + 9 \times (n - 1), 41 + 9 \times n[\mu s, & 1 \leq n \leq 15 \\ [176, \infty[\mu s, & n = 16 \end{cases}$
1	$B_n = \begin{cases} [0, 77[\mu s, & n = 0 \\ [77 + 9 \times (n - 1), 77 + 9 \times n[\mu s, & 1 \leq n \leq 15 \\ [212, \infty[\mu s, & n = 16 \end{cases}$

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Table 5: Idle Periods probability dependent Priority Class

Class #	Idle Periods probability
4	$p(n) \leq \begin{cases} 0,05, & n = 0 \\ 0,05 + n \times 0,25, & 1 \leq n \leq 3 \\ 1, & n > 3 \end{cases}$
3	$p(n) \leq \begin{cases} 0,05, & n = 0 \\ 0,18, & n = 1 \\ 0,18 + (n - 1) \times 0,125, & 2 \leq n \leq 6 \\ 1, & n > 6 \end{cases}$
2	$p(n) \leq \begin{cases} 0,05, & n = 0 \\ 0,12, & n = 1 \\ 0,12 + (n - 1) \times 0,03125, & 2 \leq n \leq 29 \end{cases} \text{ (use of note 2 in table 1)}$ $p(n) \leq \begin{cases} 0,05, & n = 0 \\ 0,12, & n = 1 \\ 0,12 + (n - 1) \times 0,0625, & 2 \leq n \leq 15 \end{cases} \text{ (not use of note 2 in table 1)}$ $p(n) \leq \begin{cases} 0,05, & n = 0 \\ 0,09 + (n - 1) \times 0,03125, & 1 \leq n \leq 7 \\ 0,59 + (n - 1) \times 0,03125, & 8 \leq n \leq 14 \\ 1, & n > 14 \end{cases} \text{ (use of note 1 in table 1 \& table 2)}$
1	$p(n) \leq \begin{cases} 0,05, & n = 0 \\ 0,12, & n = 1 \\ 0,12 + (n - 1) \times 0,0625, & 2 \leq n \leq 15 \\ 1, & n > 15 \end{cases}$
1. E define the total number of Idle Periods observed. Then E is the sum of events in all bins: $E = \sum_{n=0}^k H(B_n)$ 2. p(n) define the probability that idle periods of duration less than the upper limit specified for bin B_n occurred, p(n) = p (Idle Period < upper limit of bin B_n) $p(n) = \frac{\sum_{i=0}^n H(B_i)}{E}$	

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3.8.3 Test Procedure

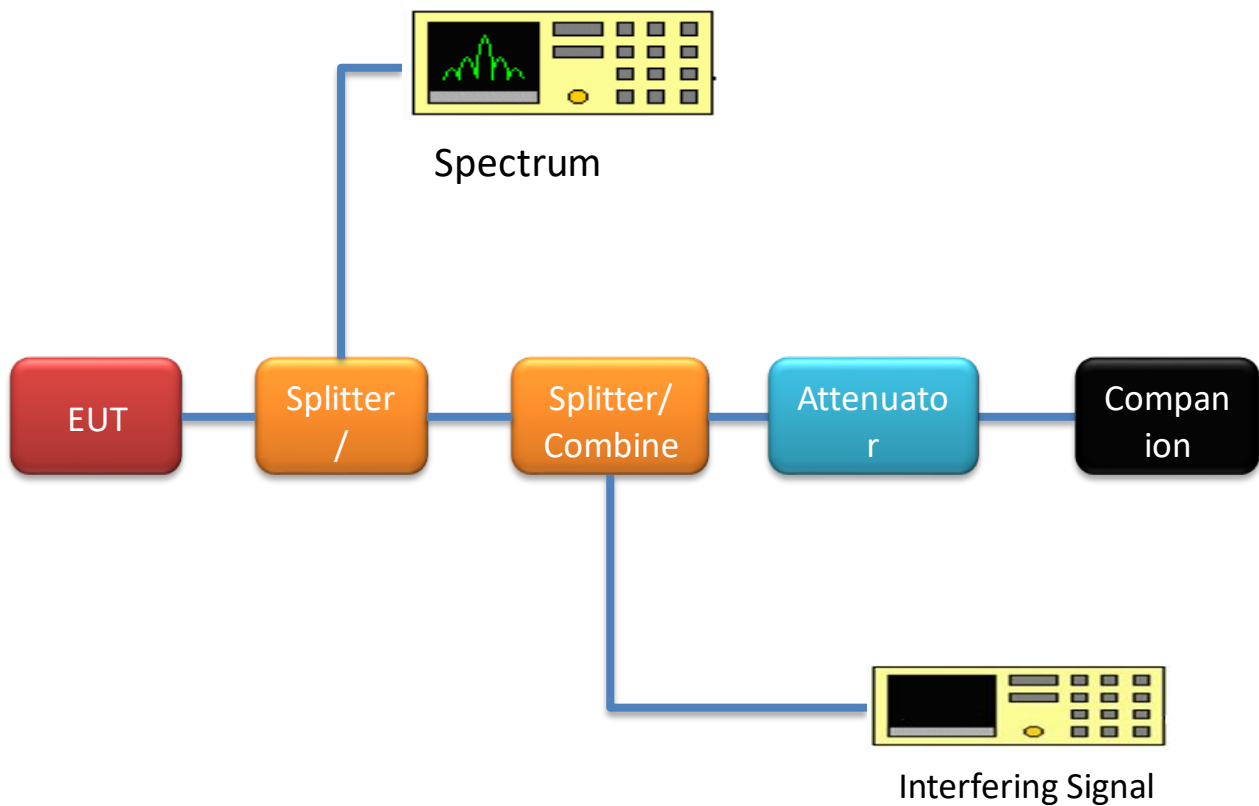
Refer to EN 301 893 V2.1.1 clause 5.4.9

Measurement Method	
☒ Conducted measurement	☐ Radiated measurement

3.8.4 Deviation from Test Standard

No deviation.

3.8.5 Test Setup Configuration



Companion Device information

Product	Brand	Model No.	Software/Firmware Version
Nighthawk X4S AC2600 Smart WIFI Router	NETGEAR	R7800	V1.0.1.30-csu4-0519



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3.8.6 List of Measurement

Clause	Test Parameter	Remarks	Pass/Fail
4.2.7.3.1	Adaptive (Frame Based Equipment)	Not Applicable	NA
4.2.7.3.2	Adaptive (Load Based Equipment)	Applicable	Pass
4.2.7.3.3	Short Control Signalling Transmissions	Applicable	Pass

3.8.7 Test Result

3.8.7.1 Adaptive Test Result

Channel Operation of EUT Device type

WCT1DR2201D

☐ Frame Based Equipment	☐ Single Channel Operation
	☐ Multi-Channel Operation
☒ Load Based Equipment	☒ Single Channel Operation
	☐ Option 1 for Multi-Channel Operation
	☒ Option 2 for Multi-Channel Operation

WC0NR2201

☒ Frame Based Equipment	☒ Single Channel Operation
	☒ Multi-Channel Operation
☐ Load Based Equipment	☐ Single Channel Operation
	☐ Option 1 for Multi-Channel Operation
	☐ Option 2 for Multi-Channel Operation

Operating Frequency Bands and Mode of EUT

WCT1DR2201D

Operational Mode	Operating Frequency (MHz)	Test Result
802.11a	5180	Pass
802.11n(40MHz)	5190	Pass

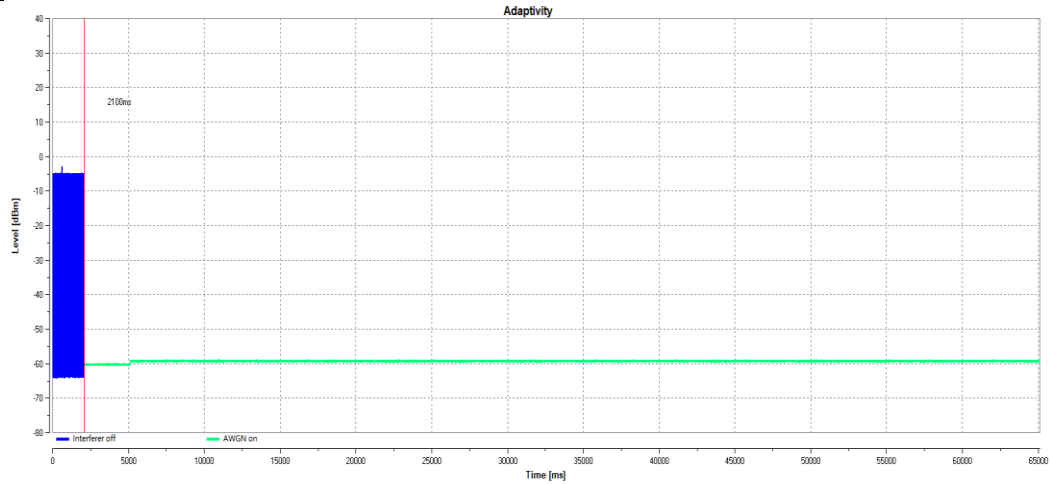
WC0NR2201

Operational Mode	Operating Frequency (MHz)	Test Result
802.11a	5180	Pass
802.11n(40MHz)	5190	Pass

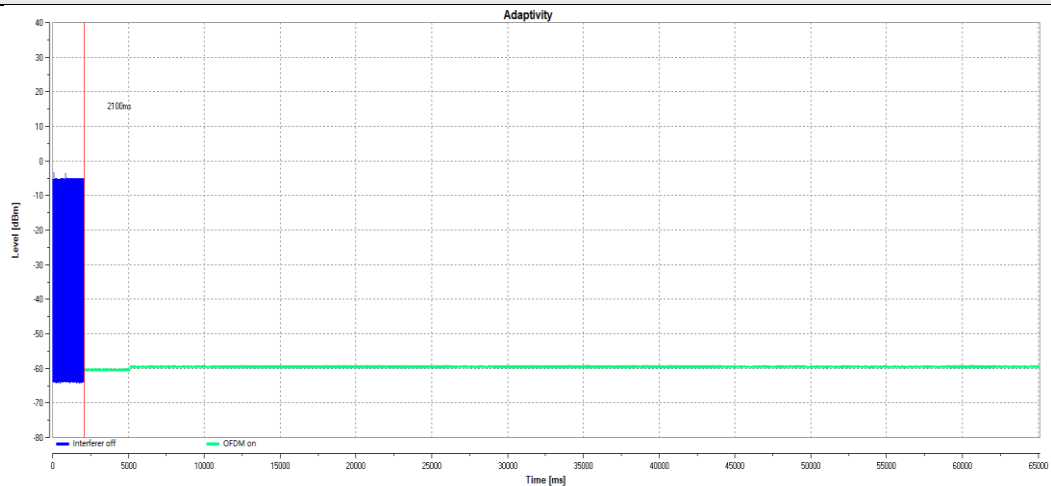
TEST REPORT N°: KSK-ESH-P24071264B-5

Wireless Module (WCT1DR2201D)

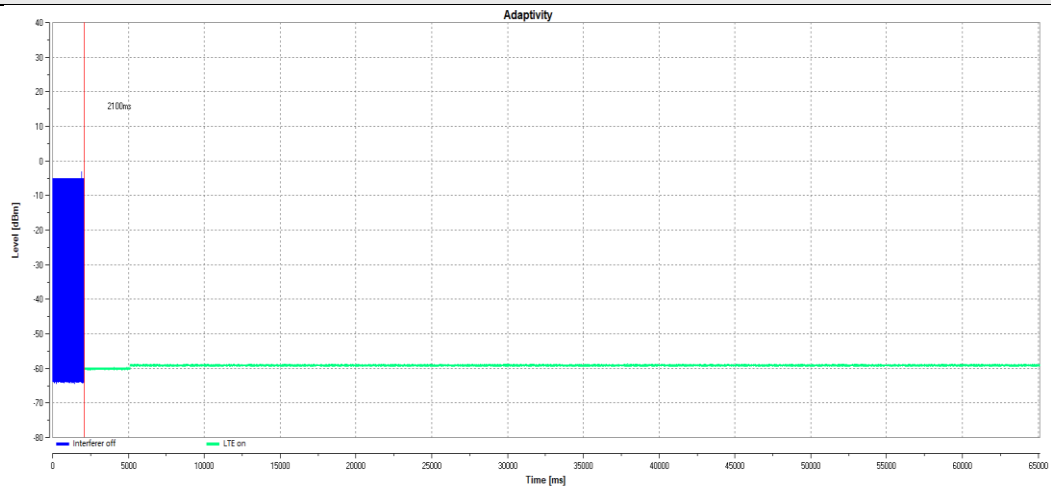
11A_5180_Additive White Gaussian Noise (AWGN) signal test result



11A_5180_OFDM signal test result

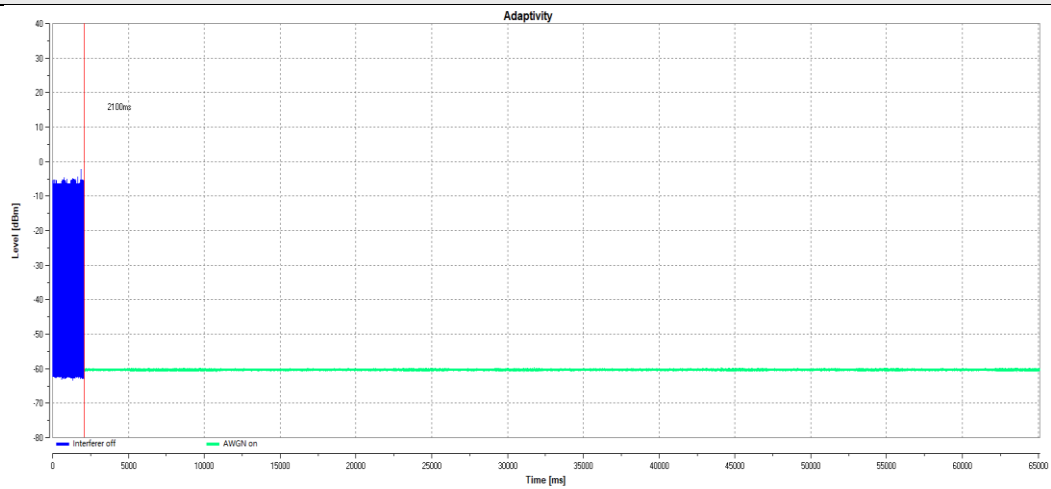


11A_5180_LTE test signal



TEST REPORT N°: KSK-ESH-P24071264B-5

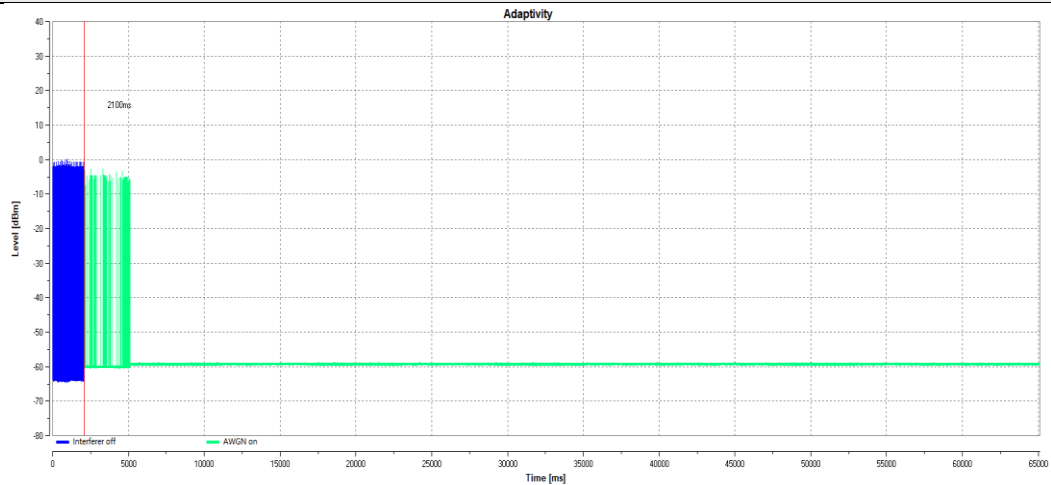
11N40_5190_Additive White Gaussian Noise (AWGN) signal test result



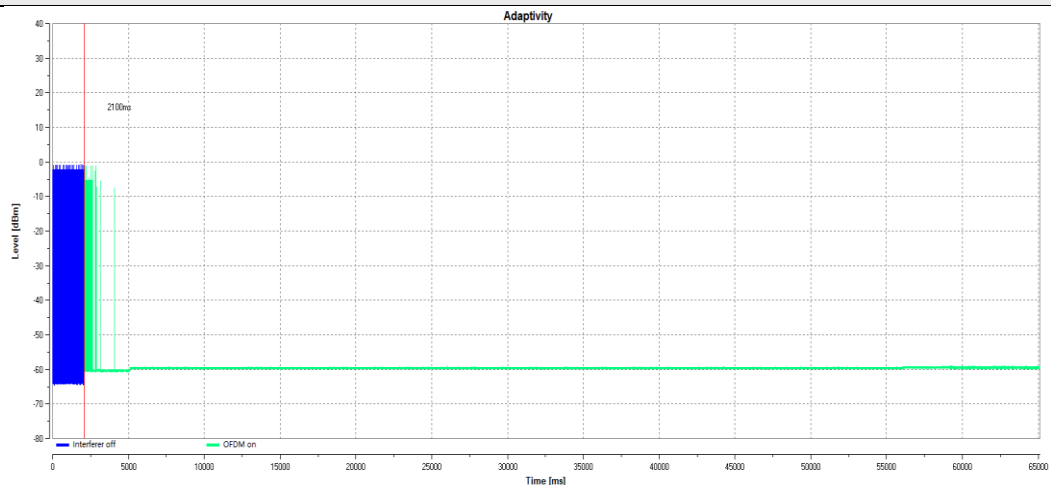
TEST REPORT N°: KSK-ESH-P24071264B-5

Wireless Module (WCONR2201)

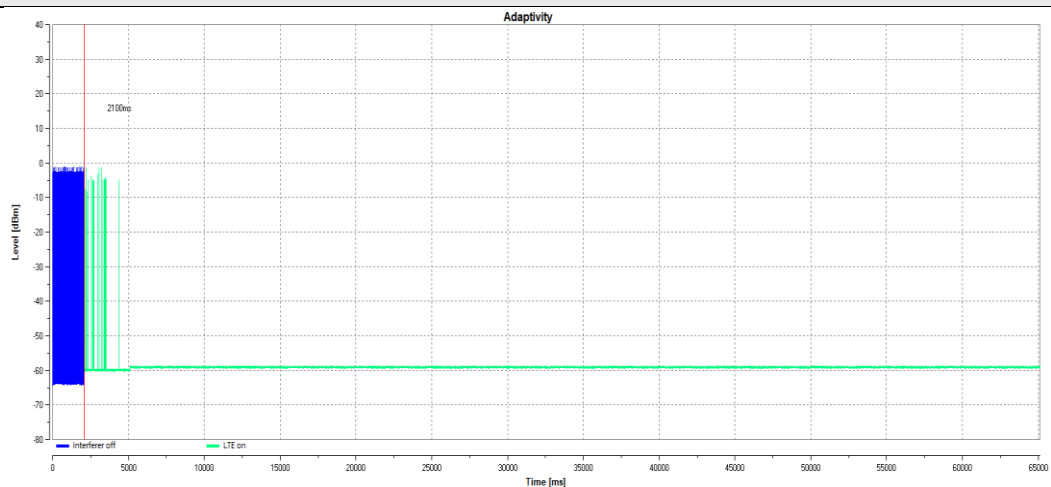
11A_5180_Additive White Gaussian Noise (AWGN) signal test result



11A_5180_OFDM signal test result

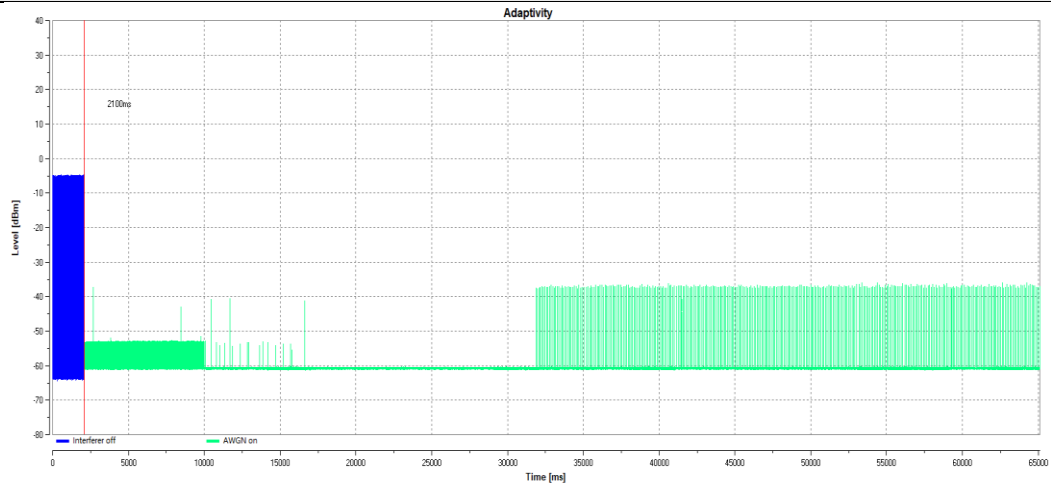


11A_5180_LTE test signal



TEST REPORT N°: KSK-ESH-P24071264B-5

11N40_5190_Additive White Gaussian Noise (AWGN) signal test result



TEST REPORT N°: KSK-ESH-P24071264B-5

3.8.7.2 Test results of Channel Access Mechanism

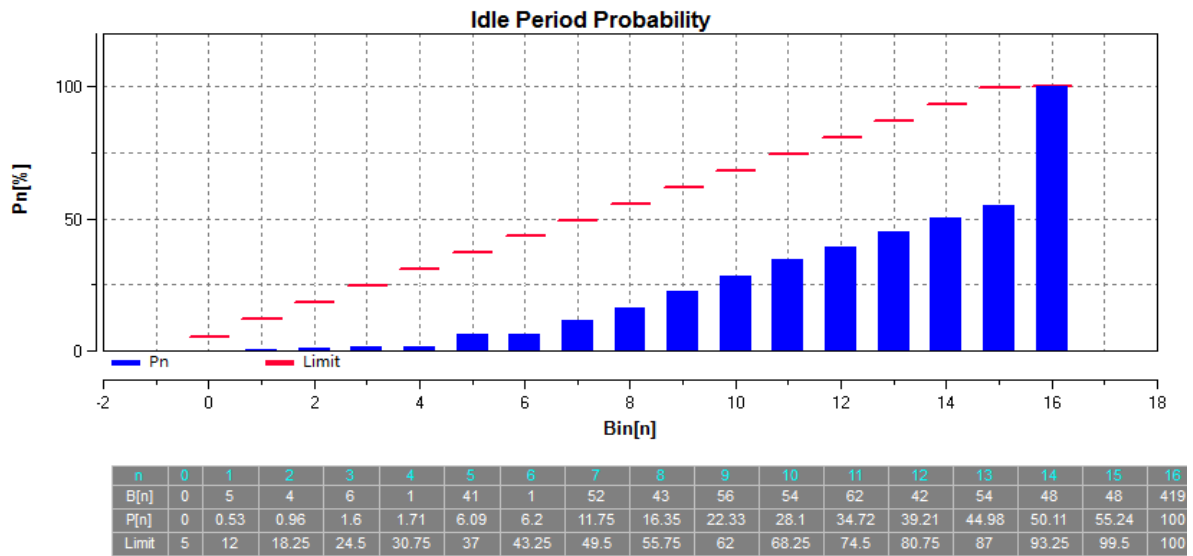
Channel Access Mechanism of EUT type

☐ Frame Based Equipment	
☒ Load Based Equipment	☒ Option A : verify Channel Access Mechanism
	☐ Option B : declaration by manufacturer

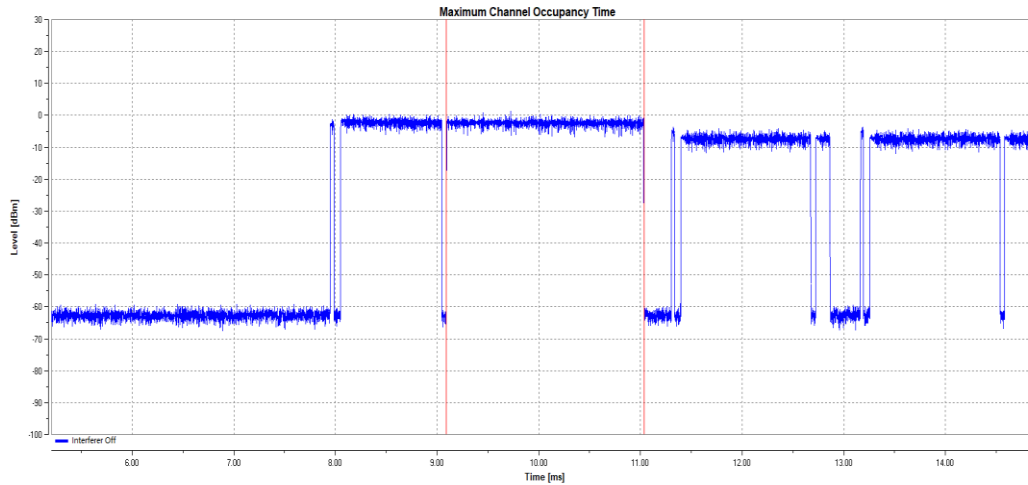
Operating Frequency Bands and Mode of EUT

Wireless Module (WCT1DR2201D)

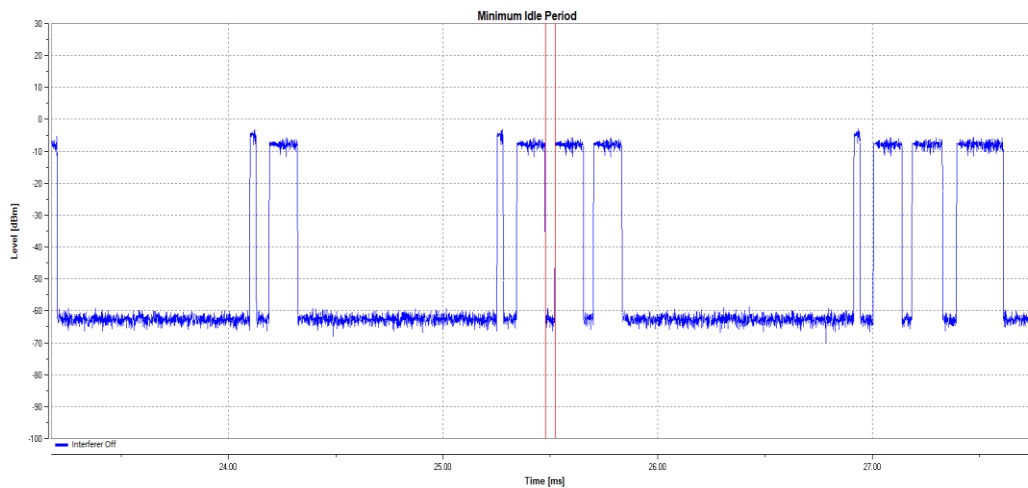
Operational Mode	Operating Frequency (MHz)	Maximum Channel Occupancy Time (ms)	Minimum Idle Period (μs)	Test Result
802.11a	5180	1.942	46	Pass



Maximum Channel Occupancy Time



Minimum Idle Period

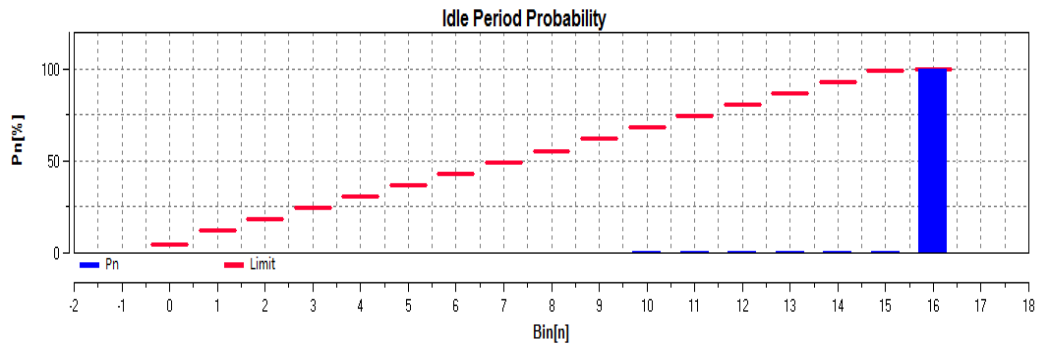




TEST REPORT N°: KSK-ESH-P24071264B-5

Wireless Module (WCONR2201)

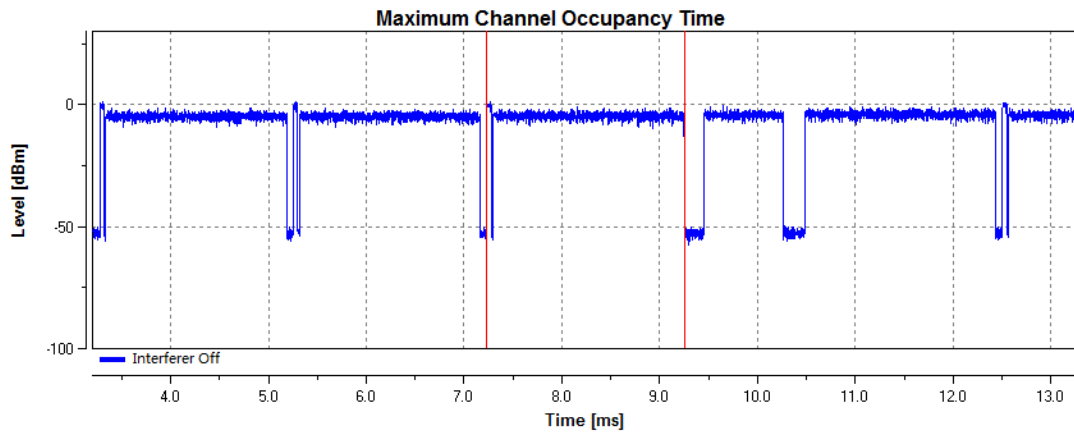
Operational Mode	Operating Frequency (MHz)	Maximum Channel Occupancy Time (ms)	Minimum Idle Period (μs)	Test Result
802.11a	5180	2.016	35	Pass



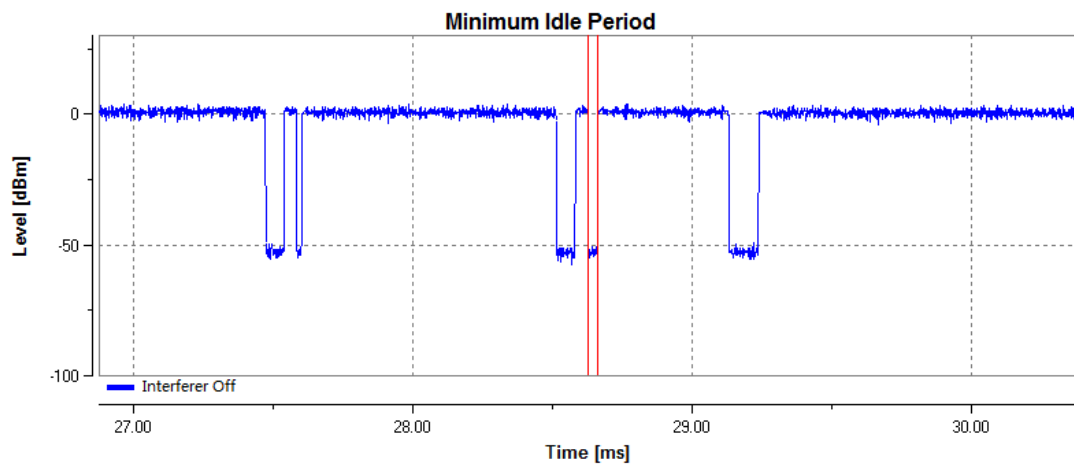
n	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
B[n]	0	1	0	0	0	1	0	0	1	0	1	0	0	0	0	1	997
P[n]	0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	100
Limit	5	12	18.25	24.5	30.75	37	43.25	49.5	55.75	62	68.25	74.5	80.75	87	93.25	99.5	100

TEST REPORT N°: KSK-ESH-P24071264B-5

Maximum Channel Occupancy Time



Minimum Idle Period





TEST REPORT N°: KSK-ESH-P24071264B-5

3.8.7.3 Short Control Signalling Transmissions Result

Wireless Module (WCT1DR2201D)

Short Control Signalling Transmission Result				
Operational Mode	Interference signal	SCST total on time (ms)	SCST Limit (ms)	PASS/FAIL
802.11a	AWGN signal	0	2.5	PASS
	OFDM signal	0	2.5	PASS
	LTE signal	0	2.5	PASS
802.11n(40MHz)	AWGN signal	0	2.5	PASS

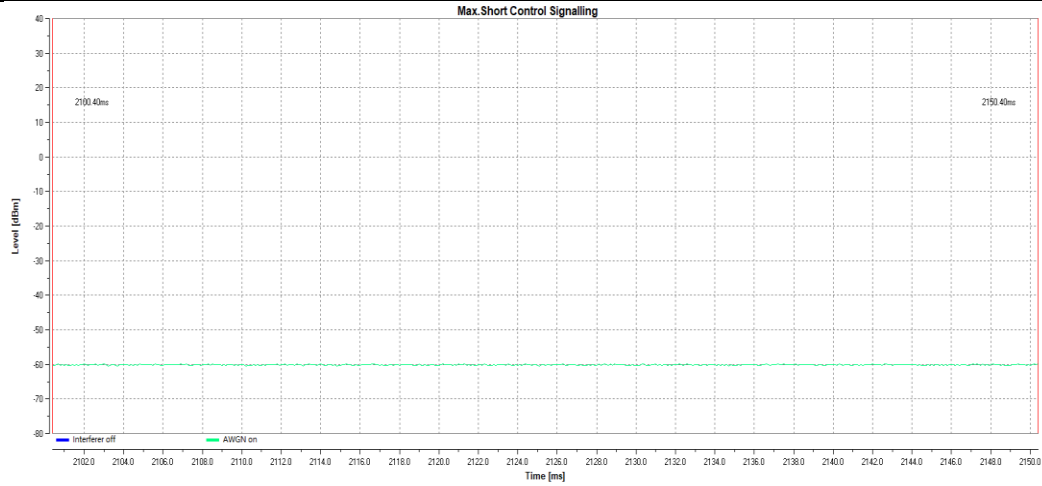
Wireless Module (WC0NR2201)

Short Control Signalling Transmission Result				
Operational Mode	Interference signal	SCST total on time (ms)	SCST Limit (ms)	PASS/FAIL
802.11a	AWGN signal	1.90	2.5	PASS
	OFDM signal	1.80	2.5	PASS
	LTE signal	1.50	2.5	PASS
802.11n(40MHz)	AWGN signal	0.00	2.5	PASS

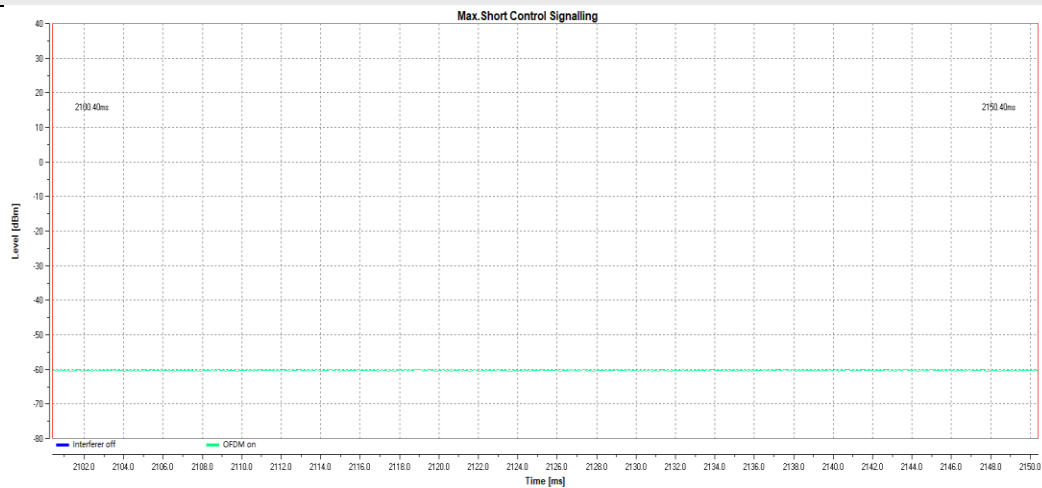
TEST REPORT N°: KSK-ESH-P24071264B-5

WCT1DR2201D

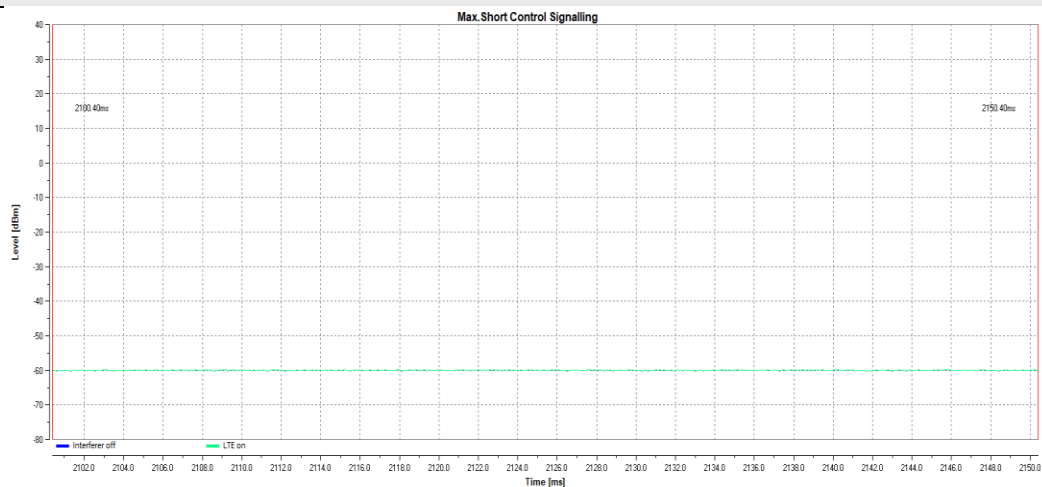
11A_5180_Additive White Gaussian Noise (AWGN) signal test result



11A_5180_OFDM signal test result

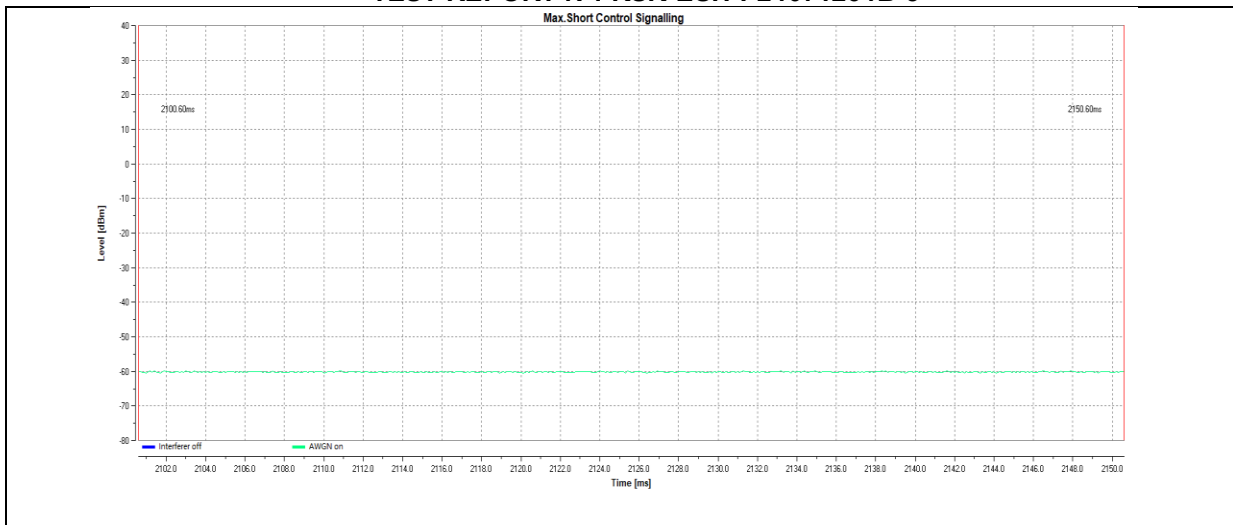


11A_5180_LTE signal test result



11N40_5190_Additive White Gaussian Noise (AWGN) signal test result

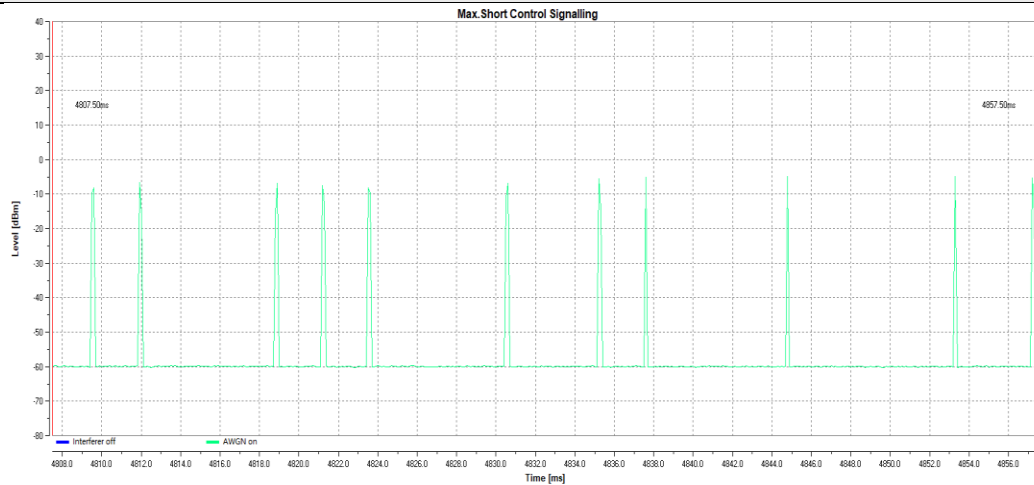
TEST REPORT N°: KSK-ESH-P24071264B-5



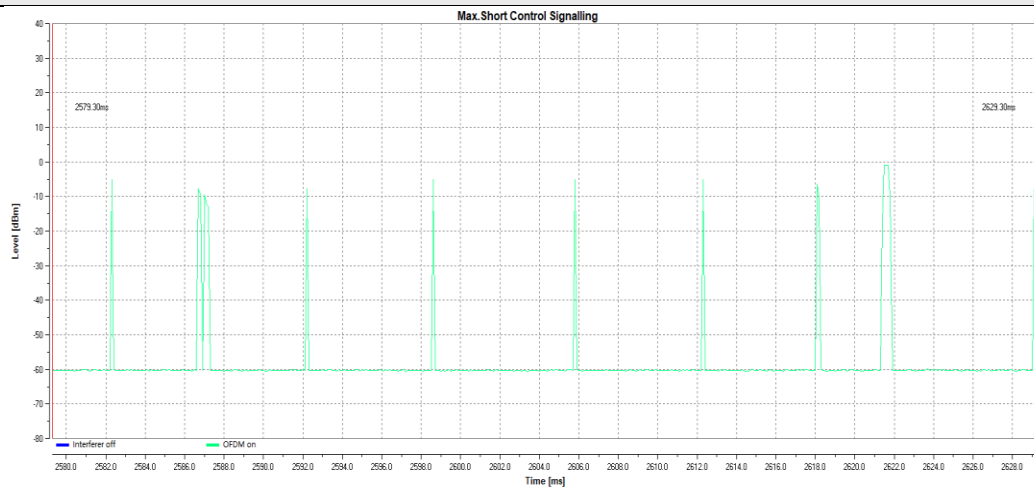
TEST REPORT N°: KSK-ESH-P24071264B-5

Wireless Module (WCONR2201)

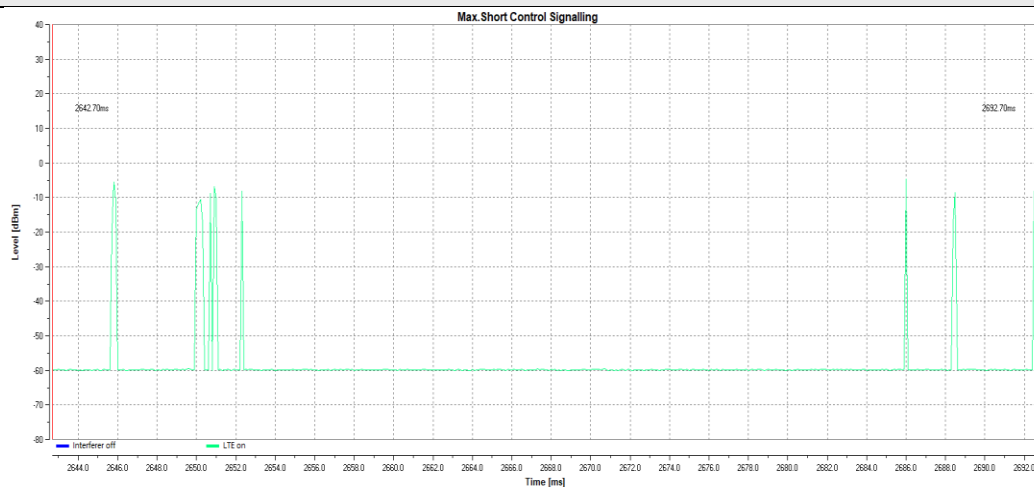
11A_5180_Additive White Gaussian Noise (AWGN) signal test result



11A_5180_OFDM signal test result

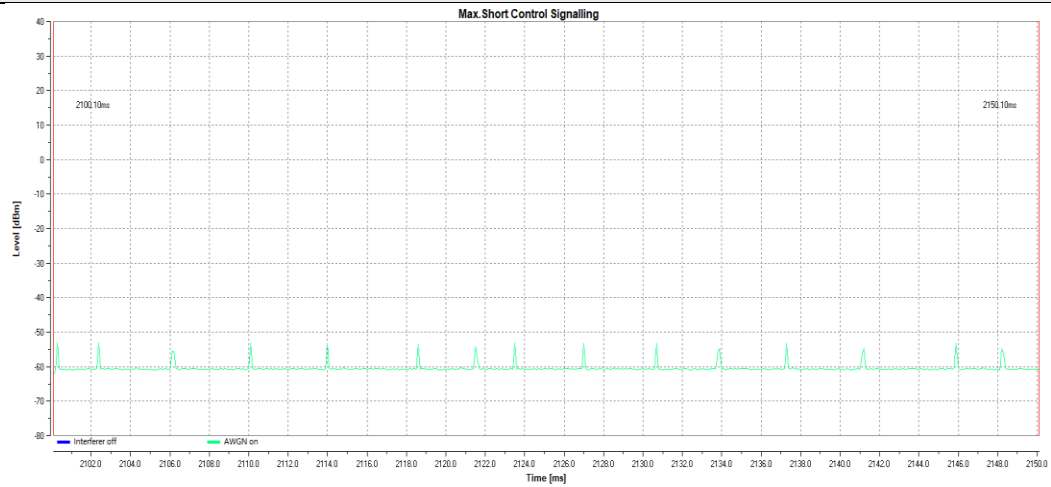


11A_5180_LTE signal test result



TEST REPORT N°: KSK-ESH-P24071264B-5

11N40_5190_Additive White Gaussian Noise (AWGN) signal test result





TEST REPORT N°: KSK-ESH-P24071264B-5

3.9 Receiver Blocking

3.9.1 Limit of Receiver Blocking

Receiver Blocking Criterion	
Minimum performance criterion	☒ PER $\leq$ 10%
	☐ Alternative performance criteria (See note)
Note: The manufacturer was declared performance criteria is x% for the intended use of the equipment.	

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 note 3)	Slave without radar detection (see note 3)	
$P_{\min} + 6$ dB	5100	-53	-59	CW
$P_{\min} + 6$ dB	4900 5000 5975	-47	-53	CW
NOTE 1: $P_{\min}$ is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined in 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. NOTE 3: Slave devices with a maximum e.i.r.p. of less than 23 dBm do not have to implement radar detection unless these devices are used in fixed outdoor point to point or fixed outdoor point to multipoint applications				

3.9.2 Test Procedure

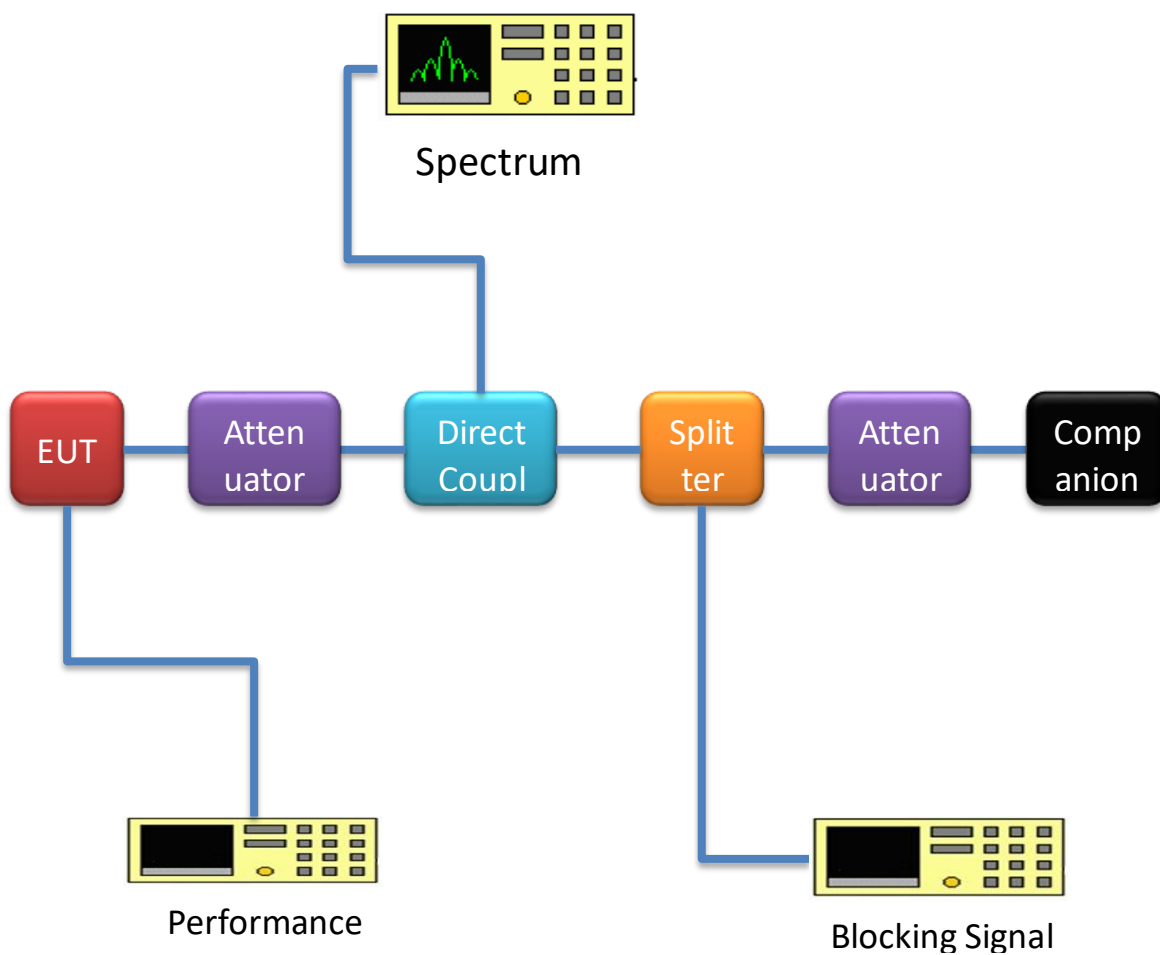
Refer to EN 301 893 V2.1.1 clause 5.4.10

Measurement Method	
☒ Conducted measurement	☐ Radiated measurement

3.9.3 Deviation from Test Standard

No deviation.

3.9.4 Test Setup Configuration





TEST REPORT N°: KSK-ESH-P24071264B-5

3.9.5 Test Results

Receiver blocking performance when operating at the lowest operating channel	
The actual blocking signal power(Note1)	antenna gain(G) :3.28dBi
	☒ at the antenna connector
	☐ in front of the antenna
Note1: For the conducted measurements , the level shall be corrected as follows: the actual blocking signal power = blocking signal power + G	

Wireless Module (WCT1DR2201D)

TestMode	Antenna	Channel	Pmin [dBm]	Wanted signal [dBm]	Freq. [MHz]	CW [dBm]	PER [%]	Limit [%]	Verdict
11A	Ant1	5180	-90.35	-84.35	4900	-53	0.10	≤10	PASS
			-90.35	-84.35	5000	-53	0.00	≤10	PASS
			-90.35	-84.35	5100	-59	0.10	≤10	PASS
			-90.35	-84.35	5975	-53	0.00	≤10	PASS

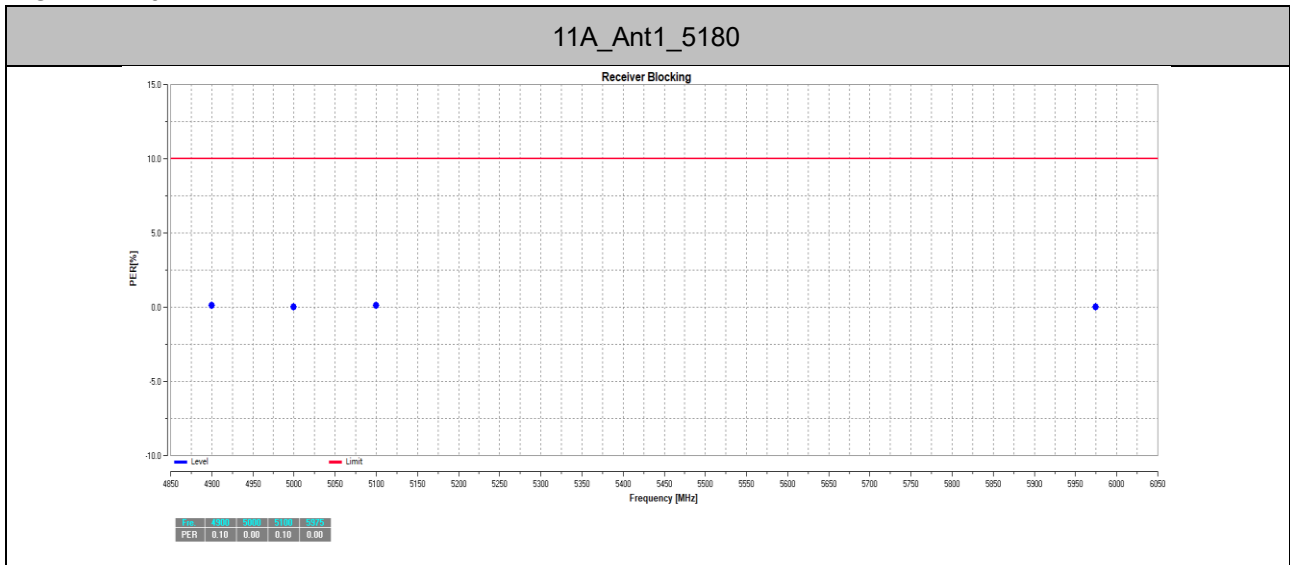
Wireless Module (WC0NR2201)

TestMode	Antenna	Channel	Pmin [dBm]	Wanted signal [dBm]	Freq. [MHz]	CW [dBm]	PER [%]	Limit [%]	Verdict
11A	Ant1	5180	-87.35	-81.35	4900	-53	0.00	≤10	PASS
			-87.35	-81.35	5000	-53	0.00	≤10	PASS
			-87.35	-81.35	5100	-59	0.00	≤10	PASS
			-87.35	-81.35	5975	-53	0.00	≤10	PASS

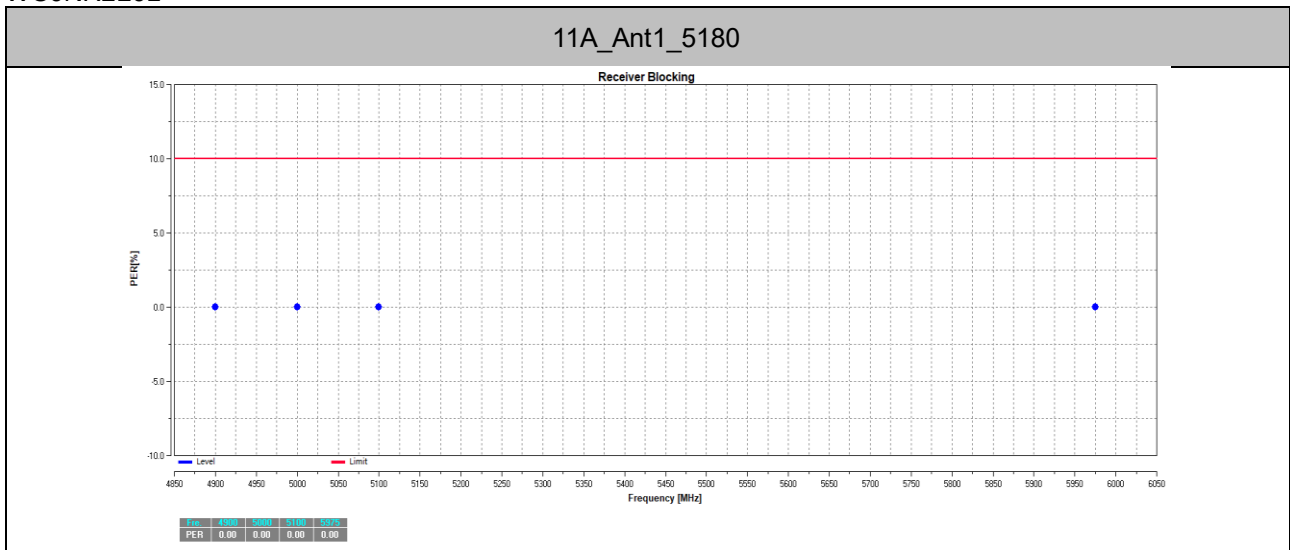


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WCT1DR2201D



WC0NR2201





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3.10 User Access Restrictions

3.10.1 Definition

User Access Restrictions are constraints implemented in the RLAN device to restrict access of the user to any hardware and/or software settings of the equipment, including software replacement(s), which may impact (directly or indirectly) the compliance of the equipment with the requirements in the present document.

NOTE: The user should be understood as the end user, the operator or any person not responsible for the compliance of the equipment against the requirements in the present document.

3.10.2 Requirement

The equipment shall be so constructed that settings (hardware and/or software) related to DFS shall not be accessible to the user if changing those settings result in the equipment no longer being compliant with the DFS requirements in clause 4.2.6.

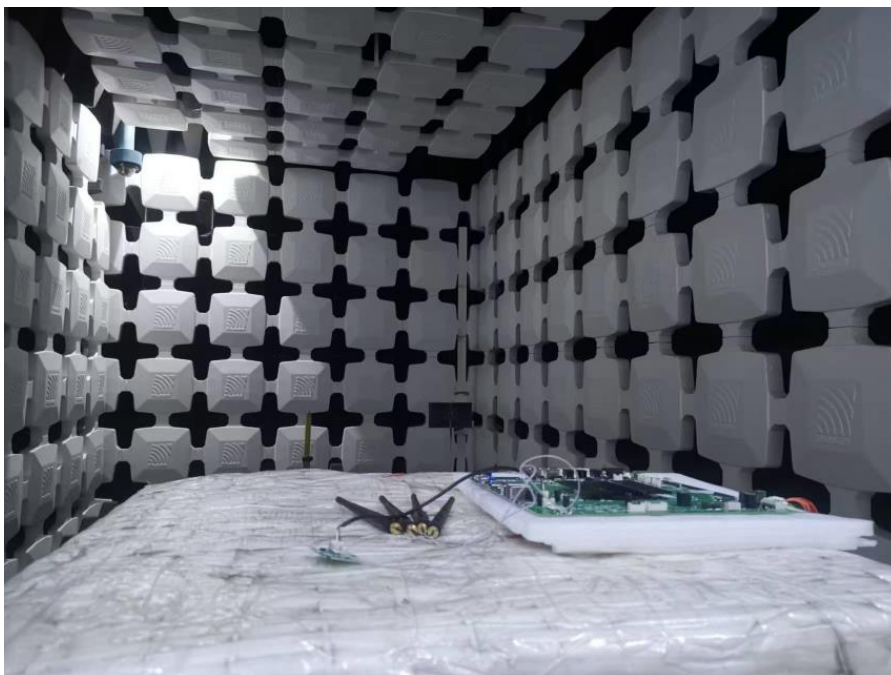
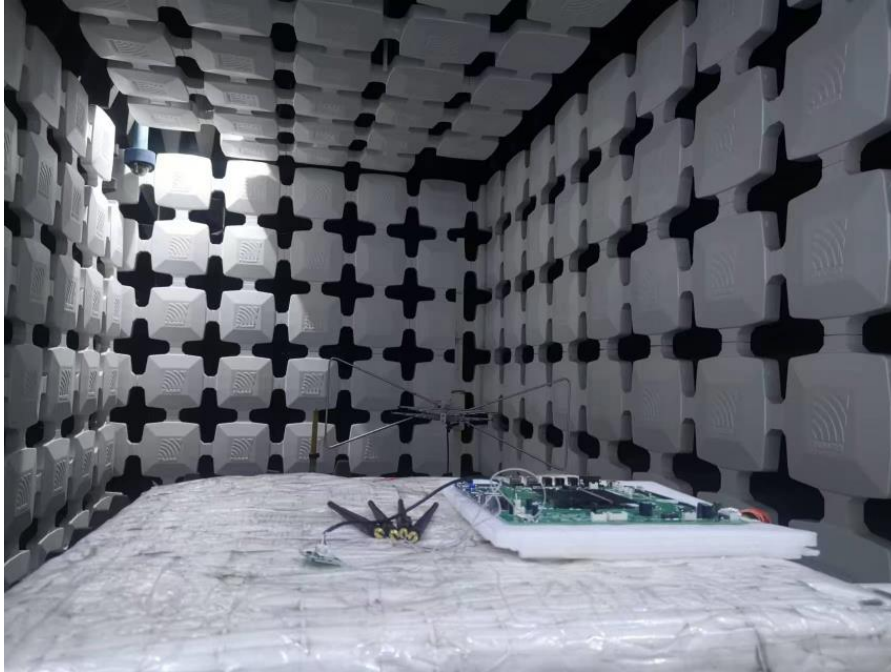
The above requirement includes the prevention of indirect access to any setting that impacts DFS.

Manufacturer provides declaration form to meet this requirement.

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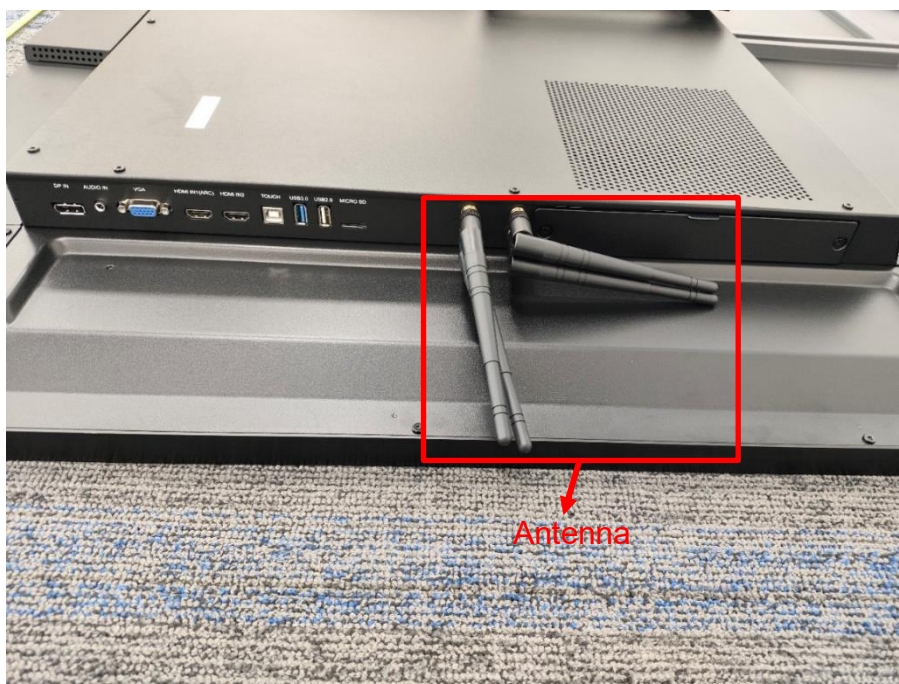
4 Photographs of the Test Configuration

TX / RX Spurious Emission Test

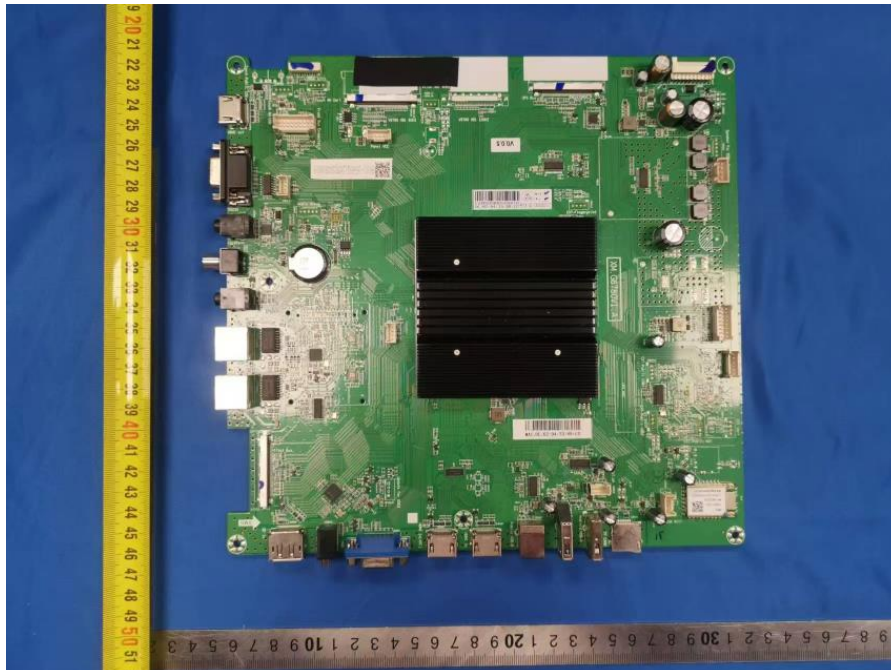


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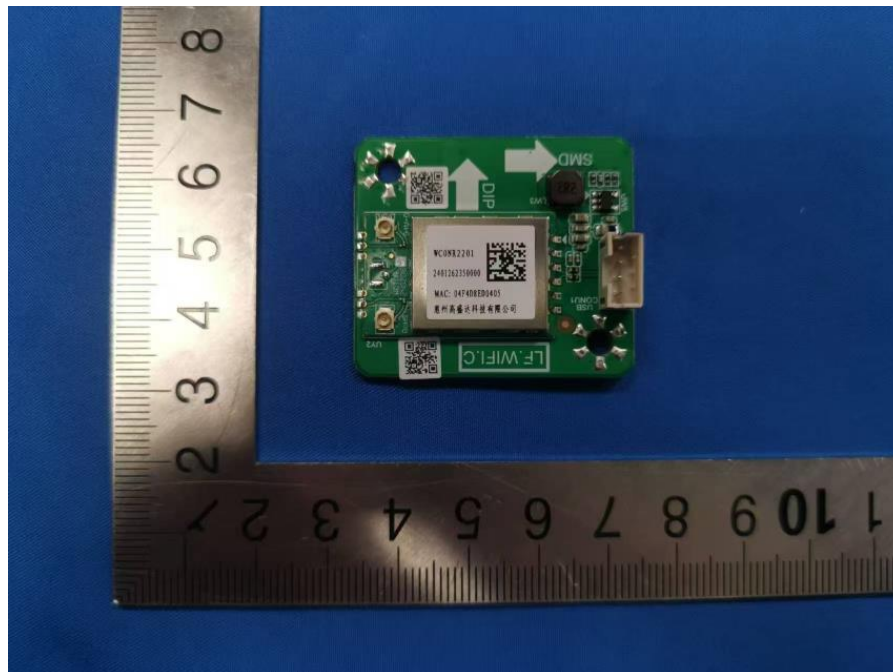
5 Photographs of the EUT



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APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications were made to the EUT by the lab during the test.

----- **END** -----