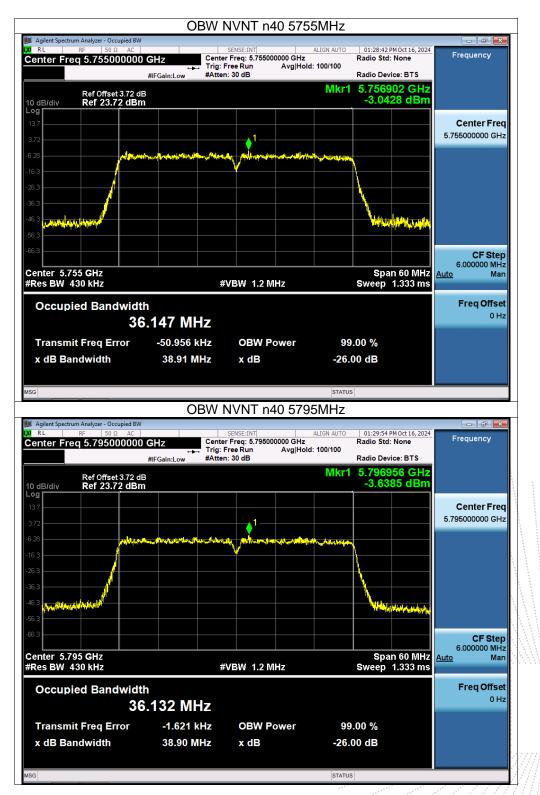


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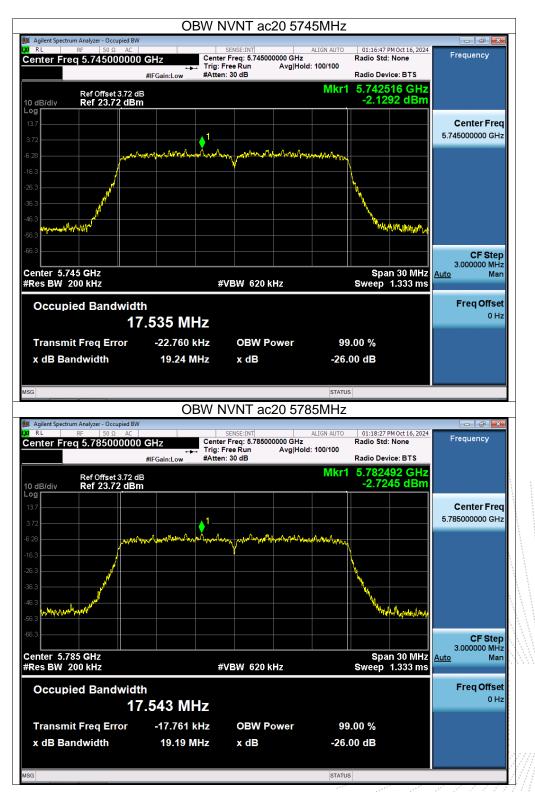




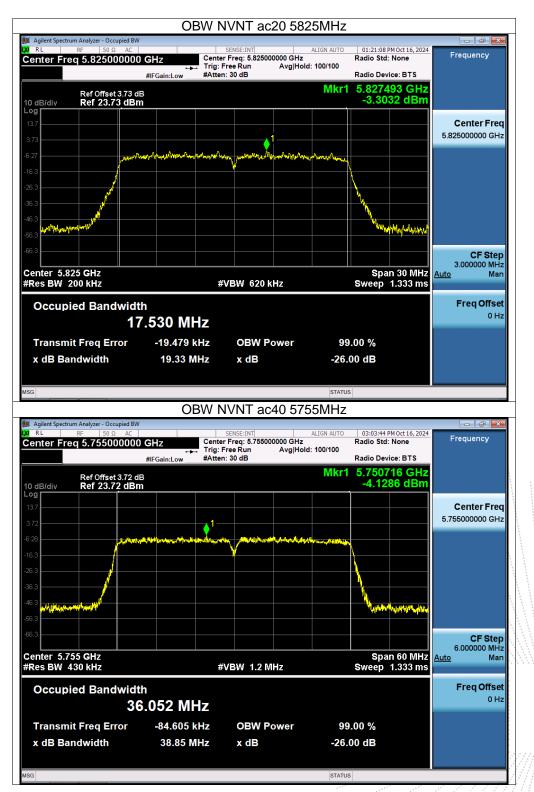
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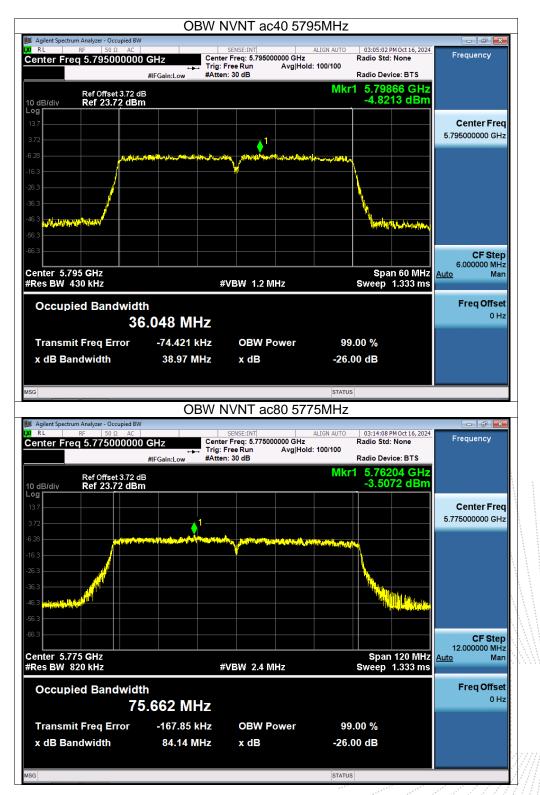




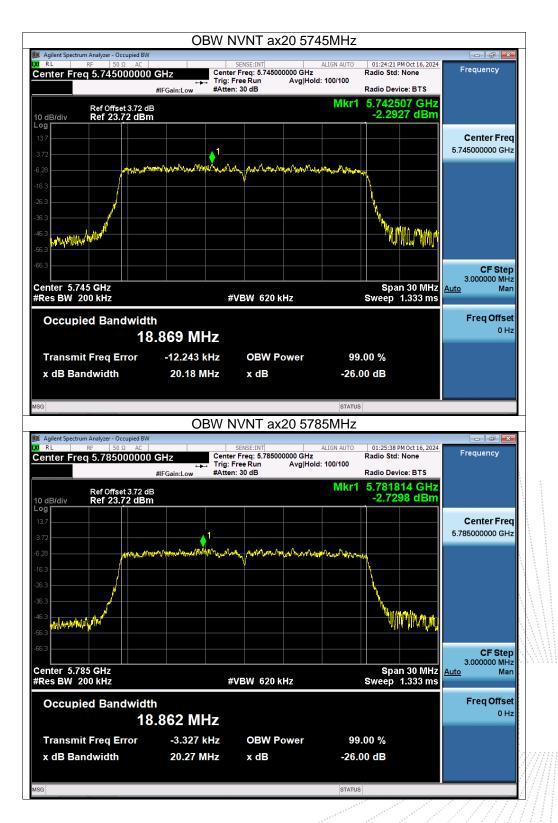




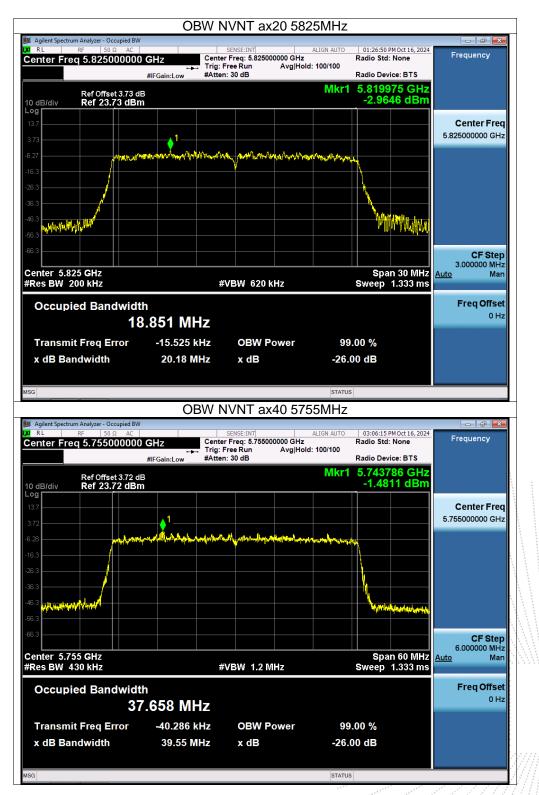




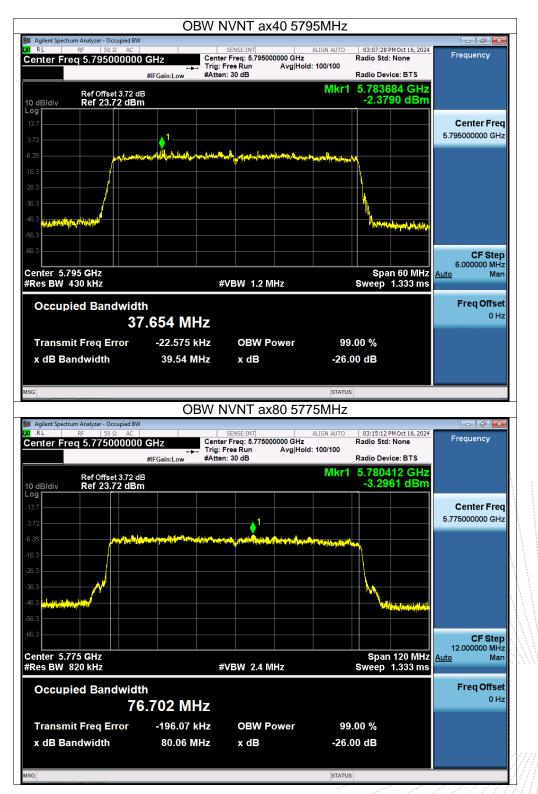












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#### **10. Maximum Conducted Output Power**

#### 10.1 Block Diagram Of Test Setup



#### 10.2 Limit

#### According to FCC §15.407

The maximum conduced output power should not exceed:

Frequency Band(MHz)	Limit
5150~5250	250mW
5725~5850	1W

# 10.3 Test Procedure

Maximum conducted output power may be measured using a spectrum analyzer/EMI receiver or an RF power meter.

#### 1. Device Configuration

If possible, configure or modify the operation of the EUT so that it transmits continuously at its maximum power control level (see section II.B.).

a) The intent is to test at 100 percent duty cycle; however a small reduction in duty cycle (to no lower than 98 percent) is permitted if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test lab to permit such continuous operation.

b) If continuous transmission (or at least 98 percent duty cycle) cannot be achieved due to hardware limitations (e.g., overheating), the EUT shall be operated at its maximum power control level with the transmit duration as long as possible and the duty cycle as high as possible.

2. Measurement using a Spectrum Analyzer or EMI Receiver (SA)

Measurement of maximum conducted output power using a spectrum analyzer requires integrating the spectrum across a frequency span that encompasses, at a minimum, either the EBW or the 99-percent occupied bandwidth of the signal.1 However, the EBW must be used to determine bandwidth dependent limits on maximum conducted output power in accordance with § 15.407(a).

a) The test method shall be selected as follows: (i) Method SA-1 or SA-1 Alternative (averaging with the EUT transmitting at full power throughout each sweep) shall be applied if either of the following conditions can be satisfied:

• The EUT transmits continuously (or with a duty cycle ≥ 98 percent).

• Sweep triggering or gating can be implemented in a way that the device transmits at the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep (with the analyzer configured as in Method SA-1, below) is equal to or shorter than the duration T of each transmission from the EUT and if those transmissions exhibit full power throughout their durations.

(ii) Method SA-2 or SA-2 Alternative (averaging across on and off times of the EUT transmissions, followed by duty cycle correction) shall be applied if the conditions of (i) cannot be achieved and the transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than  $\pm 2$  percent.

No.: BCTC/RF-EMC-005

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(iii) Method SA-3 (RMS detection with max hold) or SA-3 Alternative (reduced VBW with max hold) shall be applied if the conditions of (i) and (ii) cannot be achieved.

b) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep): (i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1 MHz.

(iii) Set VBW ≥ 3 MHz.

(iv) Number of points in sweep  $\geq$  2 Span / RBW. (This ensures that bin-to-bin spacing is  $\leq$  RBW/2, so that narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

(vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

(vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle  $\ge$  98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".

(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum

10.4 EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

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# 10.5 Test Result

Temperature:	26 ℃	Relative Humidity:	54%		
Pressure:	101kPa	Test Voltage:	AC 120V/60HZ		
Test Mode:	Test Mode: TX Frequency U-NII-1 (5180-5240MHz)				

Mode Channel		Frequency	Cond	ucted Power	(dBm)	Limit	Result	
wode	wode Channel	(MHz)	ANT A	ANT B	Total	(dBm)	Result	
NVNT	а	5180	10.7	10.68	/	24	Pass	
NVNT	а	5200	10.32	10.41	/	24	Pass	
NVNT	а	5240	9.45	9.7	/	24	Pass	
NVNT	n20	5180	9.64	9.59	12.63	24	Pass	
NVNT	n20	5200	9.32	9.21	12.28	24	Pass	
NVNT	n20	5240	8.8	8.51	11.67	24	Pass	
NVNT	n40	5190	7.57	4.2	9.21	24	Pass	
NVNT	n40	5230	6.37	6.06	9.23	24	Pass	
NVNT	ac20	5180	9.66	9.53	12.61	24	Pass	
NVNT	ac20	5200	9.33	9.2	12.28	24	Pass	
NVNT	ac20	5240	8.76	8.19	11.49	24	Pass	
NVNT	ac40	5190	7.43	7.07	10.26	24	Pass	
NVNT	ac40	5230	6.62	5.93	9.30	24	Pass	
NVNT	ac80	5210	6.68	6.83	9.77	24	Pass	
NVNT	ax20	5180	9.47	9.35	12.42	24	Pass	
NVNT	ax20	5200	9.19	9	12.11	24	Pass	
NVNT	ax20	5240	8.91	8.05	11.51	24	Pass	
NVNT	ax40	5190	7.36	7.17	10.28	24	Pass	
NVNT	ax40	5230	6.45	5.92	9.20	24	Pass	
NVNT	ax80	5210	6.83	7.02	9.94	24	Pass	

Note:

Antenna A gain:1.4 dBi, Antenna B gain: 1.4 dBi, Directional gain=[ GainANT + 10 log(NANT) dBi] =4.41 dbi<6dbi Limit=24 dBm



Temperature:	26 ℃	Relative Humidity:	54%	
Pressure:	101kPa	Test Voltage:	AC 120V/60HZ	
Test Mode: TX Frequency U-NII-3 (5745-5825MHz)				

Meda Channel		Frequency	Frequency Conducted Power (			Limit	Dessilt
Mode	Channel	(MHz)	ANT A	ANT B	Total	(dBm)	Result
NVNT	а	5745	10.64	10.12	/	30	Pass
NVNT	а	5785	10.1	9.4	/	30	Pass
NVNT	а	5825	9.75	8.91	/	30	Pass
NVNT	n20	5745	9.64	9.02	12.35	30	Pass
NVNT	n20	5785	8.95	8.35	11.67	30	Pass
NVNT	n20	5825	8.63	7.75	11.22	30	Pass
NVNT	n40	5755	7.45	7.14	10.31	30	Pass
NVNT	n40	5795	6.96	6.28	9.64	30	Pass
NVNT	ac20	5745	9.62	9.04	12.35	30	Pass
NVNT	ac20	5785	8.94	8.26	11.62	30	Pass
NVNT	ac20	5825	8.54	7.8	11.20	30	Pass
NVNT	ac40	5755	7.52	7.03	10.29	30	Pass
NVNT	ac40	5795	6.96	6.14	9.58	30	Pass
NVNT	ac80	5775	6.01	5.63	8.83	30	Pass
NVNT	ax20	5745	9.44	8.88	12.18	30	Pass
NVNT	ax20	5785	8.73	8.13	11.45	30	Pass
NVNT	ax20	5825	8.38	7.78	11.10	30	Pass
NVNT	ax40	5755	7.74	7.12	10.45	30	Pass
NVNT	ax40	5795	6.86	6.27	9.59	30	Pass
NVNT	ax80	5775	6.43	6.05	9.25	30	Pass

Note:

Antenna A gain:1.44 dBi, Antenna B gain: 1.44 dBi, Directional gain=[ GainANT + 10 log(NANT) dBi] =4.45 dbi<6dbi

Limit=30 dBm



# 11. Out Of Band Emissions

# 11.1 Block Diagram Of Test Setup



# 11.2 Limit

#### According to FCC §15.407(b)

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits: (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(2) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

# 11.3 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.

3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.

4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.

5. Repeat above procedures until all measured frequencies were complete.

#### 11.4 EUT Operating Conditions

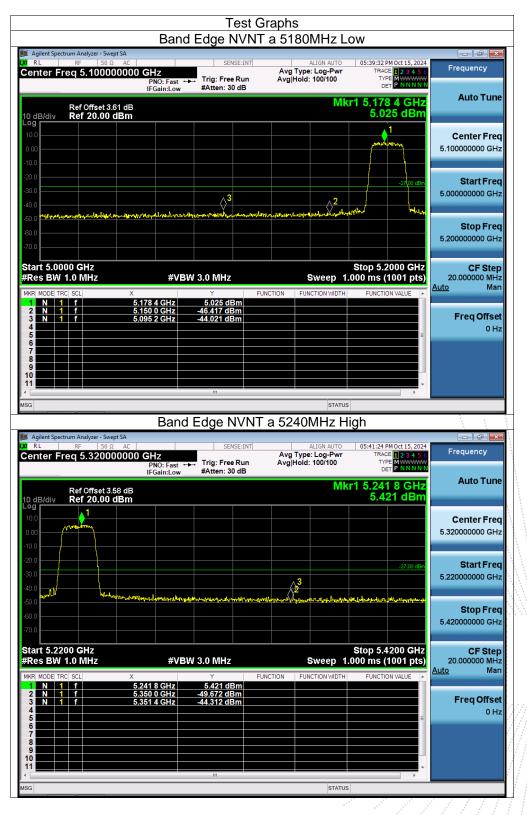
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data

#### 11.5 Test Result

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Test Voltage:	AC 120V/60HZ



Note: A(B) Represent the value of antenna A and B, The worst data is Antenna A, only shown Antenna A Plot. 5180-5240MHz



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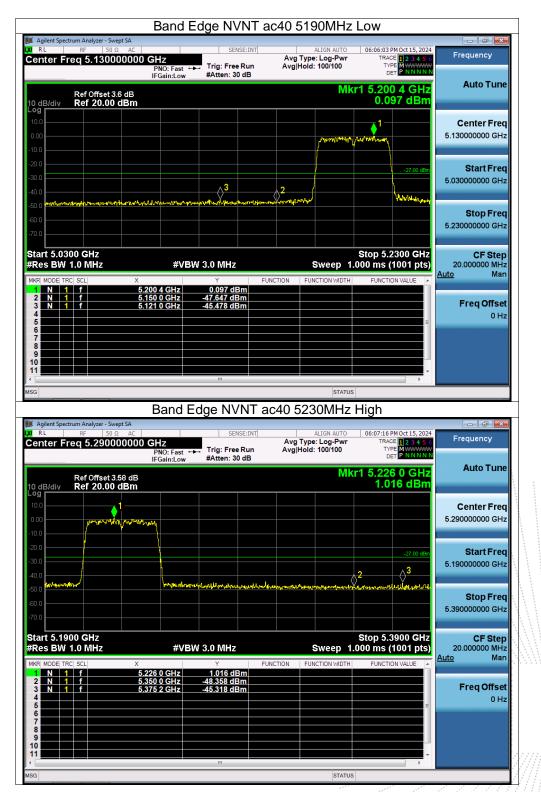




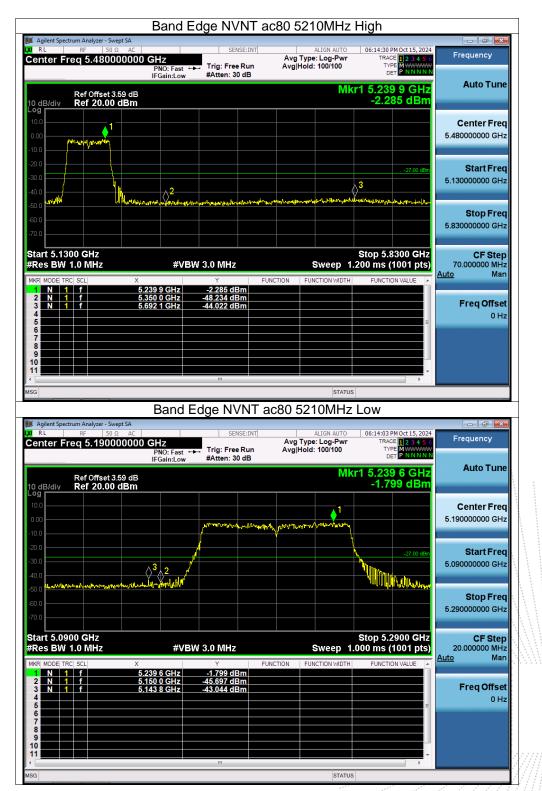


Agilent Spectrum Analyzer - Swept		Edge NVNT a	ac20 5180MHz	Low	
RL  RF  50 Ω    enter Freq 5.100000	AC	SENSE:INT → Trig: Free Run #Atten: 30 dB	ALIGN AUTO Avg Type: Log-Pwr Avg Hold: 100/100	05:47:10 PM Oct 15, 2024 TRACE 1 2 3 4 5 6 TYPE M WWWW DET P N N N N N	Frequency
Ref Offset 3.61 dB/div Ref 20.00 dl	dB		Mkr	1 5.186 2 GHz 3.853 dBm	Auto Tune
<b>99</b> 0.0 .00 0.0					<b>Center Freq</b> 5.100000000 GHz
	terrouted and the set	And alough normalized and an and an		-27)00 dBm	Start Fred 5.000000000 GH2
0.0 <b>***********************************</b>	an portunitario (1994) (r) a fordaria		Prot Marchenkerd Al.		<b>Stop Fred</b> 5.200000000 GH2
art 5.0000 GHz Res BW 1.0 MHz	#VBI	W 3.0 MHz	Sweep 1.0	Stop 5.2000 GHz 000 ms (1001 pts)	CF Step 20.000000 MHz
RR  MODE  TRC  SCL    1  N  1  F    2  N  1  F    3  N  1  F    4	X 5.186 2 GHz 5.150 0 GHz 5.131 0 GHz	Y Fl 3.853 dBm -46.845 dBm -44.166 dBm	UNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Mar <b>Freq Offset</b> 0 Hz
		m	STATUS		
· · · · · ·	Band E	dge NVNT a	ac20 5240MHz I	High	
Agilent Spectrum Analyzer - Swept RL   RF   50 Ω enter Freq 5.320000	AC	SENSE:INT Trig: Free Run #Atten: 30 dB	ALIGN AUTO Avg Type: Log-Pwr Avg Hold: 100/100	05:49:32 PM Oct 15, 2024 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N	Frequency
Ref Offset 3.55 dB/div Ref 20.00 dl	dB		Mkr	1 5.246 0 GHz 4.498 dBm	Auto Tune
					Center Fred 5.320000000 GHz
	Marthylardlyneujjynel, arthau fyr Afra		2	-27.00 dBm	Start Free 5.220000000 GHz
0.0					<b>Stop Fred</b> 5.420000000 GH2
tart 5.2200 GHz Res BW 1.0 MHz		W 3.0 MHz	-	Stop 5.4200 GHz 000 ms (1001 pts)	<b>CF Step</b> 20.000000 MHz <u>Auto</u> Mar
MODE  TRC  SCL    1  N  1  f    2  N  1  f	X 5.246 0 GHz 5.350 0 GHz	4.498 dBm	UNCTION FUNCTION WIDTH	FUNCTION VALUE	
2 N 1 f 3 N 1 f 4	5.350 0 GHz 5.414 4 GHz	-47.941 dBm -45.664 dBm		E	Freq Offset 0 Hz
9 0 1					









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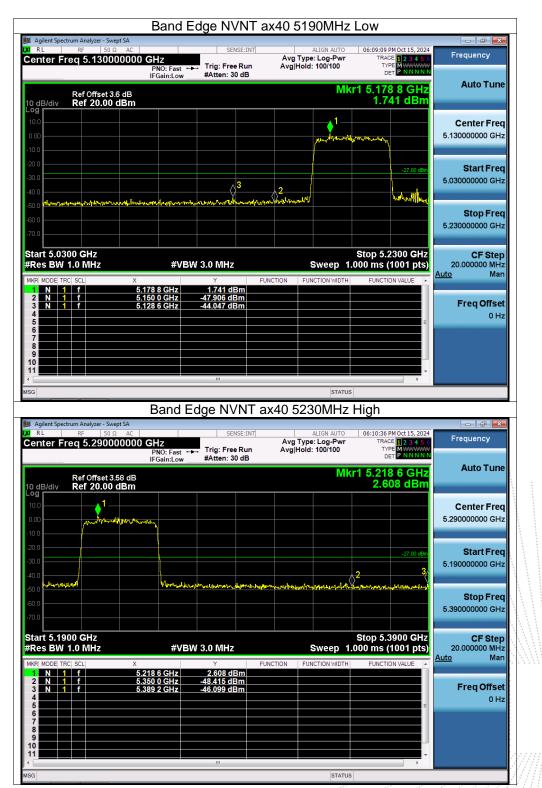




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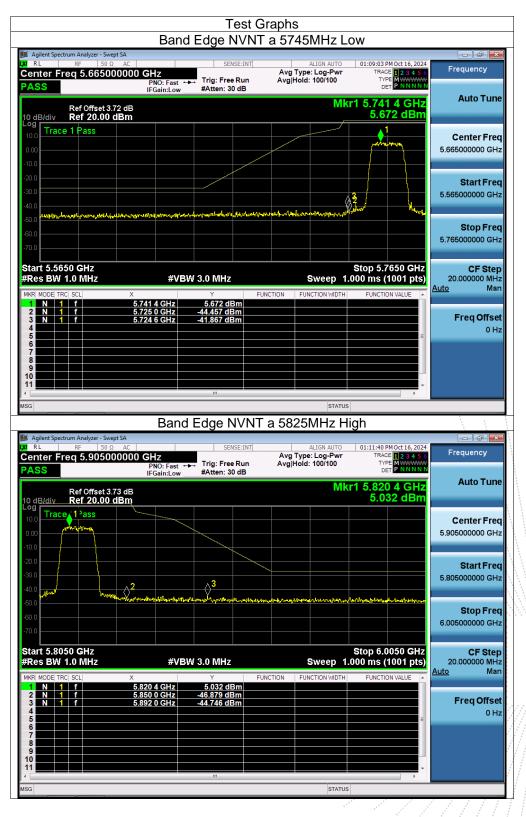




	Band E	dge NVNT a	x80 5210MHz	High	
Agilent Spectrum Analyzer - Swept SA					
a RL RF 50 Ω AC Center Freq 5.4800000		SENSE:INT → Trig: Free Run #Atten: 30 dB	ALIGN AUTO Avg Type: Log-Pwr Avg Hold: 100/100	06:17:05 PM Oct 15, 2024 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P NNNNN	Frequency
Ref Offset 3.59 dl 0 dB/div Ref 20.00 dBn	3		Mki	r1 5.232 9 GHz -1.200 dBm	Auto Tune
-og 10.0 1 0.00 1 10.0 ( <sup>10</sup> -(ng-gl/sh <sup>-1</sup> ))					Center Freq 5.48000000 GHz
20.0				-27.00 dBm	Start Freq 5.130000000 GHz
40.0 50.0 mark hard Welger	rterinikan Vagawanna	Angene and free the second of the		3 (madername)::::::::::::::::::::::::::::::::::::	Stop Freq
70.0					5.830000000 GHz
tart 5.1300 GHz Res BW 1.0 MHz	#VB	W 3.0 MHz		Stop 5.8300 GHz 200 ms (1001 pts)	<b>CF Step</b> 70.000000 MHz <u>Auto</u> Man
IKR MODE TRC SCL	× 5.232 9 GHz		NCTION FUNCTION WIDTH	FUNCTION VALUE	
2 N 1 f 3 N 1 f 4 5	5.232 9 GHZ 5.350 0 GHz 5.704 0 GHz	-1.200 dBm -47.956 dBm -43.529 dBm		E	<b>Freq Offset</b> 0 Hz
6 7 8 9 9					
		Ш			
SG			STATUS		
	Band E	dae NVNT a	x80 5210MHz	Low	
Agilent Spectrum Analyzer - Swept SA					
RL RF 50 Ω AC enter Freq 5.1900000		SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr Avg Hold: 100/100	06:15:15 PM Oct 15, 2024 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N	Frequency
Ref Offset 3.59 di	IFGain:Low	#Atten: 30 dB		r1 5.228 6 GHz	Auto Tune
0 dB/div Ref 20.00 dBn 9g				-1.763 dBm	Contor From
0.00		how how how have	1 mysellerer and		Center Freq 5.190000000 GHz
20.0		n		-27.00 dBm	Start Freq 5.09000000 GHz
10.0 50.0 60.0	and a second and a second a s			Whitemateriarity	Stop Freq 5.29000000 GHz
70.0				Stop 5.2900 GHz	CF Step
Res BW 1.0 MHz	#VB\ ×	V 3.0 MHz Y FU	Sweep 1.	000 ms (1001 pts)	20.000000 MHz <u>Auto</u> Man
1  N  1  f    2  N  1  f    3  N  1  f    4	5.228 6 GHz 5.150 0 GHz 5.147 0 GHz	-1.763 dBm -47.085 dBm -44.277 dBm			Freq Offset
				=	
5 6 7 8 9					



Note: A(B) Represent the value of antenna A and B. The worst data is Antenna A, only shown Antenna A Plot. 5745-58250MHz



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		dge NVNT a	ac40 5755MHz	Low	
📕 Agilent Spectrum Analyzer - Swept SA 🖬 RL RF 50 Ω A	C	SENSE:INT	ALIGN AUTO	03:04:08 PM Oct 16, 2024	Frequency
Center Freq 5.6950000	PNO: Fast 🛏	🛏 Trig: Free Run	Avg Type: Log-Pwr Avg Hold: 100/100	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P NNNN	requeries
A55	IFGain:Low	#Atten: 30 dB	Nu la		Auto Tune
Ref Offset 3.72 d 0 dB/div Ref 20.00 dB	lB m		IVIKI	1 5.751 2 GHz 1.042 dBm	
.og					
					Center Freq 5.69500000 GHz
10.0				Contraction of the second	0.0000000000000
20.0					Start Freq
30.0			<u>3</u>		5.595000000 GHz
40.0		work out a section of the section of	32	Mullimohile	
50.0	difficults and other address as				Stop Freq
60.0					5.795000000 GHz
70.0					
Start 5.5950 GHz Res BW 1.0 MHz	#\/B\	N 3.0 MHz		Stop 5.7950 GHz 100 ms (1001 pts)	CF Step 20.000000 MHz
	# <b>VD</b> \$		INCTION FUNCTION WIDTH	FUNCTION VALUE	Auto Man
1 N 1 f	5.751 2 GHz	1.042 dBm	Netion Powerion wibin	PONCHON VALUE	
2 N 1 f 3 N 1 f	5.725 0 GHz 5.724 0 GHz	-44.795 dBm -42.212 dBm			Freq Offset
4 5					0 Hz
6 7					
8					
10				-	
		m		•	
SG					
Agilent Spectrum Analyzer - Swept SA		age NVNT a	c40 5795MHz I	High	
RL RF 50 Ω A	C	SENSE:INT	ALIGN AUTO	03:05:25 PM Oct 16, 2024	Frequency
enter Freq 5.8550000	PNO: Fast 🛏	🛏 Trig: Free Run	Avg Type: Log-Pwr Avg Hold: 100/100	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N	requeries
<u> </u>	IFGain:Low	#Atten: 30 dB	Mia		Auto Tune
Ref Offset 3.72 c 0 dB/div Ref 20.00 dB			IVIKI	1 5.791 0 GHz 0.920 dBm	
Og Trace 1 Pass					
10.0 <b>1</b>					Center Freq 5.85500000 GHz
10.0	more				5.85500000 GHz
20.0				×	Start Er an
30.0					Start Freq 5.755000000 GHz
40.0	Langer	2			
50.0		and the second of the second	๛ <sub>ู่</sub> มีไข้ๆ๛ <sub>ู</sub> ้ที่ไข่ <sup>เป</sup> ็นไข่ง <sub>ไ</sub> ข่างกันที่มีๆ กำละกันของไปเป็นไปไป	<del>๛สนาวร่างจุลสูงสุขยายใหญ่ไปสมายสูไป</del>	Stop Freq
60.0					5.955000000 GHz
70.0					
Start 5.7550 GHz		N 2 0 MIL		Stop 5.9550 GHz	CF Step
Res BW 1.0 MHz		N 3.0 MHz	-	100 ms (1001 pts)	20.000000 MHz <u>Auto</u> Man
IKR MODE TRC SCL	× 5.791 0 GHz	0.920 dBm	INCTION FUNCTION WIDTH	FUNCTION VALUE	
2 N 1 f 3 N 1 f	5.850 0 GHz 5.952 8 GHz	-47.836 dBm -45.606 dBm			Freq Offset
4 5				=	0 Hz
6 7					
8					
10					
			STATUS		





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