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Appendix E for KSCR220800137702-FCC WWAN repeater

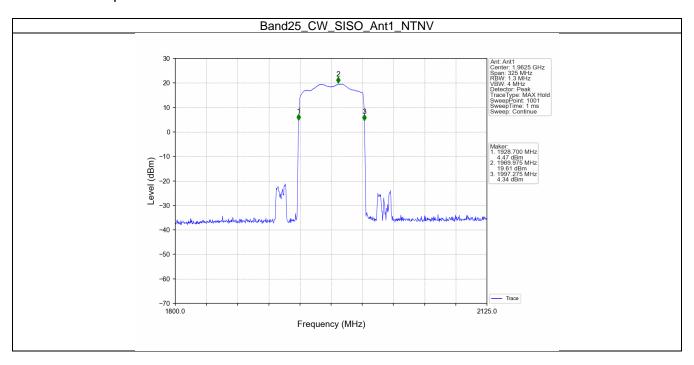
1. Out of band rejection

1.1 Band25

1.1.1 Test Result

	Band: 25 / NTNV									
Signal	ignal Sweep Frequency Range (MHz) TX Type ANT F0 (MHz) FL (MHz) FH (MHz) Verdict									
CW	1800 - 2125	SISO	1	1969.975	1928.700	1997.275	Pass			

1.1.2 Test Graph





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2. AGC threshold

2.1 Band25

2.1.1 Test Result

	Band: 25 / NTNV									
Signal	Frequency (MHz)	TX Type	ANT	AGC Threshold (dBm)	Verdict					
AWGN	1969.975	SISO	1	-3.20	Pass					
GMSK	1969.975	SISO	1	-3.20	Pass					



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- 3. Input-versus-output signal comparison
- 3.1 Band25 OBW

3.1.1 Test Result

	Band: 25 / NTNV										
	Signal		TX Type	ANT	99% OBW (MHz)		Verdict				
Type	Level (dBm)	Frequency (MHz)		AINT	Output	Input	verdict				
AWGN	-0.2	1969.975	SISO	1	4.538	4.541	Pass				
AWGN	-3.2	1969.975	SISO	1	4.542	4.528	Pass				
GMSK	-0.2	1969.975	SISO	1	0.243	0.244	Pass				
GIVISK	-3.2	1969.975	SISO	1	0.244	0.245	Pass				



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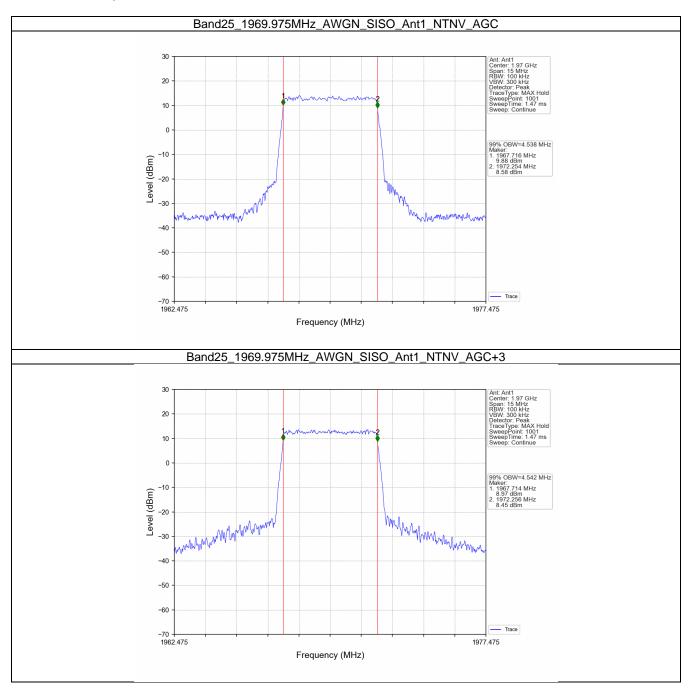
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3.1.2 Test Graph



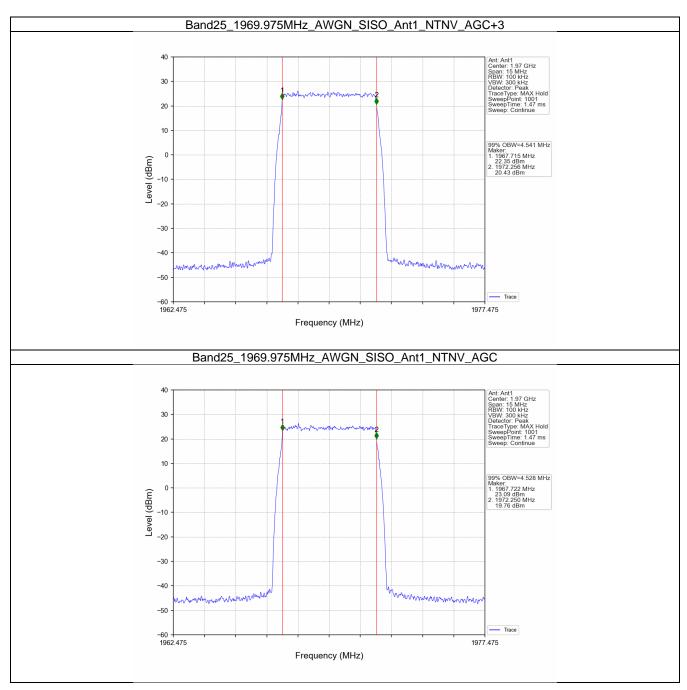


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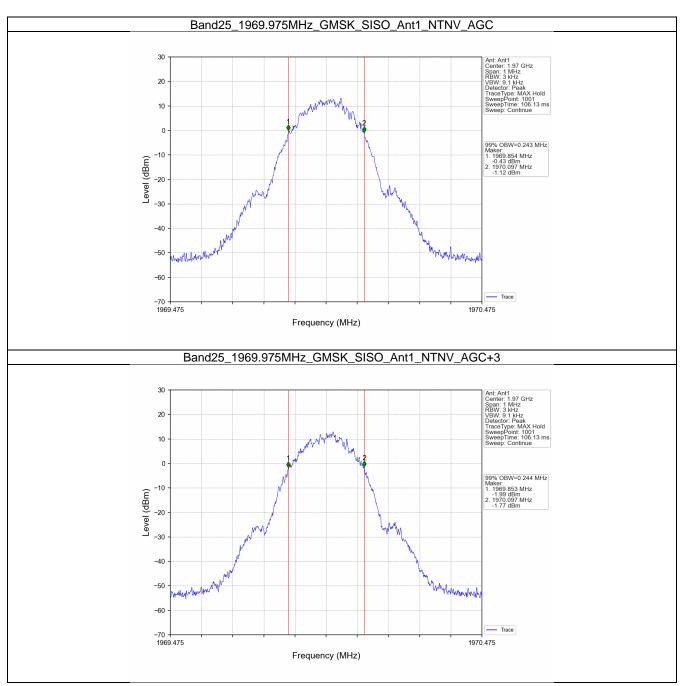
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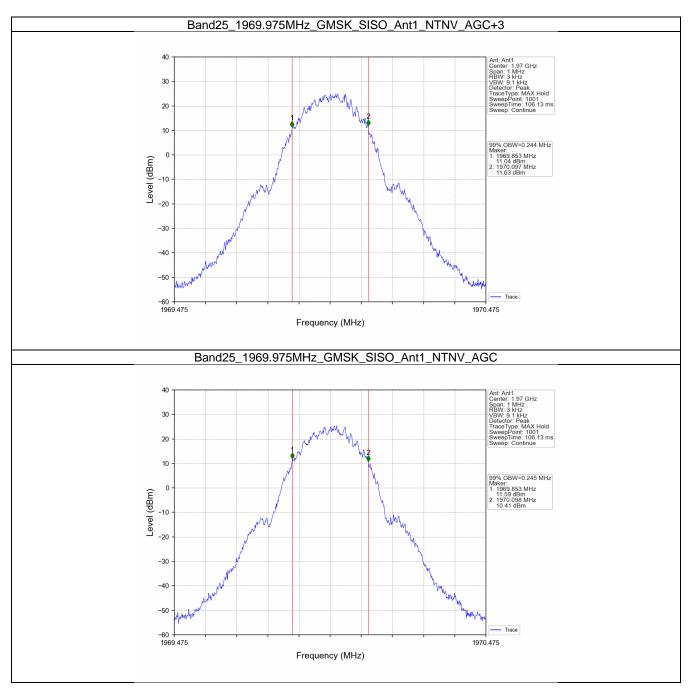


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3.2 Band25_EBW

3.2.1 Test Result

	Band: 25 / NTNV										
	Signal		TV Type	ANT	26dB EB	W (MHz)	Verdict				
Type	Level (dBm)	Frequency (MHz)	TX Type	AINT	Output	Input	verdict				
AWGN	-0.2	1969.975	SISO	1	5.054	5.052	Pass				
AWGN	-3.2	1969.975	SISO	1	5.063	5.083	Pass				
GMSK	-0.2	1969.975	SISO	1	0.314	0.315	Pass				
GIVISK	-3.2	1969.975	SISO	1	0.315	0.312	Pass				



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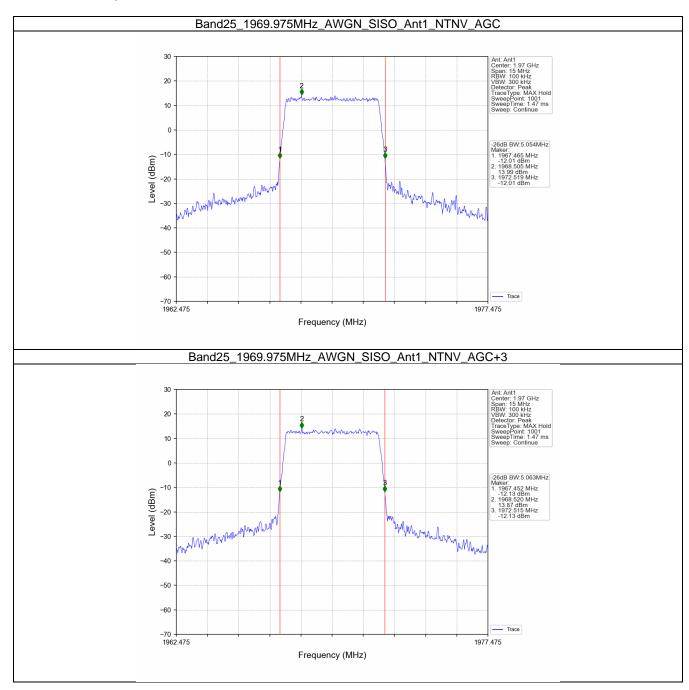
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3.2.2 Test Graph



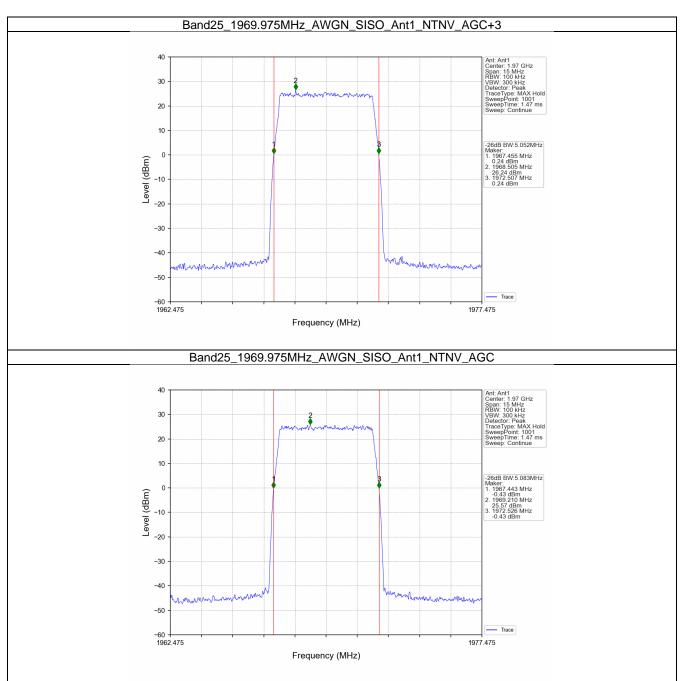


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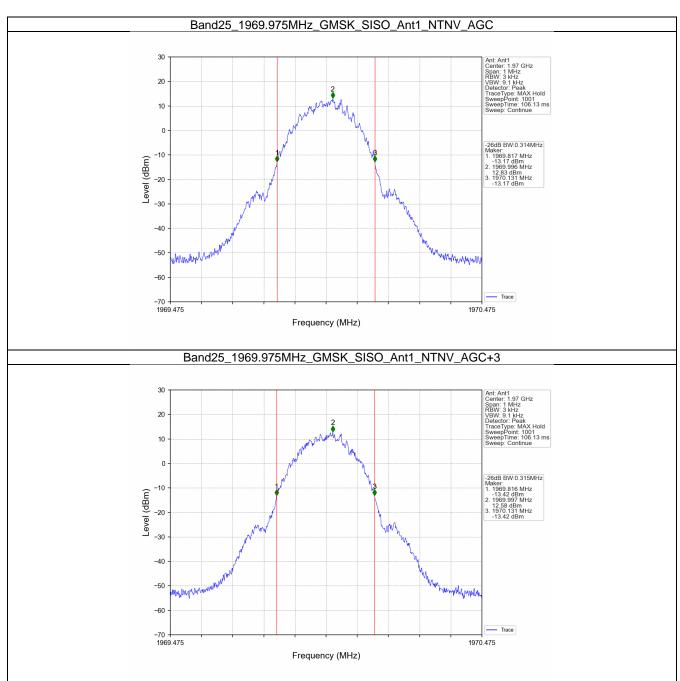
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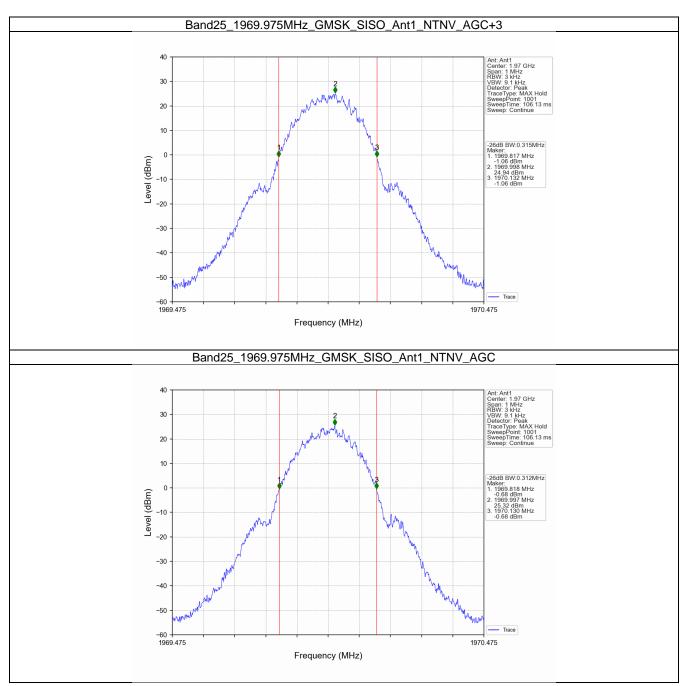
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- 4. Input/output power and amplifier/booster gain
- 4.1 Band25_EIRP

4.1.1 Test Result

				19	30MHz-199	5MHz / NTN	1V					
			Signal	Input		Output Powe	r (dBm/MHz	<u>z)</u>	Total			
Operation Band	Frequency (MHz)	Signal Type	Level (dBm)	Power (dBm)	Ant 1	Ant 2	Ant 3	Ant 4	Output Power (dBm/MHz)	EIRP (dBm/MHz)	Gain (dB)	
	SISO mode											
			Pre- AGC	-3.2	13.21		-	-	13.21	16.21	21.39	
1930MHz-	1969.975	AWGN	3dB Above AGC	-0.2	14.08		ŀ	ı	14.08	`	/	
1995MHz	1969.975		Pre- AGC	-3.2	20.68		1	1	20.68	23.68	22.85	
		GMSK	3dB Above AGC	-0.2	21.82				21.82	24.82	/	

				193	30MHz-1995	MHz / NTNV					
Operation	Frequency	Signal	Signal Level	Input Power		Total Output wer (dBm/Ml			EIRP (dBm/MHz)		Gain
Band	(MHz)	Type	(dBm)	(dBm)	SISO	2X2 MIMO	4X4 MIMO	SISO	2X2 MIMO	4X4 MIMO	(dB)
MIMO mode											
			Pre-AGC	-3.2	13.21	16.22	19.23	16.21	19.22	22.23	/
1930MHz-	1969.975	AWGN	3dB Above AGC	-0.2	14.08	17.09	20.10	17.08	20.09	23.10	/
1995MHz			Pre-AGC	-3.2	20.68	23.69	26.70	23.68	26.69	29.70	/
	1969.975	GMSK	3dB Above AGC	-0.2	21.82	24.83	27.84	24.82	27.83	30.84	/



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				193	30MHz-1995	MHz / NTNV						
Operation	Frequency	Signal	Signal Level	Input Power		Total Output Power (dBm)			EIRP (dBm)		Gain	
Band	(MHz)	Type	(dBm)	(dBm)	SISO	2X2 MIMO	4X4 MIMO	SISO	2X2 MIMO	4X4 MIMO	(dB)	
MIMO mode												
			Pre-AGC	-3.2	13.21	16.22	19.23	16.21	19.22	22.23	/	
1930MHz-	1969.975	AWGN	3dB Above AGC	-0.2	14.08	17.09	20.10	17.08	20.09	23.10	/	
1995MHz			Pre-AGC	-3.2	20.68	23.69	26.70	23.68	26.69	29.70	/	
	1969.975	1969.975	GMSK	3dB Above AGC	-0.2	21.82	24.83	27.84	24.82	27.83	30.84	/

Remark:

1.The EUT supports SISO working mode. Each antenna can be used as SISO working port. We only present the worst result, the test data of ant 1 port.

2.This EUT supports 2*2 and 4*4MIMO, For MIMO mode the output signals are considered completely uncorrelated, so the antenna gain is 3dBi



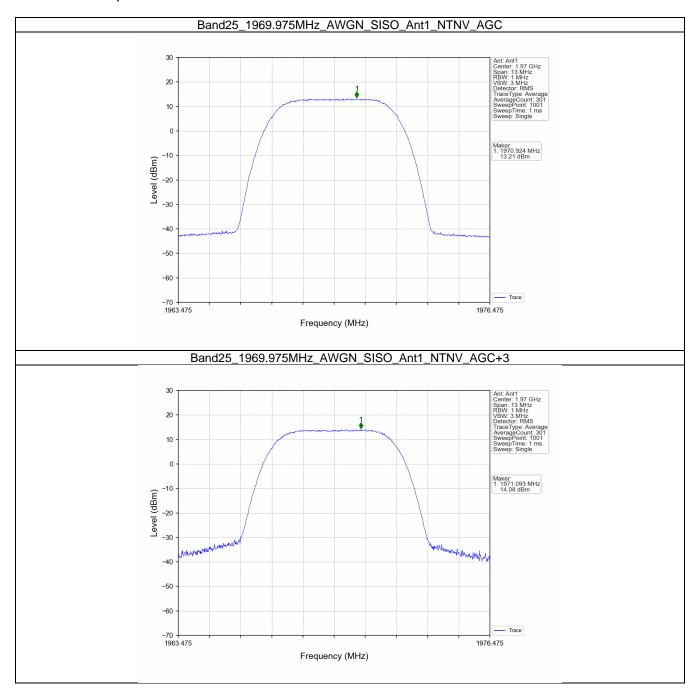
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4.1.2 Test Graph



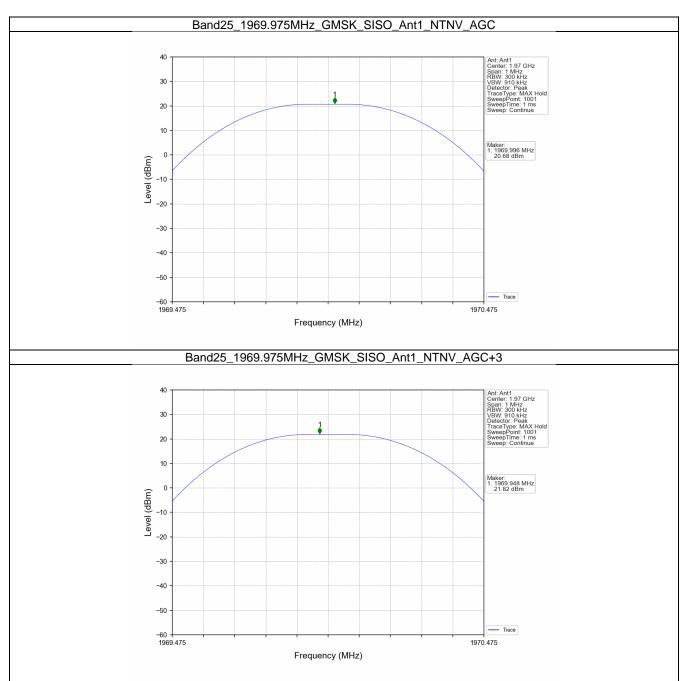


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4.2 Band25 PAPR

4.2.1 Test Result

	Band: 25 / NTNV										
	Signal		TX Type	ANT	PAPF	R (dB)	Verdict				
Type	Level (dBm)	Frequency (MHz)	1 × 1 ype	ANI	Result	Limit	verdict				
AWGN	-3.2	1969.975	SISO	1	8.33	<=13	Pass				
AWGN	-0.2	1969.975	SISO	1	8.30	<=13	Pass				
GMSK	-3.2	1969.975	SISO	1	0.27	<=13	Pass				
GIVISK	-0.2	1969.975	SISO	1	0.26	<=13	Pass				



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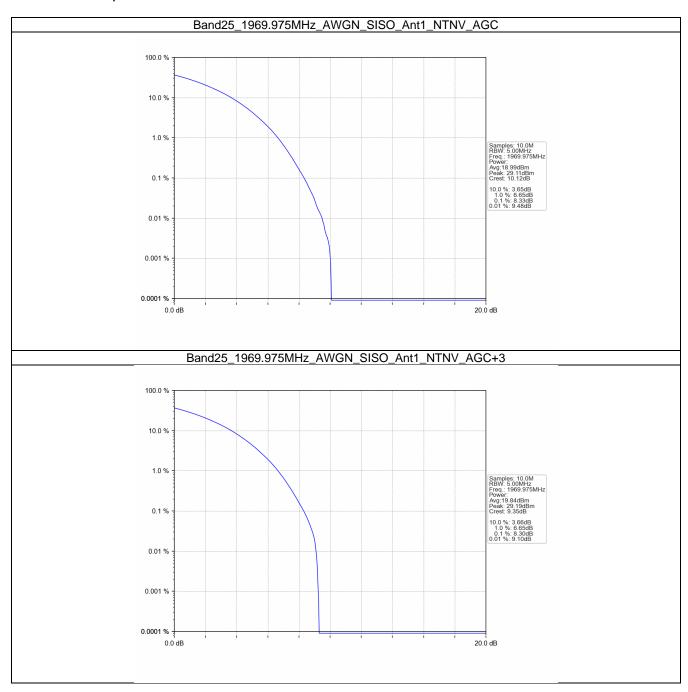
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4.2.2 Test Graph





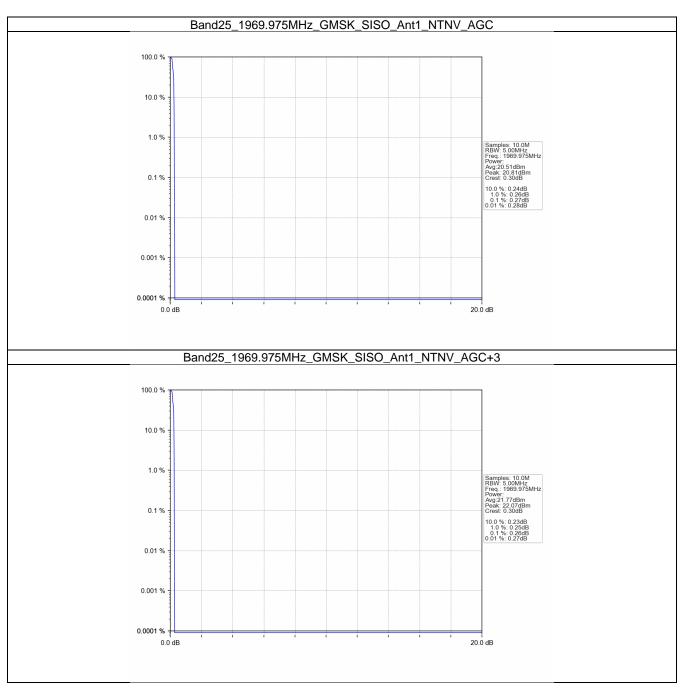
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5. Out-of-band/out-of-block (including intermodulation) emissions

5.1 Band25

5.1.1 Test Result

					E	Band: 2	5 / NTNV				
	S	ignal						001	B (dBm)		
Input	Туре	Level (dBm)	Frequency (MHz)	Channel	ТХ Туре	ANT	Result for SISO	Result for 4*4 MIMO	Limit for SISO	Limit for 4*4 MIMO	Verdict
T	AVACAL	-3.2	1932.5	LCH	SISO	1	-81.55	-75.53	-13.00	-19.02	Pass
Two	AWGN	-0.2	1932.5	LCH	SISO	1	-81.39	-75.37	-13.00	-19.02	Pass
0	AVACAL	-3.2	1932.5	LCH	SISO	1	-81.42	-75.40	-13.00	-19.02	Pass
One	AWGN	-0.2	1932.5	LCH	SISO	1	-81.33	-75.31	-13.00	-19.02	Pass
T	AVACAL	-3.2	1992.5	HCH	SISO	1	-81.22	-75.20	-13.00	-19.02	Pass
Two	AWGN	-0.2	1992.5	HCH	SISO	1	-81.13	-75.11	-13.00	-19.02	Pass
One	AWGN	-3.2	1992.5	HCH	SISO	1	-80.97	-74.95	-13.00	-19.02	Pass
One	AWGN	-0.2	1992.5	HCH	SISO	1	-80.88	-74.86	-13.00	-19.02	Pass
Turo	GMSK	-3.2	1930.1	LCH	SISO	1	-81.11	-75.09	-13.00	-19.02	Pass
Two	GIVION	-0.2	1930.1	LCH	SISO	1	-80.93	-74.91	-13.00	-19.02	Pass
0	CMCK	-3.2	1930.1	LCH	SISO	1	-81.02	-75.00	-13.00	-19.02	Pass
One	GMSK	-0.2	1930.1	LCH	SISO	1	-80.82	-74.80	-13.00	-19.02	Pass
T	CMCK	-3.2	1994.9	HCH	SISO	1	-80.60	-74.58	-13.00	-19.02	Pass
Two	GMSK	-0.2	1994.9	HCH	SISO	1	-80.48	-74.46	-13.00	-19.02	Pass
One	GMSK	-3.2	1994.9	HCH	SISO	1	-80.32	-74.30	-13.00	-19.02	Pass
One	GIVION	-0.2	1994.9	HCH	SISO	1	-80.74	-74.72	-13.00	-19.02	Pass

Note 1: This EUT supports 4*4 MIMO, since we only presented the results of a test port of the worst, so we subtract the limit 10 * log (4).

Note 2: All the test frequency points below the -19.02dBm, Meet the test requirements.



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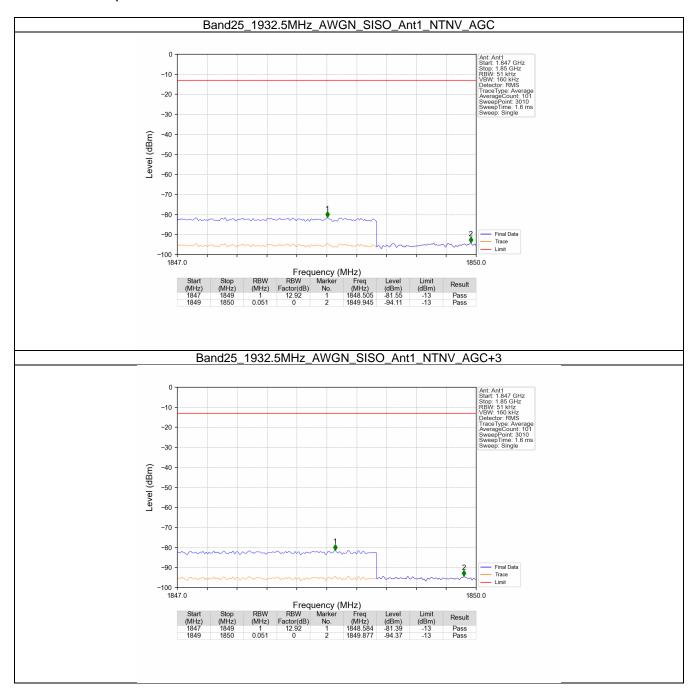
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5.1.2 Test Graph



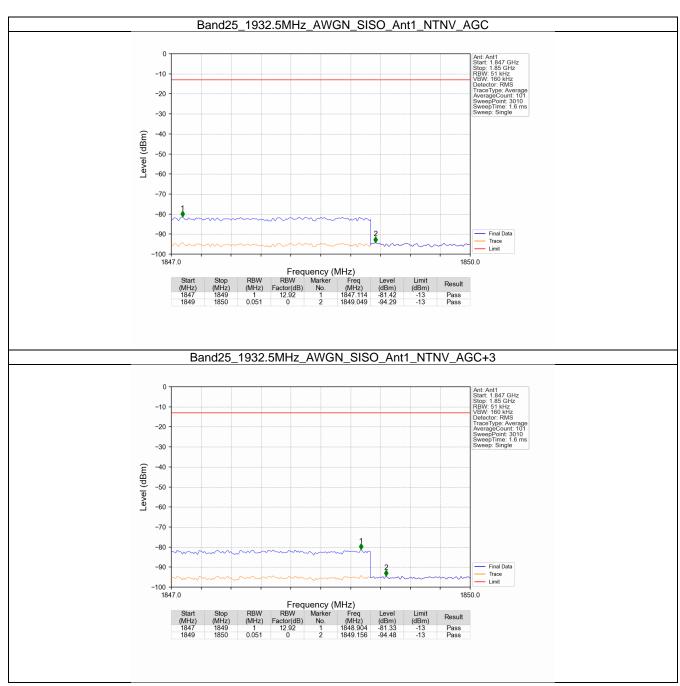


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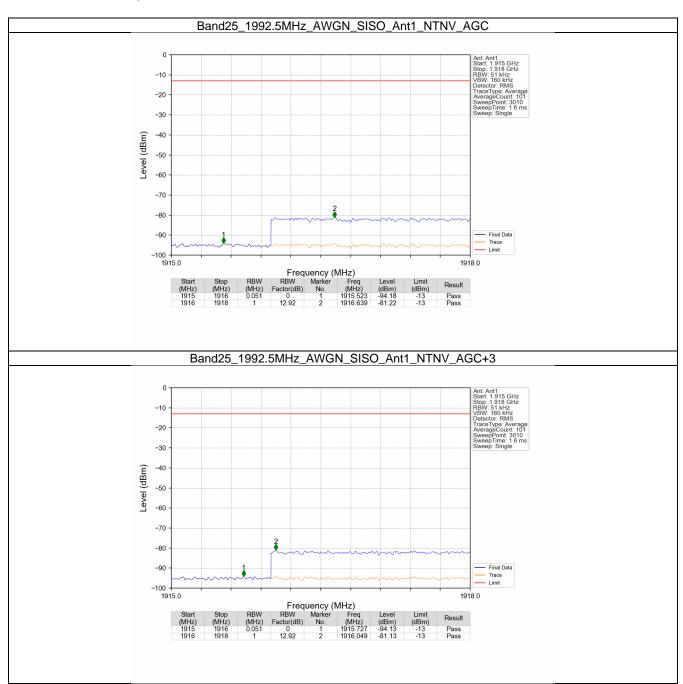


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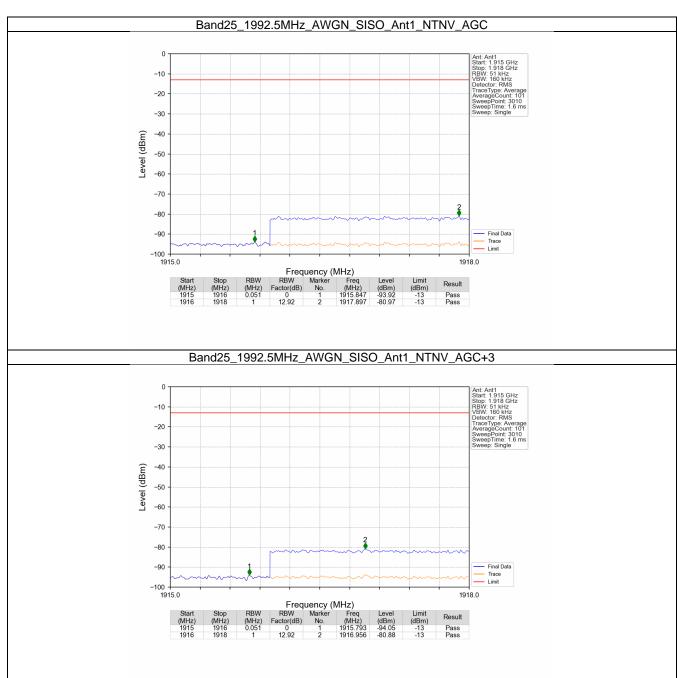


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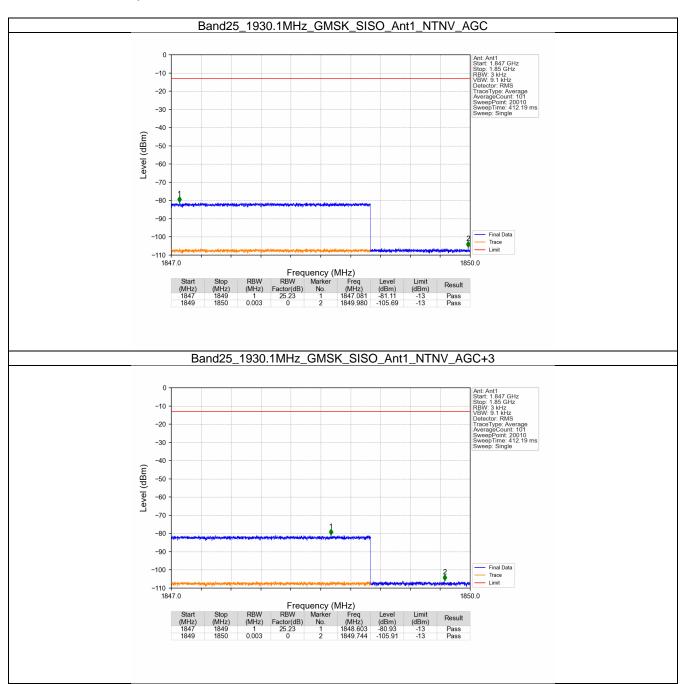


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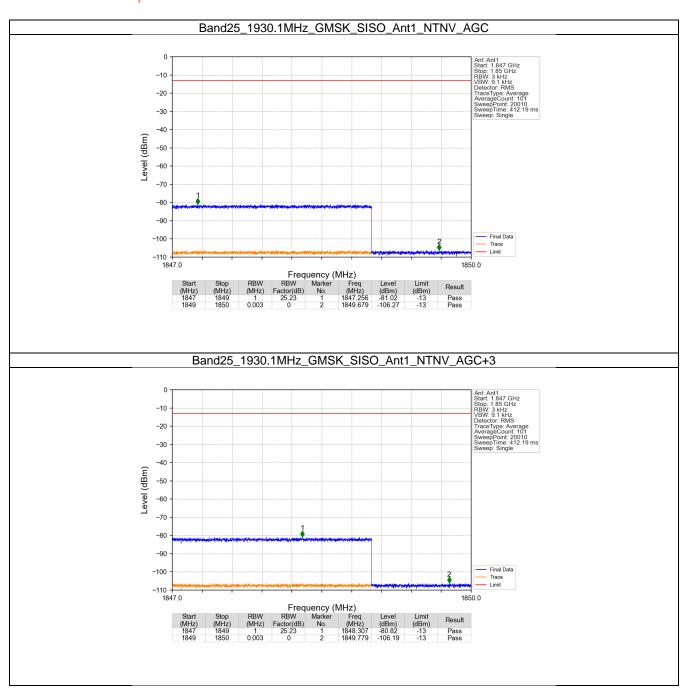


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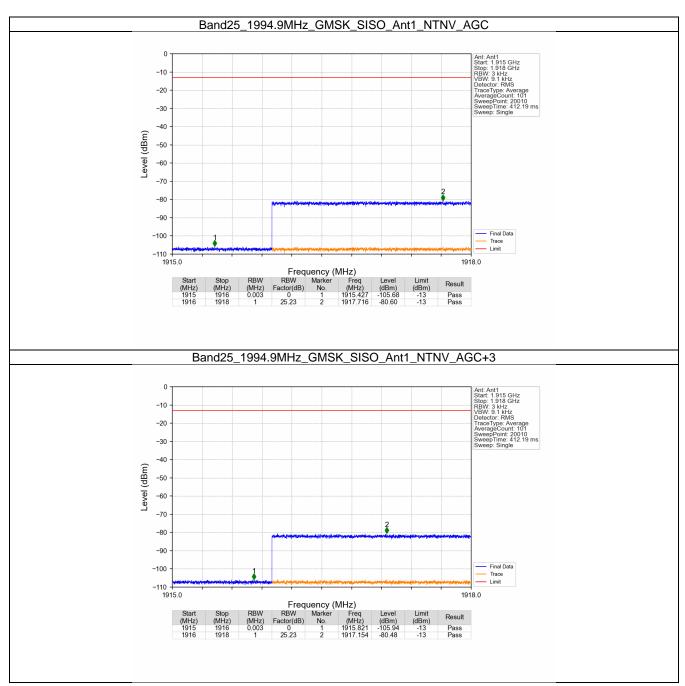


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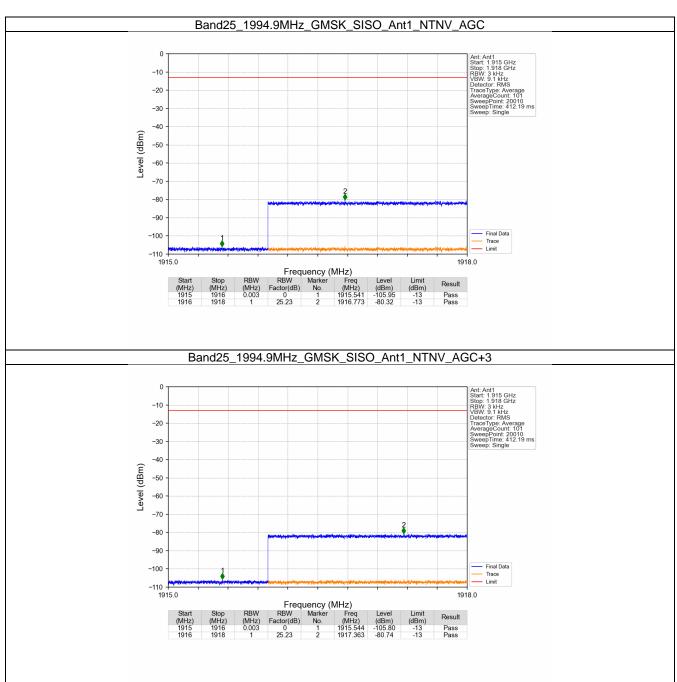
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6. Spurious emissions

6.1 Band25

6.1.1 Test Result

						Band: 25 / I	NTNV				
	Signa	ı				Fraguenay		SE (dBr	n)		
Туре	Level (dBm)	Frequency (MHz)	Channel	TX Type	ANT	Frequency Range (MHz)	Result for SISO	Result for 4*4 MIMO	Limit for SISO	Limit for 4*4MIMO	Verdict
						0.009-0.15	-50.32	-44.30	-13.00	-19.02	Pass
						0.15-30	-62.75	-56.73	-13.00	-19.02	Pass
		1932.5	LCH	SISO	1	30-1000	-80.58	-74.56	-13.00	-19.02	Pass
						1000-10000	-73.17	-67.15	-13.00	-19.02	Pass
						10000-19150	-66.92	-60.90	-13.00	-19.02	Pass
						0.009-0.15	-44.15	-38.13	-13.00	-19.02	Pass
						0.15-30	-56.98	-50.96	-13.00		Pass
AWGN	-3.2	1962.5	MCH	SISO	1	30-1000	-74.66	-68.64	-13.00	-19.02	Pass
						1000-10000	-66.92	-60.90	-13.00	-19.02	Pass
						10000-19150	-60.88	-54.86	-13.00	-19.02	Pass
						0.009-0.15	-50.18	-44.16	-13.00	-19.02	Pass
						0.15-30	-62.51	-56.49	-13.00	-19.02 Pa	Pass
		1992.5	HCH	SISO	1	30-1000	-80.75	-74.73	-13.00		Pass
						1000-10000	-72.72	-66.70	-13.00	-19.02 Pass	Pass
						10000-19150	-66.80	-60.78	-13.00		Pass
						0.009-0.15	-50.40	-44.38		Pass	
						0.15-30	-62.91	-56.89	-13.00		Pass
		1930.1	LCH	SISO	1	30-1000	-80.60	-74.58	-13.00	-19.02	Pass
						1000-10000	-73.35	-67.33	-13.00	-19.02	Pass
						10000-19150	-66.82	-60.80	-13.00	-19.02	Pass
						0.009-0.15	-44.04	-38.02	-13.00	-19.02	Pass
						0.15-30	-57.14	-51.12	-13.00	-19.02	Pass
GMSK	-3.2	1962.5	MCH	SISO	1	30-1000	-74.40	-68.38	-13.00	-19.02	Pass
						1000-10000	-67.19	-61.17	-13.00	-19.02	Pass
						10000-19150	-60.94	-54.92	-13.00	-19.02	Pass
						0.009-0.15	-49.91	-43.89	-13.00	-19.02	Pass
						0.15-30	-61.94	-55.92	-13.00	-19.02	Pass
		1994.9	HCH	SISO	1	30-1000	-80.43	-74.41	-13.00	-19.02	Pass
				0.00	, ' <u></u>	1000-10000	-64.27	-58.25	-13.00	-19.02	Pass
						10000-19150	-66.86	-60.84	-13.00	-19.02	Pass

Note 1: This EUT supports 4*4 MIMO, since we only presented the results of a test port of the worst, so we subtract the limit 10 * log (4).

Note 2: All the test frequency points below the -19.02dBm, Meet the test requirements.



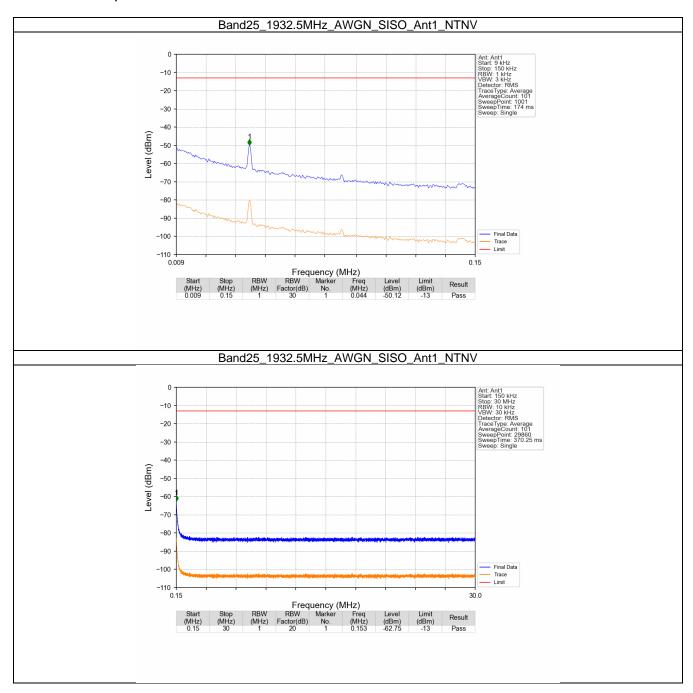
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6.1.2 Test Graph



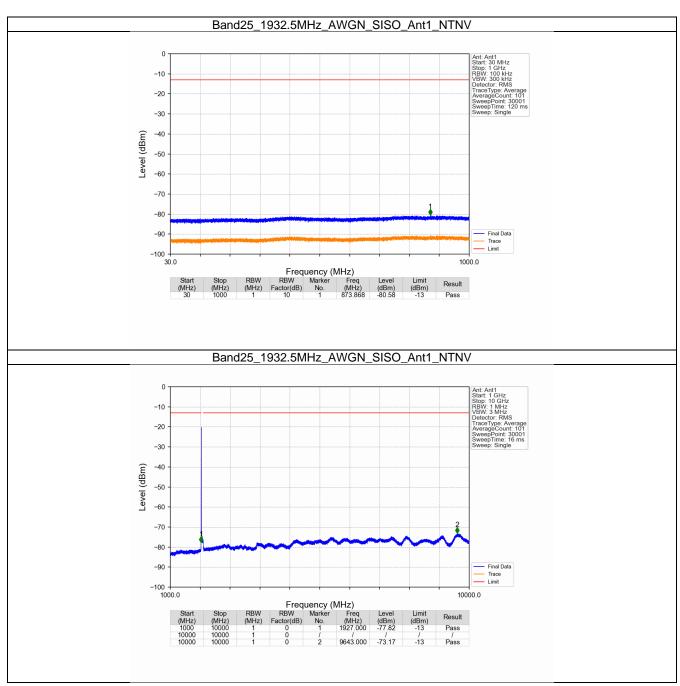


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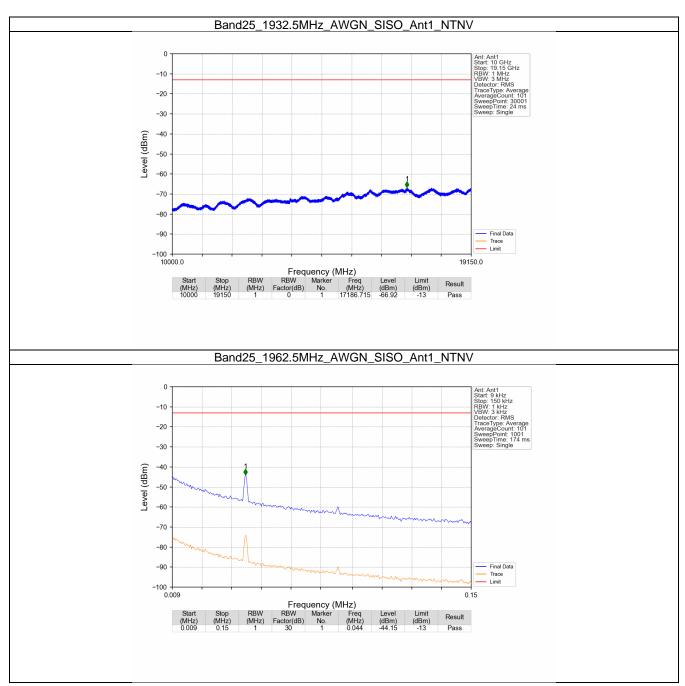


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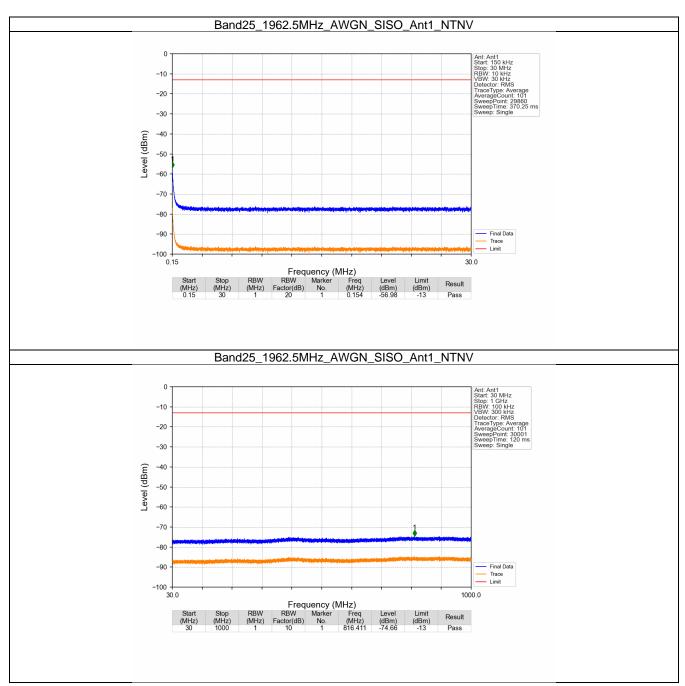


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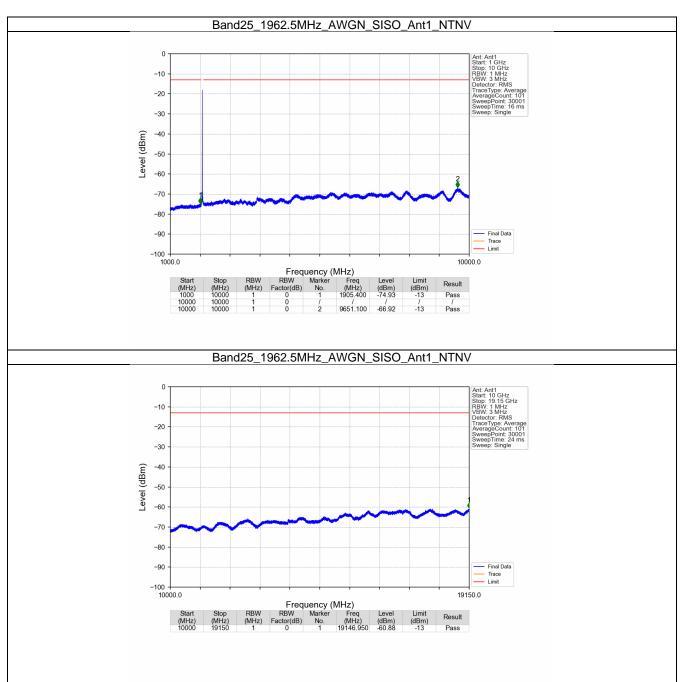
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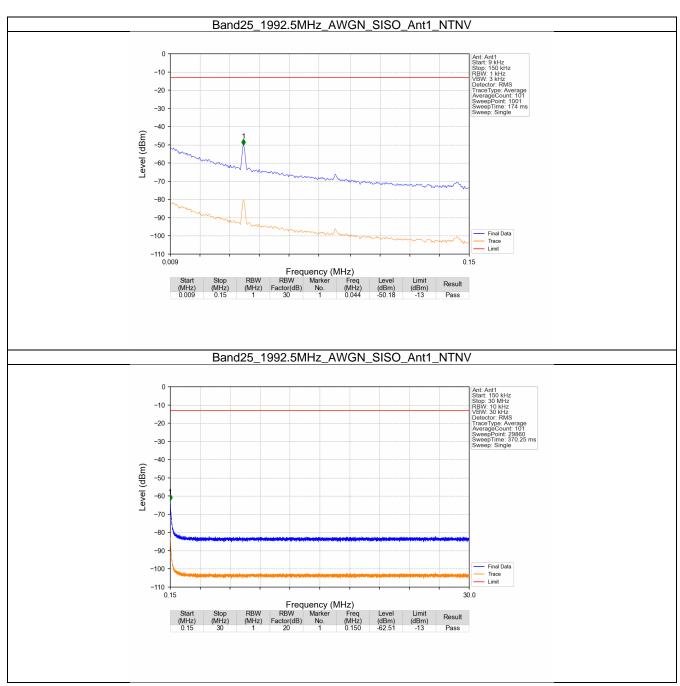


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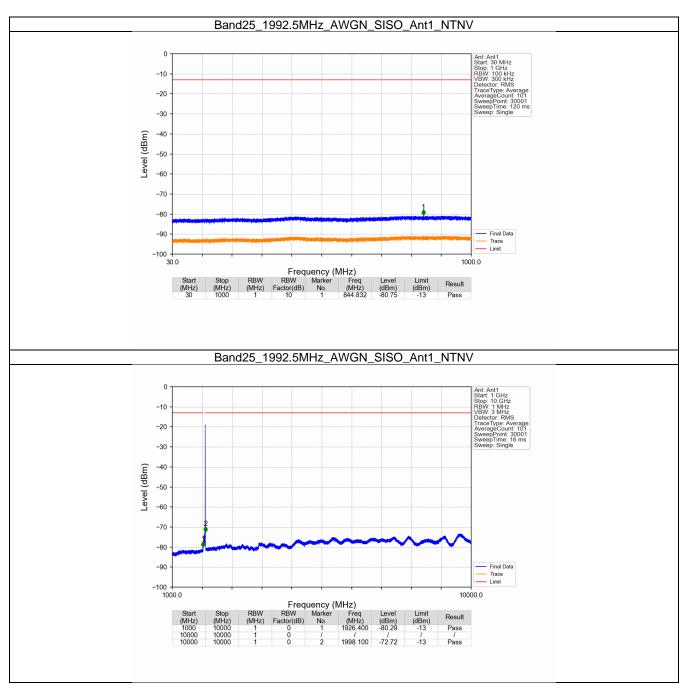


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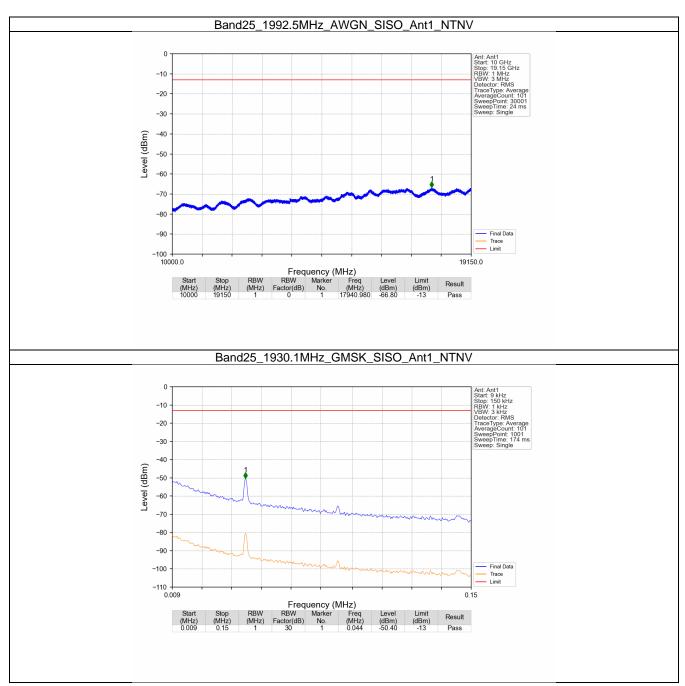


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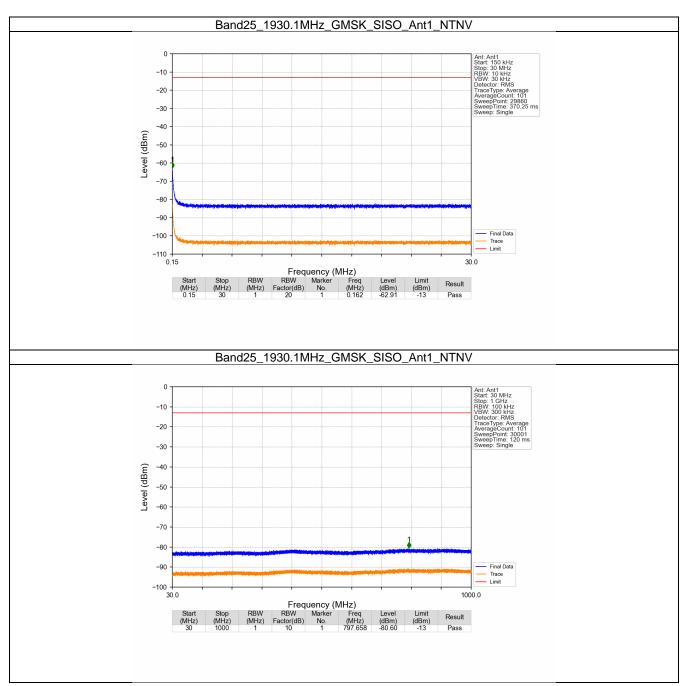


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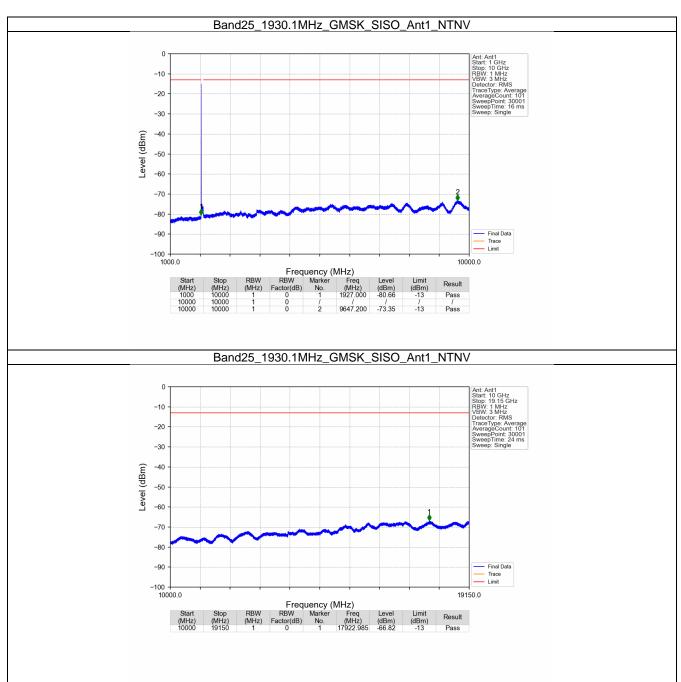


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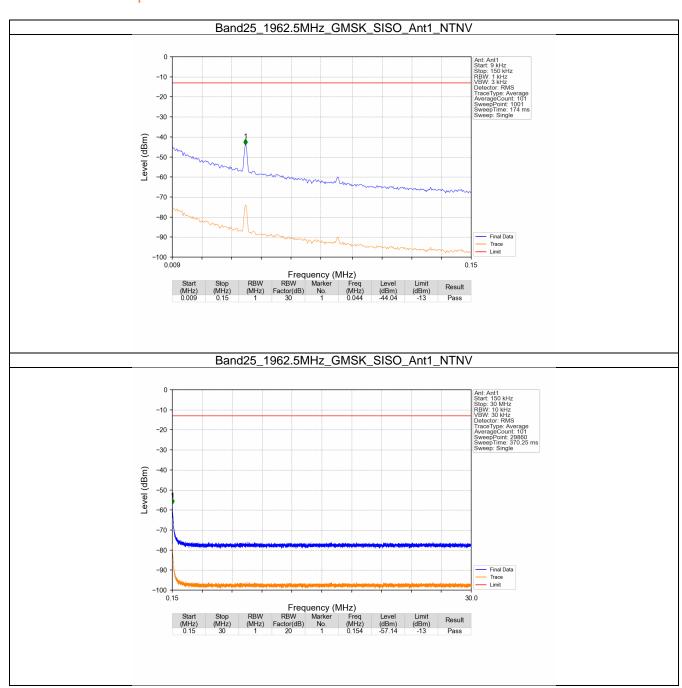


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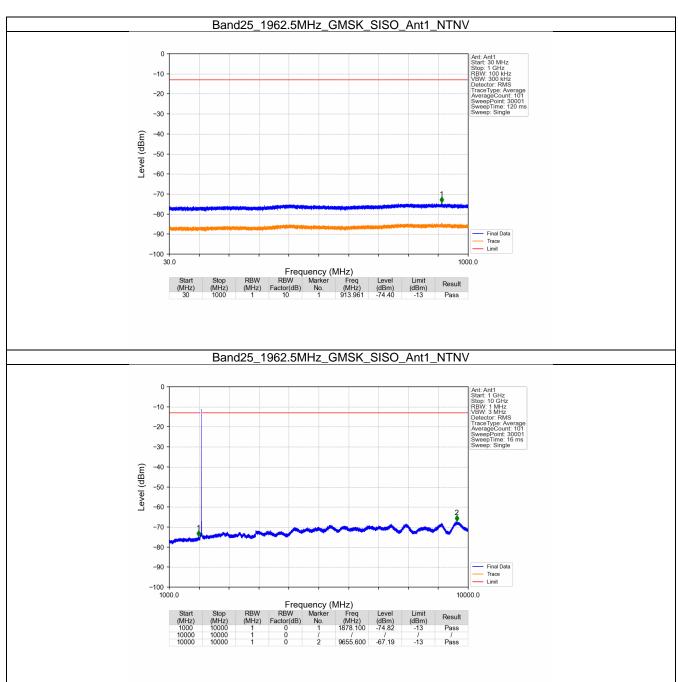
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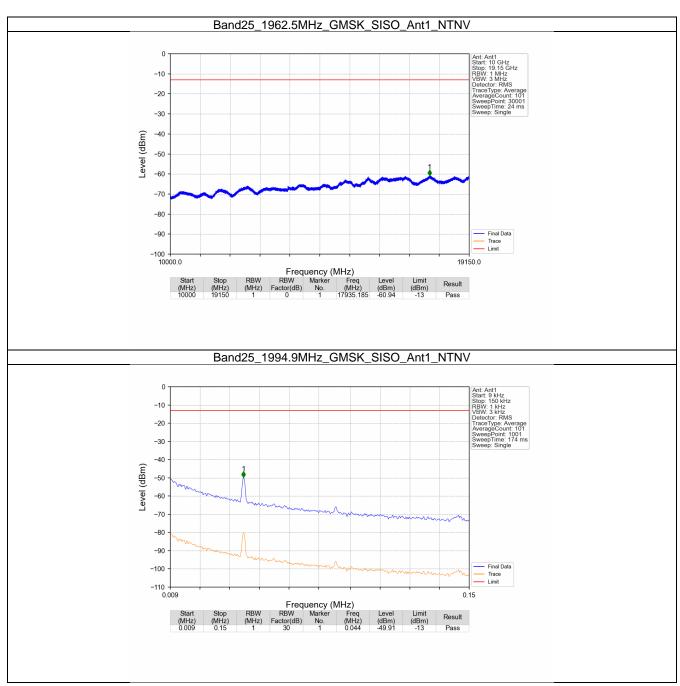


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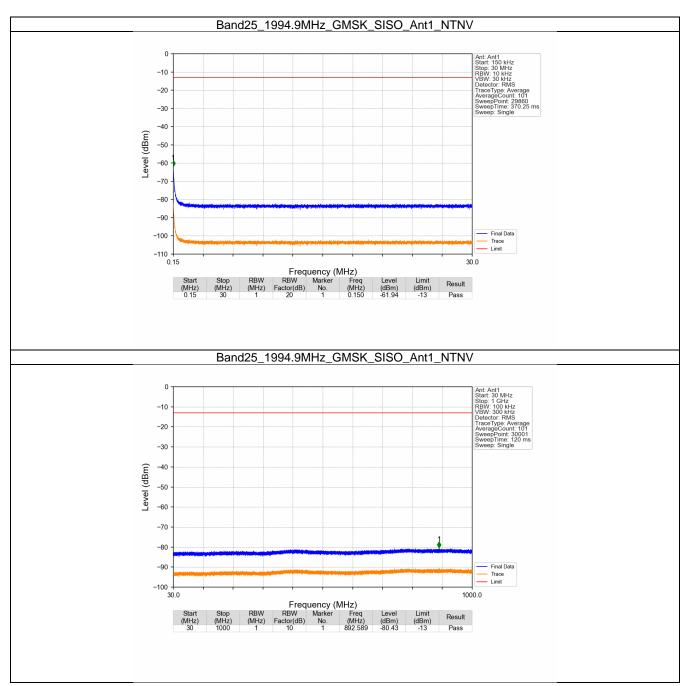


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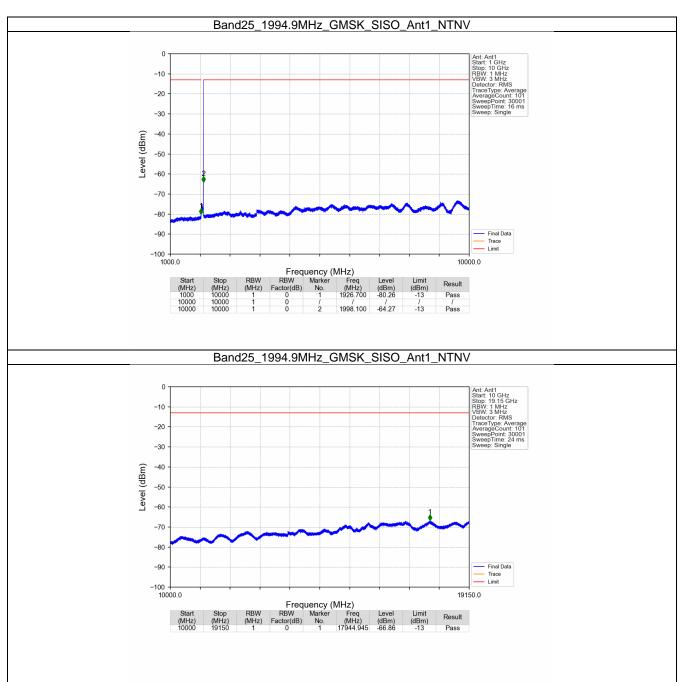


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7. Frequency stability measurements

7.1 Band25_Ant1

7.1.1 Test Result

			Band: 25 /	/ NTNV						
	Signal		Temp	Voltage	Freq. Error	Tolerance	Verdict			
Type	Level (dBm)	Frequency (MHz)	(°C)	(VDC)		(ppm)	Verdict			
				40.2	0.00	0.00	Pass			
			20	48	0.00	0.00				
				55.8	0.00	0.00	Pass			
			-10	48	0.00	0.00	Pass			
		1930.1	0	48	0.00	0.00				
			10	48	0.00	0.00	Pass			
			30	48	0.00	0.00	Pass			
			40	48	0.00	(Hz) (ppm) Vertical 0.00 0.00 Pass 0.00 0.00 Pass				
			45	48	0.00	(ppm) Vertical 0.00 Pass				
				40.2	0.00	0.00	Pass			
			20	48	0.00	0.00	Pass			
				55.8	0.00	0.00	Pass			
			-10	48	0.00	0.00	Pass			
CW	-3.2	1962.5	0	48	0.00	0.00	Pass			
			10	48	0.00	0.00	Pass			
			30	48	0.00	0.00	Pass			
			40	48	0.00	0.00	Pass			
			45	48	0.00	0.00	Pass			
				40.2	0.00	0.00	Pass			
			20	48	0.00	0.00	Pass			
				55.8	0.00	0.00	Pass			
			-10	48	0.00	0.00	Pass			
		1994.9	0	48	0.00	0.00	Pass			
			10	48	0.00	0.00	Pass			
			30	48	0.00	0.00				
			40	48	0.00	0.00				
			45	48	0.00	0.00	Pass			



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