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Appendix for WCDMA Band 4

Applicant: Howen Technologies Co., Ltd.

**Address: Room 2001 & 2004, Building 2A, Shenzhen International
Innovation Valley, Dashi 1st Road, Nanshan District, Shenzhen,
China**

Product Name: Dashcam

**Model: Hero-ME40-02, Hero-MC30-01, Hero-MC30-02, Hero-MC30-
03, Hero-ME41-02, Hero-ME41-03, Hero-ME40-01, Hero-ME40-03,
Hero-MA90-01, Hero-MA90-02, Hero-MA90-03**

FCC ID: 2AGBD1-HERO-ME40-02

TABLE OF CONTENTS

1. Conducted Output Power	2
2. Frequency Stability	2
3. 99% & 26dB Bandwidth	5
4. Peak-Average Ratio	14
5. Spurious Emission and Band Edge	19

1. Conducted Output Power

1.1 Test Result

1.1.1 Band4

Band: 4					
ENV	Mode		Frequency (MHz)	Conducted Power (dBm)	Verdict
	Network	Subset			
NTNV	RMC	12.2kbps RMC	1712.4	21.88	Pass
			1732.6	22.07	Pass
			1752.6	22.07	Pass
	HSDPA	Subtest 1	1712.4	19.71	Pass
		Subtest 2	1712.4	19.73	Pass
		Subtest 3	1712.4	19.72	Pass
		Subtest 4	1712.4	19.70	Pass
		Subtest 1	1732.6	20.37	Pass
		Subtest 2	1732.6	20.26	Pass
		Subtest 3	1732.6	20.19	Pass
		Subtest 4	1732.6	20.00	Pass
		Subtest 1	1752.6	20.00	Pass
		Subtest 2	1752.6	20.01	Pass
		Subtest 3	1752.6	19.94	Pass
		Subtest 4	1752.6	19.92	Pass
	HSUPA	Subtest 1	1712.4	17.92	Pass
		Subtest 2	1712.4	18.19	Pass
		Subtest 3	1712.4	18.00	Pass
		Subtest 4	1712.4	17.09	Pass
		Subtest 5	1712.4	17.93	Pass
		Subtest 1	1732.6	18.01	Pass
		Subtest 2	1732.6	18.43	Pass
		Subtest 3	1732.6	18.45	Pass
		Subtest 4	1732.6	17.46	Pass
		Subtest 5	1732.6	17.84	Pass
		Subtest 1	1752.6	17.87	Pass
		Subtest 2	1752.6	18.22	Pass
		Subtest 3	1752.6	18.54	Pass
		Subtest 4	1752.6	17.99	Pass
		Subtest 5	1752.6	17.27	Pass

2. Frequency Stability

2.1 Test Result

2.1.1 Band4

Band: 4							
Network	Frequency (MHz)	Temp. (°C)	Voltage (VDC)	Freq. Error (Hz)	Freq. vs. Rated (ppm)		Verdict
					Result	Limit	
RMC	1712.4	24	9.0	8.705	0.0051	-2.5 to 2.5	Pass
			12.0	-6.659	-0.0039	-2.5 to 2.5	Pass
			36.0	-6.516	-0.0038	-2.5 to 2.5	Pass
		-40	12.0	-4.978	-0.0029	-2.5 to 2.5	Pass

		-30	12.0	-3.512	-0.0021	-2.5 to 2.5	Pass
		-20	12.0	-2.868	-0.0017	-2.5 to 2.5	Pass
		-10	12.0	-1.402	-0.0008	-2.5 to 2.5	Pass
		0	12.0	-2.053	-0.0012	-2.5 to 2.5	Pass
		10	12.0	-1.159	-0.0007	-2.5 to 2.5	Pass
		30	12.0	-0.651	-0.0004	-2.5 to 2.5	Pass
		40	12.0	0.057	0.0000	-2.5 to 2.5	Pass
		50	12.0	0.229	0.0001	-2.5 to 2.5	Pass
		60	12.0	1.574	0.0009	-2.5 to 2.5	Pass
		70	12.0	1.180	0.0007	-2.5 to 2.5	Pass
	1732.6	24	9.0	-2.739	-0.0016	-2.5 to 2.5	Pass
			12.0	-2.089	-0.0012	-2.5 to 2.5	Pass
			36.0	-1.953	-0.0011	-2.5 to 2.5	Pass
		-40	12.0	-2.038	-0.0012	-2.5 to 2.5	Pass
		-30	12.0	-1.009	-0.0006	-2.5 to 2.5	Pass
		-20	12.0	-1.194	-0.0007	-2.5 to 2.5	Pass
		-10	12.0	-1.373	-0.0008	-2.5 to 2.5	Pass
		0	12.0	-2.446	-0.0014	-2.5 to 2.5	Pass
		10	12.0	-1.624	-0.0009	-2.5 to 2.5	Pass
		30	12.0	-1.044	-0.0006	-2.5 to 2.5	Pass
		40	12.0	-0.343	-0.0002	-2.5 to 2.5	Pass
		50	12.0	-1.366	-0.0008	-2.5 to 2.5	Pass
		60	12.0	-1.202	-0.0007	-2.5 to 2.5	Pass
		70	12.0	-0.751	-0.0004	-2.5 to 2.5	Pass
	1752.6	24	9.0	-7.081	-0.0040	-2.5 to 2.5	Pass
			12.0	-5.565	-0.0032	-2.5 to 2.5	Pass
			36.0	-6.895	-0.0039	-2.5 to 2.5	Pass
		-40	12.0	-6.130	-0.0035	-2.5 to 2.5	Pass
		-30	12.0	-5.829	-0.0033	-2.5 to 2.5	Pass
		-20	12.0	-6.566	-0.0037	-2.5 to 2.5	Pass
		-10	12.0	-5.057	-0.0029	-2.5 to 2.5	Pass
		0	12.0	-4.842	-0.0028	-2.5 to 2.5	Pass
		10	12.0	-5.908	-0.0034	-2.5 to 2.5	Pass
		30	12.0	-5.615	-0.0032	-2.5 to 2.5	Pass
		40	12.0	-6.101	-0.0035	-2.5 to 2.5	Pass
		50	12.0	-5.629	-0.0032	-2.5 to 2.5	Pass
		60	12.0	-6.208	-0.0035	-2.5 to 2.5	Pass
		70	12.0	-5.550	-0.0032	-2.5 to 2.5	Pass
HSDPA	1712.4	24	9.0	-1.037	-0.0006	-2.5 to 2.5	Pass
			12.0	-1.702	-0.0010	-2.5 to 2.5	Pass
			36.0	-1.438	-0.0008	-2.5 to 2.5	Pass
		-40	12.0	-1.044	-0.0006	-2.5 to 2.5	Pass
		-30	12.0	-1.287	-0.0008	-2.5 to 2.5	Pass
		-20	12.0	-1.781	-0.0010	-2.5 to 2.5	Pass
		-10	12.0	0.014	0.0000	-2.5 to 2.5	Pass
		0	12.0	-1.330	-0.0008	-2.5 to 2.5	Pass
		10	12.0	-0.894	-0.0005	-2.5 to 2.5	Pass
		30	12.0	-1.009	-0.0006	-2.5 to 2.5	Pass
		40	12.0	-0.851	-0.0005	-2.5 to 2.5	Pass
		50	12.0	-1.445	-0.0008	-2.5 to 2.5	Pass
		60	12.0	-1.330	-0.0008	-2.5 to 2.5	Pass
		70	12.0	-0.930	-0.0005	-2.5 to 2.5	Pass
	1732.6	24	9.0	-1.853	-0.0011	-2.5 to 2.5	Pass
			12.0	-1.788	-0.0010	-2.5 to 2.5	Pass
			36.0	-2.081	-0.0012	-2.5 to 2.5	Pass
		-40	12.0	-1.273	-0.0007	-2.5 to 2.5	Pass
		-30	12.0	-1.466	-0.0008	-2.5 to 2.5	Pass
		-20	12.0	-0.722	-0.0004	-2.5 to 2.5	Pass
		-10	12.0	-1.266	-0.0007	-2.5 to 2.5	Pass

		0	12.0	-0.787	-0.0005	-2.5 to 2.5	Pass
		10	12.0	-1.838	-0.0011	-2.5 to 2.5	Pass
		30	12.0	-1.788	-0.0010	-2.5 to 2.5	Pass
		40	12.0	-1.624	-0.0009	-2.5 to 2.5	Pass
		50	12.0	-1.180	-0.0007	-2.5 to 2.5	Pass
		60	12.0	-1.309	-0.0008	-2.5 to 2.5	Pass
		70	12.0	-1.459	-0.0008	-2.5 to 2.5	Pass
	1752.6	24	9.0	-10.471	-0.0060	-2.5 to 2.5	Pass
			12.0	-8.397	-0.0048	-2.5 to 2.5	Pass
			36.0	-8.633	-0.0049	-2.5 to 2.5	Pass
		-40	12.0	-9.391	-0.0054	-2.5 to 2.5	Pass
		-30	12.0	-8.411	-0.0048	-2.5 to 2.5	Pass
		-20	12.0	-8.683	-0.0050	-2.5 to 2.5	Pass
		-10	12.0	-7.939	-0.0045	-2.5 to 2.5	Pass
		0	12.0	-8.590	-0.0049	-2.5 to 2.5	Pass
		10	12.0	-9.105	-0.0052	-2.5 to 2.5	Pass
		30	12.0	-9.041	-0.0052	-2.5 to 2.5	Pass
		40	12.0	-7.703	-0.0044	-2.5 to 2.5	Pass
		50	12.0	-8.161	-0.0047	-2.5 to 2.5	Pass
		60	12.0	-8.862	-0.0051	-2.5 to 2.5	Pass
		70	12.0	-8.047	-0.0046	-2.5 to 2.5	Pass
HSUPA	1712.4	24	9.0	12.968	0.0076	-2.5 to 2.5	Pass
			12.0	13.182	0.0077	-2.5 to 2.5	Pass
			36.0	12.395	0.0072	-2.5 to 2.5	Pass
		-40	12.0	13.897	0.0081	-2.5 to 2.5	Pass
		-30	12.0	13.003	0.0076	-2.5 to 2.5	Pass
		-20	12.0	14.455	0.0084	-2.5 to 2.5	Pass
		-10	12.0	12.023	0.0070	-2.5 to 2.5	Pass
		0	12.0	13.075	0.0076	-2.5 to 2.5	Pass
		10	12.0	12.581	0.0073	-2.5 to 2.5	Pass
		30	12.0	12.081	0.0071	-2.5 to 2.5	Pass
		40	12.0	13.962	0.0082	-2.5 to 2.5	Pass
		50	12.0	13.490	0.0079	-2.5 to 2.5	Pass
		60	12.0	13.282	0.0078	-2.5 to 2.5	Pass
		70	12.0	13.726	0.0080	-2.5 to 2.5	Pass
	1732.6	24	9.0	-0.508	-0.0003	-2.5 to 2.5	Pass
			12.0	-0.508	-0.0003	-2.5 to 2.5	Pass
			36.0	-0.751	-0.0004	-2.5 to 2.5	Pass
		-40	12.0	-0.701	-0.0004	-2.5 to 2.5	Pass
		-30	12.0	0.043	0.0000	-2.5 to 2.5	Pass
		-20	12.0	0.114	0.0001	-2.5 to 2.5	Pass
		-10	12.0	0.229	0.0001	-2.5 to 2.5	Pass
		0	12.0	0.072	0.0000	-2.5 to 2.5	Pass
		10	12.0	-0.823	-0.0005	-2.5 to 2.5	Pass
		30	12.0	1.109	0.0006	-2.5 to 2.5	Pass
		40	12.0	0.000	0.0000	-2.5 to 2.5	Pass
		50	12.0	-1.130	-0.0007	-2.5 to 2.5	Pass
		60	12.0	0.036	0.0000	-2.5 to 2.5	Pass
		70	12.0	-0.372	-0.0002	-2.5 to 2.5	Pass
	1752.6	24	9.0	-4.041	-0.0023	-2.5 to 2.5	Pass
			12.0	-3.991	-0.0023	-2.5 to 2.5	Pass
			36.0	-2.632	-0.0015	-2.5 to 2.5	Pass
		-40	12.0	-2.267	-0.0013	-2.5 to 2.5	Pass
		-30	12.0	-2.267	-0.0013	-2.5 to 2.5	Pass
		-20	12.0	-2.568	-0.0015	-2.5 to 2.5	Pass
		-10	12.0	-2.439	-0.0014	-2.5 to 2.5	Pass
		0	12.0	-2.496	-0.0014	-2.5 to 2.5	Pass
		10	12.0	-3.619	-0.0021	-2.5 to 2.5	Pass
		30	12.0	-4.234	-0.0024	-2.5 to 2.5	Pass

		40	12.0	0.408	0.0002	-2.5 to 2.5	Pass
		50	12.0	1.209	0.0007	-2.5 to 2.5	Pass
		60	12.0	-0.401	-0.0002	-2.5 to 2.5	Pass
		70	12.0	-0.336	-0.0002	-2.5 to 2.5	Pass

3. 99% & 26dB Bandwidth

3.1 Test Result

3.1.1 Band4_OBW

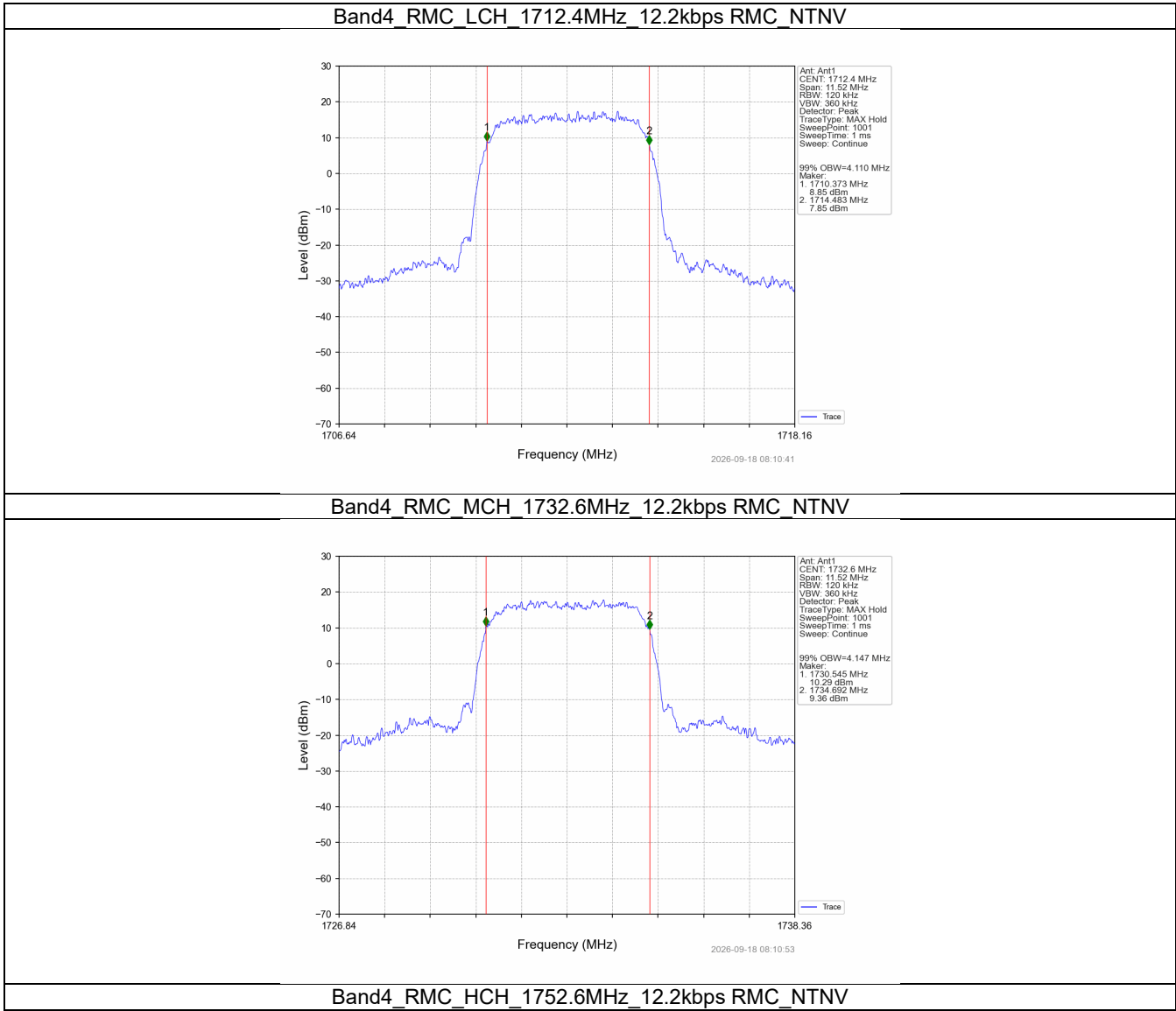
Band: 4						
ENV	Mode		Frequency (MHz)	99% Occupied Bandwidth (MHz)		Verdict
	Network	Subset		Result	Limit	
NTNV	RMC	12.2kbps RMC	1712.4	4.110	/	Pass
			1732.6	4.147	/	Pass
			1752.6	4.132	/	Pass
	HSDPA	Subtest 1	1712.4	4.200	/	Pass
			1732.6	4.179	/	Pass
			1752.6	4.192	/	Pass
	HSUPA	Subtest 1	1712.4	4.203	/	Pass
			1732.6	4.161	/	Pass
			1752.6	4.216	/	Pass

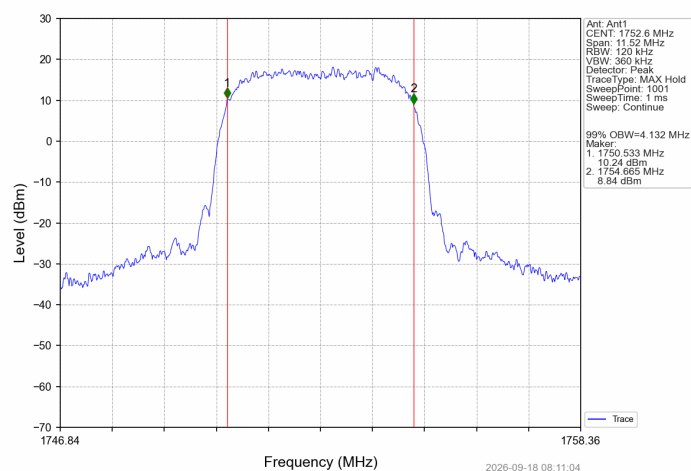
3.1.2 Band4_XDB

Band: 4						
ENV	Mode		Frequency (MHz)	26dB Bandwidth (MHz)		Verdict
	Network	Subset		Result	Limit	
NTNV	RMC	12.2kbps RMC	1712.4	4.727	/	Pass
			1732.6	4.723	/	Pass
			1752.6	4.739	/	Pass
	HSDPA	Subtest 1	1712.4	5.595	/	Pass
			1732.6	4.807	/	Pass
			1752.6	6.340	/	Pass
	HSUPA	Subtest 1	1712.4	5.753	/	Pass
			1732.6	4.765	/	Pass
			1752.6	6.044	/	Pass

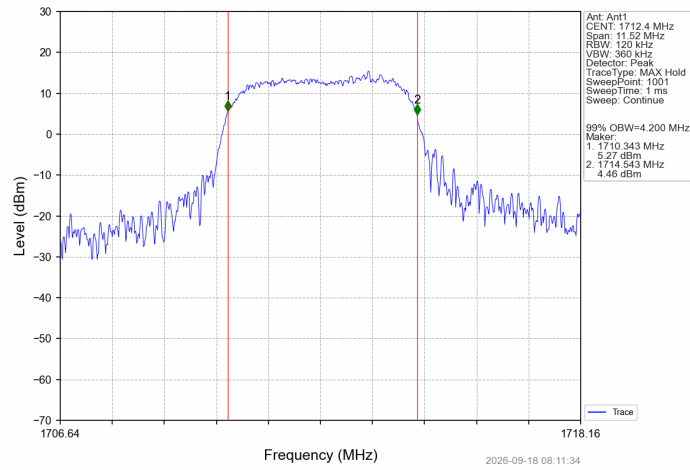
3.2 Test Graph

3.2.1 Band4_OBW

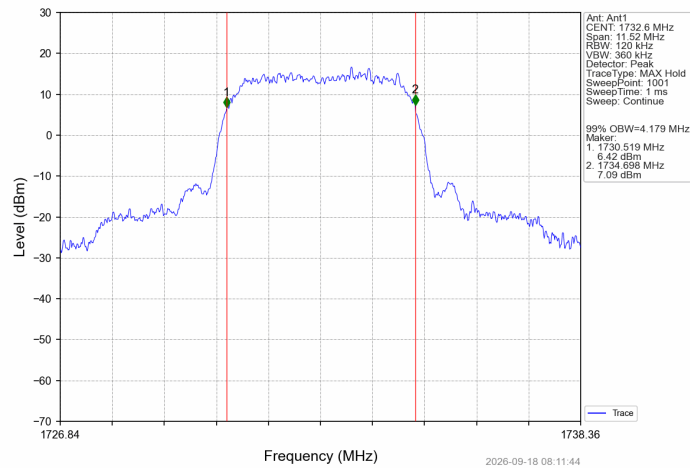




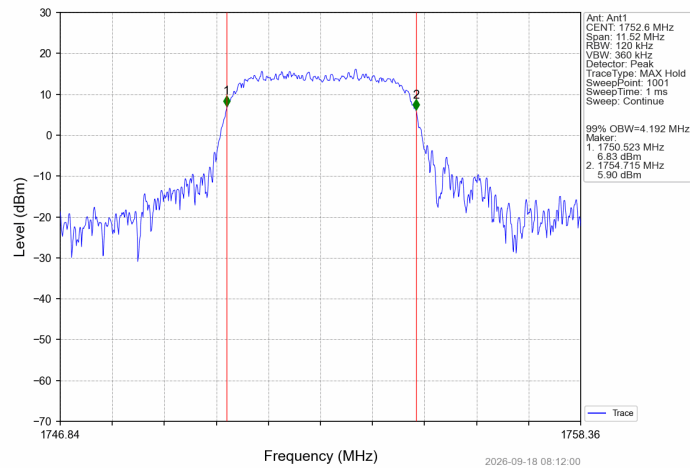
Band4 HSDPA LCH 1712.4MHz Subtest 1 NTN



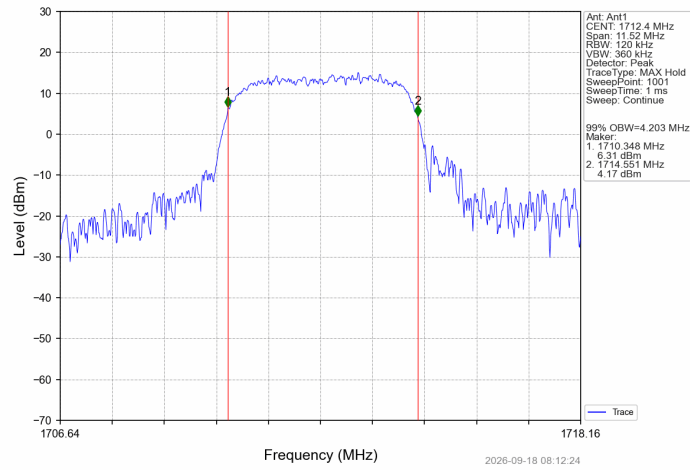
Band4 HSDPA MCH 1732.6MHz Subtest 1 NTN



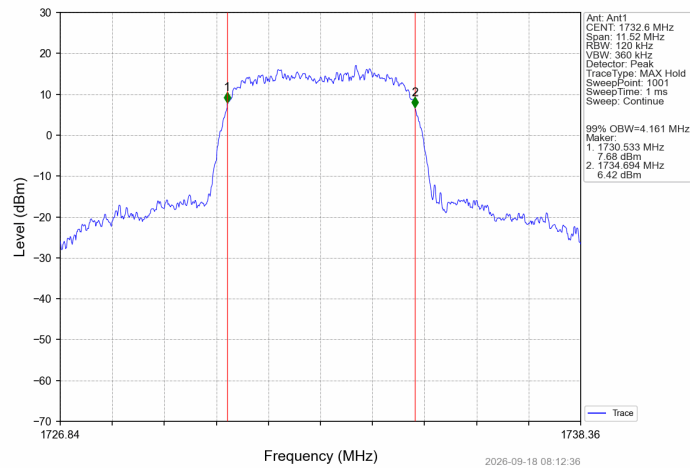
Band4 HSDPA HCH 1752.6MHz Subtest 1 NTN



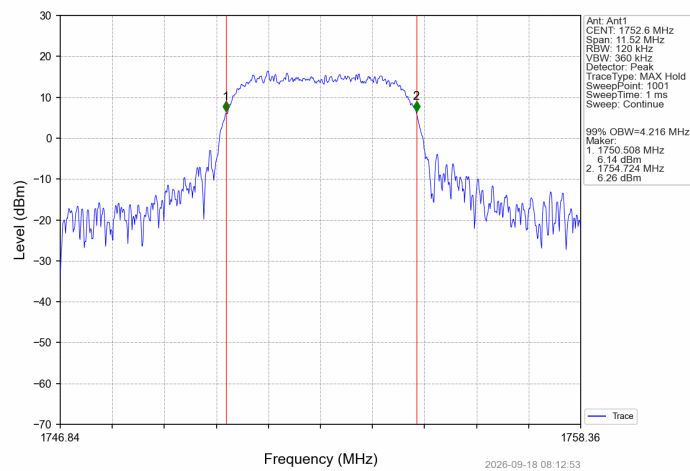
Band4 HSUPA LCH 1712.4MHz Subtest 1 NTN



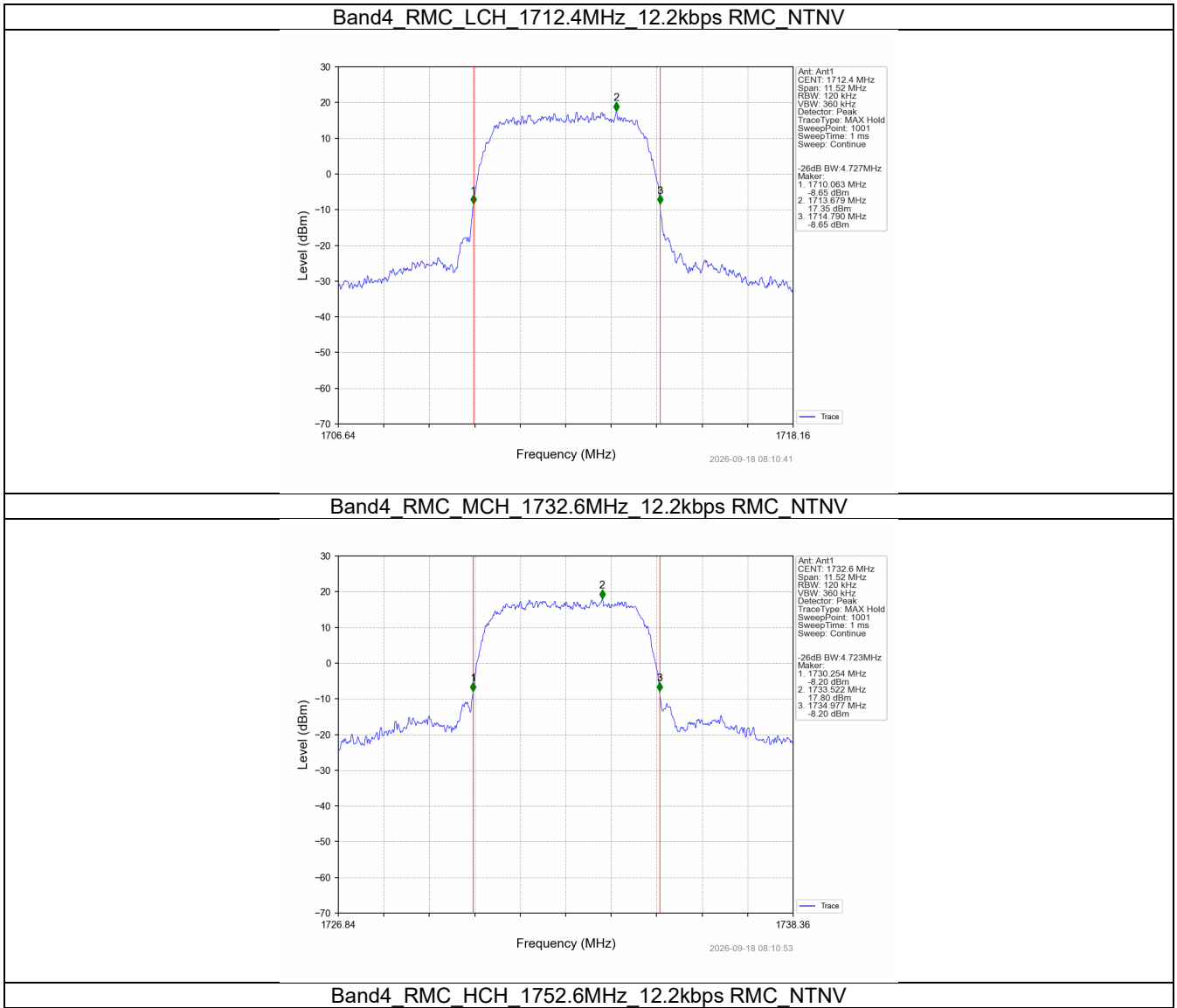
Band4 HSUPA MCH 1732.6MHz Subtest 1 NTN

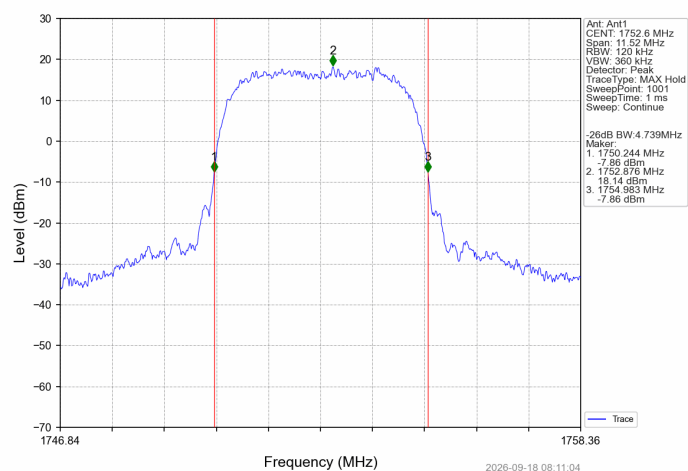


Band4 HSUPA HCH 1752.6MHz Subtest 1 NTN

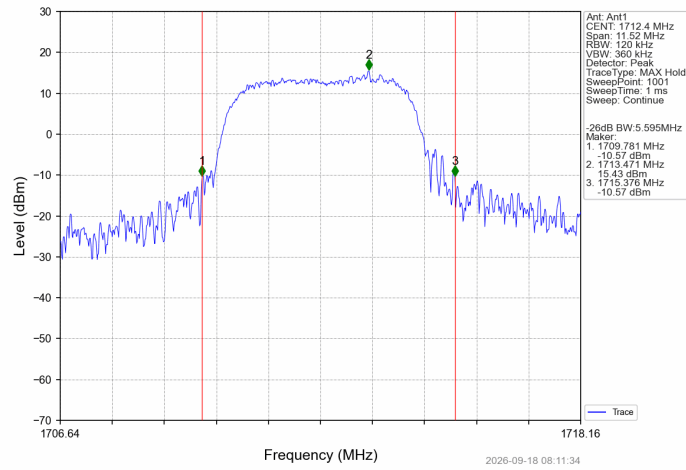


3.2.2 Band4_XDB

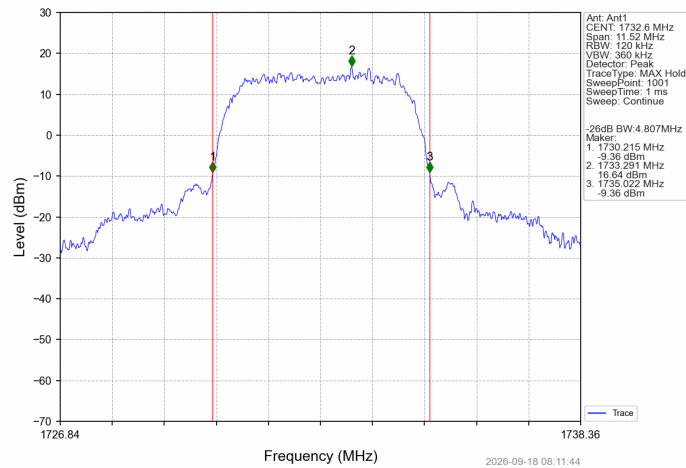




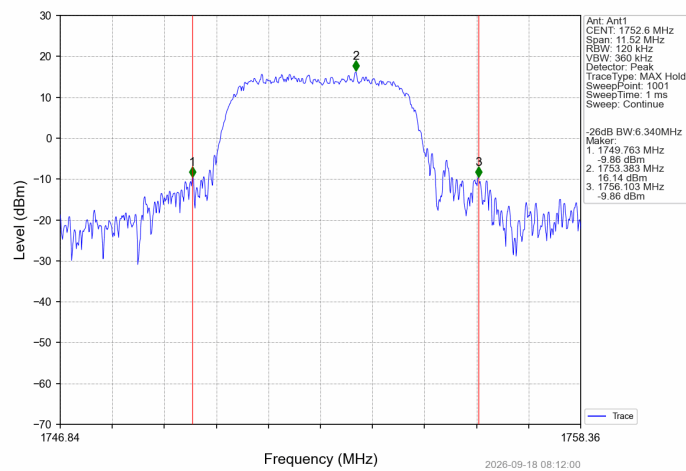
Band4 HSDPA LCH 1712.4MHz Subtest 1 NTN



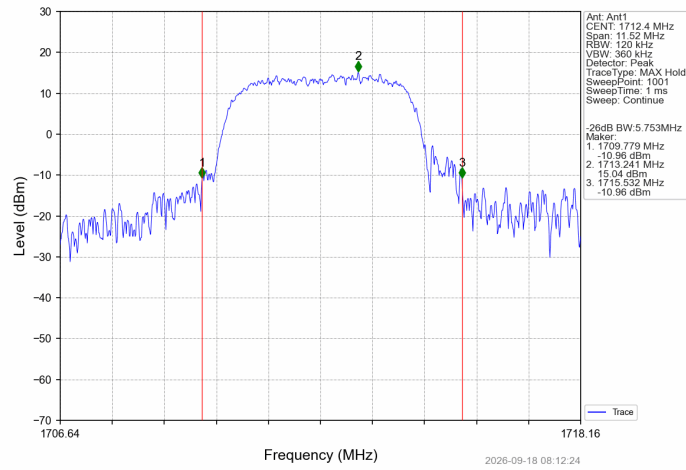
Band4 HSDPA MCH 1732.6MHz Subtest 1 NTN



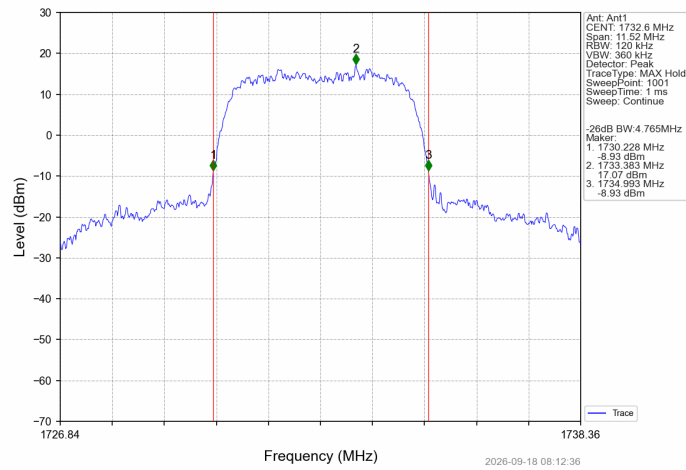
Band4 HSDPA HCH 1752.6MHz Subtest 1 NTN



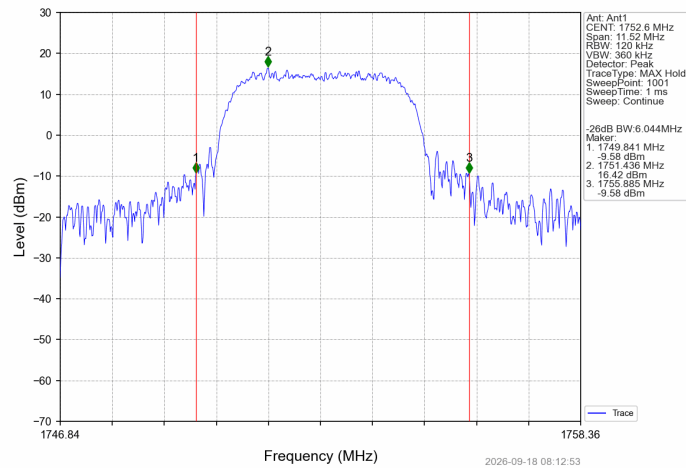
Band4_HSUPA_LCH_1712.4MHz_Subtest 1_NTNV



Band4_HSUPA_MCH_1732.6MHz_Subtest 1_NTNV



Band4_HSUPA_HCH_1752.6MHz_Subtest 1_NTNV



4. Peak-Average Ratio

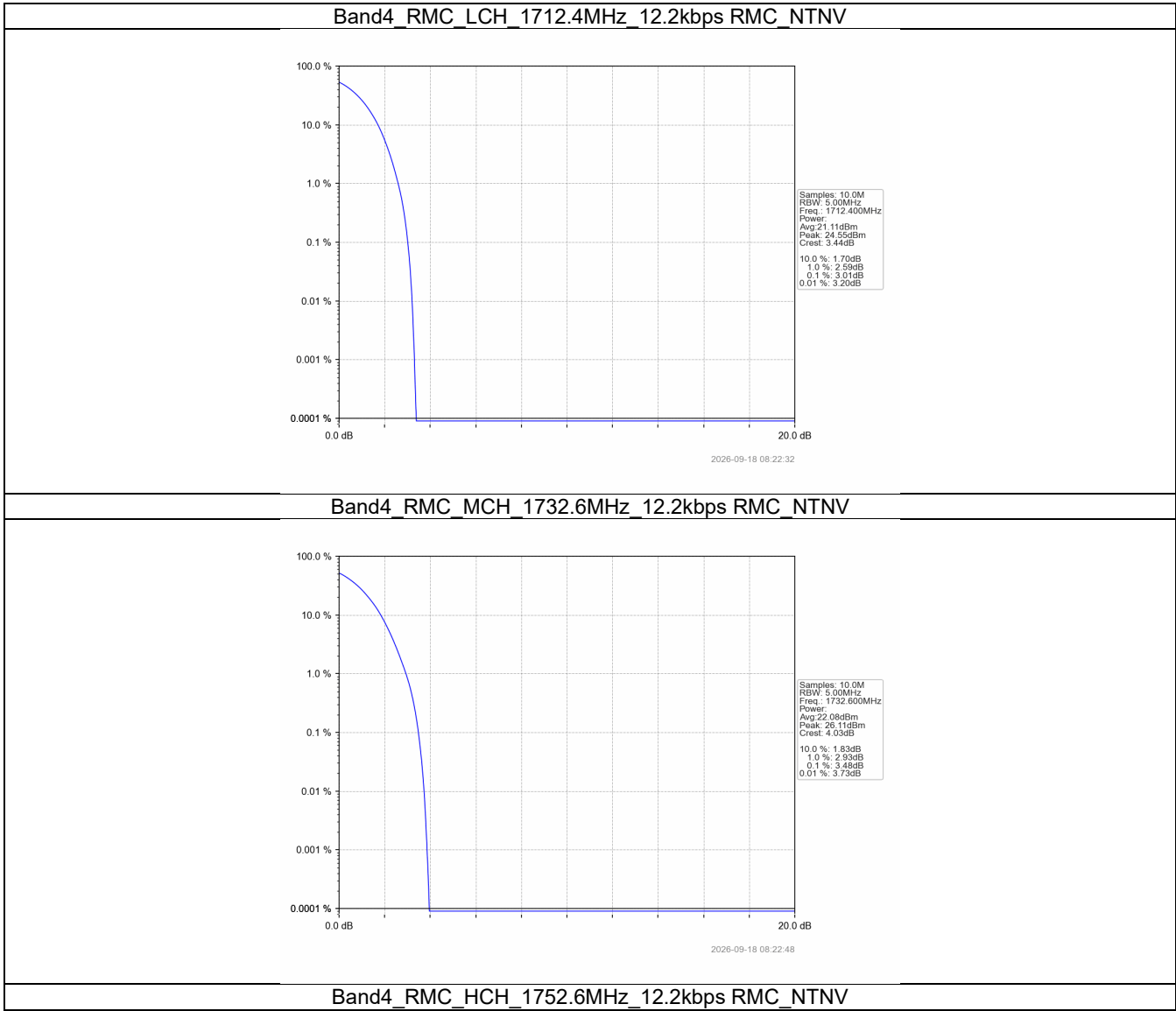
4.1 Test Result

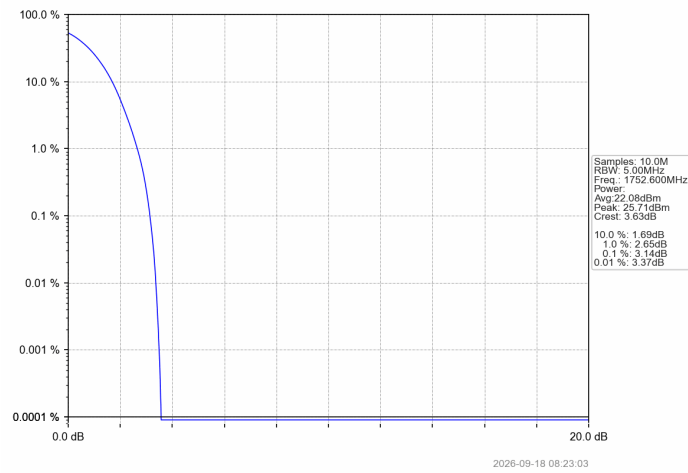
4.1.1 Band4

Band: 4						
ENV	Mode		Frequency (MHz)	Peak-Average Ratio (dB)		Verdict
	Network	Subset		Result	Limit	
NTNV	RMC	12.2kbps RMC	1712.4	3.01	<=13	Pass
			1732.6	3.48	<=13	Pass
			1752.6	3.14	<=13	Pass
	HSDPA	Subtest 1	1712.4	5.62	<=13	Pass
			1732.6	5.87	<=13	Pass
			1752.6	5.64	<=13	Pass
	HSUPA	Subtest 1	1712.4	6.79	<=13	Pass
			1732.6	7.47	<=13	Pass
			1752.6	6.99	<=13	Pass

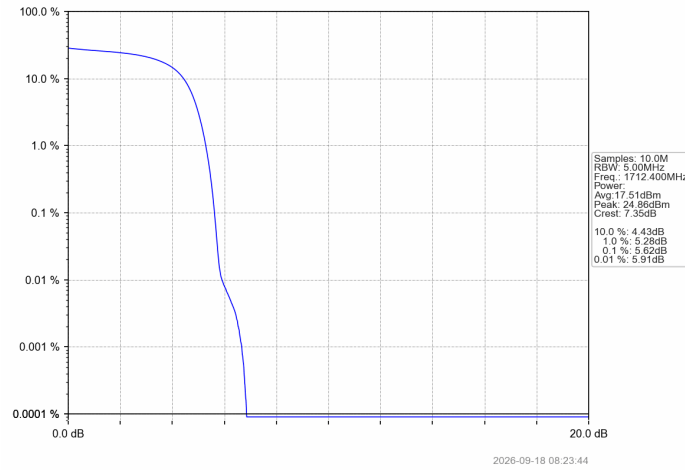
4.2 Test Graph

4.2.1 Band4

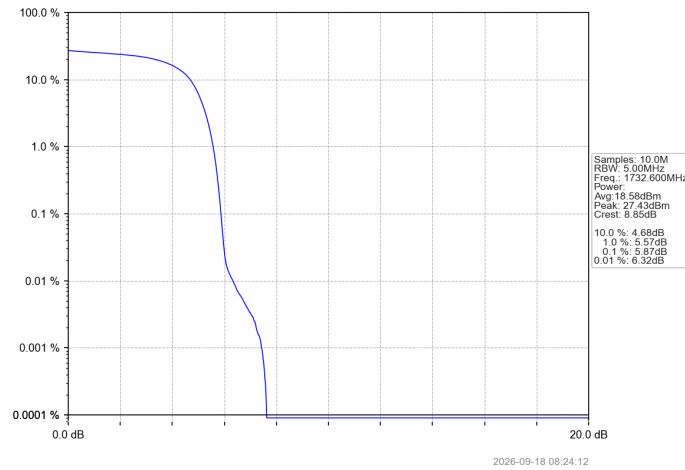




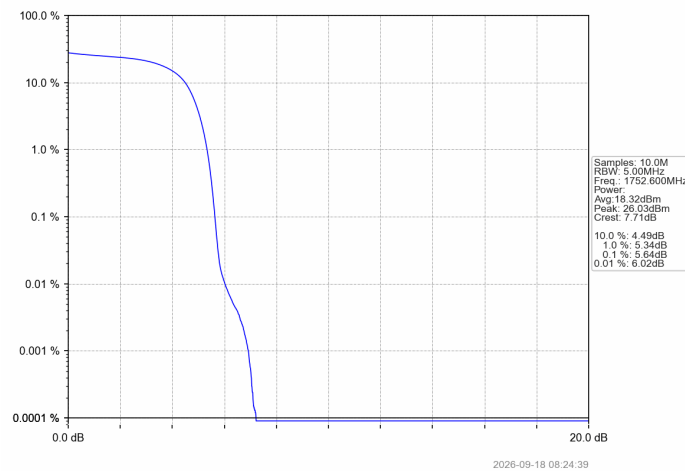
Band4 HSDPA LCH 1712.4MHz Subtest 1 NTV



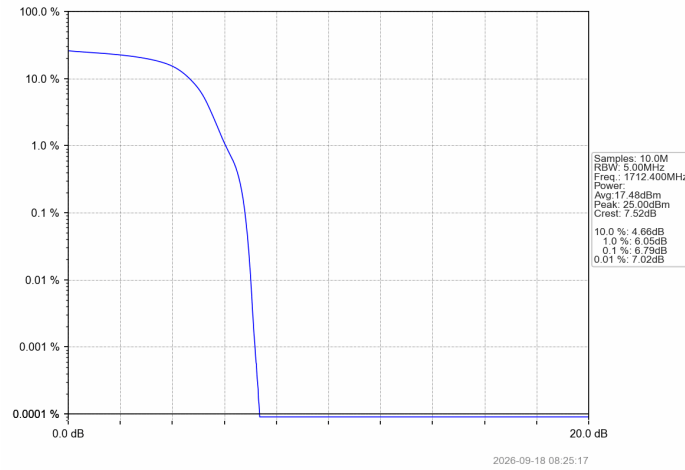
Band4 HSDPA MCH 1732.6MHz Subtest 1 NTV



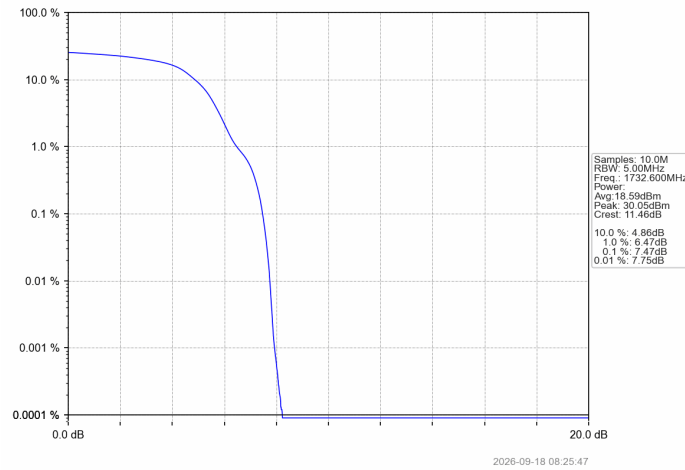
Band4 HSDPA HCH 1752.6MHz Subtest 1 NTV



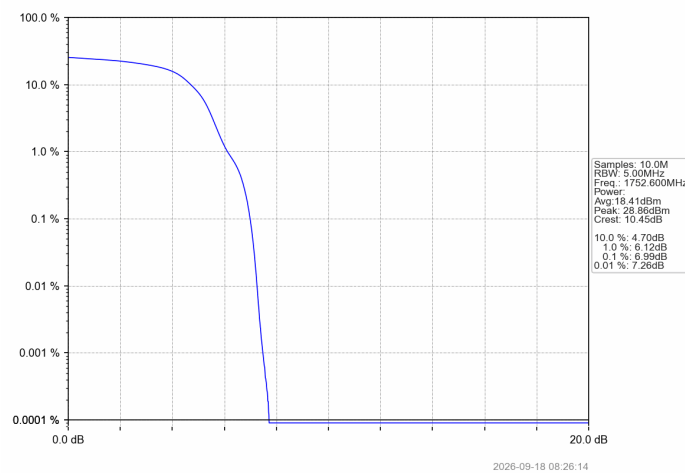
Band4 HSUPA LCH 1712.4MHz Subtest 1 NTNV



Band4 HSUPA MCH 1732.6MHz Subtest 1 NTNV



Band4 HSUPA HCH 1752.6MHz Subtest 1 NTNV



5. Spurious Emission and Band Edge

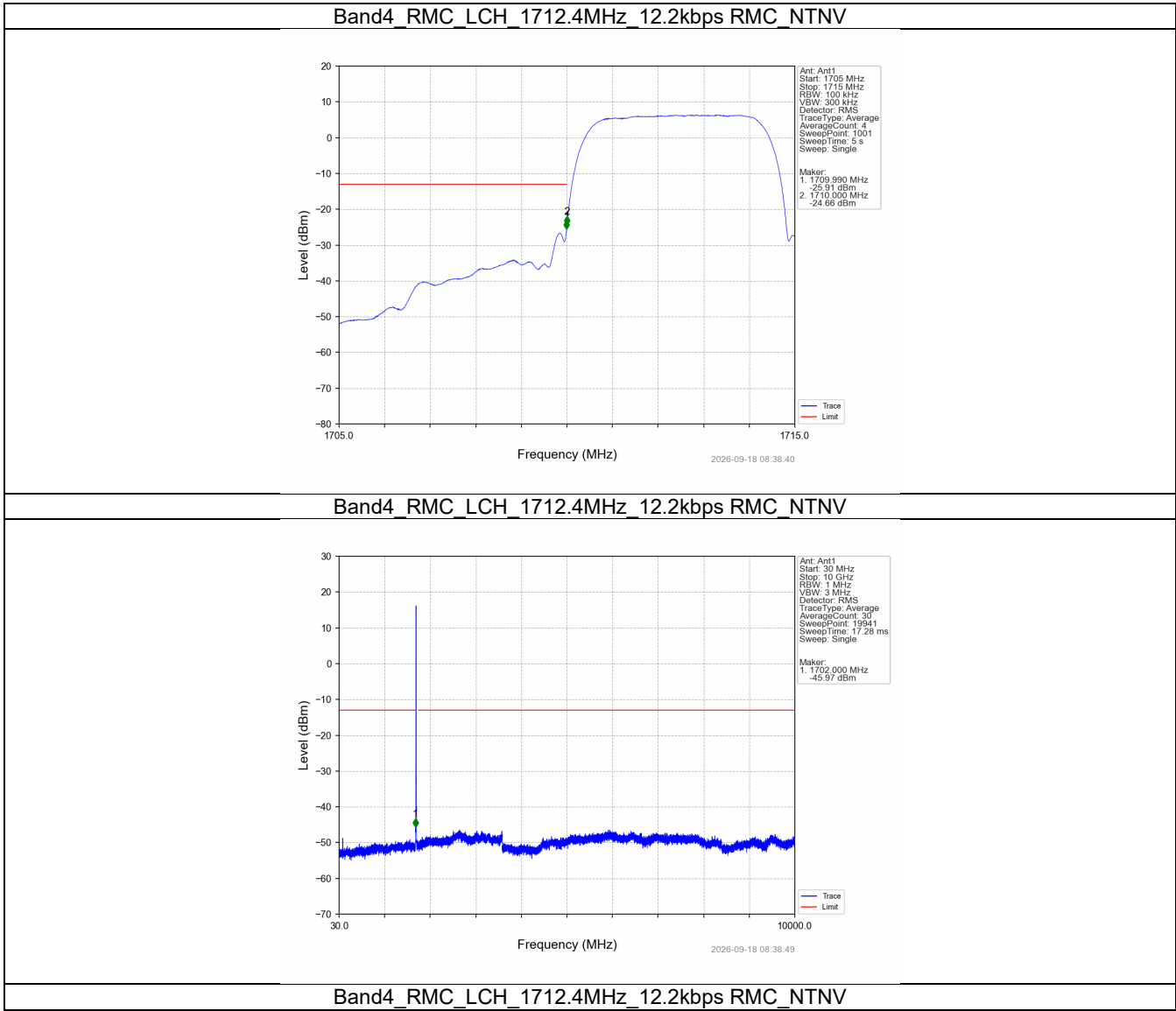
5.1 Test Result

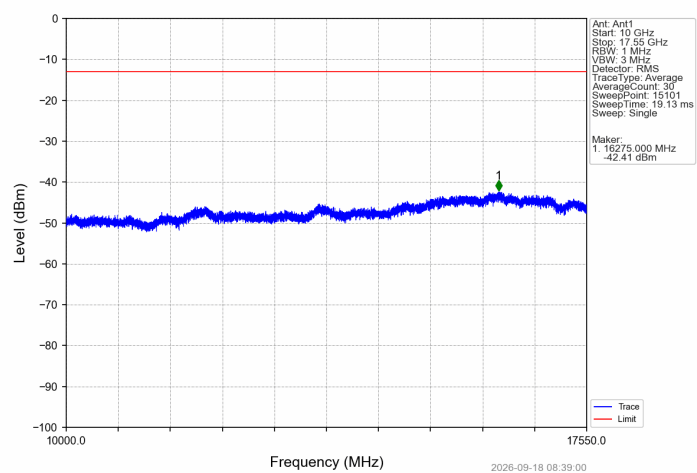
5.1.1 Band4

Band: 4						
ENV	Mode		Frequency (MHz)	Spurious Emission		Verdict
	Network	Subset		Result	Limit	
NTNV	RMC	12.2kbps RMC	1712.4	Refer To Test Graph	Pass	
			1732.6	Refer To Test Graph	Pass	
			1752.6	Refer To Test Graph	Pass	
	HSDPA	Subtest 1	1712.4	Refer To Test Graph	Pass	
			1732.6	Refer To Test Graph	Pass	
			1752.6	Refer To Test Graph	Pass	
	HSUPA	Subtest 1	1712.4	Refer To Test Graph	Pass	
			1732.6	Refer To Test Graph	Pass	
			1752.6	Refer To Test Graph	Pass	

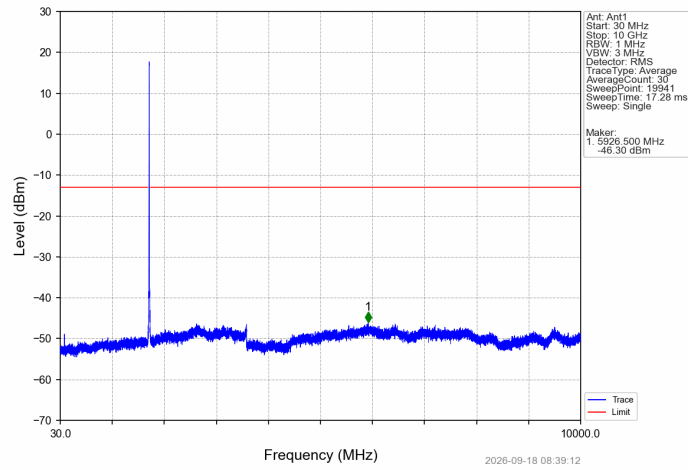
5.2 Test Graph

5.2.1 Band4

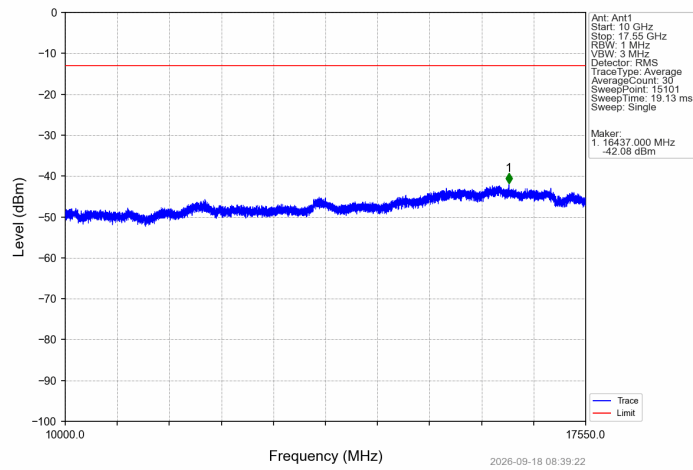




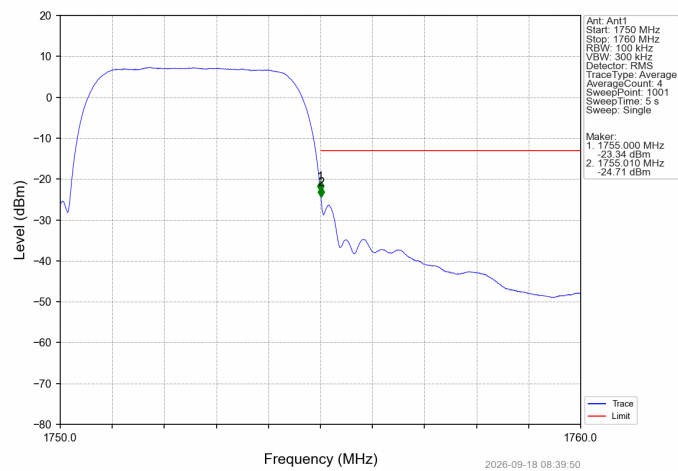
Band4_RMC_MCH_1732.6MHz_12.2kbps_RMC_NTNV



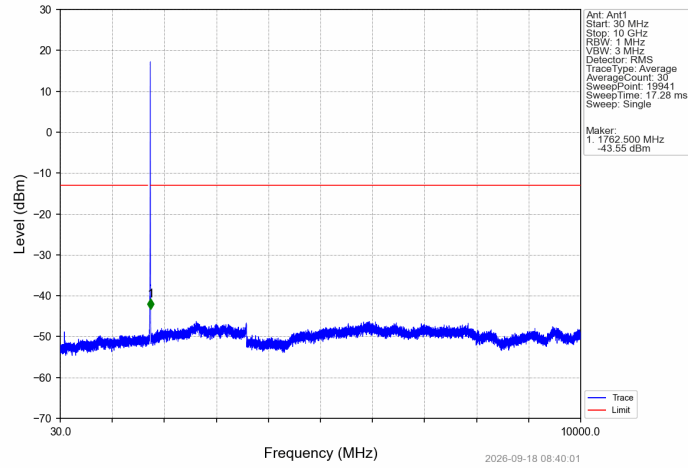
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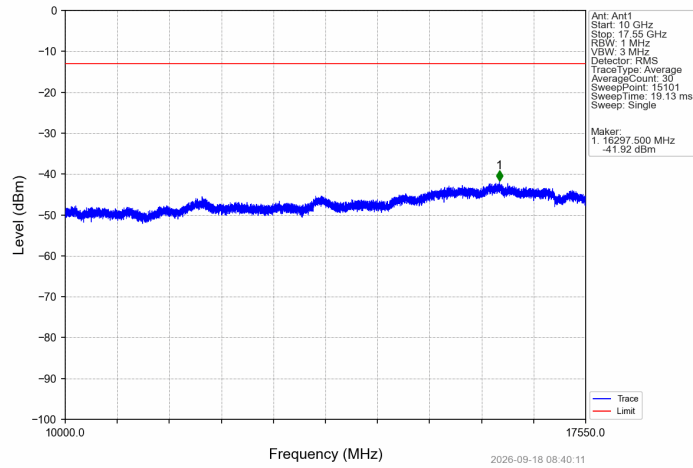
Band4_RMC_HCH_1752.6MHz_12.2kbps_RMC_NTNV



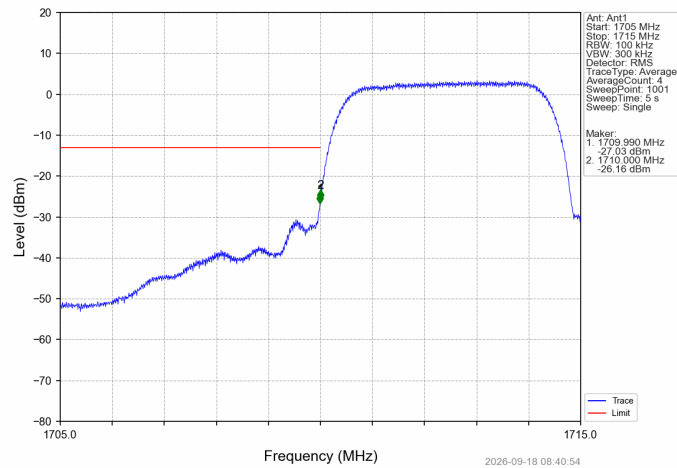
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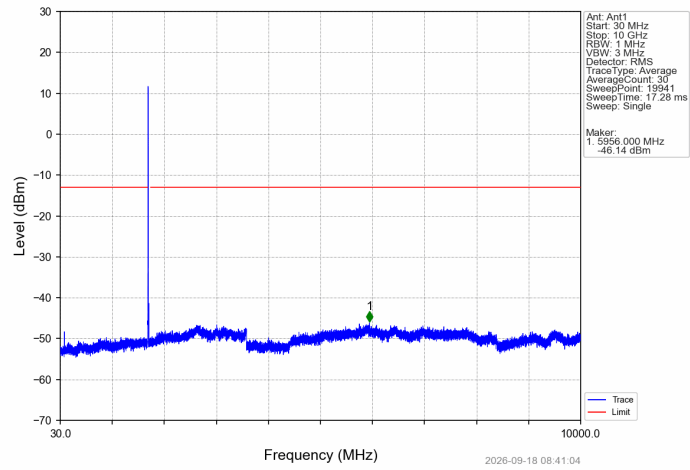
Band4_RMC_HCH_1752.6MHz_12.2kbps_RMC_NTNV



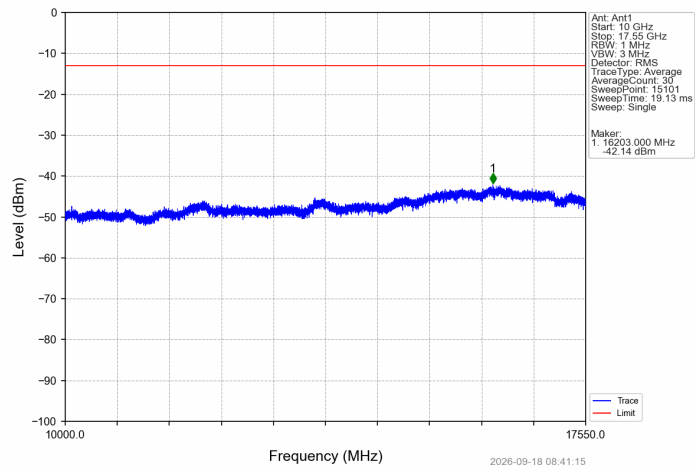
Band4_HSDPA_LCH_1712.4MHz_Subtest 1_NTNV



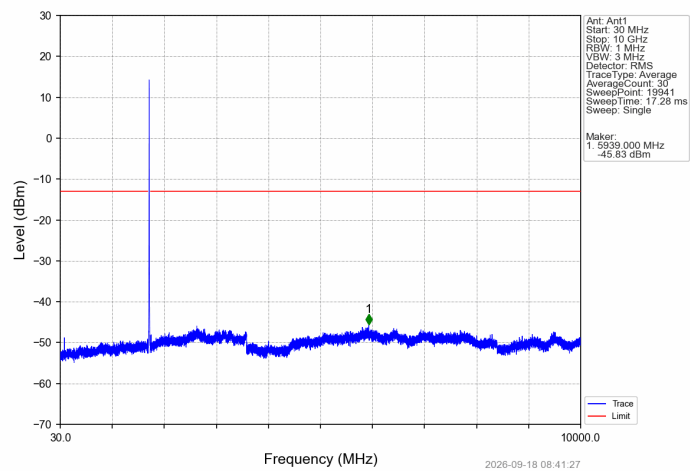
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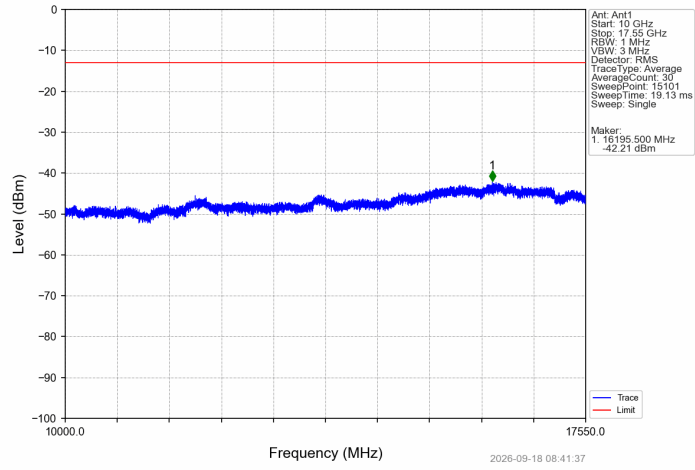
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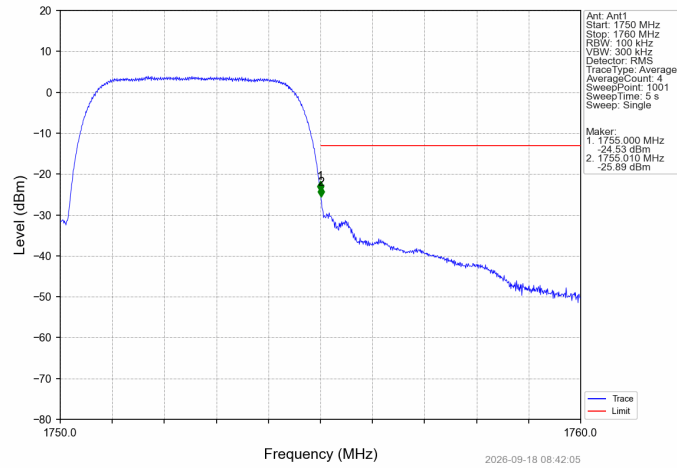
Band4_HSDPA_MCH_1732.6MHz_Subtest 1_NTNV



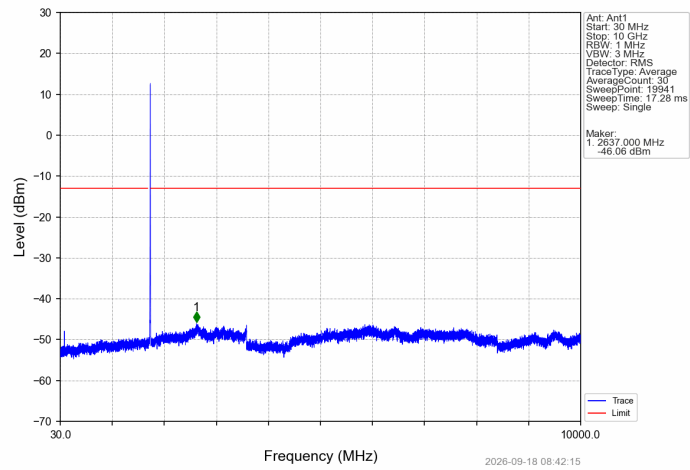
Band4 HSDPA MCH 1732.6MHz Subtest 1_NTNV



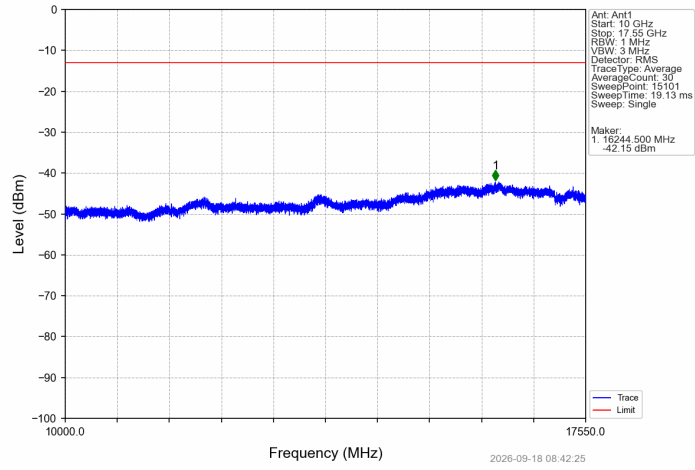
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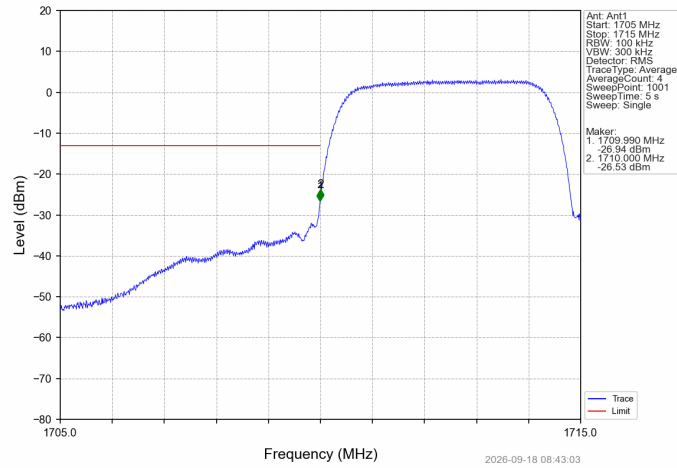
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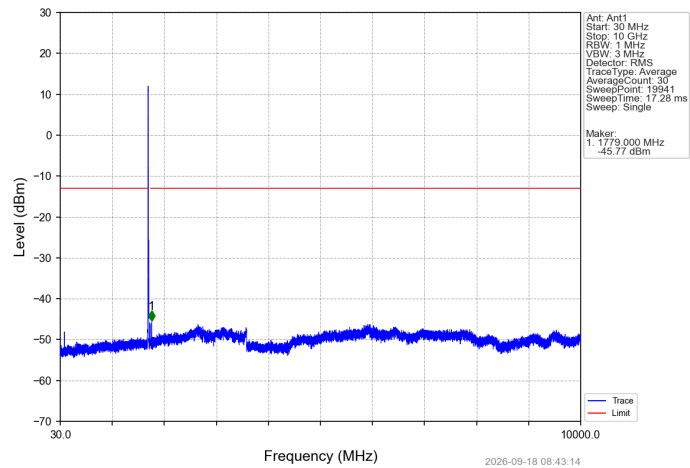
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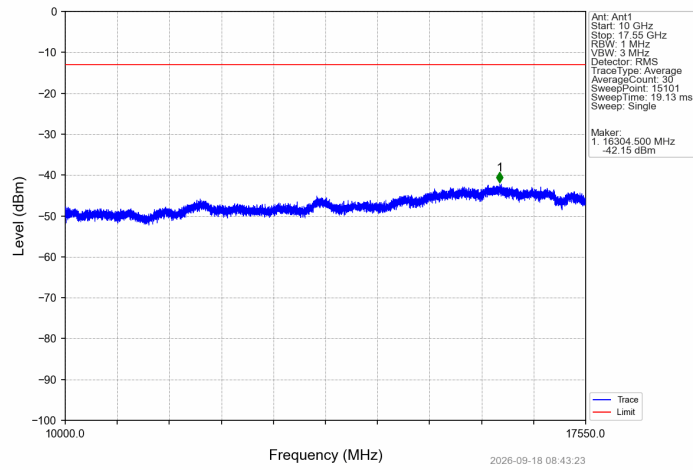
Band4 HSUPA LCH 1712.4MHz Subtest 1 NTN



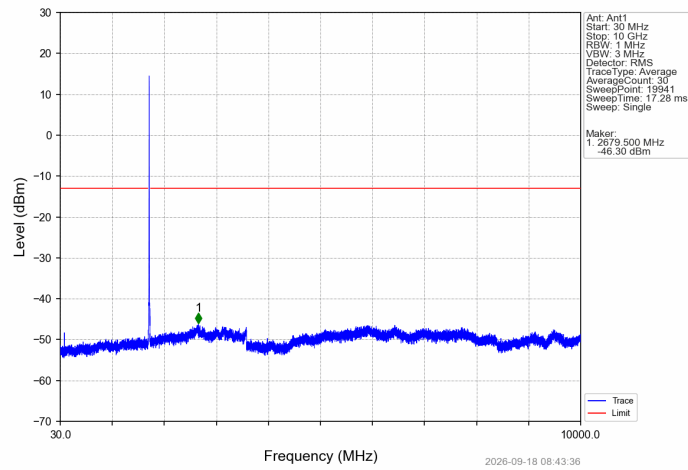
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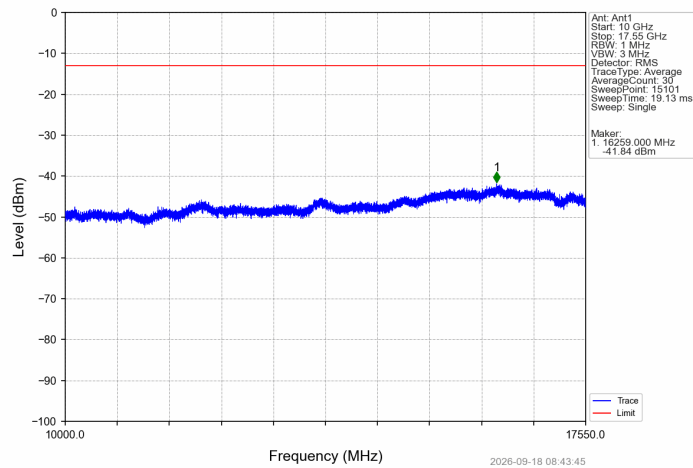
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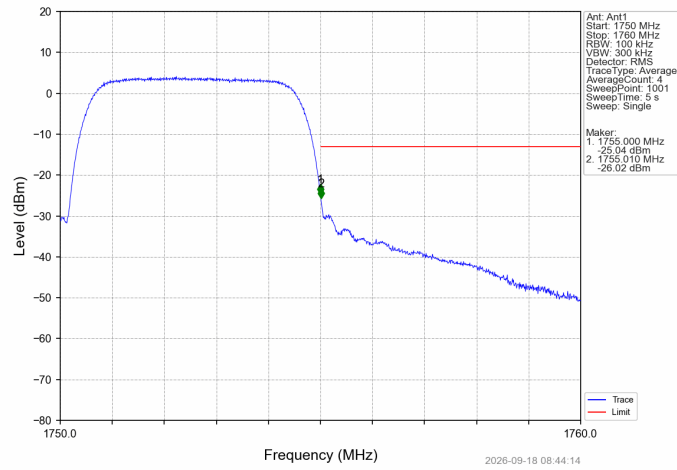
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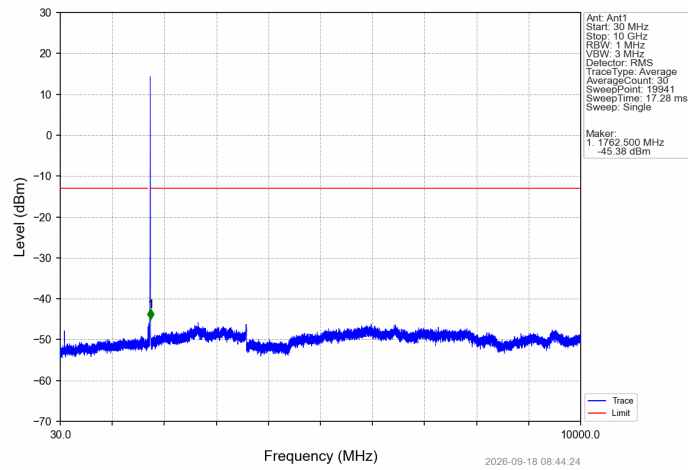
Band4 HSUPA MCH 1732.6MHz Subtest 1 NTN



Band4 HSUPA HCH 1752.6MHz Subtest 1_NTNV



Band4 HSUPA HCH 1752.6MHz Subtest 1_NTNV



Band4 HSUPA HCH 1752.6MHz Subtest 1_NTNV

