



Spot Check Evaluation

APPLICANT : Xiaomi Communications Co., Ltd.
EQUIPMENT : Mobile Phone
BRAND NAME : POCO
MODEL NAME : 24095PCADG
FCC ID : 2AFZZRA8EG
STANDARD : 47 CFR Part 2, 22(H), 24(E), 27(L), 27(M), 27(O),
27(Q), Part96
47 CFR Part 15 Subpart C §15.247
47 CFR Part 15 Subpart E §15.407
TEST DATE(S) : Aug. 15, 2024 ~ Oct. 16, 2024

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia



Approved by: Jason Jia

Sporton International Inc. (Kunshan)

No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China



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1 General Description

1.1 Applicant

Xiaomi Communications Co., Ltd.

#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085

1.2 Manufacturer

Xiaomi Communications Co., Ltd.

#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Phone
Brand Name	POCO
Model Name	24095PCADG
FCC ID	2AFZZRA8EG
IMEI Code	Conducted: 862769070026585/862769070026593 for BT/WLAN 862769070029589/862769070029597 for WWAN Radiation: 862769070028524 for BT/WLAN 862769070029282/862769070029290 for WWAN Conduction: 862669070025702/862769070025710 DFS: 862769070026585/862769070026593
HW Version	135300O16
SW Version	Xiaomi HyperOS 1.0
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Modification of EUT

No modifications are made to the EUT during all test items.



1.5 Testing Site

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	CO01-KS TH01-KS DFS01-KS 03CH03-KS 03CH04-KS	CN1257	314309

1.6 Test Software

Item	Site	Manufacturer	Name	Version
1.	TH01-KS	Tonscend	JS1120-3 test system China_210602	3.3.10
2.	DFS01-KS	Sporton	Test Tools	1.0
3.	CO01-KS	AUDIX	E3	6.2009-8-24
4.	03CH03-KS	AUDIX	E3	210616
5.	03CH04-KS	AUDIX	E3	210616

1.7 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC KDB 484596 D01 Referencing Test Data v02r03
- ♦ 47 CFR Part 2, 22(H), 24(E), 27(L), 27(M), 27(O), 27(Q), Part96
- ♦ 47 CFR Part 15 Subpart C §15.247
- ♦ 47 CFR Part 15 Subpart E §15.407
- ♦ ANSI C63.10-2013
- ♦ ANSI C63.26-2015



2 Re-use of Measured Data

2.1 Introduction Section

This application re-uses data collected on a similar device. The subject device of this application (Model: 24095PCADG, FCC ID: 2AFZZRA8EG) is electrically identical to the reference device (Model: 24090RA29G, FCC ID: 2AFZZRA29G) for the portions of the circuitry corresponding to the data being re-used, following the FCC KDB 484596 D01 Referencing Test Data v02r03.

ECR Data Referencing Inquiry has been approved by FCC, and the data referencing and spot check test plan includes RF/EMC, the details are presented in section 2.3 of this report, and for SAR Reference detail, please refer to FCC SAR report FA471506-01.

The criteria set in section 3 of KDB 484596 D01 v02r03 is followed to determine whether the data referencing is justified. For SAR, the higher between the referenced value and the spot check value is used to determine compliance in both standalone and simultaneous transmission conditions

The applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID: 2AFZZRA8EG .

2.2 Model Difference Information

The **main** difference between FCC ID: 2AFZZRA29G and FCC ID: 2AFZZRA8EG is as below:

- Removed LTE Band 12/13/17/26/32
- Removed TX1 B20 alternative path of B20 which used for low band + low band CA and ENDC

Other differences and all the details of similarity and difference can be found in the confidential documents (2AFZZRA8EG Operational Description of Product Equality Declaration).



2.3 Reference detail Section:

Rule Part	Equipment Class	Frequency Band (MHz)	Reference FCC ID (Parent)	Reference on test	Reference Title	FCC ID Filling (Variant)	Test on the variant	Data Referencing (Y/N)
15C	DSS (BR/EDR)	2400~2483.5	2AFZZRA29G	Full test	FR471506A	2AFZZRA8EG	Spot check	Y, All test items
	DTS (BLE)	2400~2483.5	2AFZZRA29G	Full test	FR471506B	2AFZZRA8EG	Spot check	Y, All test items
	DTS (WLAN)	2400~2483.5	2AFZZRA29G	Full test	FR471506C	2AFZZRA8EG	Spot check	Y, All test items
15E	U-NII	5180~5240	2AFZZRA29G	Full test	FR471506E	2AFZZRA8EG	Spot check	Y, All test items
		5260~5320	2AFZZRA29G	Full test	FR471506E	2AFZZRA8EG	Spot check	Y, All test items
		5500~5720	2AFZZRA29G	Full test	FR471506E	2AFZZRA8EG	Spot check	Y, All test items
		5745~5825	2AFZZRA29G	Full test	FR471506E	2AFZZRA8EG	Spot check	Y, All test items
		5260~5320 5500~5720	2AFZZRA29G	Full test	FZ471506	2AFZZRA8EG	Spot check	Y, All test items
22, 24, 27, 96,	PCE (GSM)	GSM 850/1900	2AFZZRA29G	Full test	FG471506A	2AFZZRA8EG	Spot check	Y, All test items
	PCE (WCDMA)	Band II, IV, V	2AFZZRA29G	Full test	FG471506A	2AFZZRA8EG	Spot check	Y, All test items
	PCE/CBE (LTE)	B2/4/7/7C/38/38C/41/42/48/66	2AFZZRA29G	Full test	FG471506B FG471506C FG471506E FG471506F FG471506G	2AFZZRA8EG	Spot check	Y, All test items
	PCE/CBE (NR)	n2/n5/n7/n38/n41/n48/n66/n77/n78	2AFZZRA29G	Full test	FG471506I FG471506J FG471506K FG471506L FG471506M FG471506N	2AFZZRA8EG	Spot check	Y, All test items

Y: Pointer to spot-check exhibit; N: Pointer to full test exhibit



2.4 Spot Check Verification Data Section

All test items test against the variant model based on the worst-case condition from the original model was performed in this filing to demonstrate the test data from original model remains representative for the variant model.

All test procedures follow the related section of parent report.

Spot-check measurements, while being always compliant with the applicable rule part(s) for the test under consideration, show a deviation d_{dB} from the reference data no larger than 3 dB:

$$d_{dB} = |V_{dB} - R_{dB}| \leq 3 \text{ dB} \tag{1}$$

V_{dB} , the variant spot-check level

R_{dB} , the corresponding measurement level for the reference model

An alternative to the limit of eq. (1) is available, and is based on considering how far the reference data R_{dB} is from the compliance threshold C_{dB} (also expressed in dB), for the particular test under consideration. In this case, if $M_{dB} = |C_{dB} - R_{dB}|$ is the margin in dB from the compliance limit, a spot check may be considered acceptable when the deviation d_{dB} from the reference data satisfies the following condition:

$$d_{dB} = |V_{dB} - R_{dB}| \leq (3 + M_{dB} / 20) \text{ dB} , \text{ for } 0 \leq M_{dB} \leq 60 \text{ dB} \tag{2}$$

$$d_{dB} = |V_{dB} - R_{dB}| = 6 \text{ dB} , \text{ for } M_{dB} > 60 \text{ dB}$$

where “| |” is the absolute value of the measured quantity.

When using the option in eq. (2), d_{dB} increases linearly from 3 dB to 6 dB.



Summary for spot check for each rule entry and technology is listed as below:

Mode	Test Item	2AFZZRA29G Parent Worst mode Test Result	2AFZZRA8EG Variant Check Test Result	Deviation (dB)	Deviation Limit (dB)
BT 1Mbps (DH5-CH00)	Number of Channels (N)	79	79	0	3
	Hopping Channel Separation (MHz)	1.004	1.002	0.002	3
	Dwell Time of Each Channel(s)	0.31	0.31	0	3
	20dB Bandwidth(MHz)	0.86	0.86	0	3
	99% Bandwidth(MHz)	0.76	0.76	0	3
	Conducted Band Edges(dBm)	-48.06	-49.2	1.14	3
	Conducted Spurious Emission(dBm)	-50.22	-50.55	0.33	3
BT (Ch78)	Radiated Band Edges and Radiated Spurious Emission (dBuV/m)	51.51	51.02	0.49	3
BT	AC Conducted Emission (dBuV)	34.93	33.95	0.98	3
BLE 1Mbps (CH00)	6dB Bandwidth (MHz)	0.7	0.69	0.01	3
	99% Bandwidth (MHz)	1.04	1.04	0	3
	Power Spectral Density (dBm/3KHz)	-8.4	-8.6	0.2	3
	Conducted Band Edges and Spurious Emission (dBm)	-51.86	-52.32	0.46	3
	Conducted Spurious Emission (dBm)	-50.91	-51.88	0.97	3
BLE (CH38)	Radiated Band Edges and Radiated Spurious Emission (dBuV/m)	40.2	40.22	0.02	3
BLE	AC Conducted Emission (dBuV)	34.93	33.95	0.98	3
WIFI 2.4G (802.11b CH11)	6dB Bandwidth (MHz)	8.04	8.02	0.02	3
	99% Bandwidth (MHz)	13.23	13.14	0.09	3
	Power Spectral Density (dBm/3KHz)	-7.64	-7.88	0.24	3
	Conducted Band Edges and Spurious Emission (dBm)	-34.74	-35.55	0.81	3
	Conducted Spurious Emission (dBm)	-41.41	-42.08	0.67	3
WIFI 2.4G (802.11ax HE20 CH01)	Radiated Band Edges and Spurious Emission (dBuV/m)	50.96	50.50	0.46	3
WLAN 2.4G	AC Conducted Emission (dBuV)	34.93	33.95	0.98	3
WIFI 5G (802.11a CH116)	26dB Emission Bandwidth (MHz)	23.73	23.66	0.07	3
	99% Occupied Bandwidth (MHz)	17.41	17.38	0.03	3
	Power Spectral Density (dBm/MHz)	6.9	6.88	0.02	3
WIFI 5G (802.11ax HE80 CH42)	Radiated Band Edges and Spurious Emission (dBuV/m)	50.86	50.89	0.03	3
WLAN 5G	AC Conducted Emission (dBuV)	38.5	40.8	2.3	3
WLAN 5G	DFS (S)	0.846028	0.848428	0.0024	3



Mode	Test Item	2AFZZRA29G Parent Worst mode Test Result	2AFZZRA8EG Variant Check Test Result	Deviation (dB)	Deviation Limit (dB)
Part 22/24/27 (LTE Band 48)	Peak-to-Average Ratio (dB)	5.42	5.16	0.26	3
	Occupied Bandwidth (MHz)	17.94	17.90	0.04	3
	Conducted Band Edge (dBm/MHz)	-14.08	-14.87	0.79	3
	Conducted Spurious Emission (dBm/MHz)	-42.80	-44.75	1.95	3
	Frequency Stability (ppm)	0.0016	0.0003	0.0013	3
Part 96 (LTE Band 48)	Radiated Spurious Emission (dBm)	-47.27	-49.88	2.61	3



Conducted power for Unlicensed bands

Test Item	Mode	2AFZZRA29G Parent Worst mode Test Result	2AFZZRA8EG Variant Check Test Result	Deviation (dB)	Deviation Limit (dB)
Conducted Power (dBm)	BT BR/EDR -CH 00-DH5	10.09	8.65	1.44	3
	BT BR/EDR -CH 39-DH5	8.29	7.04	1.25	3
	BT BR/EDR -CH 78-DH5	11.29	9.64	1.65	3
	BT BR/EDR -CH 00-2DH1	9.09	7.72	1.37	3
	BT BR/EDR -CH 39-2DH1	7.19	6.20	0.99	3
	BT BR/EDR -CH 78-2DH1	10.36	8.96	1.40	3
	BT BR/EDR -CH 00-3DH1	8.89	7.56	1.33	3
	BT BR/EDR -CH 39-3DH1	6.95	6.04	0.91	3
	BT BR/EDR -CH 78-3DH1	10.19	8.80	1.39	3
	BLE 1Mbps -CH00	6.49	7.02	0.31	3
	BLE 1Mbps -CH19	7.33	5.88	0.43	3
	BLE 1Mbps -CH39	6.31	6.12	0.43	3
	BLE 2Mbps -CH00	6.55	6.12	0.43	3
	BLE 2Mbps -CH19	7.37	7.05	0.32	3
	BLE 2Mbps -CH39	6.49	6.08	0.41	3
	11b-CH 01	17.18	16.87	0.31	3
	11b-CH 06	20.52	20.28	0.24	3
	11b-CH 11	16.96	16.64	0.32	3
	11g-CH 01	24.5	24.46	0.04	3
	11g-CH 06	24.88	24.42	0.46	3
	11g-CH 11	24.4	23.98	0.42	3
	11n HT20-CH 01	25.15	24.86	0.29	3
	11n HT20-CH 06	25	24.65	0.35	3
	11n HT20-CH 11	24.88	24.53	0.35	3
	11ax HE20-CH 01	24.4	24.08	0.32	3
	11ax HE20-CH 06	24.66	24.35	0.31	3
	11ax HE20-CH 11	24.31	24.02	0.29	3
	11a-CH 36	16.98	16.51	0.47	3
	11a-CH 44	16.91	16.58	0.33	3
	11a-CH 48	16.89	16.49	0.40	3
	11a-CH 52	16.88	16.65	0.23	3
	11a-CH 60	16.96	16.54	0.42	3
	11a-CH 64	16.82	16.59	0.23	3
	11a-CH 100	16.85	16.45	0.40	3
	11a-CH 116	17.06	16.91	0.15	3
	11a-CH 140	12.49	12.45	0.04	3
	11a-CH 149	17.17	16.91	0.26	3
	11a-CH 157	17.29	16.97	0.32	3
	11a-CH 165	17.21	16.92	0.29	3
	11n HT20-CH 36	16.02	15.65	0.37	3
	11n HT20-CH 44	16.00	15.53	0.47	3
	11n HT20-CH 48	15.79	15.32	0.47	3
	11n HT20-CH 52	15.72	15.42	0.30	3
	11n HT20-CH 60	15.87	15.45	0.42	3
	11n HT20-CH 64	15.84	15.51	0.33	3
11n HT20-CH 100	15.89	15.40	0.49	3	
11n HT20-CH 116	16.13	16.04	0.09	3	
11n HT20-CH 140	11.50	11.48	0.02	3	
11n HT20-CH 149	16.06	16.00	0.06	3	
11n HT20-CH 157	16.26	15.96	0.30	3	



11n HT20-CH 165	16.20	16.02	0.18	3
11ac VHT20-CH 36	16.08	15.68	0.40	3
11ac VHT20-CH 44	16.06	15.58	0.48	3
11ac VHT20-CH 48	15.85	15.45	0.40	3
11ac VHT20-CH 52	15.79	15.45	0.34	3
11ac VHT20-CH 60	15.90	15.47	0.43	3
11ac VHT20-CH 64	15.87	15.54	0.33	3
11ac VHT20-CH 100	15.94	15.46	0.48	3
11ac VHT20-CH 116	16.17	16.06	0.11	3
11ac VHT20-CH 140	11.58	11.52	0.06	3
11ac VHT20-CH 149	16.12	16.01	0.11	3
11ac VHT20-CH 157	16.33	15.98	0.35	3
11ac VHT20-CH 165	16.24	16.04	0.20	3
11ax HE20-CH 36	16.18	15.76	0.42	3
11ax HE20-CH 44	16.14	15.67	0.47	3
11ax HE20-CH 48	15.94	15.53	0.41	3
11ax HE20-CH 52	15.86	15.53	0.33	3
11ax HE20-CH 60	16.00	15.57	0.43	3
11ax HE20-CH 64	15.97	15.62	0.35	3
11ax HE20-CH 100	16.06	15.59	0.47	3
11ax HE20-CH 116	16.24	16.13	0.11	3
11ax HE20-CH 140	11.64	11.60	0.04	3
11ax HE20-CH 149	16.24	16.10	0.14	3
11ax HE20-CH 157	16.41	16.06	0.35	3
11ax HE20-CH 165	16.35	16.13	0.22	3
11n HT40-CH 38	14.11	13.65	0.46	3
11n HT40-CH 46	15.06	14.57	0.49	3
11n HT40-CH 54	15.01	14.60	0.41	3
11n HT40-CH 62	14.52	14.20	0.32	3
11n HT40-CH 102	13.80	13.62	0.18	3
11n HT40-CH 110	14.77	14.62	0.15	3
11n HT40-CH 134	15.23	15.06	0.17	3
11n HT40-CH 151	15.32	15.13	0.19	3
11n HT40-CH 159	15.36	15.09	0.27	3
11ac VHT40-CH 38	14.34	14.16	0.18	3
11ac VHT40-CH 46	15.80	15.32	0.48	3
11ac VHT40-CH 54	15.88	15.40	0.48	3
11ac VHT40-CH 62	14.44	14.07	0.37	3
11ac VHT40-CH 102	13.72	13.44	0.28	3
11ac VHT40-CH 110	15.76	15.39	0.37	3
11ac VHT40-CH 134	15.51	15.40	0.11	3
11ac VHT40-CH 151	16.10	15.94	0.16	3
11ac VHT40-CH 159	16.24	15.86	0.38	3
11ax40-CH 38	14.24	13.76	0.48	3
11ax40-CH 46	15.17	14.69	0.48	3
11ax40-CH 54	15.12	14.70	0.42	3
11ax40-CH 62	14.65	14.29	0.36	3
11ax40-CH 102	13.94	13.70	0.24	3
11ax40-CH 110	14.88	14.73	0.15	3
11ax40-CH 134	15.35	15.16	0.19	3
11ax40-CH 151	15.41	15.21	0.20	3
11ax40-CH 159	15.47	15.19	0.28	3
11ac VHT80-CH 042	13.40	12.98	0.42	3
11ac VHT80-CH 058	12.70	12.53	0.17	3
11ac VHT80-CH 106	13.30	13.08	0.22	3



	11ac VHT80-CH 122	14.15	13.86	0.29	3
	11ac VHT80-CH 138	14.01	13.93	0.08	3
	11ac VHT80-CH 155	14.21	13.88	0.33	3
	11ax HE80-CH 042	13.57	13.09	0.48	3
	11ax HE80-CH 058	12.84	12.63	0.21	3
	11ax HE80-CH 106	13.43	13.16	0.27	3
	11ax HE80-CH 122	14.24	13.97	0.27	3
	11ax HE80-CH 138	14.13	14.02	0.11	3
	11ax HE80-CH 155	14.33	13.98	0.35	3

Conducted power/ERP/EIRP for Licensed bands

Test Item	Mode	Bandwidth	Channel	Frequency	Modulation	2AFZZRA29G Parent Worst mode Test Result		2AFZZRA8EG Variant Check Test Result		Deviation (dB)	Deviation Limit (dB)	
						Coducted (dBm)	ERP/EIRP (W)	Coducted (dBm)	ERP/EIRP (W)			
Conducted Power /ERP/EIRP	GSM 850	/	128	824.2	GMSK	32.4	1.7378	32.15	1.6406	0.25	3	
	GSM 850	/	189	836.4	GMSK	32.46	1.7620	32.26	1.6827	0.2	3	
	GSM 850	/	251	848.8	GMSK	32.45	1.7579	32.28	1.6904	0.17	3	
	GSM 1900	/	512	1850.2	GMSK	29.31	0.8531	29.12	0.8166	0.19	3	
	GSM 1900	/	661	1880	GMSK	29.45	0.8810	29.22	0.8356	0.23	3	
	GSM 1900	/	810	1909.8	GMSK	29.43	0.8770	29.18	0.8279	0.25	3	
	WCDMA 850	/	4132	826.4	BPSK	24.48	0.2805	24.36	0.2729	0.12	3	
	WCDMA 850	/	4182	836.4	BPSK	24.5	0.2818	24.38	0.2742	0.12	3	
	WCDMA 850	/	4233	846.6	BPSK	24.44	0.2780	24.29	0.2685	0.15	3	
	WCDMA1900	/	9262	1852.4	BPSK	22.91	0.1954	22.85	0.1928	0.06	3	
	WCDMA1900	/	9400	1880	BPSK	22.98	0.1986	22.90	0.1950	0.08	3	
	WCDMA1900	/	9538	1907.6	BPSK	22.93	0.1963	22.82	0.1914	0.11	3	
	WCDMA1700	/	1312	1712.4	BPSK	23.91	0.2460	23.69	0.2339	0.22	3	
	WCDMA1700	/	1413	1732.6	BPSK	23.96	0.2489	23.75	0.2371	0.21	3	
	WCDMA1700	/	1513	1752.6	BPSK	23.92	0.2466	23.63	0.2307	0.29	3	
	B2	20M	18700	1860	1860	QPSK	23.01	0.2000	22.61	0.1824	0.4	3
	B2	20M	18900	1880	1880	QPSK	23.05	0.2018	22.67	0.1849	0.38	3
	B2	20M	19100	1900	1900	QPSK	22.98	0.1986	22.65	0.1841	0.33	3
	B4	20M	20050	1720	1720	QPSK	23.81	0.2404	23.75	0.2371	0.06	3
	B4	20M	20175	1732.5	1732.5	QPSK	23.86	0.2432	23.80	0.2399	0.06	3
	B4	20M	20300	1745	1745	QPSK	23.83	0.2415	23.72	0.2355	0.11	3
	B66	20M	132072	1720	1720	QPSK	23.83	0.2415	23.68	0.2333	0.15	3
	B66	20M	132322	1745	1745	QPSK	23.94	0.2477	23.73	0.2360	0.21	3
	B66	20M	132572	1770	1770	QPSK	23.93	0.2472	23.65	0.2317	0.28	3
	B7	20M	20850	2510	2510	QPSK	23.68	0.2333	23.64	0.2312	0.04	3
	B7	20M	21100	2535	2535	QPSK	23.75	0.2371	23.68	0.2333	0.07	3
	B7	20M	21350	2560	2560	QPSK	23.66	0.2323	23.61	0.2296	0.05	3
	B7C	20M+20M	20850_21048	2510_2529.8	2510_2529.8	QPSK	23.24	0.2109	23.22	0.2099	0.02	3
	B7C	20M+20M	21001_21199	2525.1_2544.9	2525.1_2544.9	QPSK	23.29	0.2133	23.24	0.2109	0.05	3
	B7C	20M+20M	21152_21350	2540.2_2560	2540.2_2560	QPSK	23.28	0.2128	23.13	0.2056	0.15	3
	B38	20M	37850	2580	2580	QPSK	23.43	0.2203	23.40	0.2188	0.03	3
	B38	20M	38000	2595	2595	QPSK	23.52	0.2249	23.43	0.2203	0.09	3



B38	20M	38150	2610	QPSK	23.48	0.2228	23.38	0.2178	0.1	3
B41	20M	39750	2506	QPSK	23.44	0.2208	23.40	0.2188	0.04	3
B41	20M	40620	2593	QPSK	23.6	0.2291	23.49	0.2234	0.11	3
B41	20M	41490	2680	QPSK	23.54	0.2259	23.39	0.2183	0.15	3
B38C-20M+20M	20M+20M	37850_38048	2580_2599.8	QPSK	23.38	0.2178	23.31	0.2143	0.07	3
B38C-20M+20M	20M+20M	37901_38099	2585.1_2604.9	QPSK	23.39	0.2183	23.35	0.2163	0.04	3
B38C-20M+20M	20M+20M	37952_38150	2590.2_2610	QPSK	23.36	0.2168	23.27	0.2123	0.09	3
B42	20M	42190	3460	QPSK	24.56	0.2858	24.34	0.2716	0.22	3
B42	20M	42590	3500	QPSK	24.59	0.2877	24.45	0.2786	0.14	3
B42	20M	42990	3540	QPSK	24.54	0.2844	24.47	0.2799	0.07	3
B48	20M	55340	3560	QPSK	24.41	0.2761	24.33	0.2710	0.08	3
B48	20M	55830	3609	QPSK	24.48	0.2805	24.36	0.2729	0.12	3
B48	20M	56640	3690	QPSK	24.38	0.2742	24.29	0.2685	0.09	3
N2-L	20M	372000	1860	PI/2 BPSK	22.83	0.1919	22.78	0.1897	0.05	3
N2-M	20M	376000	1880	PI/2 BPSK	22.78	0.1897	22.72	0.1871	0.06	3
N2-H	20M	380000	1900	PI/2 BPSK	22.64	0.1837	22.61	0.1824	0.03	3
N5-L	20M	166800	834	PI/2 BPSK	24.37	0.2735	24.33	0.2710	0.04	3
N5-M	20M	167300	836.5	PI/2 BPSK	24.46	0.2793	24.41	0.2761	0.05	3
N5-H	20M	167800	839	PI/2 BPSK	24.4	0.2754	24.28	0.2679	0.12	3
N7-L	50M	505000	2525	PI/2 BPSK	22.85	0.1928	22.81	0.1910	0.04	3
N7-M	50M	507000	2535	PI/2 BPSK	23.01	0.2000	22.98	0.1986	0.03	3
N7-H	50M	509000	2545	PI/2 BPSK	23.3	0.2138	23.13	0.2056	0.17	3
N38-L	40M	518000	2590	QPSK	23.16	0.2070	23.11	0.2046	0.05	3
N38-M	40M	519000	2595	QPSK	23.16	0.2070	23.09	0.2037	0.07	3
N38-H	40M	520000	2600	QPSK	23.18	0.2080	23.15	0.2065	0.03	3
N41-L	100M	509202	2546.01	QPSK	23.16	0.2070	23.11	0.2046	0.05	3
N41-M	100M	518598	2592.99	QPSK	23.23	0.2104	23.18	0.2080	0.05	3
N41-H	100M	528000	2640	QPSK	23.03	0.2009	22.98	0.1986	0.05	3
N66-L	40M	346000	1730	PI/2 BPSK	24.2	0.2630	24.16	0.2606	0.04	3
N66-M	40M	349000	1745	PI/2 BPSK	24	0.2512	23.96	0.2489	0.04	3
N66-H	40M	352000	1760	PI/2 BPSK	24.09	0.2564	24.03	0.2529	0.06	3
N48-L	40M	638000	3570	PI/2 BPSK	24.23	0.2649	24.14	0.2594	0.09	3
N48-M	40M	641666	3624.99	PI/2 BPSK	24.58	0.2871	24.48	0.2805	0.1	3
N48-H	40M	645332	3679.98	PI/2 BPSK	24.15	0.2600	24.10	0.2570	0.05	3
N77 27O-L	100M	650000	3750	PI/2 BPSK	26.17	0.4140	26.14	0.4111	0.03	3
N77 27O-M	100M	656000	3840	PI/2 BPSK	26.19	0.4159	26.13	0.4102	0.06	3
N77 27O-H	100M	662000	3930	PI/2 BPSK	26.4	0.4365	26.31	0.4276	0.09	3
N78 27O	100M	650000	3750	QPSK	26.31	0.4276	26.27	0.4236	0.04	3
N77 27Q	100M	633334	3500.01	PI/2 BPSK	26.3	0.4266	26.25	0.4217	0.05	3
N78 27Q	100M	633334	3500.01	PI/2 BPSK	26.28	0.4246	26.11	0.4083	0.17	3



Conclusion:

All test items test against the variant model based on the worst-case condition from the original model was performed in this filing to demonstrate the test data from original model remains representative for the variant model.

Based on the spot check test result, the test data from the original model is representative for the variant model. All spot check test data are shown within expected level compliant to limit line.

We are using power and ERP/EIRP measurements from the original parent model reports to list on the grant.

The same detection mechanism/software/antenna gain is used in the variant of DFS. Hence, all test cases refer to parent report.

We confirm that the test data referencing policy of FCC KDB 484596 D01 Referencing Test Data v02r03 has been followed and the test data as referenced from the parent model report represents compliance with new FCC ID.



3 List of Measuring Equipment

For BT/WIFI:

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 11, 2023	Aug. 28, 2024~ Oct. 16, 2024	Oct. 10, 2024	Conducted (TH01-KS)
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 10, 2024		Oct. 09, 2025	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 02, 2024	Aug. 28, 2024~ Oct. 16, 2024	Jan. 01, 2025	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 02, 2024	Aug. 28, 2024~ Oct. 16, 2024	Jan. 01, 2025	Conducted (TH01-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 18, 2024	Aug. 28, 2024	Apr. 17, 2025	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 11, 2023	Aug. 28, 2024	Oct. 10, 2024	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	Apr. 18, 2024	Aug. 28, 2024	Apr. 17, 2025	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 11, 2023	Aug. 28, 2024	Oct. 10, 2024	Conduction (CO01-KS)
Signal Analyzer	R&S	FSV7	101472	10Hz~7GHz	Jan. 02, 2024	Aug. 30, 2024	Jan. 01, 2025	Conducted (DFS01-KS)
MXG-B RF Vector Signal Generator	Keysight	5182B /5182BX07	MY56200417 /MY59360210	9kHz~7.2GHz	Apr 17, 2024	Aug. 30, 2024	Apr 16, 2025	Conducted (DFS01-KS)
Combiner	MTJ Cooperation	MTJ7112	N/A	0.4-6GHz	NCR	Aug. 30, 2024	NCR	Conducted (DFS01-KS)
EMI Test Receiver	Keysight	N9038A	MY56400004	3Hz~8.5GHz;Max 30dBm	Oct. 11, 2023	Aug. 15, 2024	Oct. 10, 2024	Radiation (03CH03-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55370528	10Hz~44GHz	Oct. 11, 2023	Aug. 15, 2024	Oct. 10, 2024	Radiation (03CH03-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 11, 2023	Aug. 15, 2024	Sep. 10, 2024	Radiation (03CH03-KS)
Bilog Antenna	TeseQ	CBL6112D	23182	30MHz-1GHz	Dec. 06, 2023	Aug. 15, 2024	Dec. 05, 2024	Radiation (03CH03-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 23, 2023	Aug. 15, 2024	Oct. 22, 2024	Radiation (03CH03-KS)
SHF-EHF Horn	com-power	AH-840	101115	18GHz~40GHz	Oct. 15, 2023	Aug. 15, 2024	Oct. 14, 2024	Radiation (03CH03-KS)
Amplifier	SONOMA	310N	413740	30MHz~1000MHz	Jan. 03, 2024	Aug. 15, 2024	Jan. 02, 2025	Radiation (03CH03-KS)
Amplifier	EM	EM18G40GA	060851	18~40GHz	Jan. 03, 2024	Aug. 15, 2024	Jan. 02, 2025	Radiation (03CH03-KS)
high gain Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	2082394	1Ghz-18Ghz	Jan. 03, 2024	Aug. 15, 2024	Jan. 02, 2025	Radiation (03CH03-KS)
Amplifier	Keysight	83017A	MY53270319	1GHz~26.5GHz	Oct. 11, 2023	Aug. 15, 2024	Oct. 10, 2024	Radiation (03CH03-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Aug. 15, 2024	NCR	Radiation (03CH03-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Aug. 15, 2024	NCR	Radiation (03CH03-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Aug. 15, 2024	NCR	Radiation (03CH03-KS)

NCR: No Calibration Required.



For WWAN Bands:

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 11, 2023	Aug. 28, 2024~ Oct. 16, 2024	Oct. 10, 2024	Conducted (TH01-KS)
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 10, 2024		Oct. 09, 2025	Conducted (TH01-KS)
Power divider	STI	STI08-0055	-	0.5~40GHz	NCR	Aug. 28, 2024~ Oct. 16, 2024	NCR	Conducted (TH01-KS)
Temperature & humidity chamber	Hongzhan	LP-150U	H2014011440	-40~+150°C 20%~95%RH	Jul. 04, 2024	Aug. 28, 2024~ Oct. 16, 2024	Jul. 03, 2025	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY57471079	10Hz-44G,MAX 30dB	Oct. 11, 2023	Aug. 22, 2024~ Oct. 15, 2024	Oct. 10, 2024	Radiation (03CH04-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY57471079	10Hz-44G,MAX 30dB	Oct. 10, 2024		Oct. 09, 2025	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	59913	30MHz-1GHz	Aug. 18, 2024	Aug. 22, 2024~ Oct. 15, 2024	Aug. 17, 2025	Radiation (03CH04-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 23, 2023	Aug. 22, 2024~ Oct. 15, 2024	Oct. 22, 2024	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 27, 2024	Aug. 22, 2024~ Oct. 15, 2024	Jan. 26, 2025	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	413740	9KHz-1GHz	Jan. 03, 2024	Aug. 22, 2024~ Oct. 15, 2024	Jan. 02, 2025	Radiation (03CH04-KS)
Amplifier	EM	EM18G40GA	060728	18~40GHz	Jan. 02, 2024	Aug. 22, 2024~ Oct. 15, 2024	Jan. 01, 2025	Radiation (03CH04-KS)
high gain Amplifier	EM	EM01G18GA	060840	1Ghz-18Ghz	Oct. 11, 2023	Aug. 22, 2024~ Oct. 15, 2024	Oct. 10, 2024	Radiation (03CH04-KS)
high gain Amplifier	EM	EM01G18GA	060840	1Ghz-18Ghz	Oct. 10, 2024		Oct. 09, 2025	Radiation (03CH04-KS)
Amplifier	EM	EM01G18GA	060892	1Ghz-18Ghz	Oct. 11, 2023	Aug. 22, 2024~ Oct. 15, 2024	Oct. 10, 2024	Radiation (03CH04-KS)
Amplifier	EM	EM01G18GA	060892	1Ghz-18Ghz	Oct. 10, 2024		Oct. 09, 2025	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Aug. 22, 2024~ Oct. 15, 2024	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Aug. 22, 2024~ Oct. 15, 2024	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Aug. 22, 2024~ Oct. 15, 2024	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required.



4 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Conducted Measurement (BT/WIFI2.4G/5G)

Conducted Spurious Emission & Bandedge	±2.22 dB
Occupied Channel Bandwidth	±0.1%
Conducted Power	±0.50 dB
Conducted Power Spectral Density	±0.90 dB
Frequency	±0.4 ppm

Uncertainty of Conducted Measurement (DFS)

Test Item	Uncertainty
Conducted Generated signal Levels	±0.56 dB
Conducted Time	0.38%

Uncertainty of Conducted Measurement (WWAN)

Conducted Spurious Emission & Bandedge	±2.22 dB
Occupied Channel Bandwidth	±0.1%
Conducted Power	±0.50 dB
Peak to Average Ratio	±0.46 dB
Frequency Stability	±0.4 ppm

Uncertainty of AC Conducted Emission Measurement (0.15 MHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.84 dB
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03CH03-KS(BT/WIF):

Uncertainty of Radiated Emission Measurement (9 KHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.30dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	6.08dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.18dB
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.22dB
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03CH04-KS(WWAN):

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.83 dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.83 dB
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.82 dB
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-THE END-



Appendix A. Radiated Spurious Emission Test Data

Test Engineer :	Jake Zhou	Relative Humidity :	53-58%
		Temperature :	23-26°C

Radiated Spurious Emission Test Modes for Co-location

Mode	Band	Band	Antenna	Modulation	Channel	Frequency	Data Rate	RU	Remark
Mode 1	Co-location	2.4G WIFI	6	802.11ax HE20	01	2412	MCS0	Full	-
		WWAN	3	Part 96 LTE Band 48 BW=20M					
Mode 2	Co-location	5G U-NII-1	6	802.11ax HE80	42	5210	MCS0	Full	-
		-	6	Bluetooth-LE	38	2478	2Mbps	Full	-
		WWAN	3	Part 96 LTE Band 48 BW=20M					

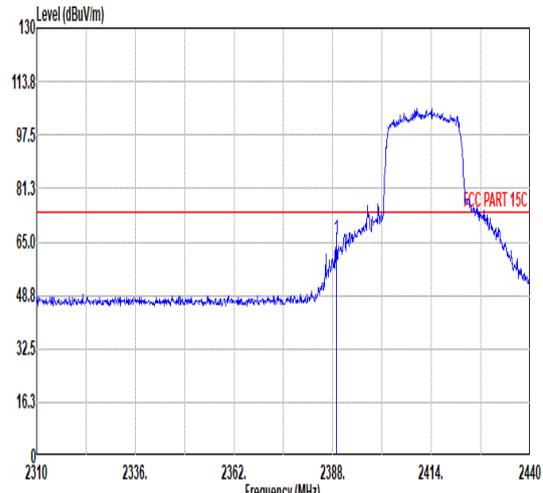
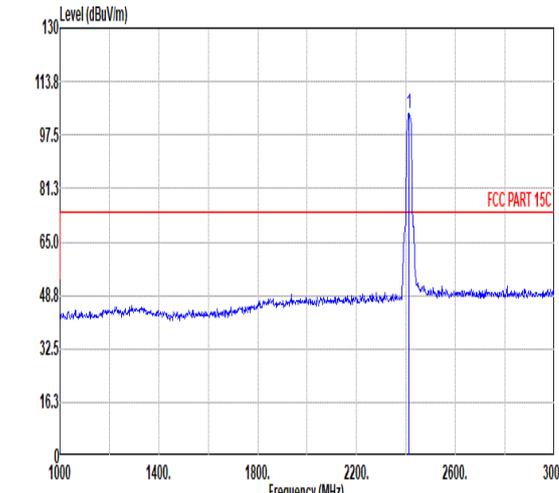
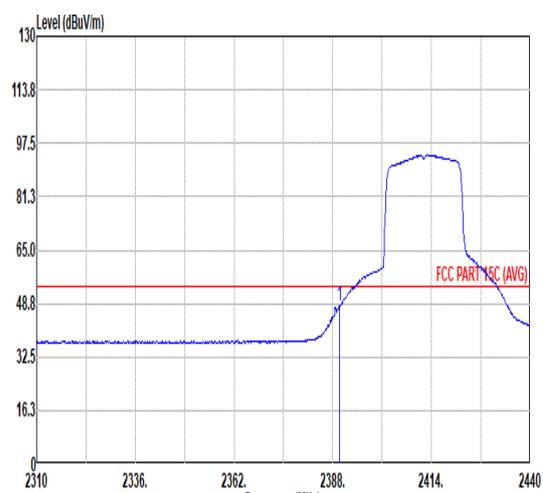
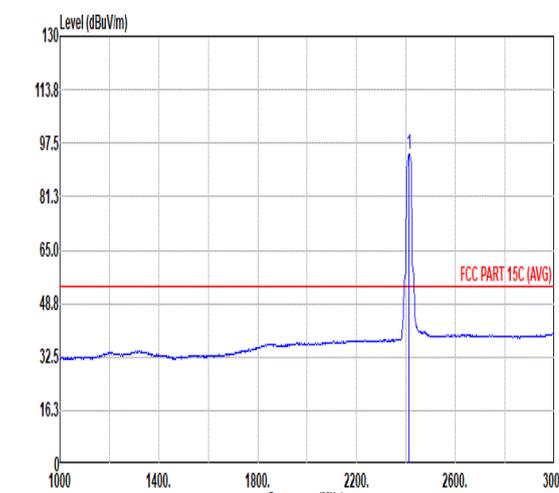
Summary of each worse mode

Mode	Modulation	Ch.	Freq. (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol.	Peak Avg.	Result	Remark
1	802.11ax HE20	01	2389.95	50.83	54.00	-3.17	H	AVERAGE	Pass	Band Edge
	802.11ax HE20	01	4824.00	44.42	74.00	-29.58	H	PEAK	Pass	Harmonic
2	802.11ax HE80	42	5149.76	50.67	54.00	-3.33	H	AVERAGE	Pass	Band Edge
	802.11ax HE80	42	10420.00	44.50	68.20	-23.70	V	PEAK	Pass	Harmonic
	Bluetooth-LE	38	2485.24	40.48	54.00	-13.52	V	AVERAGE	Pass	Band Edge
	Bluetooth-LE	38	4956.00	46.87	54.00	-7.13	H	AVERAGE	Pass	Harmonic



	1																																																																													
Mode	Band Edge																																																																													
	2400-2483.5_802.11ax HE20_CH01_Full_2412MHz																																																																													
ANT	6																																																																													
Pol.	Horizontal	Fundamental																																																																												
Peak	<table border="1"> <thead> <tr> <th>Limit</th> <th>Read</th> <th>Ant</th> <th>Cable</th> <th>Preamp</th> <th>Aux</th> <th>APos</th> <th>TPos</th> <th>Remark</th> </tr> <tr> <th>Freq</th> <th>Level</th> <th>Line Margin</th> <th>Level Factor</th> <th>Loss Factor</th> <th>Factor</th> <th></th> <th></th> <th></th> </tr> <tr> <th>MHz</th> <th>dBuV/m</th> <th>dBuV/m</th> <th>dB</th> <th>dBuV</th> <th>dB/m</th> <th>dB</th> <th>dB</th> <th>cm</th> <th>deg</th> </tr> </thead> <tbody> <tr> <td>1 2389.82</td> <td>66.56</td> <td>74.00</td> <td>-7.44</td> <td>58.32</td> <td>31.94</td> <td>7.16</td> <td>36.86</td> <td>6.00</td> <td>206 311 PEAK</td> </tr> </tbody> </table>	Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos	Remark	Freq	Level	Line Margin	Level Factor	Loss Factor	Factor				MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	1 2389.82	66.56	74.00	-7.44	58.32	31.94	7.16	36.86	6.00	206 311 PEAK	<table border="1"> <thead> <tr> <th>Limit</th> <th>Read</th> <th>Ant</th> <th>Cable</th> <th>Preamp</th> <th>Aux</th> <th>APos</th> <th>TPos</th> <th>Remark</th> </tr> <tr> <th>Freq</th> <th>Level</th> <th>Line Margin</th> <th>Level Factor</th> <th>Loss Factor</th> <th>Factor</th> <th></th> <th></th> <th></th> </tr> <tr> <th>MHz</th> <th>dBuV/m</th> <th>dBuV/m</th> <th>dB</th> <th>dBuV</th> <th>dB/m</th> <th>dB</th> <th>dB</th> <th>cm</th> <th>deg</th> </tr> </thead> <tbody> <tr> <td>1 2412.00</td> <td>105.97</td> <td>-----</td> <td>-----</td> <td>97.49</td> <td>32.14</td> <td>7.20</td> <td>36.86</td> <td>6.00</td> <td>206 311 PEAK</td> </tr> </tbody> </table>	Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos	Remark	Freq	Level	Line Margin	Level Factor	Loss Factor	Factor				MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	1 2412.00	105.97	-----	-----	97.49	32.14	7.20	36.86	6.00	206 311 PEAK
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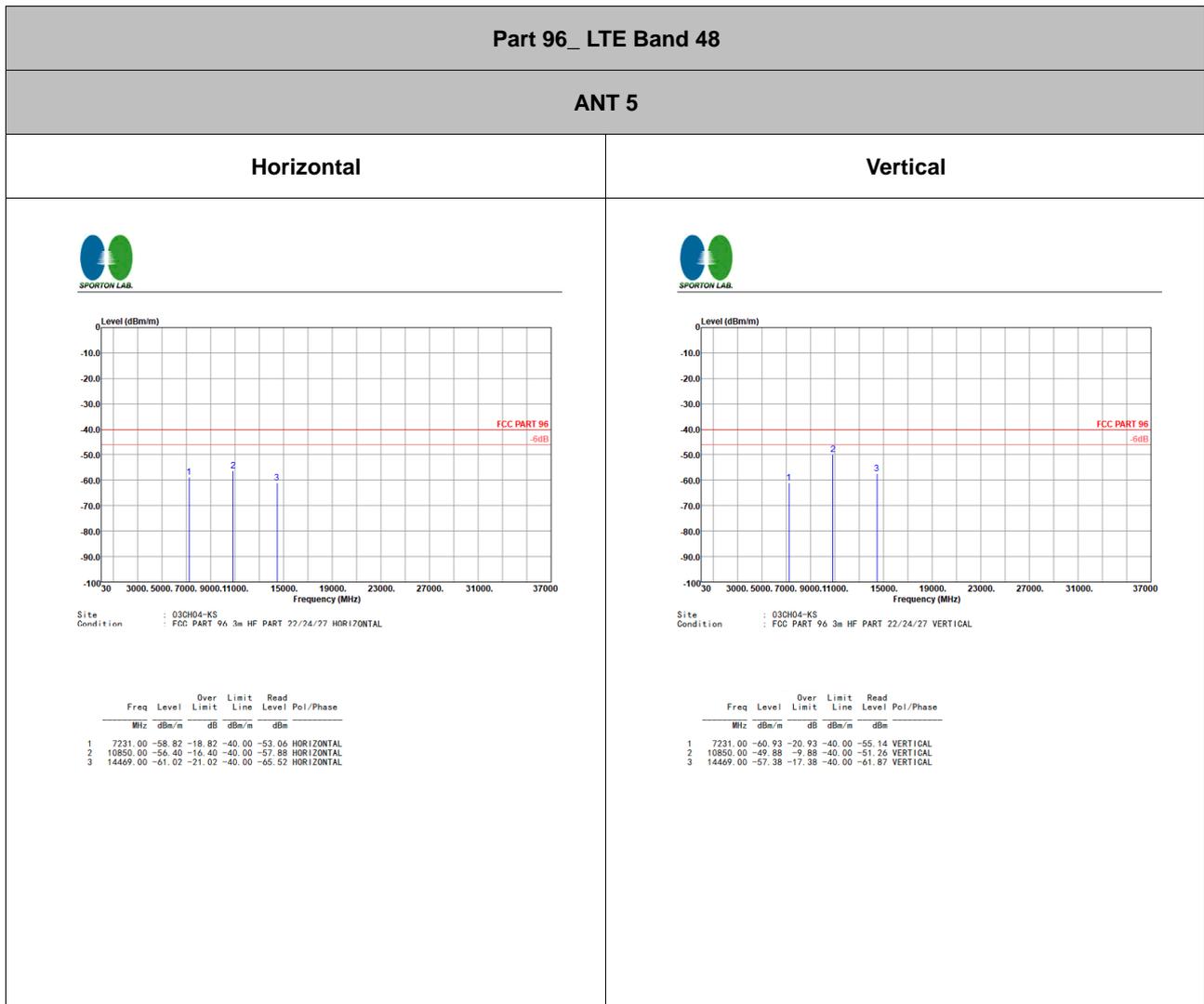
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Note: For all plots above, the over limit line signals are Fundamental signal which can be ignored.



LTE Band 48 / 20MHz / QPSK / Ant.5								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	7231	-58.82	-40	-18.82	-70.28	2.84	14.30	H
	10850	-56.40	-40	-16.40	-66.34	3.49	13.43	H
	14469	-61.02	-40	-21.02	-71.26	3.85	14.09	H
	7231	-60.93	-40	-20.93	-72.39	2.84	14.30	V
	10850	-49.88	-40	-9.88	-59.82	3.49	13.43	V
	14469	-57.38	-40	-17.38	-67.62	3.85	14.09	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.





Appendix C. Reference Report



FCC RF Test Report

APPLICANT : Xiaomi Communications Co., Ltd.
EQUIPMENT : Mobile Phone
BRAND NAME : Redmi
MODEL NAME : 24090RA29G
FCC ID : 2AFZZRA29G
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System
TEST DATE(S) : Jul. 18, 2024 ~ Jul. 30, 2024

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia



Approved by: Jason Jia

Sporton International Inc. (Kunshan)

**No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China**



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APPENDIX A. CONDUCTED TEST RESULTS

APPENDIX B. AC CONDUCTED EMISSION TEST RESULT

APPENDIX C. RADIATED SPURIOUS EMISSION

APPENDIX D. DUTY CYCLE PLOTS

APPENDIX E. SETUP PHOTOGRAPHS



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR471506C	Rev. 01	Initial issue of report	Aug. 19, 2024



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.1	-	99% Bandwidth	-	Report Only	-
3.2	15.247(b)	Power Output Measurement	≤ 30dBm	Pass	-
3.3	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	Conducted Band Edges	≤ 20dBc	Pass	-
		Conducted Spurious Emission		Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.02 dB at 4904.00 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 15.07 dB at 15.146 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	15.203 & 15.247(b)	Pass	-

Conformity Assessment Condition:

- The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
- The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty"

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.



1 General Description

1.1 Applicant

Xiaomi Communications Co., Ltd.

#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085

1.2 Manufacturer

Xiaomi Communications Co., Ltd.

#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Phone
Brand Name	Redmi
Model Name	24090RA29G
FCC ID	2AFZZRA29G
IMEI Code	Conducted: 861793070040843/861793070040850 Conduction: 861793070038664/861793070038672 Radiation: 861793070038607
HW Version	135300O16
SW Version	Xiaomi HyperOS 1.0
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	2412 MHz ~ 2462 MHz
Maximum (Peak) Output Power to antenna	802.11b : 20.52 dBm (0.1127 W) 802.11g : 24.88 dBm (0.3076 W) 802.11n HT20 : 25.00 dBm (0.3162 W) 802.11ax HE20 : 24.66 dBm (0.2924 W)
99% Occupied Bandwidth	802.11b : 13.227 MHz 802.11g : 17.423 MHz 802.11n HT20 : 18.422 MHz 802.11ax HE20 : 19.261 MHz
Antenna Type / Gain	PIFA Antenna type with gain -1.6 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ax : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM)

Note: 802.11ax support OFDMA full RU tone and partial RU tone, both full RU and partial RU-left (for low CH) and partial RU-right (for high CH) test output power, the full RU power > partial RU, therefore the full RU perform full, and partial RU verify PSD/RSE.



1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Testing Location

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	CO01-KS 03CH03-KS TH01-KS	CN1257	314309

1.7 Test Software

Item	Site	Manufacturer	Name	Version
1.	TH01-KS	Tonscend	JS1120-3 test system China_210602	3.3.10
2.	03CH03-KS	AUDIX	E3	210616
3.	CO01-KS	AUDIX	E3	6.2009-8-24

1.8 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR Part 15 Subpart C §15.247
- ♦ FCC KDB 558074 D01 15.247 Meas Guidance v05r02
- ♦ ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



2 Test Configuration of Equipment Under Test

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437	-	-



2.2 Test Mode

Final test modes are considering the modulation and worse data rates as below table.

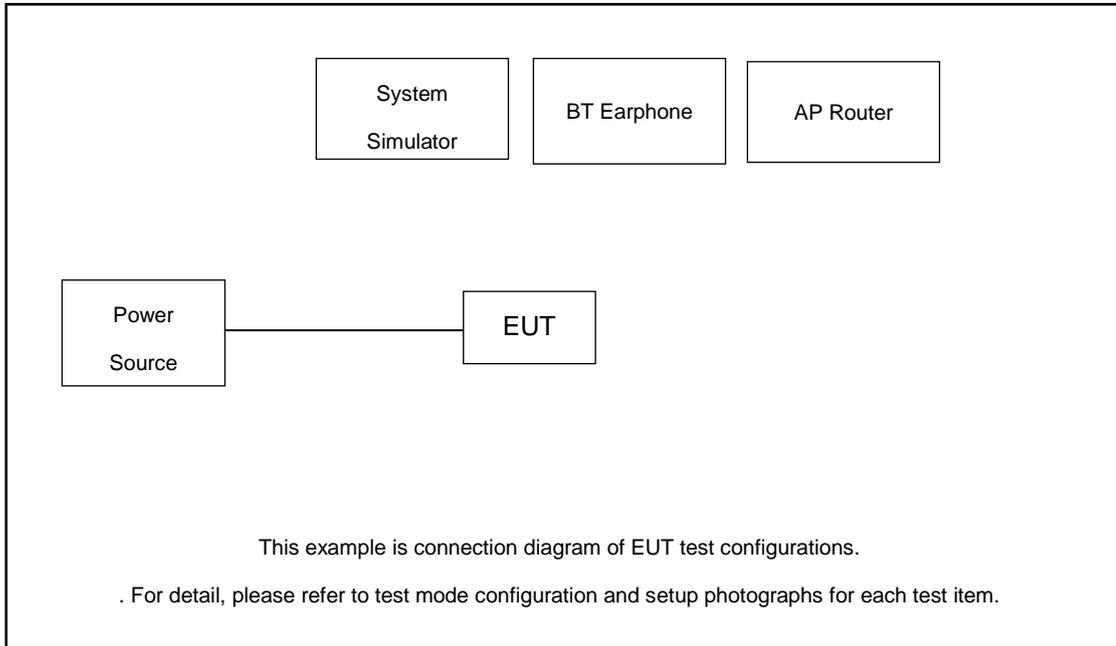
Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
802.11ax HE20	MCS0

Test Cases	
AC Conducted Emission	Mode 1 :GSM 850 Idle + Bluetooth Link + WLAN Link (2.4G) + USB Cable 3 + Adapter 3
Remark: For Radiated Test Cases, The tests were performance with Adapter and USB Cable	

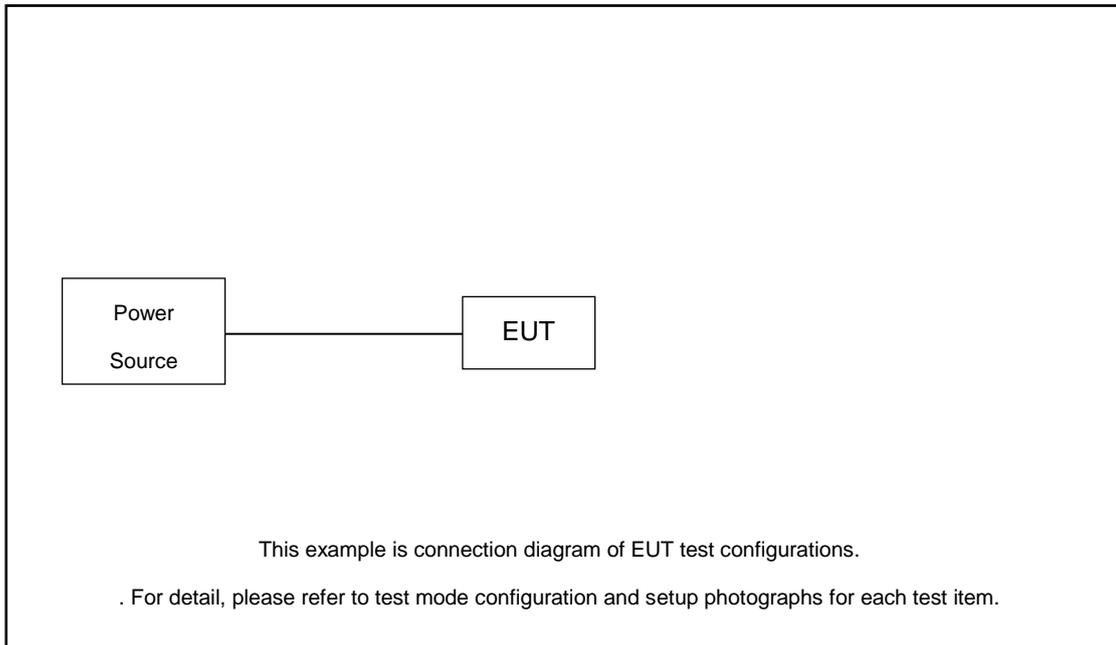
RSE Co-location
802.11ax HE20_Full RU_CH01_TX + LTE Band 48 Link

2.3 Connection Diagram of Test System

AC Conducted Emission:



Radiated Emission:



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Lenovo	thinkplus-BH3	N/A	N/A	N/A
2.	LTE Base Station	Anritus	MT8821C	N/A	N/A	Unshielded,1.8m
3.	Notebook	Lenovo	G480	QDS-BRCM1050I	N/A	shielded cable DC O/P 1.8m , Unshielded AC I/P cable 1.8m
4.	WLAN AP	D-link	DIR-655	KA21R655B1	N/A	Unshielded,1.8m

2.5 EUT Operation Test Setup

For WLAN RF test items, an engineering test program was provided and enabled to make EUT continuous transmit.

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

$$\text{Offset} = \text{RF cable loss} + \text{attenuator factor}.$$

Following shows an offset computation example with cable loss 12.31 dB and 10dB attenuator.

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\ &= 12.31 + 10 = 22.31 \text{ (dB)} \end{aligned}$$

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

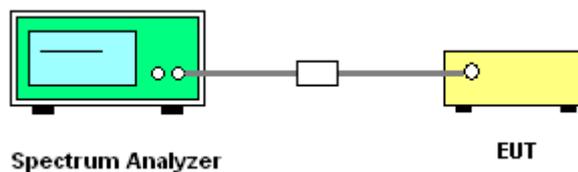
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

1. The testing follows ANSI C63.10-2013 clause 11.8
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 1%~5% of OBW and set the Video bandwidth (VBW) $\geq 3 \times \text{RBW}$.
6. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.

3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna with directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

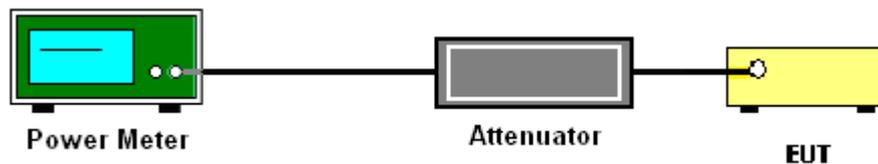
3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 clause 11.9.1.3 PKPM1 Peak power meter or ANSI C63.10-2013 clause 11.9.2.3.1 Method AVGPM method.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup





3.2.5 Test Result of Peak Output Power

2.4GHz Band Single Antenna										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
					Ant6	Ant6	Ant6	Ant6	Ant6	
11b	1Mbps	1	1	2412	17.18	30.00	-1.60	15.58	36.00	Pass
11b	1Mbps	1	2	2417	18.09	30.00	-1.60	16.49	36.00	Pass
11b	1Mbps	1	6	2437	20.52	30.00	-1.60	18.92	36.00	Pass
11b	1Mbps	1	8	2447	18.33	30.00	-1.60	16.73	36.00	Pass
11b	1Mbps	1	9	2452	17.87	30.00	-1.60	16.27	36.00	Pass
11b	1Mbps	1	10	2457	17.26	30.00	-1.60	15.66	36.00	Pass
11b	1Mbps	1	11	2462	16.96	30.00	-1.60	15.36	36.00	Pass
11g	6Mbps	1	1	2412	24.50	30.00	-1.60	22.90	36.00	Pass
11g	6Mbps	1	6	2437	24.88	30.00	-1.60	23.28	36.00	Pass
11g	6Mbps	1	11	2462	24.40	30.00	-1.60	22.80	36.00	Pass
HT20	MCS0	1	1	2412	22.75	30.00	-1.60	21.15	36.00	Pass
HT20	MCS0	1	6	2437	25.00	30.00	-1.60	23.40	36.00	Pass
HT20	MCS0	1	11	2462	22.92	30.00	-1.60	21.32	36.00	Pass

2.4GHz Band Single Antenna											
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Peak Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
						Ant6	Ant6	Ant6	Ant6	Ant6	
HE20	MCS0	1	1	2412	Full	24.40	30.00	-1.60	22.80	36.00	Pass
HE20	MCS0	1	1	2412	26/0	15.76	30.00	-1.60	14.16	36.00	Pass
HE20	MCS0	1	1	2412	52/37	19.19	30.00	-1.60	17.59	36.00	Pass
HE20	MCS0	1	1	2412	106/53	21.84	30.00	-1.60	20.24	36.00	Pass
HE20	MCS0	1	6	2437	Full	24.66	30.00	-1.60	23.06	36.00	Pass
HE20	MCS0	1	6	2437	26/0	17.94	30.00	-1.60	16.34	36.00	Pass
HE20	MCS0	1	6	2437	52/37	21.18	30.00	-1.60	19.58	36.00	Pass
HE20	MCS0	1	6	2437	106/53	23.41	30.00	-1.60	21.81	36.00	Pass
HE20	MCS0	1	11	2462	Full	24.31	30.00	-1.60	22.71	36.00	Pass
HE20	MCS0	1	11	2462	26/8	16.94	30.00	-1.60	15.34	36.00	Pass
HE20	MCS0	1	11	2462	52/40	19.79	30.00	-1.60	18.19	36.00	Pass
HE20	MCS0	1	11	2462	106/54	22.63	30.00	-1.60	21.03	36.00	Pass



3.2.6 Test Result of Average Output Power (Reporting Only)

2.4GHz Band Single Antenna								
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power with duty factor (dBm)	DG (dBi)	EIRP Power (dBm)
					Ant6	Ant6	Ant6	Ant6
11b	1Mbps	1	1	2412	0.00	14.92	-1.60	13.32
11b	1Mbps	1	2	2417	0.00	15.72	-1.60	14.12
11b	1Mbps	1	6	2437	0.00	18.06	-1.60	16.46
11b	1Mbps	1	8	2447	0.00	15.95	-1.60	14.35
11b	1Mbps	1	9	2452	0.00	15.53	-1.60	13.93
11b	1Mbps	1	10	2457	0.00	14.88	-1.60	13.28
11b	1Mbps	1	11	2462	0.00	14.56	-1.60	12.96
11g	6Mbps	1	1	2412	0.13	16.26	-1.60	14.66
11g	6Mbps	1	6	2437	0.13	17.62	-1.60	16.02
11g	6Mbps	1	11	2462	0.13	17.03	-1.60	15.43
HT20	MCS0	1	1	2412	0.14	15.30	-1.60	13.70
HT20	MCS0	1	6	2437	0.14	17.63	-1.60	16.03
HT20	MCS0	1	11	2462	0.14	15.39	-1.60	13.79

2.4GHz Band Single Antenna												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Duty Factor (dB)	Average Conducted Power with duty factor (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
						Ant6	Ant6	Ant6	Ant6	Ant6	Ant6	
HE20	MCS0	1	1	2412	Full	0.18	15.07	30.00	-1.60	13.47	36.00	Pass
HE20	MCS0	1	1	2412	26/0	0.04	6.22	30.00	-1.60	4.62	36.00	Pass
HE20	MCS0	1	1	2412	52/37	0.04	9.13	30.00	-1.60	7.53	36.00	Pass
HE20	MCS0	1	1	2412	106/53	0.08	12.33	30.00	-1.60	10.73	36.00	Pass
HE20	MCS0	1	6	2437	Full	0.18	16.71	30.00	-1.60	15.11	36.00	Pass
HE20	MCS0	1	6	2437	26/0	0.04	8.28	30.00	-1.60	6.68	36.00	Pass
HE20	MCS0	1	6	2437	52/37	0.04	11.40	30.00	-1.60	9.80	36.00	Pass
HE20	MCS0	1	6	2437	106/53	0.08	13.82	30.00	-1.60	12.22	36.00	Pass
HE20	MCS0	1	11	2462	Full	0.18	15.70	30.00	-1.60	14.10	36.00	Pass
HE20	MCS0	1	11	2462	26/8	0.04	7.67	30.00	-1.60	6.07	36.00	Pass
HE20	MCS0	1	11	2462	52/40	0.04	10.59	30.00	-1.60	8.99	36.00	Pass
HE20	MCS0	1	11	2462	106/54	0.08	13.02	30.00	-1.60	11.42	36.00	Pass

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

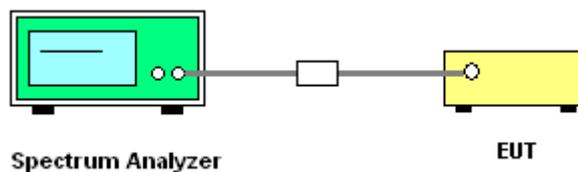
3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure of ANSI C63.10-2013 clause 11.10.2 Method PKPSD.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB relative to the maximum PSD level in 100 kHz by RF conducted measurement.

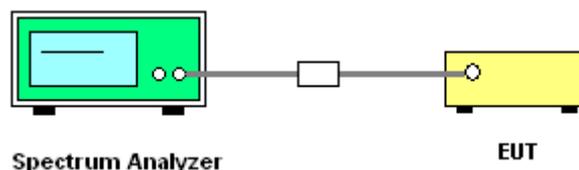
3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.4.3 Test Procedures

1. The testing follows ANSI C63.10-2013 clause 11.11
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Please refer to Appendix A.



3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

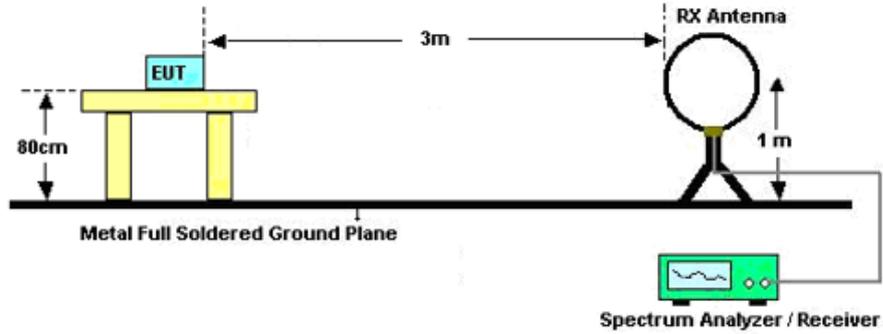


3.5.3 Test Procedures

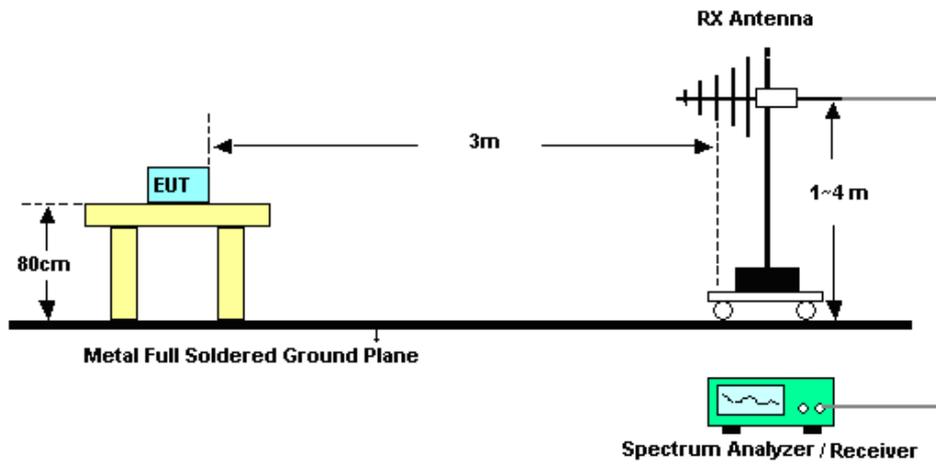
1. The testing follows ANSI C63.10-2013 clause 11.11 & 11.12
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: $\text{Antenna Factor} + \text{Cable Loss} + \text{Read Level} - \text{Preamp Factor} = \text{Level}$
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than peak limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
8. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1 \text{ GHz}$; $\text{VBW} \geq \text{RBW}$; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1 \text{ GHz}$ for peak measurement.
For average measurement:
 - $\text{VBW} = 10 \text{ Hz}$, when duty cycle is no less than 98 percent.
 - $\text{VBW} \geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

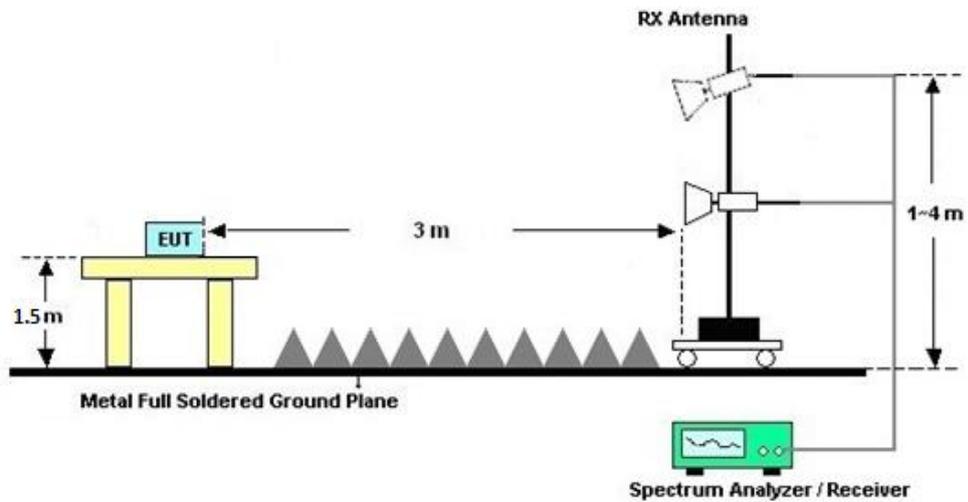
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz





3.5.5 Test Results of Radiated Spurious Emissions (9kHz ~ 30MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C.

3.5.7 Duty Cycle

Please refer to Appendix D.

3.5.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic or 40GHz, whichever is lower)

Please refer to Appendix C.



3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

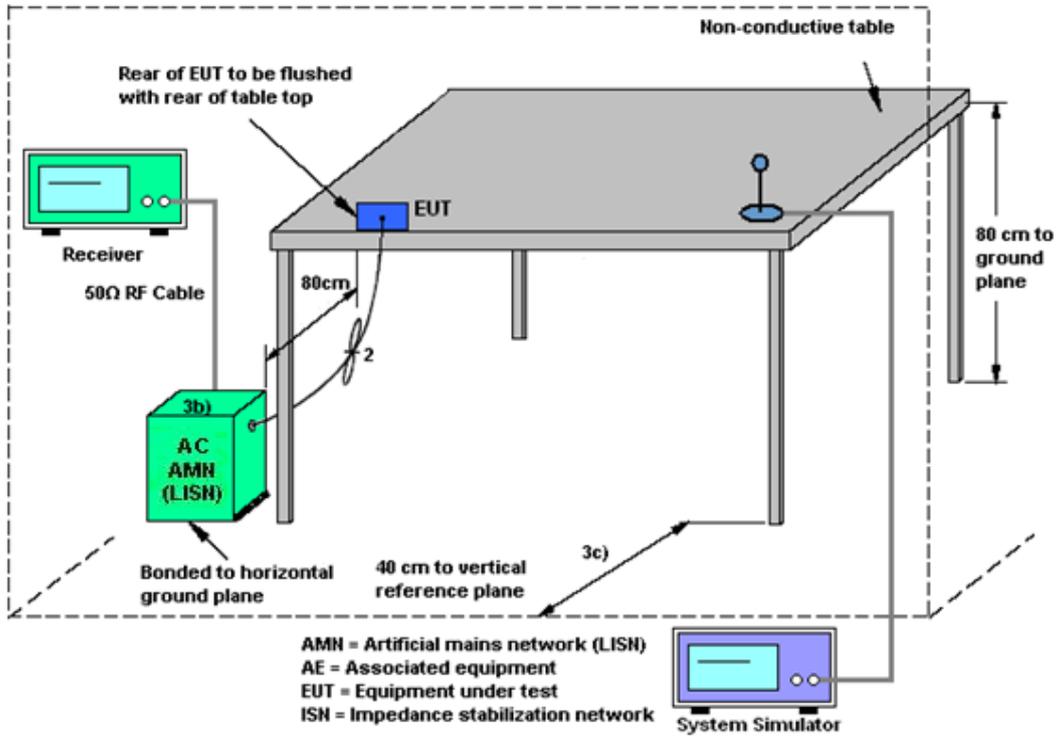
3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.6.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF bandwidth = 9kHz) with Maximum Hold Mode.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting Antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. The use of a permanently attached Antenna or of an Antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	Keysight	N9038A	MY56400004	3Hz~8.5GHz;Max 30dBm	Oct. 11, 2023	Jul. 18, 2024~Jul. 23, 2024	Oct. 10, 2024	Radiation (03CH03-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55370528	10Hz~44GHz	Oct. 11, 2023	Jul. 18, 2024~Jul. 23, 2024	Oct. 10, 2024	Radiation (03CH03-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 11, 2023	Jul. 18, 2024~Jul. 23, 2024	Sep. 10, 2024	Radiation (03CH03-KS)
Bilog Antenna	TeseQ	CBL6112D	23182	30MHz~1GHz	Dec. 06, 2023	Jul. 18, 2024~Jul. 23, 2024	Dec. 05, 2024	Radiation (03CH03-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 23, 2023	Jul. 18, 2024~Jul. 23, 2024	Oct. 22, 2024	Radiation (03CH03-KS)
SHF-EHF Horn	com-power	AH-840	101115	18GHz~40GHz	Oct. 15, 2023	Jul. 18, 2024~Jul. 23, 2024	Oct. 14, 2024	Radiation (03CH03-KS)
Amplifier	SONOMA	310N	413740	30MHz~1000MHz	Jan. 03, 2024	Jul. 18, 2024~Jul. 23, 2024	Jan. 02, 2025	Radiation (03CH03-KS)
Amplifier	EM	EM18G40GA	060851	18~40GHz	Jan. 03, 2024	Jul. 18, 2024~Jul. 23, 2024	Jan. 02, 2025	Radiation (03CH03-KS)
high gain Amplifier	MITEQ	AMF-7D-00101800-30-10P	2082394	1Ghz~18Ghz	Jan. 03, 2024	Jul. 18, 2024~Jul. 23, 2024	Jan. 02, 2025	Radiation (03CH03-KS)
Amplifier	Keysight	83017A	MY53270319	1GHz~26.5GHz	Oct. 11, 2023	Jul. 18, 2024~Jul. 23, 2024	Oct. 10, 2024	Radiation (03CH03-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Jul. 18, 2024~Jul. 23, 2024	NCR	Radiation (03CH03-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Jul. 18, 2024~Jul. 23, 2024	NCR	Radiation (03CH03-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Jul. 18, 2024~Jul. 23, 2024	NCR	Radiation (03CH03-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr 18, 2024	Jul. 28, 2024	Apr 17, 2025	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 11, 2023	Jul. 28, 2024	Oct. 10, 2024	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	Apr 18, 2024	Jul. 28, 2024	Apr 17, 2025	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP00000811	AC 0V~300V, 45Hz~1000Hz	Oct. 11, 2023	Jul. 28, 2024	Oct. 10, 2024	Conduction (CO01-KS)
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 11, 2023	Jul. 19, 2024~Jul. 30, 2024	Oct. 10, 2024	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 02, 2024	Jul. 19, 2024~Jul. 30, 2024	Jan. 01, 2025	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 02, 2024	Jul. 19, 2024~Jul. 30, 2024	Jan. 01, 2025	Conducted (TH01-KS)

NCR: No Calibration Required



5 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.10-2013. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Conducted Measurement

Conducted Spurious Emission & Bandedge	±2.22 dB
Occupied Channel Bandwidth	±0.1%
Conducted Power	±0.50 dB
Conducted Power Spectral Density	±0.90 dB
Frequency	0.04ppm

Uncertainty of AC Conducted Emission Measurement (0.15 MHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.84 dB
---	---------

Uncertainty of Radiated Emission Measurement (9 KHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.30 dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	6.08 dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.18 dB
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.22 dB
---	---------

----- THE END -----



Appendix A. Conducted Test Results



Ambient Condition: <u>25</u> °C, <u>45</u> %RH	
Test Date: <u>2024/7/19~2024/7/30</u>	Test Engineer: <u>albert shi</u>

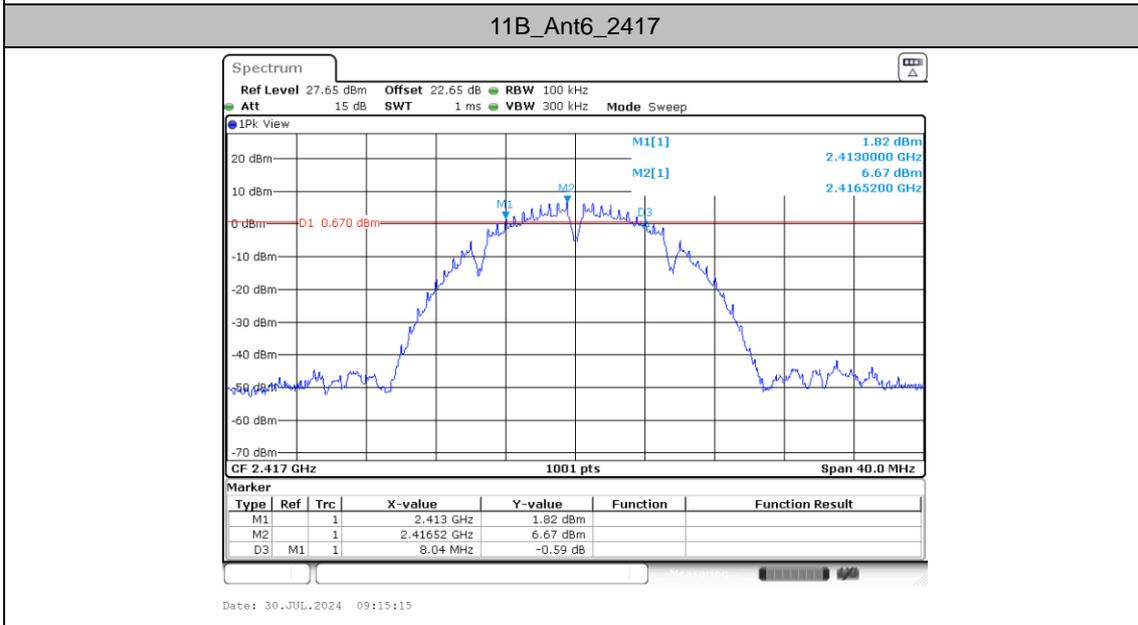
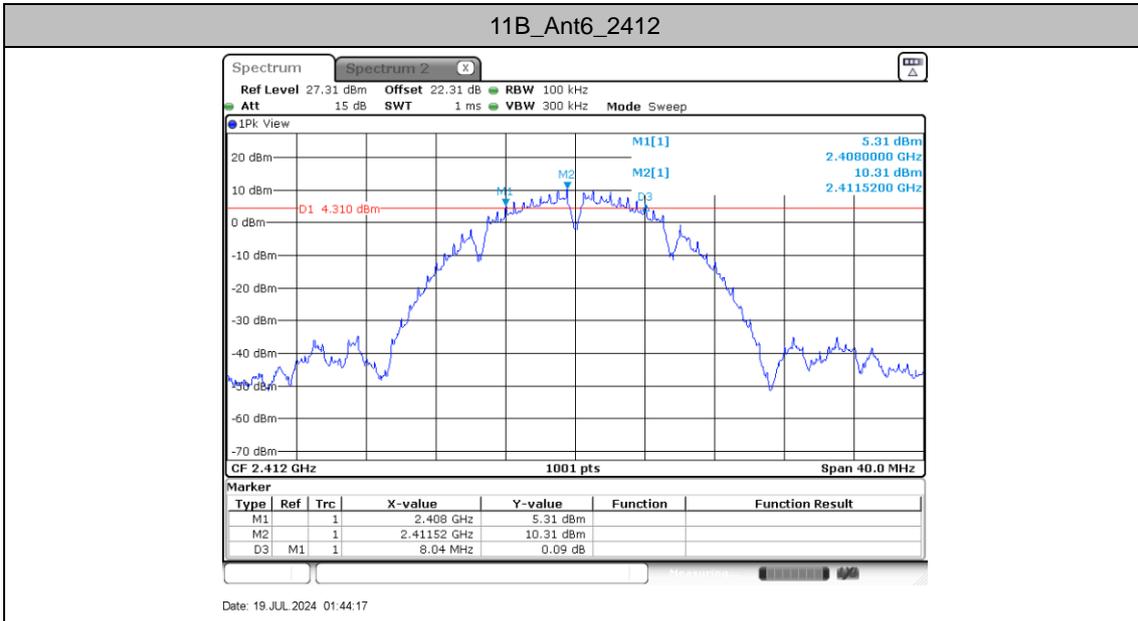
DTS Bandwidth

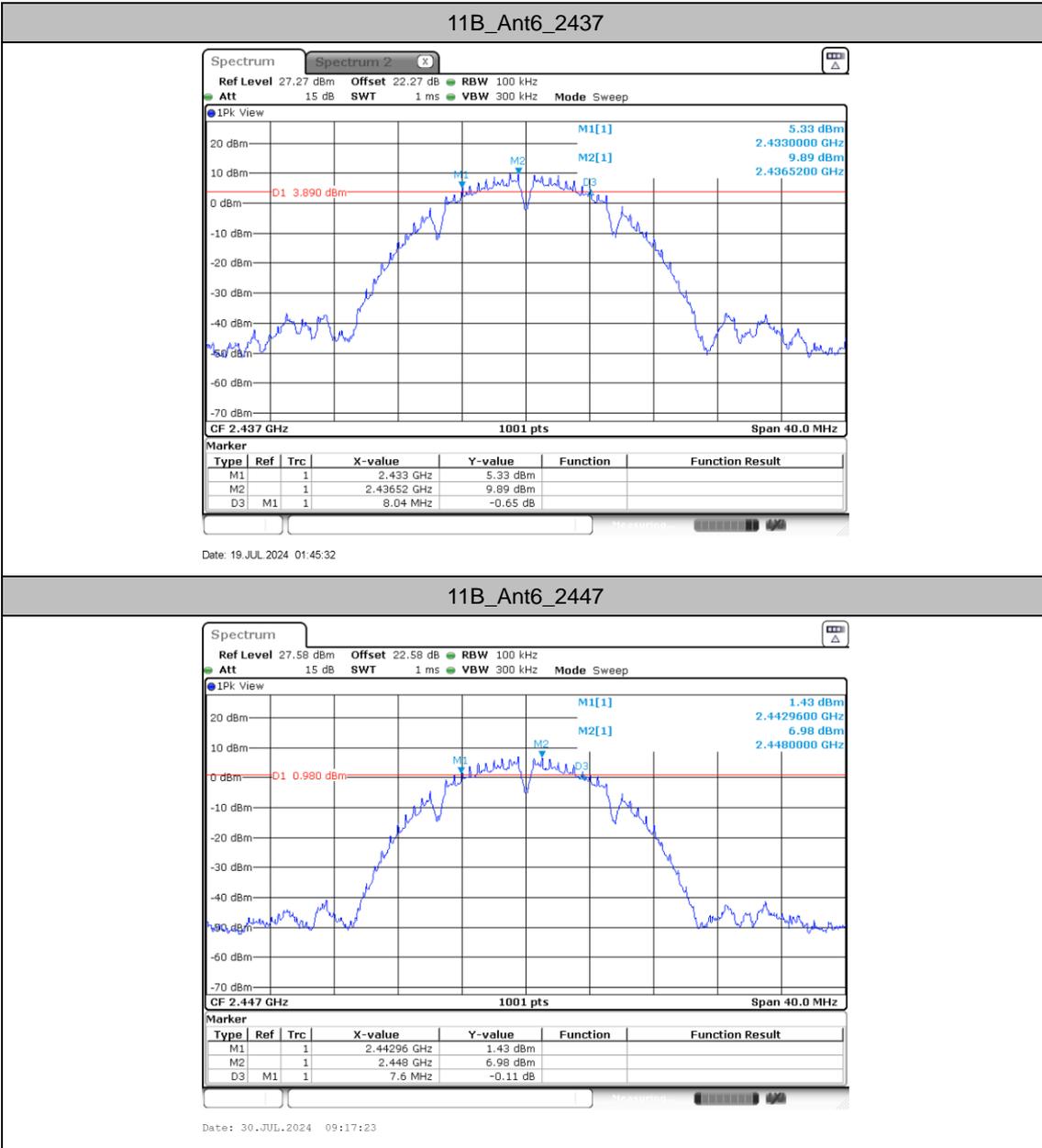
Test Result

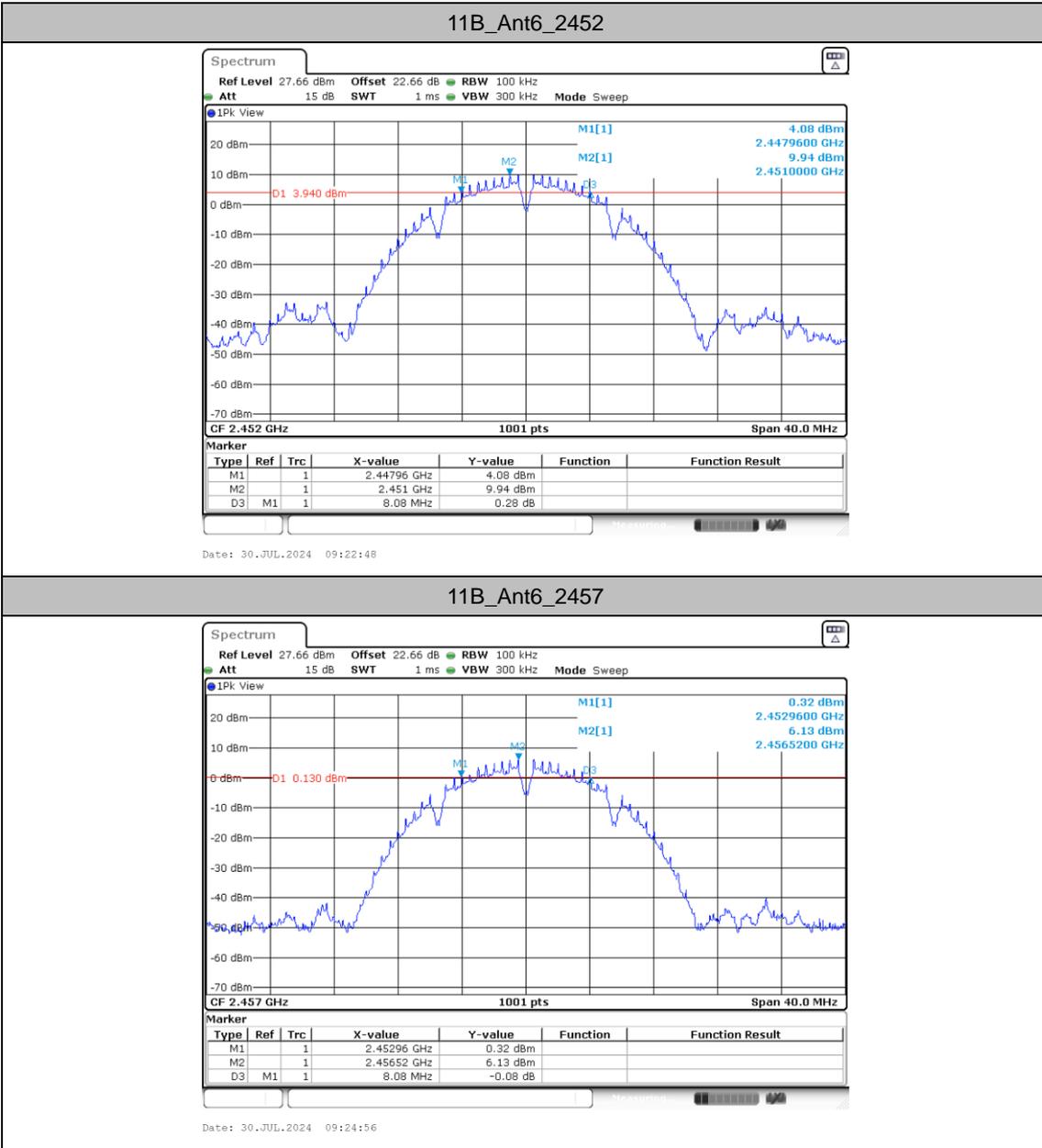
TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant6	2412	8.04	2408.00	2416.04	0.5	PASS
		2417	8.04	2413.00	2421.04	0.5	PASS
		2437	8.04	2433.00	2441.04	0.5	PASS
		2447	7.60	2442.96	2450.56	0.5	PASS
		2452	8.08	2447.96	2456.04	0.5	PASS
		2457	8.08	2452.96	2461.04	0.5	PASS
		2462	8.04	2458.00	2466.04	0.5	PASS
11G	Ant6	2412	15.96	2404.20	2420.16	0.5	PASS
		2437	15.72	2429.44	2445.16	0.5	PASS
		2462	16.32	2453.84	2470.16	0.5	PASS
11N20SISO	Ant6	2412	16.92	2403.84	2420.76	0.5	PASS
		2437	16.52	2428.88	2445.40	0.5	PASS
		2462	17.16	2453.24	2470.40	0.5	PASS
11AX20SISO	Ant6	2412	18.72	2402.80	2421.52	0.5	PASS
		2437	18.56	2427.88	2446.44	0.5	PASS
		2462	18.72	2452.56	2471.28	0.5	PASS



Test Graphs

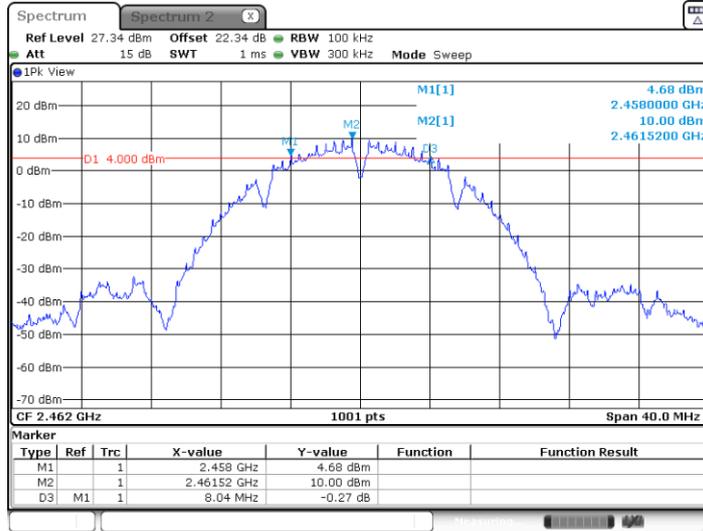






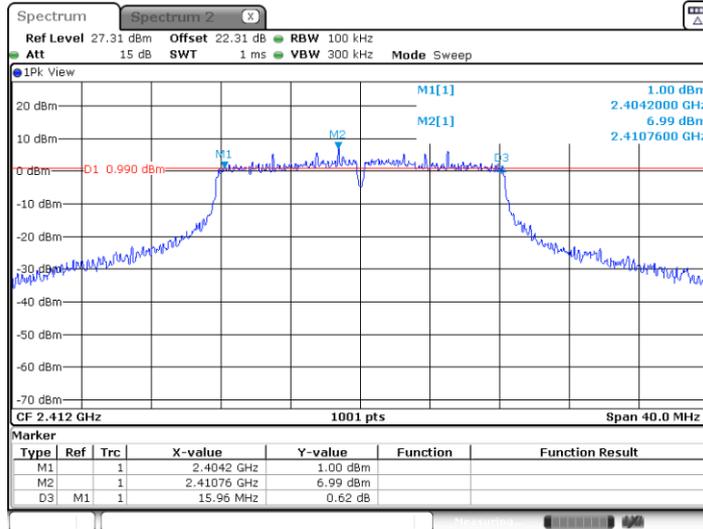


11B_Ant6_2462

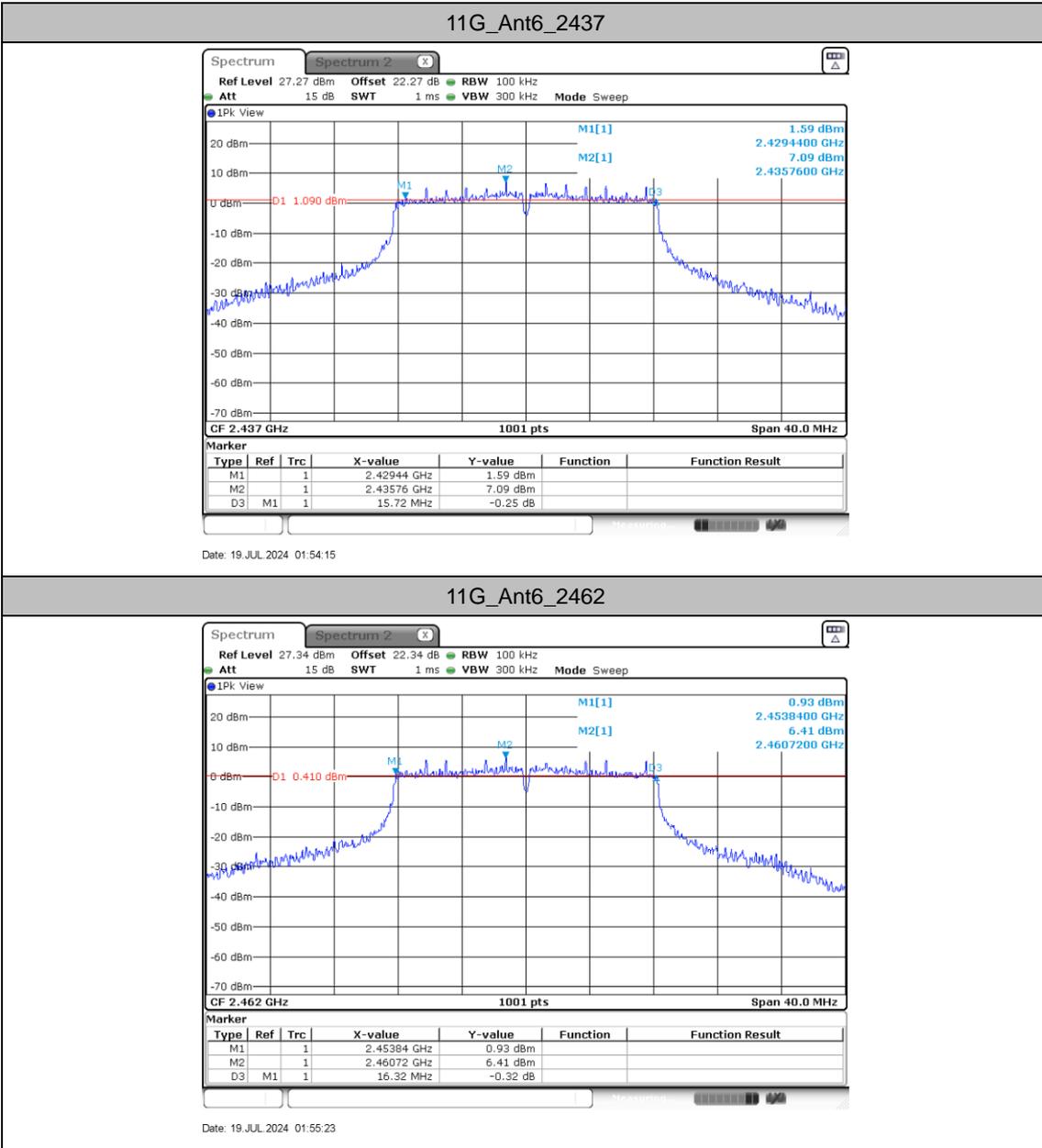


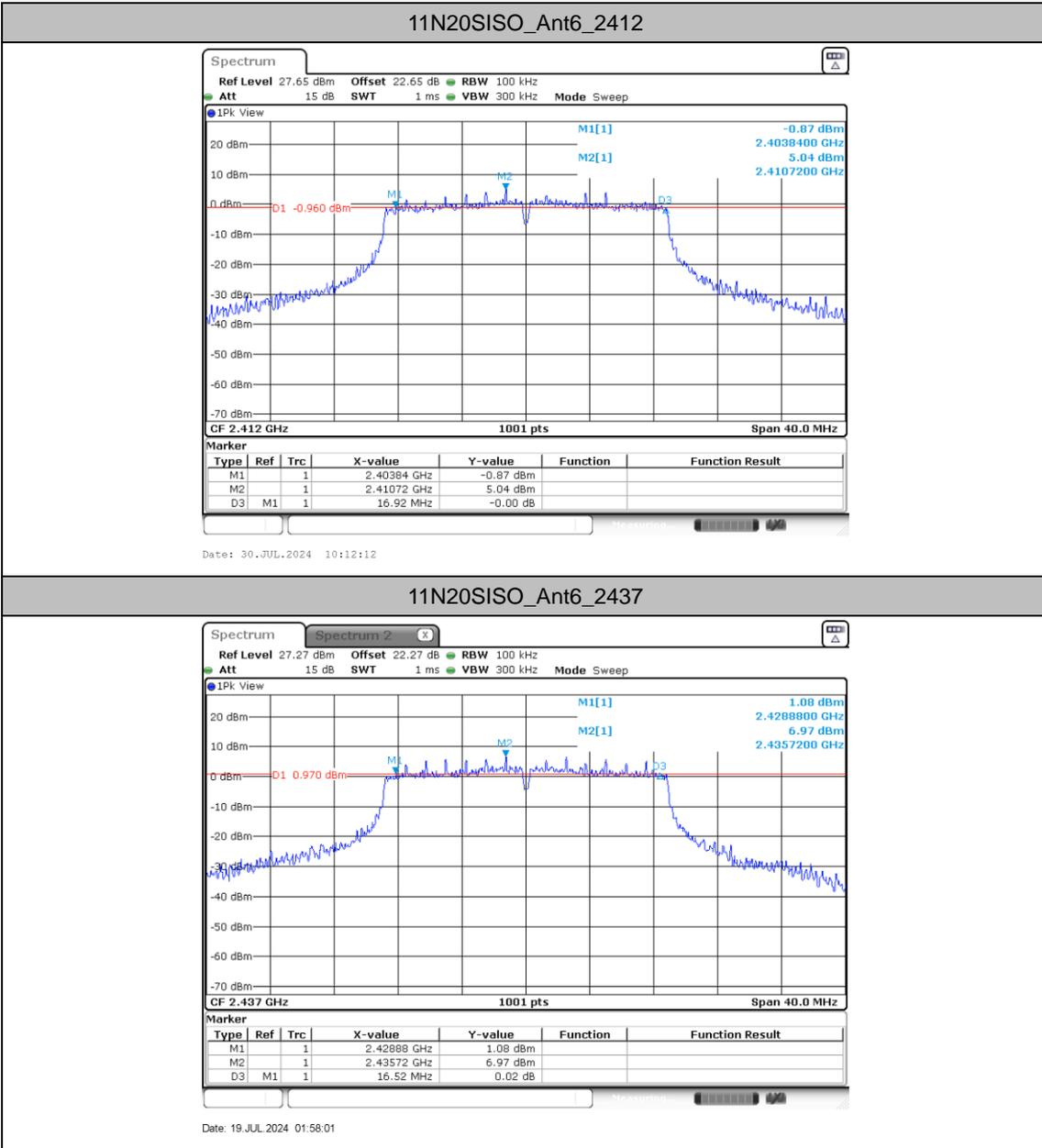
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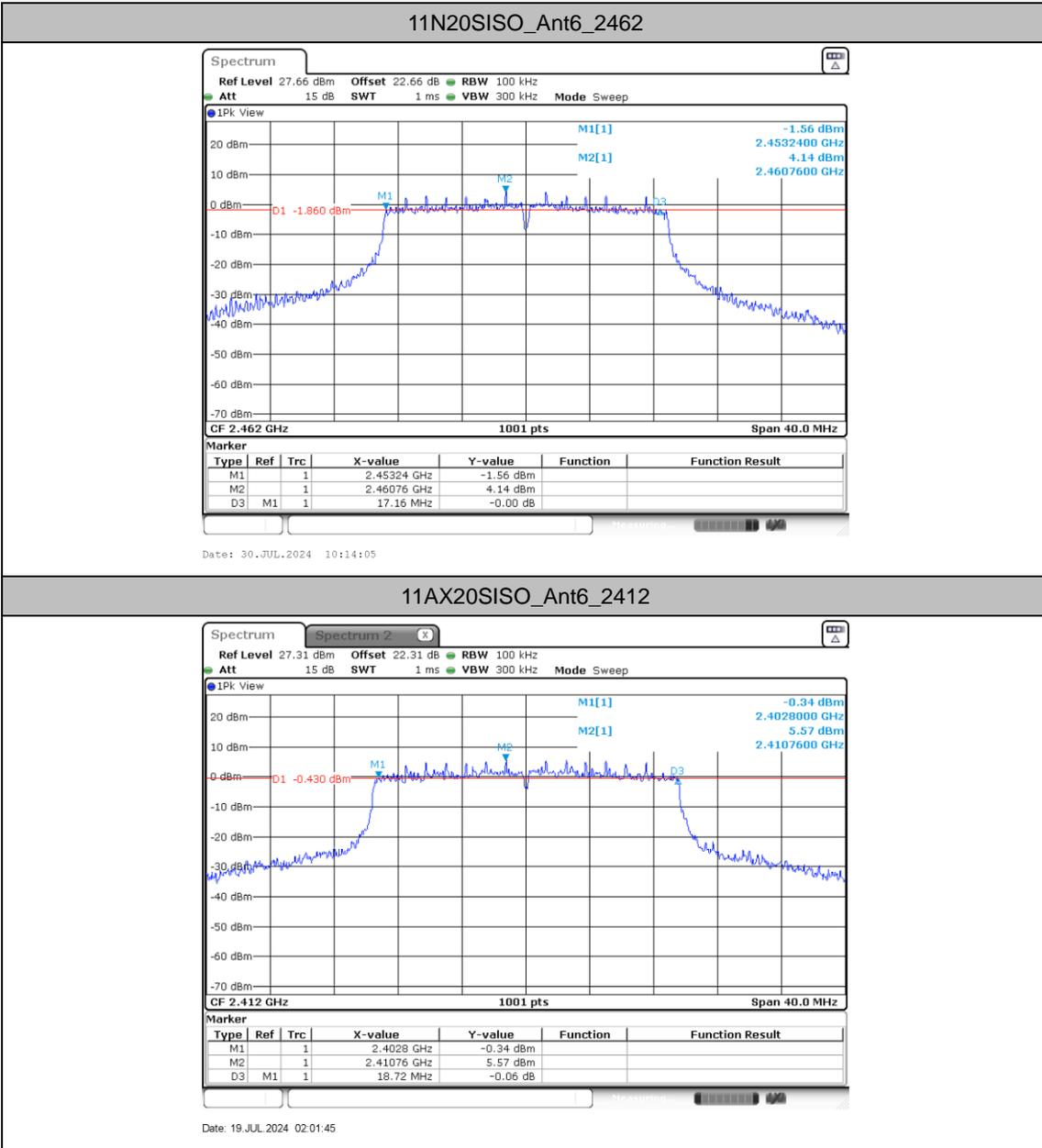
11G_Ant6_2412

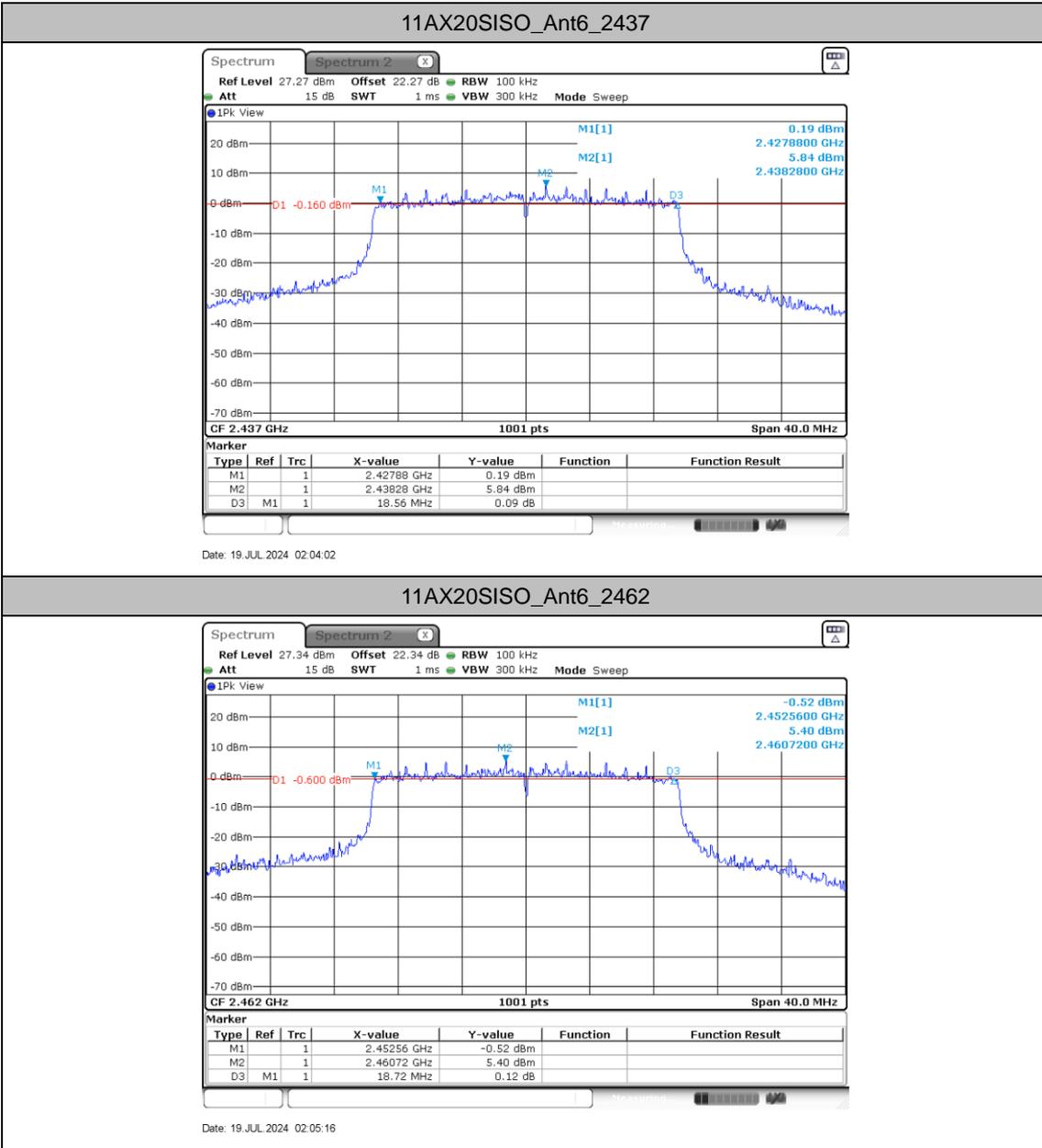


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Occupied Channel Bandwidth

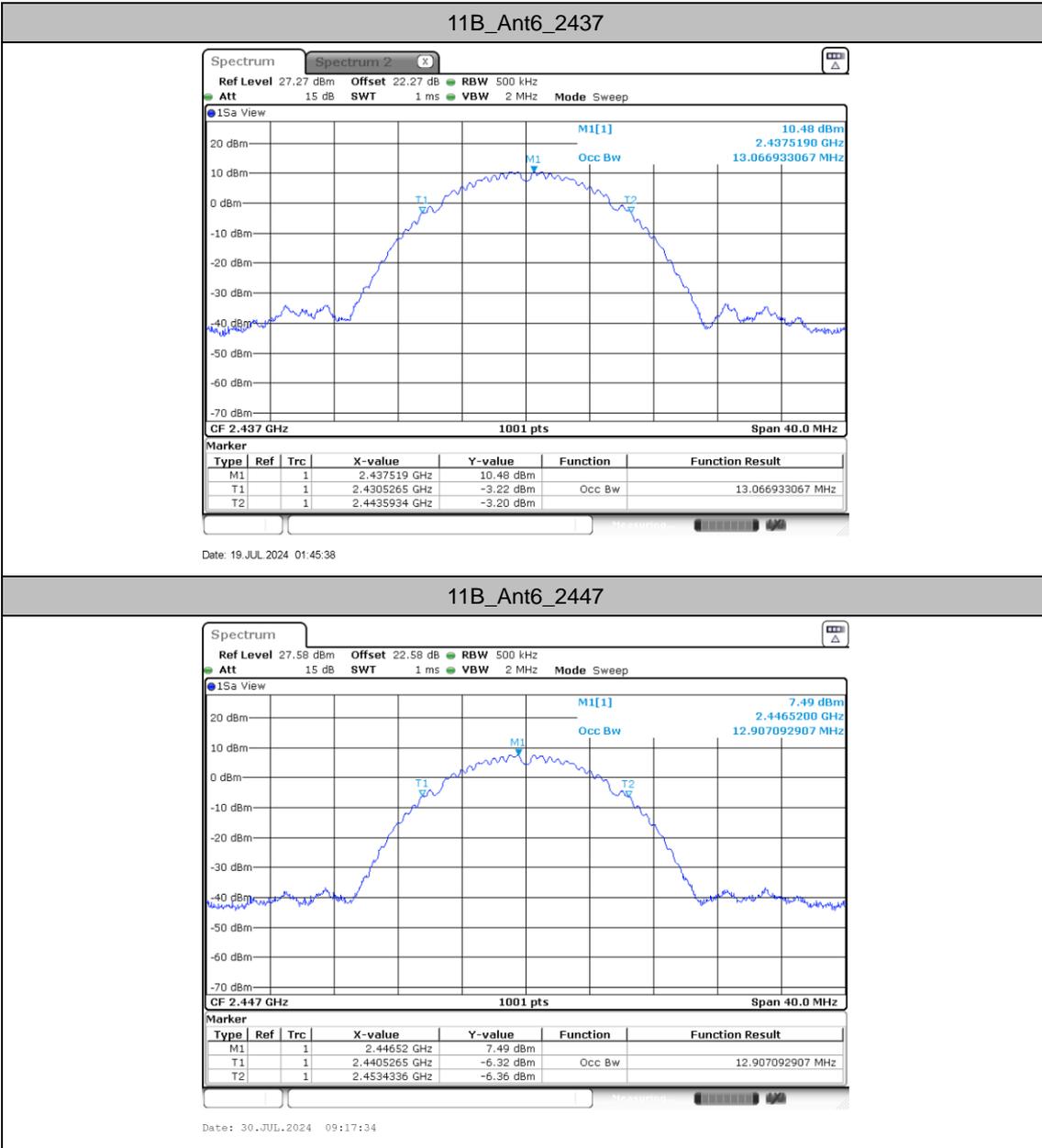
Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]
11B	Ant6	2412	13.107	2405.4865	2418.5934
		2417	12.867	2410.6064	2423.4735
		2437	13.067	2430.5265	2443.5934
		2447	12.907	2440.5265	2453.4336
		2452	13.147	2445.3666	2458.5135
		2457	12.907	2450.4865	2463.3936
		2462	13.227	2455.3666	2468.5934
11G	Ant6	2412	17.423	2403.3287	2420.7512
		2437	17.263	2428.3686	2445.6314
		2462	17.343	2453.3287	2470.6713
11N20SISO	Ant6	2412	18.382	2402.8492	2421.2308
		2437	18.422	2427.7692	2446.1908
		2462	18.382	2452.7692	2471.1508
11AX20SISO	Ant6	2412	19.261	2402.4096	2421.6703
		2437	19.181	2427.4096	2446.5904
		2462	19.261	2452.3696	2471.6304



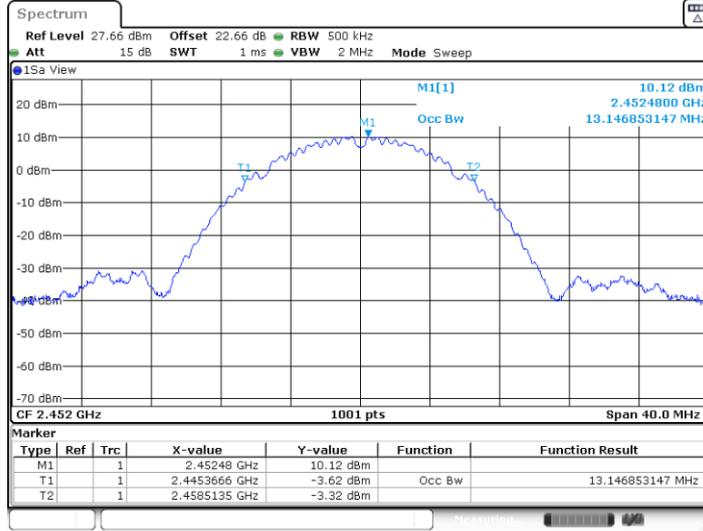
Test Graphs





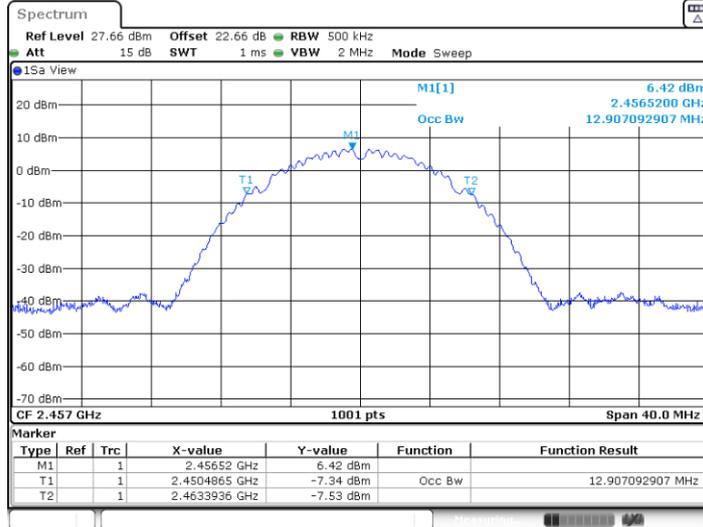


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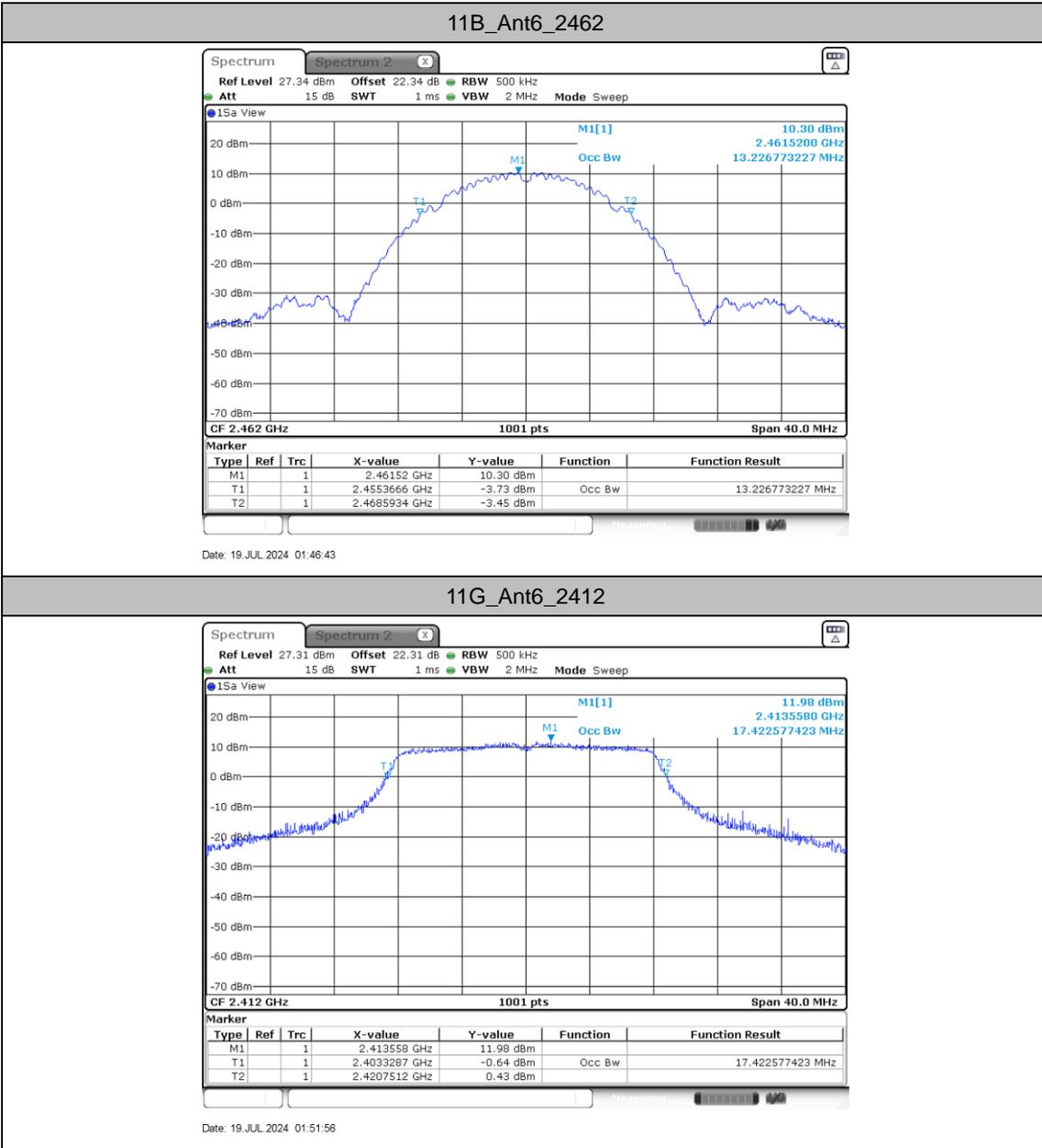


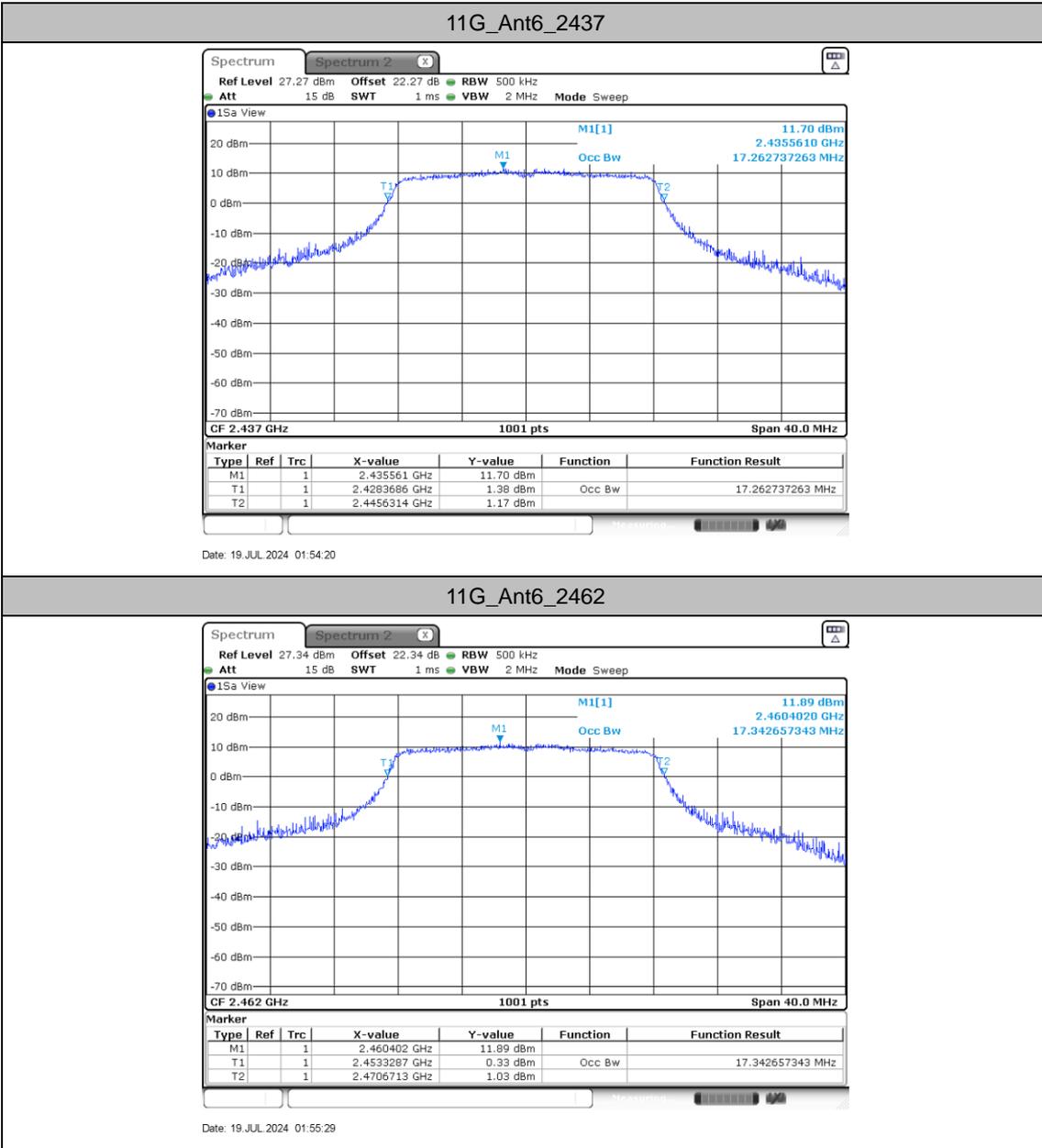
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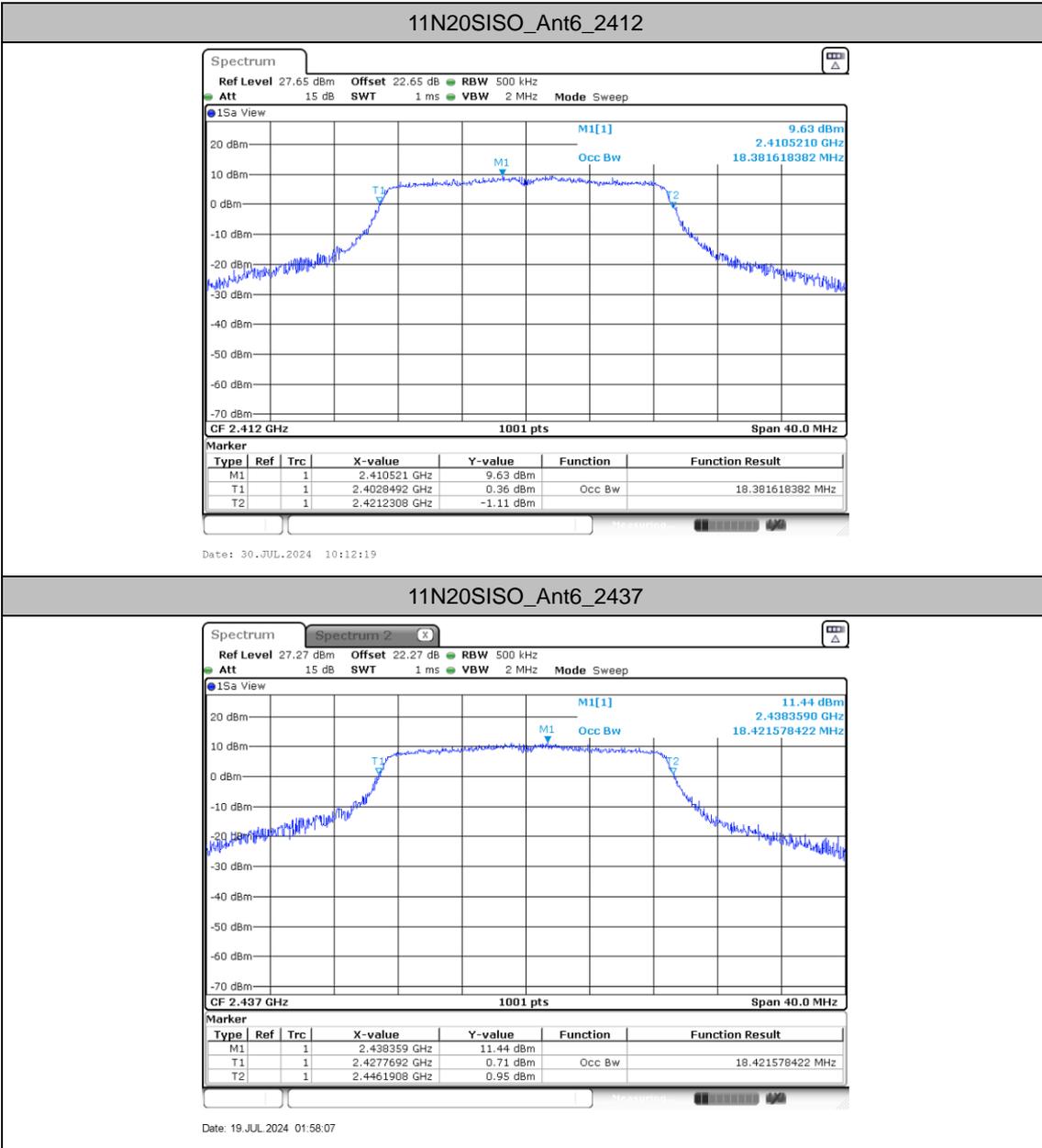
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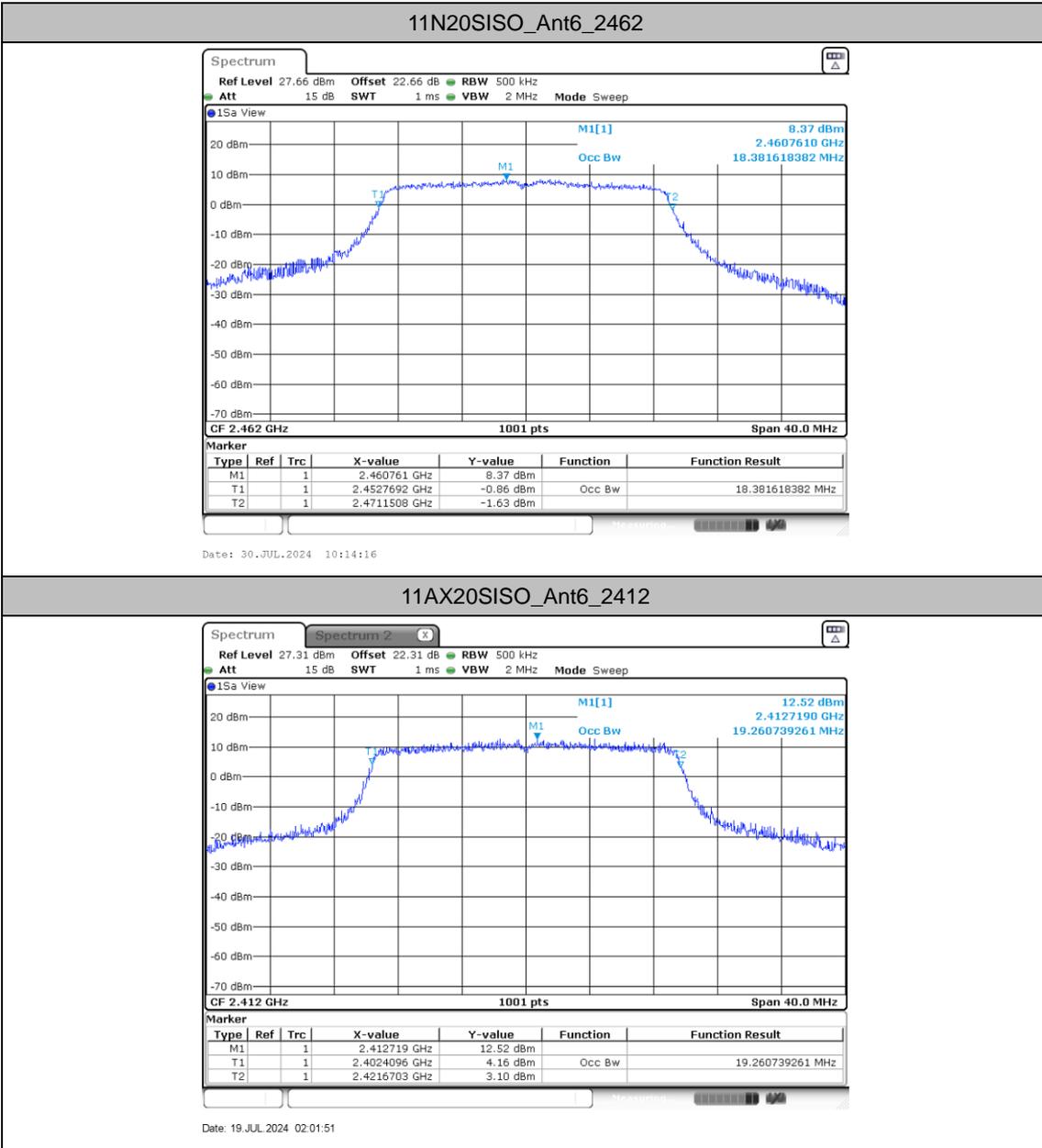


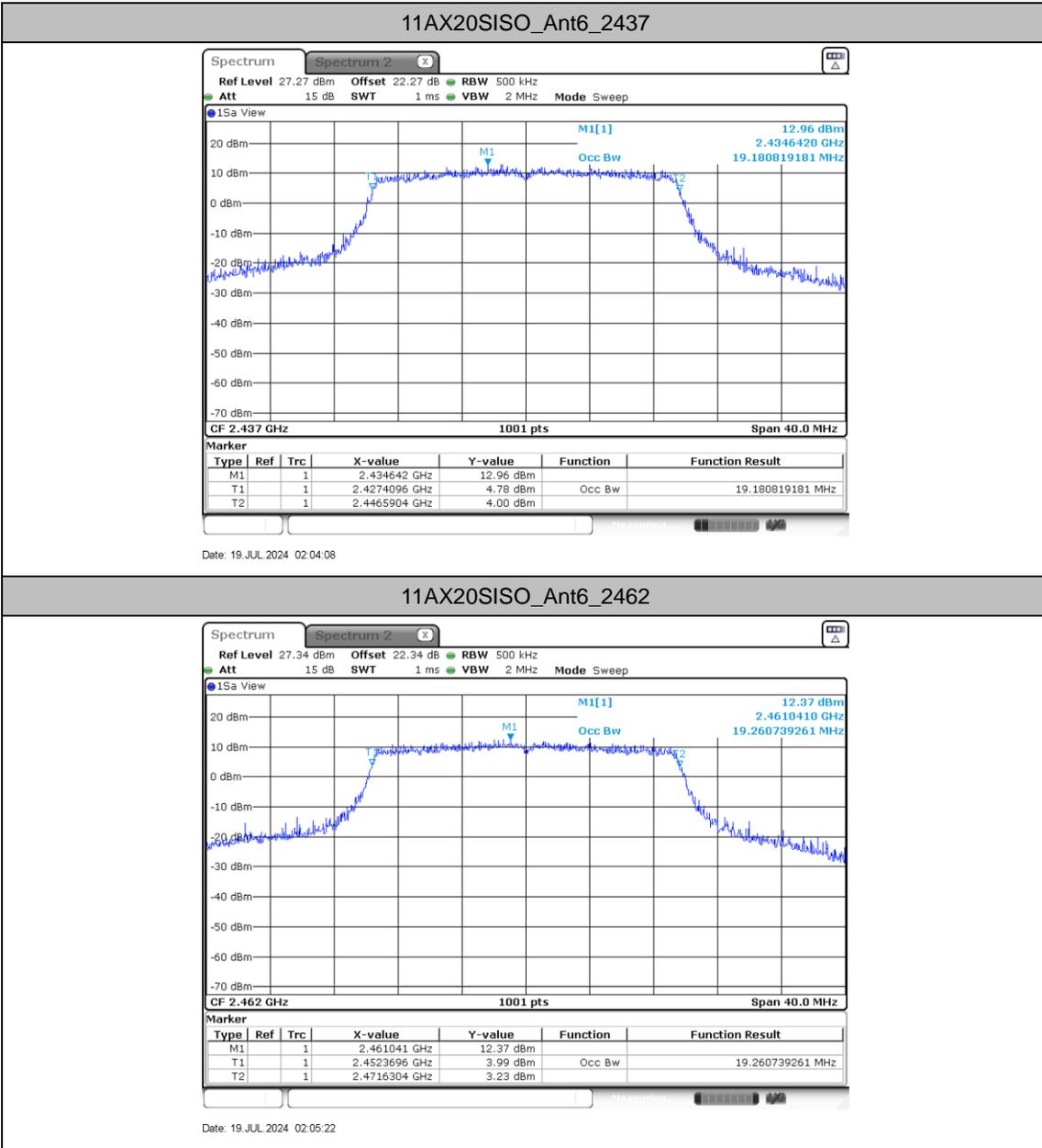
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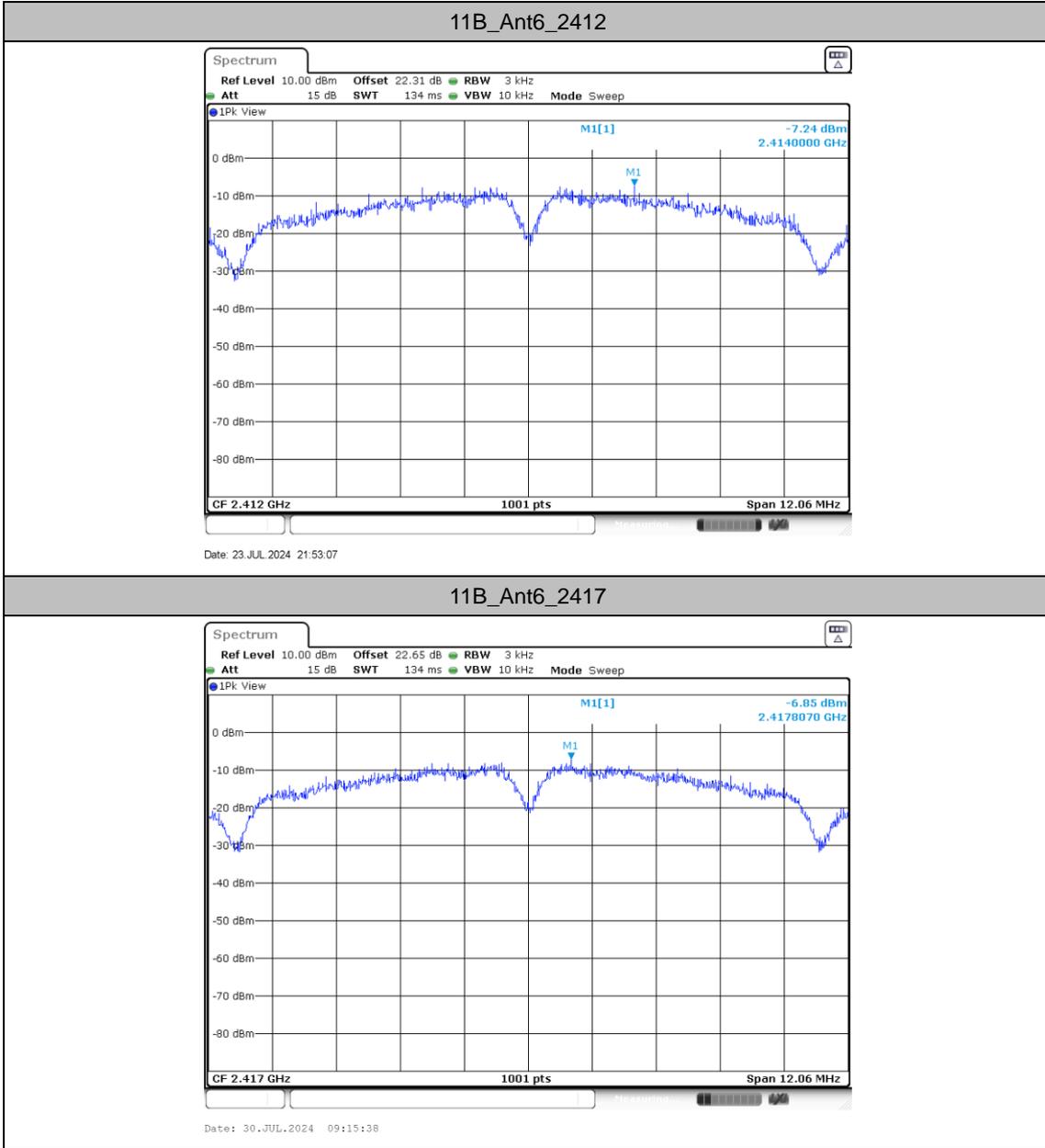
Maximum power spectral density

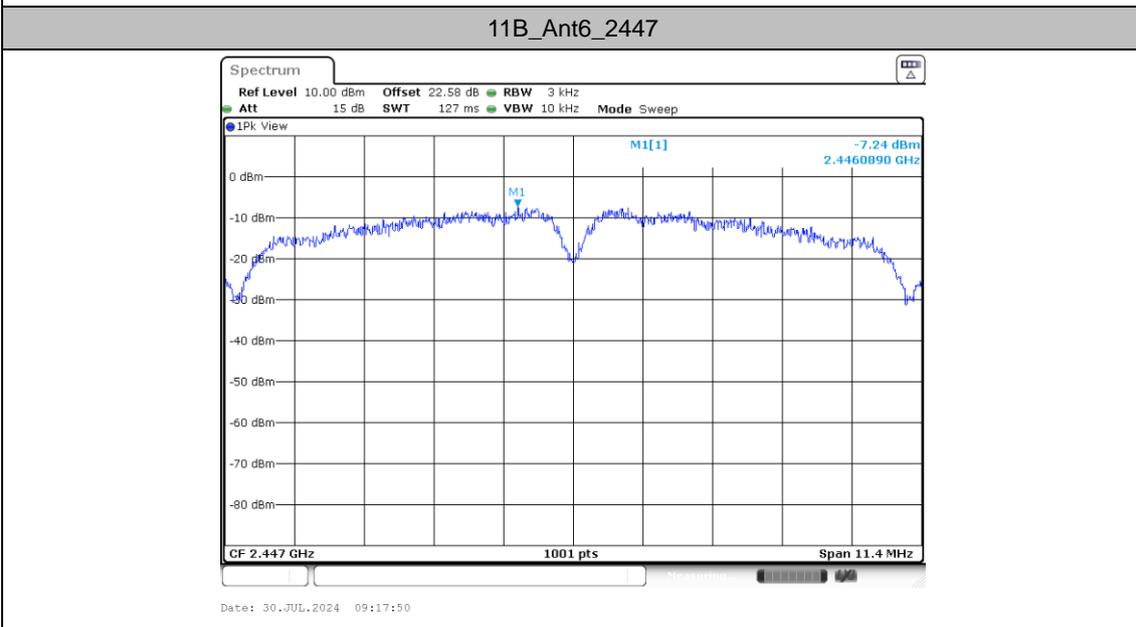
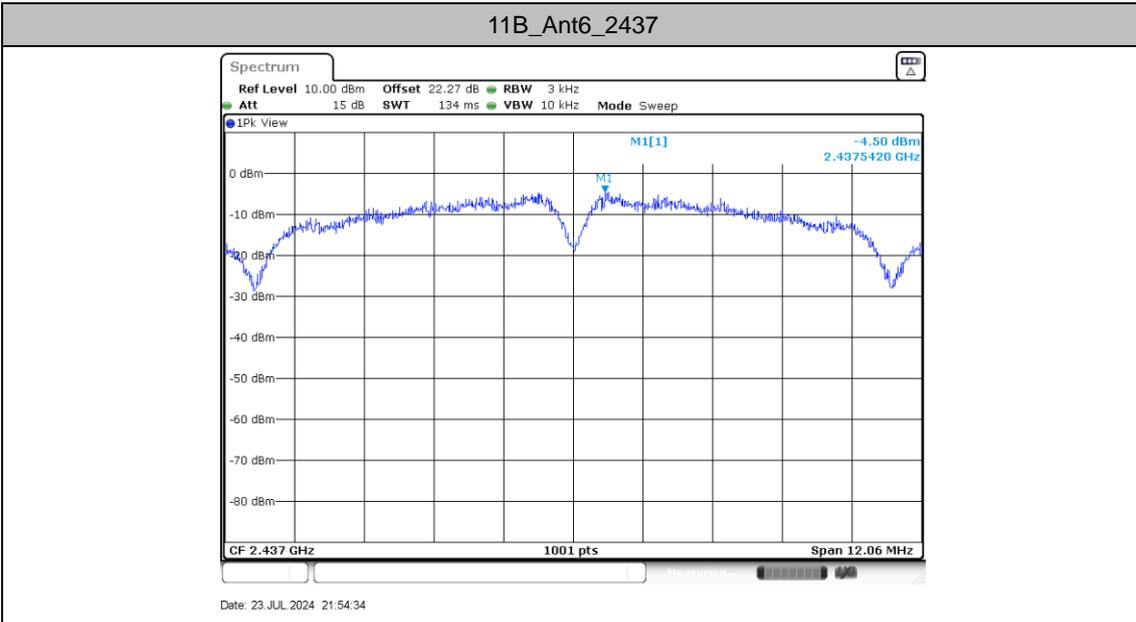
Test Result

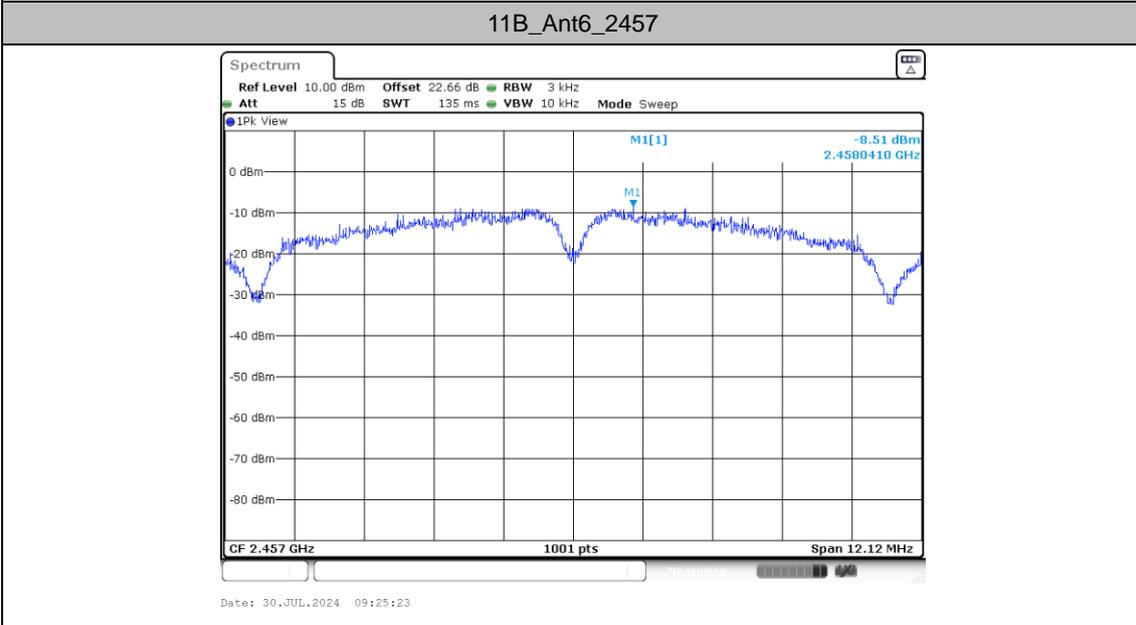
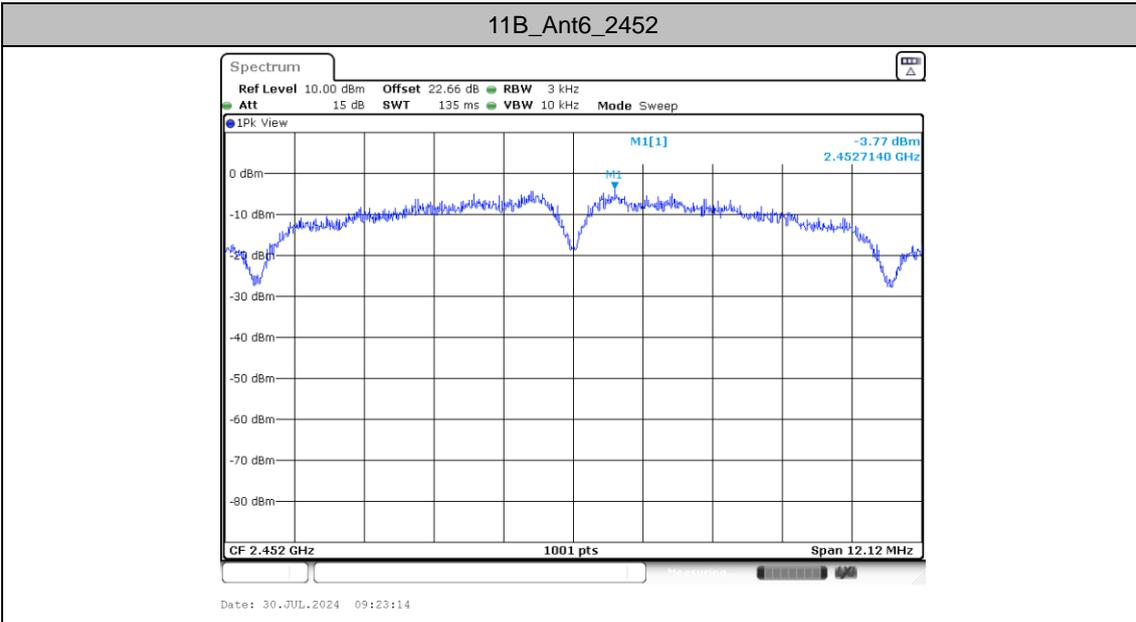
TestMode	Antenna	Freq(MHz)	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
11B	Ant6	2412	-7.24	≤8.00	PASS
		2417	-6.85	≤8.00	PASS
		2437	-4.5	≤8.00	PASS
		2447	-7.24	≤8.00	PASS
		2452	-3.77	≤8.00	PASS
		2457	-8.51	≤8.00	PASS
		2462	-7.64	≤8.00	PASS
11G	Ant6	2412	-7.83	≤8.00	PASS
		2437	-6.86	≤8.00	PASS
		2462	-7.22	≤8.00	PASS
11N20SISO	Ant6	2412	-8.37	≤8.00	PASS
		2437	-6.86	≤8.00	PASS
		2462	-10.20	≤8.00	PASS
11AX20SISO	Ant6	2412	-10.89	≤8.00	PASS
		2437	-9.6	≤8.00	PASS
		2462	-10	≤8.00	PASS



Test Graphs

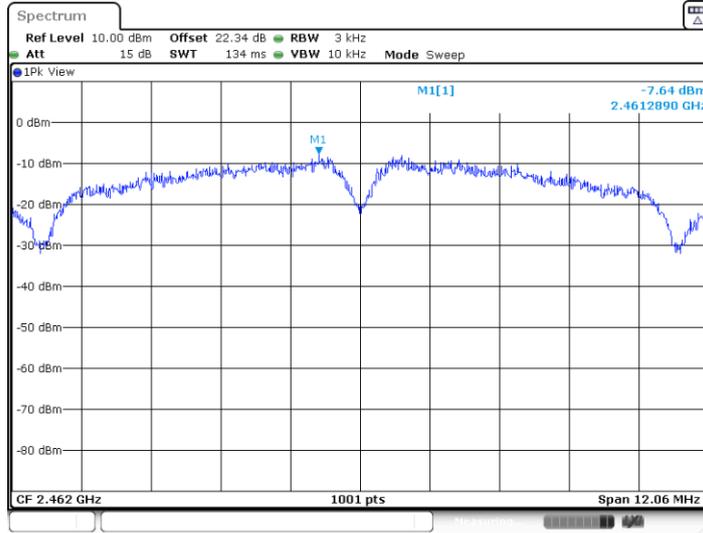






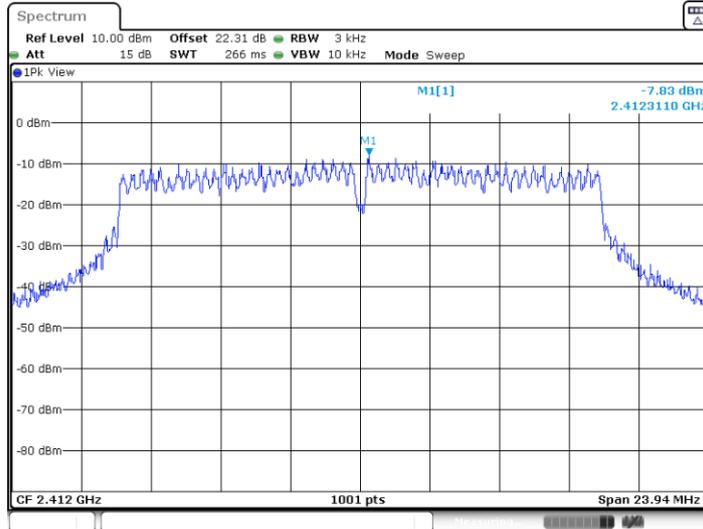


11B_Ant6_2462

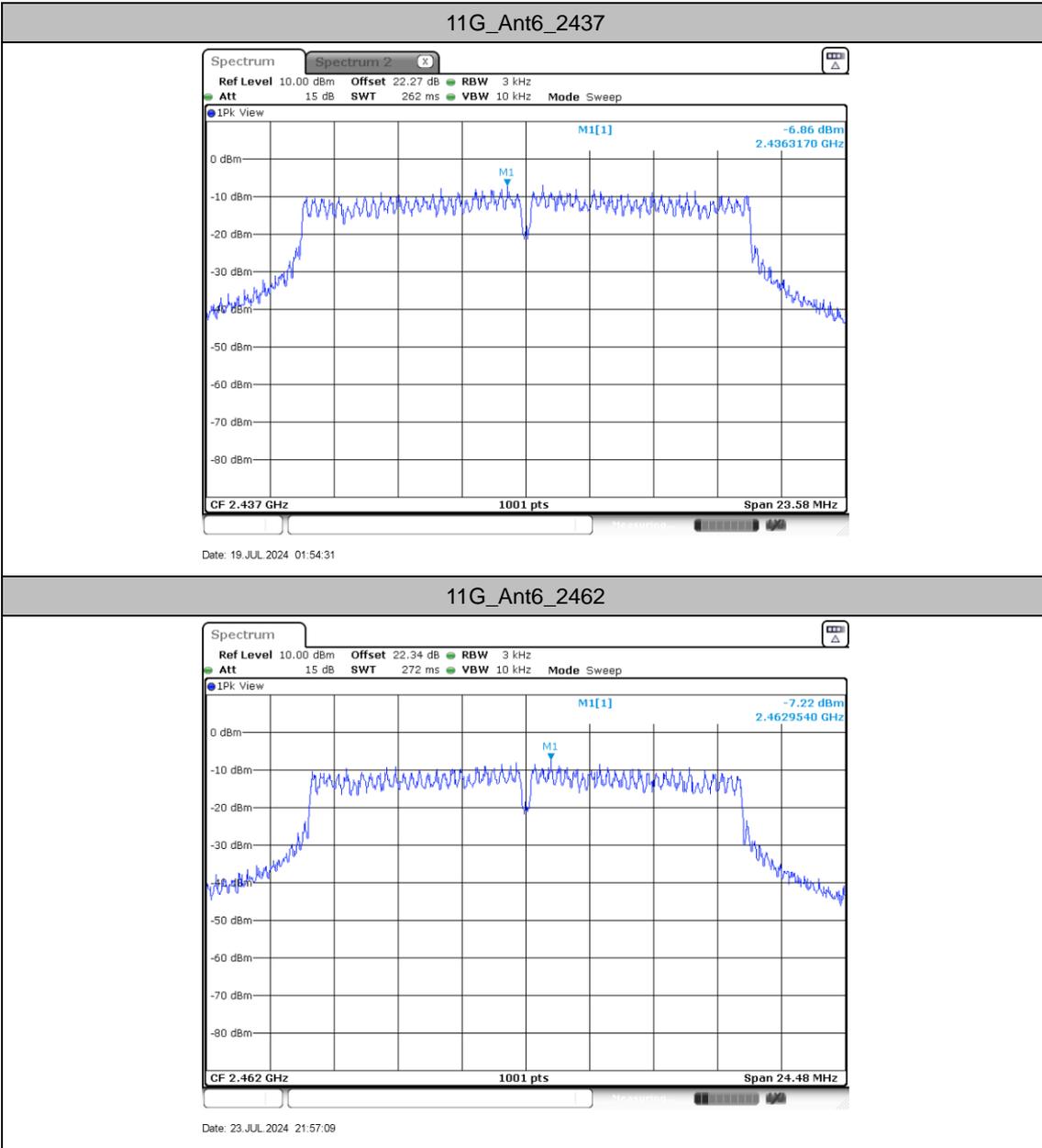


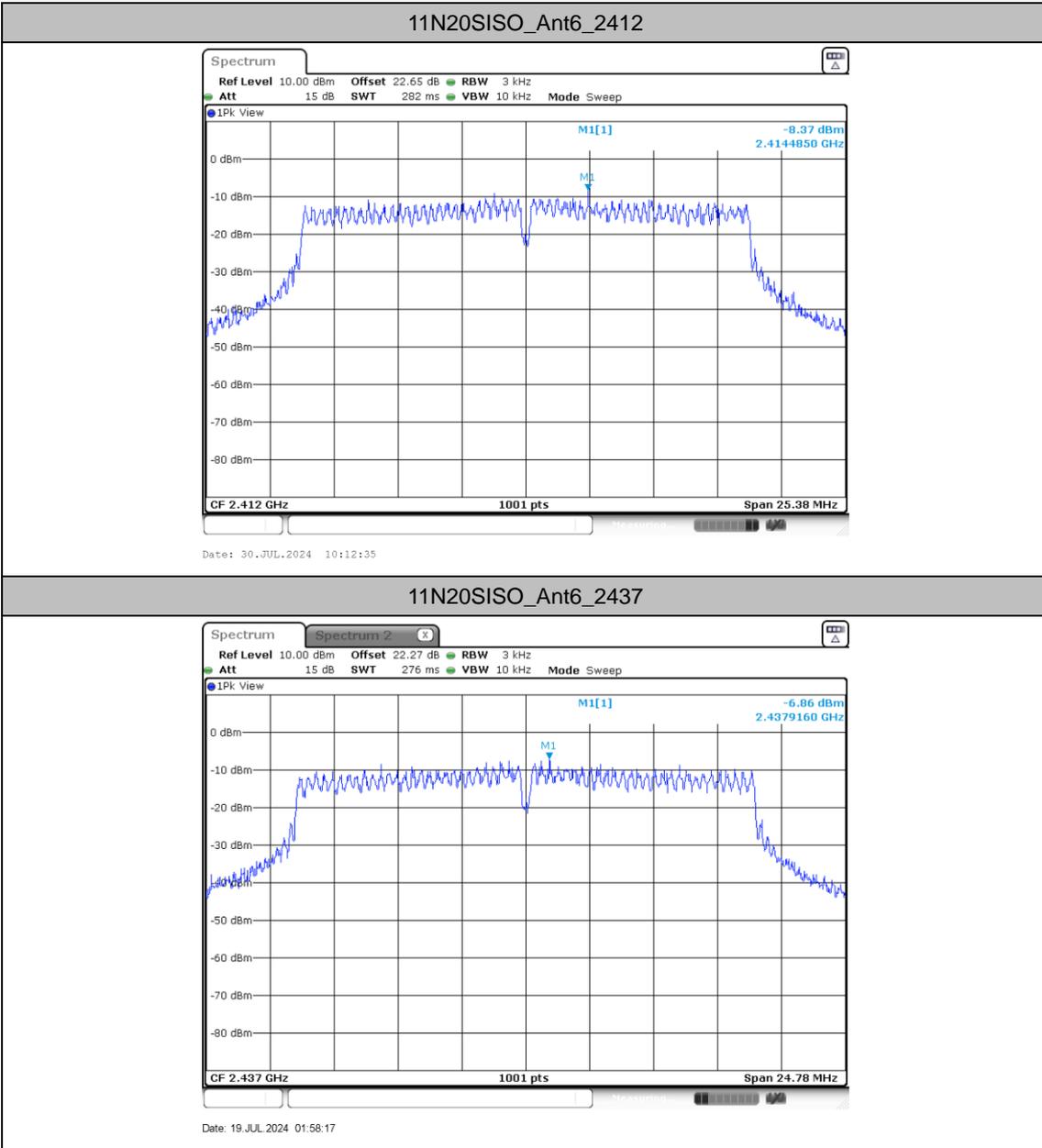
Date: 23 JUL 2024 21:55:23

11G_Ant6_2412



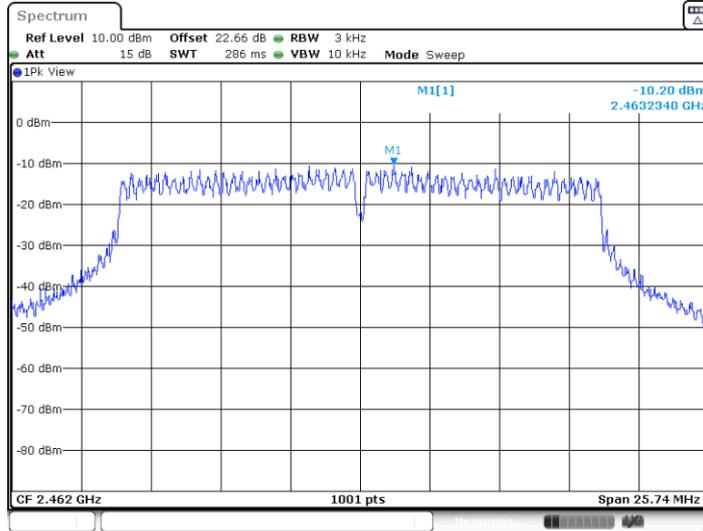
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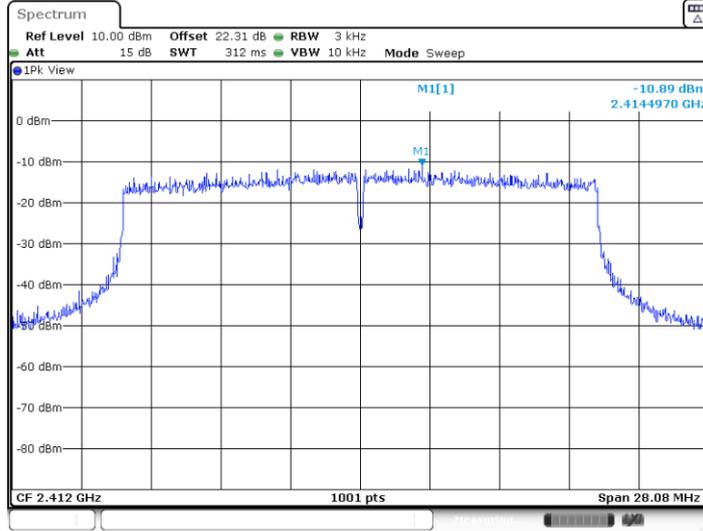


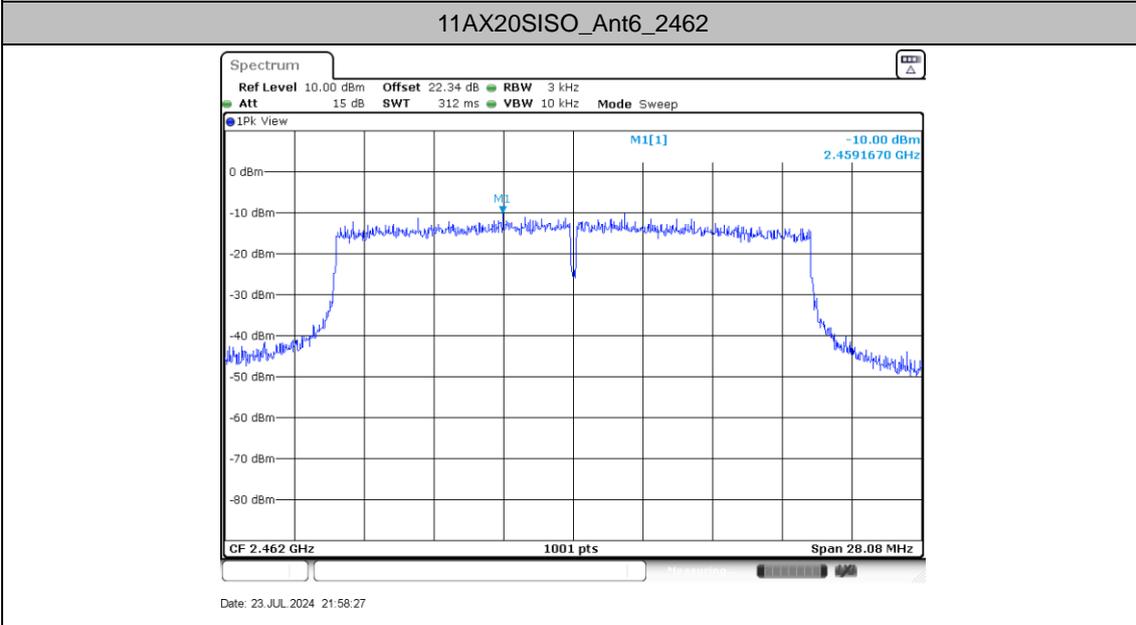
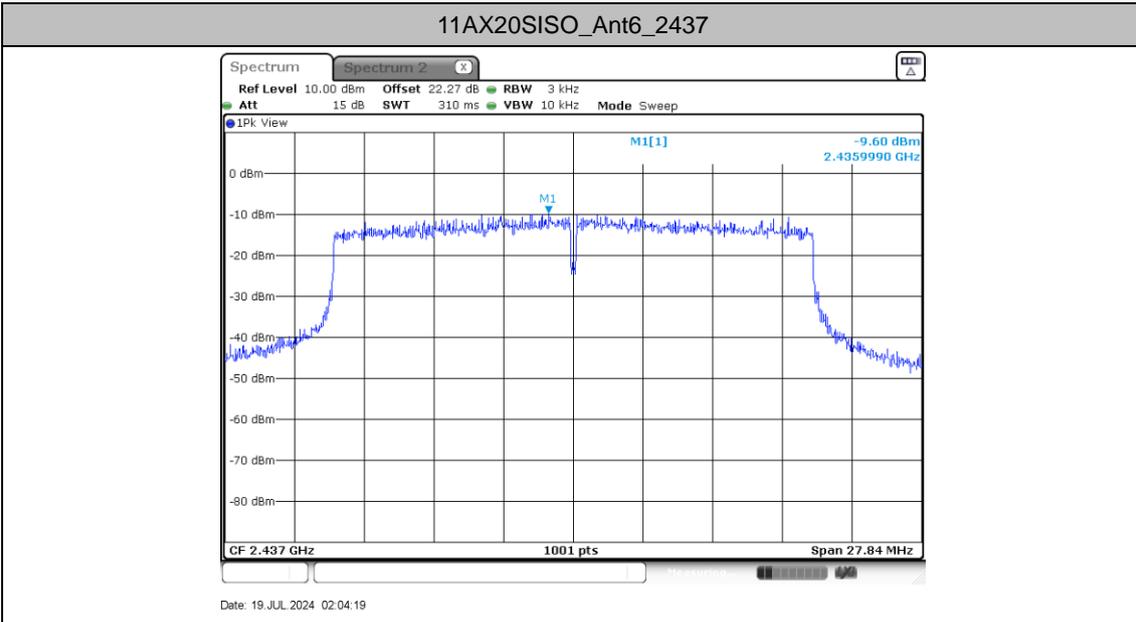


11N20SISO_Ant6_2462



11AX20SISO_Ant6_2412







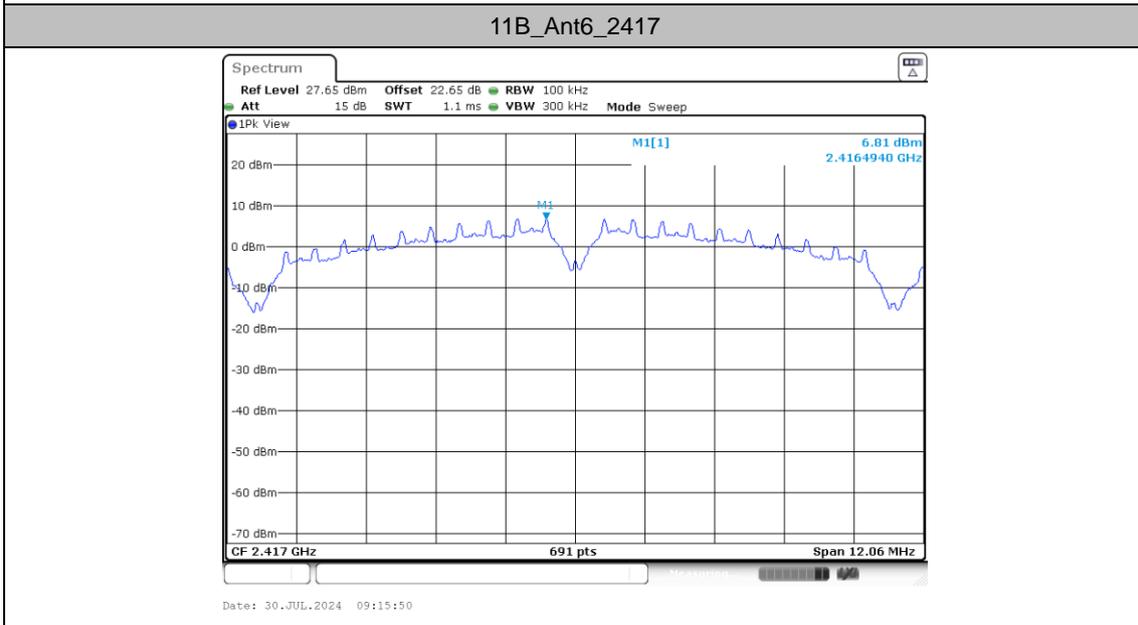
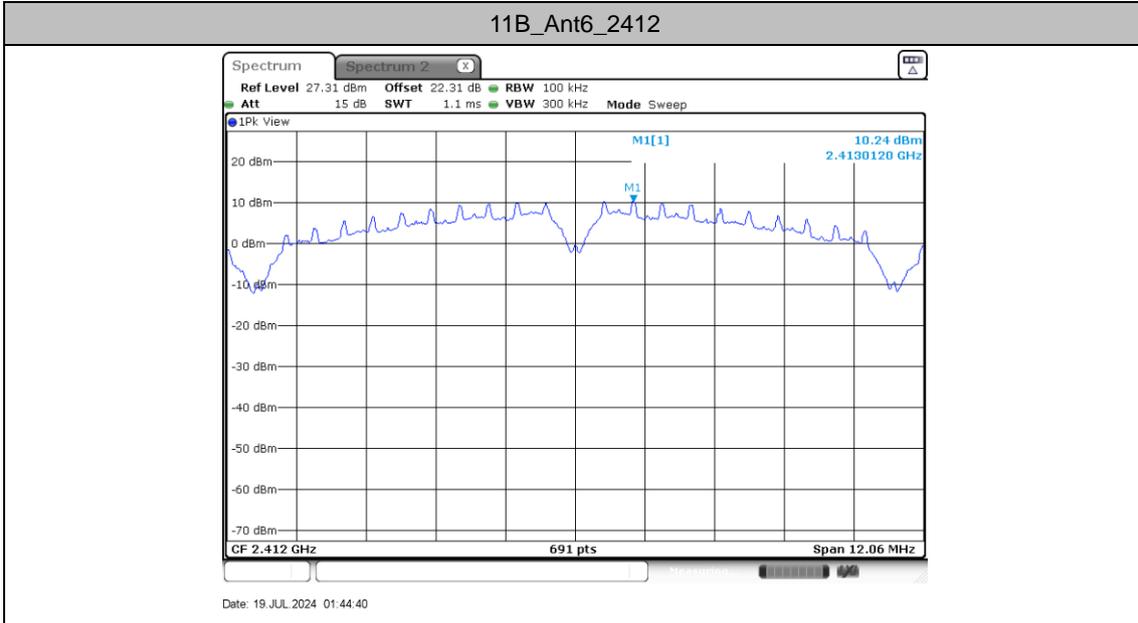
Reference level measurement

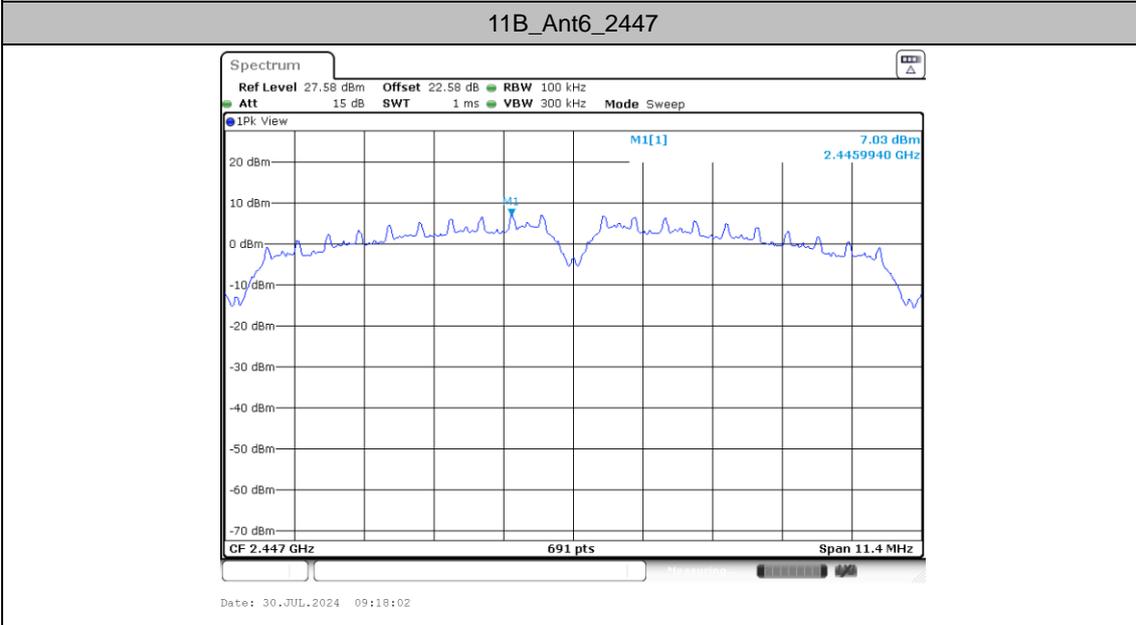
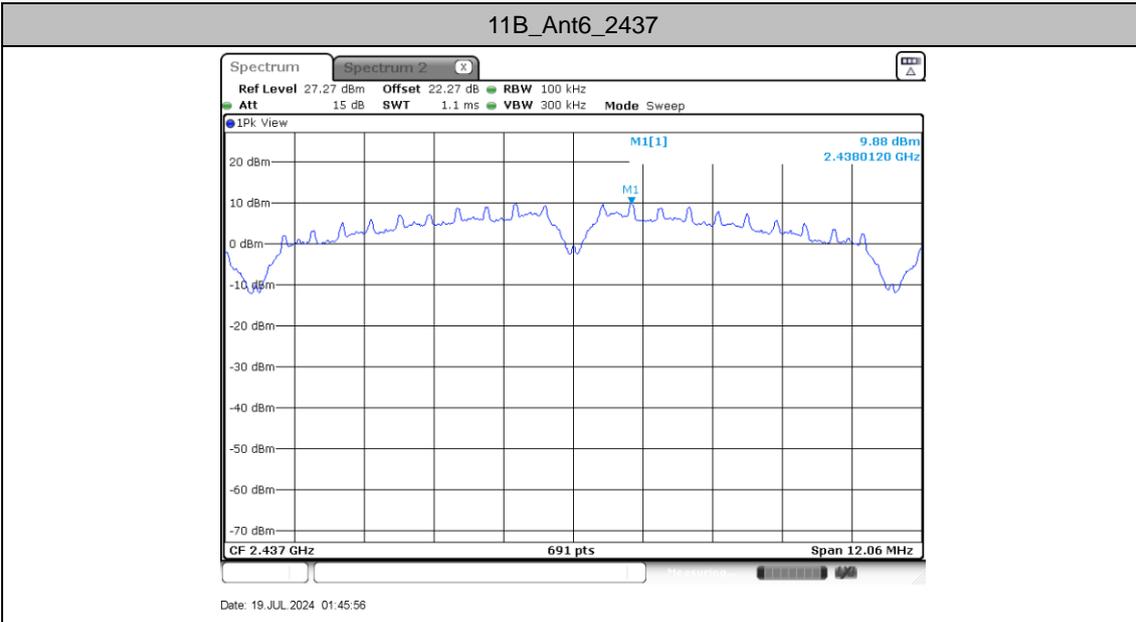
Test Result

TestMode	Antenna	Freq(MHz)	Max.Point[MHz]	Result[dBm/100KHz]
11B	Ant6	2412	2413.01	10.24
		2417	2416.49	6.81
		2437	2438.01	9.88
		2447	2445.99	7.03
		2452	2452.49	9.68
		2457	2456.49	6.14
		2462	2462.51	9.80
11G	Ant6	2412	2410.75	6.98
		2437	2435.74	6.96
		2462	2463.28	6.50
11N20SISO	Ant6	2412	2413.25	4.88
		2437	2435.75	6.94
		2462	2464.50	3.59
11AX20SISO	Ant6	2412	2410.74	5.82
		2437	2439.50	5.47
		2462	2463.26	5.40



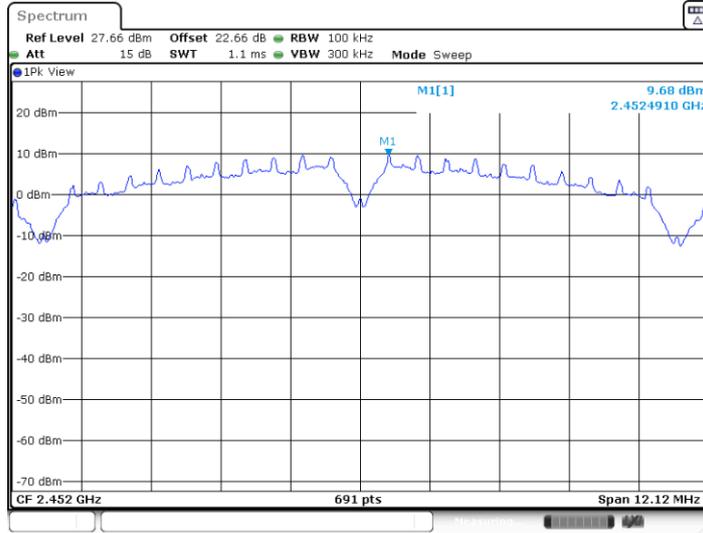
Test Graphs





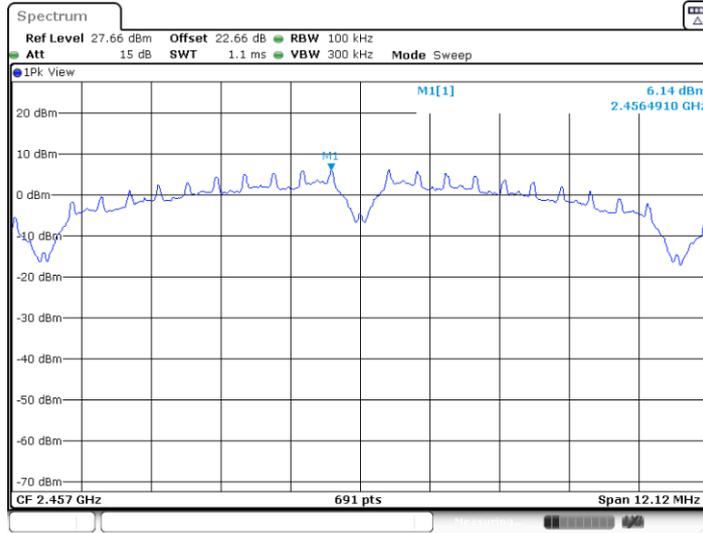


11B_Ant6_2452

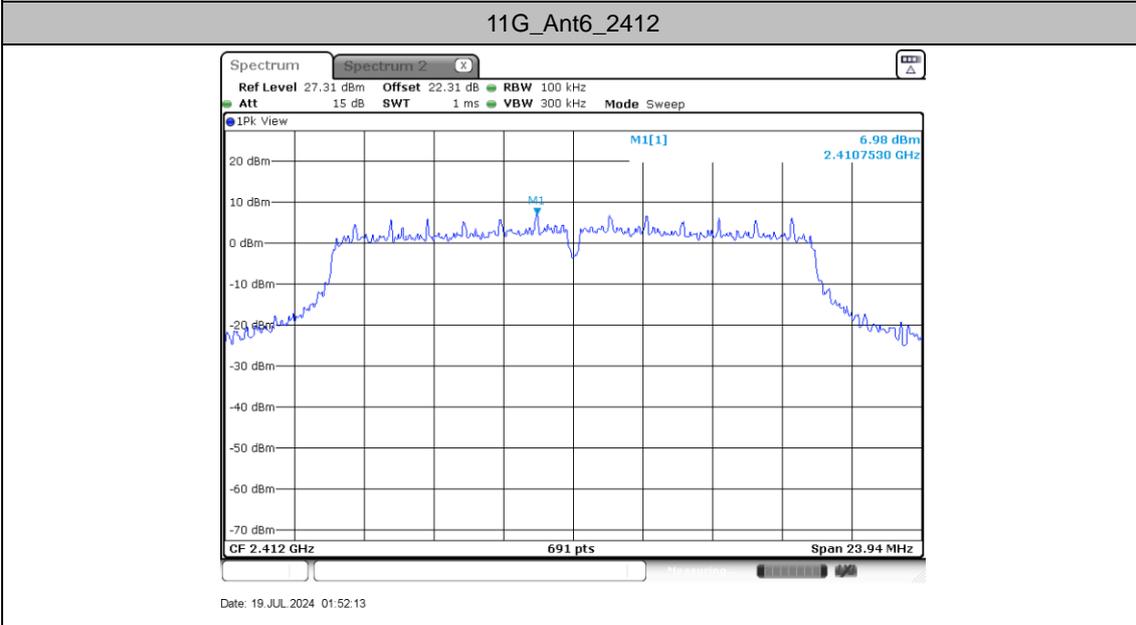
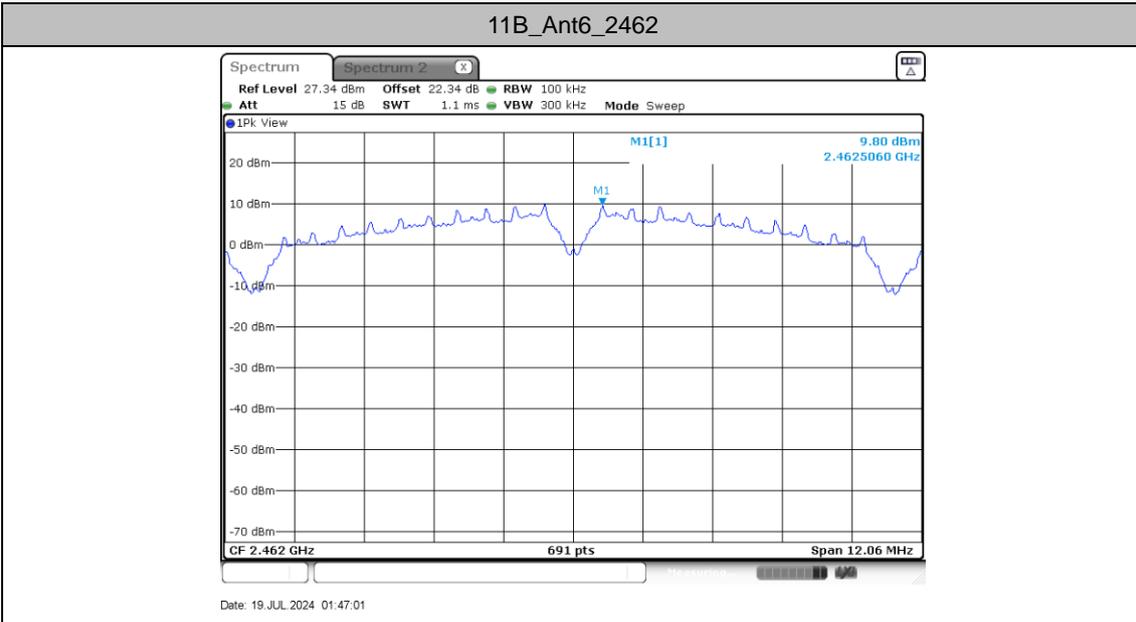


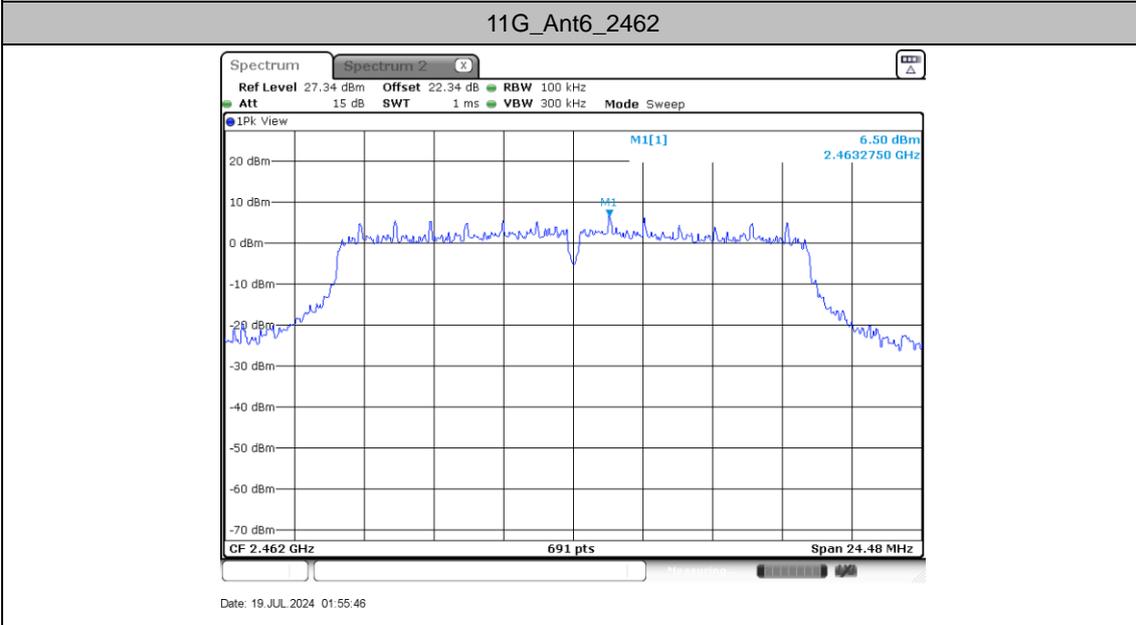
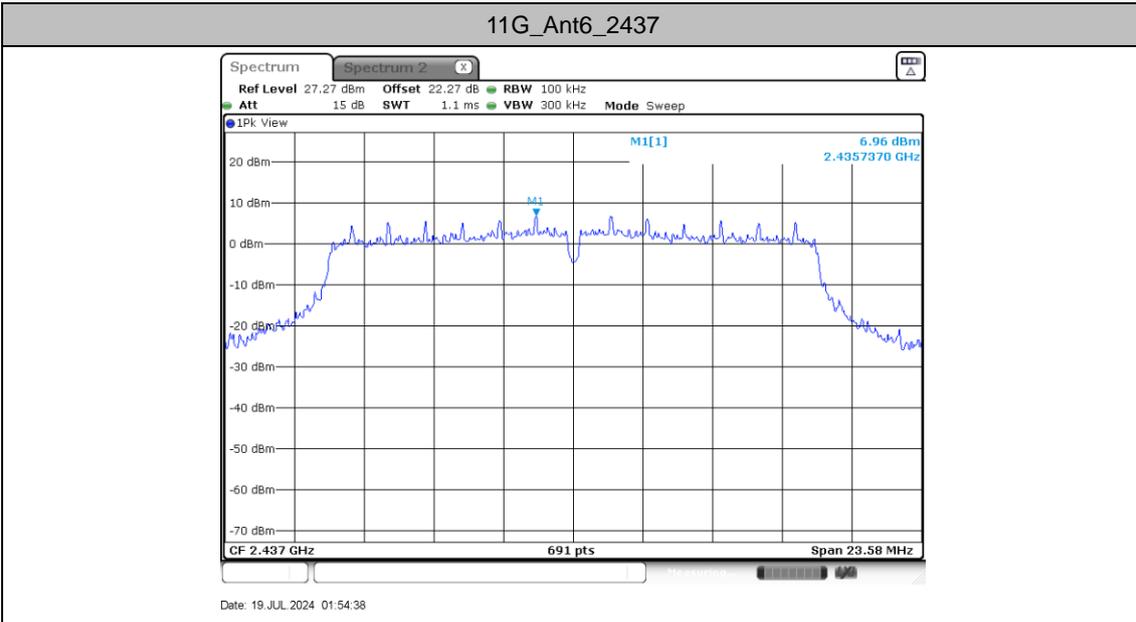
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11B_Ant6_2457



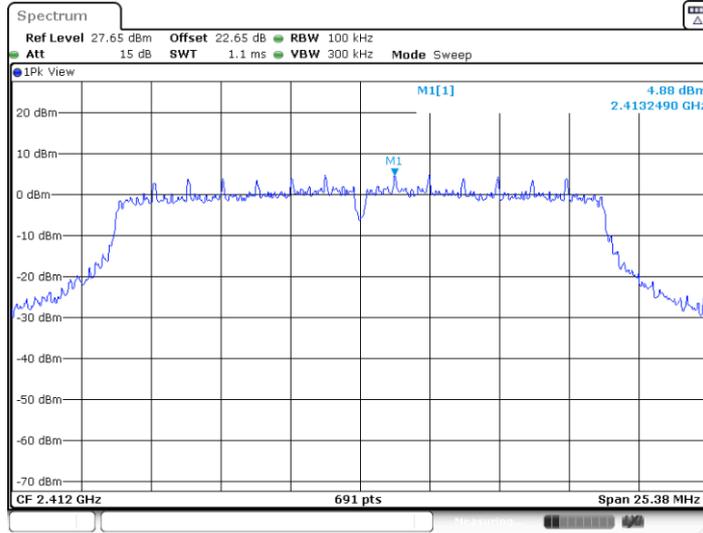
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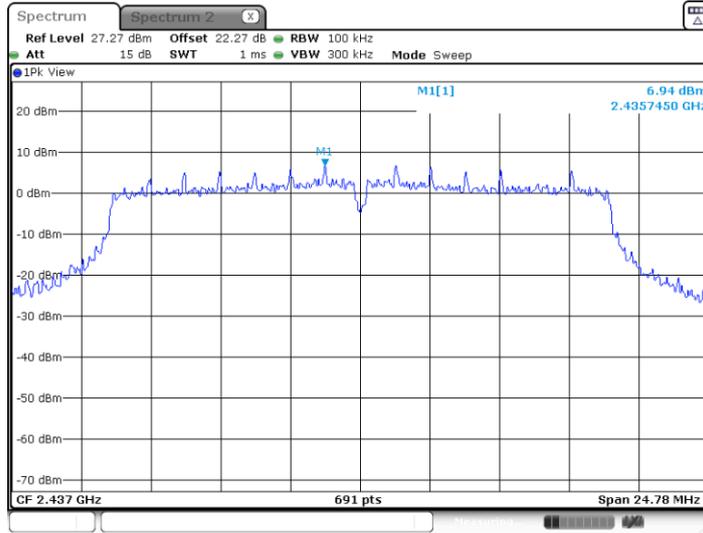


11N20SISO_Ant6_2412



Date: 30.JUL.2024 10:12:47

11N20SISO_Ant6_2437



Date: 19.JUL.2024 01:58:25