Spot Check Evaluation

APPLICANT	:	Motorola Mobility LLC
EQUIPMENT	:	Mobile Cellular Phone
BRAND NAME	:	Motorola
MODEL NAME	:	XT2437-3
FCC ID	:	IHDT56AS9
STANDARD	:	47 CFR Part 2, 22, 24, 27, 90S 47 CFR Part 15 Subpart C §15.225 47 CFR Part 15 Subpart C §15.247 47 CFR Part 15 Subpart E §15.407
TEST DATE(S)	:	Aug. 05, 2024 ~ Aug. 21, 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

ACCREDITED
Cert #5145.02

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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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR471919-01C	Rev. 01	Initial issue of report	Sep. 03, 2024

Conformity Assessment Condition:
1. 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. 2. 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

Motorola Mobility LLC
222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

1.2 Manufacturer

Motorola Mobility LLC
222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2437-3
FCC ID	IHDT56AS9
IMEI Code	Conducted/DFS/CBP: 359867620008119/359867620008127 Radiation: 359867620006634 Conduction: 359867620006899/359867620006907
HW Version	DVT2
SW Version	U4UQ34.39
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 Specification of Accessory

Accessories Information				
AC Adapter 1(US)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-331L
AC Adapter 1(EU)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-332L
AC Adapter 1(UK)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-333L
AC Adapter 1(AU)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-335L
AC Adapter 1(AR)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-336L
AC Adapter 1(BR)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-337L
AC Adapter 1((CHILE))	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-339L
AC Adapter 1(KR)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-330L
AC Adapter 2(US)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-331L
AC Adapter 2(EU)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-332L
AC Adapter 2(UK)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-333L
AC Adapter 2(AR)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-336L
AC Adapter 2(BR)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-337L
Battery 1	**Brand Name**	Motorola(ATL)	**Model Name**	RW50
Earphone 1	**Brand Name**	Motorola(Lyand)	**Model Name**	SH38D62338
Earphone 2	**Brand Name**	Motorola(Juwei)	**Model Name**	S928E43096
USB Cable 1	**Brand Name**	Motorola(Washin)	**Model Name**	S928D92375
USB Cable 2	**Brand Name**	Motorola(Saibao)	**Model Name**	S928D95755
Wireless Earphones	**Brand Name**	Motorola	**Model Name**	XT2443-1

1.6 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 03CH03-KS 03CH02-KS 03CH06-KS TH01-KS DFS01-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.	03CH02-KS	AUDIX	E3	6.2009-8-24al
4.	03CH06-KS	AUDIX	E3	210616
5.	DFS01-KS	Sporton	Test Tools	1.0
6.	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:

- FCC KDB 484596 D01 Referencing Test Data v02r03
- 47 CFR Part 2, 22, 24, 27, 90S, 90S
- 47 CFR Part 15 Subpart C §15.225
- 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: XT2437-3, FCC ID: IHDT56AS9) is electrically identical to the reference device (Model: XT2437-1, XT2437-2, FCC ID: IHDT56AS8) 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.
For Conducted items of 5G NR bands please refer to report number: TR-24ADRTCC7017.
For SAR Reference detail, please refer to FCC SAR report FA471919-01.

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 transimission conditions

The applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID: IHDT56AS9 .

2.2 Model Difference Information

The **main** difference between FCC ID: IHDT56AS8 and FCC ID: IHDT56AS9 is as below:

- Remove WCDMA IV and LTE B4/12/13/17/25/66 and 5G NR n2/n66.
- Add LTE B20/32 and 5G NR n8/n20/n38/n41/n77.

Other differences and all the details of similarity and difference can be found in the confidential documents (IHDT56AS9 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	IHDT56AS8	Full test	FR471919A	IHDT56AS9	Spot check	Y, All test items
	DTS (BLE)	2400~2483.5	IHDT56AS8	Full test	FR471919B	IHDT56AS9	Spot check	Y, All test items
	DTS (WLAN)	2400~2483.5	IHDT56AS8	Full test	FR471919C	IHDT56AS9	Spot check	Y, All test items
	DXX (NFC)	13.56	IHDT56AS8	Full test	FR471919D	IHDT56AS9	Spot check	Y, All test items
15E	U-NII	5180~5240	IHDT56AS8	Full test	FR471919E	IHDT56AS9	Spot check	Y, All test items
		5260~5320	IHDT56AS8	Full test	FR471919E	IHDT56AS9	Spot check	Y, All test items
		5500~5720	IHDT56AS8	Full test	FR471919E	IHDT56AS9	Spot check	Y, All test items
		5745~5825	IHDT56AS8	Full test	FR471919E	IHDT56AS9	Spot check	Y, All test items
		5260~5320 5500~5720	IHDT56AS8	Full test	FZ471919	IHDT56AS9	Spot check	Y, All test items
	6XD	5925~7125	IHDT56AS8	Full test	FR471919F	IHDT56AS9	Spot check	Y, All test items
22 24	PCE (GSM, WCDMA)	GSM 850/1900 WCDMA B2/B5	IHDT56AS8	Full test	FG471919A	IHDT56AS9	Spot check	Y, All test items
22 24 27 90	PCE (LTE)	LTE B2/B5/B7/B7C/ B26/B38/B38C/ B42/B42C	IHDT56AS8	Full test	FG471919B FG471919C FG471919D FG471919E FG471919F	IHDT56AS9	Spot check	Y, All test items
22 27	PCE (NR)	5G NR n5/n7/n26	IHDT56AS8	Full test	FG471919G	IHDT56AS9	Spot check	Y, RSE item.

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:

$$d_{dB} = | V_{dB} – R_{dB} | \leq 3 \text{ dB} \quad (1)$$

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 ddB from the reference data satisfies the following condition:

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

$$d_{dB} = | V_{dB} – R_{dB} | = 6 \text{ dB} \text{ , for } M_{dB} > 60 \text{ dB} \quad (2)$$

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	IHDT56AS8 Parent Worst mode Test Result	IHDT56AS9 Variant Check Test Result	Deviation	Deviation Limit
BT 1Mbps (CH78)	Number of Channels (N)	79	79	0.00	3
	Hopping Channel Separation (MHz)	1.009	1.003	0.01	3
	Dwell Time of Each Channel(s)	0.31	0.31	0.00	3
	20dB Bandwidth(MHz)	0.95	0.94	0.01	3
	99% Bandwidth(MHz)	0.836	0.836	0.00	3
	Conducted Band Edges(dBm)	-52.28	-51.03	1.25	3
	Conducted Spurious Emission(dBm)	-43.36	-45.96	2.60	3
BT 1Mbps (CH78)	Radiated Band Edges and Radiated Spurious Emission (dBuV/m)	56.36	57.48	-1.12	3
BT	AC Conducted Emission (dBuV)	46.04	44.68	1.36	3
BLE 1Mbps (CH39)	6dB Bandwidth (MHz)	0.67	0.67	0.00	3
	99% Bandwidth (MHz)	1.02	1.02	0.00	3
	Power Spectral Density (dBm/3KHz)	-9.35	-9.50	0.15	3
	Conducted Band Edges and Spurious Emission (dBm)	-55.57	-52.79	2.78	3
	Conducted Spurious Emission (dBm)	-50.79	-49.64	1.15	3
BLE 2Mbps (CH39)	Radiated Band Edges and Spurious Emission (dBuV/m)	45.97	46.01	-0.04	3
BLE	AC Conducted Emission (dBuV)	46.04	44.68	1.36	3
WIFI 2.4G (802.11b CH11)	6dB Bandwidth (MHz)	8.06	8.02	0.04	3
	99% Bandwidth (MHz)	12.895	13.287	0.39	3
	Power Spectral Density (dBm/3KHz)	-0.08	-0.15	0.07	3
	Conducted Band Edges and Spurious Emission (dBm)	-34.75	-36.73	1.98	3
	Conducted Spurious Emission (dBm)	-50.78	-49.45	1.33	3
WIFI 2.4G (802.11ax HE40 CH03)	Radiated Band Edges and Spurious Emission (dBuV/m)	50.69	48.16	2.53	3
WIFI 2.4G	AC Conducted Emission (dBuV)	46.04	44.68	1.36	3
WIFI 5G (802.11a CH149)	26dB Emission Bandwidth (MHz)	20.91	20.45	0.46	3
	99% Occupied Bandwidth (MHz)	16.69	16.38	0.31	3
	Power Spectral Density (dBm/MHz)	8.39	7.80	0.59	3
	DFS (s)	0.763225	0.972832	0.209607	3
WIFI 5G (11ax HE40_Ch62)	Radiated Band Edges and Spurious Emission (dBuV/m)	50.80	50.41	0.39	3

WIFI 5G	AC Conducted Emission (dBuV)	36.87	36.45	0.42	3
WIFI 6G UNII-8 (802.11ax HE80 CH199)	26dB Emission Bandwidth (MHz)	81.18	80.99	0.19	3
	99% Occupied Bandwidth (MHz)	76.952	76.876	0.08	3
	Fundamental Maximum EIRP (dBm)	11.34	11.06	0.28	3
	Fundamental Power Spectral Density (dBm/MHz)	-2.05	-2.56	0.51	3
	In-Band Emissions (Channel Mask) (dB)	-37.39	-37.15	0.24	3
WIFI 6G UNII-7 (802.11ax HE160 CH199)	Contention Based Protocol (dBm)	-69.05	-68.09	0.96	3
WIFI 6G (11ax HE160_Ch15)	Radiated Band Edges and Spurious Emission (dBuV/m)	50.62	50.46	0.16	3
WLAN 6G	AC Conducted Emission (dBuV)	43.18	45.05	1.87	3
Part 15C NFC	20dB Emission Bandwidth (KHz)	2.49	2.49	0	3
	99% Occupied Bandwidth (KHz)	2.11	2.10	0.01	3
	Field Strength of Fundamental (dBuV/m @ 30m)	9.36	11.95	2.59	3
	Radiated Spurious Emissions (dBuV/m)	29.5	30.68	1.18	3
	AC Power Line Conducted Emissions(dBuV)	45.12	43.97	1.15	3
Part 22/24/27/90 (Worst LTE Band 7C)	Conducted Power(dBm)	23.01	22.85	0.16	3
	Equivalent Isotropic Radiated Power(dBm)	20.84	20.68	0.16	3
	Peak-to-Average Ratio (dB)	6.46	6.34	0.12	3
	Occupied Bandwidth(MHz)	37.80	38.12	0.32	3
	Conducted Band Edge (dBm)	-26.52	-28.49	1.97	3
	Conducted Spurious Emission(dBm)	-50.27	-51.26	0.99	3
	Frequency Stability (ppm)	0.0029	0.0026	0.00	3

Test Item	Mode	IHDT56AS8 Parent Worst mode Test Result	IHDT56AS9 Variant Check Test Result	Deviation (dB)	Deviation Limit (dB)
Conducted Power (dBm)	BT BR/EDR	14.05	13.76	0.29	3
	BLE 1Mbps	5.69	5.39	0.3	3
	BLE 2Mbps	5.94	5.49	0.45	3
	11b, 2.4GHz	24.78	24.42	0.36	3
	11g, 2.4GHz	27.79	27.65	0.14	3
	11n HT20, 2.4GHz	27.88	27.25	0.63	3
	11n HT40, 2.4GHz	26.14	25.2	0.94	3
	11ax 20, 2.4GHz	28.03	27.41	0.62	3
	11ax 40, 2.4GHz	26.19	25.29	0.9	3
	11a, 5.2GHz	19.36	19.01	0.35	3
	11a, 5.3GHz	20.05	19.86	0.19	3
	11a, 5.5GHz	19.69	19.12	0.57	3
	11a, 5.8GHz	21.09	20.81	0.28	3
	11n HT20, 5.2GHz	19.54	19.12	0.42	3
	11n HT20, 5.3GHz	19.66	19.25	0.41	3
	11n HT20, 5.5GHz	19.92	19.34	0.58	3
	11n HT20, 5.8GHz	20.91	20.53	0.38	3
	11ac VHT20, 5.2GHz	19.59	19.24	0.35	3
	11ac VHT20, 5.3GHz	19.72	19.34	0.38	3
	11ac VHT20, 5.5GHz	19.74	19.62	0.12	3
	11ac VHT20, 5.8GHz	20.92	20.63	0.29	3
	11ax HE20, 5.2GHz	19.67	19.08	0.59	3
	11ax HE20, 5.3GHz	19.80	19.71	0.09	3
	11ax HE20, 5.5GHz	20.02	19.27	0.75	3
	11ax HE20, 5.8GHz	21.05	20.75	0.3	3
	11n HT40, 5.2GHz	19.82	19.33	0.49	3
	11n HT40, 5.3GHz	19.60	19.17	0.43	3
	11n HT40, 5.5GHz	19.99	19.27	0.72	3
	11n HT40, 5.8GHz	19.74	19.31	0.43	3
	11ac VHT40, 5.2GHz	19.96	19.56	0.4	3
	11ac VHT40, 5.3GHz	19.71	19.22	0.49	3
	11ac VHT40, 5.5GHz	19.99	19.54	0.45	3
	11ac VHT40, 5.8GHz	19.83	19.32	0.51	3
	11ax HE40, 5.2GHz	20.37	20.02	0.35	3
	11ax HE40, 5.3GHz	20.06	19.54	0.52	3
	11ax HE40, 5.5GHz	20.39	19.98	0.41	3
	11ax HE40, 5.8GHz	20.31	19.98	0.33	3
	11ac VHT80, 5.2GHz	17.13	16.88	0.25	3
	11ac VHT80, 5.3GHz	17.56	17.11	0.45	3
	11ac VHT80, 5.5GHz	18.95	18.45	0.5	3
	11ac VHT80, 5.8GHz	18.69	18.19	0.5	3
	11ax HE80, 5.2GHz	17.19	16.84	0.35	3
	11ax HE80, 5.3GHz	17.63	17.38	0.25	3
	11ax HE80, 5.5GHz	19.63	19.31	0.32	3
	11ax HE80, 5.8GHz	19.21	18.96	0.25	3
	11ac VHT160, 5.2GHz	15.34	14.98	0.36	3
	11ac VHT160, 5.5GHz	14.75	14.32	0.43	3
	11ax HE160, 5.2GHz	15.36	15.13	0.23	3
	11ax HE160, 5.5GHz	14.76	14.35	0.41	3
	11ax HE20, U-NII-5	10.00	9.23	0.77	3

	11ax HE20, U-NII-6	9.31	8.7	0.61	3
	11ax HE20, U-NII-7	9.42	9.03	0.39	3
	11ax HE20, U-NII-8	10.04	9.82	0.22	3
	11ax HE40, U-NII-5	13.09	12.62	0.47	3
	11ax HE40, U-NII-6	12.27	12.04	0.23	3
	11ax HE40, U-NII-7	12.49	11.89	0.60	3
	11ax HE40, U-NII-8	13.39	13.13	0.26	3
	11ax HE80, U-NII-5	15.01	14.24	0.77	3
	11ax HE80, U-NII-6	14.70	14.22	0.48	3
	11ax HE80, U-NII-7	14.44	13.66	0.78	3
	11ax HE80, U-NII-8	15.64	15.36	0.28	3
	11ax HE160, U-NII-5	16.44	15.68	0.76	3
	11ax HE160, U-NII-6	16.22	15.78	0.44	3
	11ax HE160, U-NII-7	16.31	15.75	0.56	3
	11ax HE160, U-NII-8	15.37	15.17	0.2	3
	GSM 850	32.84	32.82	0.02	3
	GSM 1900	29.16	28.93	0.23	3
	WCDMA 850	23.03	22.93	0.1	3
	WCDMA1900	22.81	22.79	0.02	3
	LTE B2	22.92	22.61	0.31	3
	LTE B5	22.94	22.92	0.02	3
	LTE B26 (Part 22H)	23.06	23.05	0.01	3
	LTE B26 (Part 90S)	22.82	22.71	0.11	3
	LTE B7	23.03	23.01	0.02	3
	LTE B7C	23.01	22.85	0.16	3
	LTE B38	23.16	23.12	0.04	3
	LTE B38C	23.11	22.81	0.30	3
	LTE B42	23.15	23.02	0.13	3
	LTE B42C	23.04	22.96	0.08	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/CBP. 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. 16, 2024~ Aug. 18, 2024	Oct. 10, 2024	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 02, 2024	Aug. 16, 2024~ Aug. 18, 2024	Jan. 01, 2025	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 02, 2024	Aug. 16, 2024~ Aug. 18, 2024	Jan. 01, 2025	Conducted (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY56400023	3Hz~8.5GHz;Max 30dBm	Jan. 02, 2024	Aug. 15, 2024	Jan. 01, 2025	Radiation (03CH06-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY60242126	10Hz-44GHz	Oct. 11, 2023	Aug. 15, 2024	Oct. 10, 2024	Radiation (03CH06-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 11, 2023	Aug. 15, 2024	Sep. 10, 2024	Radiation (03CH06-KS)
Bilog Antenna	TeseQ	CBL6111D	59915	30MHz-1GHz	Aug. 19, 2023	Aug. 15, 2024	Aug. 18, 2024	Radiation (03CH06-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00218652	1GHz~18GHz	Apr. 11, 2024	Aug. 15, 2024	Apr. 10, 2025	Radiation (03CH06-KS)
SHF-EHF Horn	Com-power	AH-840	101093	18GHz~40GHz	Jan. 06, 2024	Aug. 15, 2024	Jan. 05, 2025	Radiation (03CH06-KS)
Amplifier	SONOMA	310N	372171	9KHz ~1GHZ	Jan. 02, 2024	Aug. 15, 2024	Jan. 01, 2025	Radiation (03CH06-KS)
Amplifier	EM	EM18G40GA	060728	18~40GHz	Jan. 02, 2024	Aug. 15, 2024	Jan. 01, 2025	Radiation (03CH06-KS)
high gain Amplifier	MITEQ	AMF-7D-00101800-30-10P	2082395	1Ghz-18Ghz	Jan. 02, 2024	Aug. 15, 2024	Jan. 01, 2025	Radiation (03CH06-KS)
Amplifier	Keysight	83017A	MY53270319	500MHz~26.5GHz	Oct. 11, 2023	Aug. 15, 2024	Oct. 10, 2024	Radiation (03CH06-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Aug. 15, 2024	NCR	Radiation (03CH06-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Aug. 15, 2024	NCR	Radiation (03CH06-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Aug. 15, 2024	NCR	Radiation (03CH06-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 18, 2024	Aug. 08, 2024	Apr. 17, 2025	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 11, 2023	Aug. 08, 2024	Oct. 10, 2024	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	Apr. 18, 2024	Aug. 08, 2024	Apr. 17, 2025	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 11, 2023	Aug. 08, 2024	Oct. 10, 2024	Conduction (CO01-KS)
Spectrum Analyzer	R&S	FSV7	101632	10Hz~7GHz	Jan. 03, 2024	Aug. 05, 2024	Jan. 02, 2025	DFS (DFS01-KS)
Signal Generator	KEYSIGHT	N5182B	MY53050604	9KHz~6GHz	Apr. 17, 2024	Aug. 05, 2024	Apr. 16, 2025	DFS (DFS01-KS)
Combiner	MTJ Cooperation	MTJ7112	N/A	0.4-6GHz	NCR	Aug. 05, 2024	NCR	DFS (DFS01-KS)
Signal Analyzer	R&S	FSV7	101472	10Hz~7GHz	Jan. 02, 2024	Aug. 21, 2024	Jan. 01, 2025	CBP (DFS01-KS)
MXG-B RF Vector Signal Genertor	Keysight	5182B /5182BX07	MY56200417 /MY59360210	9kHz~7.2GHz	Apr. 17, 2024	Aug. 21, 2024	Apr. 16, 2025	CBP (DFS01-KS)

NCR: No Calibration Required.

For NFC:

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV30	101338	10Hz~30GHz	Jan. 05, 2024	Aug. 18, 2024	Jan. 04, 2025	Conducted (TH01-KS)
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 11, 2023	Aug. 18, 2024	Oct. 10, 2024	Conducted (TH01-KS)
Temperature &humidity chamber	Hongzhan	LP-150U	H2014011440	-40~+150°C 20%~95%RH	Jul. 04, 2024	Aug. 18, 2024	Jul. 03, 2025	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz;Max 30dBm	Oct. 11, 2023	Aug. 15, 2024	Oct. 10, 2024	Radiation (03CH02-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 11, 2023	Aug. 15, 2024	Sep. 10, 2024	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6111D	44483	30MHz-1GHz	Dec. 06, 2023	Aug. 15, 2024	Dec. 05, 2024	Radiation (03CH02-KS)
Amplifier	SONOMA	310N	413740	9KHz-1GHz	Jan. 03, 2024	Aug. 15, 2024	Jan. 02, 2025	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Aug. 15, 2024	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Aug. 15, 2024	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Aug. 15, 2024	NCR	Radiation (03CH02-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 18, 2024	Aug. 08, 2024	Apr. 17, 2025	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 11, 2023	Aug. 08, 2024	Oct. 10, 2024	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	Apr. 18, 2024	Aug. 08, 2024	Apr. 17, 2025	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 11, 2023	Aug. 08, 2024	Oct. 10, 2024	Conduction (CO01-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. 16, 2024~ Aug. 18, 2024	Oct. 10, 2024	Conducted (TH01-KS)
Power divider	STI	STI08-0055	-	0.5~40GHz	NCR	Aug. 16, 2024~ Aug. 18, 2024	NCR	Conducted (TH01-KS)
Temperature &humidity chamber	Hongzhan	LP-150U	H2014011440	-40~+150°C 20%~95%RH	Jul. 04, 2024	Aug. 16, 2024~ Aug. 18, 2024	Jul. 03, 2025	Conducted (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY56400004	3Hz~8.5GHz;Max 30dBm	Oct. 11, 2023	Aug. 08, 2024	Oct. 10, 2024	Radiation (03CH03-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55370528	10Hz-44GHz	Oct. 11, 2023	Aug. 08, 2024	Oct. 10, 2024	Radiation (03CH03-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 11, 2023	Aug. 08, 2024	Sep. 10, 2024	Radiation (03CH03-KS)
Bilog Antenna	TeseQ	CBL6112D	23182	30MHz-1GHz	Dec. 06, 2023	Aug. 08, 2024	Dec. 05, 2024	Radiation (03CH03-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 23, 2023	Aug. 08, 2024	Oct. 22, 2024	Radiation (03CH03-KS)
SHF-EHF Horn	com-power	AH-840	101115	18GHz~40GHz	Oct. 15, 2023	Aug. 08, 2024	Oct. 14, 2024	Radiation (03CH03-KS)
Amplifier	SONOMA	310N	413740	30MHz ~1000MHz	Jan. 03, 2024	Aug. 08, 2024	Jan. 02, 2025	Radiation (03CH03-KS)
Amplifier	EM	EM18G40GA	060851	18~40GHz	Jan. 03, 2024	Aug. 08, 2024	Jan. 02, 2025	Radiation (03CH03-KS)
high gain Amplifier	MITEQ	AMF-7D-00101800-30-10P	2082394	1Ghz-18Ghz	Jan. 03, 2024	Aug. 08, 2024	Jan. 02, 2025	Radiation (03CH03-KS)
Amplifier	Keysight	83017A	MY53270319	1GHz~26.5GHz	Oct. 11, 2023	Aug. 08, 2024	Oct. 10, 2024	Radiation (03CH03-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Aug. 08, 2024	NCR	Radiation (03CH03-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Aug. 08, 2024	NCR	Radiation (03CH03-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Aug. 08, 2024	NCR	Radiation (03CH03-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 Hz**

Uncertainty of Conducted Measurement (WIFI 6G)

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 Hz**
Conducted Generated signal Levels	**±0.56 dB**
Conducted Time	**0.54%**

Uncertainty of Conducted Measurement (NFC)

Test Item	Uncertainty
Occupied Channel Bandwidth	**±0.1%**
Frequency	**±0.4 Hz**

Uncertainty of Conducted Measurement (DFS)

Conducted Generated signal Levels	±0.56 dB
Conducted Time	0.38%

Uncertainty of Conducted Measurement (WWAN)

Test Item	Uncertainty
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 Hz

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

03CH06-KS(BT/WIF):

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.30 dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	6.06 dB

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.18 dB

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.38 dB

03CH02-KS(NFC):

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.30dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	6.04dB

03CH03-KS(WWAN):

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

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

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

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

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.83dB

-THE END-

Appendix A. Radiated Spurious Emission Test Data

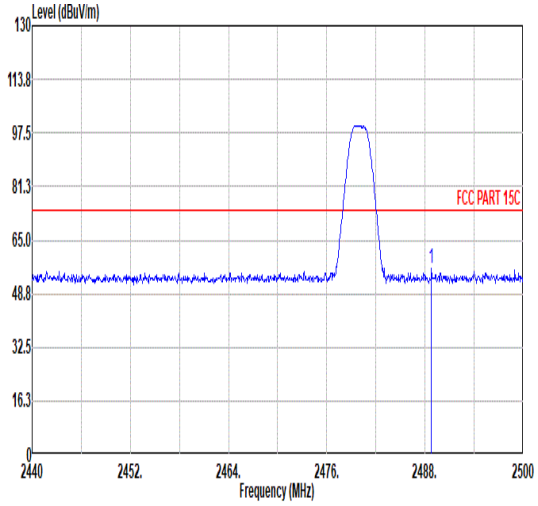
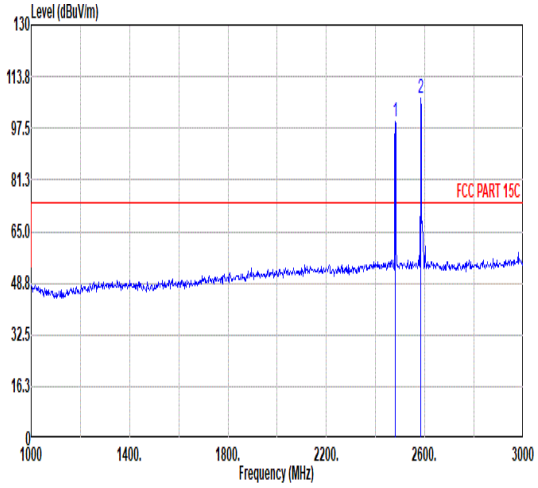
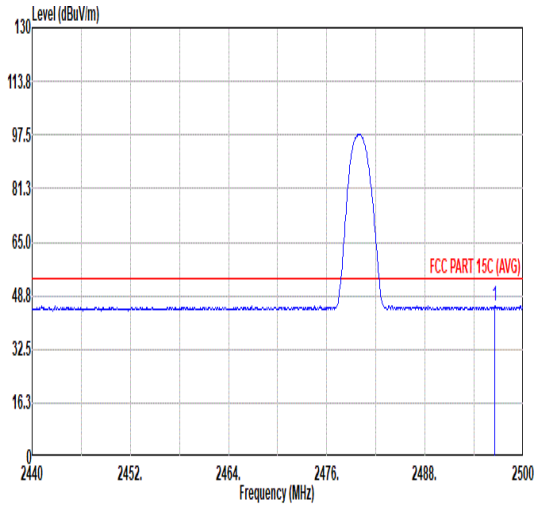
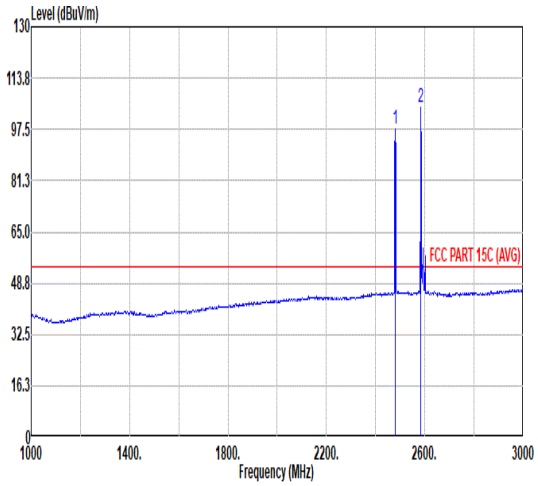
Test Engineer :	levi zhao	**Relative Humidity :**	22 ~ 23 ℃
		Temperature :	41 ~ 42 %

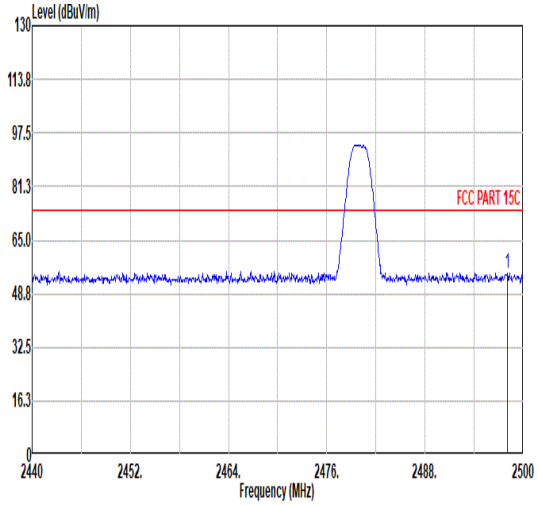
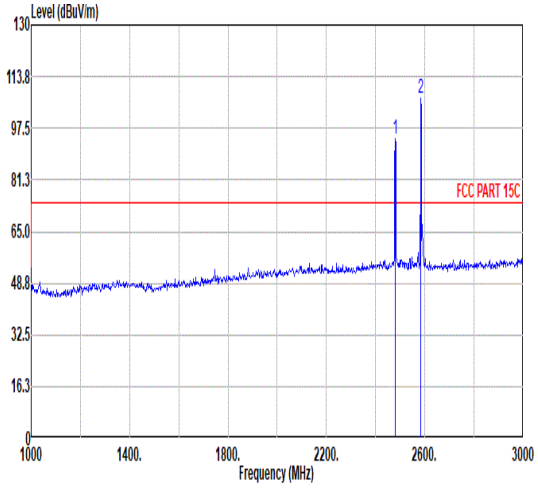
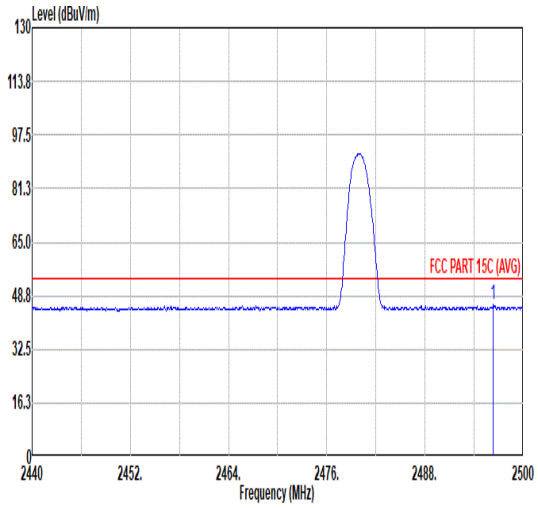
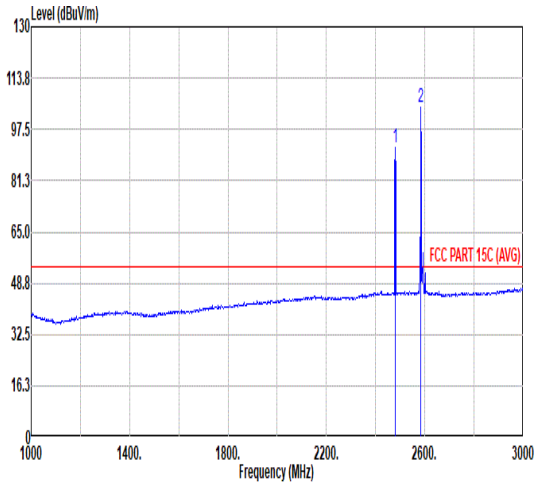
Radiated Spurious Emission Test Modes

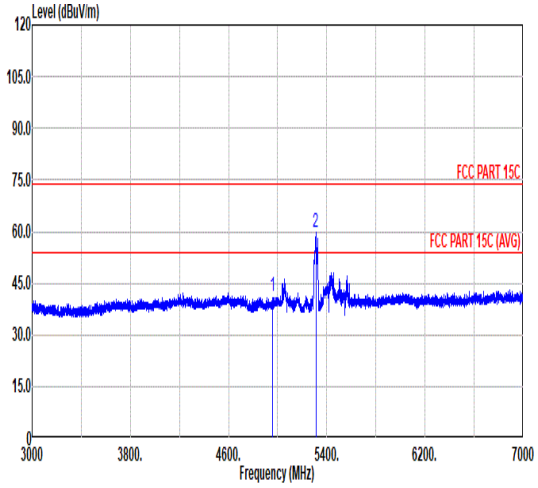
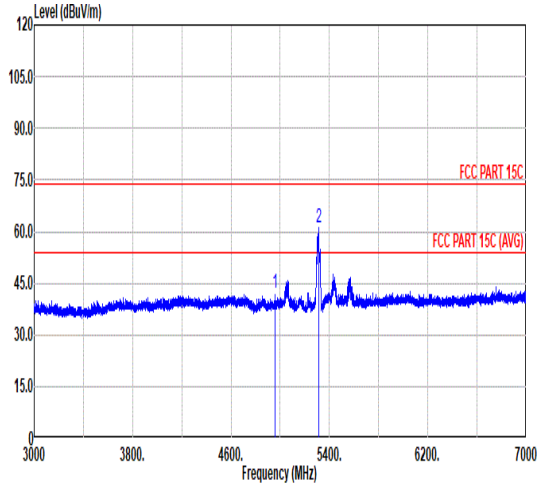
Mode	Band	Band (GHz)	Antenna	Modulation	Channel	Frequency	Data Rate	RU	Remark
Mode 1	2400-2483.5	2400-2483.5	6	Bluetooth-LE_GSFK	39	2480	2Mbps	Full	-
	U-NII-2A	5.25-5.35	CDD 6+8	802.11ax HE40	62	5310	MCS0	Full	-
	Part 27M B41 BW=20M								
	NFC on								

Summary of each worse mode

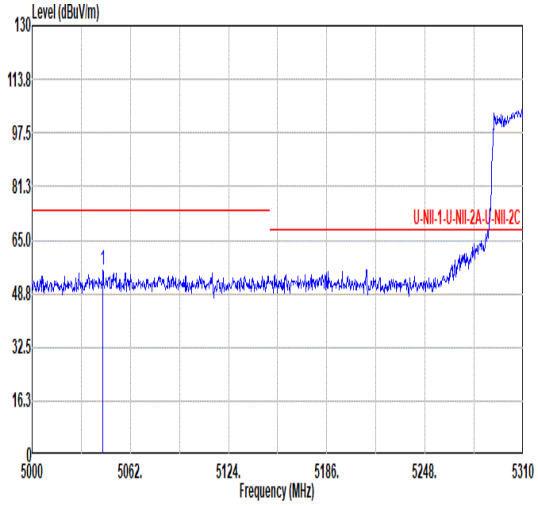
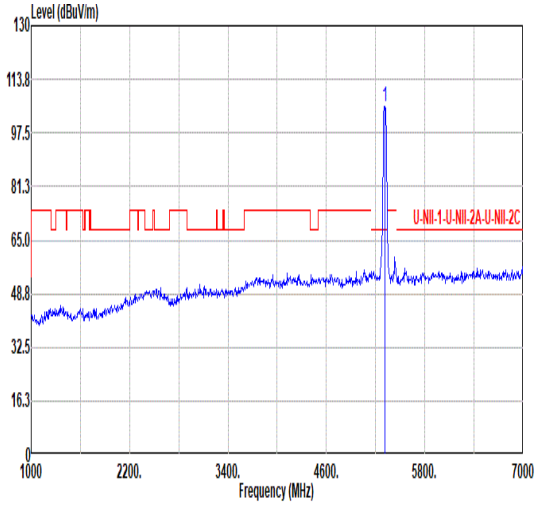
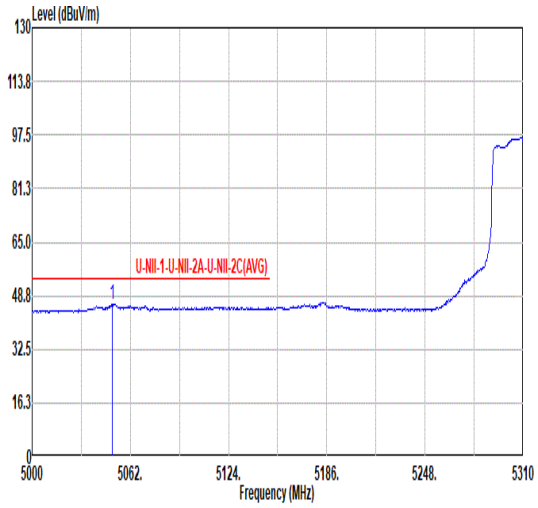
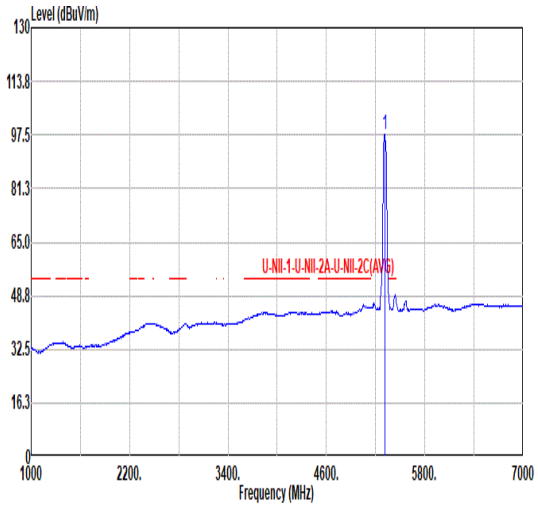
Mode	Modulation	Ch.	Freq. (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol.	Peak Avg.	Result	Remark
1	Bluetooth-LE_GSFK	39	2496.34	46.04	54.00	-7.96	V	AVERAGE	Pass	Band Edge
	Bluetooth-LE_GSFK	39	4960.00	41.94	74.00	-32.06	V	PEAK	Pass	Harmonic
	802.11ax HE40	62	5350.20	50.85	54.00	-3.15	H	Average	Pass	Band Edge
	802.11ax HE40	62	7752.40	62.37	70.20	-7.83	V	Peak	Pass	Harmonic

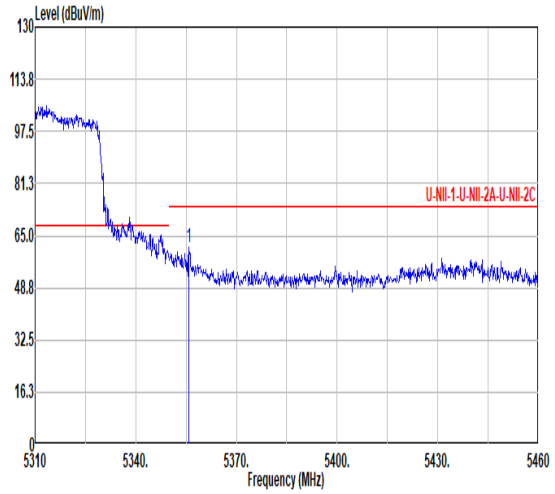
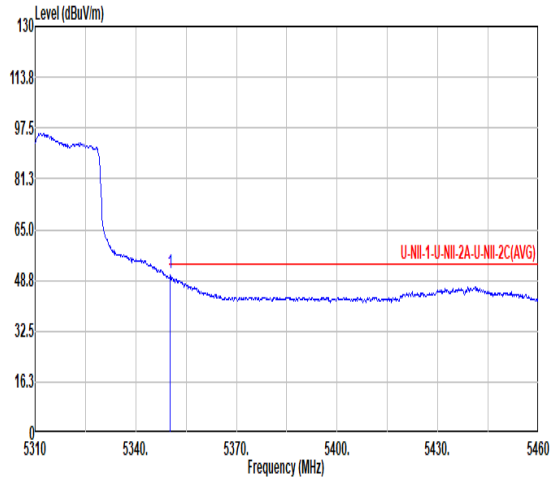
Mode	1	
	Co-location Band Edge	
	Bluetooth-LE_GSFK_CH39_2480MHz_Full	
ANT	6	
Pol.	Horizontal	Fundamental
Peak	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2488.78 56.44 74.00 -17.56 43.31 32.63 6.74 32.24 6.00 307 309 PEAK	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2480.00 99.82 ------ ------ 86.74 32.58 6.73 32.23 6.00 307 309 Peak 2 2584.00 106.92 ------ ------ 93.93 32.36 6.87 32.24 6.00 307 309 Peak
Avg	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2496.52 45.66 54.00 -8.34 32.47 32.68 6.75 32.24 6.00 307 309 AVERAGE	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2480.00 97.66 ------ ------ 84.58 32.58 6.73 32.23 6.00 307 309 Average 2 2584.00 104.57 ------ ------ 91.58 32.36 6.87 32.24 6.00 307 309 Average

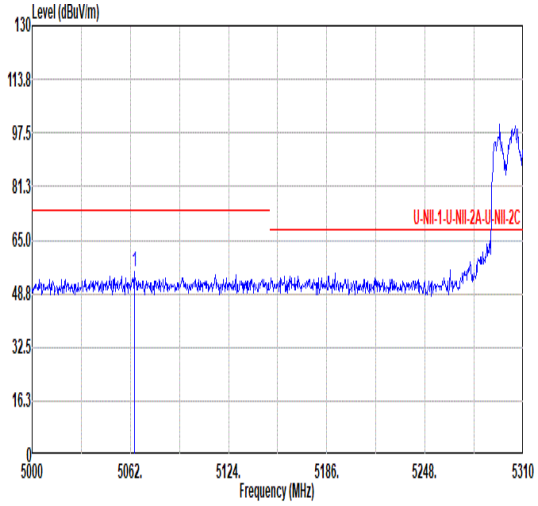
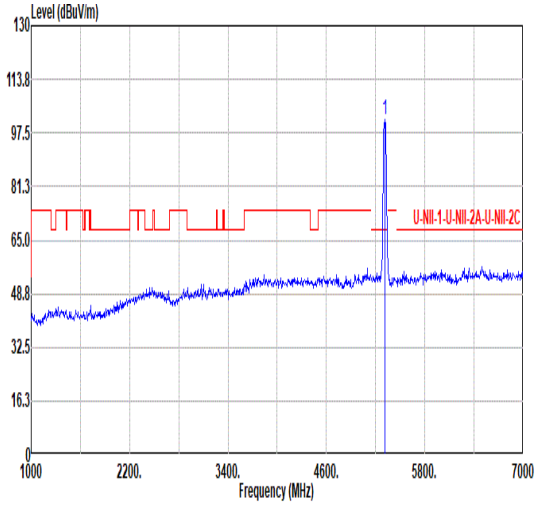
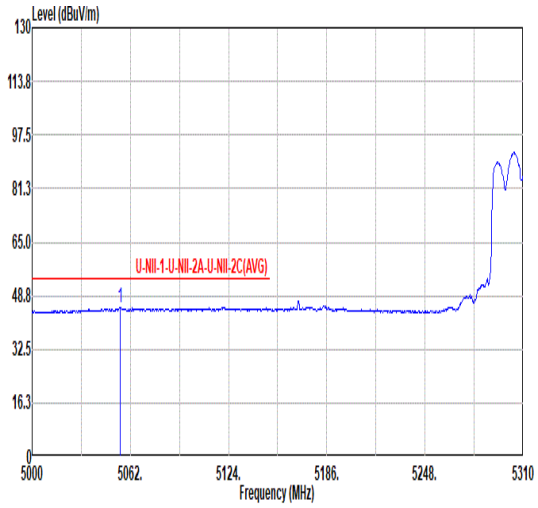
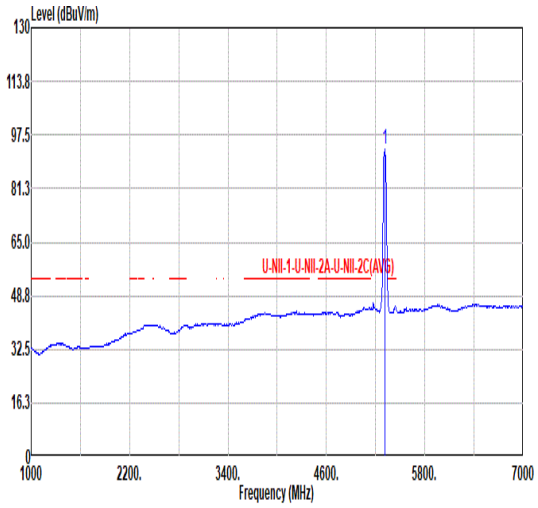
Mode	1	
	Co-location Band Edge	
	Bluetooth-LE_GSFK_CH39_2480MHz_Full	
ANT	6	
Pol.	Vertical	Fundamental
Peak	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2498.02 55.14 74.00 -18.86 41.94 32.69 6.75 32.24 6.00 245 0 PEAK	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2480.00 94.01 ------ ------ 80.93 32.58 6.73 32.23 6.00 245 0 Peak 2 2584.00 106.81 ------ ------ 93.82 32.36 6.87 32.24 6.00 245 0 Peak
Avg	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2496.34 46.04 54.00 -7.96 32.85 32.68 6.75 32.24 6.00 245 0 AVERAGE	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2480.00 91.80 ------ ------ 78.72 32.58 6.73 32.23 6.00 245 0 Average 2 2584.00 104.50 ------ ------ 91.51 32.36 6.87 32.24 6.00 245 0 Average

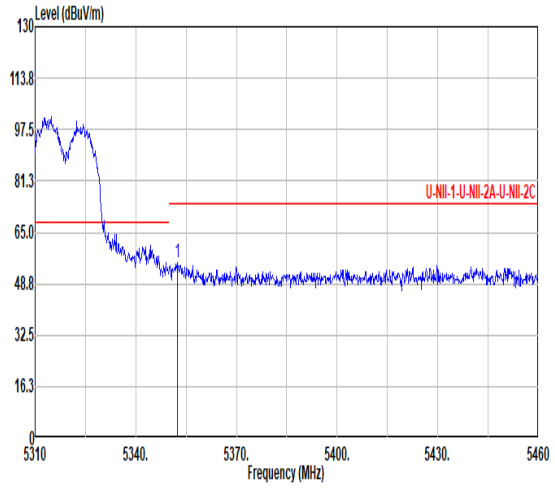
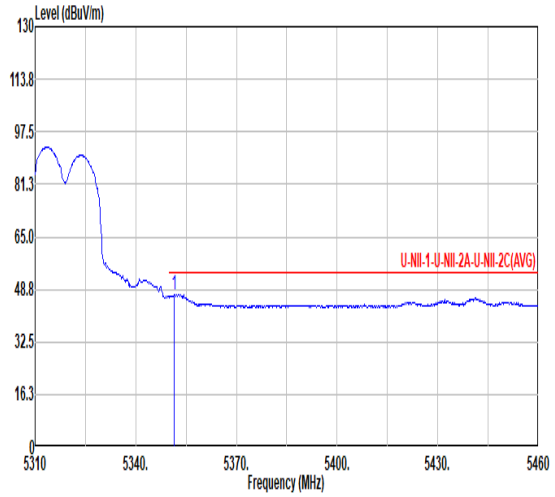
Mode	1	
	Co-location Harmonic	
	Bluetooth-LE_GSFK_CH39_2480MHz_Full	
ANT	6	
Pol.	Horizontal	Vertical
Peak Avg	 Limit Over Read Ant Cable Preamp Aux APos TPos Freq Level Line Limit Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 4960.00 41.34 74.00 -32.66 58.89 34.00 9.61 61.16 0.00 --- --- PEAK 2 5310.40 59.83 74.00 -14.17 76.23 34.52 9.89 60.81 0.00 --- --- Peak	 Limit Over Read Ant Cable Preamp Aux APos TPos Freq Level Line Limit Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 4960.00 41.94 74.00 -32.06 59.49 34.00 9.61 61.16 0.00 --- --- PEAK 2 5313.20 60.97 74.00 -13.03 77.36 34.53 9.89 60.81 0.00 --- --- Peak

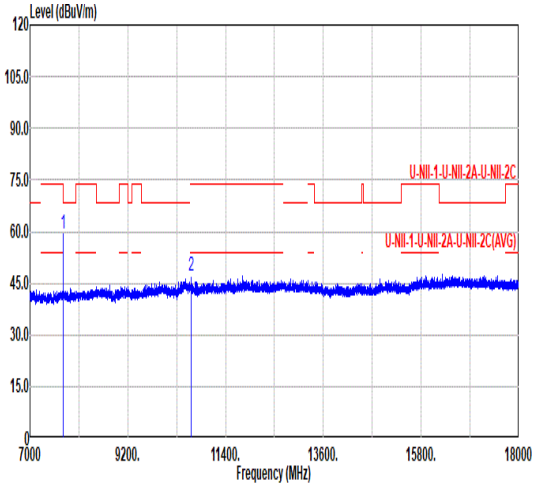
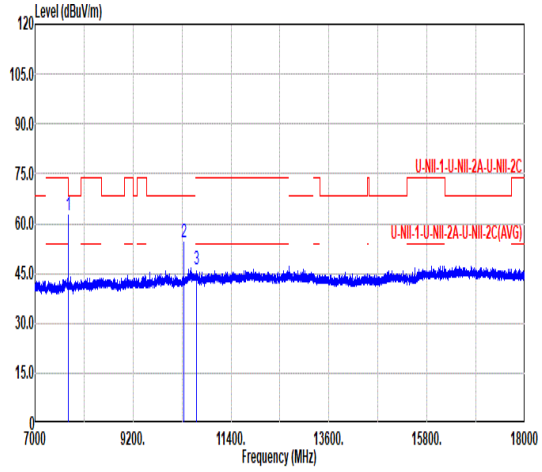
Note: #2 is co-location of WLAN 5G_CH62 TX fundamental signal.

Mode	1	
	Co-location Band Edge	
	802.11ax HE40_CH62_5310MHz_Full	
ANT	CDD 6+8	
Pol.	Horizontal	Fundamental
Peak	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 5044.64 55.88 74.00 -18.12 44.14 34.00 9.69 31.95 0.00 100 334 PEAK	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 5310.00 105.68 ------ ------ 93.06 34.53 9.89 31.80 0.00 100 334 PEAK
Avg	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 5050.53 46.27 54.00 -7.73 34.51 34.00 9.70 31.94 0.00 100 334 AVERAGE	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 5310.00 97.53 ------ ------ 84.93 34.52 9.89 31.81 0.00 100 334 AVERAGE

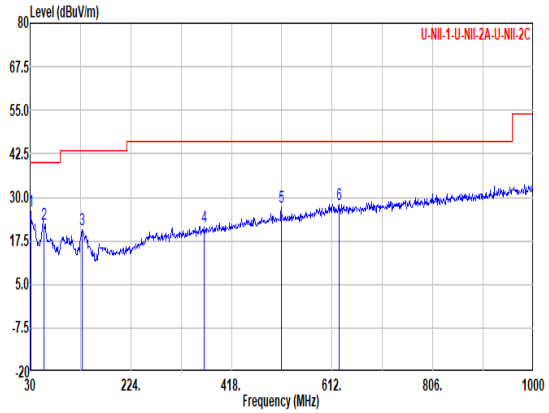
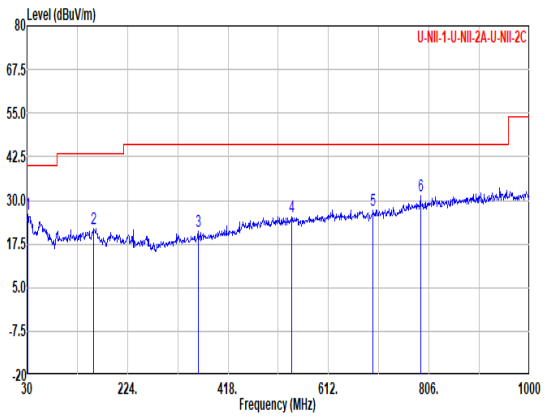
Mode	1	
	Co-location Band Edge	
	802.11ax HE40_CH62_5310MHz_Full	
ANT	CDD 6+8	
Pol.	Horizontal	Fundamental
Peak	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 5355.90 61.36 74.00 -12.64 48.62 34.61 9.91 31.78 0.00 100 334 PEAK	Blank
Avg	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 5350.20 50.85 54.00 -3.15 38.12 34.60 9.91 31.78 0.00 100 334 Average	Blank

Mode	1	
	Co-location Band Edge	
	802.11ax HE40_CH62_5310MHz_Full	
ANT	CDD 6+8	
Pol.	Vertical	Fundamental
Peak	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 5064.48 55.25 74.00 -18.75 43.45 34.03 9.71 31.94 0.00 300 311 PEAK	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 5310.00 101.35 ------ ------ 88.73 34.53 9.89 31.80 0.00 300 311 PEAK
Avg	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 5055.49 45.23 54.00 -8.77 33.46 34.01 9.70 31.94 0.00 300 311 AVERAGE	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 5310.00 93.01 ------ ------ 80.39 34.53 9.89 31.80 0.00 300 311 AVERAGE

Mode	1	
	Co-location Band Edge	
	802.11ax HE40_CH62_5310MHz_Full	
ANT	CDD 6+8	
Pol.	Vertical	Fundamental
Peak	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 5352.45 55.61 74.00 -18.39 42.88 34.60 9.91 31.78 0.00 300 311 PEAK	Blank
Avg	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 5351.55 47.26 54.00 -6.74 34.53 34.60 9.91 31.78 0.00 300 311 AVERAGE	Blank

Mode	1	
	Co-location Harmonic	
	802.11ax HE40_CH62_5310MHz_Full	
ANT	CDD 6+8	
Pol.	Horizontal	Vertical
Peak Avg	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 7752.40 59.18 70.20 -11.02 71.84 35.90 12.10 60.66 0.00 100 262 Peak 2 10620.00 46.88 74.00 -27.12 55.95 37.88 14.31 61.26 0.00 --- --- PEAK	 Freq Level Limit Line Over Limit Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 7752.40 62.37 70.20 -7.83 75.03 35.90 12.10 60.66 0.00 100 265 Peak 2 10336.30 54.56 68.20 -13.64 64.36 37.37 14.11 61.28 0.00 100 91 Peak 3 10620.00 46.28 74.00 -27.72 55.35 37.88 14.31 61.26 0.00 --- --- PEAK

Note: #1 is the 3rd harmonic from LTE B41, the limit should be -25dBm and converted to field strength limit 70.2dBμV/m @3m distance, the test results is Pass.

Mode	1	
	30-1G	
	802.11ax HE40_CH62_5310MHz_Full	
ANT	CDD 6+8	
Pol.	Horizontal	Vertical
Peak		

	Freq	Level	Limit Line	Over Limit	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	30.97	25.90	40.00	-14.10	33.01	25.09	0.76	32.96	0.00	---	---	Peak
2	57.16	22.33	40.00	-17.67	41.19	12.85	1.04	32.75	0.00	---	---	Peak
3	130.88	20.91	43.50	-22.59	34.37	17.56	1.69	32.71	0.00	---	---	Peak
4	364.65	21.59	46.00	-24.41	30.88	20.98	2.83	33.10	0.00	---	---	Peak
5	514.03	27.10	46.00	-18.90	33.04	24.33	3.15	33.42	0.00	---	---	Peak
6	625.58	27.94	46.00	-18.06	31.46	26.32	3.69	33.53	0.00	---	---	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	31.94	25.95	40.00	-14.05	33.76	24.39	0.76	32.96	0.00	---	---	Peak
2	159.01	21.96	43.50	-21.54	36.23	16.57	1.84	32.68	0.00	---	---	Peak
3	360.77	20.98	46.00	-25.02	30.36	20.88	2.81	33.07	0.00	---	---	Peak
4	540.22	25.32	46.00	-20.68	30.76	24.90	3.18	33.52	0.00	---	---	Peak
5	698.33	27.11	46.00	-18.89	30.02	26.71	3.95	33.57	0.00	---	---	Peak
6	789.51	31.24	46.00	-14.76	32.30	28.04	4.19	33.29	0.00	---	---	Peak

Appendix C. Reference Report

FCC RF Test Report

APPLICANT	:	Motorola Mobility LLC
EQUIPMENT	:	Mobile Cellular Phone
BRAND NAME	:	Motorola
MODEL NAME	:	XT2437-1, XT2437-2
FCC ID	:	IHDT56AS8
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System
TEST DATE(S)	:	Jul. 23, 2024 ~ Aug. 14, 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

ACCREDITED
Cert #5145.02

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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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR471919C	Rev. 01	Initial issue of report	Aug. 21, 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 3.06 dB at 7311.00 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 10.37 dB at 0.476 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	15.203 & 15.247(b)	Pass	-

Conformity Assessment Condition:

1. 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.
2. 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

Motorola Mobility LLC
222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

1.2 Manufacturer

Motorola Mobility LLC
222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2437-1, XT2437-2
FCC ID	IHDT56AS8
IMEI Code	Conducted: 357931300017436/357931300017400 Conduction: 355709740016651/355709740016669 Radiation: 355709740016511/355709740016529
HW Version	DVT2
SW Version	U4UQ34.39
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. The two model names are only for market segment, no other difference.

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	**<MIMO Ant 6+8>** 802.11b : 24.78 dBm (0.3006 W) 802.11g : 27.79 dBm (0.6012 W) 802.11n HT20 : 27.88 dBm (0.6138 W) 802.11n HT40 : 26.14 dBm (0.4111 W) 802.11ax HE20 : 28.03 dBm (0.6353 W) 802.11ax HE40 : 26.19 dBm (0.4159 W)
99% Occupied Bandwidth	**<MIMO Ant 6+8>** 802.11b : 12.990 MHz 802.11g : 16.533 MHz 802.11ax HE20 : 19.086 MHz 802.11ax HE40 : 34.867 MHz
Antenna Type / Gain	<ANT6> IFA Antenna type with gain -3.93 dBi <ANT8> IFA Antenna type with gain -4.4 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n/ax : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ax : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM)

Note:

1. The device supports WLAN MIMO CDD mode.
2. For WLAN SISO & MIMO mode, the whole testing has assessed only MIMO mode by referring to the higher normal output power.
3. For 802.11n & 11ax mode, the whole testing have assessed only 802.11ax to cover 11n by referring to the higher output power.
4. 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/PSD > partial RU, therefore the full RU perform full, and partial RU verify bandedge/spurious.

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 03CH08-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.	03CH08-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
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- 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.

1.9 Specification of Accessory

Accessories Information				
AC Adapter 1(US)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-331L
AC Adapter 1(EU)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-332L
AC Adapter 1(UK)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-333L
AC Adapter 1(AU)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-335L
AC Adapter 1(AR)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-336L
AC Adapter 1(BR)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-337L
AC Adapter 1((CHILE))	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-339L
AC Adapter 1(KR)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-330L
AC Adapter 2(US)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-331L
AC Adapter 2(EU)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-332L
AC Adapter 2(UK)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-333L
AC Adapter 2(AR)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-336L
AC Adapter 2(BR)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-337L
Battery 1	**Brand Name**	Motorola(ATL)	**Model Name**	RW50
USB Cable 1	**Brand Name**	Motorola(Washin)	**Model Name**	S928D92375
USB Cable 2	**Brand Name**	Motorola(Saibao)	**Model Name**	S928D95755
Wireless Earphones	**Brand Name**	Motorola	**Model Name**	XT2443-1

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 (Z 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.

MIMO Antenna

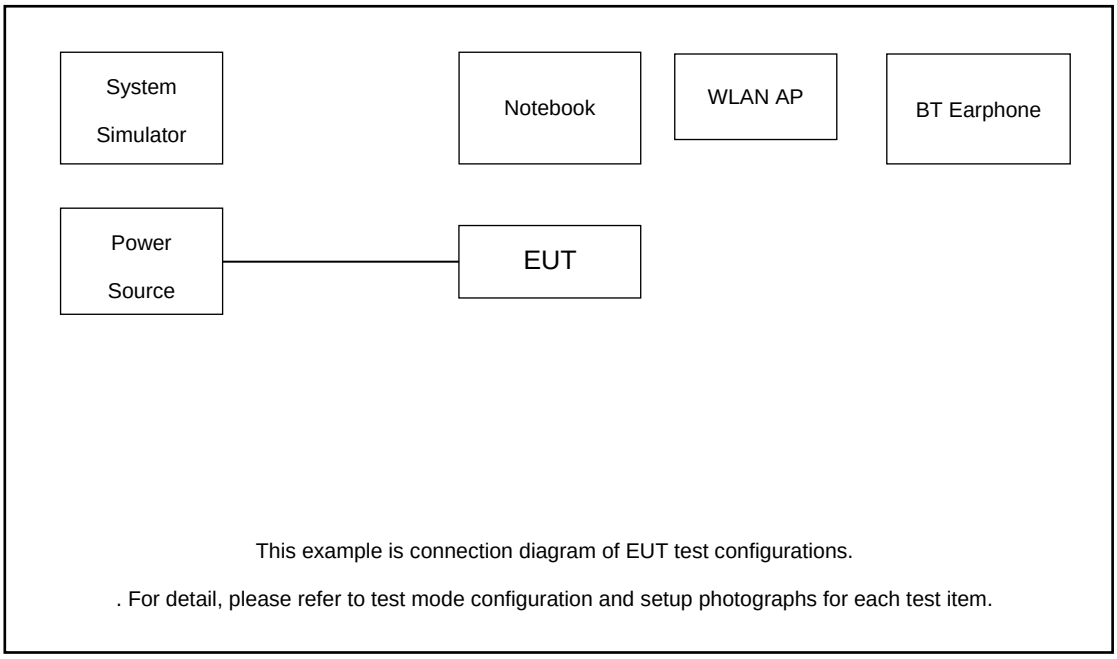
Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20 (Covered by HE20)	MCS0
802.11n HT40 (Covered by HE40)	MCS0
802.11ax HE20	MCS0
802.11ax HE40	MCS0

Test Cases	
AC Conducted Emission	Mode 1 :GSM 850 Idle + Bluetooth Link + WLAN Link (2.4G) + USB Cable1 (Charging from Adapter1)
Remark: For Radiated Test Cases, The tests were performance with Adapter 1 and USB Cable1.	

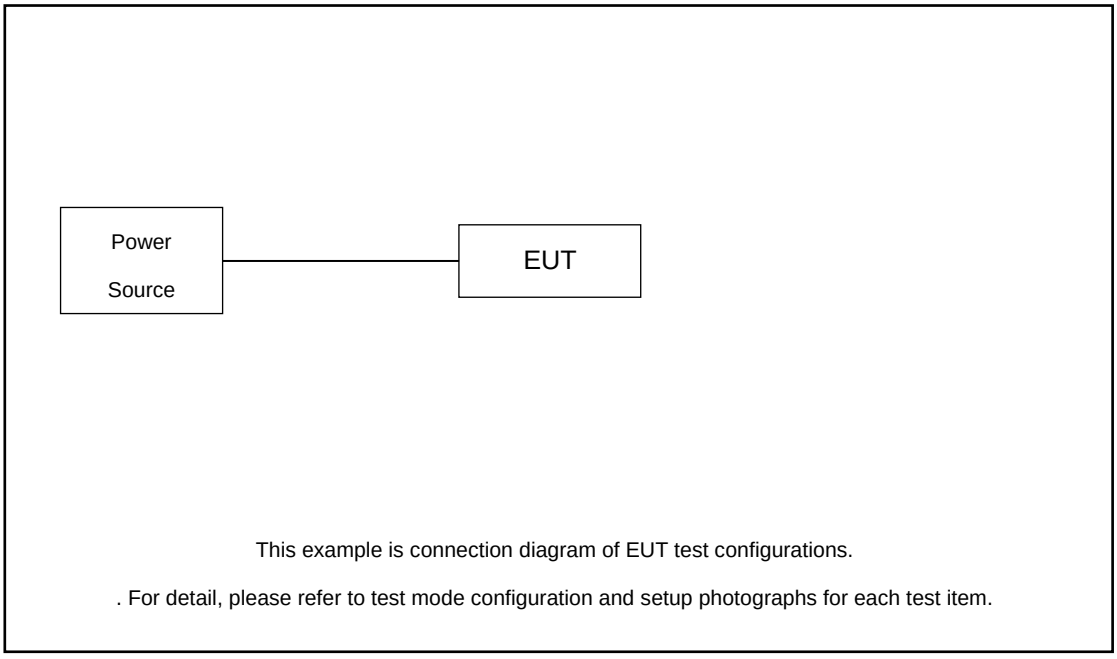
RSE Co-location
802.11ax HE40 CH03_TX + 5G NR n7 Link

2.3 Connection Diagram of Test System

For AC conduction emission:



For 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.	Router	D-link	DIR-655	KA21R655B1	N/A	Unshielded,1.8m
5.	SD Card	Kingston	8GB	N/A	N/A	N/A

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.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 1.87 dB and 20dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 1.87 + 20 = 21.87 (dB)

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.

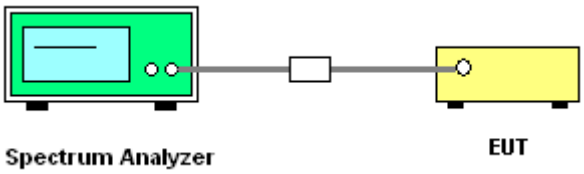
3.1.2 Measuring Instruments

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) ≥ 3*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.

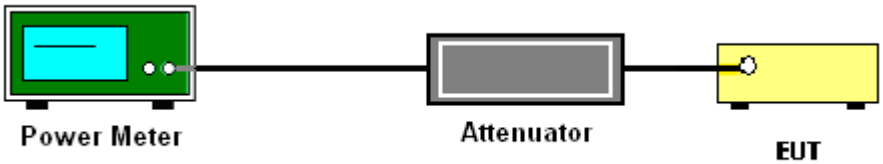
3.2.2 Measuring Instruments

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.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

2.4GHz Band MIMO																	
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	Ant8	SUM	Ant6	Ant8	Ant6	Ant8	Ant6	Ant8	Ant6	Ant8	
11b	1Mbps	2	1	2412	21.49	22.03	24.78	30.00		-3.93		20.85		36.00		Pass
11b	1Mbps	2	6	2437	21.68	21.70	24.70	30.00		-3.93		20.77		36.00		Pass
11b	1Mbps	2	11	2462	21.66	21.87	24.78	30.00		-3.93		20.85		36.00		Pass
11g	6Mbps	2	1	2412	23.59	24.26	26.95	30.00		-3.93		23.02		36.00		Pass
11g	6Mbps	2	6	2437	24.81	24.75	27.79	30.00		-3.93		23.86		36.00		Pass
11g	6Mbps	2	11	2462	22.43	22.65	25.55	30.00		-3.93		21.62		36.00		Pass
HT20	MCS0	2	1	2412	24.32	24.82	27.59	30.00		-3.93		23.66		36.00		Pass
HT20	MCS0	2	6	2437	24.82	24.92	27.88	30.00		-3.93		23.95		36.00		Pass
HT20	MCS0	2	10	2457	23.31	23.29	26.31	30.00		-3.93		22.38		36.00		Pass
HT20	MCS0	2	11	2462	21.25	21.62	24.45	30.00		-3.93		20.52		36.00		Pass
HT40	MCS0	2	3	2422	20.02	20.88	23.48	30.00		-3.93		19.55		36.00		Pass
HT40	MCS0	2	6	2437	22.68	22.56	25.63	30.00		-3.93		21.70		36.00		Pass
HT40	MCS0	2	7	2442	23.13	23.12	26.14	30.00		-3.93		22.21		36.00		Pass
HT40	MCS0	2	8	2447	18.37	18.51	21.45	30.00		-3.93		17.52		36.00		Pass
HT40	MCS0	2	9	2452	18.35	18.29	21.33	30.00		-3.93		17.40		36.00		Pass

2.4GHz Band MIMO																	
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	Ant8	SUM	Ant6	Ant8	Ant6	Ant8	Ant6	Ant8	Ant6	Ant8	
HE20	MCS0	2	1	2412	Full	24.42	24.95	27.70	30.00		-3.93		23.77		36.00		Pass
HE20	MCS0	2	1	2412	26/0	18.09	18.57	21.35	30.00		-3.93		17.42		36.00		Pass
HE20	MCS0	2	1	2412	52/37	20.81	20.62	23.73	30.00		-3.93		19.80		36.00		Pass
HE20	MCS0	2	1	2412	106/53	21.12	21.85	24.51	30.00		-3.93		20.58		36.00		Pass
HE20	MCS0	2	6	2437	Full	25.05	24.99	28.03	30.00		-3.93		24.10		36.00		Pass
HE20	MCS0	2	6	2437	26/0	18.82	19.94	22.43	30.00		-3.93		18.50		36.00		Pass
HE20	MCS0	2	6	2437	52/37	21.24	21.25	24.26	30.00		-3.93		20.33		36.00		Pass
HE20	MCS0	2	6	2437	106/53	22.32	22.64	25.49	30.00		-3.93		21.56		36.00		Pass
HE20	MCS0	2	10	2457	Full	23.36	23.33	26.36	30.00		-3.93		22.43		36.00		Pass
HE20	MCS0	2	11	2462	Full	21.45	21.74	24.61	30.00		-3.93		20.68		36.00		Pass
HE20	MCS0	2	11	2462	26/8	17.31	17.44	20.39	30.00		-3.93		16.46		36.00		Pass
HE20	MCS0	2	11	2462	52/40	18.36	18.35	21.37	30.00		-3.93		17.44		36.00		Pass
HE20	MCS0	2	11	2462	106/54	18.78	19.19	22.00	30.00		-3.93		18.07		36.00		Pass
HE40	MCS0	2	3	2422	Full	20.15	20.96	23.58	30.00		-3.93		19.65		36.00		Pass
HE40	MCS0	2	6	2437	Full	22.75	22.70	25.74	30.00		-3.93		21.81		36.00		Pass
HE40	MCS0	2	7	2442	Full	23.19	23.17	26.19	30.00		-3.93		22.26		36.00		Pass
HE40	MCS0	2	8	2447	Full	18.44	18.56	21.51	30.00		-3.93		17.58		36.00		Pass
HE40	MCS0	2	9	2452	Full	18.36	18.71	21.55	30.00		-3.93		17.62		36.00		Pass

3.2.6 Test Result of Average Output Power (Reporting Only)

2.4GHz Band MIMO																		
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	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	Power Setting
					Ant6	Ant8	Ant6	Ant8	SUM	Ant6	Ant8	Ant6	Ant8	Ant6	Ant8	Ant6	Ant8		
11b	1Mbps	2	1	2412	0.60	0.62	18.99	19.30	22.16	30.00		-3.93		18.23		36.00		Pass	19.00
11b	1Mbps	2	6	2437	0.60	0.62	19.11	19.31	22.22	30.00		-3.93		18.29		36.00		Pass	19.00
11b	1Mbps	2	11	2462	0.60	0.62	19.08	19.36	22.23	30.00		-3.93		18.30		36.00		Pass	19.00
11g	6Mbps	2	1	2412	0.64	0.65	16.55	17.63	20.13	30.00		-3.93		16.20		36.00		Pass	17.00
11g	6Mbps	2	6	2437	0.64	0.65	19.09	18.81	21.96	30.00		-3.93		18.03		36.00		Pass	19.00
11g	6Mbps	2	11	2462	0.64	0.65	16.12	16.50	19.32	30.00		-3.93		15.39		36.00		Pass	16.00
HT20	MCS0	2	1	2412	0.64	0.64	16.65	17.32	20.01	30.00		-3.93		16.08		36.00		Pass	17.00
HT20	MCS0	2	6	2437	0.64	0.64	18.69	18.40	21.56	30.00		-3.93		17.63		36.00		Pass	19.00
HT20	MCS0	2	10	2457	0.64	0.64	16.31	15.89	19.12	30.00		-3.93		15.19		36.00		Pass	16.00
HT20	MCS0	2	11	2462	0.64	0.64	14.10	14.22	17.17	30.00		-3.93		13.24		36.00		Pass	14.00
HT40	MCS0	2	3	2422	0.68	0.68	13.56	13.99	16.79	30.00		-3.93		12.86		36.00		Pass	13.50
HT40	MCS0	2	6	2437	0.68	0.68	16.07	16.06	19.08	30.00		-3.93		15.15		36.00		Pass	16.00
HT40	MCS0	2	7	2442	0.68	0.68	16.60	16.85	19.74	30.00		-3.93		15.81		36.00		Pass	16.50
HT40	MCS0	2	8	2447	0.68	0.68	12.06	12.39	15.24	30.00		-3.93		11.31		36.00		Pass	11.50
HT40	MCS0	2	9	2452	0.68	0.68	11.71	11.85	14.79	30.00		-3.93		10.86		36.00		Pass	11.50

2.4GHz Band MIMO																			
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	Ant8	Ant6	Ant8	SUM	Ant6	Ant8	Ant6	Ant8	Ant6	Ant8	Ant6	Ant8	
HE20	MCS0	2	1	2412	Full	0.64	0.66	16.79	17.36	20.09	30.00		-3.93		16.16		36.00		Pass
HE20	MCS0	2	1	2412	26/0	0.60	0.60	7.14	8.84	11.08	30.00		-3.93		7.15		36.00		Pass
HE20	MCS0	2	1	2412	52/37	0.60	0.60	11.48	12.28	14.91	30.00		-3.93		10.98		36.00		Pass
HE20	MCS0	2	1	2412	106/53	0.64	0.64	13.46	14.66	17.11	30.00		-3.93		13.18		36.00		Pass
HE20	MCS0	2	6	2437	Full	0.64	0.66	19.00	18.52	21.78	30.00		-3.93		17.85		36.00		Pass
HE20	MCS0	2	6	2437	26/0	0.60	0.60	10.52	10.84	13.69	30.00		-3.93		9.76		36.00		Pass
HE20	MCS0	2	6	2437	52/37	0.60	0.60	13.05	13.28	16.18	30.00		-3.93		12.25		36.00		Pass
HE20	MCS0	2	6	2437	106/53	0.64	0.64	15.00	15.12	18.07	30.00		-3.93		14.14		36.00		Pass
HE20	MCS0	2	10	2457	Full	0.64	0.66	16.37	15.95	19.18	30.00		-3.93		15.25		36.00		Pass
HE20	MCS0	2	11	2462	Full	0.64	0.66	14.20	14.31	17.27	30.00		-3.93		13.34		36.00		Pass
HE20	MCS0	2	11	2462	26/8	0.60	0.60	7.14	6.99	10.08	30.00		-3.93		6.15		36.00		Pass
HE20	MCS0	2	11	2462	52/40	0.60	0.60	9.32	9.22	12.28	30.00		-3.93		8.35		36.00		Pass
HE20	MCS0	2	11	2462	106/54	0.64	0.64	11.36	12.19	14.81	30.00		-3.93		10.88		36.00		Pass
HE40	MCS0	2	3	2422	Full	0.70	0.70	13.61	14.10	16.87	30.00		-3.93		12.94		36.00		Pass
HE40	MCS0	2	6	2437	Full	0.70	0.70	16.19	16.12	19.17	30.00		-3.93		15.24		36.00		Pass
HE40	MCS0	2	7	2442	Full	0.70	0.70	16.67	16.94	19.82	30.00		-3.93		15.89		36.00		Pass
HE40	MCS0	2	8	2447	Full	0.70	0.70	12.14	12.45	15.31	30.00		-3.93		11.38		36.00		Pass
HE40	MCS0	2	9	2452	Full	0.70	0.70	11.81	11.90	14.87	30.00		-3.93		10.94		36.00		Pass

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Power Setting	
						Ant6	Ant8
HE20	MCS0	2	1	2412	Full	17.00	
HE20	MCS0	2	1	2412	26/0	12.00	
HE20	MCS0	2	1	2412	52/37	14.50	
HE20	MCS0	2	1	2412	106/53	15.00	
HE20	MCS0	2	6	2437	Full	19.00	
HE20	MCS0	2	6	2437	26/0	14.00	
HE20	MCS0	2	6	2437	52/37	15.50	
HE20	MCS0	2	6	2437	106/53	16.00	
HE20	MCS0	2	10	2457	Full	16.00	
HE20	MCS0	2	11	2462	Full	14.00	
HE20	MCS0	2	11	2462	26/8	11.00	
HE20	MCS0	2	11	2462	52/40	12.00	
HE20	MCS0	2	11	2462	106/54	12.50	
HE40	MCS0	2	3	2422	Full	13.50	
HE40	MCS0	2	6	2437	Full	16.00	
HE40	MCS0	2	7	2442	Full	16.50	
HE40	MCS0	2	8	2447	Full	11.50	
HE40	MCS0	2	9	2452	Full	11.50	

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.

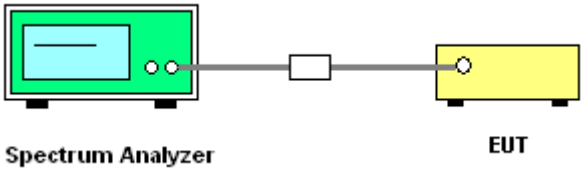
3.3.3 Test Procedures

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.
7. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01:

   Method (b): Measure and sum spectral maxima across the outputs.

   The measurement on each individual output were performed with the same span and number on each individual output. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs.

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.

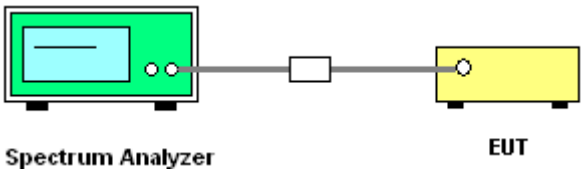
3.4.2 Measuring Instruments

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

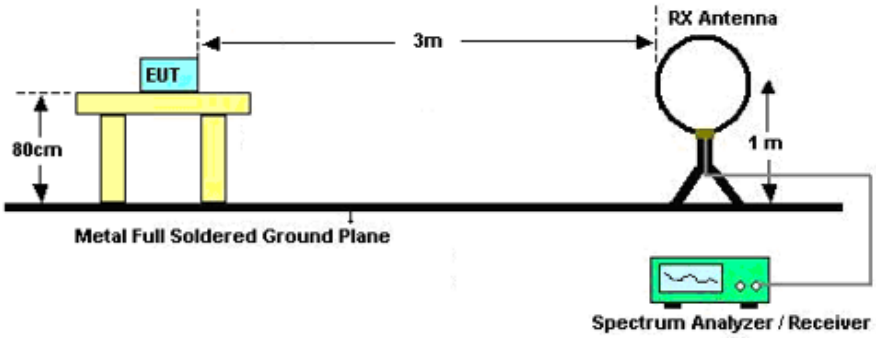
The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

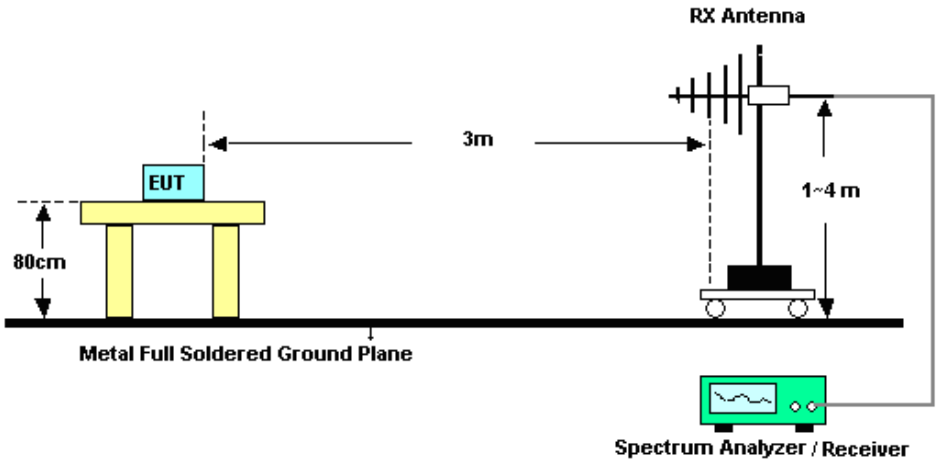
1. The testing follows ANSI C63.10-2013 clause 11.11 & 11.12
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better 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: Antenna Factor + Cable Loss + Read Level - Preamp Factor = 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 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 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

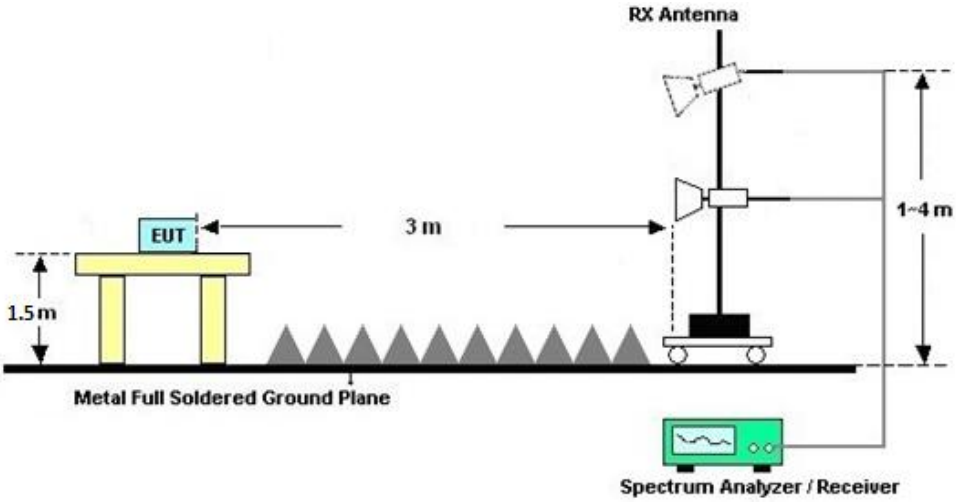
For radiated emissions below 30MHz



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.

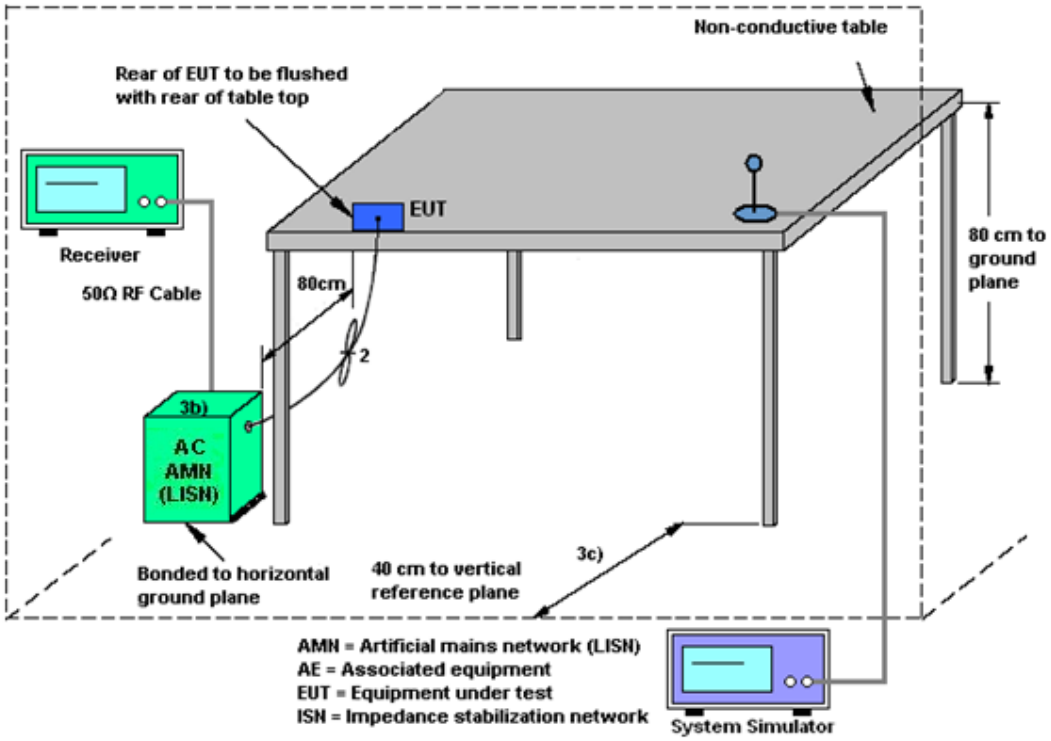
3.6.2 Measuring Instruments

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

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain = 10 log(N_{ANT}/N_{SS}=1) dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$.

Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain;

The EUT supports CDD mode.

For power, the directional gain G_{ANT} is set equal to the antenna having the highest gain, i.e., F)2)f)i).

For PSD, the directional gain calculation is following F)2)f)ii) of KDB 662911 D01 v02r01.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain “DG” is calculated as following table.

<CDD Modes>

	Ant. 6 (dBi)	Ant. 8 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
2.4 GHz	-3.93	-4.40	-3.93	-1.15	0.00	0.00

Power Limit Reduction = DG(Power) – 6dBi, (min = 0)

PSD Limit Reduction = DG(PSD) – 6dBi, (min = 0)

4 List of Measuring Equipment

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	Jul. 23, 2024~ Aug. 13, 2024	Oct. 10, 2024	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 02, 2024	Jul. 23, 2024~ Aug. 13, 2024	Jan. 01, 2025	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 02, 2024	Jul. 23, 2024~ Aug. 13, 2024	Jan. 01, 2025	Conducted (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY56400023	3Hz~8.5GHz;Max 30dBm	Jan. 02, 2024	Aug. 14, 2024	Jan. 01, 2025	Radiation (03CH08-KS)
Spectrum Analyzer	R&S	FSV40	101933	10kHz~40GHz; Max 30dBm	Oct. 11, 2023	Aug. 14, 2024	Oct. 10, 2024	Radiation (03CH08-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 11, 2023	Aug. 14, 2024	Sep. 10, 2024	Radiation (03CH08-KS)
Bilog Antenna	TESEQ	CBL 6111D	59915	30MHz-1GHz	Aug. 19, 2023	Aug. 14, 2024	Aug. 18, 2024	Radiation (03CH08-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75959	1GHz~18GHz	Mar. 01, 2024	Aug. 14, 2024	Feb. 28, 2025	Radiation (03CH08-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 27, 2024	Aug. 14, 2024	Jan. 26, 2025	Radiation (03CH08-KS)
Amplifier	SONOMA	310N	413741	9KHz-1GHz	Jan. 02, 2024	Aug. 14, 2024	Jan. 01, 2025	Radiation (03CH08-KS)
Amplifier	EM	EM01G18GA	060834	1Ghz-18Ghz	Oct. 11, 2023	Aug. 14, 2024	Oct. 10, 2024	Radiation (03CH08-KS)
high gain Amplifier	EM	EM01G18GA	060845	1Ghz-18Ghz	Jan. 03, 2024	Aug. 14, 2024	Jan. 02, 2025	Radiation (03CH08-KS)
Amplifier	EM	EM18G40GGA	060728	18~40GHz	Jan. 02, 2024	Aug. 14, 2024	Jan. 01, 2025	Radiation (03CH08-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Aug. 14, 2024	NCR	Radiation (03CH08-KS)
Turn Table	EM	EM 1000-T	N/A	0~360 degree	NCR	Aug. 14, 2024	NCR	Radiation (03CH08-KS)
Antenna Mast	EM	EM 1000-A	N/A	1 m~4 m	NCR	Aug. 14, 2024	NCR	Radiation (03CH08-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 18, 2024	Jul. 26, 2024	Apr. 17, 2025	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 11, 2023	Jul. 26, 2024	Oct. 10, 2024	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	Apr. 18, 2024	Jul. 26, 2024	Apr. 17, 2025	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 11, 2023	Jul. 26, 2024	Oct. 10, 2024	Conduction (CO01-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	**±2.26 dB**
Occupied Channel Bandwidth	**±0.1%**
Conducted Power	**±0.46 dB**
Conducted Power Spectral Density	**±0.88 dB**
Frequency	**±0.4 Hz**

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**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**6.04 dB**

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.26 dB**

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.40 dB**

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

Appendix A. Conducted Test Results

Ambient Condition: 25 ℃, 45 %RH	
Test Date: 2024.7.23~2024.8.13	**Test Engineer:** Jiang Jun

DTS Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B-CDD	Ant6	2412	8.06	2407.97	2416.03	0.5	PASS
	Ant8	2412	7.57	2407.97	2415.54	0.5	PASS
	Ant6	2437	8.04	2432.97	2441.01	0.5	PASS
	Ant8	2437	8.06	2432.97	2441.03	0.5	PASS
	Ant6	2462	8.06	2457.97	2466.03	0.5	PASS
	Ant8	2462	8.06	2457.97	2466.03	0.5	PASS
11G-CDD	Ant6	2412	14.98	2404.54	2419.52	0.5	PASS
	Ant8	2412	13.72	2404.48	2418.20	0.5	PASS
	Ant6	2437	15.05	2429.46	2444.52	0.5	PASS
	Ant8	2437	15.05	2429.48	2444.54	0.5	PASS
	Ant6	2462	15.11	2454.44	2469.56	0.5	PASS
	Ant8	2462	15.07	2454.44	2469.52	0.5	PASS
11AX20MIMO	Ant6	2412	17.00	2404.25	2421.25	0.5	PASS
	Ant8	2412	16.56	2402.96	2419.52	0.5	PASS
	Ant6	2437	16.08	2428.78	2444.86	0.5	PASS
	Ant8	2437	15.07	2429.44	2444.52	0.5	PASS
	Ant6	2457	15.11	2449.46	2464.58	0.5	PASS
	Ant8	2457	15.11	2449.44	2464.56	0.5	PASS
	Ant6	2462	18.48	2452.77	2471.25	0.5	PASS
	Ant8	2462	13.82	2454.48	2468.30	0.5	PASS
11AX40MIMO	Ant6	2422	35.56	2404.26	2439.82	0.5	PASS
	Ant8	2422	31.37	2405.71	2437.07	0.5	PASS
	Ant6	2437	35.10	2419.45	2454.55	0.5	PASS
	Ant8	2437	35.33	2419.22	2454.55	0.5	PASS
	Ant6	2442	35.06	2424.49	2459.55	0.5	PASS
	Ant8	2442	35.79	2423.76	2459.55	0.5	PASS
	Ant6	2447	35.10	2429.45	2464.55	0.5	PASS
	Ant8	2447	35.75	2429.26	2465.01	0.5	PASS
	Ant6	2452	32.59	2434.45	2467.04	0.5	PASS
	Ant8	2452	35.94	2434.45	2470.39	0.5	PASS

Test Graphs

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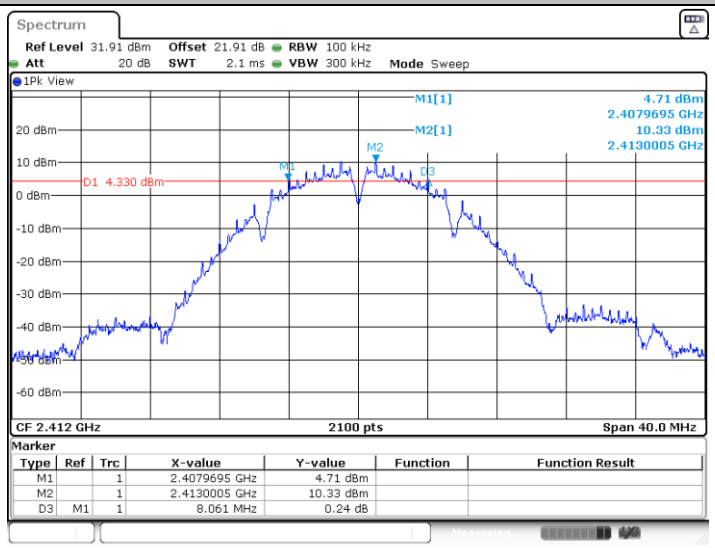

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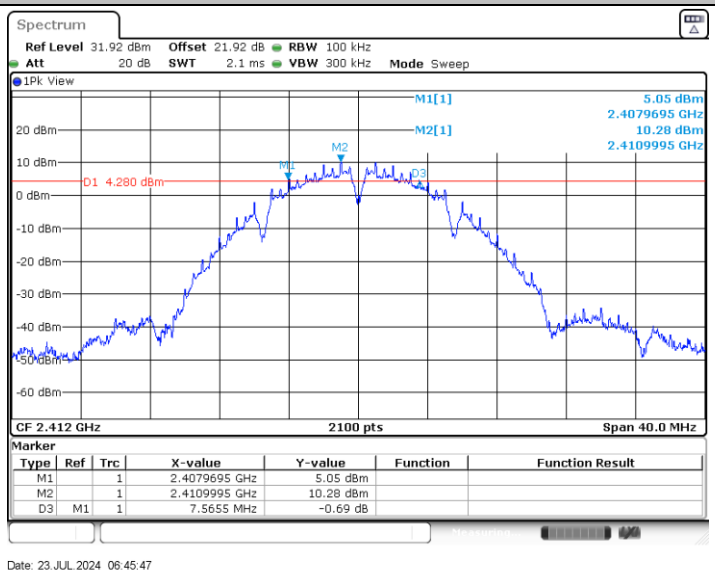

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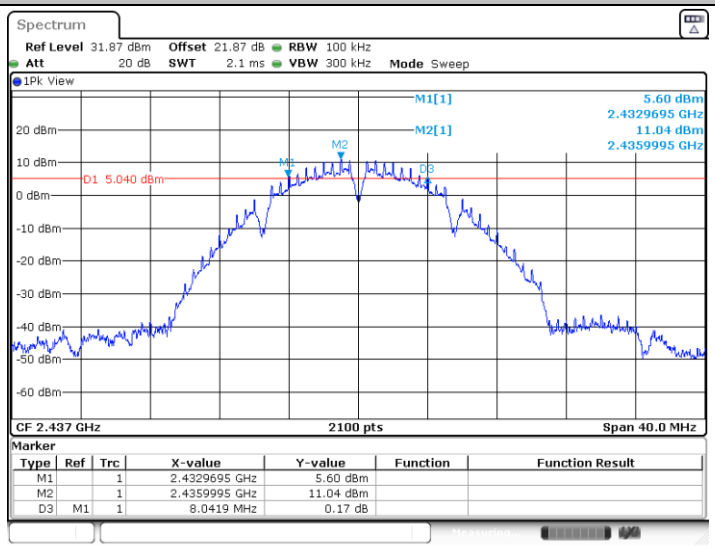

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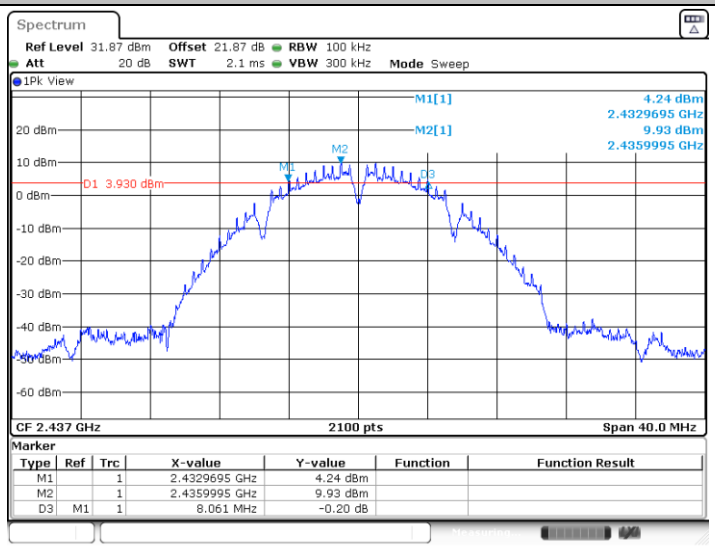

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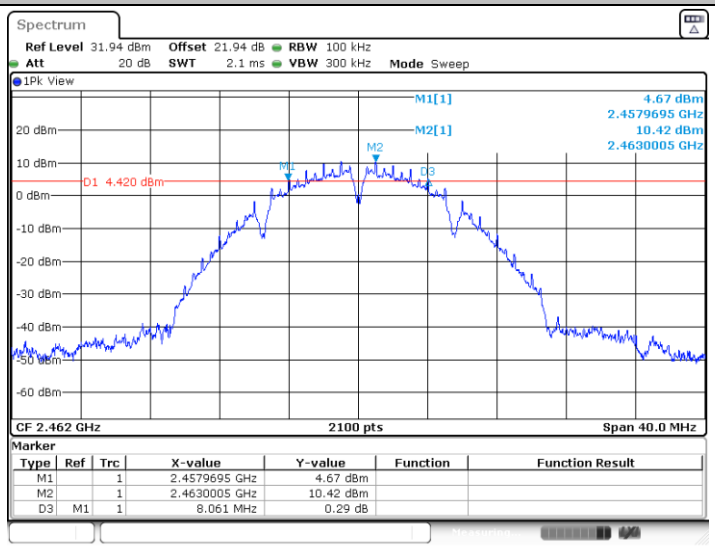

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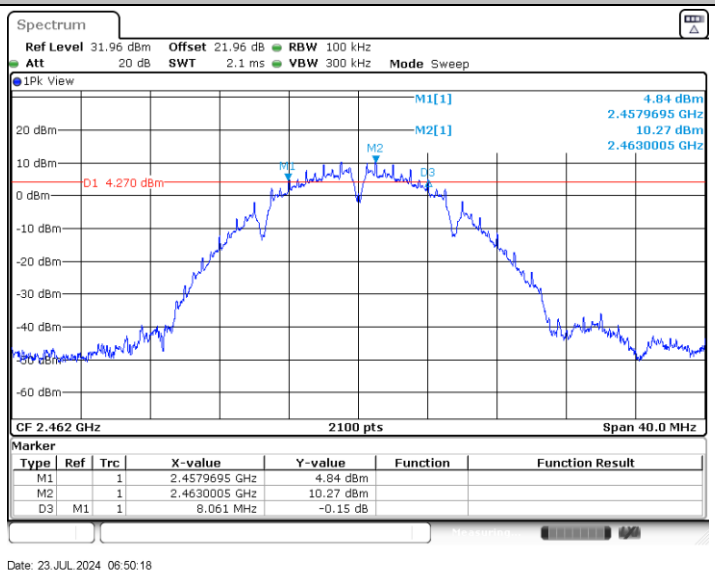

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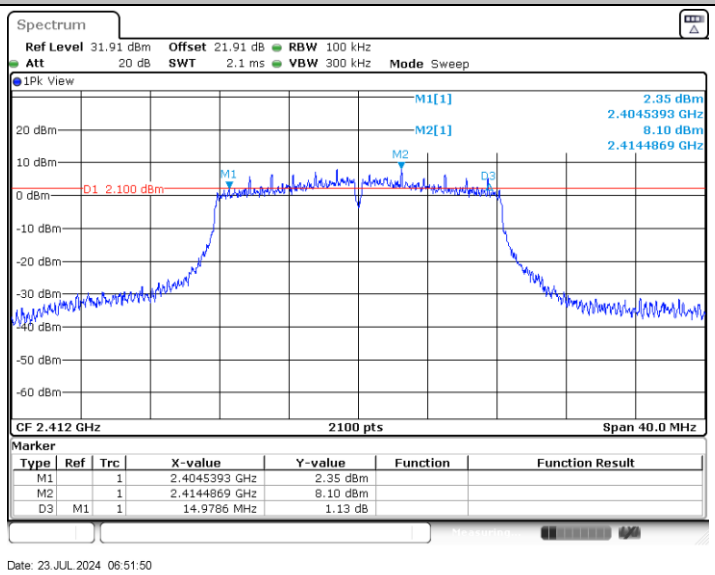

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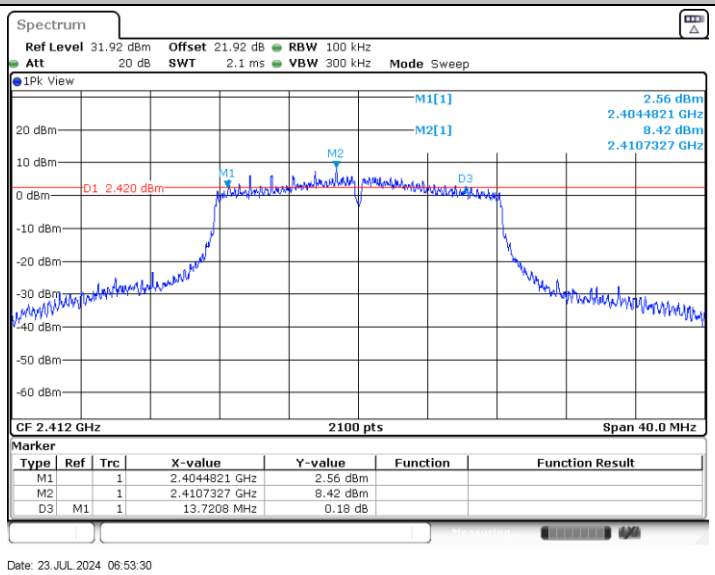

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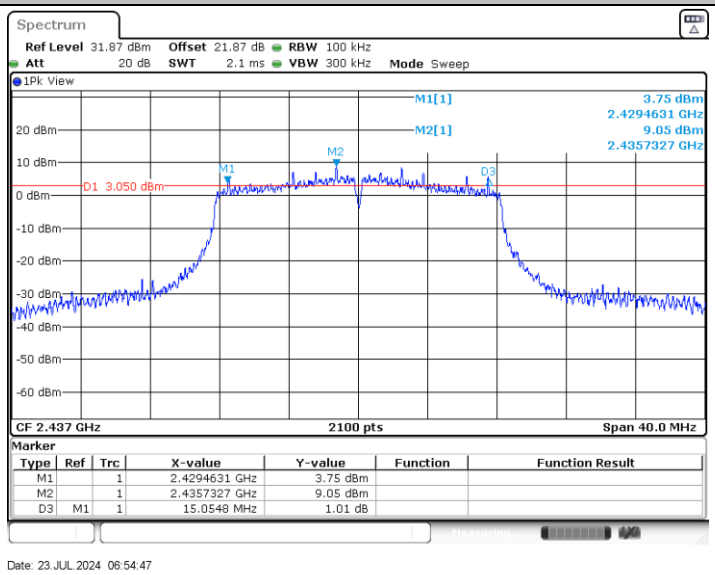

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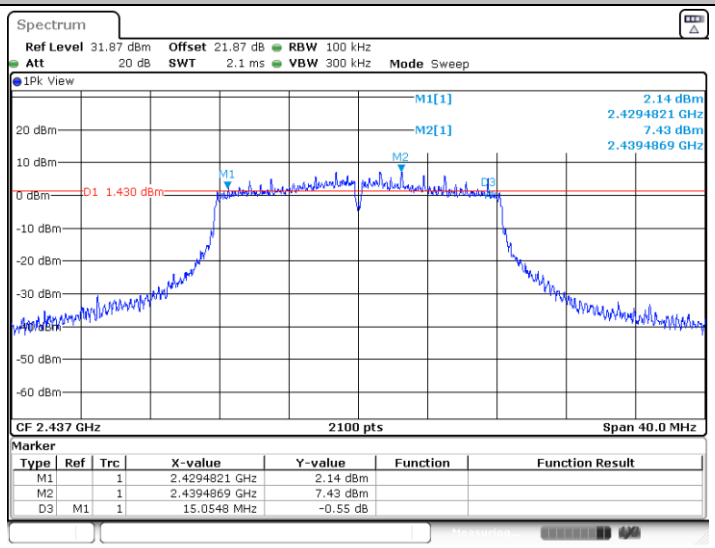

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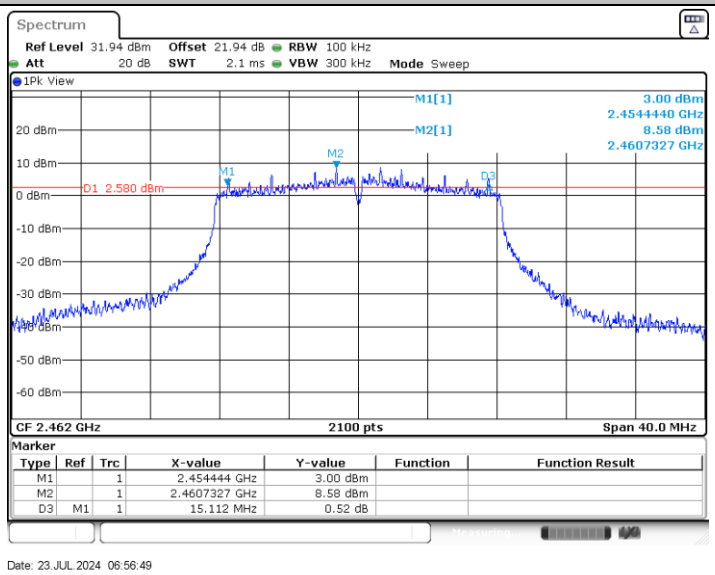

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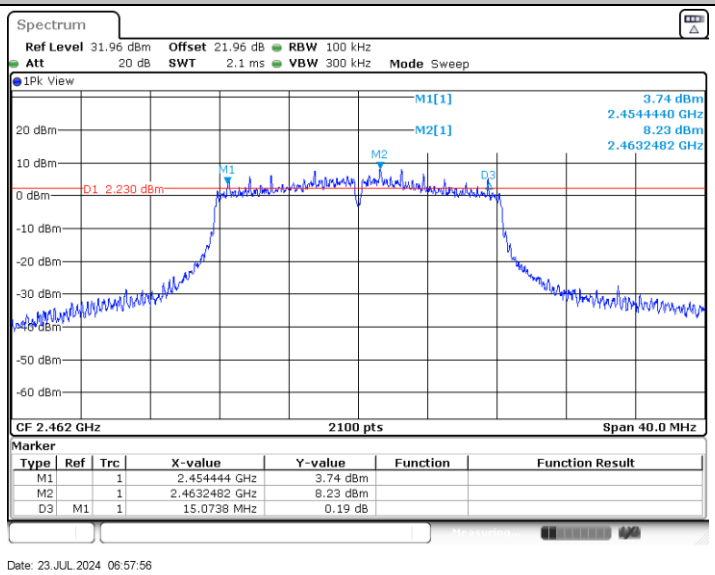

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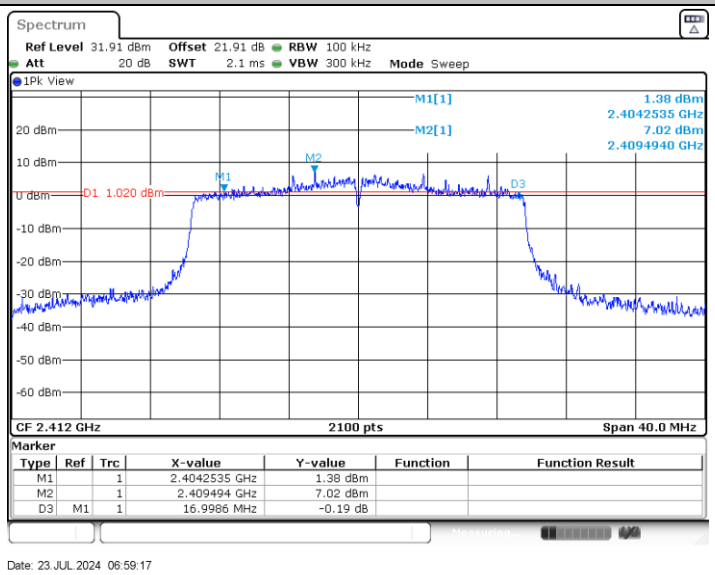

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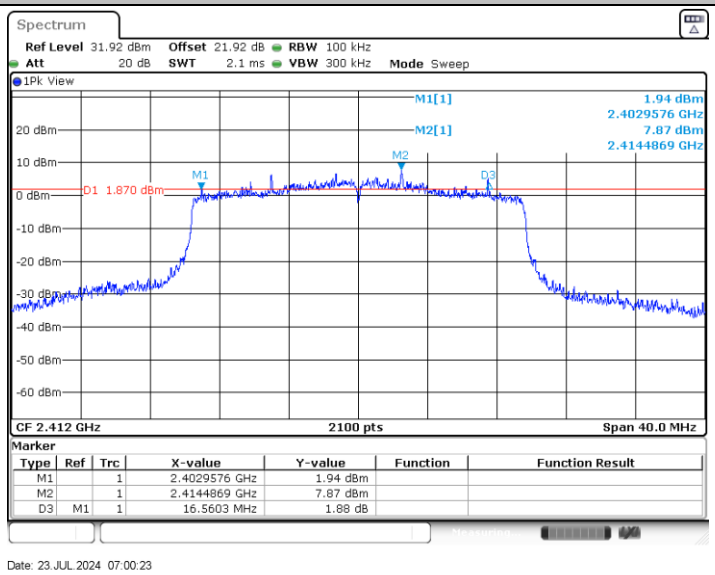

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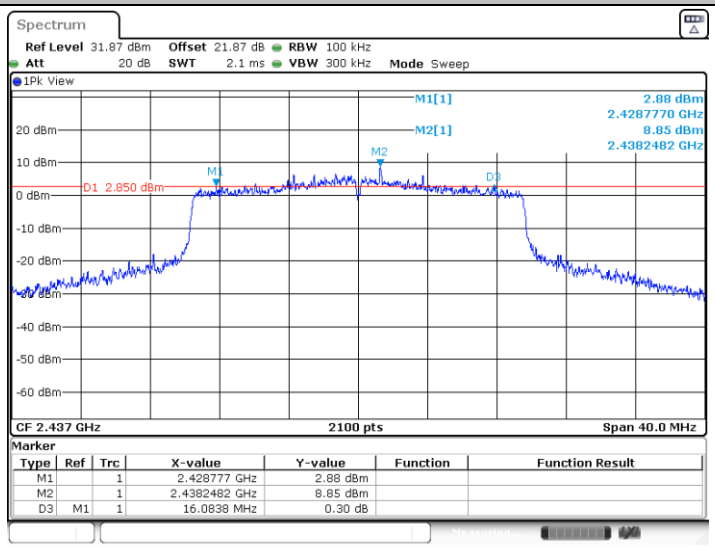

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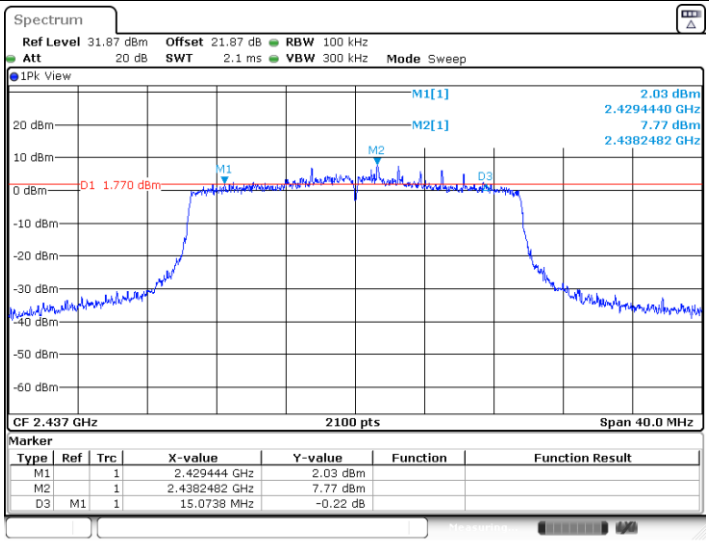

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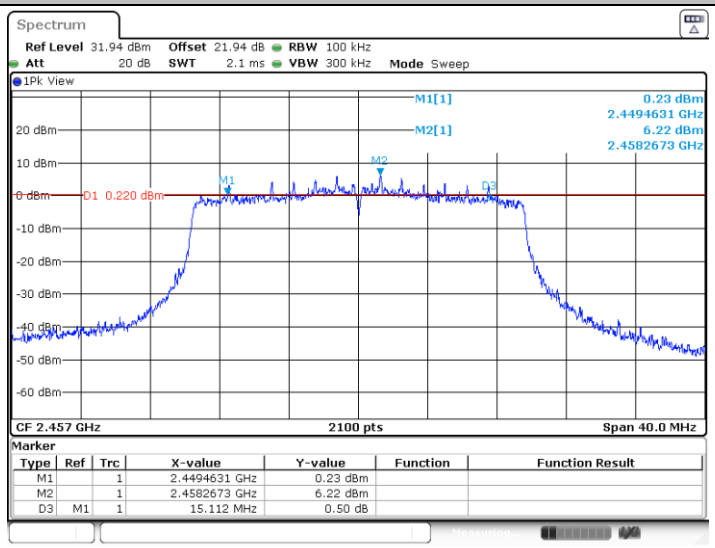

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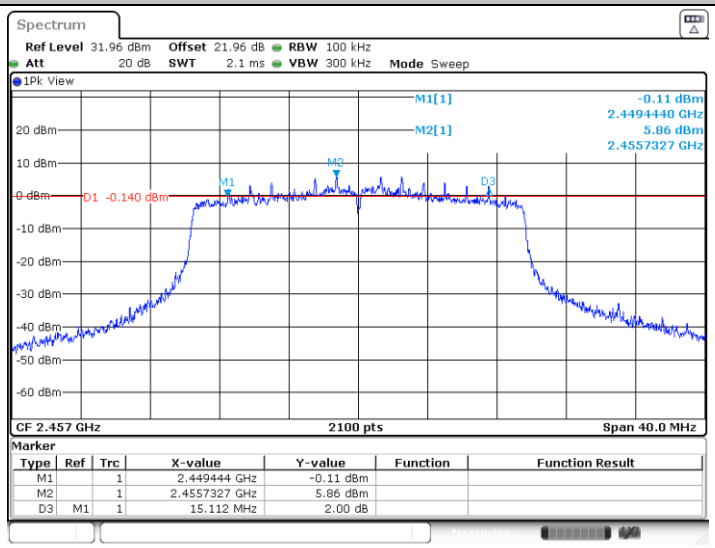

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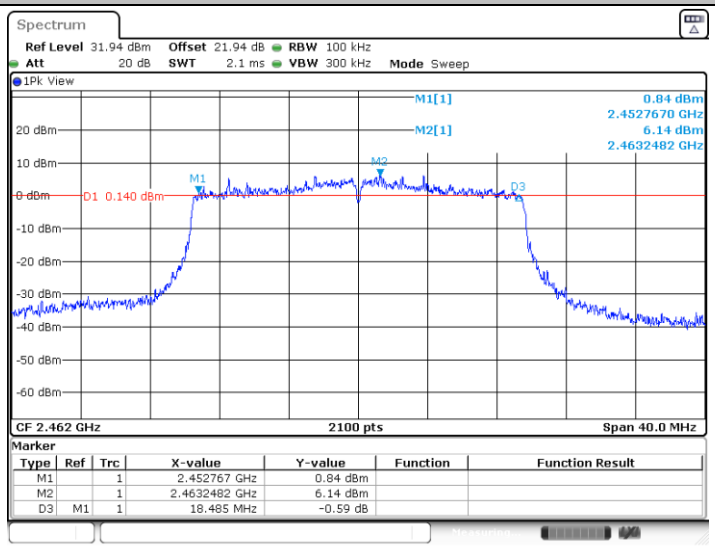

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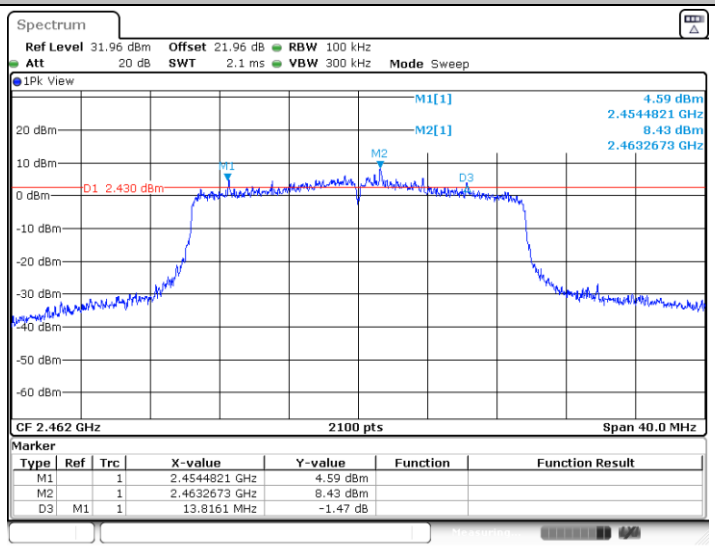

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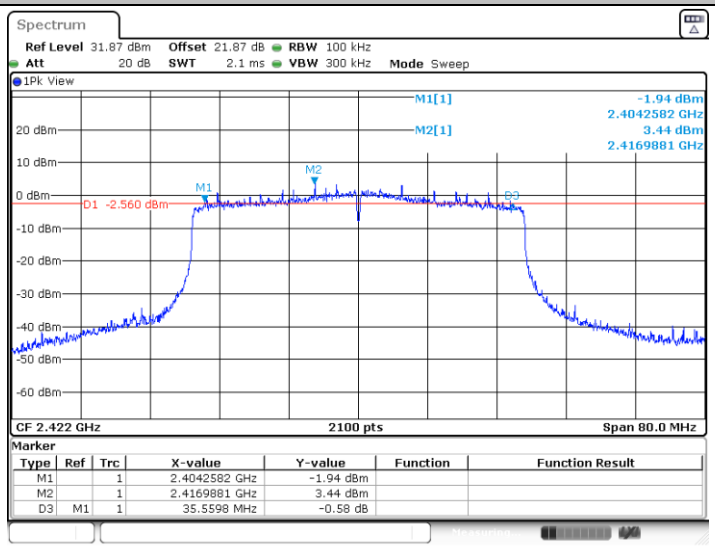

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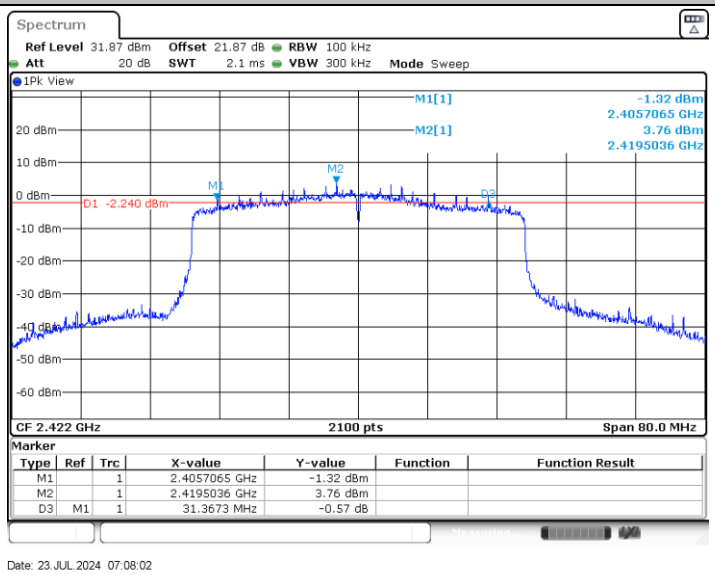

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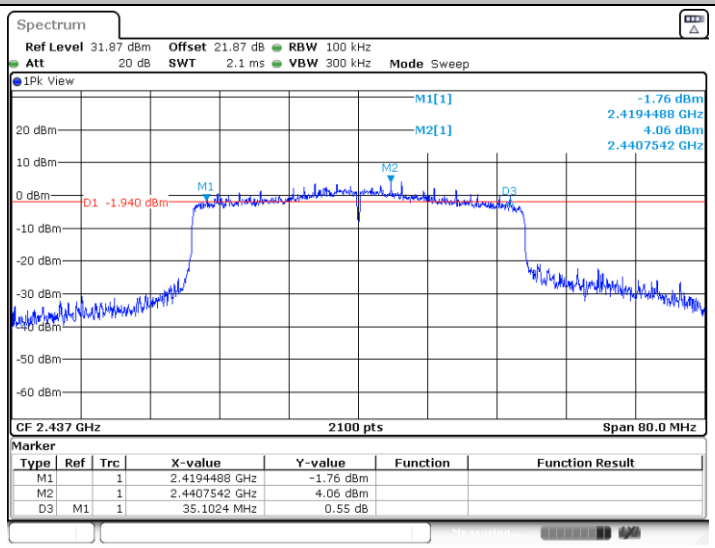

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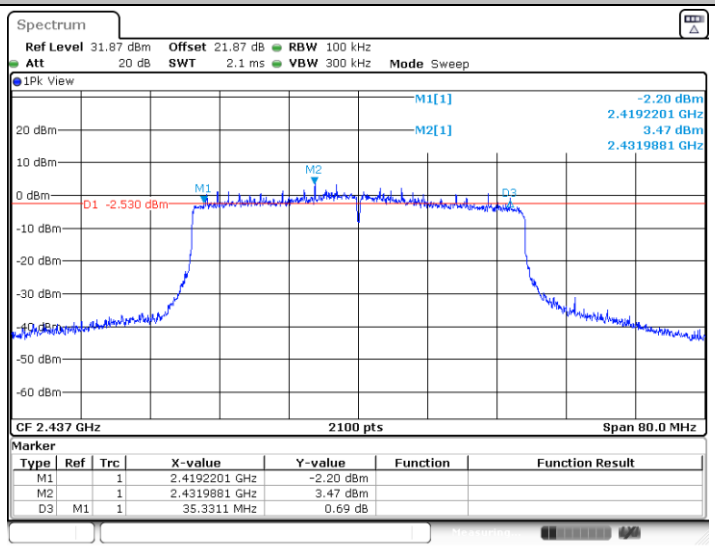

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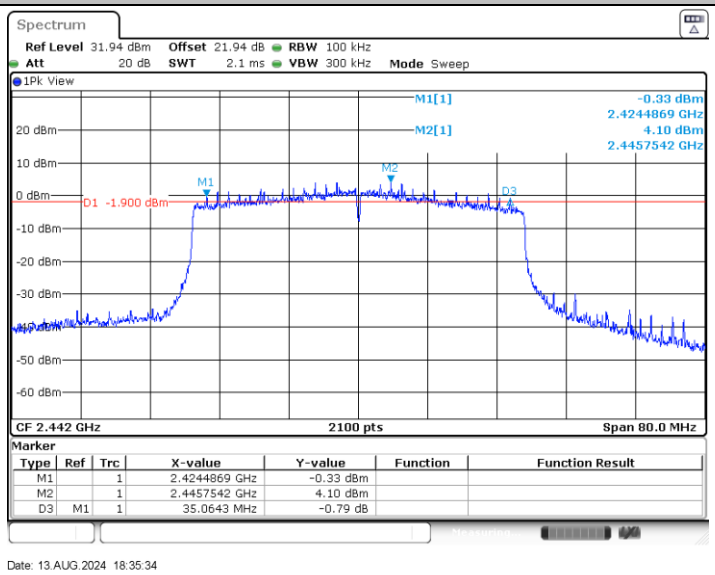

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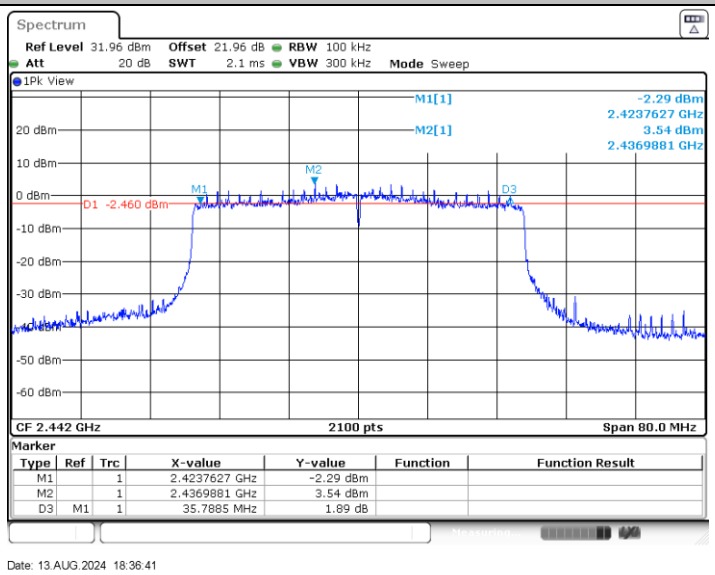

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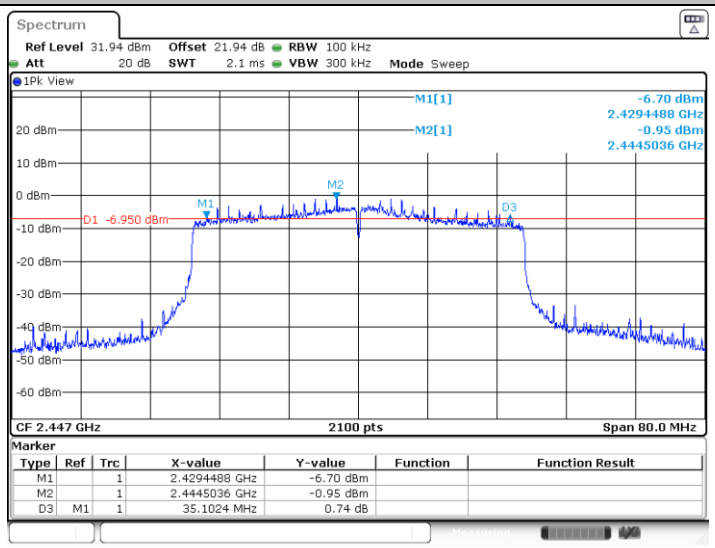

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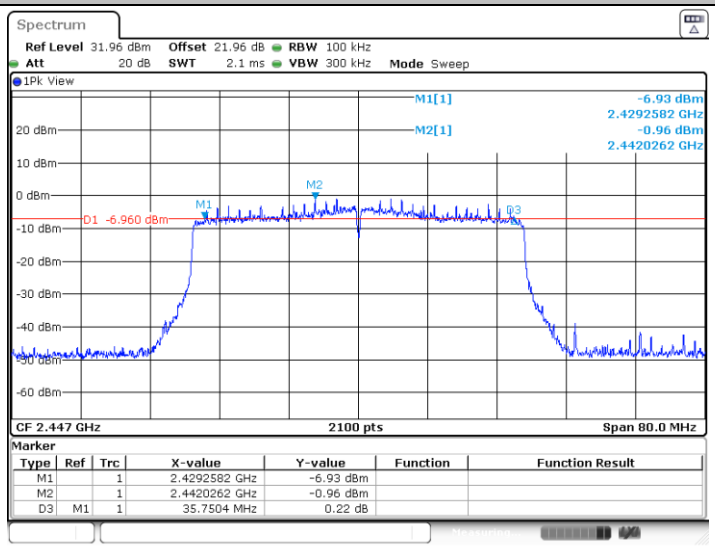

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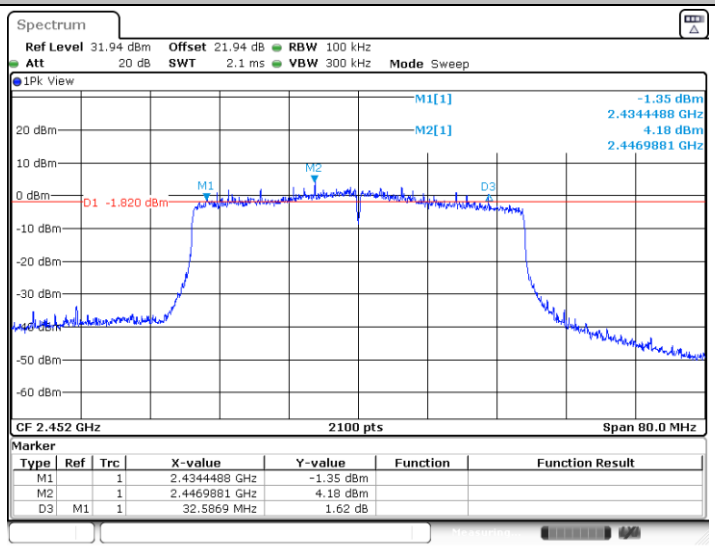

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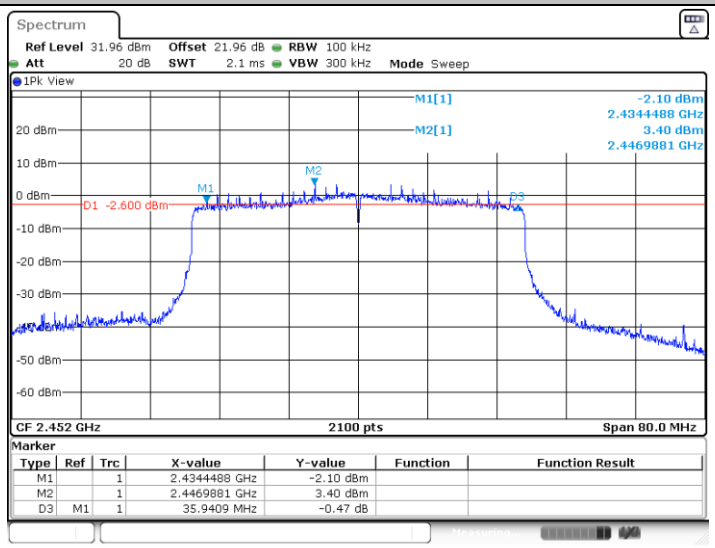

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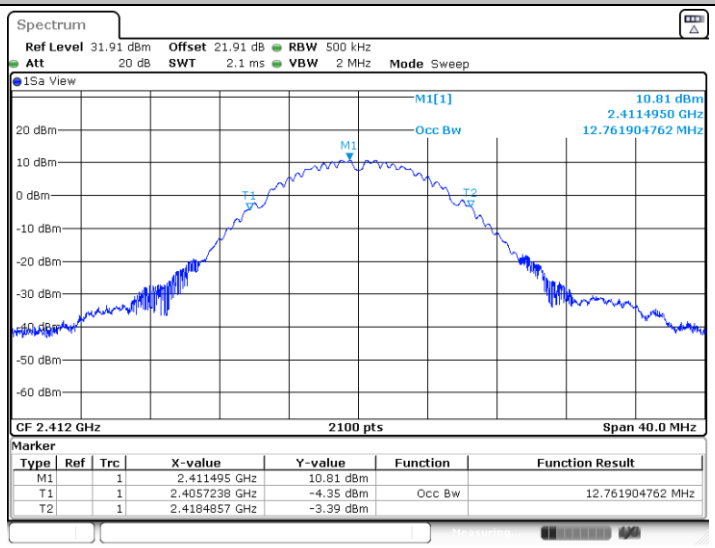
Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]
11B-CDD	Ant6	2412	12.762	2405.7238	2418.4857
	Ant8	2412	12.895	2405.5905	2418.4857
	Ant6	2437	12.933	2430.5714	2443.5048
	Ant8	2437	12.99	2430.5333	2443.5238
	Ant6	2462	12.895	2455.5905	2468.4857
	Ant8	2462	12.933	2455.5714	2468.5048
11G-CDD	Ant6	2412	16.533	2403.7619	2420.2952
	Ant8	2412	16.419	2403.7619	2420.1810
	Ant6	2437	16.514	2428.7238	2445.2381
	Ant8	2437	16.495	2428.7429	2445.2381
	Ant6	2462	16.495	2453.7429	2470.2381
	Ant8	2462	16.4	2453.7810	2470.1810
11AX20MIMO	Ant6	2412	18.971	2402.5429	2421.5143
	Ant8	2412	18.933	2402.5048	2421.4381
	Ant6	2437	19.086	2427.4476	2446.5333
	Ant8	2437	18.971	2427.5048	2446.4762
	Ant6	2457	18.971	2447.5238	2466.4952
	Ant8	2457	18.914	2447.5429	2466.4571
	Ant6	2462	18.952	2452.5048	2471.4571
	Ant8	2462	18.914	2452.5238	2471.4381
11AX40MIMO	Ant6	2422	37.714	2403.1238	2440.8381
	Ant8	2422	37.524	2403.2000	2440.7238
	Ant6	2437	37.676	2418.1238	2455.8000
	Ant8	2437	37.829	2418.0476	2455.8762
	Ant6	2442	37.676	2423.1238	2460.8000
	Ant8	2442	37.867	2423.0476	2460.9143
	Ant6	2447	37.676	2428.1238	2465.8000
	Ant8	2447	37.867	2428.0476	2465.9143
	Ant6	2452	37.676	2433.0476	2470.7238
	Ant8	2452	37.752	2433.1238	2470.8762

Test Graphs

11B-CDD_Ant6_2412



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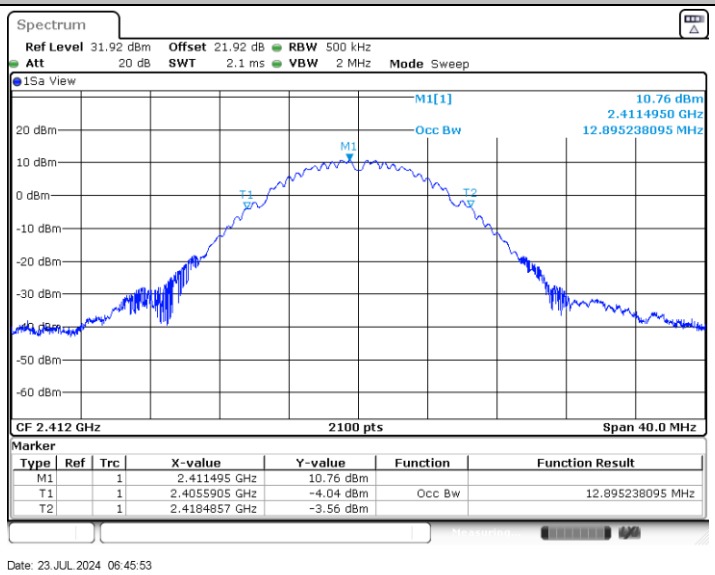

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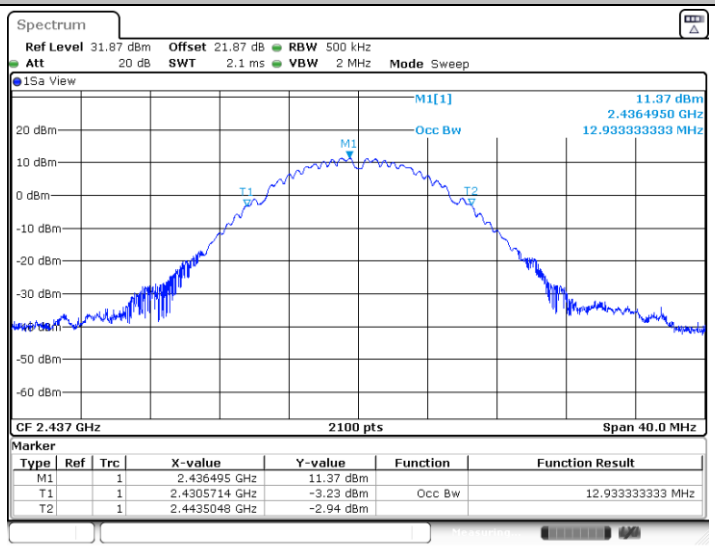

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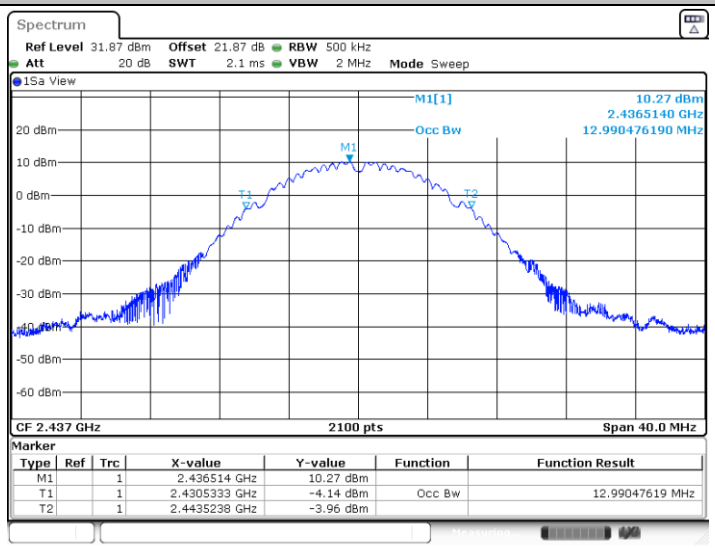

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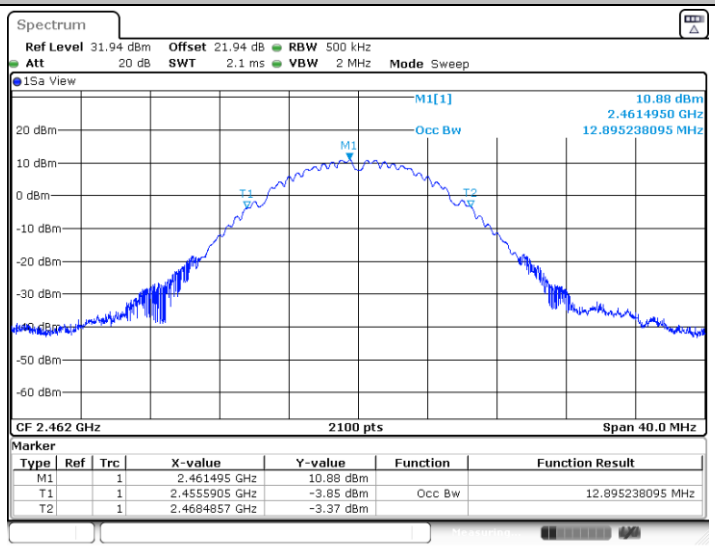

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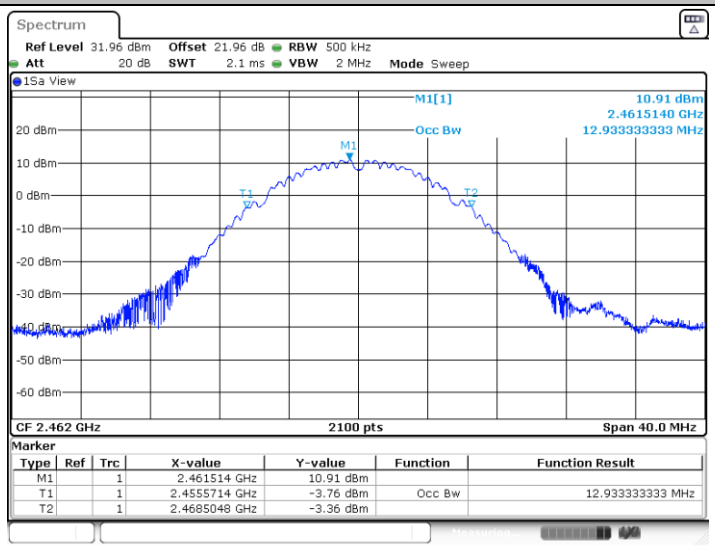

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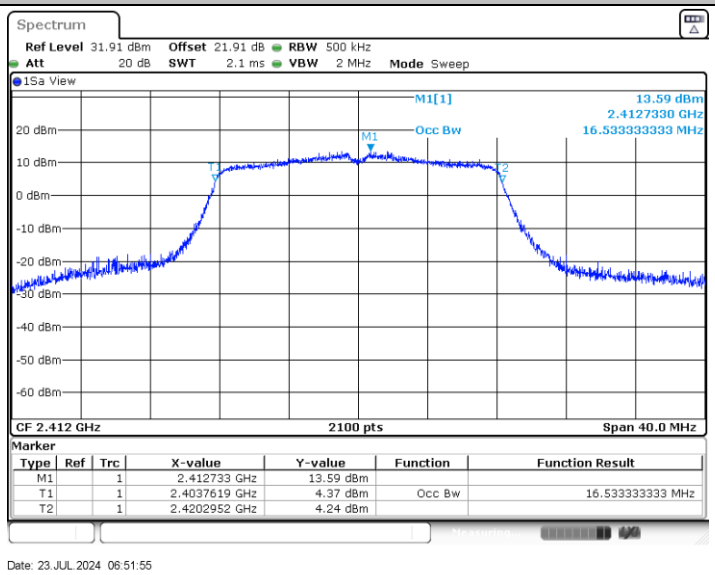

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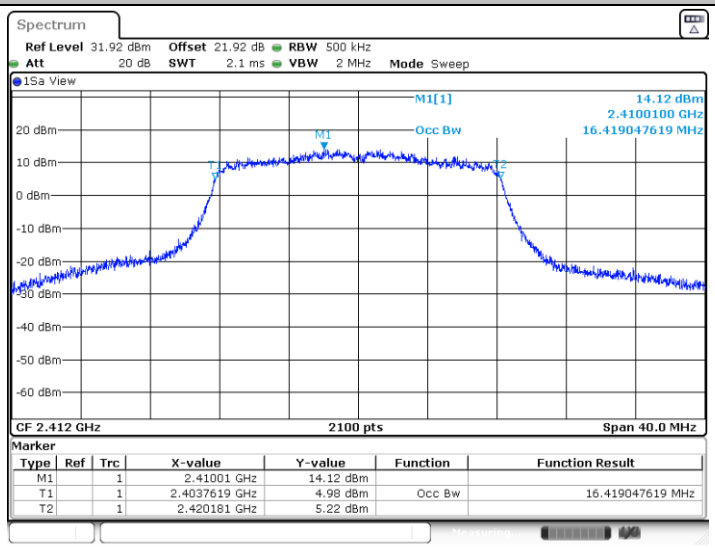

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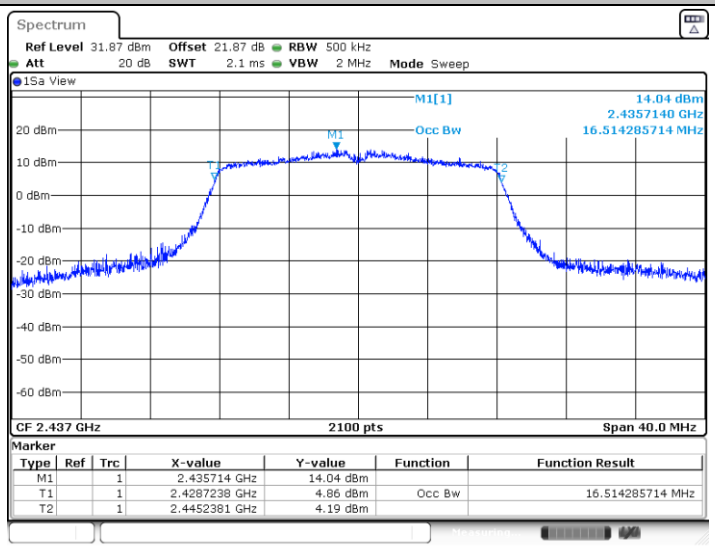

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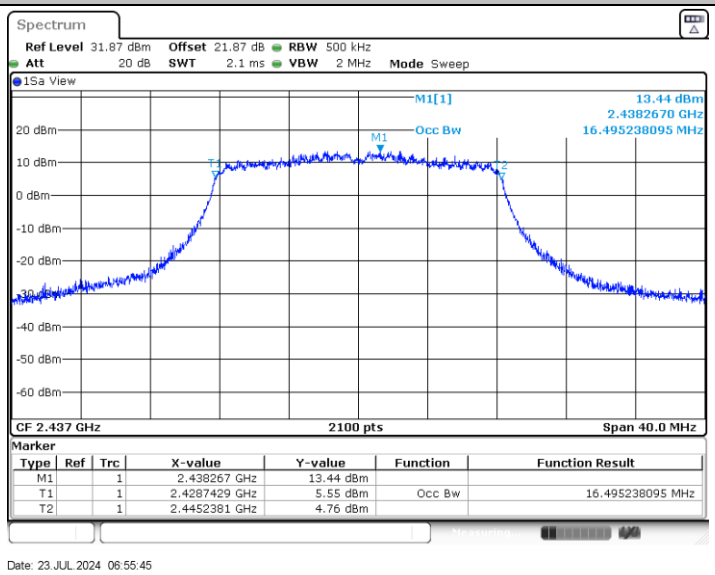

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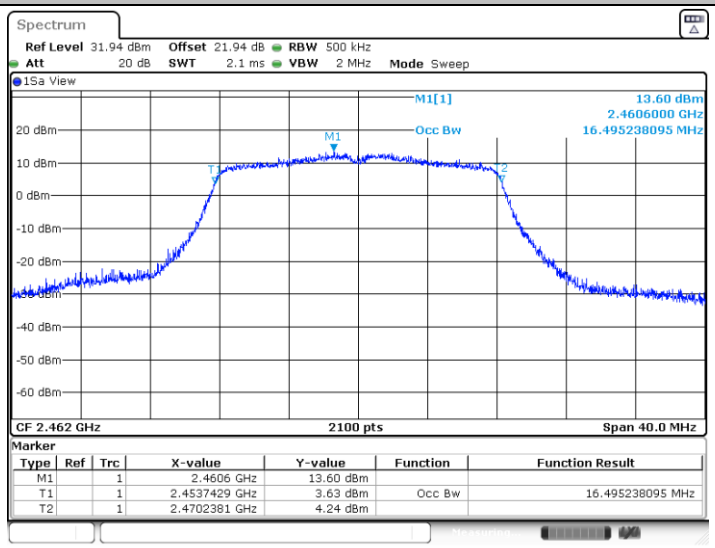

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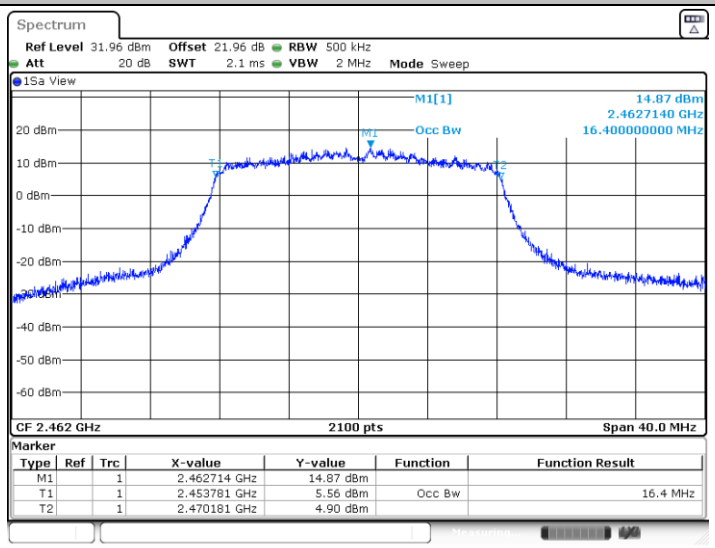

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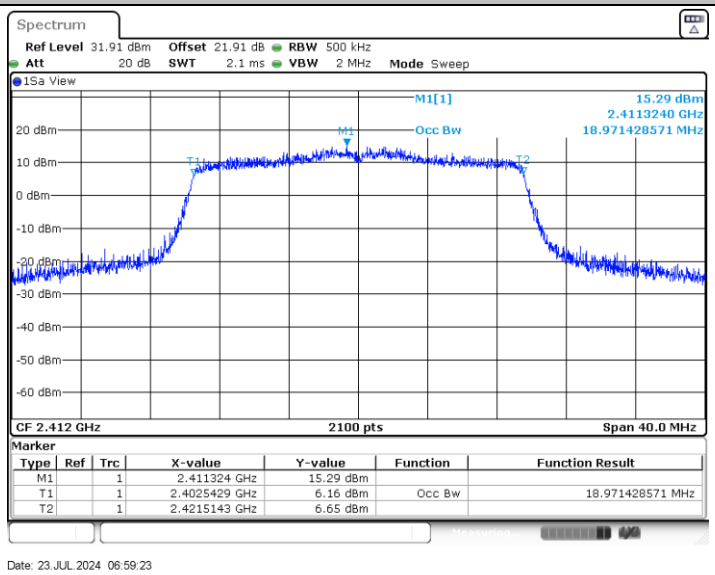

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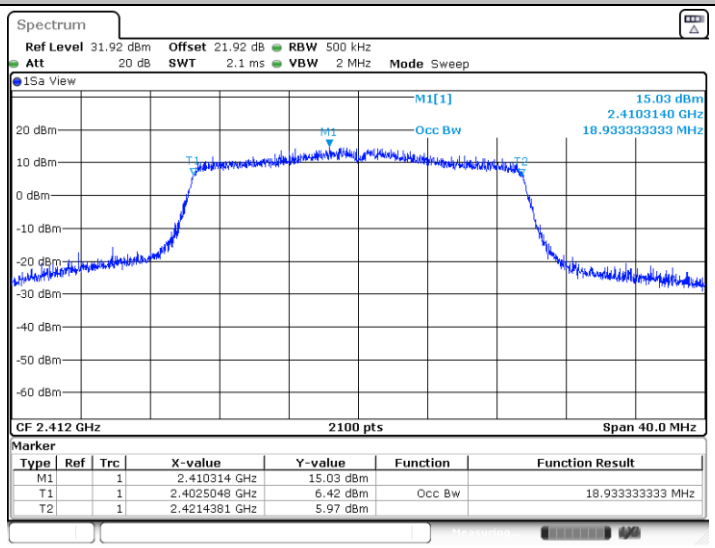

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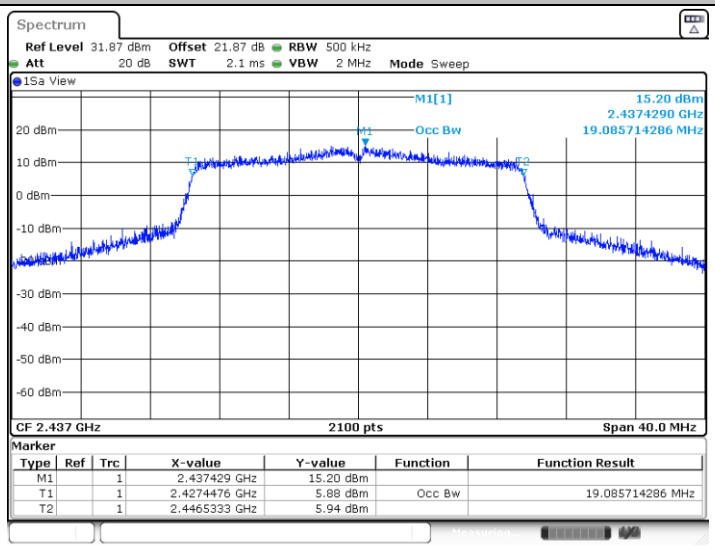

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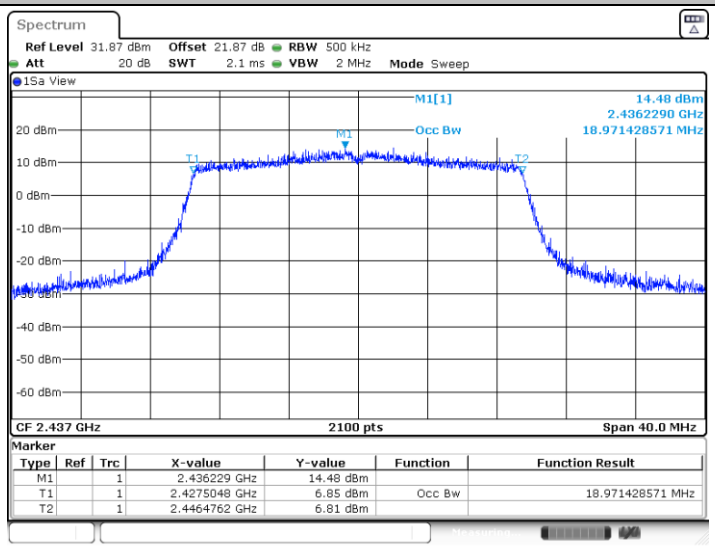

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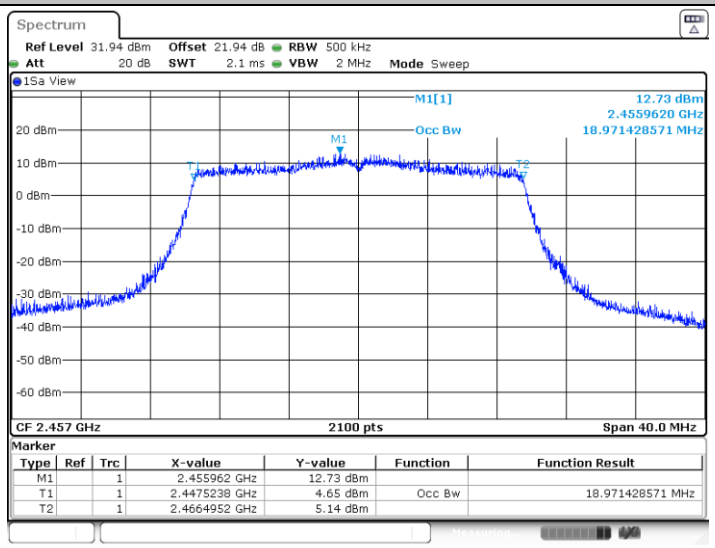

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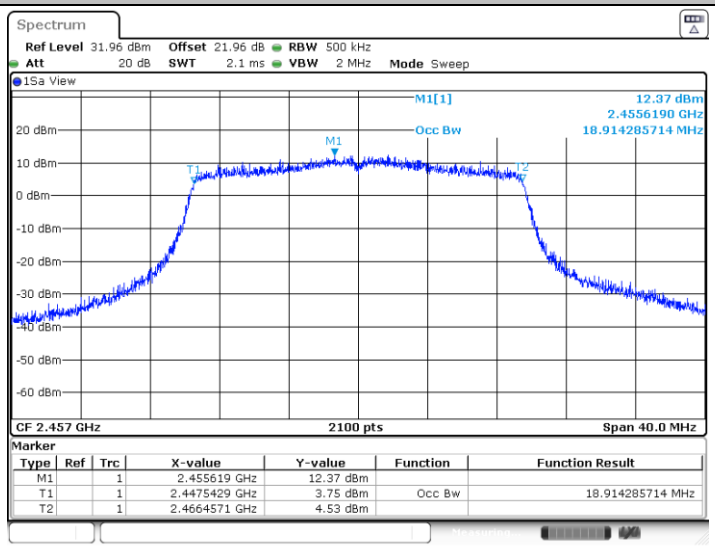

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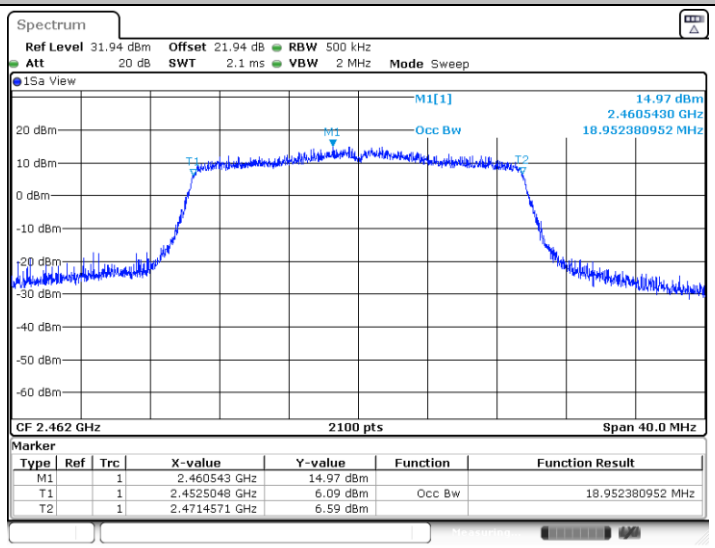

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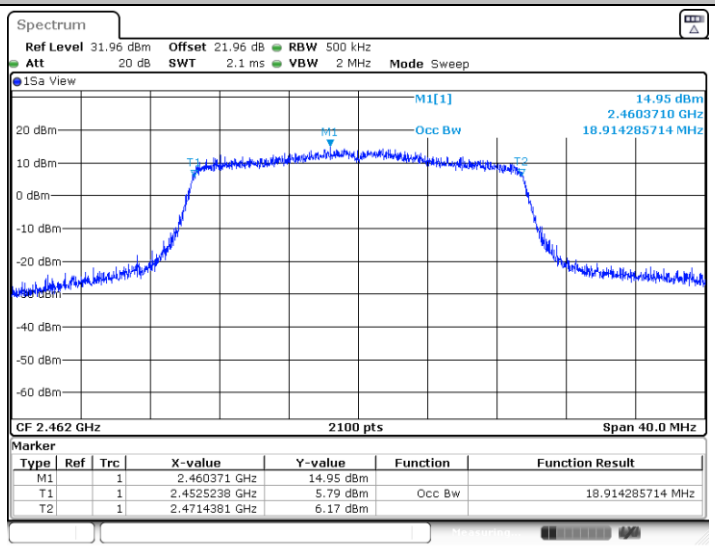

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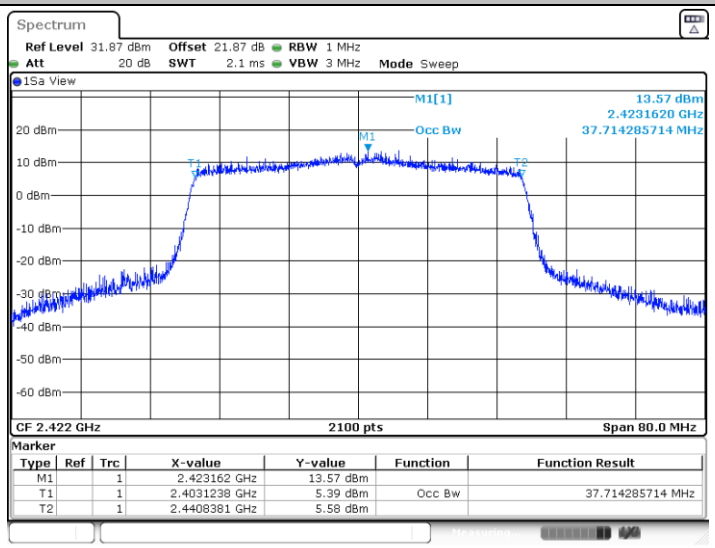

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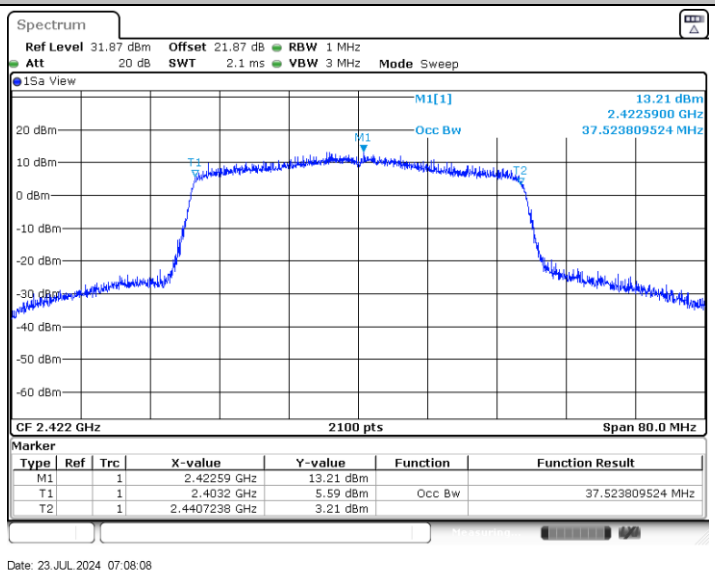

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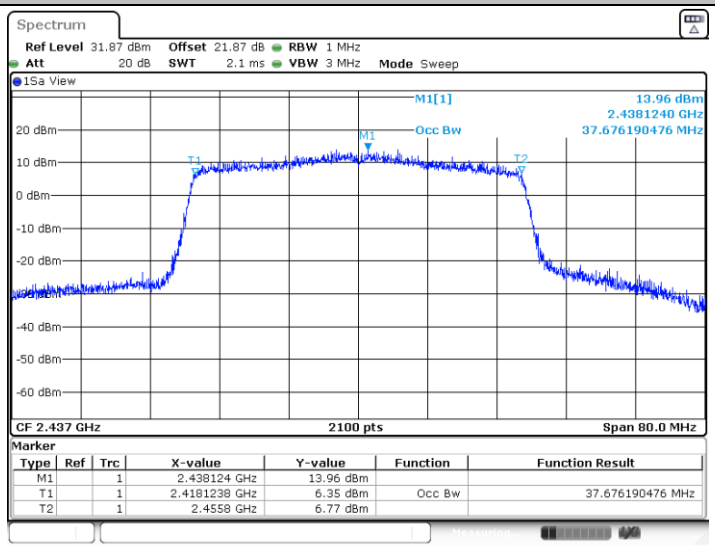

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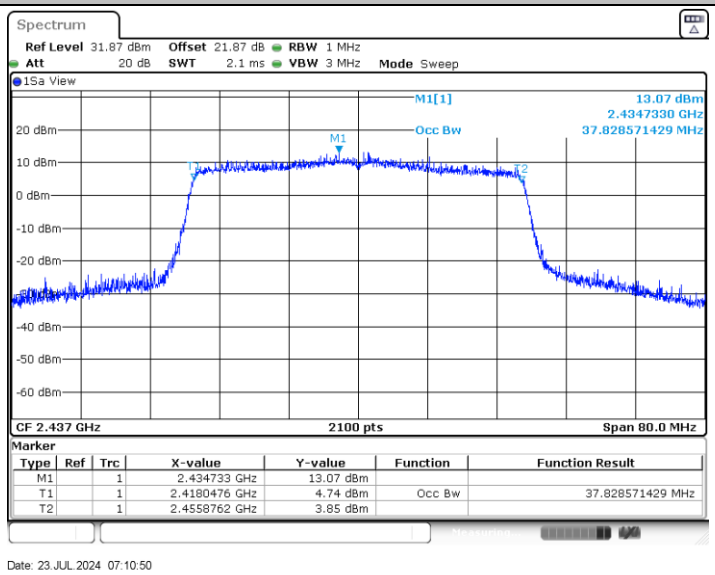

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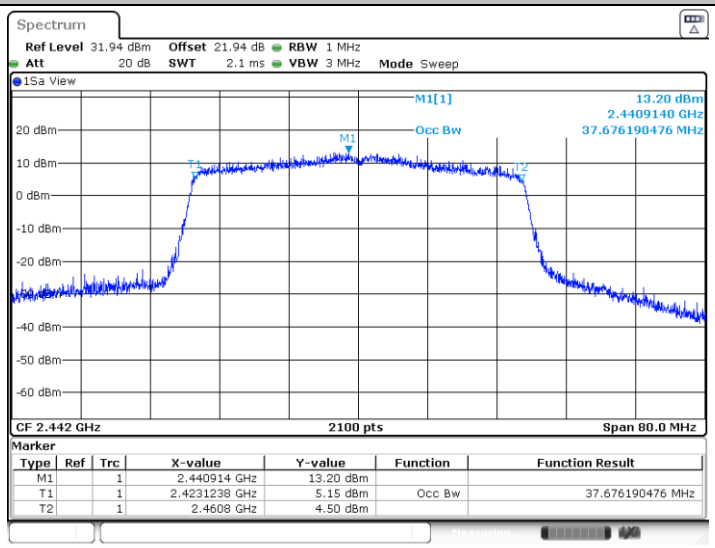
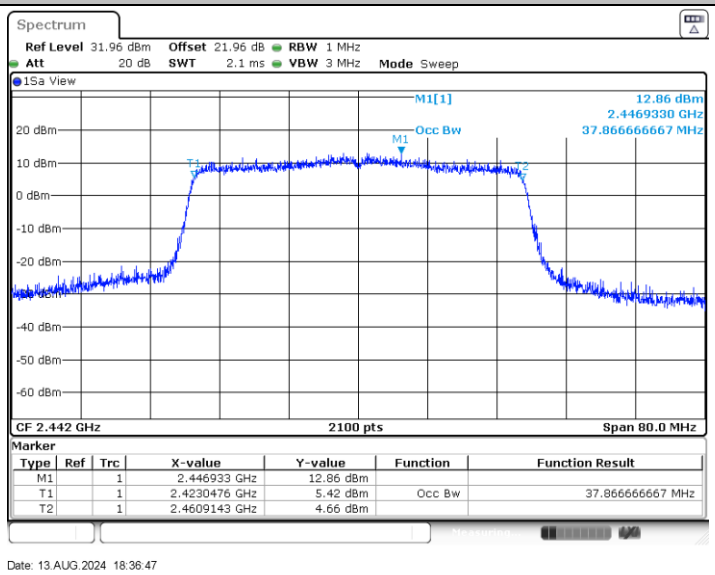
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