HCT CO.,LTD. 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA

TEL: +82-31-645-6300 FAX: +82-31-645-6401

EVALUATION REPORT

Applicant Name:
SAMSUNG Electronics Co., Ltd.

Address:
129, Samsung-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Rep. of Korea

Date of Issue:
October 29, 2021

Location:
HCT CO., LTD.,
74, Seoicheon-ro 578beon-gil, Majang-myeon,
Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA

FCC ID:	**A3LSMN980F1**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

Equipment Class(es) :	PCE, DSS, DTS, UNII, DXX, DCD
Rule Part(s) :	15, 22, 24, 27, 2, 90
Application's Statement :	The applicant takes full responsibility that the test data referenced below represents compliance for this FCC ID.
Differences Brief Description :	Hardware and software of this device are identical to the implementation in A3LSMN981B1 The operational description includes detailed information about the changes between the devices. The data from that application has been verified through appropriate spot checks to demonstrate compliance for this device as shown in the summary table below.
Test Reference :	KDB 484596 D01 Reference Test Data v01

The detail test data can be found in this documents, Appendix A.

Category	Spot Check	Verdict
Licensed EMC	ERP / EIRP	Share
	RSE	Share
Unlicensed EMC	Band Edge	Share
	Spurious Emissions	Share

Reference Detail Section

Reference FCC ID	Equipment Class	Report Title	Section
A3LSMN981B1	PCE	2G, 3G Report	All sections
		LTE B2 Report	All sections
		LTE B5 Report	All sections
		LTE B12(17) Report	All sections
		LTE B13 Report	All sections
		LTE B25 Report	All sections
		LTE B26 Report (Part 22)	All sections
		LTE B26 Report (Part 90)	All sections
		LTE B41 Report	All sections
		LTE B66(4) Report	All sections
	DSS	Bluetooth Report	All sections
	DTS	DTS Report , DTS ax Report	All sections
		BT LE Report	All sections
	NII	UNII Test Report , UNII ax Report	All sections
	DCD	WPT Report	All sections
	DXX	NFC Report	All sections

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Report prepared by : Jae Ryang Do

Engineer of Telecommunication testing center

Approved by : Jong Seok Lee

Manager of Telecommunication testing center

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REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	October 29, 2021	Initial Release

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Appendix A. The Spot check test data

1. Summary of the spot check for Licensed EMC

1.1 EFFECTIVE RADIATED POWER

Mode	Ch./ Freq.		Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol.	Limit	ERP	
	channel	Freq.(MHz)						W	W	dBm
GSM850	128	824.2	-22.86	38.18	-10.09	1.40	H	< 7.00	0.467	26.69
WCDMA850	4132	826.4	-31.15	29.93	-10.09	1.40	V		0.070	18.44
LTE B5	20425	826.5	-31.04	30.04	-10.09	1.40	H		0.072	18.55
LTE B26(22)	26805	825.5	-31.60	29.47	-10.09	1.40	H		0.063	17.98
LTE B26(90)	26740	819.0	-31.70	29.77	-10.10	1.40	H		0.067	18.26
LTE B26(90) (Straddle)	26790	824.0	-31.60	29.44	-10.09	1.40	H		0.062	17.95

Mode	Ch./ Freq.		Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol.	Limit	ERP	
	channel	Freq.(MHz)						W	W	dBm
LTE B12	23130	711.0	-33.49	26.07	-9.78	1.29	H	< 3.00	0.032	15.00
LTE B13	23255	784.5	-33.12	28.93	-10.08	1.35	V		0.056	17.50

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Mode	Frequency (MHz)		Mode	SM-N981B/DS (dBm)	SM-N980F/DS (dBm)	Deviation (dB)
	MHz	Ch.				
GSM850	824.2	128	VOICE	25.54	26.69	-1.15
WCDMA850	826.4	4132	RMC	18.34	18.44	-0.10
LTE B5 (B.W 5 MHz)	826.5	20425	QPSK	19.45	18.55	0.90
LTE B12 (B.W 10 MHz)	711.0	23130	QPSK	15.80	15.00	0.80
LTE B13 (B.W 5 MHz)	784.5	23255	QPSK	18.14	17.50	0.64
LTE B26(22) (B.W 3 MHz)	825.5	26805	QPSK	18.83	17.98	0.85
LTE B26(90) (B.W 10 MHz)	819.0	26740	QPSK	18.88	18.26	0.62
LTE B26(90) (Straddle) (B.W 10 MHz)	824.0	26790	QPSK	18.94	17.95	0.99

1.2 EQUIVALENT ISOTROPIC RADIATED POWER

Mode	Ch./ Freq.		Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol.	Limit	EIRP	
	channel	Freq.(MHz)						W	W	dBm
GSM1900	810	1909.8	-15.16	18.63	9.88	2.17	H	< 2.00	0.430	26.34
WCDMA1900	9400	1880.0	-23.08	10.90	9.98	2.25	H		0.073	18.63
LTE B2	18625	1852.5	-21.30	12.42	10.10	2.15	V		0.109	20.37
LTE B25	26065	1852.5	-21.30	12.42	10.10	2.15	V		0.109	20.37
LTE B41	41490	2680.0	-23.07	14.71	10.34	2.63	H		0.175	22.42

Mode	Ch./ Freq.		Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol.	Limit	EIRP	
	channel	Freq.(MHz)						W	W	dBm
WCDMA1700	1412	1732.4	-20.21	13.03	9.88	2.01	V	< 1.00	0.123	20.90
LTE B66	132322	1745.0	-20.58	12.55	9.97	1.99	V		0.113	20.53

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Modulation	Frequency		Mode	SM-N981B/DS (dBm)	SM-N980F/DS (dBm)	Deviation (dB)
	MHz	Ch.				
GSM1900	1909.8	810	VOICE	27.78	26.34	1.44
WCDMA1700	1732.4	1412	RMC	21.60	20.90	0.70
WCDMA1900	1880.0	9400	RMC	19.61	18.63	0.98
LTE B2 (B.W 5 MHz)	1852.5	18625	QPSK	21.62	20.37	1.25
LTE B25 (B.W 5 MHz)	1852.5	26065	QPSK	21.51	20.37	1.14
LTE B41 (B.W 20 MHz)	2680.0	41490	QPSK	21.64	22.42	-0.78
LTE B66 (B.W 20 MHz)	1745.0	132322	QPSK	21.64	20.53	1.11

1.3 RADIATED SPURIOUS EMISSIONS

Mode, Channel, (Frequency)	Freq. (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm]	C.L	Pol.	Result (dBm)
GSM850 CH 190 (824.2)	2 509.80	-57.23	10.28	-62.21	2.51	V	-54.44
GSM1900 CH 661 (1880)	7 520.00	-64.33	11.54	-49.88	4.51	V	-42.85
WDMA850 CH 4132 (826.4)	2 479.20	-51.77	10.10	-55.53	2.52	H	-47.95
WDMA1700 CH 1412 (1732.4)	6 929.60	-63.49	11.10	-51.44	4.32	V	-44.66
WDMA1900 CH 9262 (1852.4)	7 409.60	-64.15	11.24	-49.19	4.41	H	-42.36
LTE B2 CH 19175 (1907.5)	7 630.00	-63.76	11.60	-48.87	4.55	H	-41.82
LTE B5 CH 20625 (846.5)	3 386.00	-61.14	11.30	-63.30	2.99	H	-54.99
LTE B12 CH 23130 (711.0)	2 133.00	-55.10	9.12	-59.78	2.31	H	-52.97
LTE B13 CH 23205 (779.5)	2 338.5	-52.14	10.64	-58.37	2.47	V	-50.20
LTE B13 Narrow Band CH 23205 (779.5)	1 609.26	-67.51	9.08	-77.02	2.00	V	-69.94
LTE B25 CH 26065 (1852.5)	7 410.00	-64.45	11.24	-49.49	4.41	V	-42.66
LTE B26(part22) CH 26805 (825.5)	3 302.00	-60.15	11.10	-62.81	2.92	H	-54.63
LTE B26(part90) CH 26740 (819.0)	2 457.00	-58.00	10.04	-63.50	2.56	H	-56.02
LTE B26(part90) (Straddle) CH 26790 (824.0)	3 296.00	-61.07	11.00	-63.60	2.93	H	-55.52
LTE B41 CH 39750 (2506.0)	15 036.00	-55.45	14.54	-46.55	6.72	H	-38.73
LTE B66 CH 132072 (1720.0)	6 880.00	-62.40	11.14	-50.40	4.48	V	-43.74

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Modulation	Frequency		Mode	SM-N981B/DS (dBm)	SM-N980F/DS (dBm)	Deviation (dB)
	MHz	Ch.				
GSM850	2 509.80	190	VOICE	-52.23	-54.44	2.21
GSM1900	7 520.00	661	RMC	-41.58	-42.58	1.27
WDMA850	2 479.20	4132	RMC	-46.71	-47.95	1.24
WDMA1700	6 929.60	1412	RMC	-44.65	-44.66	0.01
WDMA1900	7 409.60	9262	RMC	-41.46	-42.36	0.90
LTE B2 (B.W 5 MHz)	7 630.00	19175	QPSK	-42.68	-41.82	-0.86
LTE B5 (B.W 5 MHz)	3 386.00	20625	QPSK	-53.64	-54.99	1.35
LTE B12 (B.W 10 MHz)	2 133.00	23130	QPSK	-53.58	-52.97	-0.61
LTE B13 (B.W 5 MHz)	2 338.5	23205	QPSK	-47.72	-50.20	2.48
LTE B13 Narrow Band (B.W 5 MHz)	1 609.26	23205	QPSK	-69.67	-69.94	0.27
LTE B25 (B.W 5 MHz)	7 410.00	26065	QPSK	-42.12	-42.66	0.54
LTE B26(part22) (B.W 3 MHz)	3 302.00	26805	QPSK	-52.38	-54.63	2.25
LTE B26(part90) (B.W 10 MHz)	2 457.00	26740	QPSK	-52.95	-56.02	3.07
LTE B26(part90) (Straddle) (B.W 10 MHz)	3 296.00	26790	QPSK	-54.78	-55.52	0.74
LTE B41 (B.W 10 MHz)	15 036.00	39750	QPSK	-35.35	-38.73	3.38
LTE B66 (B.W 20 MHz)	6 880.00	132072	QPSK	-43.78	-43.74	-0.04

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2. Summary of the spot check for Unlicensed EMC

Mod	Test Item	Mod/ Channel	Measured Frequency [MHz]	SM-N981B/DS Result [dBuV/m]		SM-N980F/DS Result [dBuV/m]		Deviation (dB)	
				Average	Peak	Average	Peak	Average	Peak
BT	Band Edge	3-DH5_ch 78	2483.5 MHz~ 2500 MHz	27.02	58.28	21.92	55.53	5.10	2.75
	RSE	3-DH5 _ch 39	7323 MHz	37.4	51.12	35.69	49.83	1.71	1.29
BT LE	Band Edge	2M_37 byte_ch 39	2483.5 MHz~ 2500 MHz	47.72	54.25	47.62	54.15	0.10	0.10
	RSE	2M_37 byte_ch 39	7440 MHz	44.45	51.67	43.48	52.04	-	-0.37
WLAN	DTS BE	n / ch 11 / PLS 14	# 2483.5 MHz~ 2484.5 MHz	-	63.02	-	64.62	-	-1.60
			2484.5 MHz~ 2500 MHz	-	71.29	-	70.60	-	0.69
			2483.5 MHz~ 2500 MHz	51.49	-	52.68	-	-1.19	-
	DTS RSE	n / ch 06 / PLS 17	7311 MHz	39.83	51.82	39.20	50.68	0.63	1.14
		Ant 2 b / ch 11 / PLS 19	7386 MHz	44.48	54.86	42.19	52.57	2.29	2.29
	DTS_ax BE	HE20 242T_RU 61 / ch13 / PLS 7	2483.5 MHz~ 2500 MHz	50.49	71.42	51.81	72.05	-1.32	-0.63
	DTS_ax RSE	HE20 52T_RU 40 / ch11 / PLS 16	7386 MHz	44.19	66.02	42.65	62.66	1.54	3.36
	UNII BE	n20M / ch 36 / PLS 17	4500~ 5150 MHz	51.46	66.42	51.84	67.70	-0.38	-1.28
	UNII RSE	a / ch 165 / PLS 17	11650 MHz	48.89	63.73	44.15	60.01	4.74	3.72
	UNII_ax BE	HE80 484T / ch106 / PLS 12	5350 ~ 5460 MHz	48.16	61.01	45.79	60.44	2.37	0.57
			5460 ~ 5470 MHz	-	65.61	-	64.25	-	1.36
	UNII_ax RSE	HE40_52T_RU41 / ch 151 / PLS 15	17265 MHz	-	65.18	-	64.23	-	0.95
NFC		Fundmental	13.56 MHz	14.71		12.70		2.01	
		RSE	30MHz ~ 1GHz	23.37		21.15		2.22	
WPT		Fundmental	590 ~ 625 KHz (S-pen Charging)	15.61		16.67		-1.06	

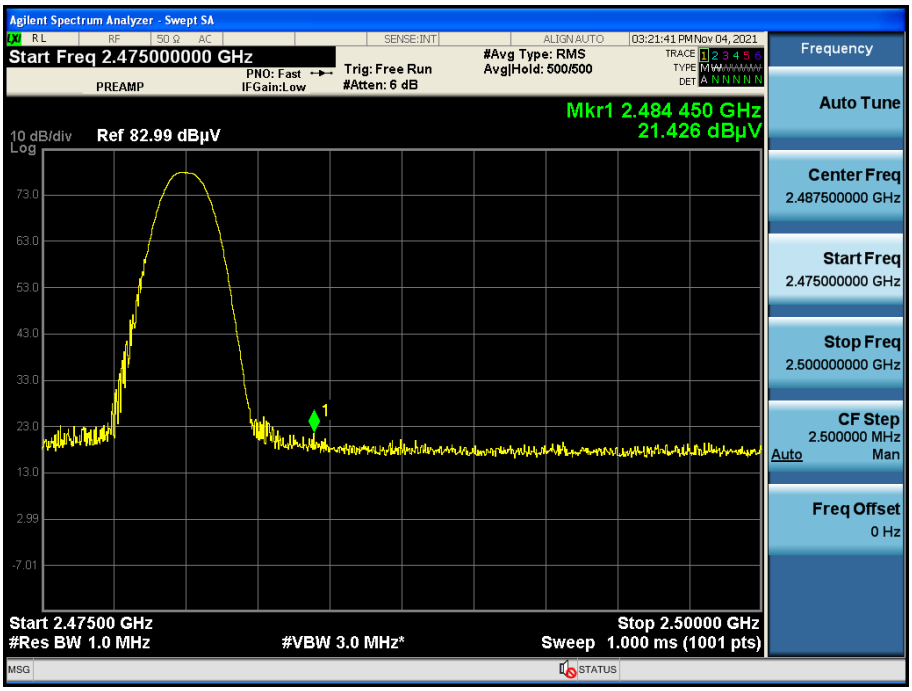
3. Test Plot

BT Band Edge (DH5/ch.78)

Bandedge

Frequency [MHz]	Measured Value dBuV	※ A.F.+CL [dB]	ANT. POL [H/V]	D.C.C.F [dB]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	21.43	34.10	H	0	55.53	73.98	18.45	PK
2483.5	12.56	34.10	H	-24.73	21.92	53.98	32.06	AV

[Radiated Restricted Band Edges plot- Peak Result]



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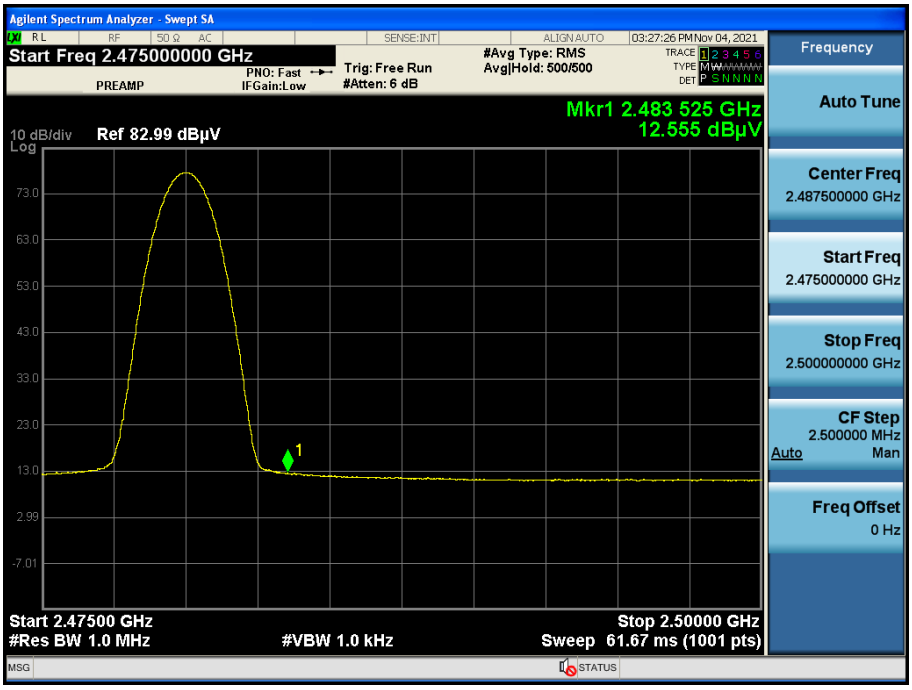
[Radiated Restricted Band Edges plot- Average Result]



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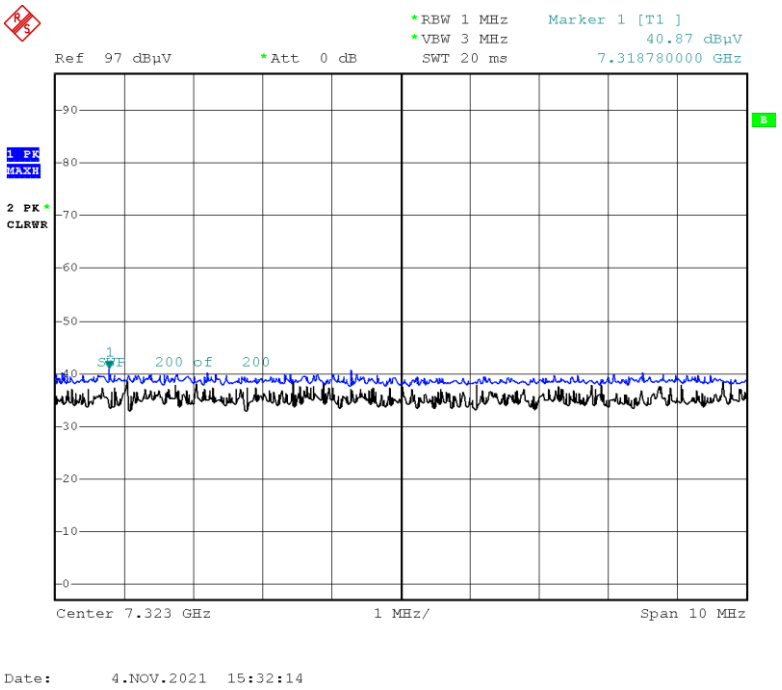
BT R.S.E 3rd Harmonic(DH5/ch.78)

RSE

Frequency [MHz]	Measured Value dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
7440	40.87	10.35	V	51.22	73.98	22.76	PK
7440	26.73	10.35	V	37.08	53.98	16.90	AV

[Radiated Spurious Emissions plot – Peak Result]



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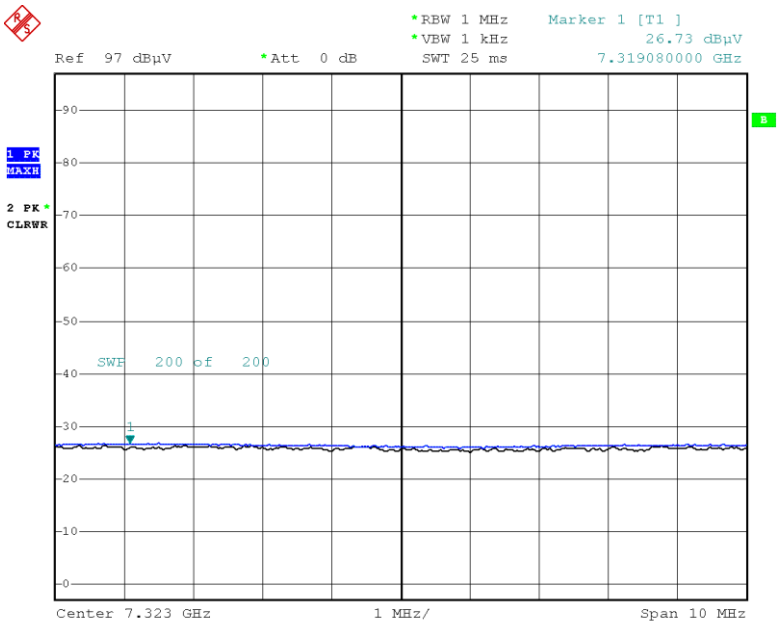
[Radiated Spurious Emissions plot – Average Result]

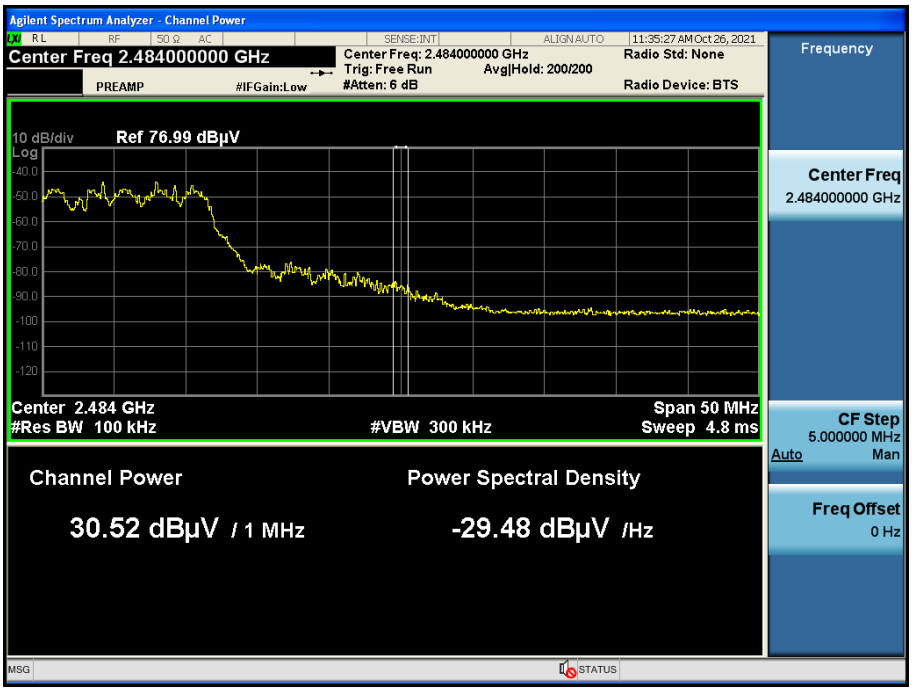


DTS Band Edge (802.11n_20 MHz 6.5 Mbps_ch11)

Bandedge

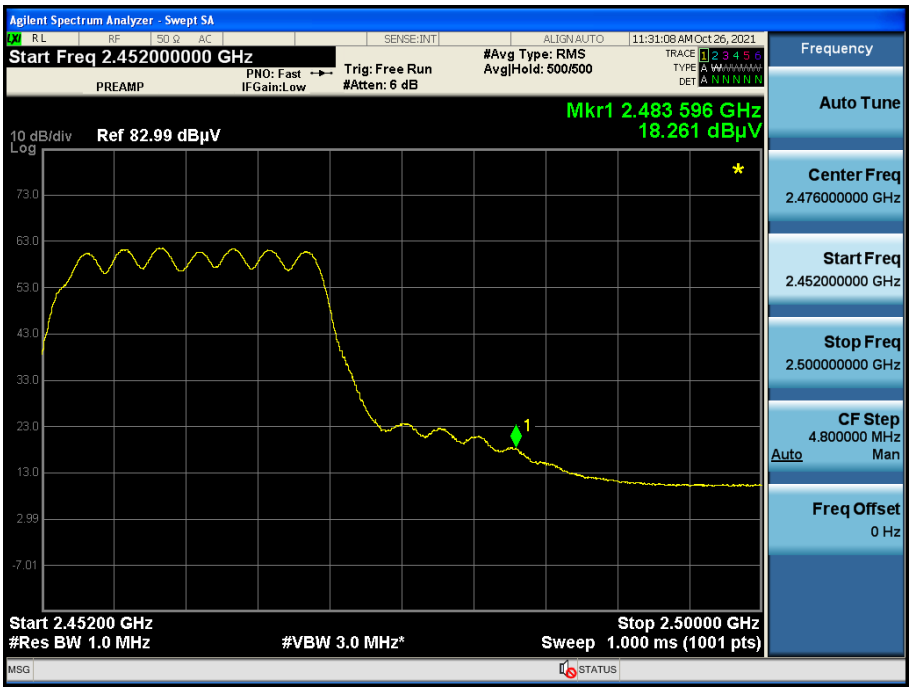
Frequency [MHz]	Measured Value dBuV	Duty Cycle Factor	※ A.F.+CL [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2484.0	30.52	0.000	34.10	H	64.62	73.98	9.36	PK
2484.5	36.50	0.000	34.10	H	70.60	73.98	3.38	PK
2483.5	18.26	0.318	34.10	H	52.68	53.98	1.30	AV

[Radiated Restricted Band Edges plot – Peak Result]



[Radiated Restricted Band Edges plot – Peak Result]

[Radiated Restricted Band Edges plot – Average Result]



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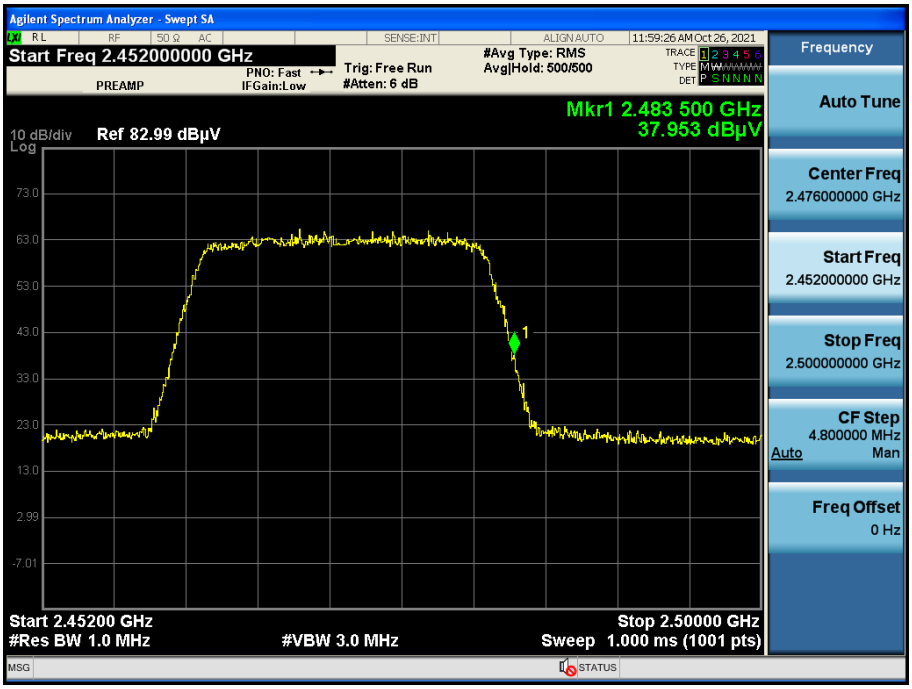
DTS Band Edge (802.11ax_20 MHz 242T_ch13)

Bandedge

Frequency [MHz]	Measured Value dBuV	Duty Cycle Factor	※ A.F.+CL [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	37.95	0.00	34.10	H	72.05	73.98	1.93	PK
2483.5	17.33	0.38	34.10	H	51.81	53.98	2.17	AV

[Radiated Restricted Band Edges plot – Peak Result]



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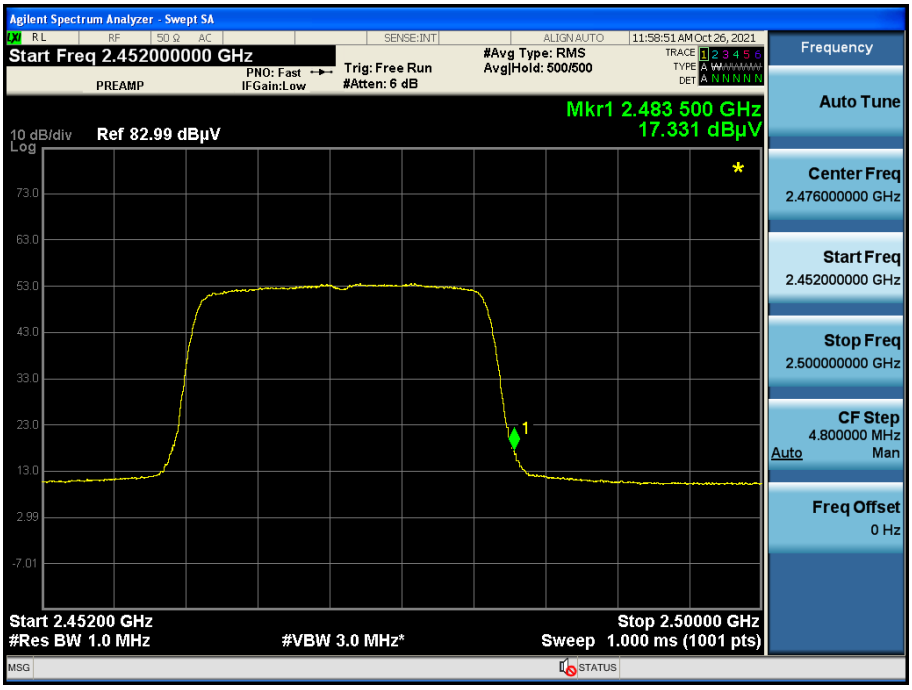
[Radiated Restricted Band Edges plot – Average Result]



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DTS R.S.E 3rd Harmonic

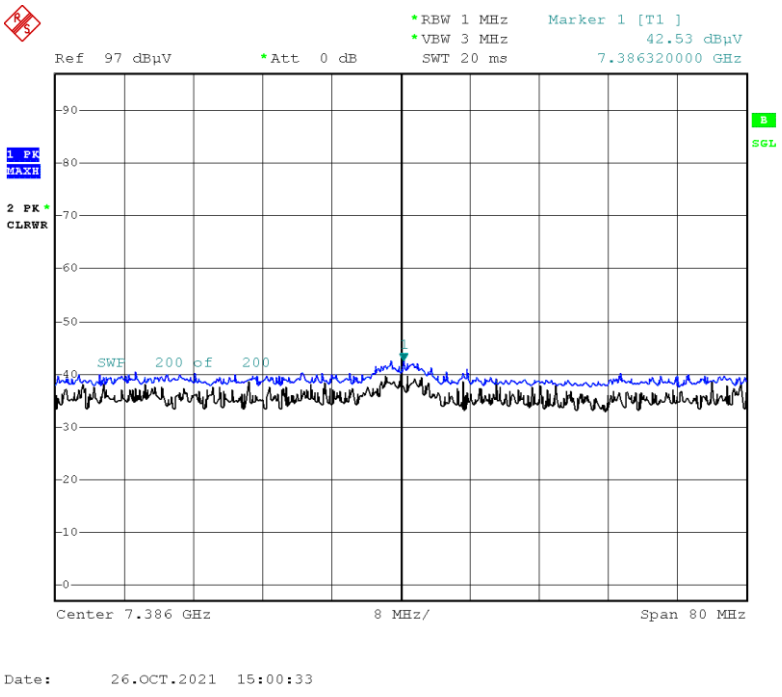
(802.11b 1 Mbps_ch.11(ANT 2)/ 802.11n 6.5 Mbps_ch.6(MIMO))

RSE

-802.11b 1 Mbps_ch.11(ANT 2)-

Frequency [MHz]	Measured Value [dBuV]	AN.+CL-AMP G [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
7386	42.53	10.04	V	52.57	73.98	21.41	PK
7386	32.15	10.04	V	42.19	53.98	11.79	AV

[Radiated Spurious Emissions plot – Peak Result]



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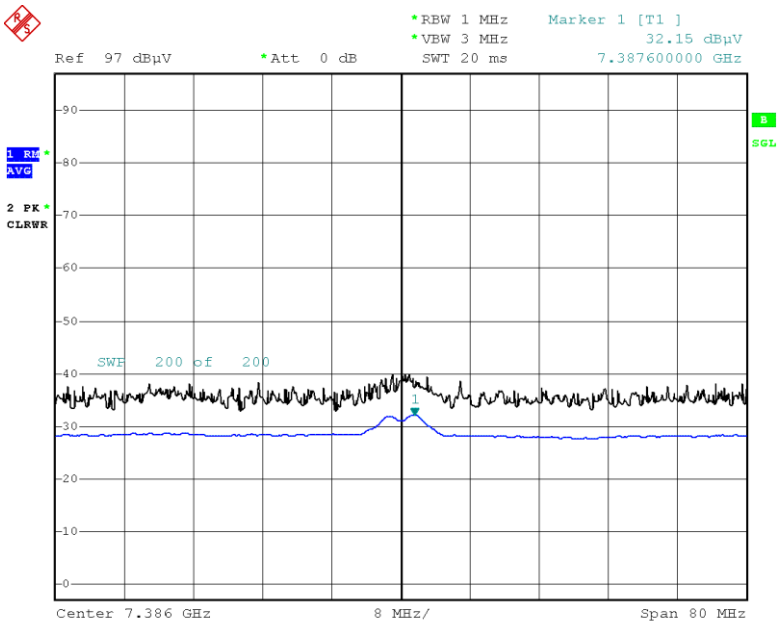
[Radiated Spurious Emissions plot – Average Result]

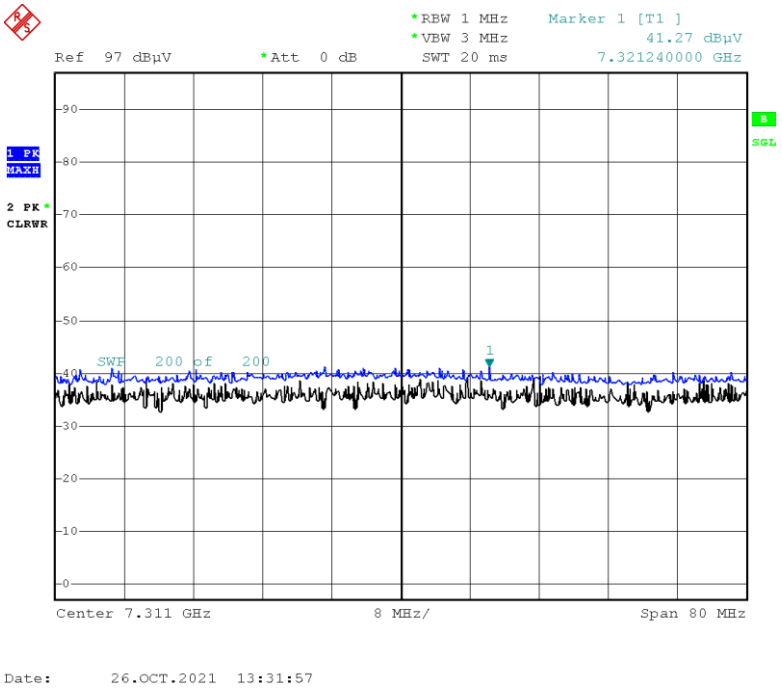


Date: 26.OCT.2021 15:00:21

-802.11n 6.5 Mbps_ch.6(MIMO)-

Frequency [MHz]	Measured Value [dBuV]	Duty Cycle Factor	AN.+CL-AMP G [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
7311	41.27	0.000	9.41	V	50.68	73.98	23.30	PK
7311	29.47	0.318	9.41	H	39.20	53.98	14.78	AV

[Radiated Spurious Emissions plot – Peak Result]



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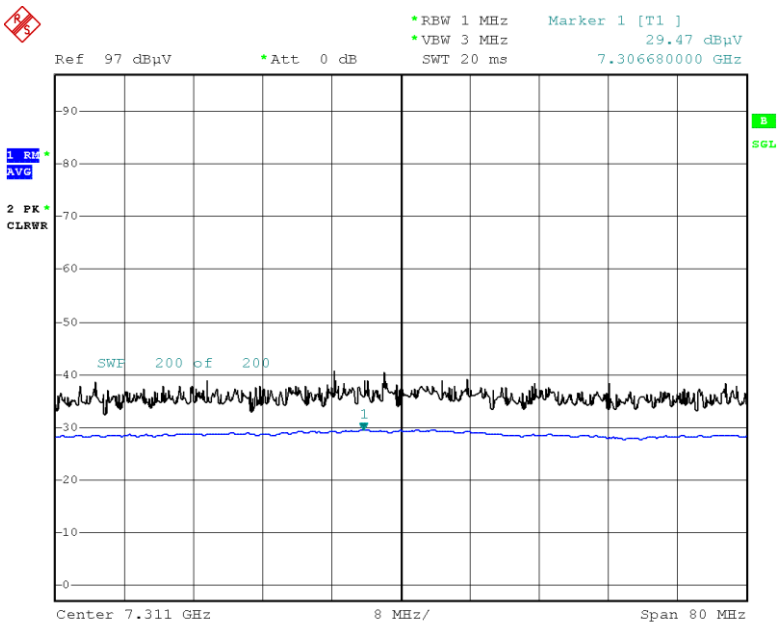
[Radiated Spurious Emissions plot – Average Result]



Date: 26.OCT.2021 13:22:51

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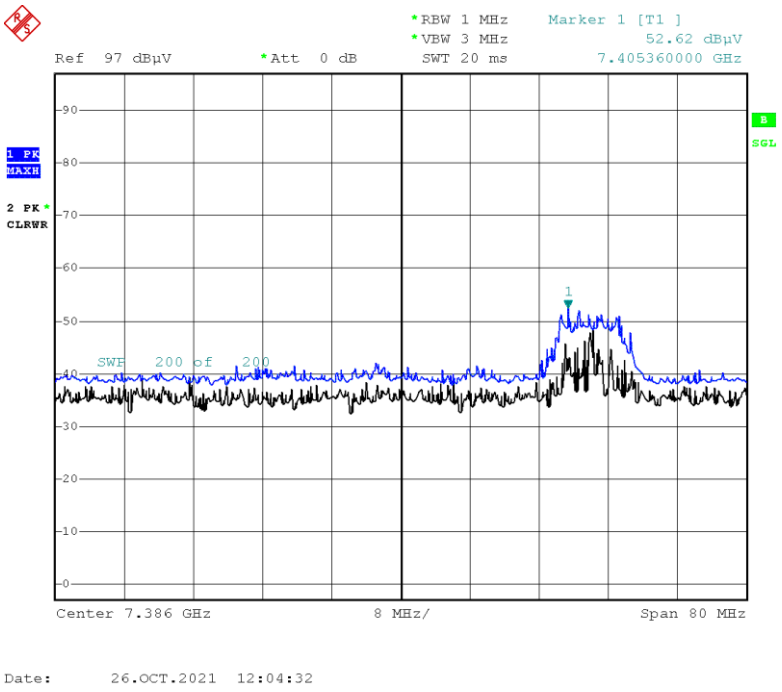
DTS R.S.E 3rd Harmonic(802.11ax_20 MHz / ch.11)

RSE

Frequency [MHz]	Measured Value [dBuV]	Duty Cycle Factor	AN.+CL-AMP G [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
7386	52.62	0.000	10.04	V	62.66	73.98	11.32	PK
7386	32.31	0.298	10.04	V	42.65	53.98	11.33	AV

[Radiated Spurious Emissions plot – Peak Result]



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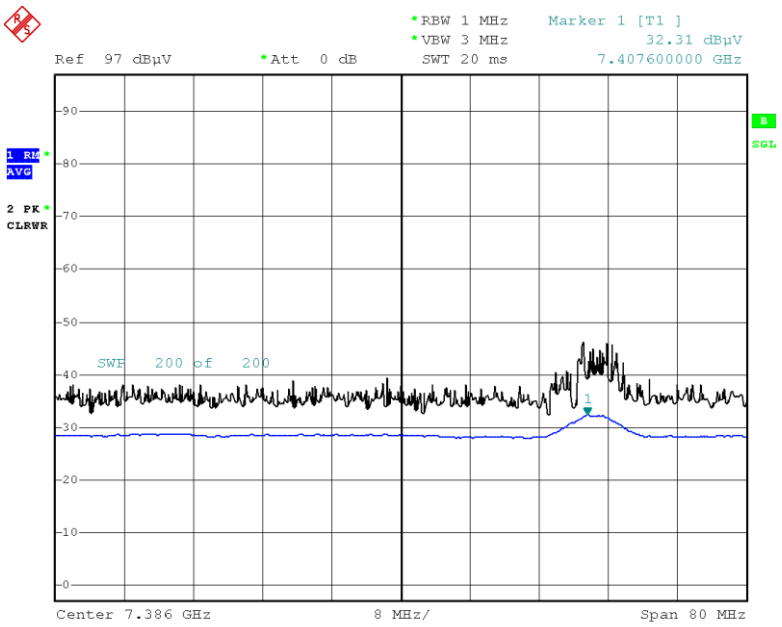
[Radiated Spurious Emissions plot – Average Result]



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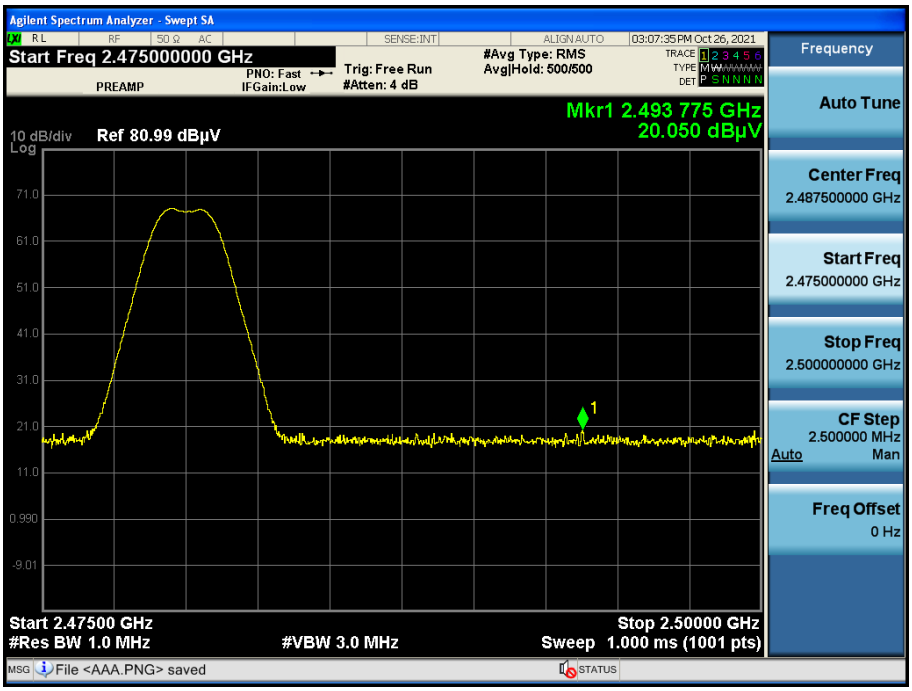
BT(LE) Band Edge (LE(5.0) 2M 37 byte/ch.39)

Bandedge

Frequency [MHz]	Measured Value dBuV	Duty cycle Factor	※ A.F.+CL [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	20.05	0.000	34.10	H	54.15	73.98	19.83	PK
2483.5	8.42	5.092	34.10	H	47.62	53.98	6.36	AV

[Radiated Restricted Band Edges plot – Peak Result]



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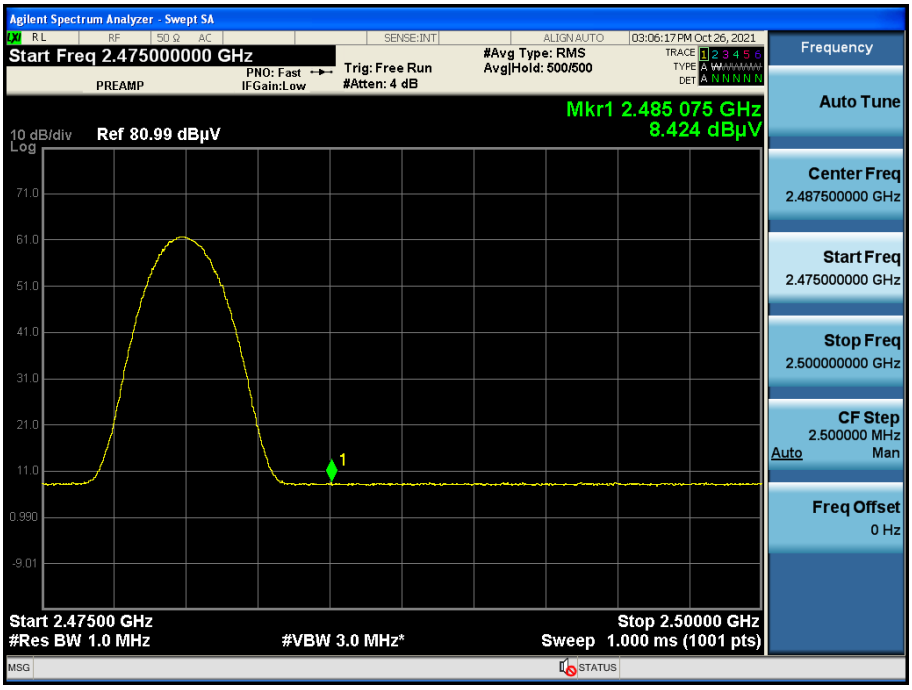
[Radiated Restricted Band Edges plot – Average Result]



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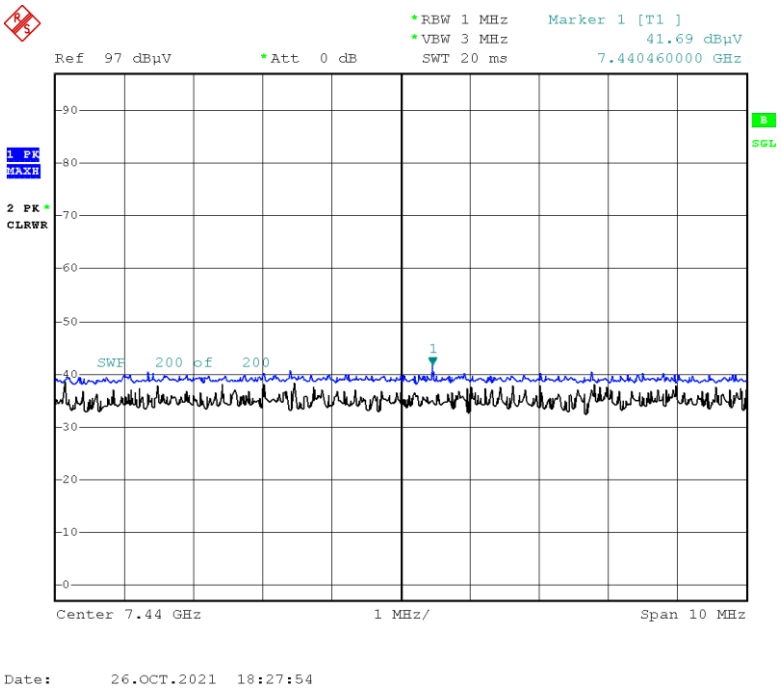
BT(LE) R.S.E 3rd Harmonic (LE(5.0) 2M 37 byte/ch.39)

RSE

Frequency [MHz]	Measured Value dBuV	Duty cycle Factor	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
7440	41.69	0.000	10.35	V	52.04	73.98	21.94	PK
7440	28.04	5.092	10.35	H	43.48	53.98	10.50	AV

[Radiated Spurious Emissions plot – Peak Result]



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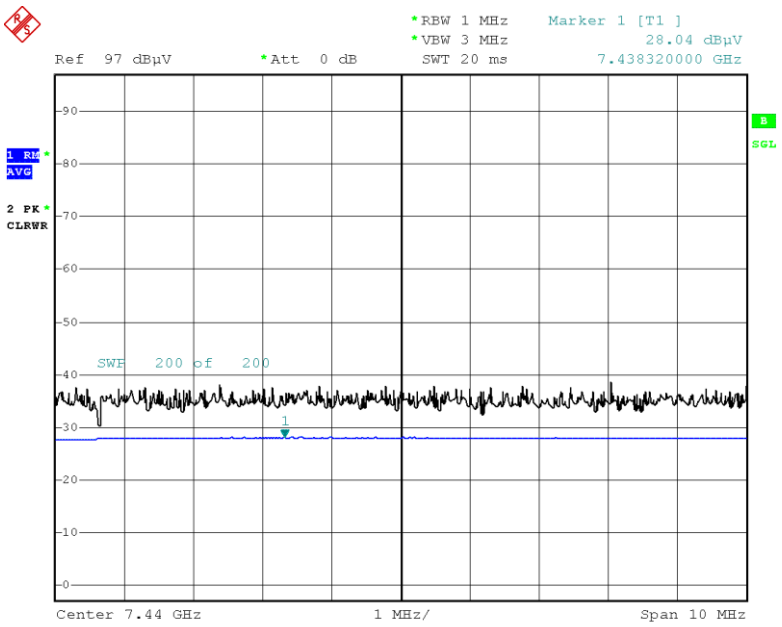
[Radiated Spurious Emissions plot – Average Result]



Date: 26.OCT.2021 16:46:03

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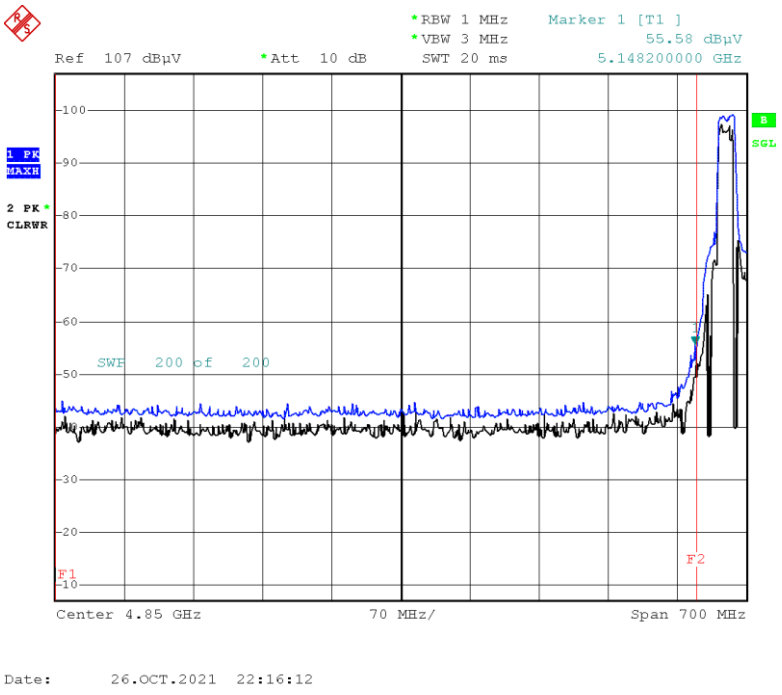
U-NII Band Edge (802.11n_20 MHz BW 6.5 Mbps_ch36)

Bandedge

Frequency [MHz]	Measured Value dBuV	CL+AF+DF-AG [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	55.58	12.12	H	67.70	73.98	6.28	PK
5150	39.72	12.12	H	51.84	53.98	2.14	AV

Radiated Restricted Band Edges plot – Peak Result



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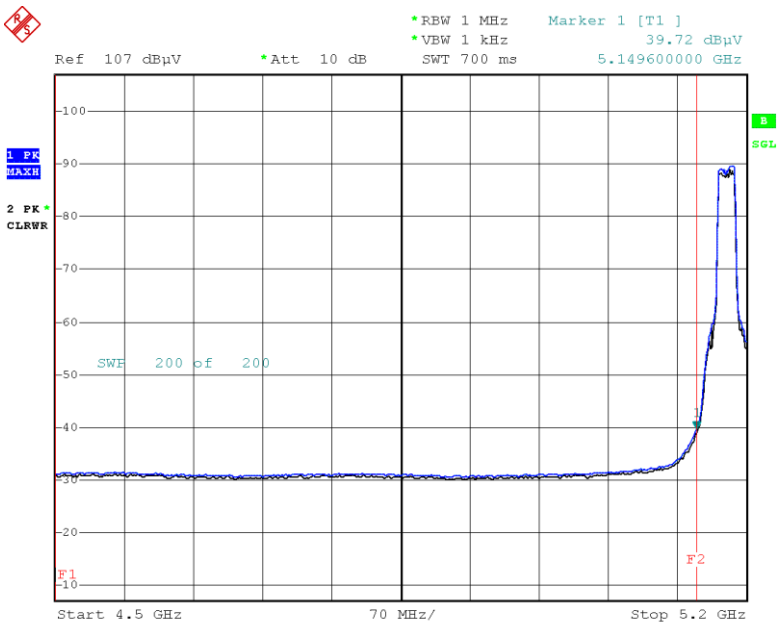
Radiated Restricted Band Edges plot – Average Result



Date: 26.OCT.2021 22:01:43

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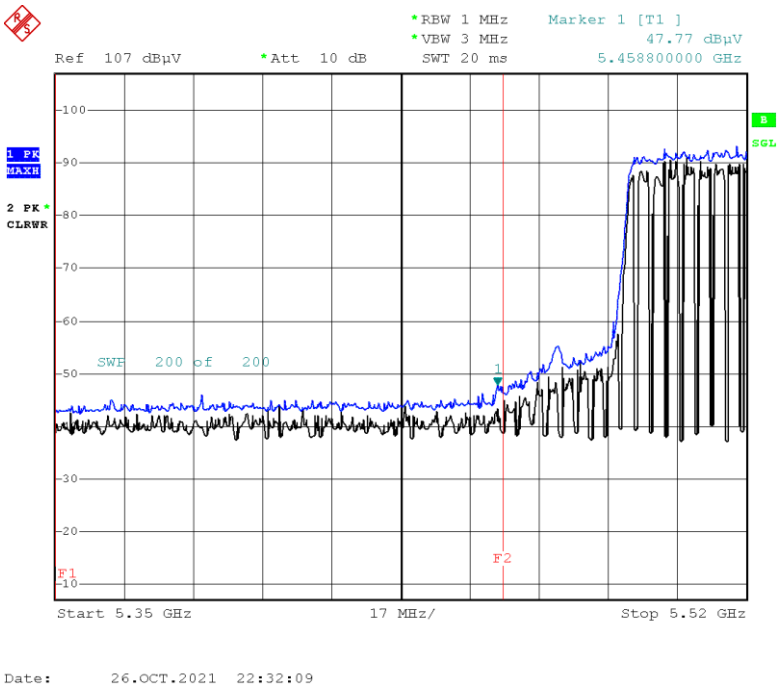
U-NII Band Edge (802.11ax_HE80 484T_ch106)

Bandedge

Frequency [MHz]	Measured Value dBuV	CL+AF+DF-AG [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	47.77	12.67	H	60.44	73.98	13.54	PK
5460	33.12	12.67	H	45.79	53.98	8.19	AV
5470	51.55	12.70	H	64.25	68.20	3.95	PK

Radiated Restricted Band Edges plot – Peak Result



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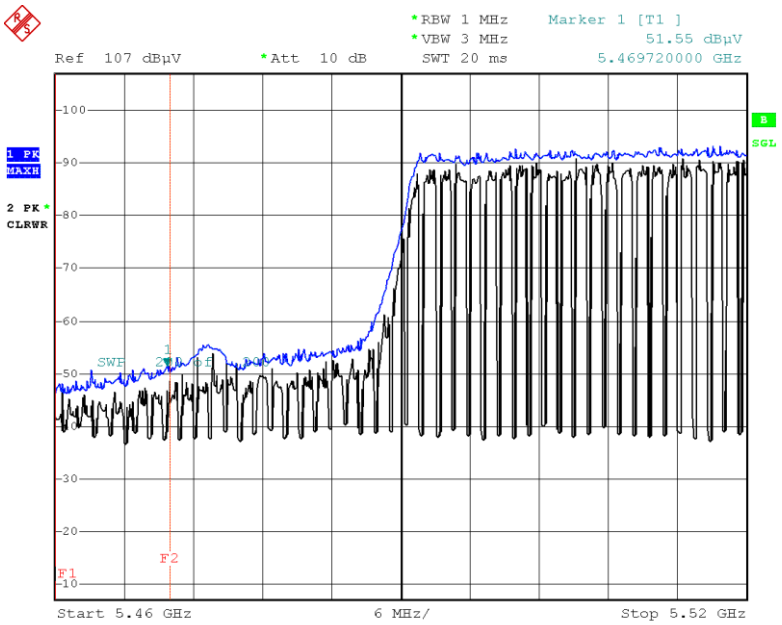
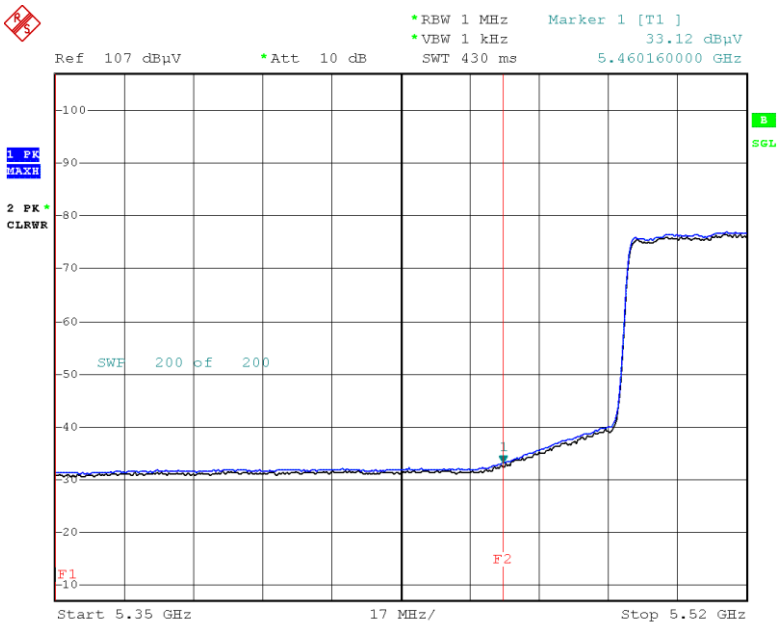
Radiated Restricted Band Edges plot – Peak Result



Date: 26.OCT.2021 22:32:43

Radiated Restricted Band Edges plot – Average Result



Date: 26.OCT.2021 22:31:44

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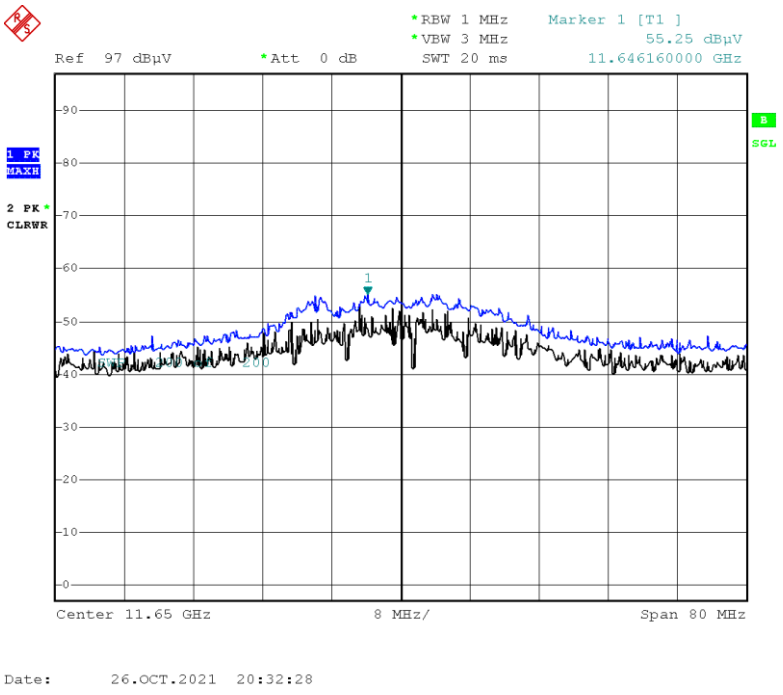
U-NII R.S.E 2nd Harmonic (802.11a_6 Mbps _ch 52)

RSE

Frequency [MHz]	Measured Value dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11 650	55.25	4.76	H	60.01	73.98	13.97	PK
11 650	39.39	4.76	H	44.15	53.98	9.83	AV

[Radiated Spurious Emissions plot – Peak Result]



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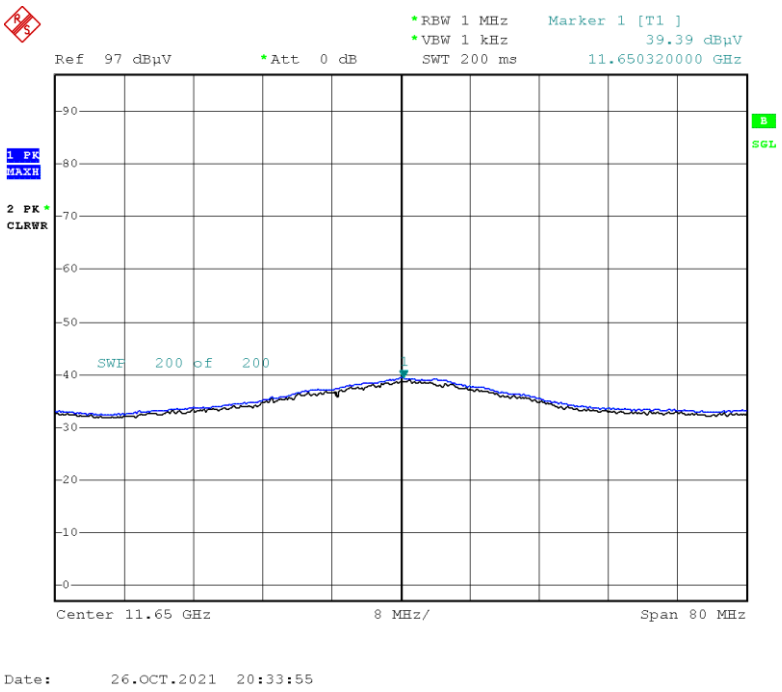
[Radiated Spurious Emissions plot – Average Result]



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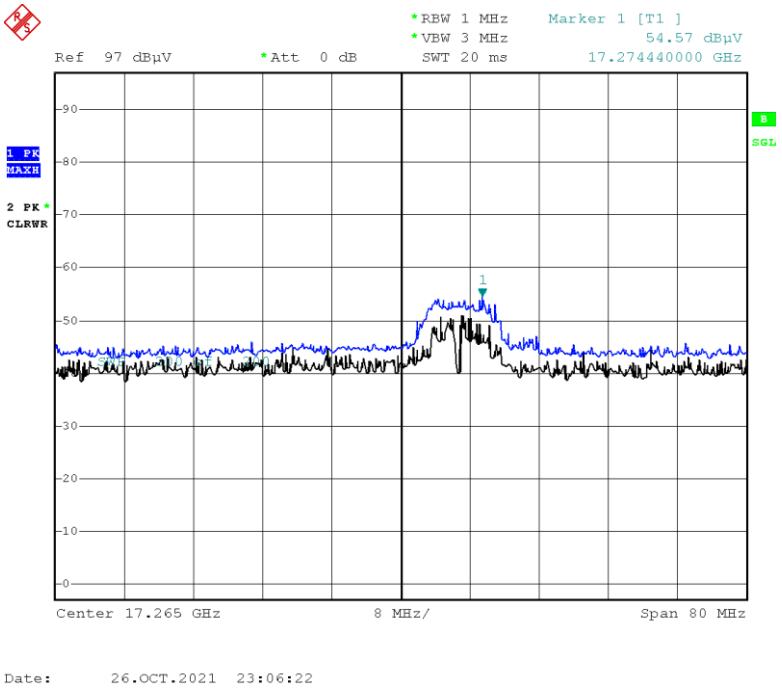
U-NII R.S.E 3rd Harmonic (802.11ax_HE40_ch151)

RSE

Frequency [MHz]	Measured Value dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
17 265	54.57	9.66	V	64.23	68.20	3.97	PK

[Radiated Spurious Emissions plot – Peak Result]



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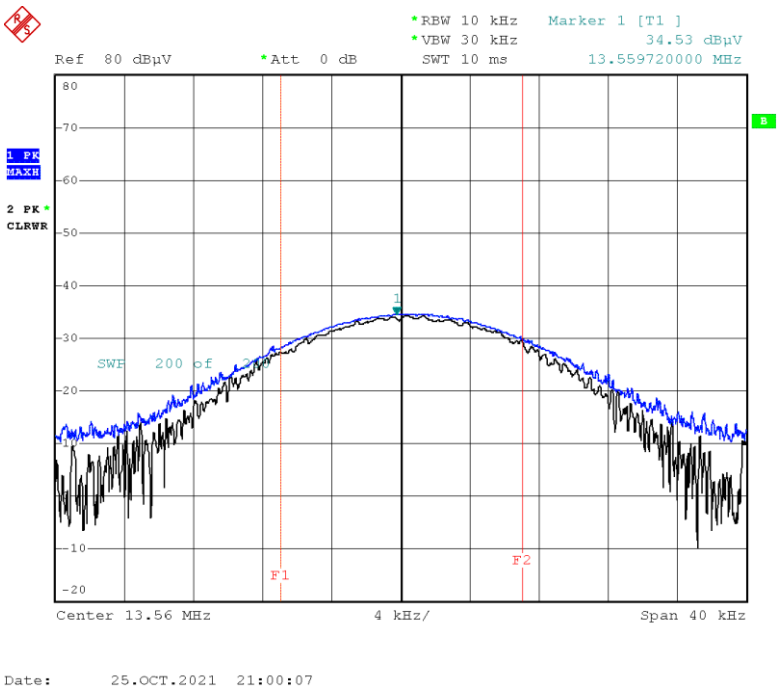
NFC fund

Frequency (MHz)	Read Level (dBuV)@3m	Ant.Factor+Cable Loss (dB/m)	Distance Correction (dB)	Result Level (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.559 72	34.53	18.17	-40.00	12.70	84.00	71.30

[plot]



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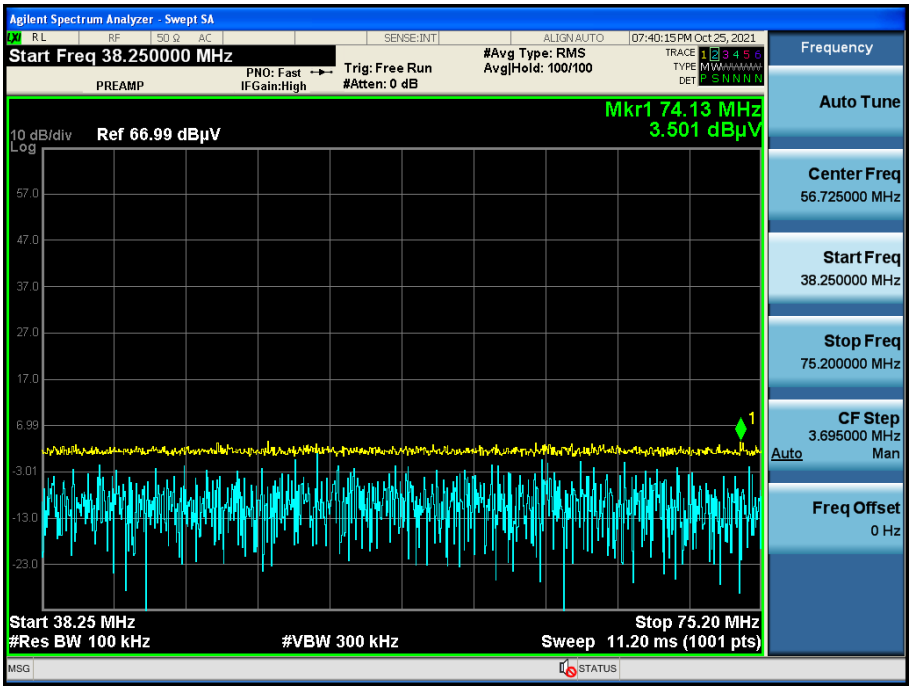
NFC R.S.E Harmonic

RSE

Frequency MHz	Measured Value dBμV	Ant. factor dB /m	Cable loss dB	Ant. POL (H/V)	Total dBμV/m	Limit dBμV/m	Margin dB
74.1300	3.50	16.90	0.75	H	21.15	40.00	18.85

[Radiated Spurious Emissions plot]



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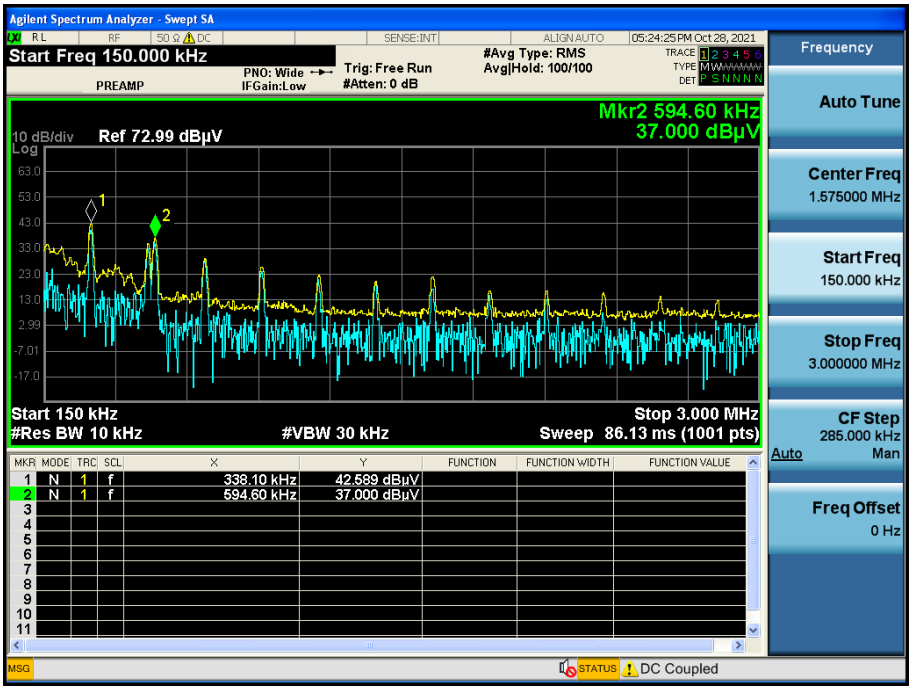
WPT

Fundamental

Frequency (kHz)	Measured Value Level (dBuV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
591.60	37	19.2	0.47	-40	16.67	32.12	15.45

[plot]



4. List of test equipment

Equipment	Model	Manufacture	Serial No.	Due to Calibration	Calibration Interval
Precision Dipole Antenna	UHAP	Schwarzbeck	01273	05/30/2022	Biennial
Precision Dipole Antenna	UHAP	Schwarzbeck	01274	05/30/2022	Biennial
Horn Antenna(1~18GHz)	BBHA 9120D	Schwarzbeck	02289	05/08/2022	Biennial
Horn Antenna(1~18GHz)	BBHA 9120D	Schwarzbeck	9120D-1299	05/04/2022	Biennial
Horn Antenna(15~40GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	10/13/2022	Biennial
Horn Antenna(15~40GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	02/11/2022	Biennial
Loop Antenna(9kHz~30 MHz)	FMZB1513	Rohde & Schwarz	1513-175	05/18/2022	Biennial
Bilog Antenna	VULB9160	Schwarzbeck	3150	03/03/2023	Biennial
Hybrid Antenna	VULB9160	Schwarzbeck	760	02/22/2023	Biennial
High Pass Filter	WHKX10-900-1000-15000-40SS	Wainwright Instruments	15	06/15/2022	Annual
High Pass Filter	WHKX10-2700-3000-18000-40SS	Wainwright Instruments	145	06/15/2022	Annual
High Pass Filter	WHNX6-4740-6000-26500-40CC	Wainwright Instruments	11	06/15/2022	Annual
LOW NOISE AMP (100 MHz ~ 18GHz)	CBLU1183540B-01	CERNEX	26822	06/15/2022	Annual
Power Amplifier	CBL18265035	CERNEX	22966	12/04/2021	Annual
Power Amplifier	CBL26405040	CERNEX	25956	03/23/2022	Annual
DC Power Supply	E3632A	Hewlett Packard	MY40004427	09/15/2022	Annual
Power Splitter(DC~26.5 GHz)	11667B	Hewlett Packard	11275	04/07/2022	Annual
Chamber	SU-642	ESPEC	93008124	03/15/2022	Annual
Signal Analyzer(10Hz~26.5GHz)	N9020A	Agilent	MY51110063	04/22/2022	Annual
ATTENUATOR(20dB)	8493C	Hewlett Packard	17280	06/01/2022	Annual
Spectrum Analyzer(10Hz~40GHz)	FSV40	REOHDE & SCHWARZ	101436	03/02/2022	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/18/2022	Annual
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262116770	07/12/2022	Annual
Wideband Radio Communication Tester	MT8820C	Anritsu Corp.	6201026545	01/07/2022	Annual
SIGNAL GENERATOR (100kHz~40GHz)	SMB100A	REOHDE & SCHWARZ	177633	07/05/2022	Annual
Signal Analyzer(5Hz~40.0GHz)	N9030B	KEYSIGHT	MY55480167	06/02/2022	Annual
FCC LTE Mobile Conducted RF Automation Test Software	-	HCT CO., LTD.,	-	-	-

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Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
Controller (Antenna mast)	CO3000	Innco system	CO3000-4p	N/A	N/A
Antenna Position Tower	MA4640/800-XP-EP	Innco system	N/A	N/A	N/A
Controller	2090	Emco	060520	N/A	N/A
Turn Table	Turn Table	Ets	N/A	N/A	N/A
Loop Antenna	Loop Antenna	Rohde & Schwarz	1513-333	03/19/2022	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	9168-0895	09/04/2022	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	9120D-1191	11/18/2021	Biennial
Horn Antenna (15 GHz ~ 40 GHz)	BBHA9170	Schwarzbeck	BBHA9170541	11/29/2021	Biennial
Spectrum Analyzer	FSP (9 kHz ~ 30 GHz)	Rohde & Schwarz	836650/016	09/13/2022	Annual
Spectrum Analyzer	FSV40-N	Rohde & Schwarz	101068-SZ	09/15/2022	Annual
Signal Analyzer	N9020A	Agilent	MY50200093	11/17/2022	Annual
Band Reject Filter	WRCJV2400/2483.5-2370/2520-60/12SS	Wainwright Instruments	2	01/06/2022	Annual
Band Reject Filter	WRCJV5100/5850-40/50-8EEK	Wainwright Instruments	1	02/08/2022	Annual
Attenuator (10 dB) 56-10	CBLU1183540B-01 56-10	CERNEX WEINSCHEL	N/A	12/23/2021	Annual
Broadband Low Noise Amplifier Attenuator (3 dB)	CBL06185030 18B-03	CERNEX Api tech.	N/A	12/23/2021	Annual
High Pass Filter	WHKX10-2700-3000-18000-40SS	Wainwright Instruments	N/A	12/23/2021	Annual
High Pass Filter	WHKX8-6090-7000-18000-40SS	Wainwright Instruments	N/A	12/23/2021	Annual
Thru	COAXIAL ATTENUATOR	T&M SYSTEM	N/A	12/23/2021	Annual
Power Amplifier	CBL18265035	CERNEX	22966	12/04/2021	Annual
Power Amplifier	CBL26405040	CERNEX	25956	03/23/2022	Annual
Bluetooth Tester	TC-3000C	TESCOM	3000C000276	03/09/2022	Annual