

EVALUATION REPORT

Applicant Name:

SAMSUNG Electronics Co., Ltd.

Date of Issue:

January 07, 2022

Location:

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

Address:

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

FCC ID: A3LSMA336B

APPLICANT: SAMSUNG Electronics Co., Ltd.

Equipment Class(es) : PCE, DSS, DTS, NII, DXX

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 A3LSMA336M
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
A3LSMA336M	PCE	3G Report	All sections
		LTE B2 Report	All sections
		LTE B12(17) Report	All sections
		LTE B5 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	All sections
		BT LE Report	All sections
	NII	UNII Test Report	All sections
	DXX	NFC Report	All sections



Report prepared by : Jae Mun Do

Engineer of Telecommunication testing center



Approved by : Jong Seok Lee

Manager of Telecommunication testing center

REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	January 07, 2022	Initial Release

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	190	836.6	-23.94	39.10	-10.19	1.41	V	< 7.00	0.563	27.50
WCDMA850	4183	836.6	-31.91	31.13	-10.19	1.41	V		0.090	19.53
LTE B5	20525	836.5	-31.92	31.12	-10.19	1.41	V		0.090	19.52
LTE B26(22)	26915	836.5	-32.81	30.23	-10.19	1.41	V		0.073	18.63
LTE B26(90)	26783	823.3	-32.33	30.72	-10.25	1.39	V		0.081	19.08
LTE B26(90) (Straddle)	26790	824.0	-32.31	30.62	-10.25	1.39	V		0.079	18.98

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(17)	23095	707.5	-31.48	28.60	-9.93	1.29	V	< 3.00	0.055	17.38

Mode	Frequency (MHz)		Mode	SM-A336M/DSN (dBm)	SM-A336B/DSN (dBm)	Deviation (dB)
	MHz	Ch.				
GSM850	836.6	190	VOICE	27.98	27.50	0.48
WCDMA850	836.6	4183	RMC	19.68	19.53	0.15
LTE B5 (B.W 3 MHz)	836.5	20525	QPSK	19.75	19.52	0.23
LTE B12(17) (B.W 3 MHz)	707.5	23095	QPSK	17.30	17.38	-0.08
LTE B26(22) (B.W 3 MHz)	836.5	26915	QPSK	19.72	18.63	1.09
LTE B26(90) (B.W 1.4 MHz)	823.3	26783	QPSK	19.43	19.08	0.35
LTE B26(90) (Straddle) (B.W 1.4 MHz)	824.0	26790	QPSK	19.40	18.98	0.43

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	-16.42	17.88	10.40	2.15	H	< 2.00	0.410	26.13
WCDMA1900	9538	1907.6	-23.12	11.18	10.40	2.15	H		0.088	19.43
LTE B2	19175	1907.5	-22.46	11.84	10.40	2.15	H		0.102	20.09
LTE B41	40620	2593.0	-23.65	13.67	10.62	2.53	V		0.150	21.76

Mode	Ch./ Freq.		Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol.	Limit	EIRP	
	channel	Freq.(MHz)						W	W	dBm
WCDMA1700	1312	1712.4	-20.21	13.39	10.04	2.05	V	< 1.00	0.137	21.38
LTE B66(4)	131979	1710.7	-20.57	13.22	10.04	2.05	V		0.132	21.21

Modulation	Frequency		Mode	SM-A336M/DSN (dBm)	SM-A336B/DSN (dBm)	Deviation (dB)
	MHz	Ch.				
GSM1900	1909.8	810	VOICE	26.42	26.13	0.29
WCDMA1700	1712.4	1312	RMC	21.51	21.38	0.14
WCDMA1900	1907.6	9538	RMC	20.07	19.43	0.64
LTE B2 (B.W 5 MHz)	1907.5	19175	QPSK	20.01	20.09	-0.08
LTE B41 (B.W 20 MHz)	2593.0	40620	QPSK	23.47	21.76	1.71
LTE B66(4) (B.W 1.4 MHz)	1710.7	131979	QPSK	21.16	21.21	-0.04

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 (836.6)	2 509.80	-47.11	10.70	-51.41	2.50	V	-43.21
GSM1900 CH 810 (1909.8)	7 639.20	-56.95	11.26	-46.24	4.47	V	-39.45
WDM850 CH 4132 (826.4)	2 479.20	-54.20	10.54	-58.98	2.48	H	-50.92
WDM1700 CH 1412 (1732.4)	6 929.60	-56.73	11.78	-48.93	4.28	V	-41.43
WDM1900 CH 9400 (1880.0)	7 520.00	-58.03	10.84	-47.18	4.46	H	-40.80
LTE B2 CH 19175 (1907.5)	7 630.00	-57.98	11.22	-47.14	4.48	V	-40.40
LTE B12(17) CH 23025 (700.5)	2 802.00	-57.18	10.80	-59.33	2.67	H	-51.20
LTE B5 CH 20415 (825.5)	2 476.50	-55.78	10.50	-60.49	2.48	H	-52.47
LTE B26(part22) CH 27033 (848.3)	2 544.90	-55.51	10.70	-59.42	2.52	V	-51.24
LTE B26(part90) CH 26783 (823.3)	2 469.90	-53.04	10.46	-57.69	2.47	H	-49.70
LTE B26(part90) (Straddle) CH 26790 (824.0)	3 296.00	-58.31	12.07	-59.80	2.89	V	-50.61
LTE B41 CH 41565 (2687.5)	13 437.50	-55.33	12.62	-45.71	6.26	V	-39.35
LTE B66 CH 132322 (1745.0)	6 980.00	-56.33	11.52	-48.15	4.28	H	-40.91

Modulation	Frequency		Mode	SM-A336M/DSN (dBm)	SM-A336B/DSN (dBm)	Deviation (dB)
	MHz	Ch.				
GSM850	2 509.80	190	VOICE	-33.29	-43.21	9.92
GSM1900	7 639.20	810	VOICE	-39.36	-39.45	0.09
WDM850	2 479.20	4132	RMC	-47.09	-50.92	3.83
WDM1700	6 929.60	1412	RMC	-40.49	-41.43	0.94
WDM1900	7 520.00	9400	RMC	-39.62	-40.80	1.18
LTE B2 (B.W 5 MHz)	7 630.00	19175	QPSK	-39.44	-40.40	0.96
LTE B12(17) (B.W 3 MHz)	2 802.00	23025	QPSK	-50.20	-51.20	1.00
LTE B5 (B.W 3 MHz)	2 476.50	20415	QPSK	-48.16	-52.47	4.31
LTE B26(part22) (B.W 1.4 MHz)	2 544.90	27033	QPSK	-46.39	-51.24	4.85
LTE B26(part90) (B.W 1.4 MHz)	2 469.90	26783	QPSK	-49.53	-49.70	0.17
LTE B26(part90) (Straddle) (B.W 1.4 MHz)	3 296.00	26790	QPSK	-48.74	-50.61	1.87
LTE B41 (B.W 5 MHz)	13 437.50	41565	QPSK	-35.86	-39.35	3.49
LTE B66 (B.W 1.4 MHz)	6 980.00	132322	QPSK	-40.29	-40.91	0.62

2. Summary of the spot check for Unlicensed EMC

Mod	Test Item	Mod / Channel	Measured Frequency [MHz]	SM-A336M/DSN Result [dBμV/m]		SM-A336B/DSN Result [dBμV/m]		Deviation (dB)	
				Peak	Average	Peak	Average	Peak	Average
BT	Band Edge	DH5 / ch.78	2483.5 MHz~2500 MHz	70.14	45.41	67.47	42.74	-2.67	-2.67
	RSE	DH5 / ch.0	7206 MHz	52.85	28.12	54.02	29.29	1.17	1.17
DTS	Band Edge	802.11n MCS0/ ch.11	2483.5 MHz~2500 MHz	70.87	48.65	70.79	48.64	-0.08	-0.01
	RSE	802.11b 1Mbps/ ch.3	7266 MHz	57.20	50.23	57.63	50.67	0.43	0.44
BT LE	Band Edge(High power)	LE(5.1) 2M 37byte/ ch.39	2483.5 MHz~2500 MHz	56.66	50.61	57.79	49.99	1.13	-0.62
	RSE (Normal Power)	LE(5.1) 1M 37byte/ ch.0	7206 MHz	57.60	50.77	56.33	48.58	-1.27	-2.19
UNII	Band Edge(Avg)	802.11ac(20M) MCS0/ ch.64	5350 MHz~5460 MHz	-	50.94	-	47.98	-	-2.96
	Band Edge(Peak)	802.11ac(20M) MCS0/ ch.100	5460 MHz ~ 5470 MHz	64.88	-	66.09	-	1.21	-
	RSE	802.11n(20M) MCS0/ ch.165	17475 MHz	64.53	-	62.71	-	-1.82	-
DBS	RSE BT	DH5/ch.0	7206 MHz	52.39	27.66	52.21	27.48	-0.18	-0.18
	RSE 5G	802.11n(20M) MCS0/ ch.165	17475 MHz	63.99	-	61.09	-	-2.90	-
NFC	Fundmental	Fundamental(Type A, 106kbps)	13.56 MHz	12.06	-	12.01	-	-0.05	-
	RSE	Type A, 106kbps	30 MHz - 1000 MHz	27.28	-	27.13	-	-0.15	-

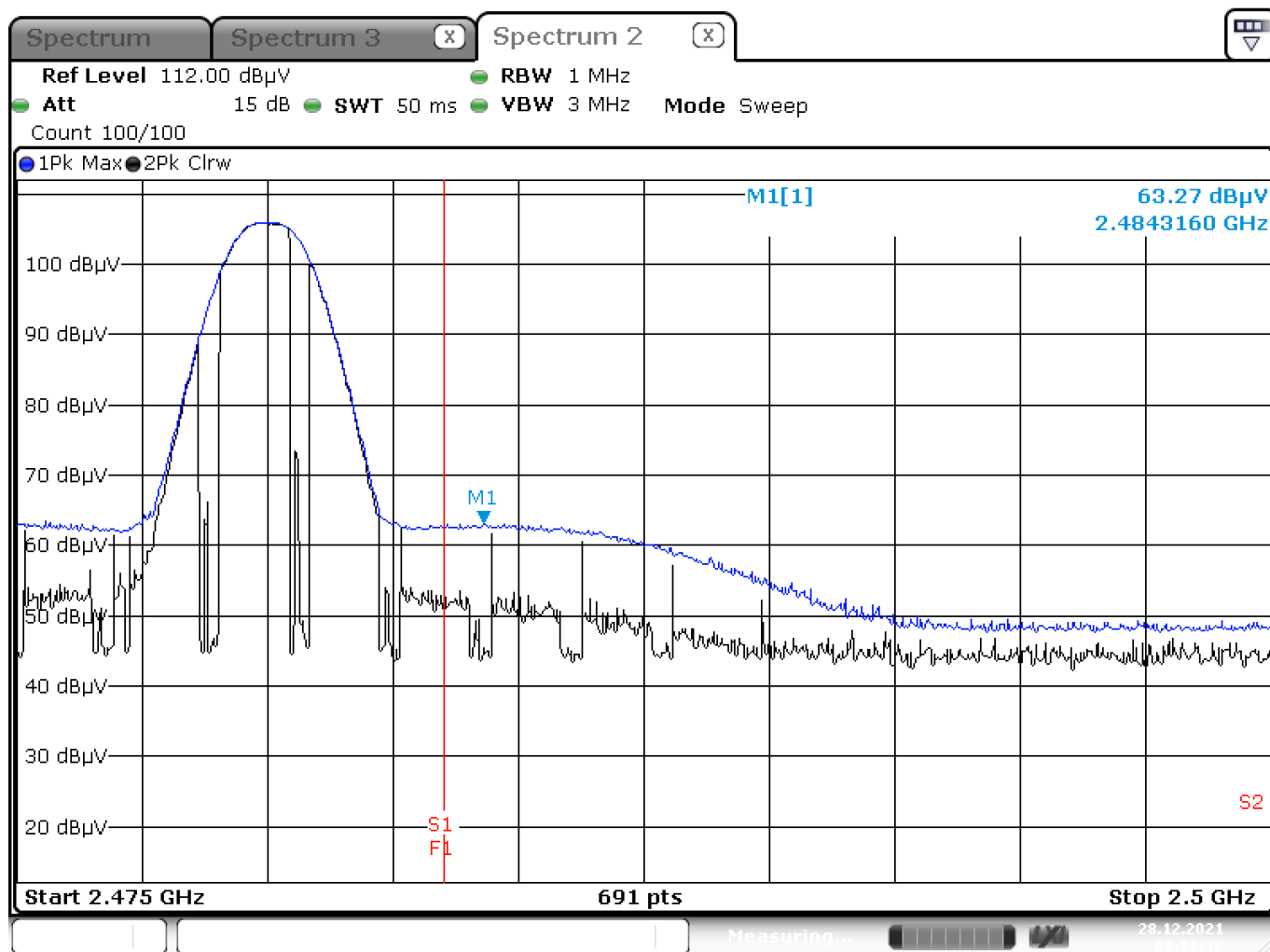
3. Test Plot

BT Band Edge (DH5/ch.78)

Bandedge

Frequency [MHz]	Measured Value [dBμV]	* A.F+C.L-AMP +ATT+D.F [dB]	ANT. POL [H/V]	Duty Cycle Correction [dB]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2483.5	63.27	4.20	H	0	67.47	73.98	6.51	PK
2483.5	63.27	4.20	H	-24.73	42.74	53.98	11.24	AV

[Radiated Restricted Band Edges plot- Peak& Average Result]

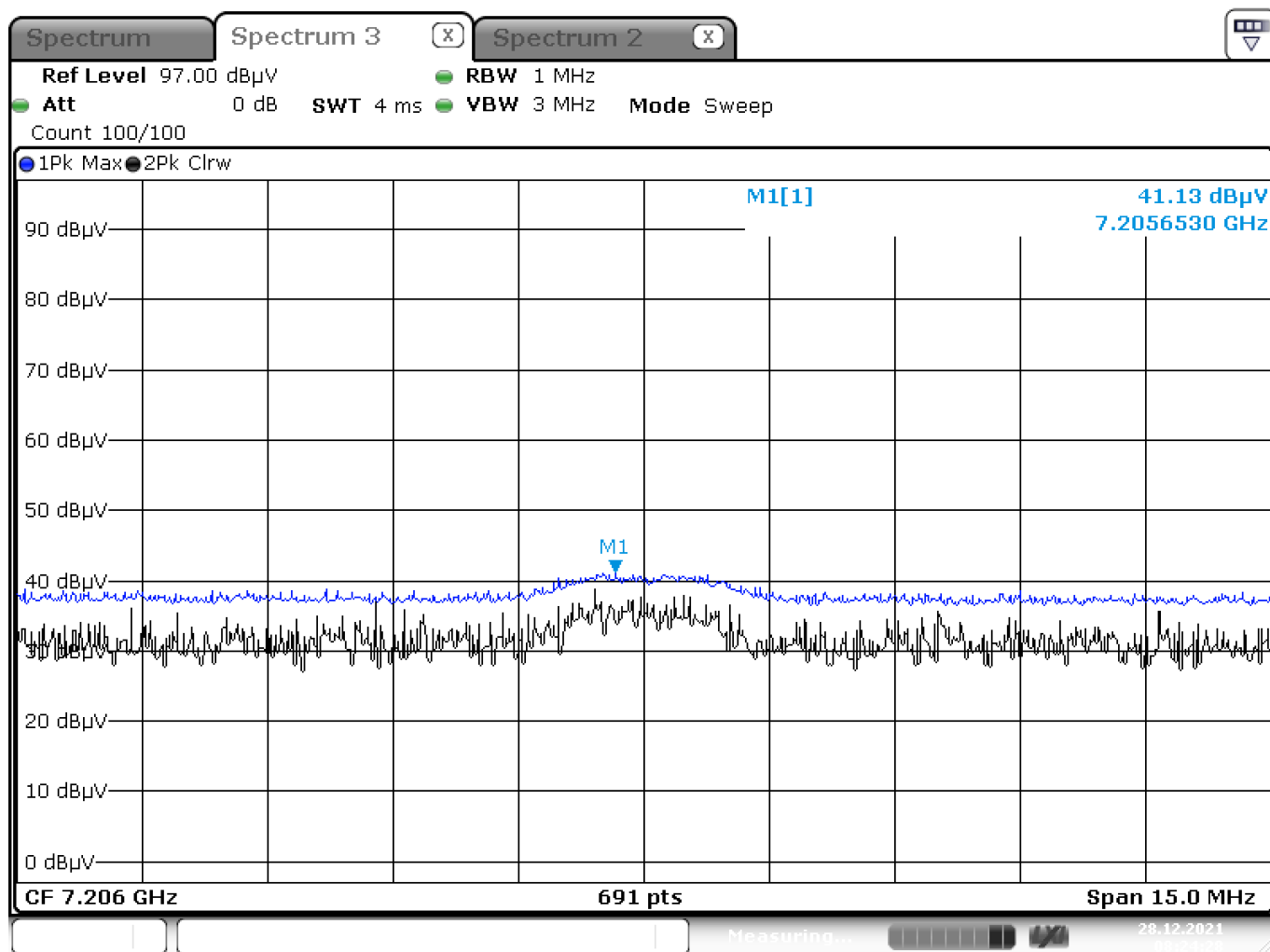


BT R.S.E 3rd Harmonic(DH5/ch.0)

RSE

Frequency [MHz]	Measured Value [dBμV]	A.F+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Duty Cycle Correction [dB]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
7206	41.13	12.89	H	0.00	54.02	73.98	19.96	PK
7206	41.13	12.89	H	-24.73	29.29	53.98	24.69	AV

[Radiated Spurious Emissions plot – Peak& Average Result]

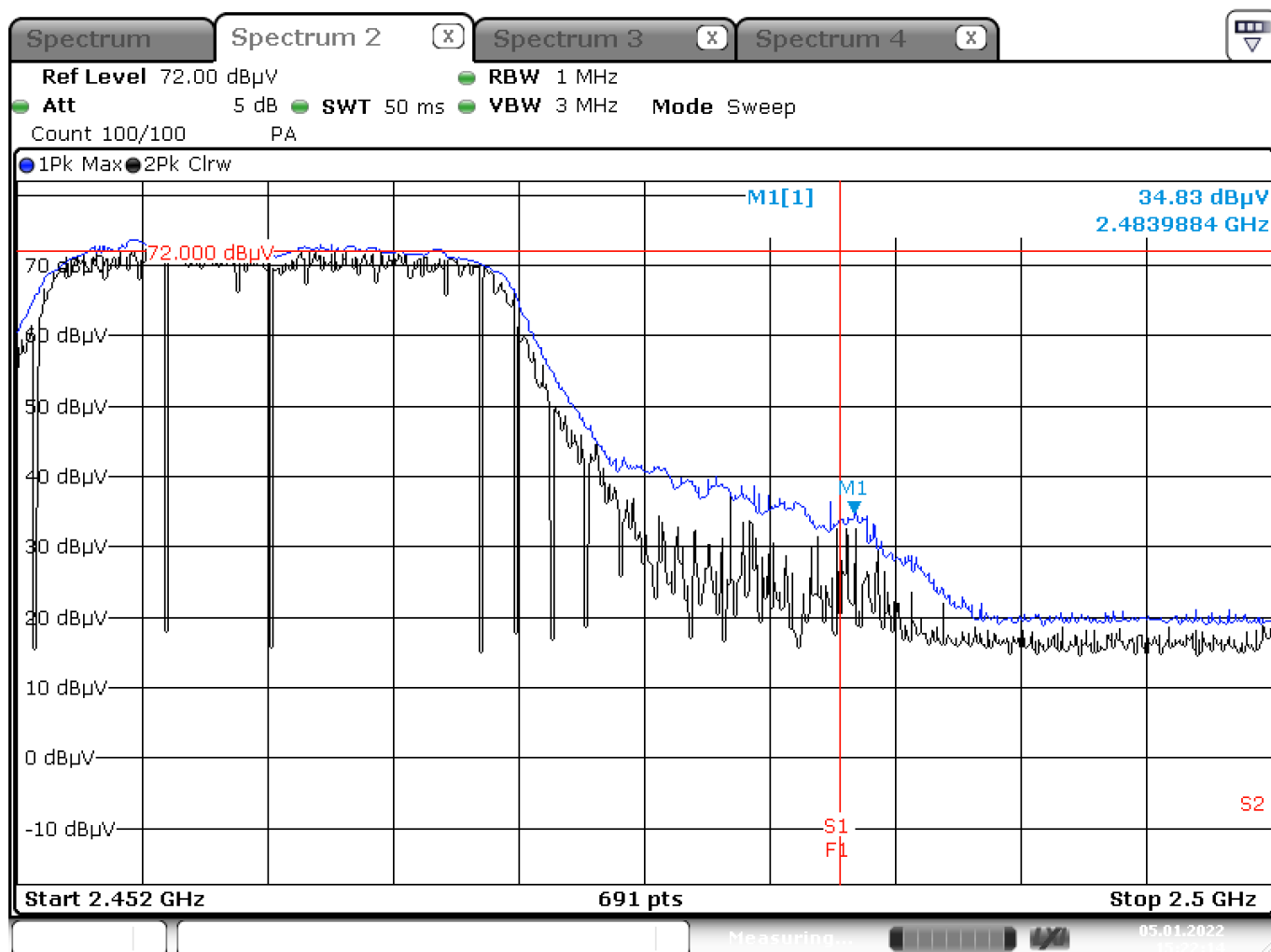


DTS Band Edge (802.11n_20 MHz BW 6.5 Mbps_ch11)

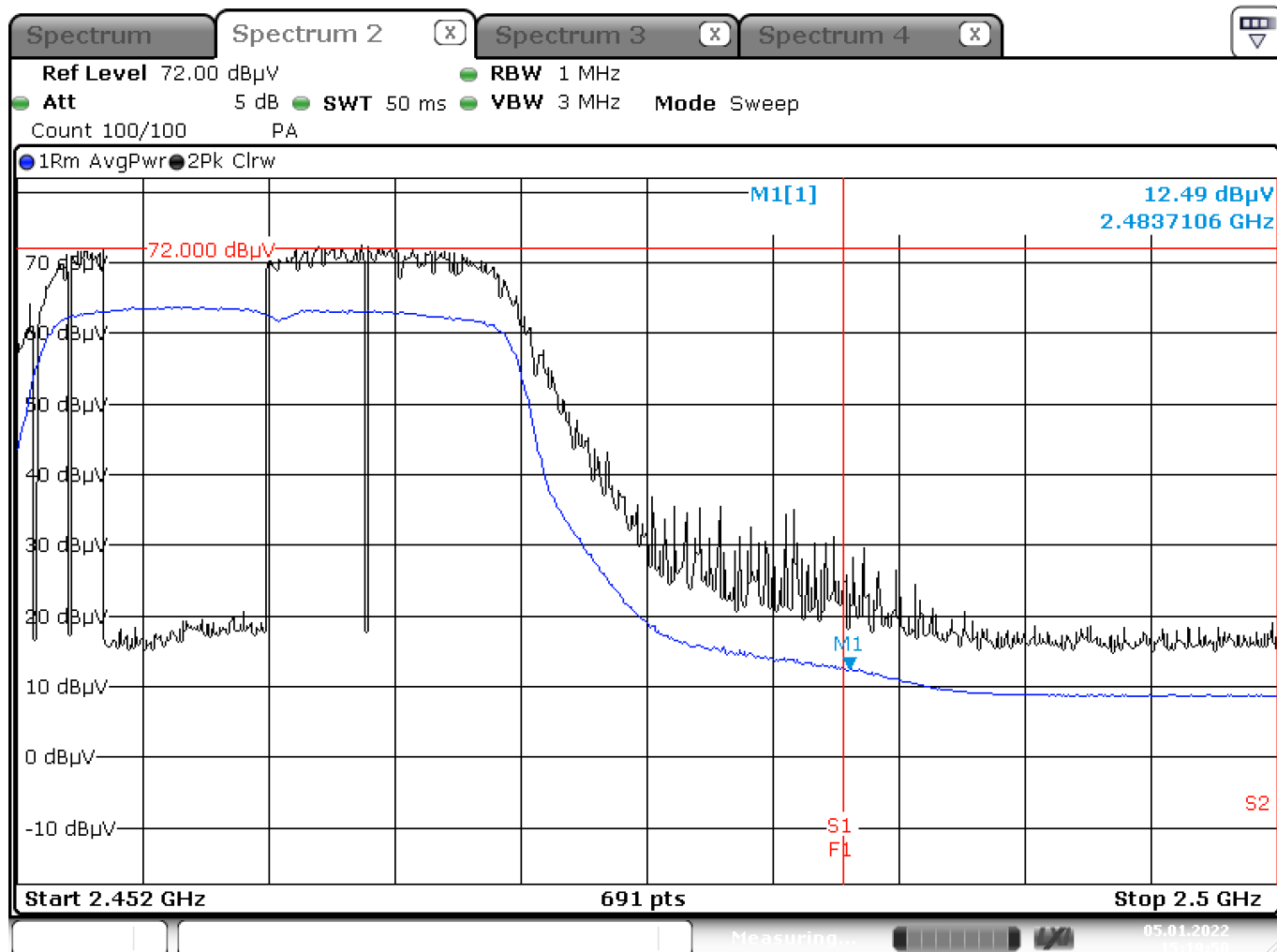
Bandedge

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor[dB]	※ A.F+C.L+D.F [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2483.5	34.83	0.00	35.96	H	70.79	73.98	3.19	PK
2483.5	12.49	0.19	35.96	H	48.64	53.98	5.34	AV

[Radiated Restricted Band Edges plot – Peak Result]



[Radiated Restricted Band Edges plot – Average Result]

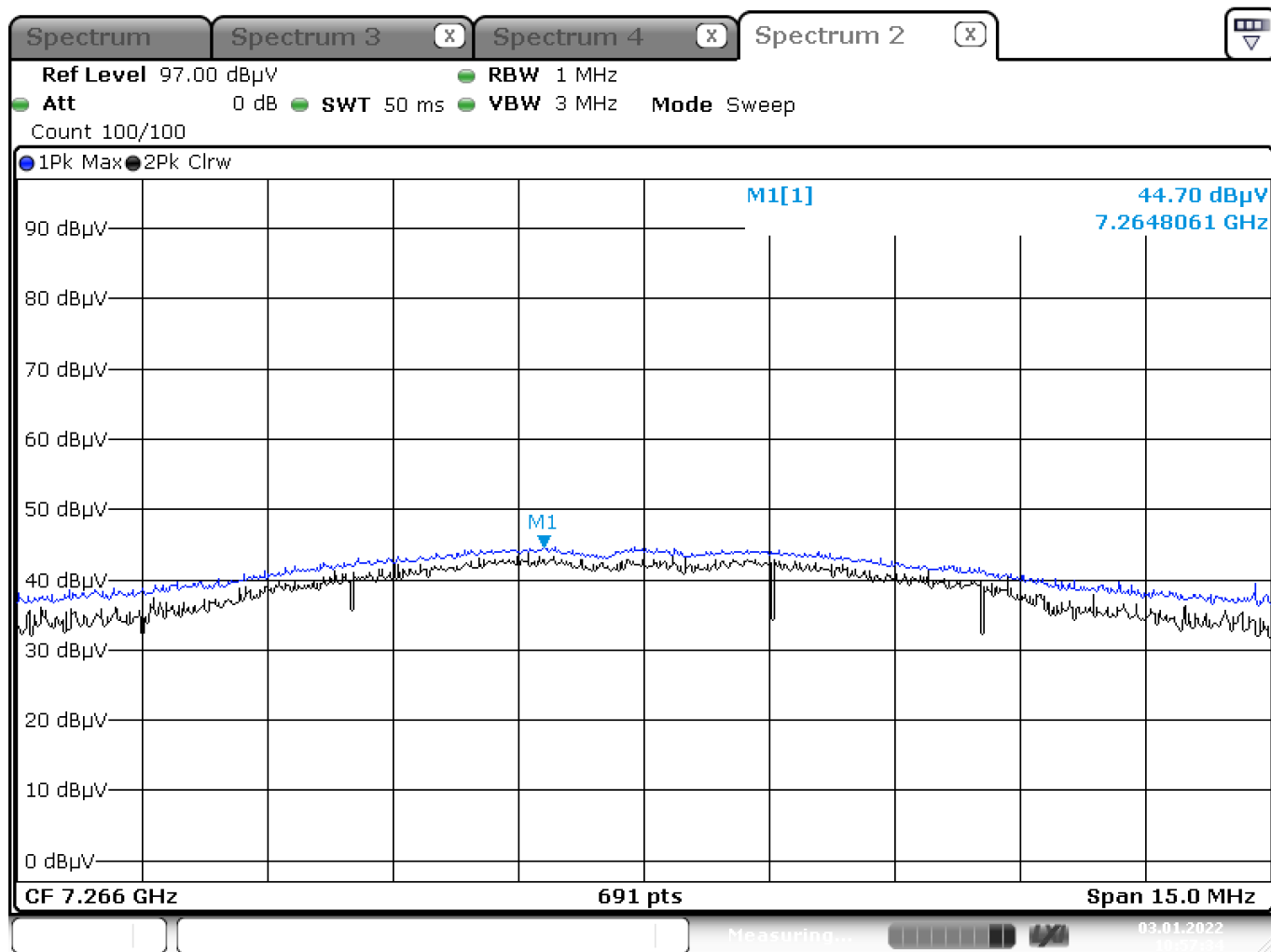


DTS R.S.E 3rd Harmonic(802.11b 1 Mbps Ch.3)

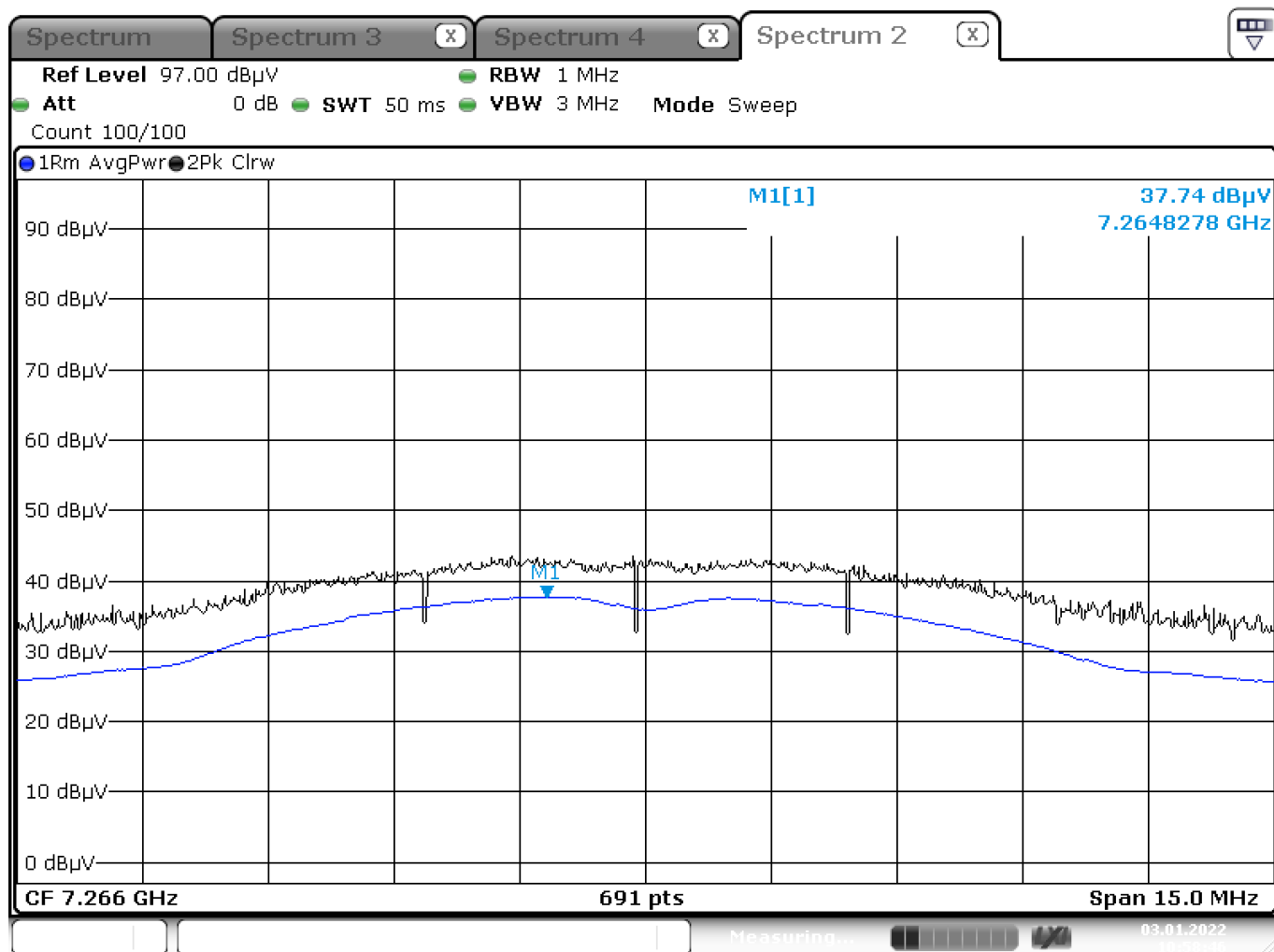
RSE

Frequency [MHz]	Measured Value [dBμV]	A.F+C.L-AMP+D.F [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
7266	44.70	12.93	H	57.63	73.98	16.35	PK
7266	37.74	12.93	H	50.67	53.98	3.31	AV

[Radiated Spurious Emissions plot – Peak Result]



[Radiated Spurious Emissions plot – Average Result]



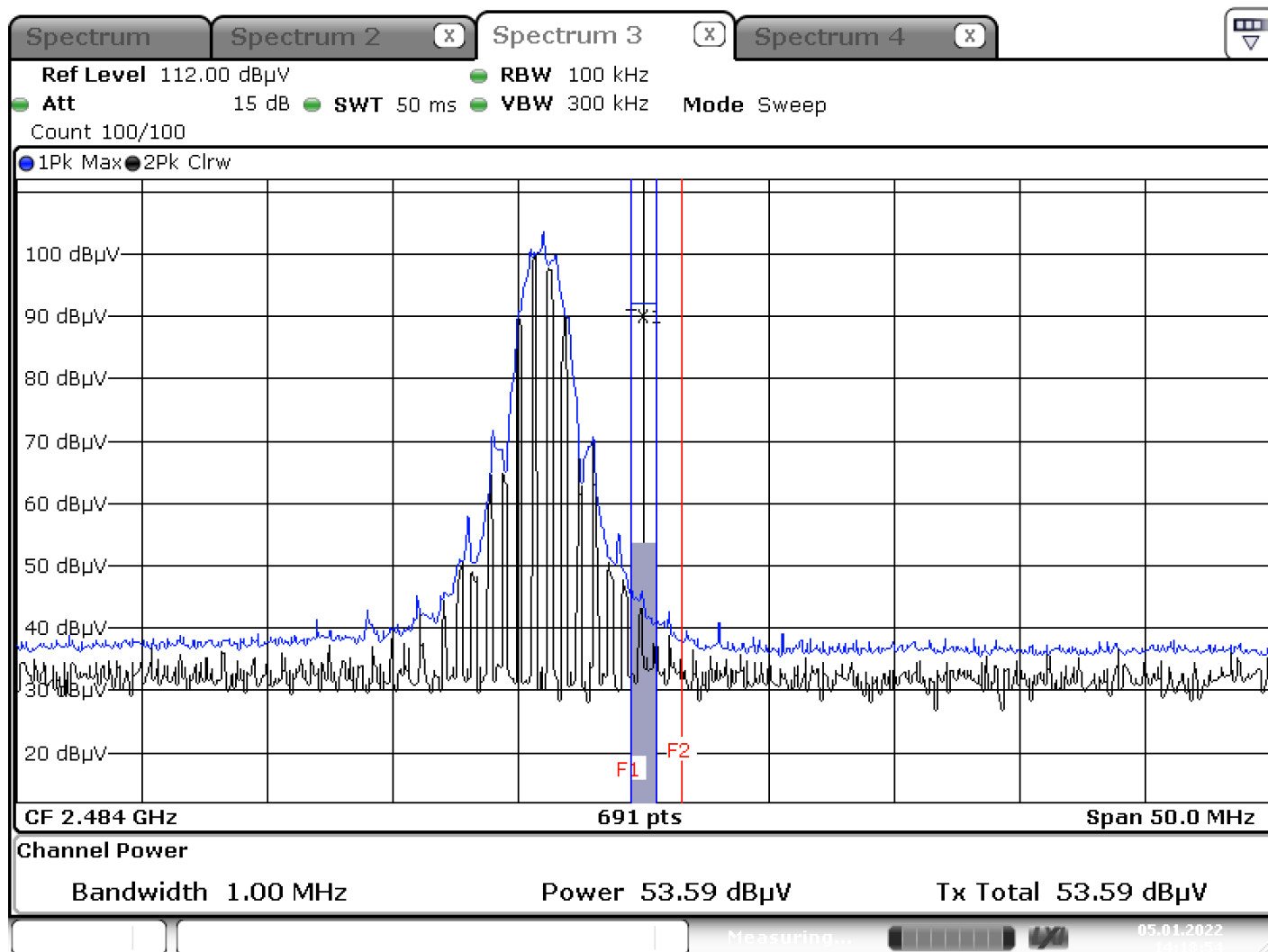
BT(LE) Band Edge (LE(5.1) 2M 37 byte/ch.39)

Bandedge

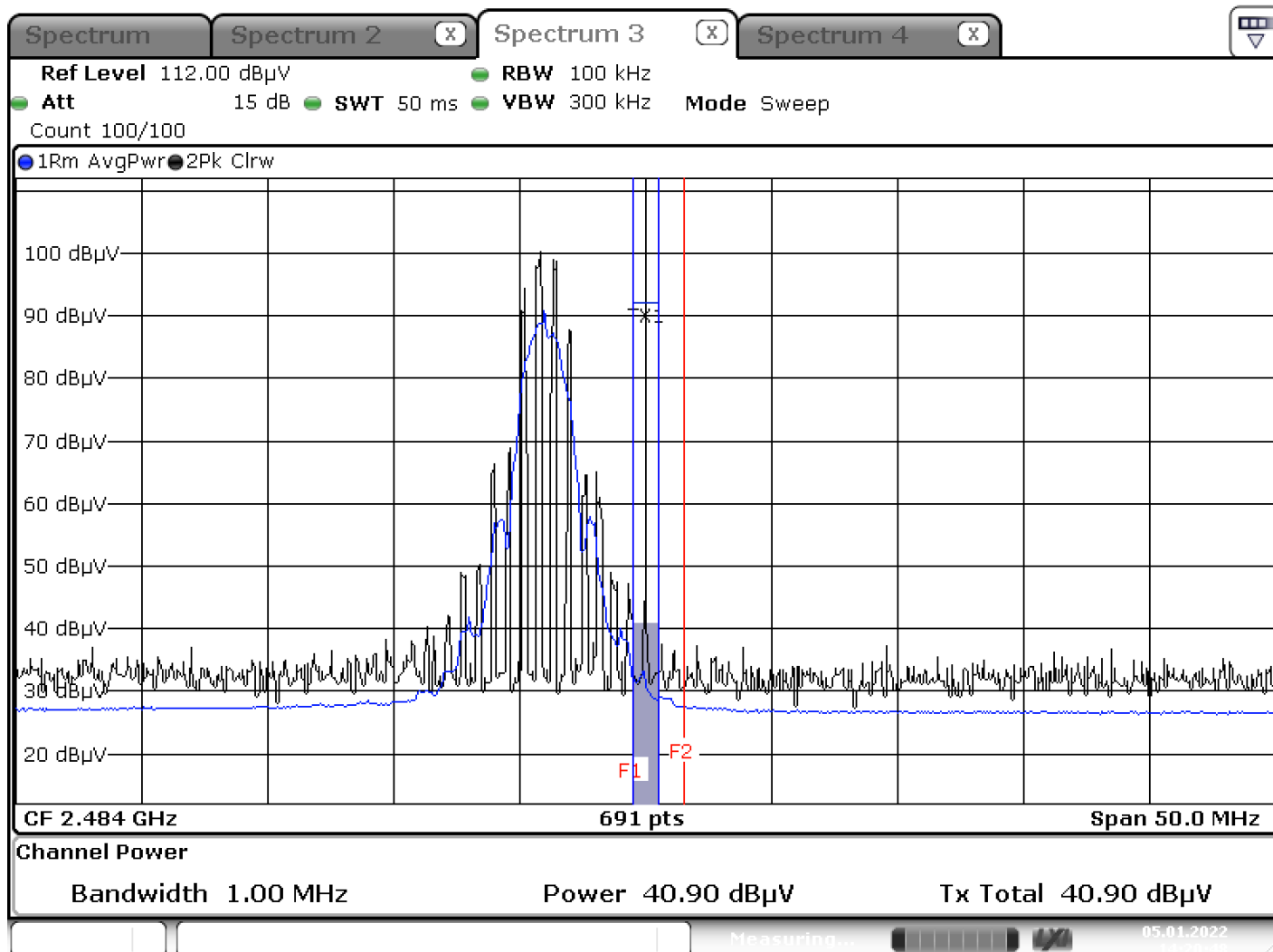
Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor[dB]	※ A.F+C.L+Att -A.G+D.F [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
#2484.0	53.59	0.00	4.20	H	57.79	73.98	16.19	PK
#2484.0	40.90	4.89	4.20	H	49.99	53.98	3.99	AV
#2485.0	49.28	0.00	4.20	H	53.48	73.98	20.50	PK
#2485.0	38.13	4.89	4.20	H	47.22	53.98	6.76	AV
2485.5~2500	52.47	0.00	4.20	H	56.67	73.98	17.31	PK
2485.5~2500	37.70	4.89	4.20	H	46.79	53.98	7.19	AV

#(2484MHz & 2485MHz) Note : integration method Used (ANSI C63.10 Section11.13.3)

[Radiated Restricted Band Edges plot – Peak Result(2484 MHz)]



[Radiated Restricted Band Edges plot – Average Result(2484 MHz)]

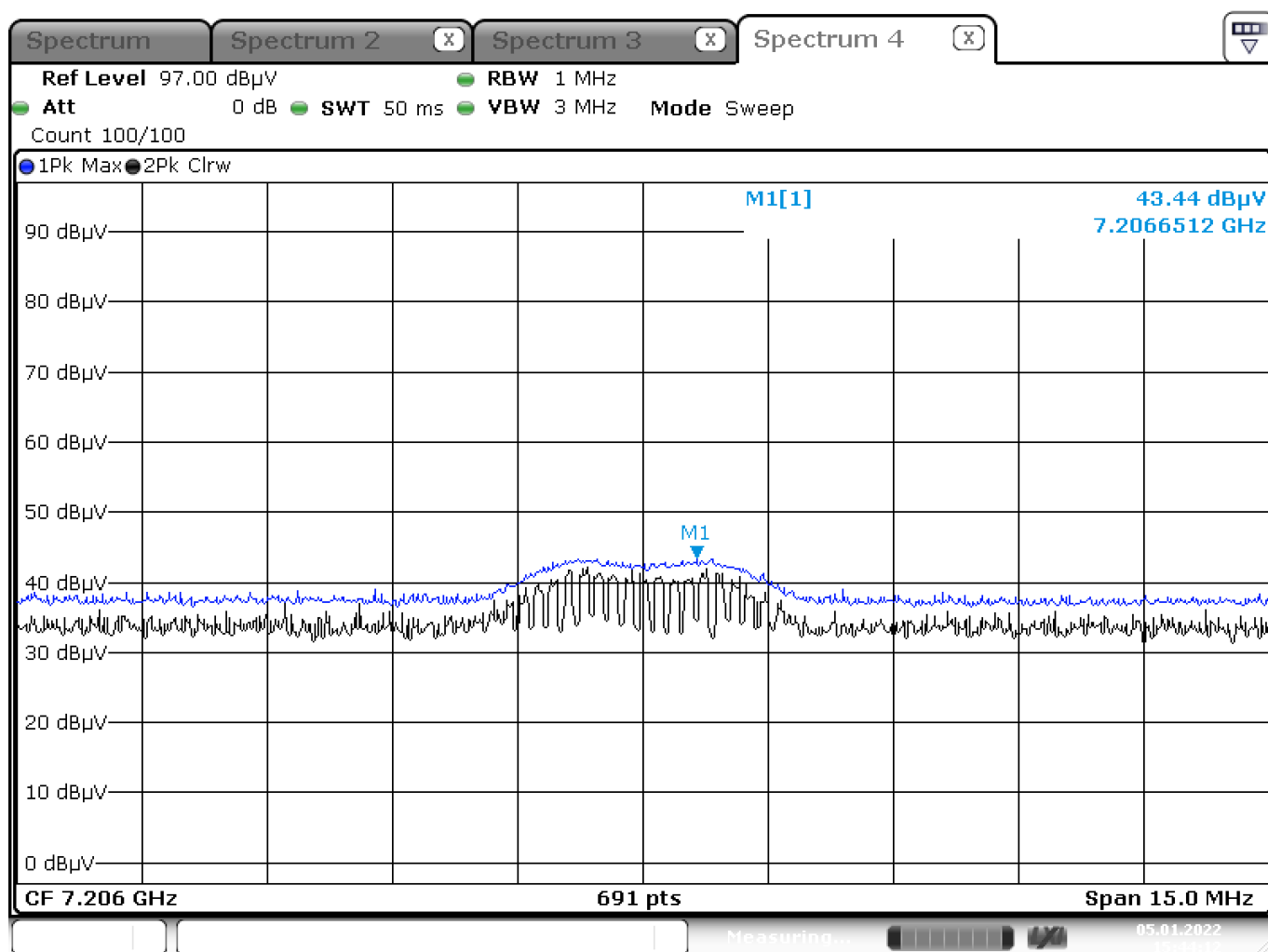


BT(LE) R.S.E 3rd Harmonic (LE(5.1) 1M 37 byte/ch.0)

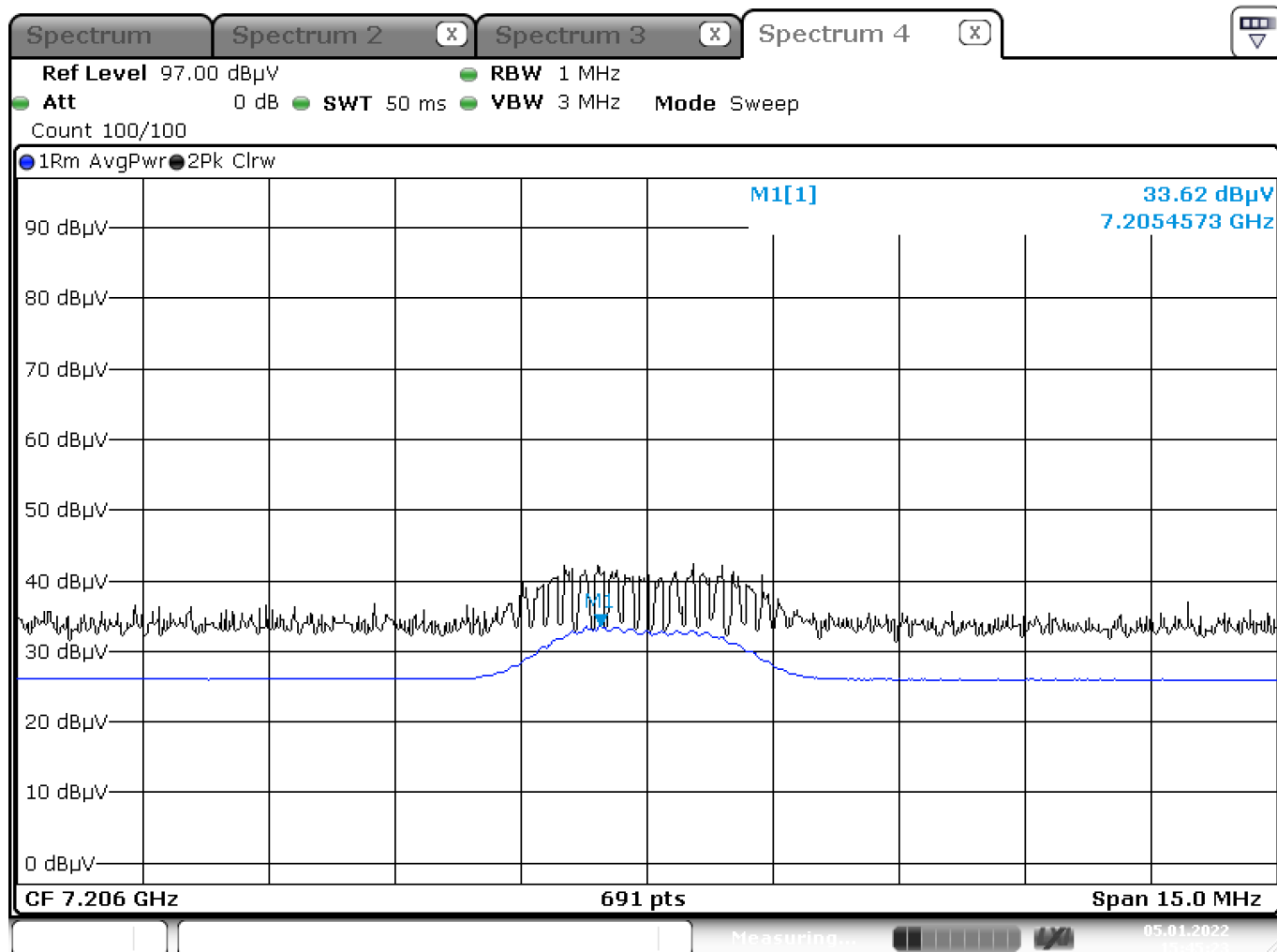
RSE

Frequency [MHz]	Measured Value [dBμV]	Duty Cycle Factor[dB]	A.F+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
7206	43.44	0.00	12.89	H	56.33	73.98	17.65	PK
7206	33.62	2.07	12.89	H	48.58	53.98	5.40	AV

[Radiated Spurious Emissions plot – Peak Result]



[Radiated Spurious Emissions plot – Average Result]

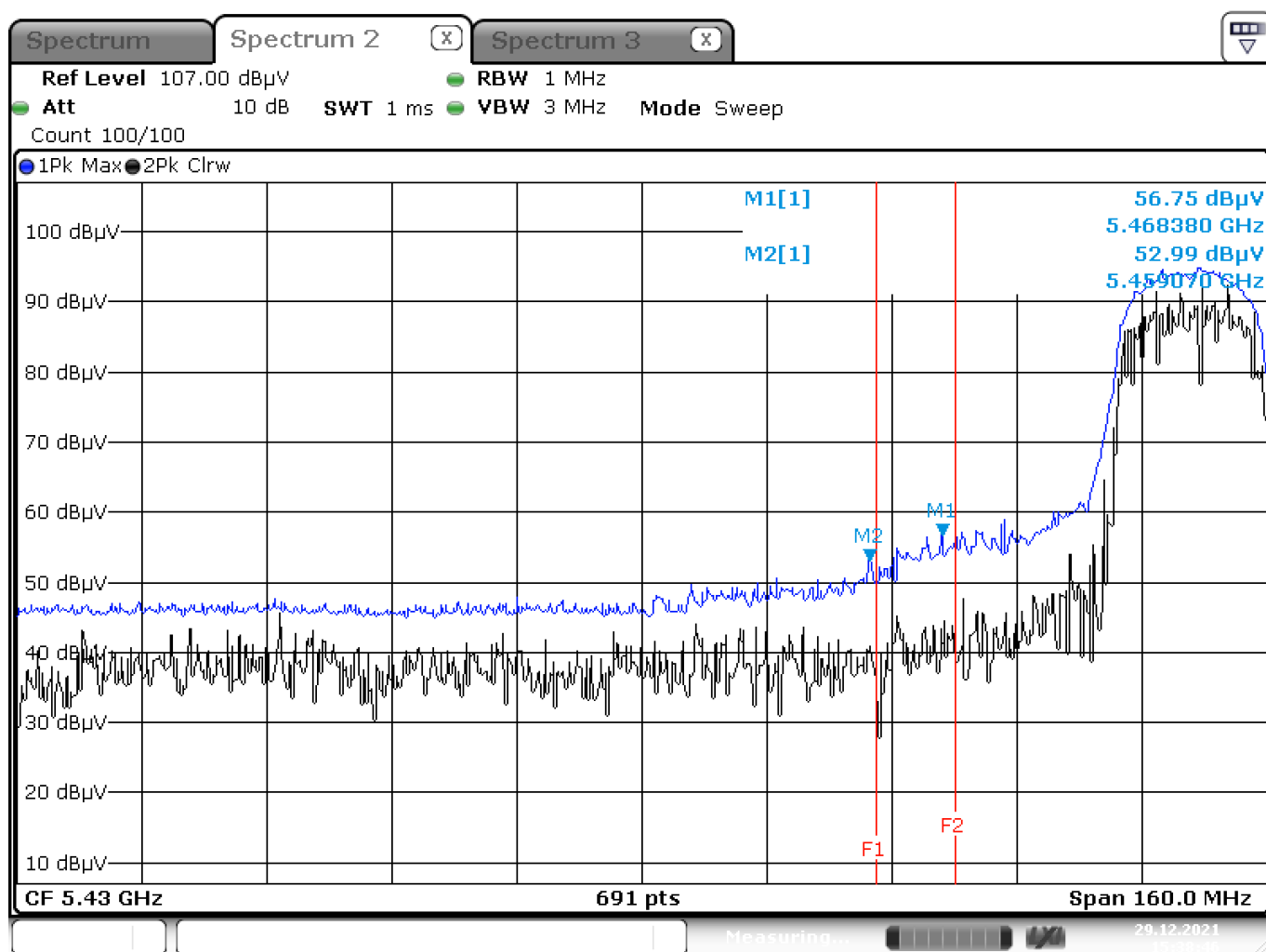


U-NII Band Edge Peak (802.11ac_20 MHz BW 6.5 Mbps_ch.100)

Bandedge

Frequency [MHz]	Measured Value [dBμV]	A.F+C.L-A.G +ATT+D.F [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5470	56.75	9.34	V	66.09	68.20	2.11	PK

Radiated Restricted Band Edges plot – Peak Result

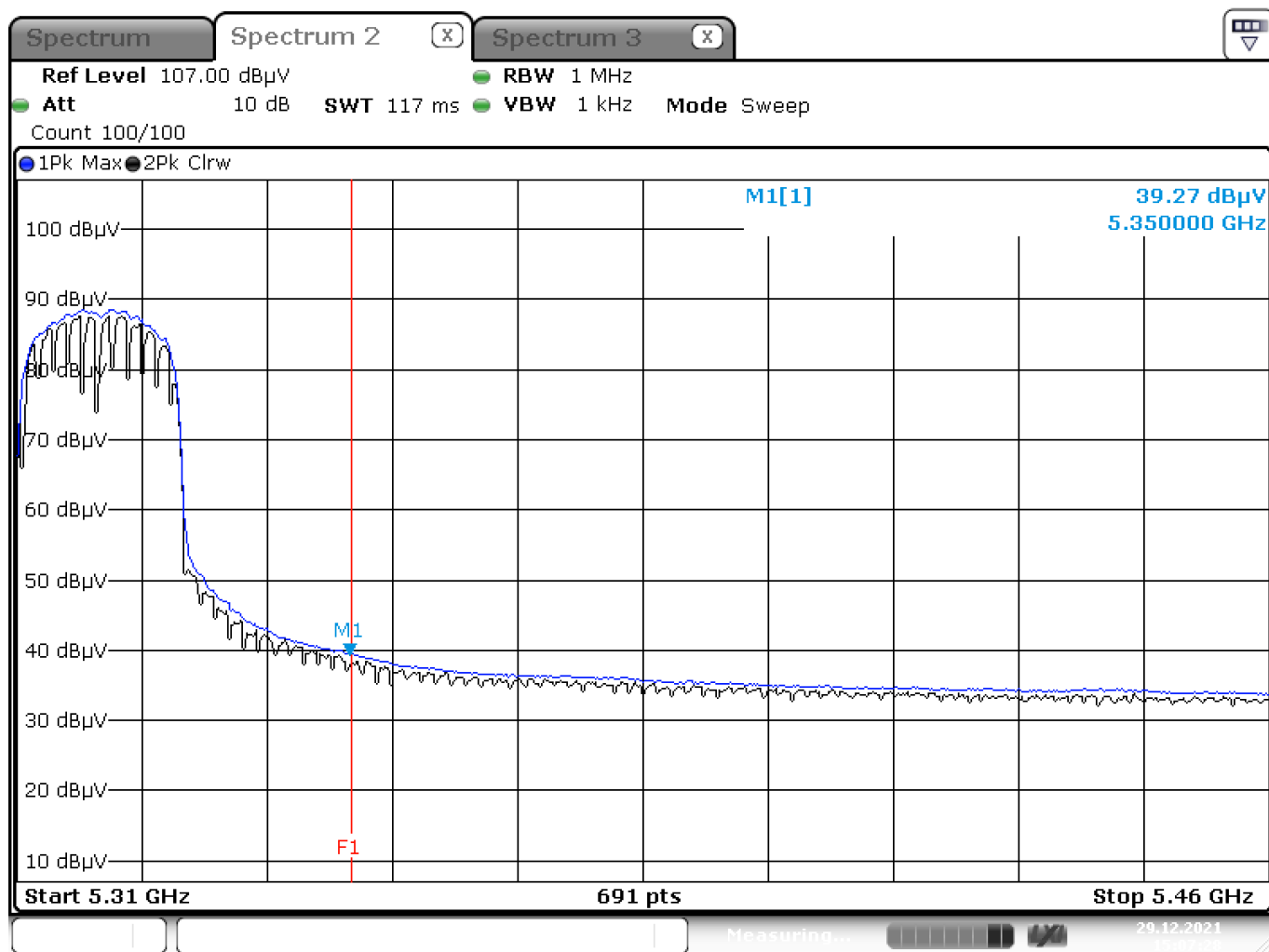


U-NII Band Edge Avg (802.11ac_20 MHz BW 6.5 Mbps_ch.64)

Bandedge

Frequency [MHz]	Measured Value [dBμV]	A.F+C.L-A.G +ATT+D.F [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
5350	39.27	8.71	V	47.98	53.98	6.00	AV

Radiated Restricted Band Edges plot – Average Result

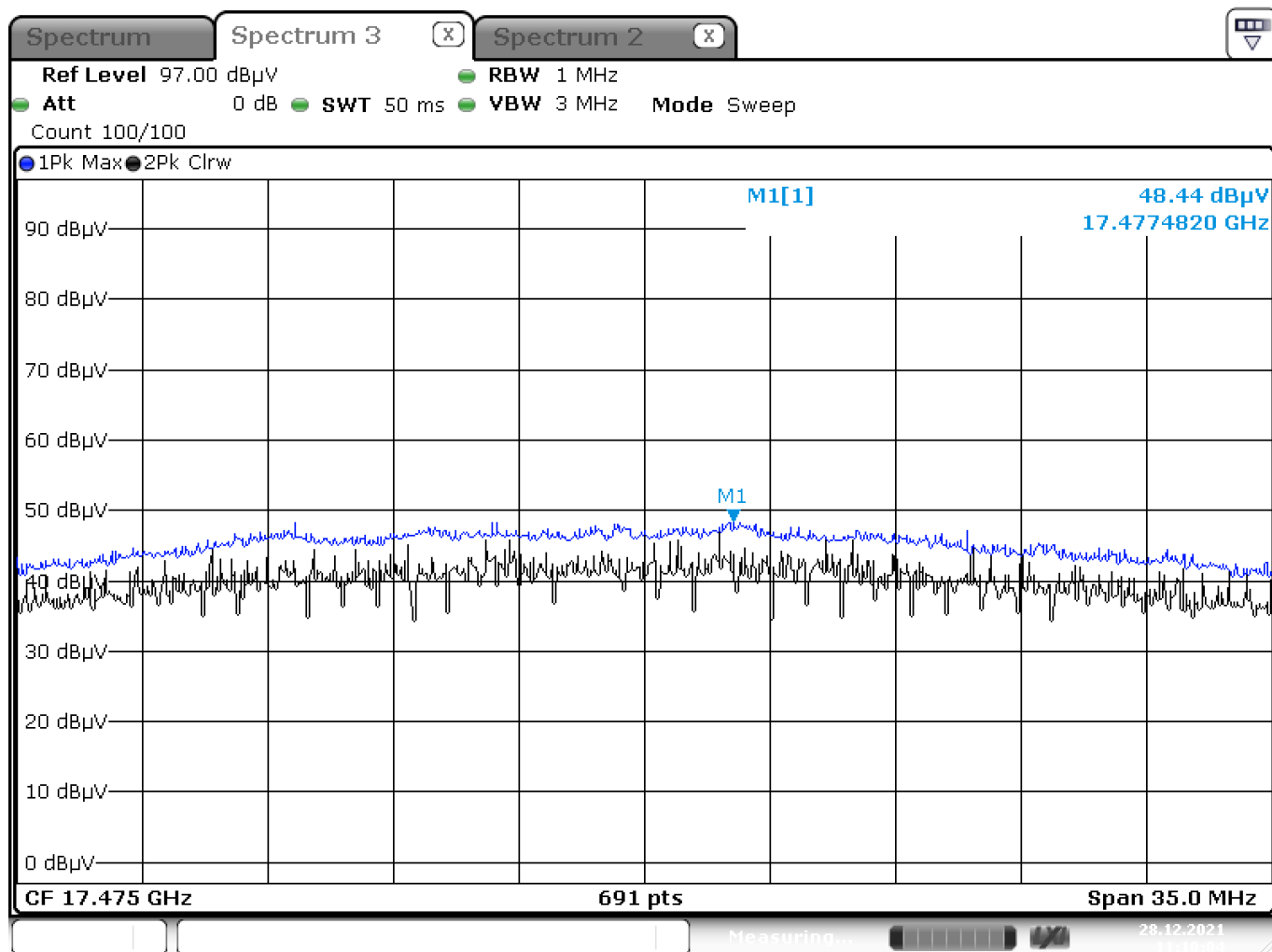


U-NII R.S.E 3rd Harmonic (802.11n_MCS0_ch.165)

RSE

Frequency [MHz]	Measured Value [dBμV]	CL+AF+DF-AG [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
17475	48.44	14.27	H	62.71	68.20	5.49	PK

[Radiated Spurious Emissions plot – Peak Result]

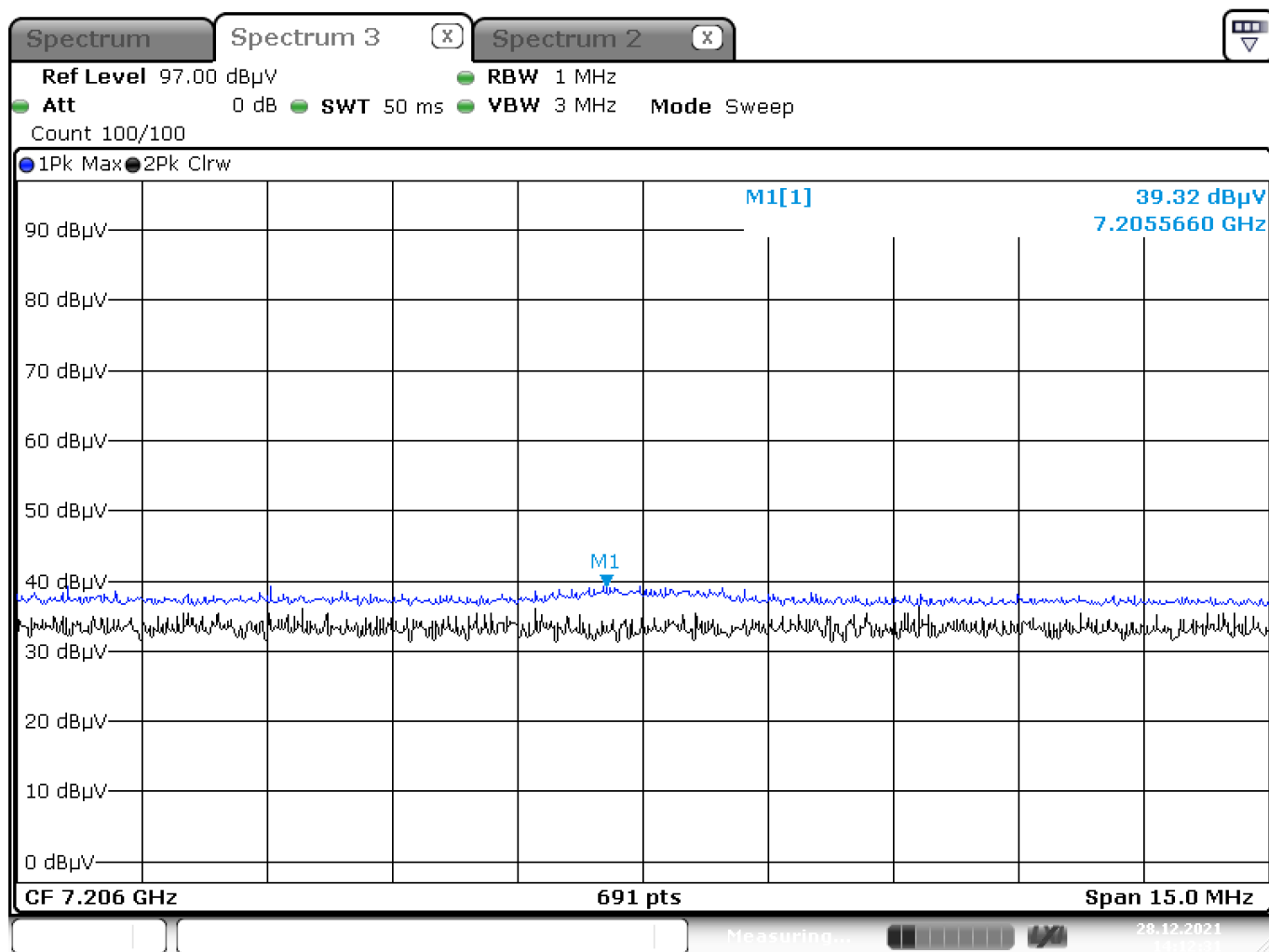


DBS BT R.S.E 3rd Harmonic (DH5_ch0)

RSE

Frequency [MHz]	Measured Value [dBμV]	A.F+C.L- A.G+D.F [dB/m]	ANT. POL [H/V]	Duty Cycle Correction [dB]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measure ment Type
7206	39.32	12.89	H	0.00	52.21	73.98	21.77	PK
7206	39.32	12.89	H	-24.73	27.48	53.98	26.50	AV

[Radiated Spurious Emissions plot – Peak& Average Result]

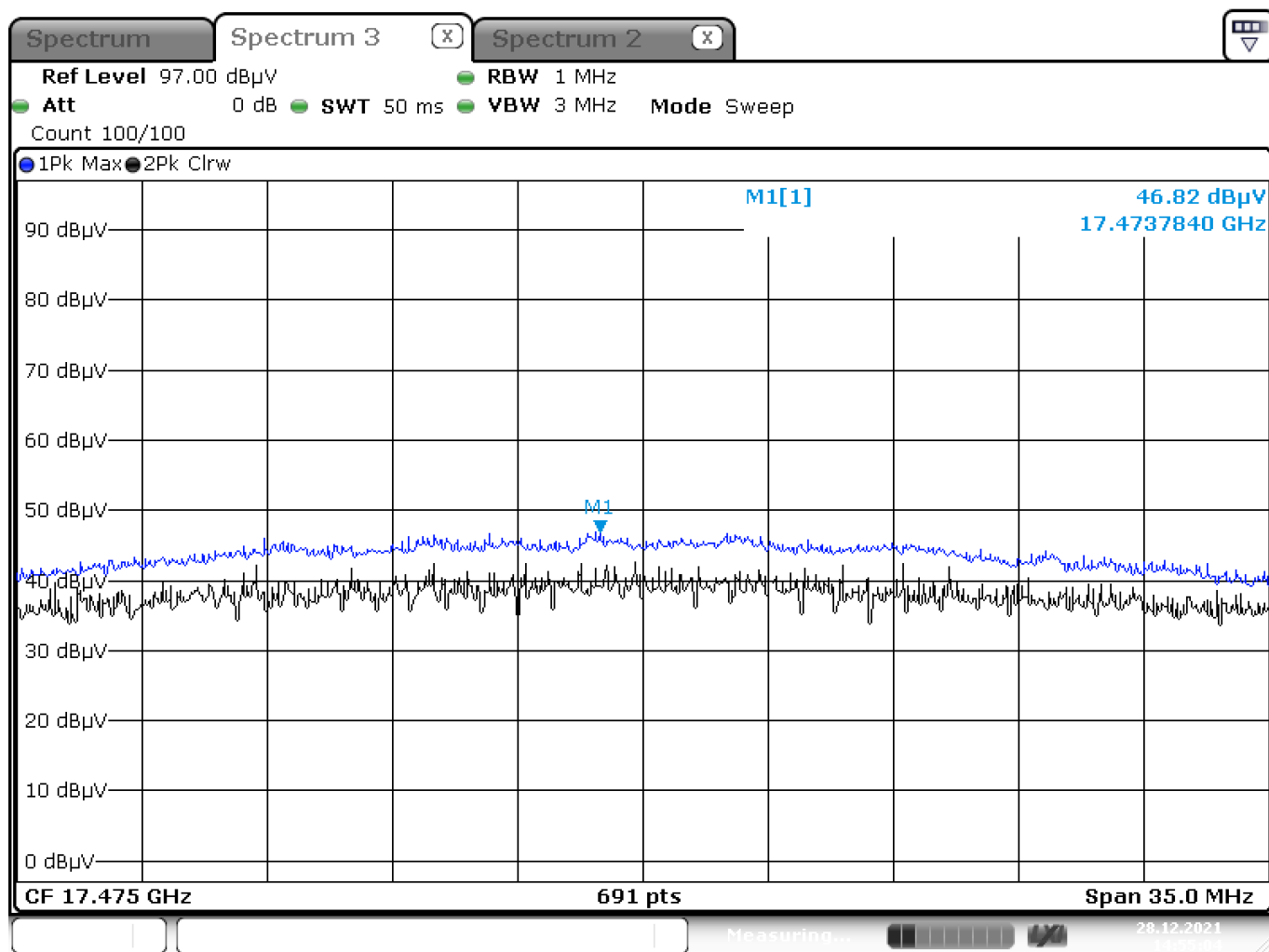


DBS 5G R.S.E 3rd Harmonic(802.11n(20M)_ MCS0/ch.165)

RSE

Frequency [MHz]	Measured Value [dBμV]	CL+AF+DF-AG [dB]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
17475	46.82	14.27	V	61.09	68.20	7.11	PK

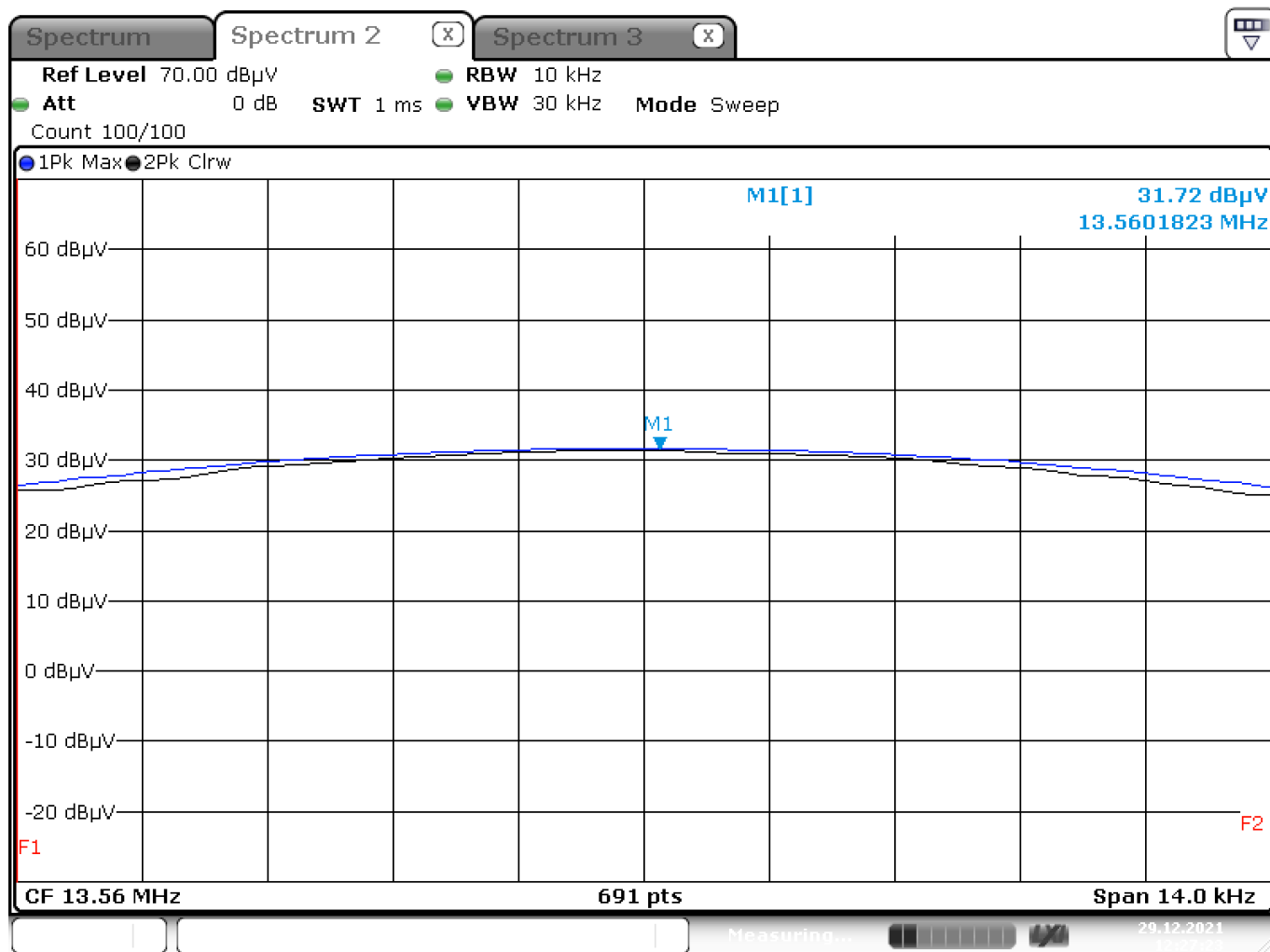
[Radiated Spurious Emissions plot – Peak Result]



NFC fund

Frequency (MHz)	Measured Level (dBμV)@3m	Ant.Factor+Cable Loss (dB/m)	Distance Correction (dB)	Result Level (dBμV/m)@30m	Limit (dBμV/m)@30m	Margin (dB)
13.5603	31.72	20.29	-40.00	12.01	84.00	71.99

[plot]

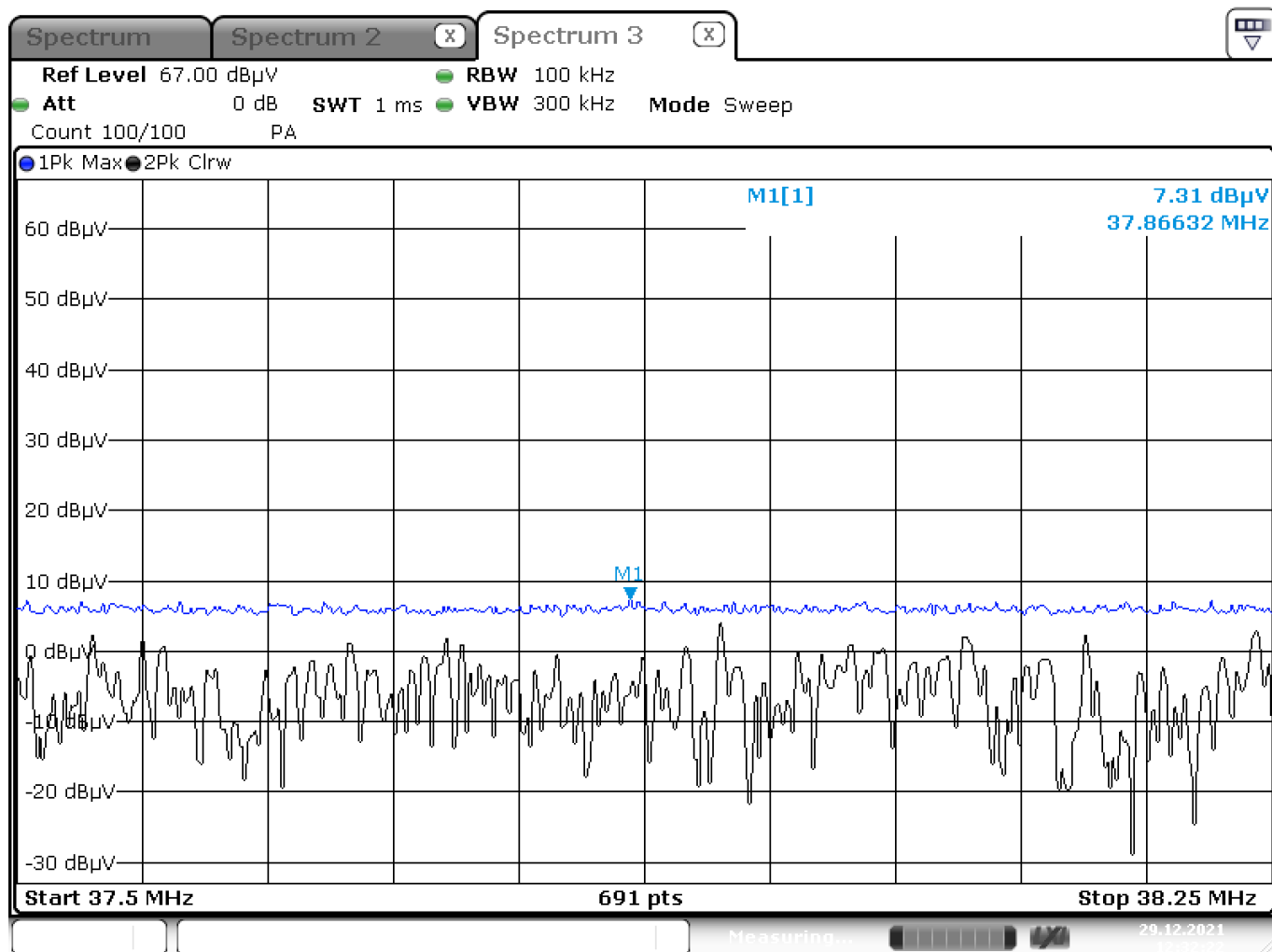


NFC R.S.E Harmonic

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
37.8403	7.31	19.07	0.75	H	27.13	40.00	12.87

[Radiated Spurious Emissions plot]



4. List of test equipment

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
H.P.F	FBSR-02B(WHK1.2/15 G-10EF)	T&M SYSTEM	-	03/02/2022	Annual
H.P.F	FBSR-02B(WHK3.3/18 G-10EF)	T&M SYSTEM	-	03/02/2022	Annual
Power Splitter(DC ~ 26.5 GHz)	11667B	Hewlett Packard	11275	04/07/2022	Annual
DC Power Supply	E3632A	Agilent	MY40010147	06/28/2022	Annual
Dipole Antenna	UHAP	Schwarzbeck	557	04/05/2023	Biennial
Dipole Antenna	UHAP	Schwarzbeck	558	04/05/2023	Biennial
Chamber	SU-642	ESPEC	93008124	03/15/2022	Annual
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	147	08/30/2022	Biennial
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1298	09/15/2023	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	10/13/2022	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	02/11/2022	Biennial
Signal Analyzer(10 Hz ~ 26.5 GHz)	N9020A	Agilent	MY52090906	05/18/2022	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	06/01/2022	Annual
Spectrum Analyzer(10 Hz ~ 40 GHz)	FSV40	REOHDE & SCHWARZ	100931	09/29/2022	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/18/2022	Annual
Loop Antenna(9 kHz ~ 30 MHz)	FMZB1513	Schwarzbeck	1513-333	03/19/2022	Biennial
Bilog Antenna	VULB9160	Schwarzbeck	3150	03/03/2023	Biennial
Hybrid Antenna	VULB9168	Schwarzbeck	760	02/22/2023	Biennial
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 (100 kHz ~ 40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	07/05/2022	Annual
Signal Analyzer(5 Hz ~ 40.0 GHz)	N9030B	KEYSIGHT	MY55480167	06/02/2022	Annual
FCC LTE Mobile Conducted RF Automation Test Software	-	HCT CO., LTD.,	-	-	-

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	EM1000	Audix	060520	N/A	N/A
Turn Table	N/A	Audix	N/A	N/A	N/A
Amp & Filter Bank Switch Controller	FBSM-01B	TNM system	TM19050002	N/A	N/A
Loop Antenna	1513	Schwarzbeck	1513-333	03/19/2022	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	9168-0895	09/04/2022	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	02296	05/19/2022	Biennial
Horn Antenna(15 GHz ~ 40 GHz)	BBHA9170	Schwarzbeck	BBHA9170124	04/12/2023	Biennial
Spectrum Analyzer	FSV(10 Hz ~ 40 GHz)	Rohde & Schwarz	101055	05/14/2022	Annual
Band Reject Filter	WRCJV2400/2483.5-2370/2520-60/12SS	Wainwright Instruments	2	01/06/2022	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	5	06/24/2022	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	6	06/24/2022	Annual
Power Amplifier	CBL18265035	CERNEX	22966	12/02/2022	Annual
Power Amplifier	CBL26405040	CERNEX	25956	03/23/2022	Annual
HPF(3~18GHz) + LNA1(1~18GHz)	FMSR-05B	TNM system	F6	01/20/2022	Annual
ATT(10dB) + LNA1(1~18GHz)	FMSR -05B	TNM system	None	01/20/2022	Annual
ATT(3dB) + LNA1(1~18GHz)	FMSR -05B	TNM system	None	01/20/2022	Annual
LNA1(1~18GHz)	FMSR -05B	TNM system	25540	01/20/2022	Annual
HPF(7~18GHz) + LNA2(6~18GHz)	FMSR -05B	TNM system	28550	01/20/2022	Annual
Thru(30MHz ~ 18GHz)	FMSR -05B	TNM system	None	01/20/2022	Annual