

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:
March 17, 2021

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

FCC ID:	A3LSMM022G
APPLICANT:	SAMSUNG Electronics Co., Ltd.

Equipment Class(es) : PCE, DSS, DTS

Rule Part(s) : 15, 22, 2

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 A3LSMA022M
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
A3LSMA022M	PCE	2G, 3G Report	All sections
		LTE B5 Report	All sections
	DSS	Bluetooth Report	All sections
	DTS	DTS Report	All sections
		BT LE 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	March 17, 2021	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	-20.21	39.56	-10.07	1.29	H	< 7.00	0.660	28.20
WCDMA850	4183	836.6	-28.98	30.79	-10.07	1.29	H		0.088	19.43
LTE B5	20525	836.5	-29.75	30.02	-10.07	1.29	H		0.073	18.66

Mode	Frequency (MHz)		Mode	SM-A022M/DS (dBm)	SM-M022G/DS (dBm)	Deviation (dB)
	MHz	Ch.				
GSM850	836.6	190	VOICE	27.86	28.20	-0.34
WCDMA850	836.6	4183	RMC	19.29	19.43	-0.14
LTE B5 (B.W 10MHz)	836.5	20525	QPSK	18.59	18.66	-0.07

1.2 RADIATED SPURIOUS EMISSIONS

Mode, Channel, (Frequency)	Freq. (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm]	C.L	Pol.	Result (dBm)
GSM850 CH 190 (836.6)	2 509.80	-39.13	10.28	-45.55	2.30	H	-37.57
WDM850 CH 4183 (836.6)	3 346.40	-58.79	11.28	-63.38	2.67	H	-54.77
LTE B5 CH 20525 (836.5)	2 509.50	-54.25	10.28	-60.67	2.30	H	-52.69



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Modulation	Frequency		Mode	SM-A022M/DS (dBm)	SM-M022G/DS (dBm)	Deviation (dB)
	MHz	Ch.				
GSM850	2 509.80	190	VOICE	-40.34	-37.57	-2.77
WDM850	3 346.40	4183	RMC	-54.87	-54.77	-0.10
LTE B5 (B.W 3MHz)	2 509.50	20525	QPSK	-47.45	-52.69	5.24

2. Summary of the spot check for Unlicensed EMC

Mod	Test Item	Mod/ Channel	Measured Frequency [MHz]	SM-A022M/DS Result [dBuV/m]		SM-M022G/DS Result [dBuV/m]		Deviation (dB)	
				Average	Peak	Average	Peak	Average	Peak
BT	Band Edge	3-DH5 / ch 78	2483.5 MHz~2500 MHz	49.35	60.92	48.89	56.86	0.46	4.06
	RSE	3-DH5 / ch 0	7206 MHz	37.23	51.12	37.23	51.13	0.00	-0.01
BT LE	Band Edge	1M_37 Bytes / ch 0	2310 MHz~2390 MHz	46.40	56.82	45.80	55.38	0.60	1.44
	RSE	1M_37 Bytes / ch 0	7206 MHz	40.47	50.62	40.83	50.84	-0.36	-0.22
WLAN	DTS BE	802.11n(20) / ch11 / PLS 16	2483.5 MHz	51.35	69.34	51.82	70.40	-0.47	-1.06
	DTS RSE	802.11n(20) / ch1 / PLS 18	7236 MHz	39.26	50.84	39.64	51.88	-0.38	-1.04

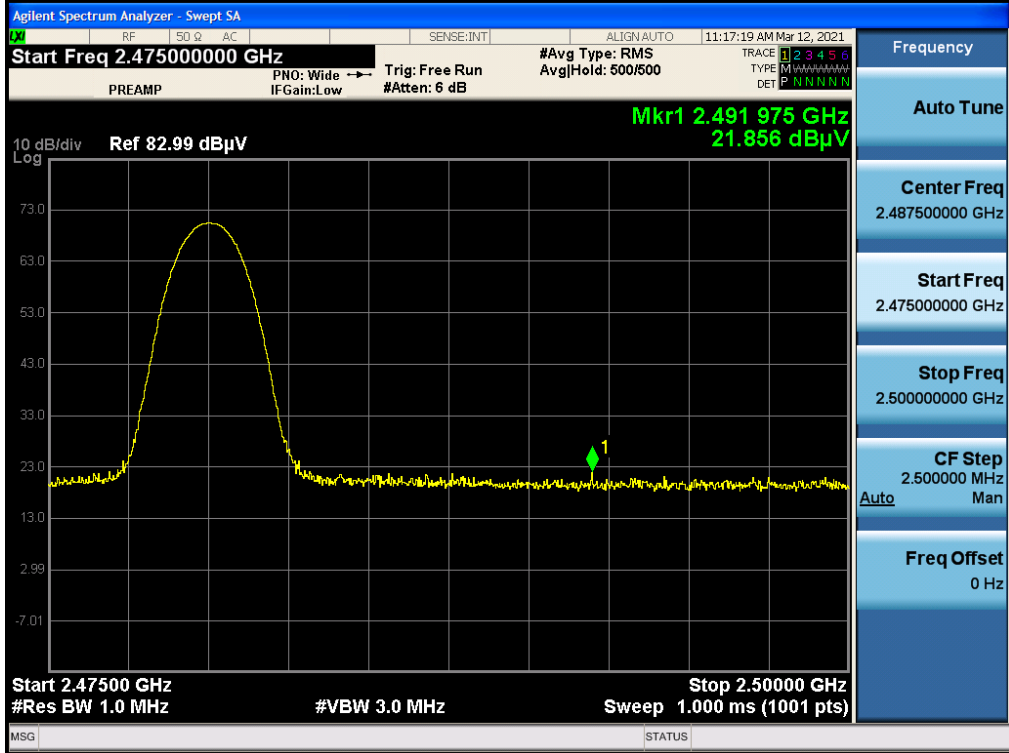
3. Test Plot

BT Band Edge (3-DH5/ch.78)

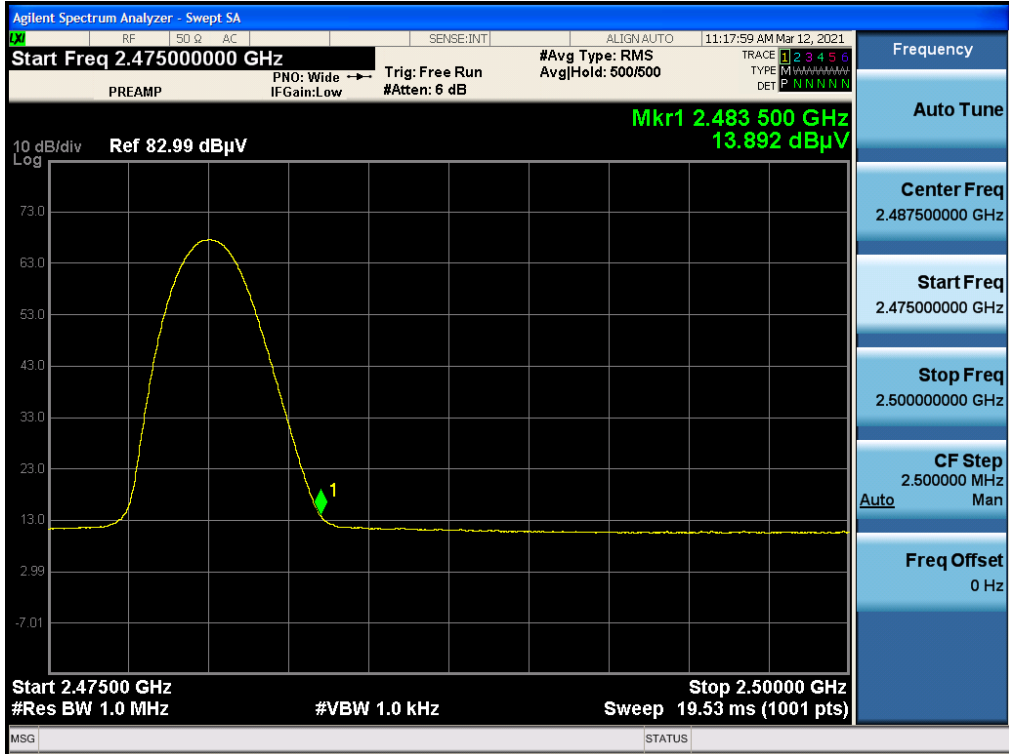
Bandedge

Frequency [MHz]	Reading dBuV	※ A.F.+CL [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	21.856	35.00	V	56.86	73.98	17.12	PK
2483.5	13.892	35.00	V	48.89	53.98	5.09	AV

[Radiated Restricted Band Edges plot- Peak Reading]



[Radiated Restricted Band Edges plot- Average Reading]

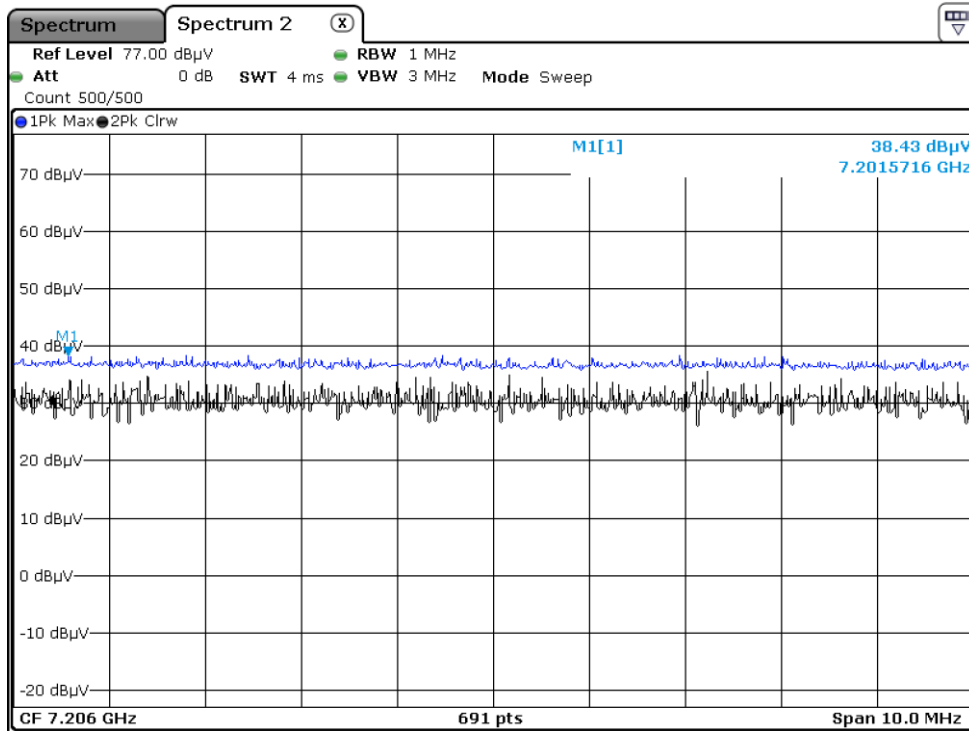


BT R.S.E 3rd Harmonic(8DPSK/ch.0)

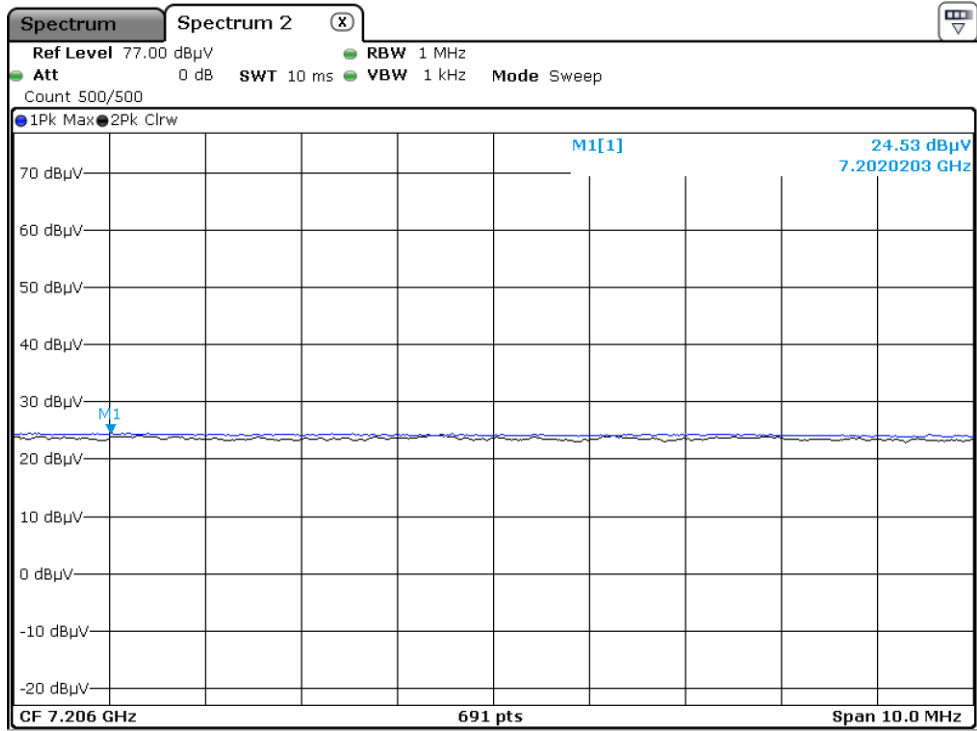
RSE

Frequency [MHz]	Reading dBuV	A.F+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
7206	38.43	12.70	H	51.13	73.98	22.85	PK
7206	24.53	12.70	H	37.23	53.98	16.75	AV

[Radiated Spurious Emissions plot – Peak Reading]



[Radiated Spurious Emissions plot – Average Reading]



DTS Band Edge (802.11n_20 MHz_6.5 Mbps/ch.11)

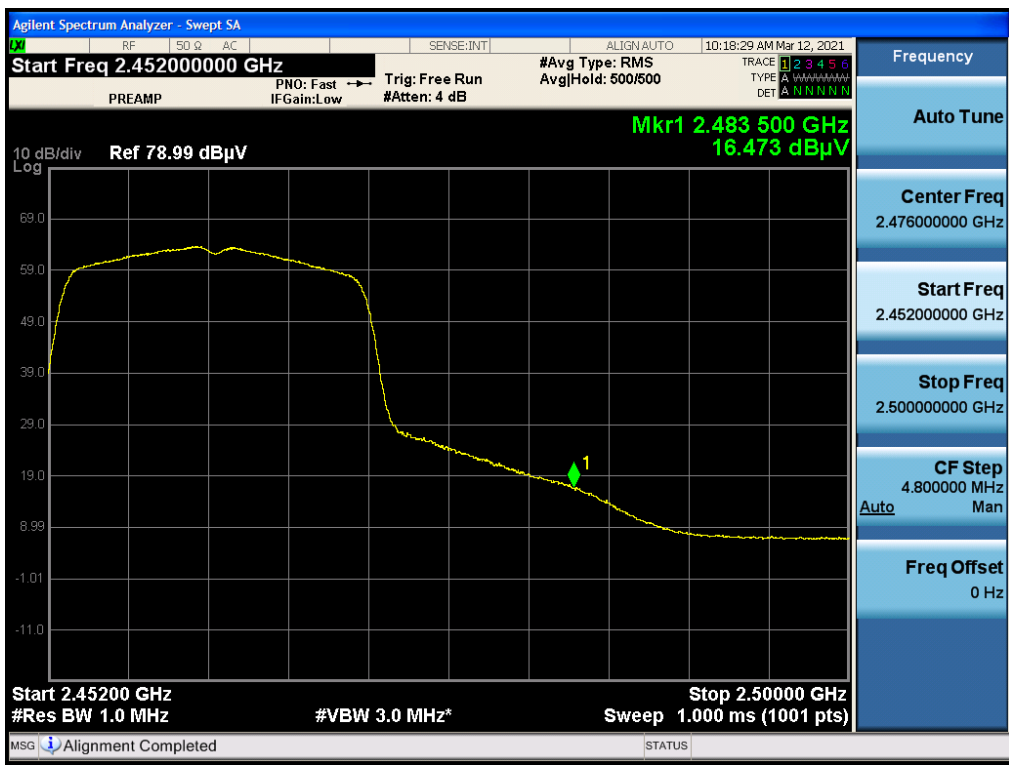
Bandedge

Frequency [MHz]	Reading dBuV	Duty Cycle Factor	※ A.F.+CL [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	35.399	0.00	35.00	V	70.40	73.98	3.58	PK
2483.5	16.473	0.35	35.00	V	51.82	53.98	2.16	AV

[Radiated Restricted Band Edges plot – Peak Reading]



[Radiated Restricted Band Edges plot – Average Reading]

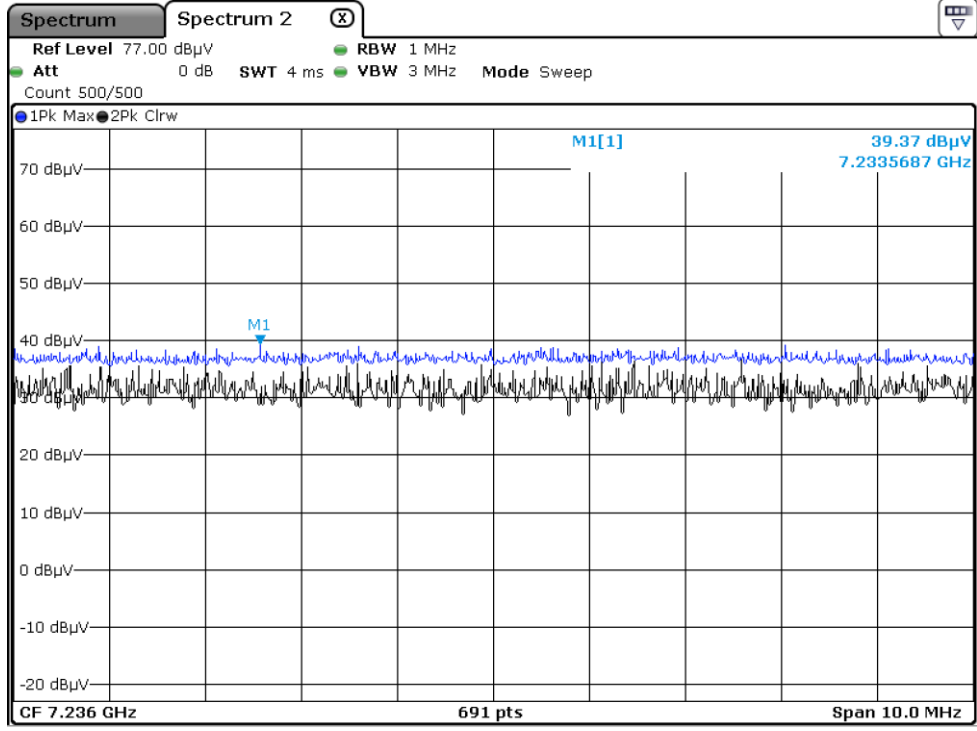


DTS R.S.E 3rd Harmonic (802.11n_20 MHz_6.5 Mbps/ch.1)

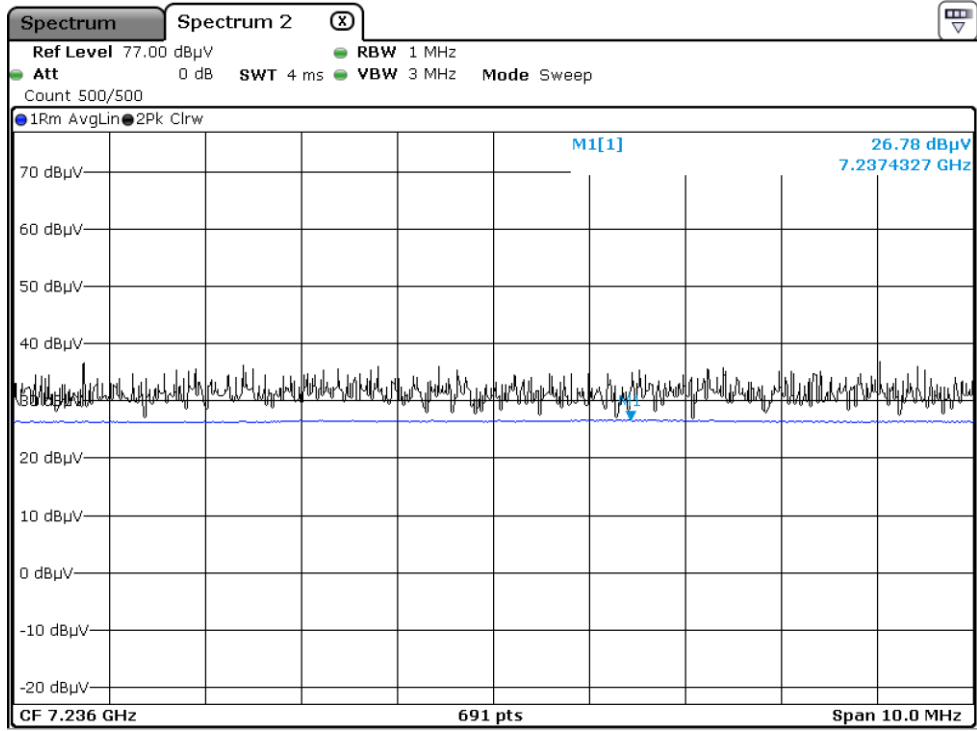
RSE

Frequency [MHz]	Reading dBuV	Duty Cycle Factor	※ A.F.+CL [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
7236	39.37	0.00	12.51	H	51.88	73.98	22.10	PK
7236	26.78	0.35	12.51	H	39.64	53.98	14.34	AV

[Radiated Spurious Emissions plot – Peak Reading]



[Radiated Spurious Emissions plot – Average Reading]

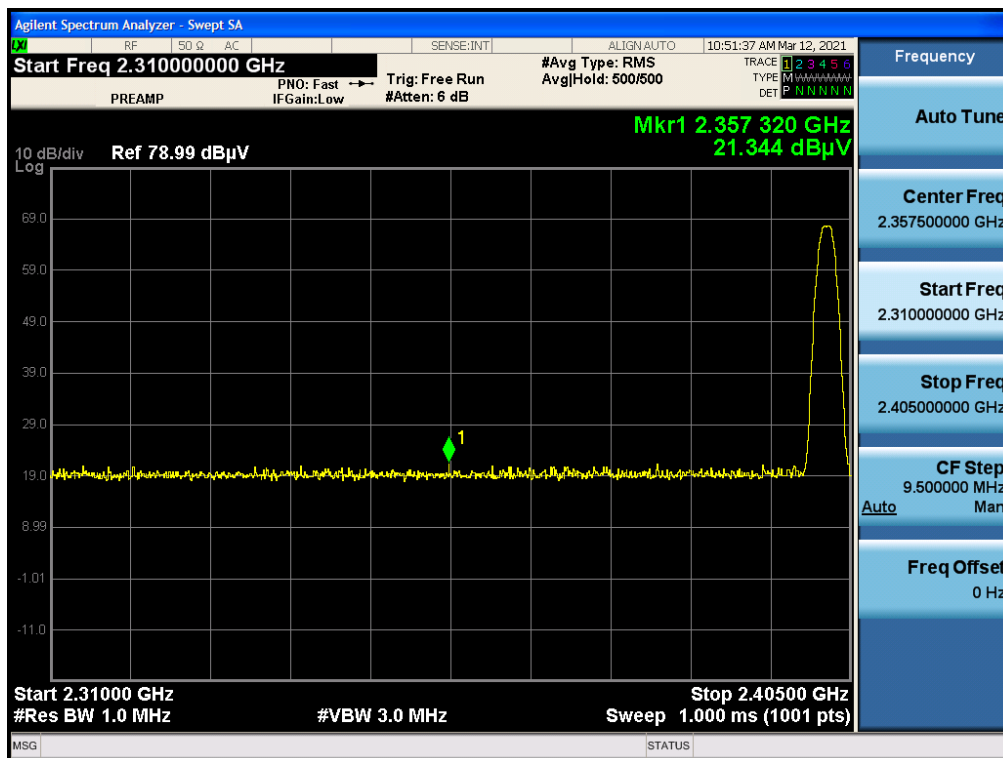


BT(LE) Band Edge (LE(5.0) 1M 37byte/ch.0)

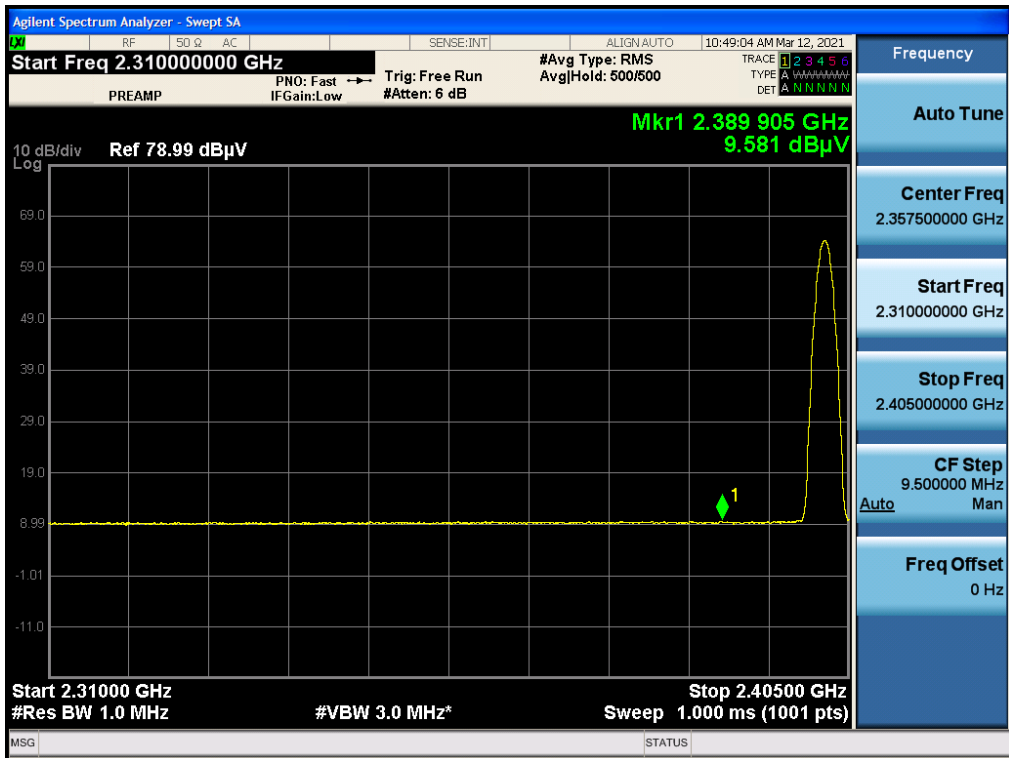
Bandedge

Frequency [MHz]	Reading dBuV	Duty cycle Factor	※ A.F.+CL [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	21.344	0.00	34.04	V	55.38	73.98	18.60	PK
2390.0	9.581	2.18	34.04	V	45.80	53.98	8.18	AV

[Radiated Restricted Band Edges plot – Peak Reading]



[Radiated Restricted Band Edges plot – Average Reading]

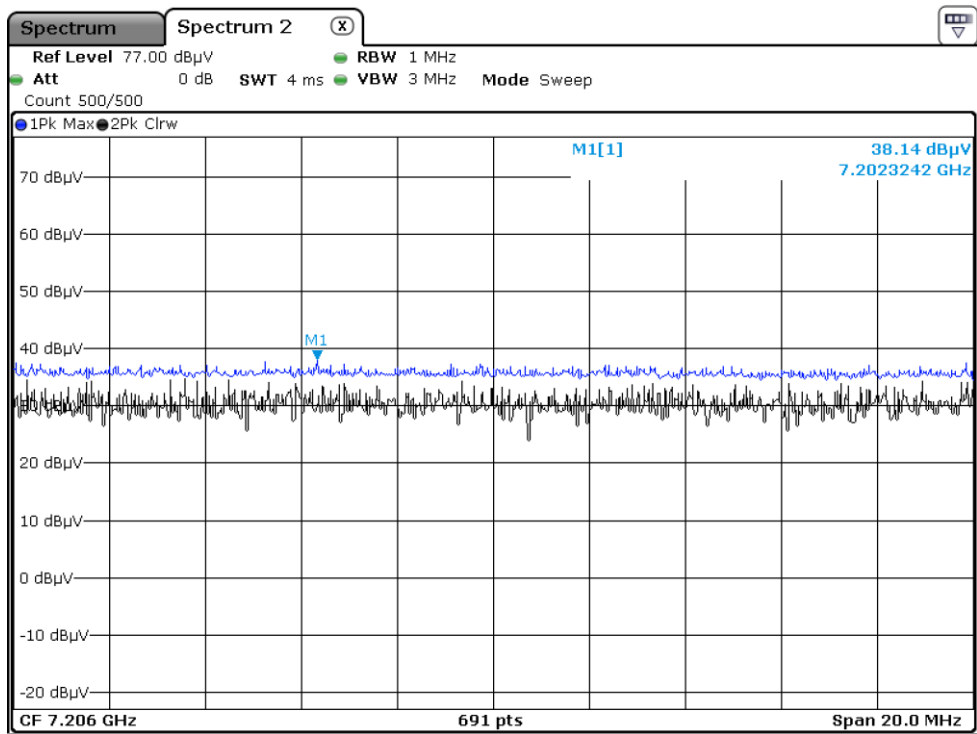


BT(LE) R.S.E 3rd Harmonic (LE(5.0) 1M 37byte/ch.0)

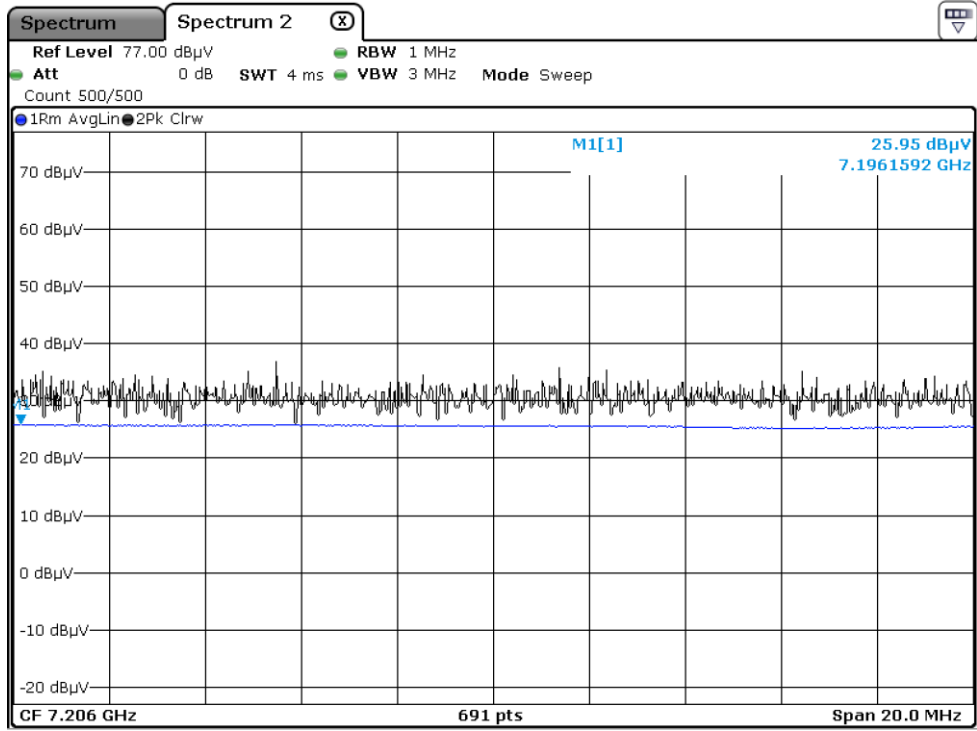
RSE

Frequency [MHz]	Reading dBuV	Duty cycle Factor	A.F+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
7206	38.14	0.00	12.70	V	50.84	73.98	23.14	PK
7206	25.95	2.18	12.70	V	40.83	53.98	14.33	AV

[Radiated Spurious Emissions plot – Peak Reading]



[Radiated Spurious Emissions plot – Average Reading]



4. List of test equipment

Manufacture	Model/ Equipment	Serial Number	Calibration Date	Calibration Interval	Calibration Due
Wainwright Instruments	WHKX10-900-1000-15000-40SS/ High Pass Filter	5	07/13/2020	Annual	07/13/2021
Wainwright Instruments	WHKX10-2700-3000-18000-40SS/ High Pass Filter	145	09/03/2020	Annual	09/03/2021
Hewlett Packard	11667B / Power Splitter(DC~26.5 GHz)	11275	04/27/2020	Annual	04/27/2021
CERNEX	LOW NOISE AMP (100MHz ~ 18GHz)	26822	06/04/2020	Annual	06/04/2021
CERNEX	CBL18265035 / Power Amplifier	22966	12/04/2020	Annual	12/04/2021
CERNEX	CBL26405040 / Power Amplifier	25956	03/23/2020	Annual	03/23/2021
Hewlett Packard	E3632A/DC Power Supply	MY40004427	09/16/2020	Annual	09/16/2021
Schwarzbeck	UHAP / Precision Dipole Antenna	01273	05/30/2020	Biennial	05/30/2022
Schwarzbeck	UHAP / Precision Dipole Antenna	01274	05/30/2020	Biennial	05/30/2022
ESPEC	SU-642 / Chamber	93008124	03/15/2021	Annual	03/15/2022
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	02289	05/08/2020	Biennial	05/08/2022
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	9120D-1299	05/10/2019	Biennial	05/10/2021
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170342	04/29/2019	Biennial	04/29/2021
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170124	02/11/2020	Biennial	02/11/2022
Agilent	N9020A/Signal Analyzer(10Hz~26.5GHz)	MY51110063	04/27/2020	Annual	04/27/2021
Hewlett Packard	8493C/ATTENUATOR(20dB)	17280	06/04/2020	Annual	06/04/2021
REOHDE & SCHWARZ	FSV40/Spectrum Analyzer(10Hz~40GHz)	101436	03/02/2021	Annual	03/02/2022
Agilent	8960 (E5515C)/ Base Station	MY48360800	08/26/2020	Annual	08/26/2021
Rohde & Schwarz	FMZB1513/ Loop Antenna(9kHz~30MHz)	1513-333	03/19/2020	Biennial	03/19/2022
Schwarzbeck	VULB9160/ Bilog Antenna	3150	03/03/2021	Biennial	03/03/2023
Schwarzbeck	VULB9160/ Hybrid Antenna	760	02/22/2021	Biennial	02/22/2023
Anritsu Corp.	MT8821C/Wideband Radio Communication Tester	6262116770	07/22/2020	Annual	07/22/2021
Anritsu Corp.	MT8820C/Wideband Radio Communication Tester	6201026545	01/07/2021	Annual	01/07/2022
REOHDE & SCHWARZ	SMB100A/ SIGNAL GENERATOR (100kHz~40GHz)	177633	07/13/2020	Annual	07/13/2021
KEYSIGHT	N9030B / Signal Analyzer(5Hz~40.0GHz)	MY55480167	06/04/2020	Annual	06/04/2021
HCT CO., LTD.,	FCC LTE Mobile Conducted RF Automation Test Software	-	-	-	-

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Innco system	CO3000 / Controller(Antenna mast)	N/A	N/A	CO3000-4p
Innco system	MA4640/800-XP-EP / Antenna Position Tower	N/A	N/A	N/A
Audix	EM1000 / Controller	N/A	N/A	060520
Audix	Turn Table	N/A	N/A	N/A
Rohde & Schwarz	Loop Antenna	05/18/2020	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	02/22/2021	Biennial	760
Schwarzbeck	BBHA 9120D / Horn Antenna	05/29/2021	Biennial	02299
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	11/29/2019	Biennial	BBHA9170541
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	07/28/2020	Annual	102168
Agilent	N9030A / Signal Analyzer	01/11/2021	Annual	MY49431210
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	01/06/2021	Annual	2
Wainwright Instruments	WRCJV5100/5850-40/50-8EEK / Band Reject Filter	02/08/2021	Annual	1
Wainwright Instruments	WHK3.0/18G-10EF / High Pass Filter	02/03/2021	Annual	8
Wainwright Instruments	WHKX8-6090-7000-18000-40SS/ High Pass Filter	02/03/2021	Annual	25
Api tech.	18B-03 / Attenuator (3 dB)	02/03/2021	Annual	1
Agilent	8493C-10 / Attenuator(10 dB)	02/03/2021	Annual	08285
CERNEX	CBLU1183540 / Power Amplifier	02/03/2021	Annual	22964
CERNEX	CBL06185030 / Power Amplifier	02/03/2021	Annual	22965
CERNEX	CBL18265035 / Power Amplifier	12/04/2020	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	03/23/2020	Annual	25956
TESCOM	TC-3000C / Bluetooth Tester	03/09/2021	Annual	3000C000276