

# EVALUATION REPORT

**Applicant Name:**

SAMSUNG Electronics Co., Ltd.

**Date of Issue:**

April 17, 2020

**Address:**129, Samsung-ro, Yeongtong-gu,  
Suwon-si, Gyeonggi-do, 16677, Rep. of Korea**Location:**HCT CO., LTD.,  
74, Seoicheon-ro 578beon-gil, Majang-myeon,  
Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA

<b>FCC ID:</b>	<b>A3LSMA217F</b>
<b>APPLICANT:</b>	<b>SAMSUNG Electronics Co., Ltd.</b>

Equipment Class(es) : PCE, DSS, DTS, UNII

Rule Part(s) : 15, 22, 24, 27, 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 A3LSMA217M.  
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
A3LSMA217M	PCE	2G, 3G Report	All sections
		LTE B2 Report	All sections
		LTE B5 Report	All sections
		LTE B41 Report	All sections
	DSS	Bluetooth Report	All sections
	DTS	WLAN DTS Report	All sections
		BT LE Report	All sections
	NII	NII Test Report	All sections



Report prepared by : Jae Mun Do

Engineer of Telecommunication testing center



Approved by : Jong Seok Lee

Manager of Telecommunication testing center

## 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	251	848.8	-24.20	39.82	-10.14	1.30	H	< 7.00	0.688	28.38
WCDMA850	4183	836.6	-32.49	31.69	-10.19	1.29	H		0.105	20.21
LTE B5	20525	836.5	-32.50	31.68	-10.19	1.29	H		0.105	20.20

Mode	Frequency (MHz)		Mode	SM-A217M/DS (dBm)	SM-A217F/DSN (dBm)	Deviation (dB)
	MHz	Ch.				
GSM850	848.8	251	VOICE	29.53	28.38	1.15
WCDMA850	836.6	4183	RMC	20.28	20.21	0.07
LTE B5	836.5	20525	QPSK(10MHz)	20.73	20.20	0.53

**1.2 EQUIVALENT ISOTROPIC 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
GSM1900	512	1850.2	-13.66	19.98	10.10	1.94	H	< 2.00	0.652	28.14
WCDMA1900	9400	1880.0	-21.78	12.11	10.15	1.98	H		0.107	20.28

Mode	Frequency		Mode	SM-A217M/DS (dBm)	SM-A217F/DSN (dBm)	Deviation (dB)
	MHz	Ch.				
GSM1900	1850.2	512	VOICE	29.19	28.14	1.05
WCDMA1900	1880.0	9400	RMC	18.82	20.28	-1.46



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

Mode	Ch./ Freq.		Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol.	Limit	EIRP	
	channel	Freq.(MHz)						W	W	dBm
LTE B2	18607	1850.7	-21.81	12.00	10.13	1.95	H	< 2.00	0.104	20.18
LTE B41	41490	2680.0	-22.68	14.30	11.10	2.38	H		0.200	23.02

Mode	Frequency		Mod/ Bandwidth	SM-A217M/DS (dBm)	SM-A217F/DSN (dBm)	Deviation (dB)
	MHz	Ch.				
LTE B2	1850.7	18607	QPSK(1.4 MHz)	21.65	20.18	1.47
LTE B41	2680.0	41490	QPSK(20 MHz)	24.84	23.02	1.82

**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 251 (848.8)	1,697.60	-31.20	9.80	-41.67	1.87	V	-33.74
WCDMA850 CH 4183 (836.6)	3,346.40	-57.01	12.48	-58.66	2.70	V	-48.89
LTE B5 CH 20525 (836.5)	2,509.50	-55.50	10.75	-60.61	2.32	H	-52.18

Modulation	Frequency		Mode	SM-A217M/DS (dBm)	SM-A217F/DSN (dBm)	Deviation (dB)
	MHz	Ch.				
GSM850	1697.6	251	VOICE	-30.92	-33.74	2.82
WCDMA850	3346.4	4184	RMC	-50.25	-48.89	-1.36
LTE B5	836.5	20525	QPSK(3MHz)	-45.08	-52.18	7.10



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

Mode, Channel (Frequency)	Freq. (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm]	C.L	Pol.	Result (dBm)
GSM1900 CH 512 (1850.2)	7,400.80	-57.50	11.10	-47.71	4.26	H	-40.87
WCDMA1900 CH 9400 (1880.0)	7,520.00	-56.76	11.30	-46.59	4.30	H	-39.59

Modulation	Frequency		Mode	SM-A217M/DS (dBm)	SM-A217F/DSN (dBm)	Deviation (dB)
	MHz	Ch.				
GSM1900	7400.8	512	VOICE	-39.98	-40.87	0.89
WCDMA1900	7520.0	9400	RMC	-39.58	-39.59	0.01



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

Mode, Channel, (Frequency)	Freq. (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm]	C.L	Pol.	Result (dBm)
LTE B2 CH 18900 (1880.0)	7,520.00	-58.24	11.30	-48.07	4.30	H	-41.07
LTE B41 CH 39675 (2498.5)	9,994.00	-59.04	11.89	-57.35	5.04	V	-50.50

Modulation	Frequency		Mode	SM-A217M/DS (dBm)	SM-A217F/DSN (dBm)	Deviation (dB)
	MHz	Ch.				
LTE B2	7520.0	18900	QPSK(3MHz)	-39.64	-41.07	1.43
LTE B41	9994.0	39675	QPSK(5MHz)	-34.58	-50.50	15.92

## 2. Summary of the spot check for Unlicensed EMC

Mod	Test Item	Mod/ Channel	Measured Frequency [MHz]	SM-A217M/DS Result [dBuV/m]		SM-A217F/DSN Result [dBuV/m]		Deviation (dB)	
				Peak	Average	Peak	Average	Peak	Average
BT	Band Edge	3-DH5/ch.78	2483.5 MHz~2500 MHz	66.04	44.69	65.50	44.75	0.54	-0.06
	RSE	DH5/ch.0	7206 MHz	51.27	40.31	50.87	37.85	0.40	2.46
BT(LE)	Band Edge	LE(5.0) 2M 255byte/ch.39	2483.5 MHz~2500 MHz	56.17	48.54	57.30	48.42	-1.13	0.12
	RSE	LE(5.0) 2M 255byte/ch.0	7206MHz	51.22	41.49	50.42	41.19	0.80	0.30
DTS	Band Edge	802.11n(20M)_ 6.5Mbps/ch.1	2310 MHz~2390 MHz	65.46	50.48	63.09	47.15	2.37	3.33
	RSE	802.11b MCS1/ch.6	7311 MHz	55.59	48.26	53.09	42.95	2.50	5.31
UNII	Band Edge	802.11n(20M)_ 6.5Mbps/ch.100	5350-5460 MHz	55.79	41.67	56.67	41.86	-0.88	-0.19
			5460-5470 MHz	65.51	-	66.14	-	-0.63	-
	RSE	802.11a(20M)_ MCS6/ch.40	15600 MHz	65.25	50.44	57.43	43.27	7.82	7.17



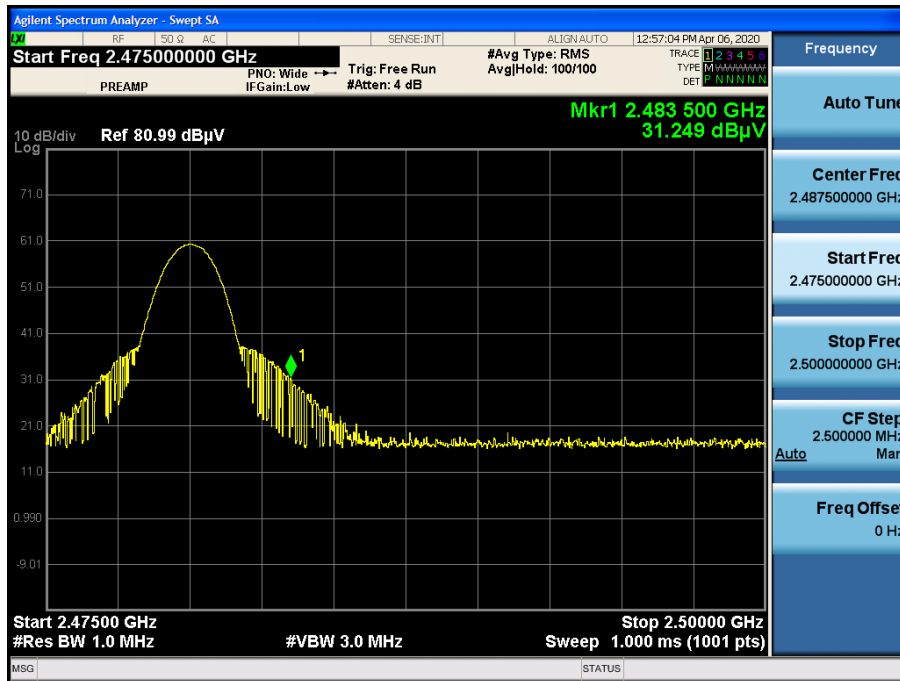
### 3. Test Plot

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

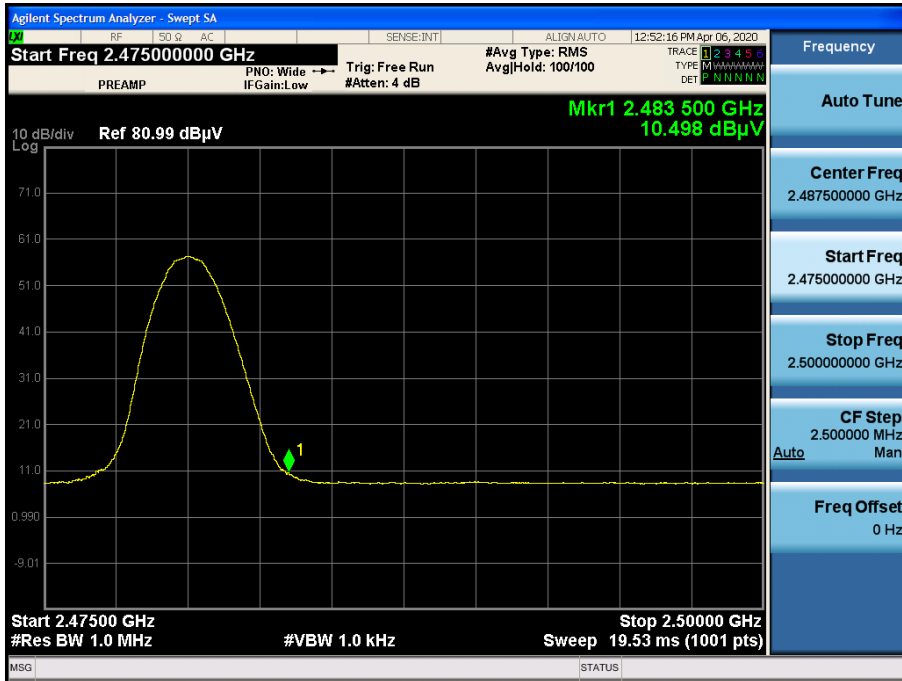
##### Bandedge

Frequency [MHz]	Reading [dBuV]	A.F.+CL [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	31.249	34.25	H	65.50	73.98	8.48	PK
2483.5	10.498	34.25	V	44.75	53.98	9.23	AV

[Radiated Restricted Band Edges plot- Peak Reading]



[Radiated Restricted Band Edges plot- Average Reading]

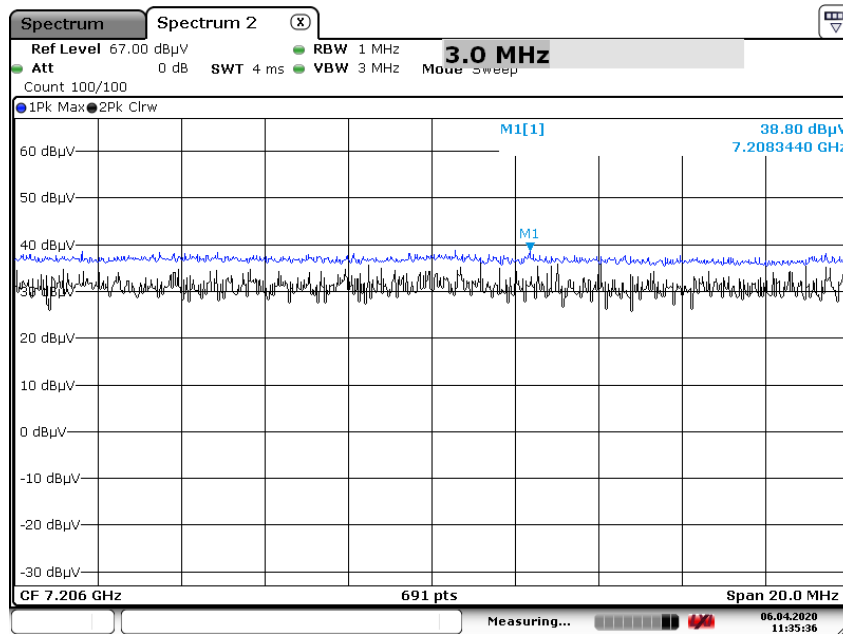


**BT R.S.E 3<sup>rd</sup> Harmonic(DH5/ch.0)**

**RSE**

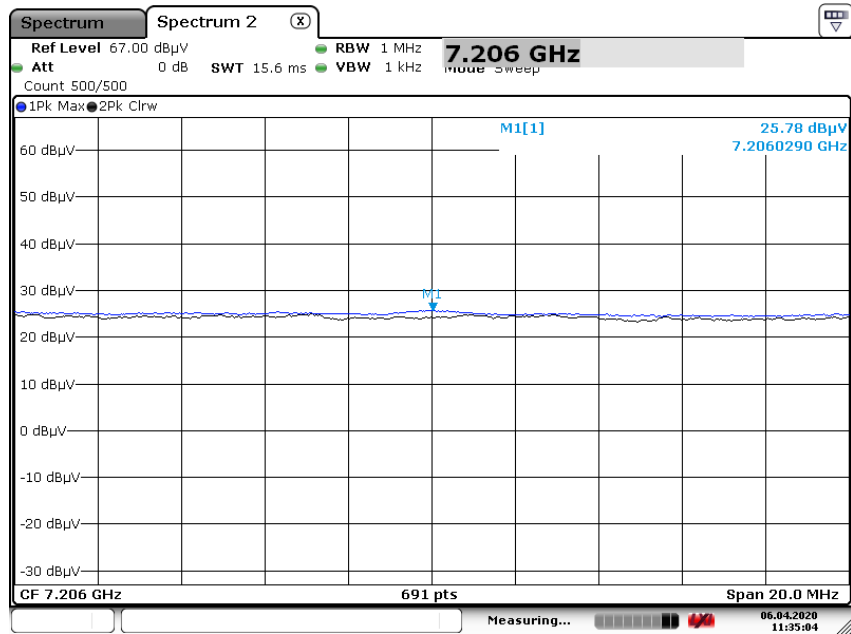
Frequency [MHz]	Reading [dBuV]	AN.+CL-AMP G [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
7206	38.80	12.07	H	50.87	73.98	23.11	PK
7206	25.78	12.07	H	37.85	53.98	16.13	AV

[Radiated Spurious Emissions plot – Peak Reading]



Date: 6.APR.2020 11:35:36

[Radiated Spurious Emissions plot – Average Reading]



Date: 6.APR.2020 11:35:04

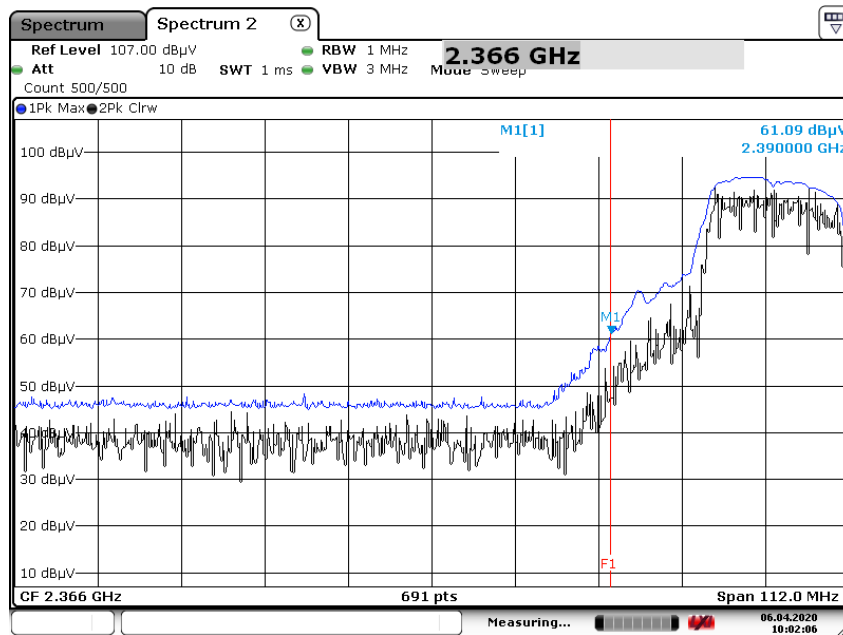
**DTS Band Edge (802.11n\_20 MHz MCS6.5/ch.1)**

Mode	Data Rate	T <sub>on</sub> (ms)	T <sub>total</sub> (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11n_20 MHz BW	MCS0_6.5 Mbps	1.334	1.454	0.917	0.37

**Bandedge**

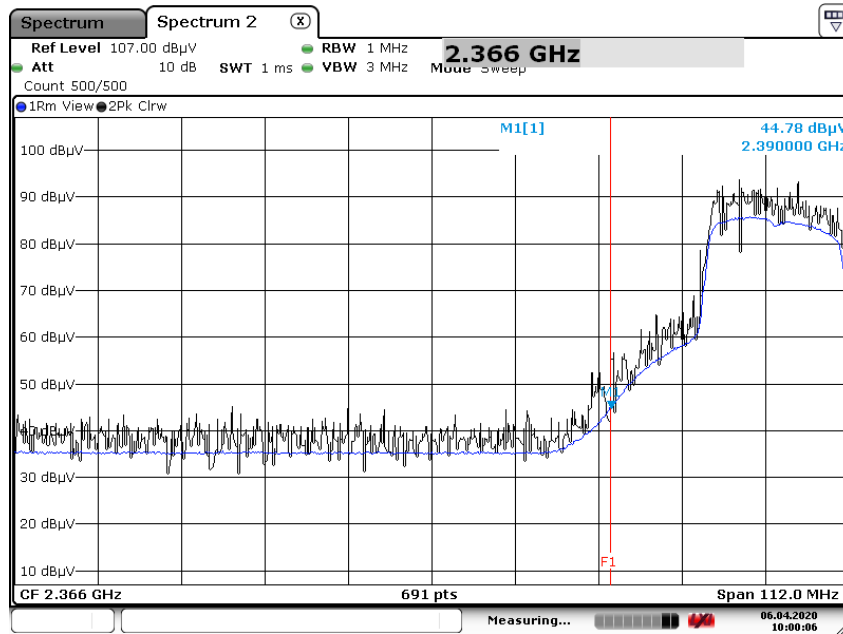
Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+CL+ATT-A.G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	61.09	0.00	2.00	H	63.09	73.98	10.89	PK
2390.0	44.78	0.37	2.00	H	47.15	53.98	6.83	AV

[Radiated Restricted Band Edges plot – Peak Reading]



Date: 6.APR.2020 10:02:06

[Radiated Restricted Band Edges plot – Average Reading]



Date: 6.APR.2020 10:00:06

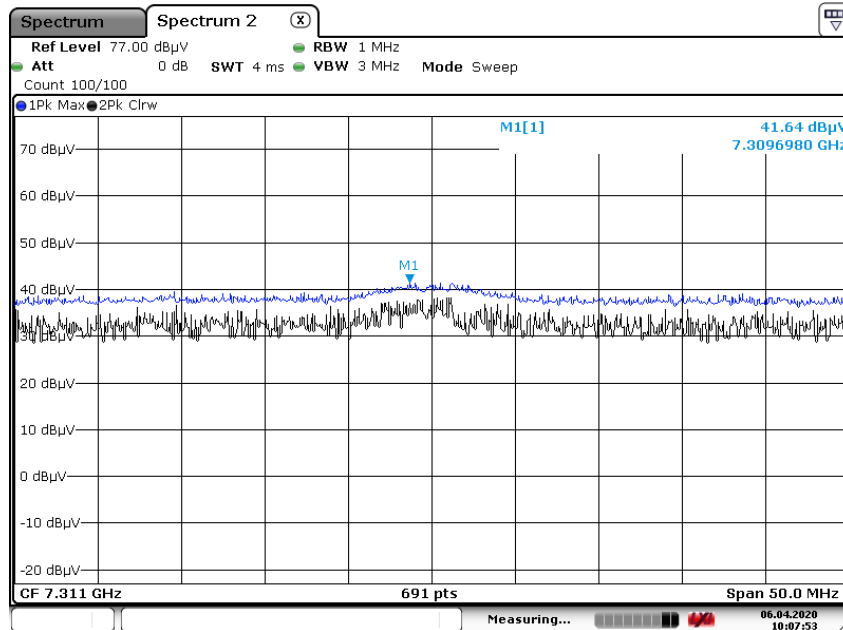
**DTS R.S.E 3<sup>rd</sup> Harmonic (802.11b 1Mbps/ch.6)**

Mode	Data Rate	T <sub>on</sub> (ms)	T <sub>total</sub> (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11b	1 Mbps	8.609	8.749	0.984	0.07

**RSE**

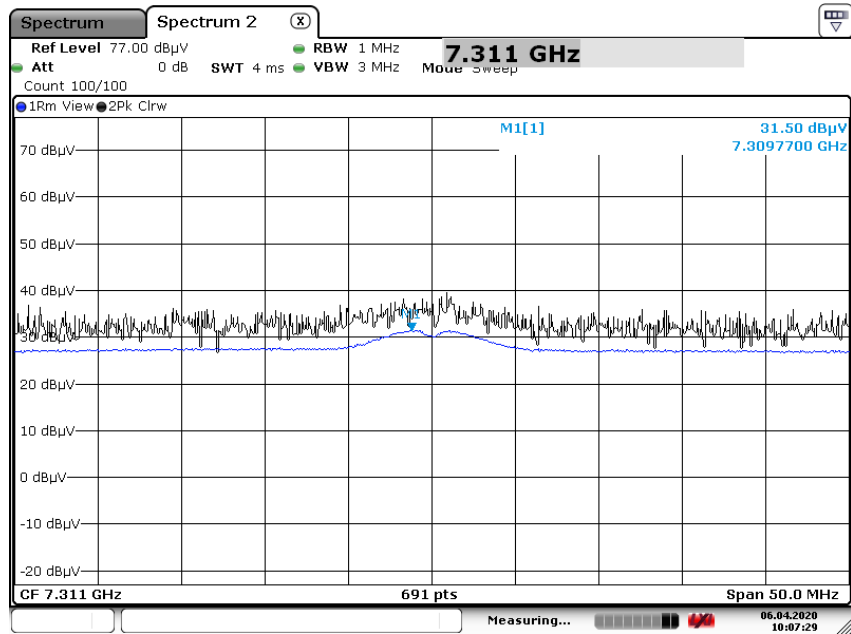
Frequency [MHz]	Reading [dBuV]	AN.+CL-AMP G [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
7311	41.64	11.45	H	53.09	73.98	20.89	PK
7311	31.50	11.45	H	42.95	53.98	11.03	AV

[Radiated Spurious Emissions plot – Peak Reading]



Date: 6.APR.2020 10:07:53

[Radiated Spurious Emissions plot – Average Reading]



Date: 6.APR.2020 10:07:29



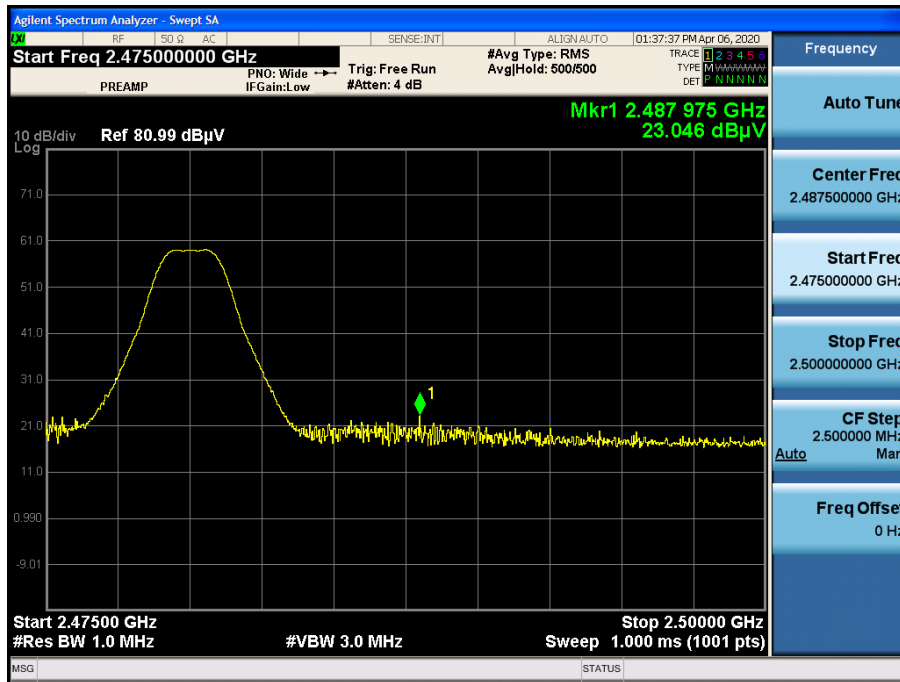
### BT(LE) Band Edge (LE(5.0) 2M 255byte/ch.39)

Mode	T <sub>on</sub> (ms)	T <sub>total</sub> (ms)	Duty Cycle	Duty Cycle Factor
BT LE_2M 255byte	1.075	1.875	0.573	2.42

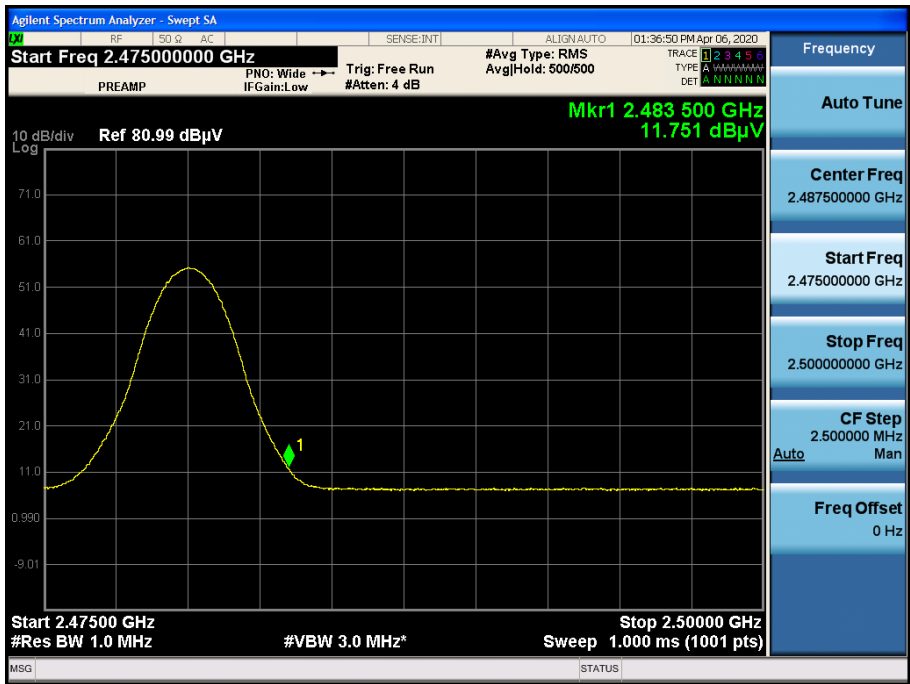
### Bandedge

Frequency [MHz]	Reading [dBuV]	Duty cycle Factor [dB]	A.F.+CL [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	23.046	0.00	34.25	H	57.30	73.98	16.68	PK
2483.5	11.751	2.42	34.25	H	48.42	53.98	5.56	AV

[Radiated Restricted Band Edges plot – Peak Reading]



[Radiated Restricted Band Edges plot – Average Reading]



### BT(LE) R.S.E 3<sup>rd</sup> Harmonic (LE(5.0) 2M 255byte/ch.0)

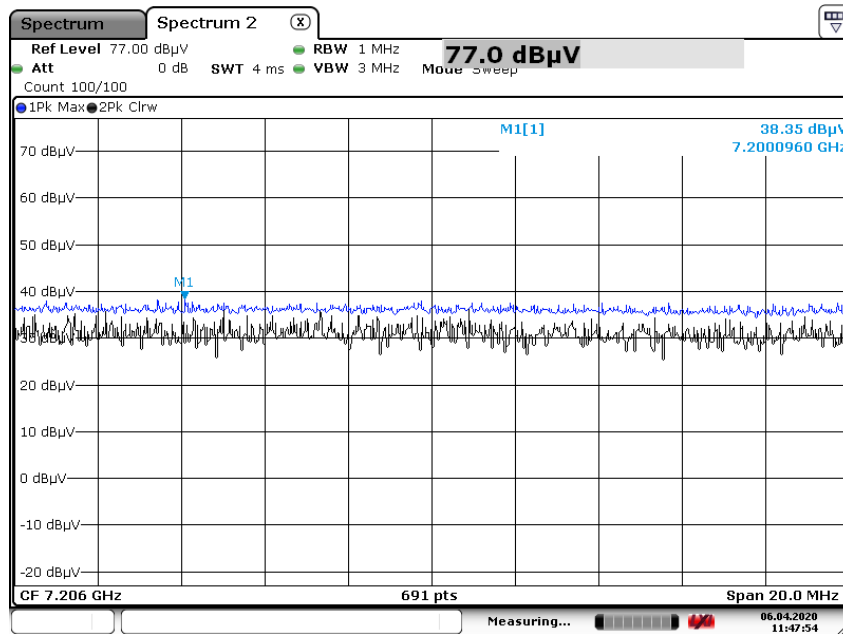
#### RSE

Frequency [MHz]	Reading [dBuV]	Duty cycle Factor [dB]	AN.+CL-AMP G [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement
								Type
7206	38.35	0.00	12.07	H	50.42	73.98	23.56	PK
7206	26.70	2.42	12.07	H	41.19	53.98	12.79	AV

#### Note:

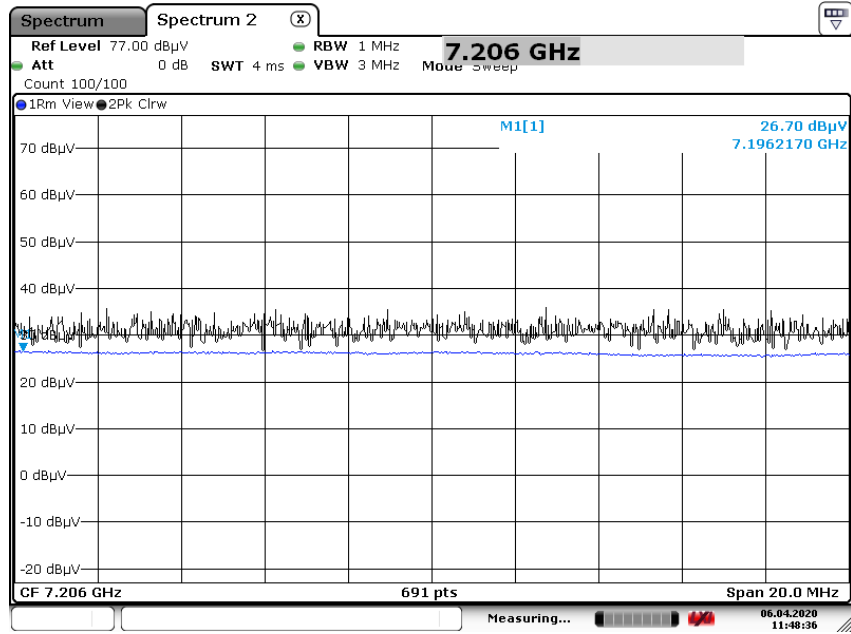
1. Reading value is ambient level measurement, this reason not add the duty cycle factor for final result.

[Radiated Spurious Emissions plot – Peak Reading]



Date: 6.APR.2020 11:47:54

[Radiated Spurious Emissions plot – Average Reading]



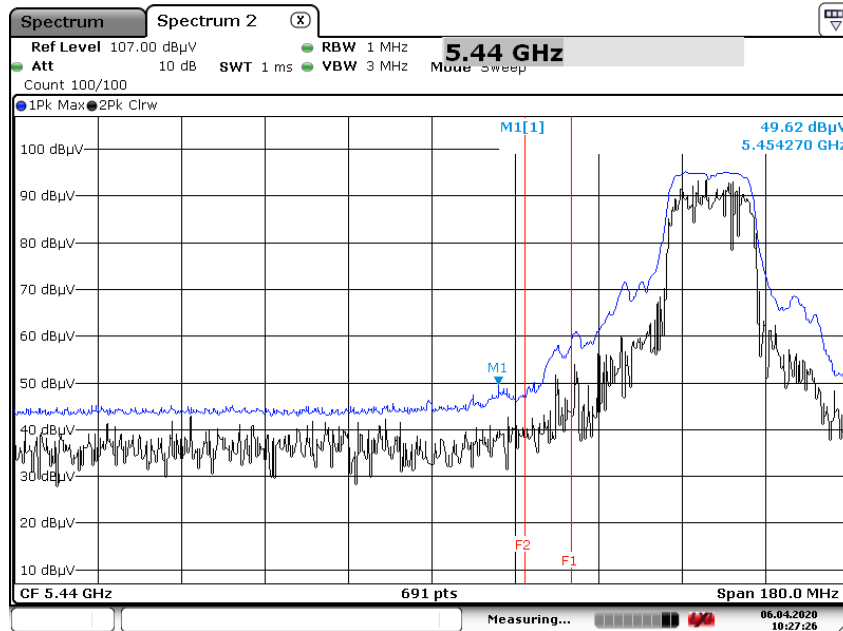
Date: 6.APR.2020 11:48:36

**U-NII Band Edge (802.11n\_20MHz MCS6.5/ch.100)**

**Bandedge**

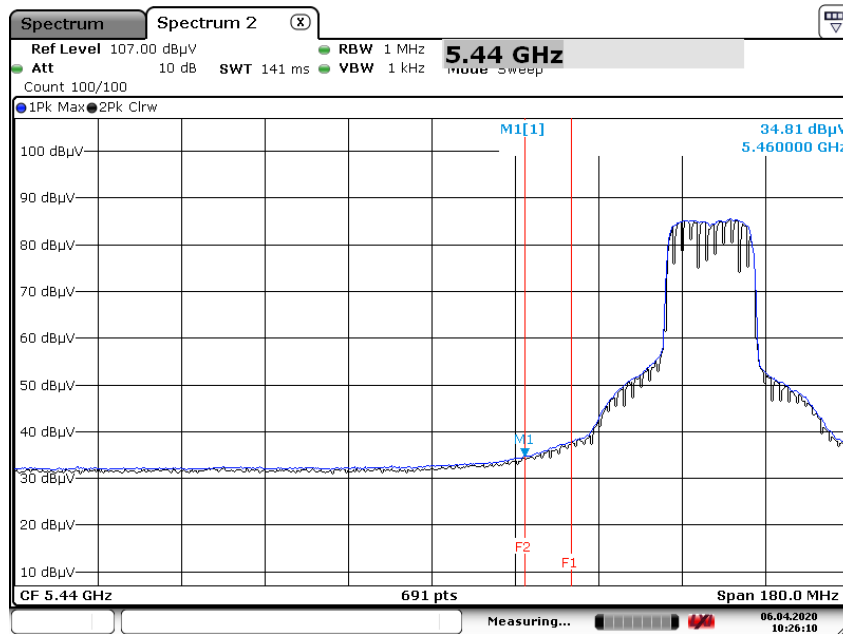
Frequency [MHz]	Reading [dBuV]	CL+AF+DF-AG [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	49.62	7.05	H	56.67	73.98	17.31	PK
5460	34.81	7.05	H	41.86	53.98	12.12	AV
5470	59.55	6.59	H	66.14	68.20	2.06	PK

Radiated Restricted Band Edges plot – Peak Reading



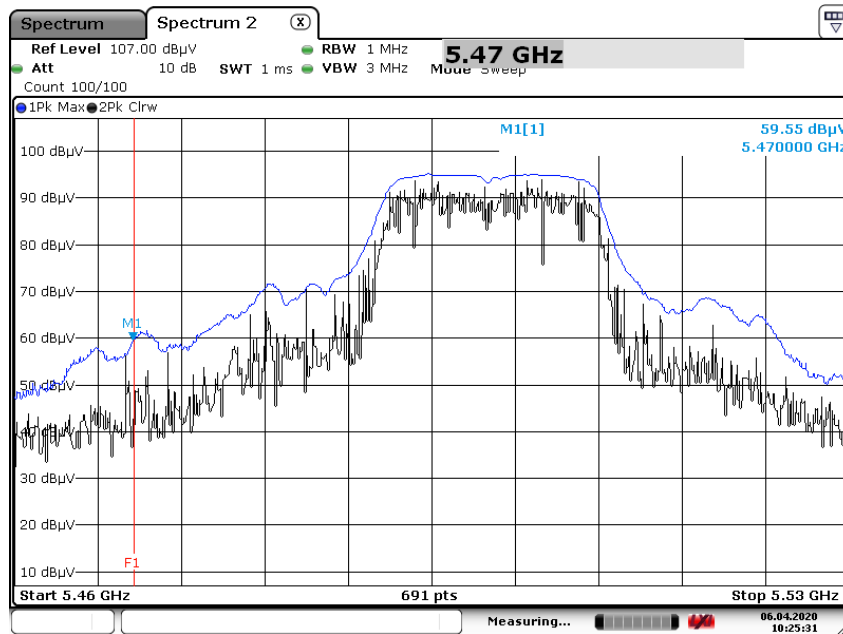
Date: 6.APR.2020 10:27:26

### Radiated Restricted Band Edges plot – Average Reading



Date: 6.APR.2020 10:26:10

### Radiated Restricted Band Edges plot



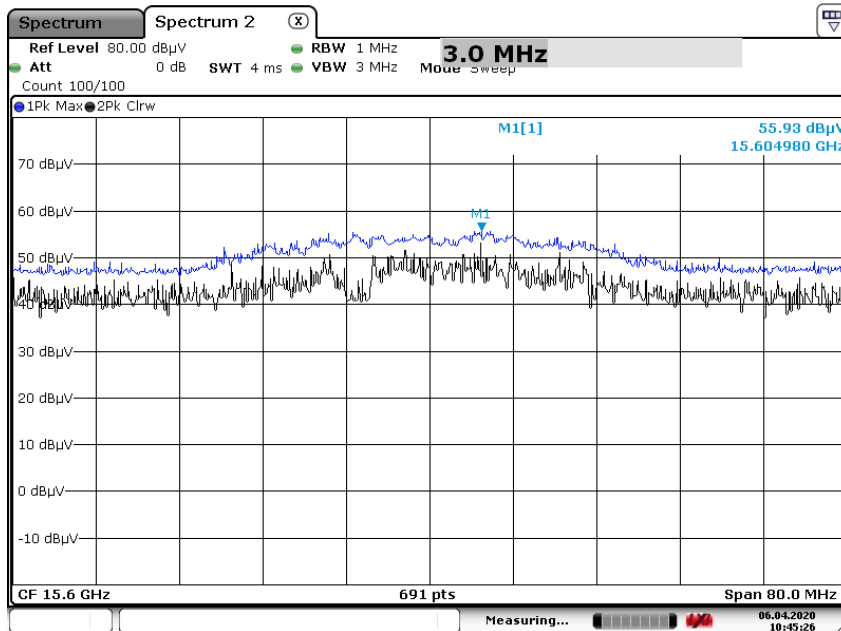
Date: 6.APR.2020 10:25:31

**U-NII R.S.E 3<sup>rd</sup> Harmonic (802.11a\_20MHz MCS6/ch.40)**

**RSE**

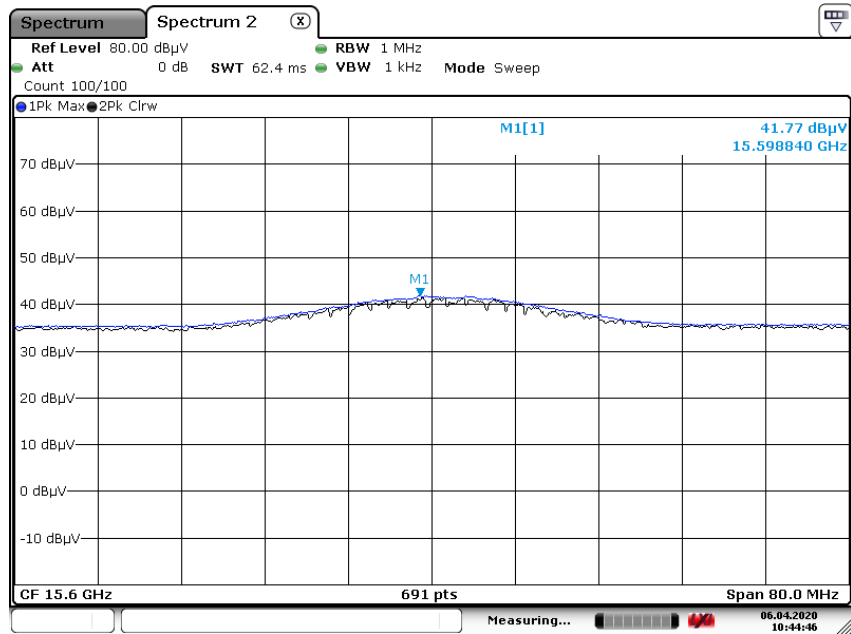
Frequency [MHz]	Reading [dBuV]	AN.+CL-AMP G [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
15600	55.93	1.50	V	57.43	73.98	16.55	PK
15600	41.77	1.50	V	43.27	53.98	10.71	AV

[Radiated Spurious Emissions plot – Peak Reading]



Date: 6.APR.2020 10:45:25

[Radiated Spurious Emissions plot – Average Reading]



Date: 6.APR.2020 10:44:46



#### 4. List of test equipment

Manufacture	Model/ Equipment	Serial Number	Calibration Date	Calibration Interval	Calibration Due
T&M SYSTEM	FBSR-02B(WHK1.2/15G-10EF)/H.P.F	-	03/09/2020	Annual	03/09/2021
T&M SYSTEM	FBSR-02B(WHK3.3/18G-10EF)/H.P.F	-	03/09/2020	Annual	03/09/2021
WAINWRIGHT INSTRUMENT	WHNX6.0/26.5G-6SS/H.P.F	1	03/19/2020	Annual	03/19/2021
Hewlett Packard	11667B / Power Splitter(DC~26.5 GHz)	11275	05/03/2019	Annual	05/03/2020
Agilent	E3632A/DC Power Supply	MY40004326	07/01/2019	Annual	07/01/2020
Schwarzbeck	UHAP/ Dipole Antenna	557	03/29/2019	Biennial	03/29/2021
Schwarzbeck	UHAP/ Dipole Antenna	558	03/29/2019	Biennial	03/29/2021
ESPEC	SU-642 / Chamber	93000717	08/14/2019	Annual	08/14/2020
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	147	08/29/2019	Biennial	08/29/2021
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	9120D-1298	09/25/2019	Biennial	09/25/2021
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170342	04/29/2019	Biennial	04/29/2021
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170124	01/28/2019	Biennial	01/28/2021
Agilent	N9020A/Signal Analyzer(10Hz~26.5GHz)	MY51110063	05/08/2019	Annual	05/08/2020
Hewlett Packard	8493C/ATTENUATOR(20dB)	17280	06/04/2019	Annual	06/04/2020
REOHDE & SCHWARZ	FSV40/Spectrum Analyzer(10Hz~40GHz)	100931	10/14/2019	Annual	10/14/2020
Agilent	8960 (E5515C)/ Base Station	MY48360800	08/27/2019	Annual	08/27/2020
Schwarzbeck	FMZB1513/ Loop Antenna(9kHz~30MHz)	1513-175	08/23/2018	Biennial	08/23/2020
Schwarzbeck	VULB9160/ Bilog Antenna	9160-3368	08/09/2018	Biennial	08/09/2020
Schwarzbeck	VULB9160/ Hybrid Antenna	760	03/22/2019	Biennial	03/22/2021
Anritsu Corp.	MT8821C/Wideband Radio Communication Tester	6201502997	08/09/2019	Annual	08/09/2020
Anritsu Corp.	MT8820C/Wideband Radio Communication Tester	6201026545	01/30/2019	Annual	01/22/2021
REOHDE & SCHWARZ	SMB100A/ SIGNAL GENERATOR (100kHz~40GHz)	177633	07/15/2019	Annual	07/15/2020
REOHDE & SCHWARZ	ESU40 / EMI TEST RECEIVER	100524	05/17/2019	Annual	05/17/2020
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	04/26/2019	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	03/22/2019	Biennial	760
Schwarzbeck	VULB 9160 / TRILOG Antenna	08/09/2018	Biennial	9160-3368
Schwarzbeck	BBHA 9120D / Horn Antenna	04/29/2019	Biennial	9120D-937
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	11/29/2019	Biennial	BBHA9170541
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	07/31/2019	Annual	102168
Agilent	N9030A / Signal Analyzer	01/13/2020	Annual	MY49431210
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	06/19/2019	Annual	2
Wainwright Instruments	WRCJV5100/5850-40/50-8EEK / Band Reject Filter	02/10/2020	Annual	1
Api tech.	18B-03 / Attenuator (3 dB)	03/02/2020	Annual	1
Agilent	8493C-10 / Attenuator(10 dB)	03/02/2020	Annual	08285
CERNEX	CBLU1183540 / Power Amplifier	03/02/2020	Annual	22964
CERNEX	CBL06185030 / Power Amplifier	03/02/2020	Annual	22965
Wainwright Instruments	WHK3.0/18G-10EF / High Pass Filter	03/02/2020	Annual	8
Wainwright Instruments	WHKX7.0/18G-8SS / High Pass Filter	03/02/2020	Annual	25
CERNEX	CBL18265035 / Power Amplifier	12/26/2019	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	06/18/2019	Annual	25956