

# 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:**

April 26, 2019

**Location:**HCT CO., LTD.,  
74, Seoicheon-ro 578beon-gil, Majang-myeon,  
Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA**FCC ID:****A3LSMA202K****APPLICANT:****SAMSUNG Electronics Co., Ltd.**

Equipment Class(es) :

PCE, DSS, DTS, DXX

Rule Part(s) :

15, 22, 24, 2

Application's Statement :

The applicant takes full responsibility that the test data referenced below represents compliance for this FCC ID.

Differences

Brief Description :

Bluetooth &amp; WLAN hardware and software of this device are identical to the implementation in A3LSMA202F. 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
A3LSMA202F	PCE	2G, 3G Report	All sections
		LTE B5 Report	All sections
	DSS	Bluetooth Report	All sections
	DTS	WLAN DTS Report	All sections
		BT LE Report	All sections
	DXX	NFC Test Report	All sections


**Report prepared by : Jung Ki Lim****Engineer of Telecommunication testing center**

**Approved by : Jong Seok Lee****Manager of Telecommunication testing center**

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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
WCDMA850	4183	836.6	-34.05	28.25	-10.21	0.87	V	< 7.00	0.052	17.17
LTE B5	20525	836.5	-34.94	27.33	-10.21	0.86	V		0.042	16.26

Modulation	Frequency		Mode	SM-A202F/DS (dBm)	SM-A202K (dBm)	Deviation (dB)
	MHz	Ch.				
WCDMA850	836.6	4183	RMC	17.92	17.17	0.75
LTE B5	836.5	20525	QPSK(10MHz)	17.89	16.26	1.63

#### 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	-14.75	17.29	10.27	1.34	H	< 2.00	0.419	26.22
WCDMA1900	9400	1880.0	-19.56	12.57	10.29	1.36	H		0.141	21.50

Modulation	Frequency		Mode	SM-A202F/DS (dBm)	SM-A202K (dBm)	Deviation (dB)
	MHz	Ch.				
GSM1900	1850.2	512	VOICE	27.54	26.22	1.32
WCDMA1900	1880.0	9400	RMC	22.16	21.50	0.66

**1.3 RADIATED SPURIOUS EMISSIONS**

Ch.	Freq.(MHz)	<u>Measured Level</u> [dBm]	Ant. Gain (dBd)	<u>Substitute Level</u> [dBm]	C.L	Pol.	Result (dBm)	dBc
WCDMA850 CH 4183 (836.6)	2,509.80	-55.33	8.83	-61.65	1.62	V	-56.59	107.89
LTE B5 CH 20600 (844.0)	2,532.00	-41.84	8.85	-48.20	1.61	H	-43.11	94.34

Modulation	Frequency		Mode	SM-A202F/DS (dBm)	SM-A202K (dBm)	Deviation (dB)
	MHz	Ch.				
WCDMA850	2509.8	4183	RMC	-50.18	-56.59	6.41
LTE B5	844.0	20600	QPSK(10MHz)	-40.57	-43.11	2.54

Ch.	Freq.(MHz)	<u>Measured Level</u> [dBm]	Ant. Gain (dBd)	<u>Substitute Level</u> [dBm]	C.L	Pol.	Result (dBm)	dBc
GSM1900 CH 661 (1880.0)	5,640.00	-46.83	13.78	-47.66	2.70	H	-36.58	78.05
WCDMA1900 CH 9400 (1880.0)	5,640.00	-55.11	13.78	-55.94	2.70	V	-44.86	86.33

Modulation	Frequency		Mode	SM-A202F/DS (dBm)	SM-A202K (dBm)	Deviation (dB)
	MHz	Ch.				
GSM1900	5640.0	661	VOICE	-35.70	-36.58	0.88
WCDMA1900	5640.0	9400	RMC	-40.72	-44.86	4.14

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

	Test Item	Mod/Channel	Measured Frequency	SM-A202F/DS Result [dBuV/m]		SM-A202K Result [dBuV/m]		Deviation (dB)	
				Peak	Average	Peak	Average	Peak	Average
BT	Band Edge	2DH5 / ch. 78	2483.5 MHz~2500 MHz	48.82	71.60	47.73	70.66	1.09	0.94
	RSE	DH5 / ch. 78	7440 MHz	42.25	55.84	42.62	56.86	-0.37	-1.02
DTS	Band Edge	802.11g 6Mbps/ch.11	2483.5 MHz~2500 MHz	51.66	70.66	47.99	62.12	3.67	8.54
	RSE	802.11g 6Mbps/ch.6	7311 MHz	50.87	59.24	49.98	-	0.89	59.24
BT(LE)	Band Edge	LE(5.0) 2M 255byte/ch.39	2483.5 MHz~2500 MHz	45.37	64.38	44.02	64.82	1.35	-0.44
	RSE	LE(5.0) 2M 255byte/ch.39	7440 MHz	46.29	56.09	46.67	57.00	-0.38	-0.91
NFC	Fundamental	Type A, 106kbps	13.5599	11.96		13.92		-1.96	
	RSE	Type A, 106kbps	30M ~1GHz	31.90		31.89		0.01	

### 3. List of test equipment for EMC

Manufacture	Model/ Equipment	Serial Number	Calibration Date	Calibration Interval	Calibration Due
REOHDE & SCHWARZ	SCU 18 / AMPLIFIER	10094	04/16/2019	Annual	04/16/2020
Wainwright	WHK1.2/15G-10EF/H.P.F	4	04/02/2019	Annual	04/02/2020
Wainwright	WHK3.3/18G-10EF/H.P.F	2	04/02/2019	Annual	04/02/2020
Hewlett Packard	11667B / Power Splitter(DC~26.5 GHz)	5001	06/07/2018	Annual	06/07/2019
Agilent	E3632A/DC Power Supply	KR75303243	05/09/2018	Annual	05/09/2019
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	93000718	08/07/2018	Annual	08/07/2019
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	147	09/14/2018	Annual	09/14/2019
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	9120D-1298	10/04/2018	Annual	10/04/2019
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170342	04/25/2017	Biennial	04/25/2019
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170124	04/25/2017	Biennial	04/25/2019
Agilent	N9020A/Signal Analyzer(10Hz~26.5GHz)	MY52090906	06/08/2018	Annual	06/08/2019
Hewlett Packard	8493C/ATTENUATOR(20dB)	17280	06/21/2018	Annual	06/21/2019
REOHDE & SCHWARZ	FSV40/Spectrum Analyzer(10Hz~40GHz)	100931	10/22/2018	Annual	10/22/2019
Agilent	8960 (E5515C)/ Base Station	MY48360800	09/27/2018	Annual	09/27/2019
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	08/13/2018	Annual	08/13/2019
Anritsu Corp.	MT8820C/Wideband Radio Communication Tester	6201026545	01/30/2019	Annual	01/30/2020
REOHDE & SCHWARZ	SMB100A/ SIGNAL GENERATOR (100kHz~40GHz)	177633	07/19/2018	Annual	07/19/2019
REOHDE & SCHWARZ	ESU40 / EMI TEST RECEIVER	100524	07/27/2018	Annual	07/27/2019
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	08/23/2018	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	05/02/2017	Biennial	9120D-937
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	12/04/2017	Biennial	BBHA9170541
Rohde & Schwarz	FSP(9 kHz ~ 30 GHz) / Spectrum Analyzer	09/03/2018	Annual	100688
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	09/28/2018	Annual	101068-SZ
Agilent	N9020A / Signal Analyzer	06/08/2018	Annual	MY51110085
Wainwright Instruments	WHK3.0/18G-10EF / High Pass Filter	06/07/2018	Annual	8
Wainwright Instruments	WHKX7.0/18G-8SS / High Pass Filter	05/09/2018	Annual	29
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	06/29/2018	Annual	2
Wainwright Instruments	WRCJV5100/5850-40/50-8EEK / Band Reject Filter	01/03/2019	Annual	2
Api tech.	18B-03 / Attenuator (3 dB)	06/07/2018	Annual	1
Agilent	8493C-10 / Attenuator(10 dB)	07/17/2018	Annual	08285
CERNEX	CBLU1183540 / Power Amplifier	07/10/2018	Annual	22964
CERNEX	CBL06185030 / Power Amplifier	07/10/2018	Annual	22965
CERNEX	CBL18265035 / Power Amplifier	01/03/2019	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	06/29/2018	Annual	25956

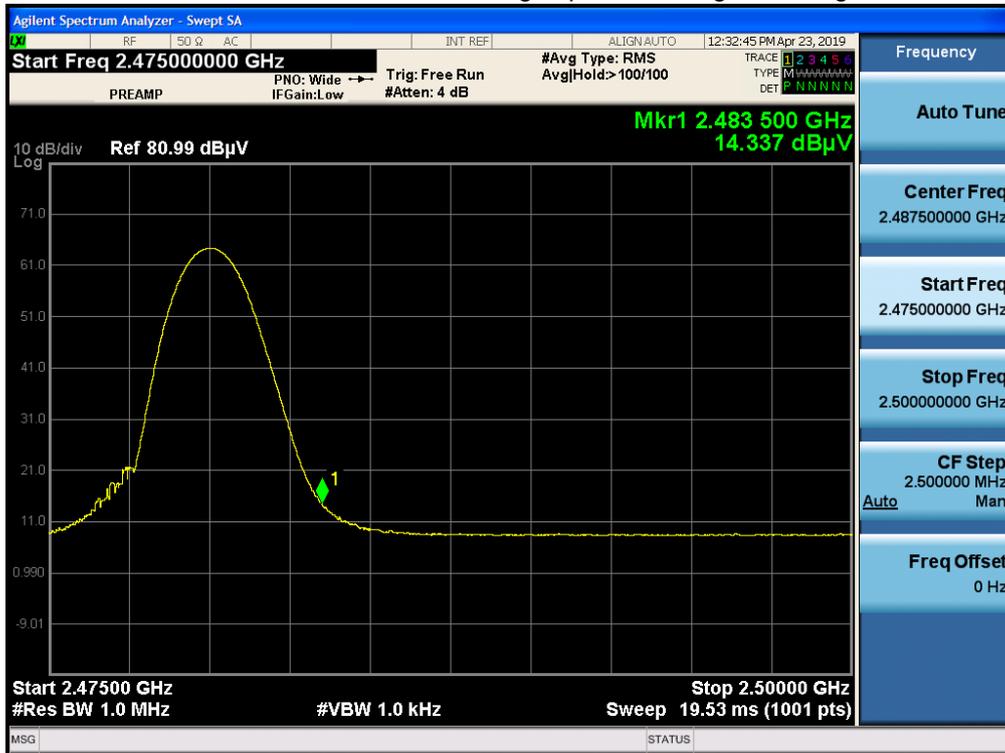
### 3. Test Plot

#### BT Band Edge (2DH-5/ch.78)

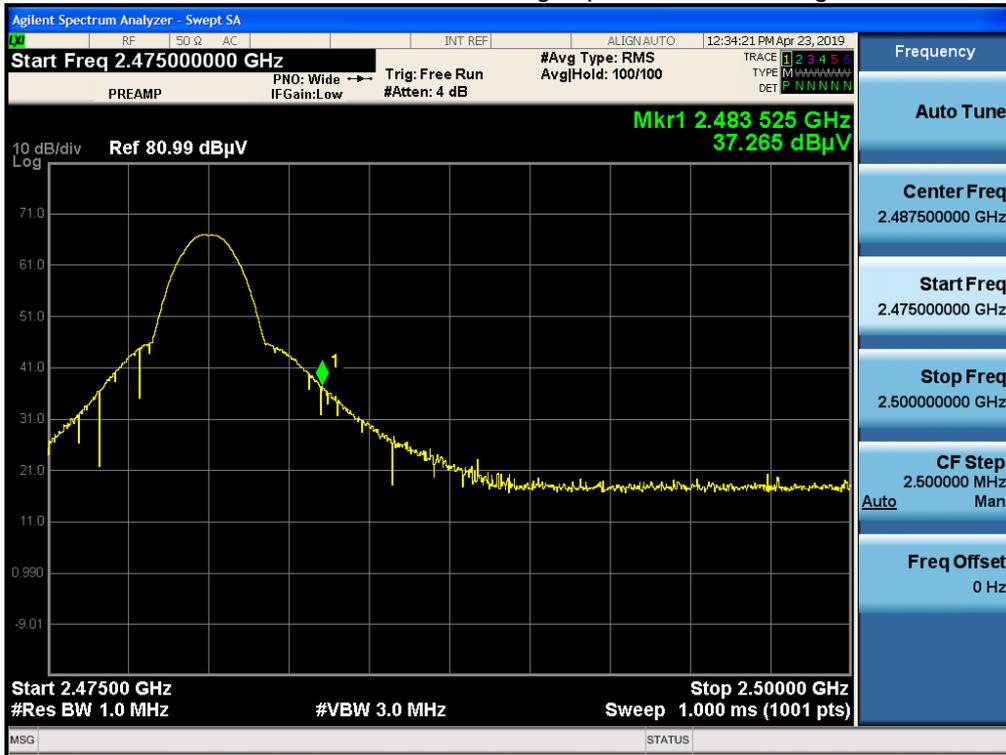
##### Bandedge

Frequency [MHz]	Reading [dBuV]	A.F + C.L + D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	37.27	33.39	H	70.66	73.98	3.33	PK
2483.5	14.34	33.39	H	47.73	53.98	6.25	AV

Radiated Restricted Band Edges plot – Average Reading



### Radiated Restricted Band Edges plot – Peak Reading

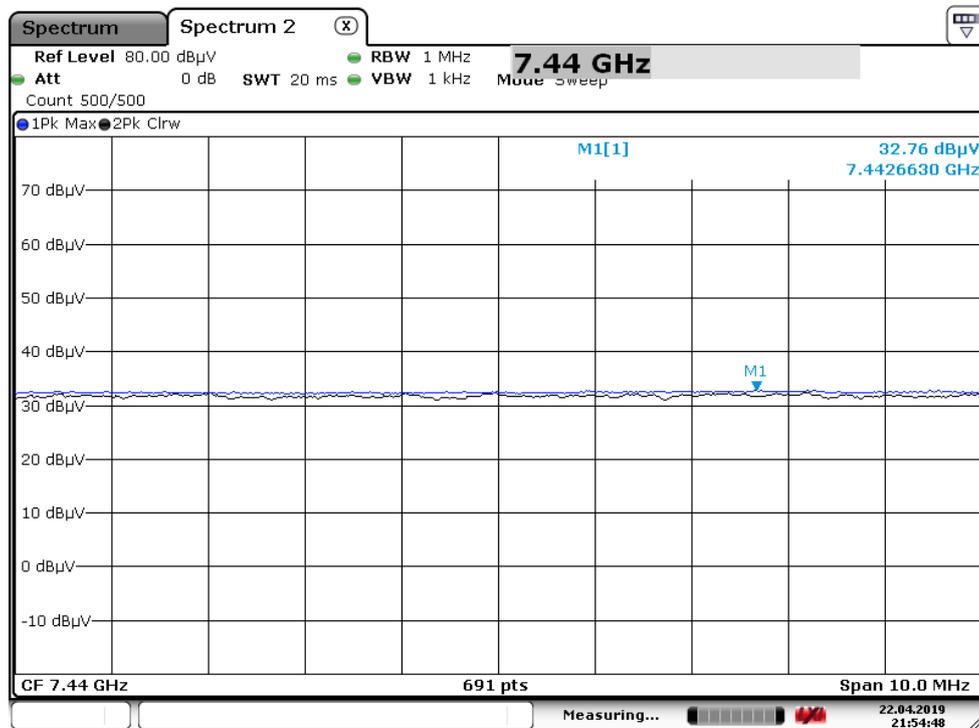


### BT R.S.E 3<sup>rd</sup> Harmonic(DH-5/ch.78)

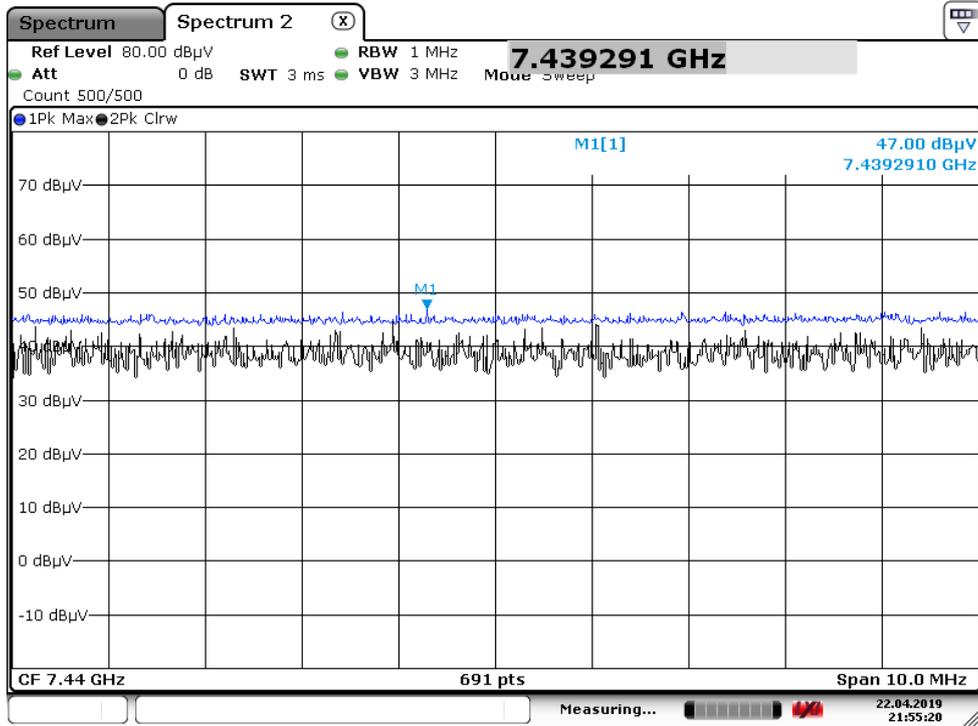
#### RSE

Frequency [MHz]	Reading [dBuV]	A.F + C.L - A.G + D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
7440	47.00	9.86	H	56.86	73.98	17.12	PK
7440	32.76	9.86	H	42.62	53.98	11.36	AV

Radiated Spurious Emissions plot – Average Reading



Radiated Spurious Emissions plot – Peak Reading

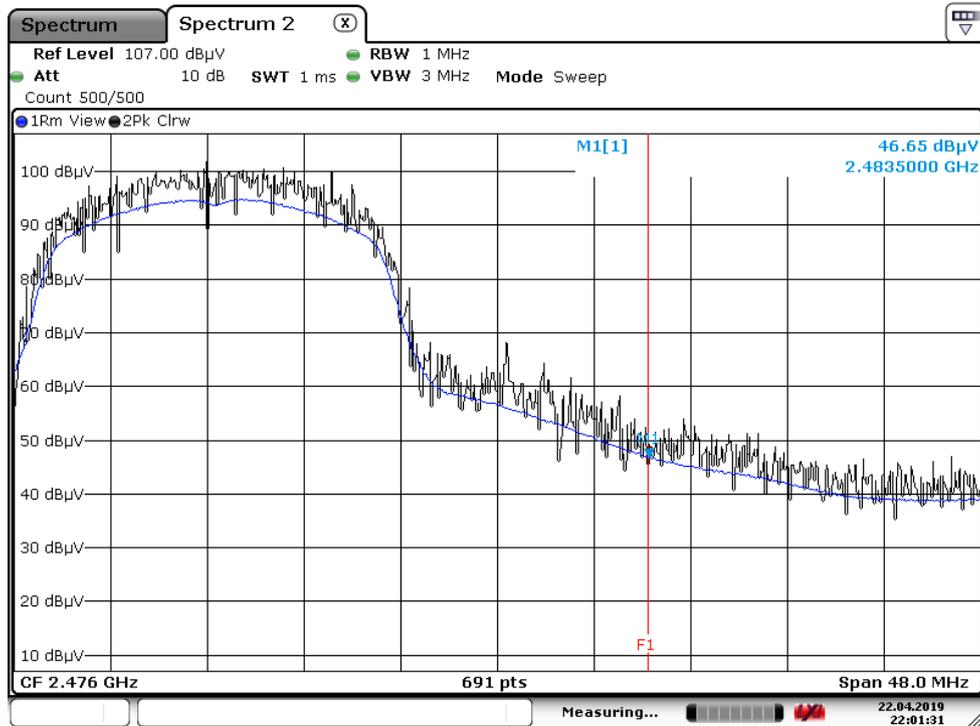


**DTS Band Edge (802.11g\_MCS0/ch.11)**

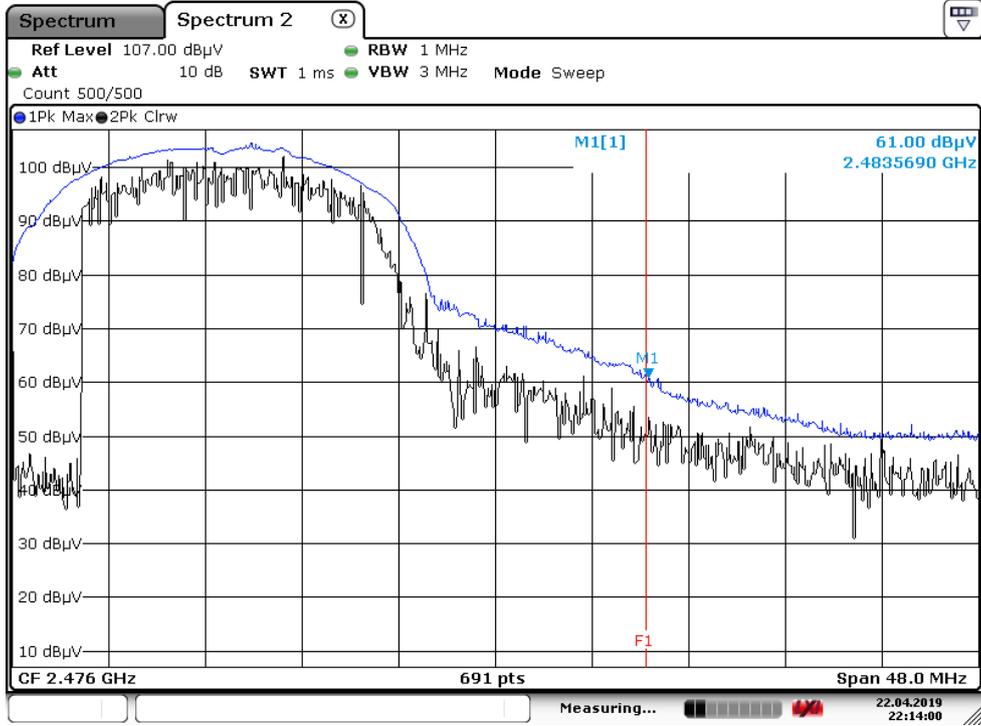
**Bandedge**

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	61.00	0.00	1.12	H	62.12	73.98	11.87	PK
2483.5	46.65	0.22	1.12	H	47.99	53.98	5.99	AV

Radiated Restricted Band Edges plot – Average Reading



Radiated Restricted Band Edges plot – Peak Reading

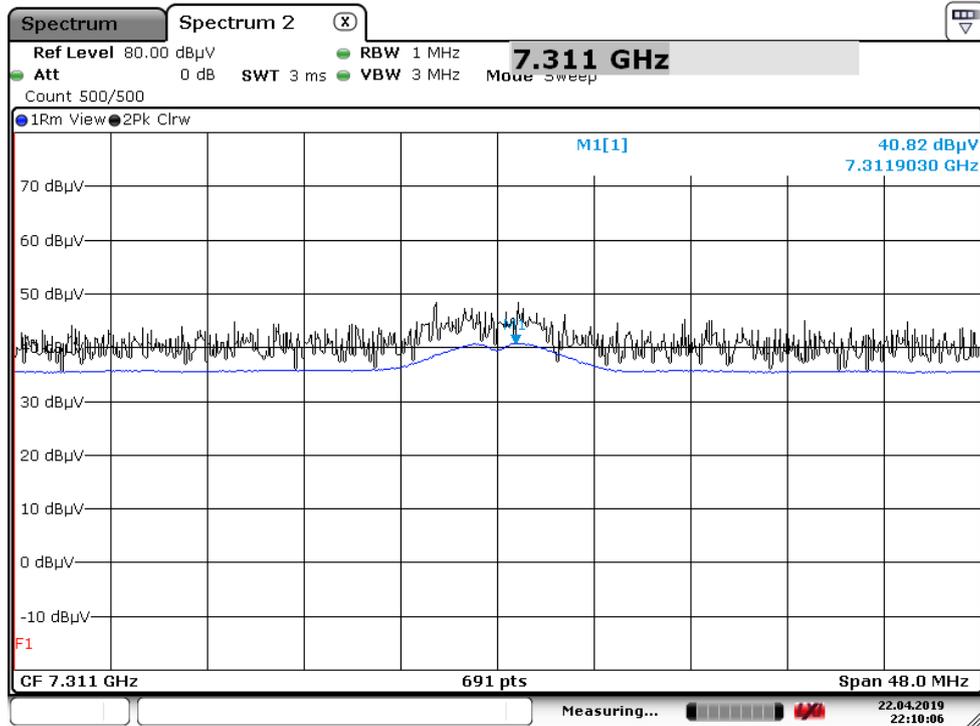


### DTS R.S.E 3<sup>rd</sup> Harmonic (802.11b 6Mbps/ch.6)

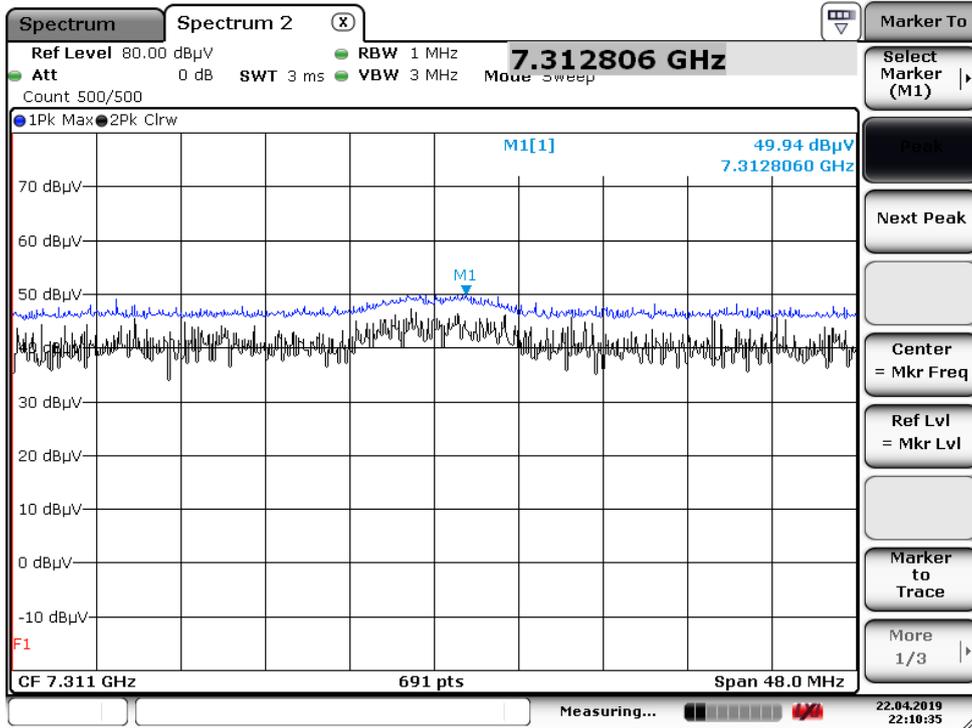
#### RSE

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
7311	49.94	9.16	H	59.10	73.98	14.88	PK
7311	40.82	9.16	H	49.98	53.98	4.00	AV

Radiated Spurious Emissions plot – Average Reading



### Radiated Spurious Emissions plot – Peak Reading

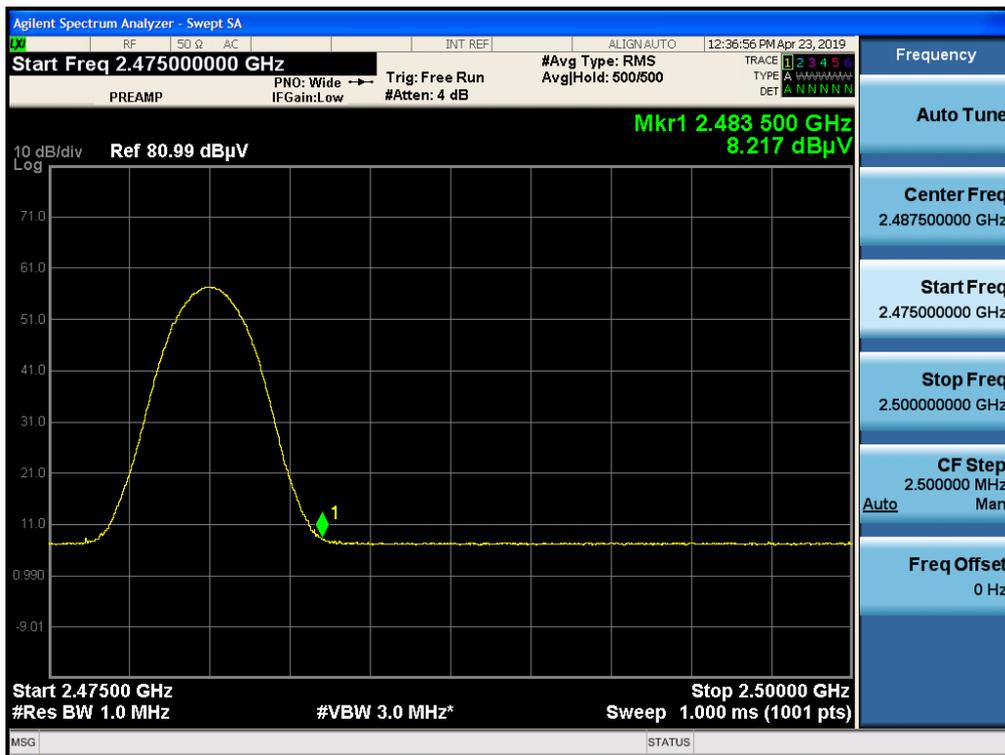


### BT(LE) Band Edge (LE(5.0) 2M 255byte/ch.39)

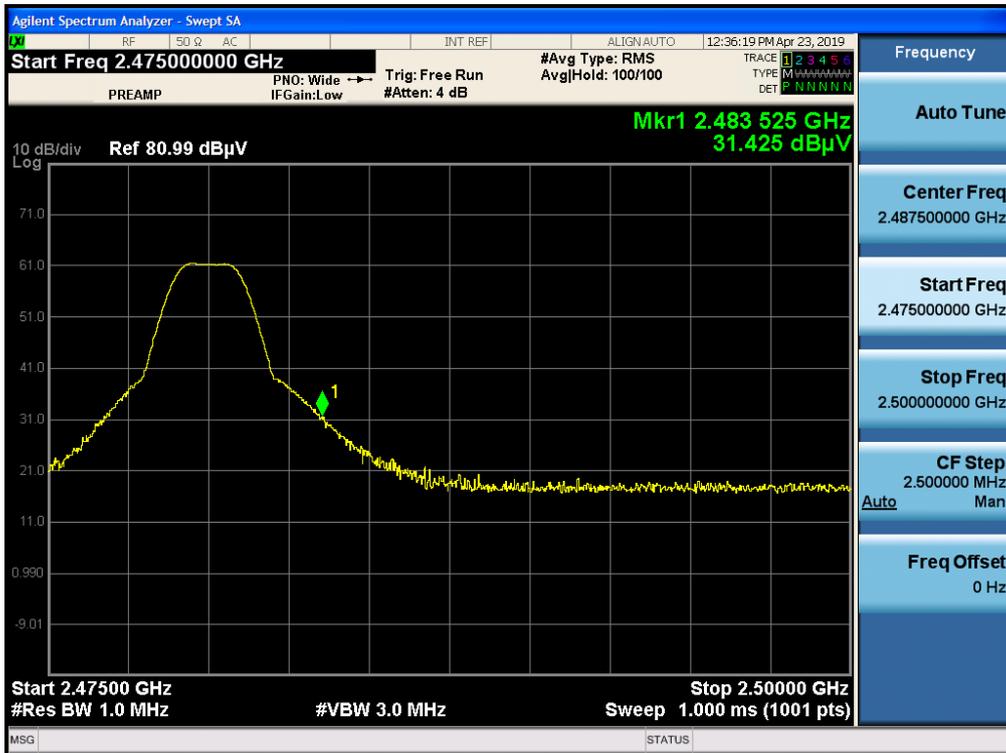
#### Bandedge

Frequency [MHz]	Reading [dBuV]	Duty cycle Factor [dB]	A.F + C.L + D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	31.43	0.00	33.39	H	64.82	73.98	9.17	PK
2483.5	8.22	2.41	33.39	H	44.02	53.98	9.96	AV

Radiated Restricted Band Edges plot – Average Reading



Radiated Restricted Band Edges plot – Peak Reading

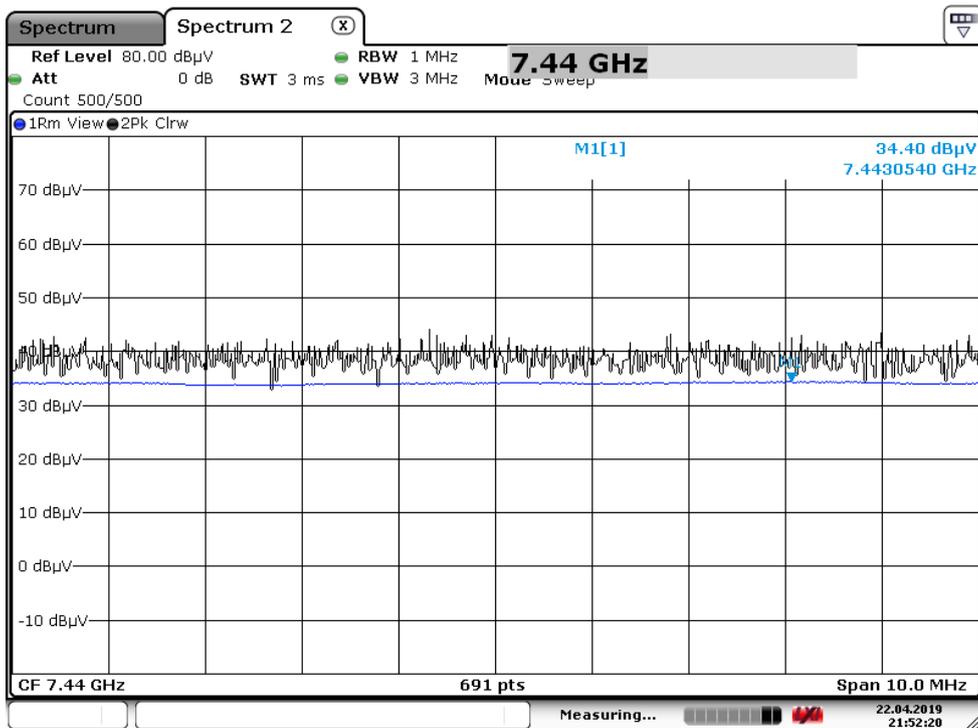


**BT(LE) R.S.E 3<sup>rd</sup> Harmonic (LE(5.0) 2M 255byte/ch.39)**

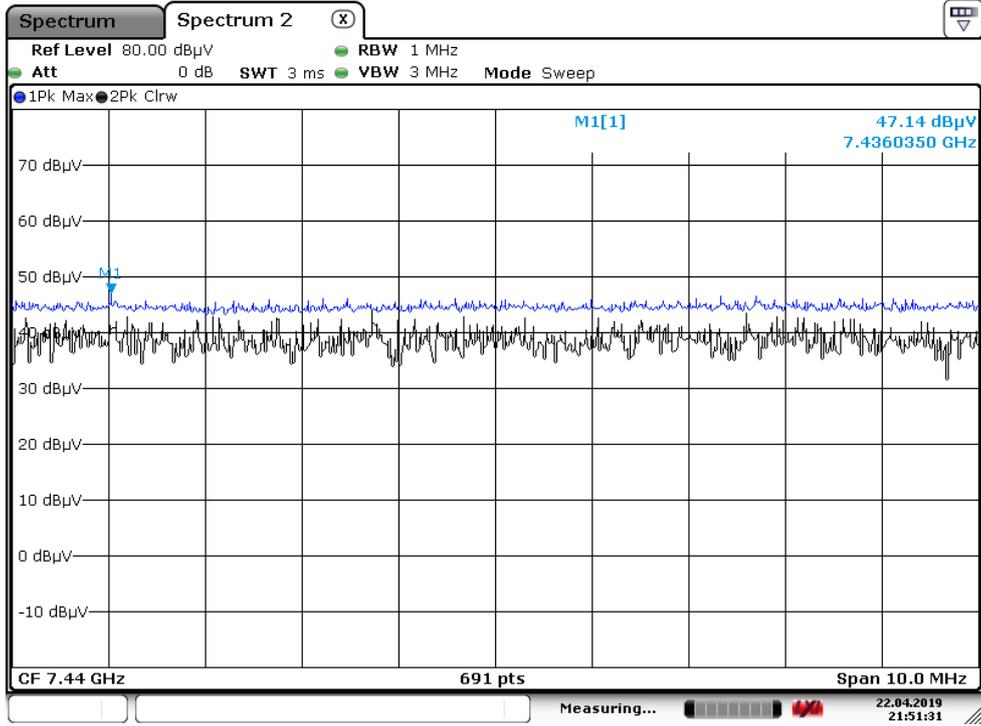
**RSE**

Frequency [MHz]	Reading [dBuV]	Duty cycle		A.F + C.L - A.G + D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
		Factor [dB]							
7440	47.14	0.00		9.86	H	57.00	73.98	16.98	PK
7440	34.40	2.41		9.86	H	46.67	53.98	7.31	AV

Radiated Spurious Emissions plot – Average Reading



### Radiated Spurious Emissions plot – Peak Reading

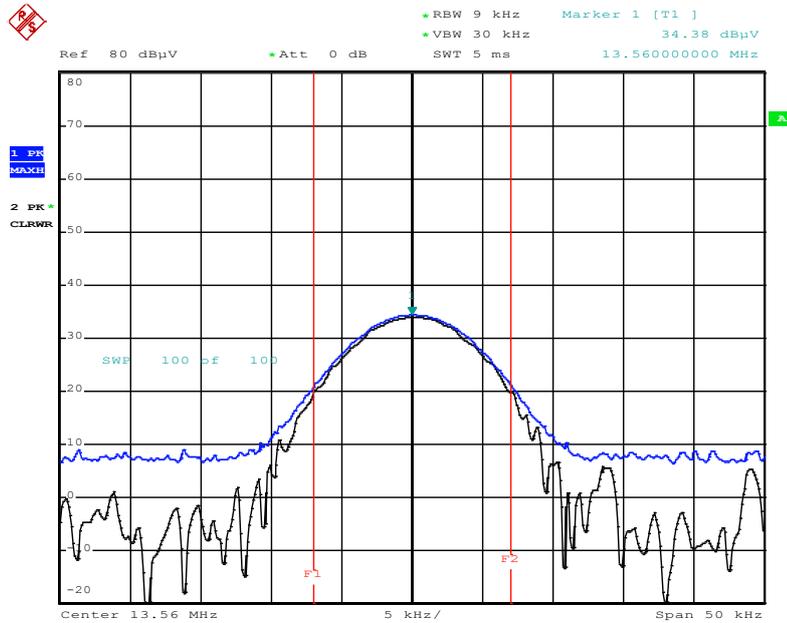


### NFC Fundamental (Type A, 106kbps)

#### Fundamental

Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor +Cable Loss (dB/m)	Distance Correction (dB)	Total (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.5599	34.38	19.54	-40	13.92	84	70.08

Fundamental plot



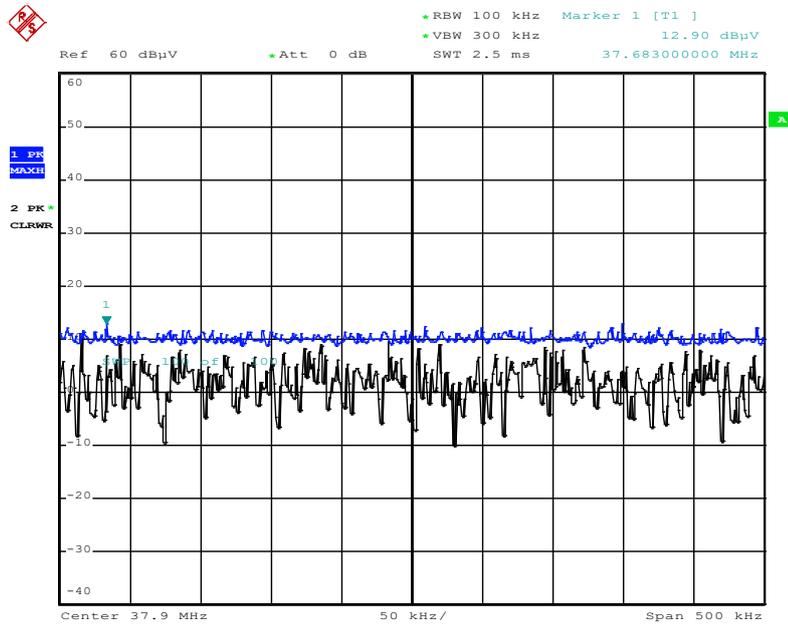
Date: 15.APR.2019 09:09:19

### NFC R.S.E (Type A, 106kbps)

#### RSE

Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Ant. Pol (H/V)	Total (dBuV/m)	Limit (dBuV/m)	Margin (dB)
37.8376	12.90	18.50	0.49	H	31.89	40.00	8.11

Radiated Spurious Emissions plot



Date: 12.APR.2019 14:42:50