China

FCC - TEST REPORT

Report Number	:	60.790.19.015.01R01	Date of Issue	: June 20, 2019
Model	:	CX FLEX SINGLE-POWER		
Product Type	:	**Merchandise Theft Deterrent System**		
Applicant	:	Mobile Technologies Inc.		
Address	:	1050 NE 67th Ave, Hillsboro, OR 97124		
Production Facility	:	HONG KONG ANDROIDS TECHNOLOGY CO.LTD		
Address	:	Yitoa Technology Industrial Park, Baihua Yuan Rd., The Second Industrial Area, Guangming Sub-district Office, Guangming New District, Shenzhen, China		
Test Result	:	■Positive ☐Negative		
Total pages including Appendices	:	18		

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China

1 Table of Contents

China

2 Description of Equipment Under Test

Description of the Equipment Under Test

Product:	Merchandise Theft Deterrent System
Model no.:	CX FLEX SINGLE-POWER
FCC ID:	2AA2X-15000223
Rating:	EUT rating: 5.2V DC, 3A Assist AC/DC adapter:100-240V~1A, 50-60Hz input 5.2V, 3A DC output
Frequency:	125kHz (Tx and Rx)
Modulation:	AM

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.	REMARK
AC/DC adapter	EDAC POWER ELEC.	EA1018A21-052	Provided by applicant
User Card	MTI	/	Provided by applicant

Auxiliary Software Used during Test:

DESCRIPTION	SOFTWARE NAME	VERSION	REMARK
/	/	/	/

3 Summary of Test Standards

Test Standards
FCC Part 15 Subpart C 10-1-17 Edition Federal Communications Commission, PART 15 — Radio Frequency Devices, Subpart C — Unintentional Radiators

All the tests were performed using the procedures from ANSI C63.4(2014) and ANSI C63.10 (2013).

4 Details about the Test Laboratory

Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13 Zhiheng Wisdomland Business Park,
Nantou Checkpoint Road 2,
Shenzhen 518052, P.R.China
FCC Registration Number: 514049

Emission Tests	
Test Item	Test Site
FCC Part 15 Subpart C	
FCC Title 47 Part 15.205, 15.209 Spurious Radiated Emission	Site 1
FCC Title 47 Part 15.207 Conduct Emission	Site 1
FCC Title 47 Part 15.215 20dB Bandwidth	Site 1

4.1 Test Equipment Site List

Radiated emission Test – Site 1

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	2019-7-6
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100398	2019-7-6
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	2019-6-28
Horn Antenna	Rohde & Schwarz	HF907	102294	2019-6-28
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	2019-7-6
Signal Generator	Rohde & Schwarz	SMY01	839369/005	2019-7-6
Attenuator	Agilent	8491A	MY39264334	2019-7-6
3m Semi-anechoic chamber	TDK	9X6X6	----	2020-7-7
Test software	Rohde & Schwarz	EMC32	Version 9.15.00	N/A

Conducted Emission Test - Site 1

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 3	101782	2019-7-6
LISN	Rohde & Schwarz	ENV4200	100249	2019-7-6
LISN	Rohde & Schwarz	ENV432	101318	2019-7-6
LISN	Rohde & Schwarz	ENV216	100326	2019-7-6
ISN	Rohde & Schwarz	ENY81	100177	2019-7-6
ISN	Rohde & Schwarz	ENY81-CA6	101664	2019-7-6
High Voltage Probe	Rohde & Schwarz	TK9420(VT9420)	9420-584	2019-6-30
RF Current Probe	Rohde & Schwarz	EZ-17	100816	2019-6-30
Attenuator	Shanghai Huaxiang	TS2-26-3	080928189	2019-7-6
Test software	Rohde & Schwarz	EMC32	Version9.15.00	N/A

20dB Bandwidth– Site 1

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Analyzer	Rohde & Schwarz	FSV40	101030	2019-7-6

4.2 Measurement System Uncertainty

Measurement System Uncertainty Emissions

System Measurement Uncertainty	
Items	**Extended Uncertainty**
Uncertainty for Radiated Emission in 3m chamber 9kHz-30MHz	4.46dB
Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz	Horizontal: 4.91dB; Vertical: 4.89dB;
Uncertainty for Radiated Emission in 3m chamber 1000MHz-18000MHz	Horizontal: 4.80dB; Vertical: 4.79dB;
Uncertainty for Conducted Emission at AC Power Line 150kHz-30MHz	3.21dB
Uncertainty for frequency test	0.6×10-7

5 Summary of Test Results

Emission Tests				
FCC Part 15 Subpart C				
Test Condition	Pages	Test Result		
		Pass	Fail	N/A
FCC Title 47 Part 15.205, 15.209 Spurious Radiated Emission	12-14	☒	☐	☐
FCC Title 47 Part 15.207 Conduct Emission	15-16	☒	☐	☐
FCC Title 47 Part 15.215 20dB Bandwidth	17	☒	☐	☐

6 General Remarks

Remarks

This submittal(s) (test report) is intended for **FCC ID: 2AA2X-15000223**, complies with Section 15.205, 15.207, 15.209, 15.215 of the FCC Part 15, Subpart C rules.

The TX and RX frequency range is 125kHz.

SUMMARY:

- All tests according to the regulations cited on page 8 were

■ - Performed

☐ - **Not** Performed

- The Equipment Under Test

■ - **Fulfills** the general approval requirements.

☐ - **Does not** fulfill the general approval requirements.

Sample Received Date: May 20, 2019

Testing Start Date: June 4, 2019

Testing End Date: June 25, 2019

Reviewed by:

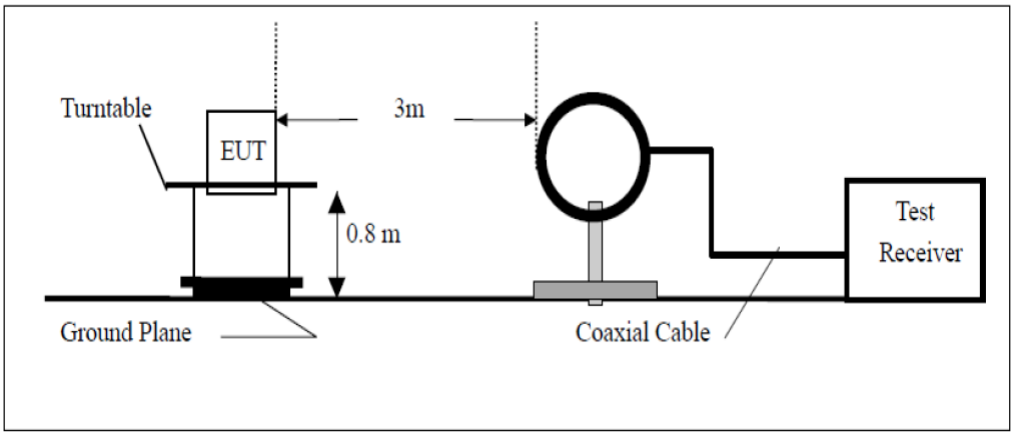
Hosea CHAN
EMC Project Engineer

Prepared by:

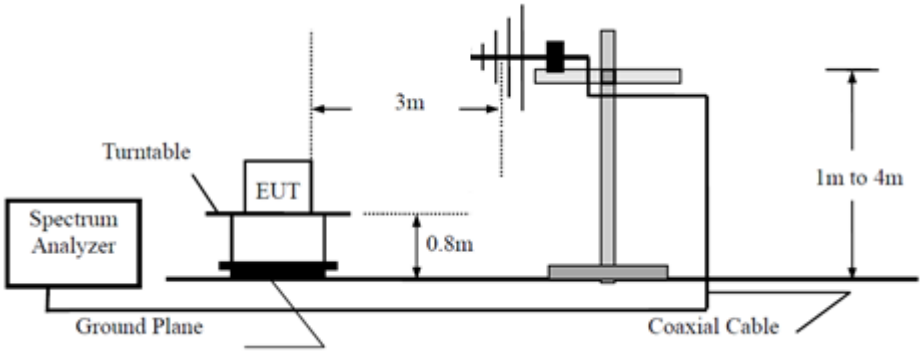
Eric LI
EMC Senior Project Engineer

7 Test Setups

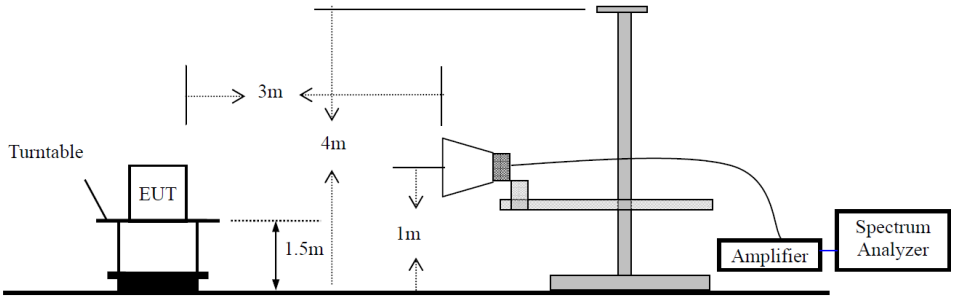
7.1 Radiated test setups 9kHz-30MHz



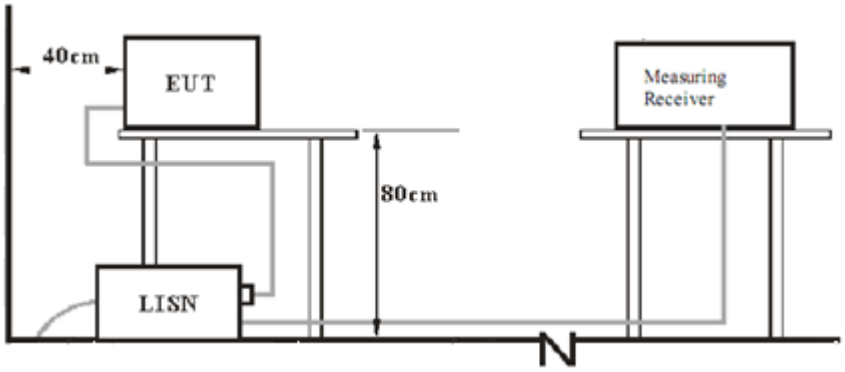
7.2 Radiated test setups Below 1GHz



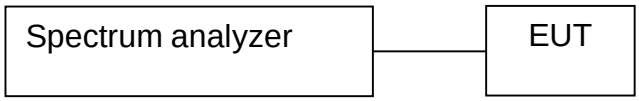
7.3 Radiated test setups Above 1GHz



7.4 AC Power Line Conducted Emission test setups



7.5 Conducted RF test setups



8 Emission Test Results

8.1 Spurious Radiated Emission

EUT: CX FLEX SINGLE-POWER
Op Condition: Operated, TX Mode
Test Specification: FCC15.205, 15.209
Comment: 120V AC
Remark: 9kHz to 30MHz

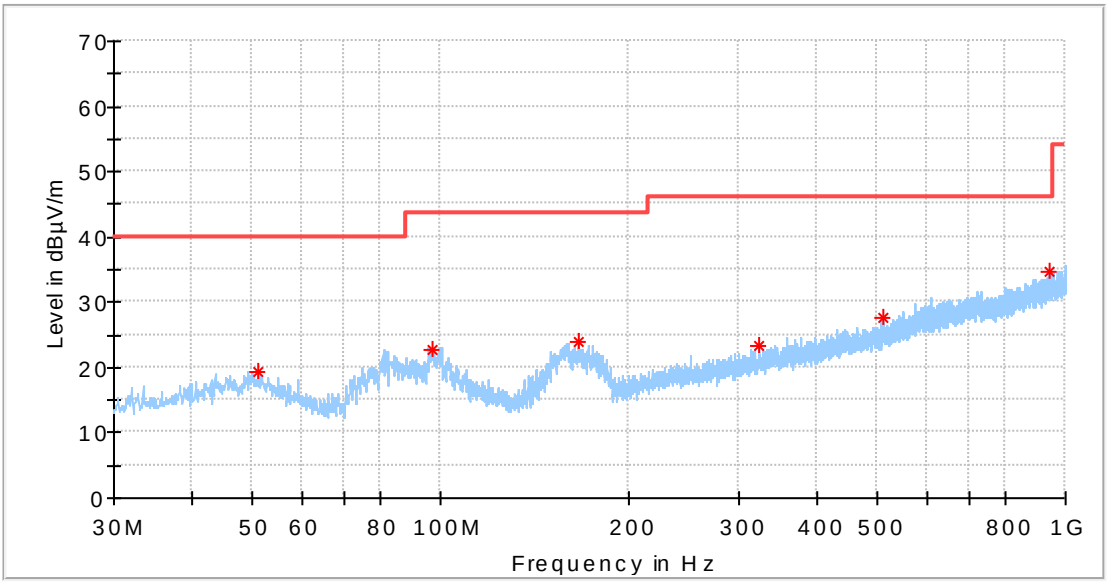
Test Result
☒ Passed
☐ Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector PK/QP/AV
0.125	36.47	105.67	-69.20	Peak
0.250	35.53	99.65	-64.12	Peak

Spurious Radiated Emission

EUT:	CX FLEX SINGLE-POWER
Op Condition:	Operated, TX Mode
Test Specification:	FCC15.205, 15.209
Comment:	120V AC
Remark:	30MHz to 1GHz, Antenna: Horizontal

Test Result
☒ Passed
☐ Not Passed

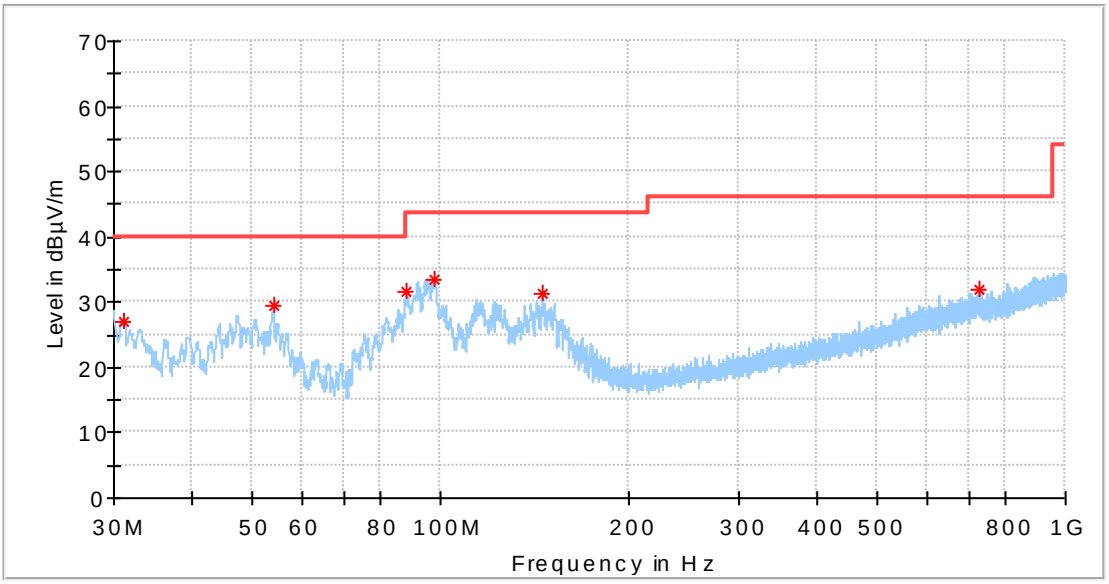


Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Corr. (dB)
51.097500	19.34	40.00	-20.66	17.9
97.172500	22.70	43.50	-20.80	15.4
166.224375	23.98	43.50	-19.52	14.3
323.061250	23.45	46.00	-22.55	20.6
510.271250	27.76	46.00	-18.24	24.2
943.255000	34.74	46.00	-11.26	30.7

Spurious Radiated Emission

EUT:	CX FLEX SINGLE-POWER
Op Condition:	Operated, TX Mode
Test Specification:	FCC15.205, 15.209
Comment:	120V AC
Remark:	30MHz to 1GHz, Antenna: Vertical

Test Result
☒ Passed
☐ Not Passed

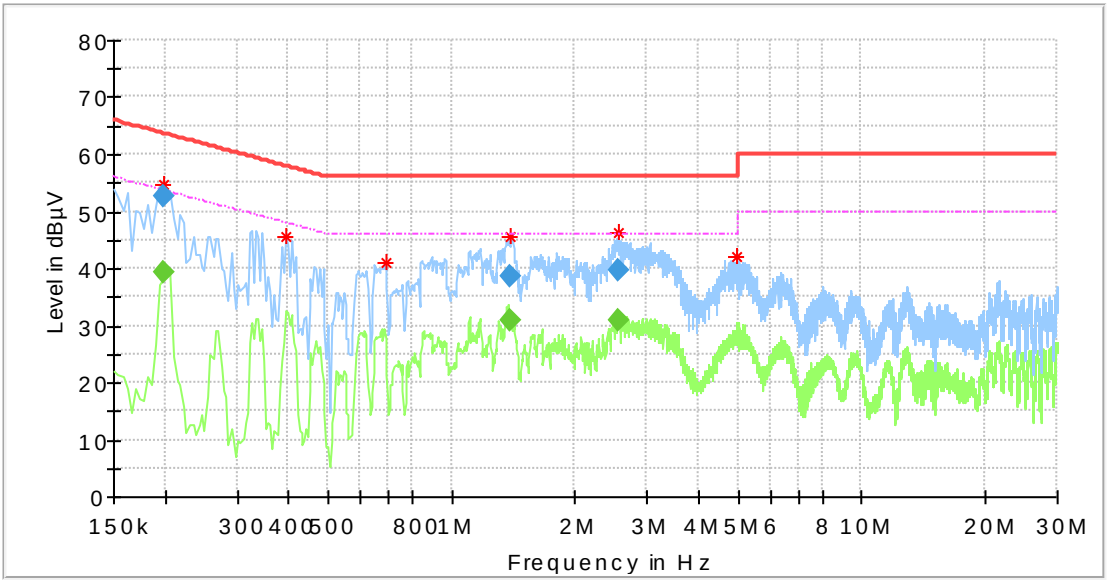


Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Corr. (dB)
31.212500	27.11	40.00	-12.89	14.1
54.128750	29.33	40.00	-10.67	17.2
88.200000	31.74	43.50	-11.76	13.8
97.596875	33.62	43.50	-9.88	15.5
145.430000	31.41	43.50	-12.09	13.3
728.400000	31.87	46.00	-14.13	27.7

8.2 Conducted Emission at AC Power Line

EUT:	CX FLEX SINGLE-POWER
Op Condition:	Operated, TX Mode
Test Specification:	FCC15.207
Comment:	120V AC
Remark:	L Line

Test Result
☒ Passed
☐ Not Passed



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Corr. (dB)
0.198500	54.87	---	63.86	-8.99	10.2
0.394000	45.51	---	57.98	-12.47	10.3
0.690000	41.08	---	56.00	-14.92	10.3
1.393500	45.75	---	56.00	-10.25	10.3
2.553500	46.22	---	56.00	-9.78	10.3
4.978000	42.17	---	56.00	-13.83	10.4

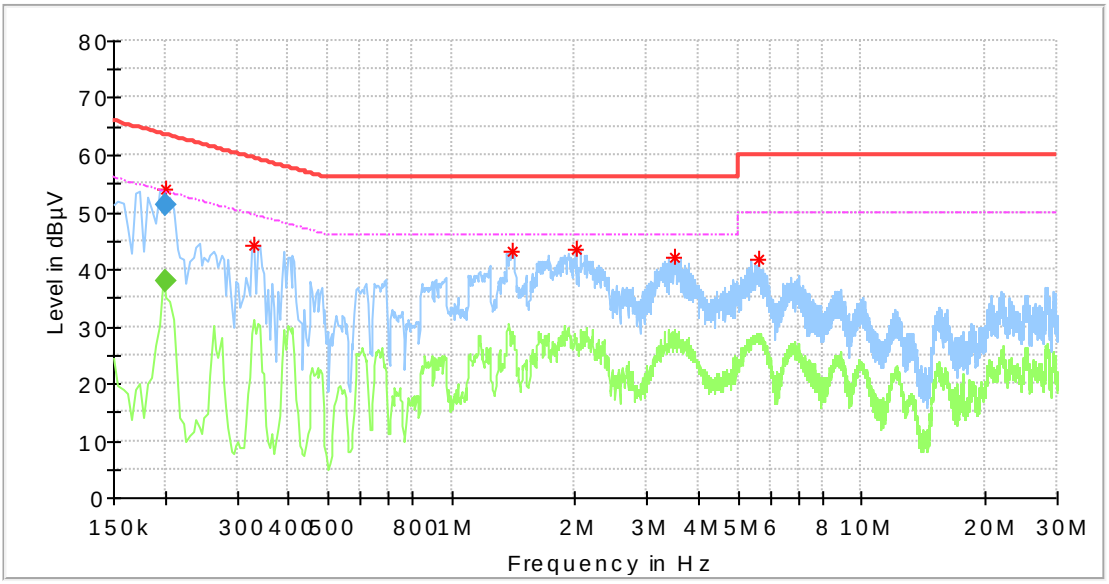
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Corr. (dB)
0.198500	---	39.39	53.67	-14.28	10.2
0.198500	52.61	---	63.67	-11.06	10.2
1.393500	---	30.84	46.00	-15.16	10.3
1.393500	38.67	---	56.00	-17.33	10.3
2.553500	---	31.04	46.00	-14.96	10.3
2.553500	39.54	---	56.00	-16.46	10.3

Conducted Emission at AC Power Line

EUT:	CX FLEX SINGLE-POWER
Op Condition:	Operated, TX Mode
Test Specification:	FCC15.207
Comment:	120V AC
Remark:	N Line

Test Result
☒ Passed
☐ Not Passed



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Corr. (dB)
0.201500	53.94	---	63.69	-9.76	10.2
0.330000	44.31	---	59.45	-15.14	10.3
1.402000	43.31	---	56.00	-12.69	10.3
2.006000	43.52	---	56.00	-12.48	10.3
3.510000	42.04	---	56.00	-13.96	10.4
5.598000	41.76	---	60.00	-18.24	10.5

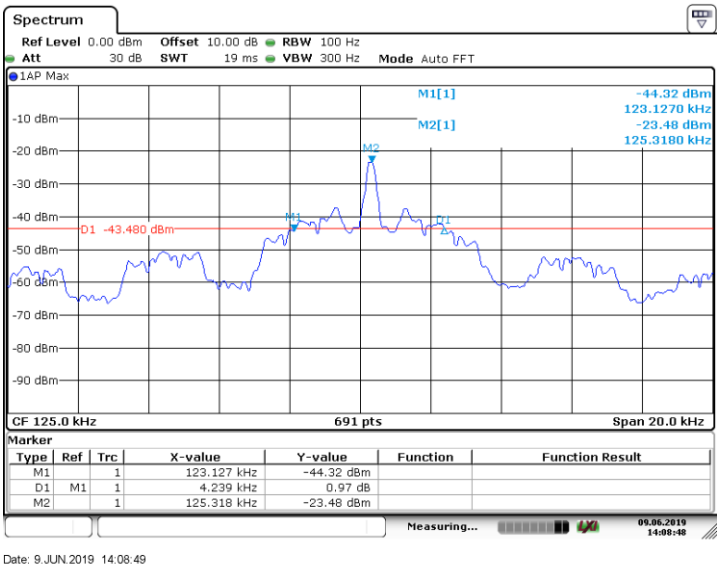
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Corr. (dB)
0.201500	---	37.73	53.55	-15.82	10.2
0.201500	51.36	---	63.55	-12.19	10.2

8.3 6dB & 99% Bandwidth

EUT: CX FLEX SINGLE-POWER
Op Condition: Operated, TX Mode
Test Specification: FCC15.215, 20dB&99% Bandwidth
Comment: 120V AC

Test Result
☒ Passed
☐ Not Passed



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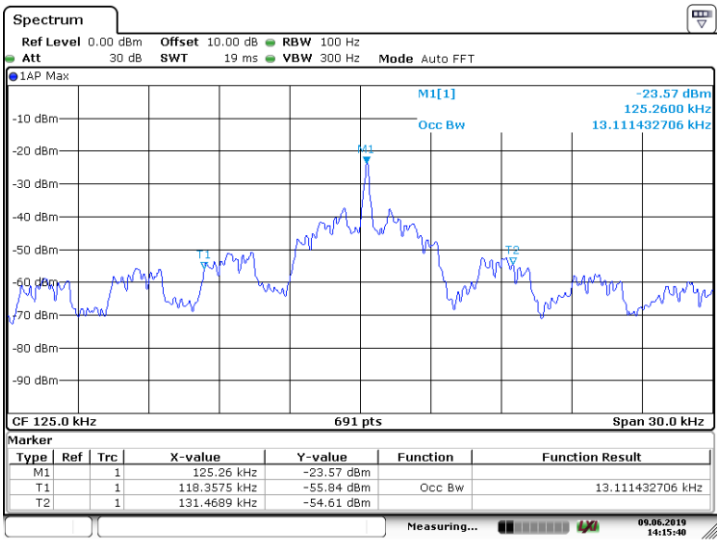

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Bandwidth	Measured Value
20dB bandwidth	4.2 kHz
99% bandwidth	13.1 kHz

9 Appendix A - General Product Information

Radiofrequency radiation exposure evaluation

This exposure evaluation is intended for **FCC ID: 2AA2X-15000223.**

According to KDB 447498 D01v06 section 4.3.1, For frequencies below 100 MHz and test separation distances ≤ 50 mm, the Numeric threshold is determined as:

Step a)
[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR

Step b)
{[Power allowed at numeric threshold for 50mm in step a)] + [(test separation distance – 50mm) · (f(MHz)/150)]} mW

Step c) 1)
For test separation distances > 50mm and < 200mm, the power threshold at the corresponding test separation distance at 100MHz in step b) is multiplied by [1 + log(100/f(MHz))]

Step c) 2)
For test separation distances ≤ 50mm, the power threshold determined by the equation in c) 1) for 50mm and 100MHz is multiplied by ½.

>> The fundamental frequency of the EUT is 125kHz, the test separation distance is ≤ 50mm.
(Manufacturer specified the separation distance is: 20mm)

Step a)
>> Numeric threshold, mW / 50mm * √0.1GHz ≤ 3.0
Numeric threshold ≤ 474.3mW

Step b)
>> Numeric threshold ≤ 474.3mW + (50mm-50mm * 100MHz/150)
Numeric threshold ≤ 474.3mW

Step c) 1) & c) 2)
>> Numeric threshold ≤ 474.3mW * [1 + log 100/100MHz] * ½
Numeric threshold ≤ 237.15mW

>> The transmitter strength of EUT measured is: 36.47 dBµV/m
The power calculated is 0.0000000885mW
Which is smaller than the Numeric threshold.
Therefore, the device is exempt from stand-alone SAR test requirements.