



NFC TEST REPORT

No.I20Z60047-IOT07

for

LG Electronics USA,Inc

**Multi-band GSM/WCDMA/LTE phone with Bluetooth, Wlan, NFC
mobile phone**

LM-K510EMW, LMK510EMW, K510EMW

FCC ID: ZNFK510EMW

with

Issued Date: 2020-03-12

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S.Government.

Test Laboratory:

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I20Z60047-IOT07	Rev.0	1st edition	2020-03-12

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1. Test Laboratory

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2005 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0, and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (ISED#: 24849). The detail accreditation scope can be found on NVLAP website.

1.2. Testing Location

Location 1: CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing,
P. R. China 100191

Location 2: CTTL(Shouxiang)

Address: No. 51 Shouxiang Science Building, Xueyuan Road,
Haidian District, Beijing, P. R. China 100191

1.3. Testing Environment

Normal Temperature: 15-35°C
Extreme Temperature: -20/+50°C
Normal Relative Humidity: 20-75%
Normal Air Pressure 86Kpa-106Kpa

1.4. Project data

Testing Start Date: 2020-01-19
Testing End Date: 2020-02-28

1.5. Signature



Zhou Bin

(Prepared this test report)



Pang Shuai

(Reviewed this test report)



Zhu Liang

(Approved this test report)



2. Client Information

2.1. Applicant Information

Company Name: LG Electronics USA, Inc.
Address: 1000 Sylvan Avenue, Englewood Cliffs NJ 07632
City: /
Country: /
Contact: /
Email: /
Telephone: +82-2-6946-1675
Fax: /

2.2. Manufacturer Information

Company Name: LG Electronics Inc.
Address: LG Twin Towers, 128, Yeoui-daero, Yeongdeungpo-gu, Seoul, Korea
150-721
City: /
Country: /
Contact: /
Email: /
Telephone: +82-2-6946-1675
Fax: /

3. Equipment Under Test (EUT)

3.1. About EUT

Description	UMTS Quad Bands/GSM Quad Bands/LTE mobile phone
Model name/HVIN	LM-K510EMW, LMK510EMW, K510EMW
Brand name	LG
FCC ID	ZNFK510EMW
UMTS Frequency Band(s)	FDD I/II/V/VIII
GSM Frequency Band(s)	GSM900/1800/1900/850
E-UTRA Frequency Band(s)	FDD01/03/07/08/20/28/38
Extreme Temperature	-10/+55°C
Nominal Voltage	3.85V
Extreme High Voltage	4.2V
Extreme Low Voltage	3.6V

3.2. Internal Identification of EUT

EUT ID*	SN or IMEI	Date of receipt
UT24a	353266110017936/ 353266110017944	/
UT34a	353266110020138/ 353266110020146	/
UT29a	353266110016912/ 353266110016920	/

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE

AE ID*	Description	SN
AE1	Battery	/
AE2	Charger	/
AE3	USB Cable	/
AE1		
Model	BL-T49	
Manufacturer	ATL	
Capacitance	4000mAh	
Nominal voltage	3.87v	
AE2		
Model	MCS-V02WR	
Manufacturer	Sunlin Electrocnis	
Length of cable	/	
AE3		
Model	DC15WB-G	

4. Reference Documents

4.1. Documents supplied by applicant

EUT parameters, referring to Annex A for detailed information, are supplied by the client or manufacturer, which are the bases of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
CFR 47 Part 2	Part 2 — Frequency Allocations and Radio Treaty Matters; General Rules and Regulations.	2018
CFR 47 Part 15	Part 15 — Radio Frequency Devices. Subpart C — Intentional Radiators. § 15.35 Measurement detector functions and bandwidths. § 15.207 Conducted limits. § 15.209 Radiated emission limits, general requirements. § 15.215 Additional provisions to the general radiated emission limitations. § 15.225 Operation within the band 13.110–14.010 MHz.	2018
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013

5. Test Results

5.1. Summary of Test Results

Table 2: Summary of Test Results

No	Test Cases	Clause in Regulation	Section in This Report	Verdict
1	Electric Field Strength of Fundamental Emissions	CFR 47 § 15.225(a)	B.1	P(Set. NFC02)
2	Electric Field Strength of Outside the Allocated Bands	CFR 47 § 15.225(b) CFR 47 § 15.225(c)		P(Set. NFC02)
3	Electric Field Radiated Emissions	CFR 47 § 15.209	B.2	P(Set. NFC01)
		CFR 47 § 15.225(d)	B.3	P(Set. NFC01)
4	Frequency Tolerance	CFR 47 § 15.225(e)	B.4	P(Set. NFC03)
5	20dB Bandwidth	CFR 47 § 15.215(c)	B.5	P(Set. NFC04)
6	Conducted Emissions	CFR 47 § 15.207	B.6	P(Set. NFC01)
The measurement is carried out according to ANSI C63.10. See ANNEX B for details.				

Test Conditions:

For this report, all the test cases listed above were tested under normal Temperature, Voltage, humidity and Air Pressure except the Frequency Tolerance test case. The specific conditions of Frequency Tolerance test case are listed in section B.4.3

See Table 3 for terms for result verdict:

Table 3 Terms for result verdict

P	Pass, The EUT complies with the essential requirements in the standard.
NP	Not Perform, The test was not performed by CTTL
NA	Not Applicable, The test was not applicable
F	Fail, The EUT does not comply with the essential requirements in the standard

5.2. Statements

The test cases listed in Section 5.1 of this report for the EUT specified in Section 3 were performed by CTTL according to the reference documents in Section 4.

The EUT meets all applicable requirements of the regulations and standards in Section 4.2.

6. Test Facilities Utilized



Table 4: Test Facilities Utilized

NO.	NAME	TYPE	SERIES NUMBER	PRODUCER	CAL. DUE DATE	CAL. INTERVAL
1.	Spectrum Analyzer	RSA3408A	B010277	Tektronix	2020-09-26	1 Year
2.	Climatic chamber	SH242	93008658	ESPEC	2021-01-18	1 Year
3.	Vector Signal Analyzer	FSQ40	200089	Rohde & Schwarz	2020-05-15	1 Year
4.	H-field Antenna	HFH2-Z2	829324/007	R&S	2020-12-03	1 Year
5.	Test Receiver	ESCI	100344	R&S	2021-02-27	1 Year
6.	LISN	ENV216	101200	R&S	2020-03-14	1 Year
7.	Test Receiver	ESU26	100235	Rohde & Schwarz	2020-03-01	1 Year
8.	BiLog Antenna	VULB9163	9163-1222	Schwarzbeck	2020-03-14	1 Year

7. Measurement Uncertainty

Table 5: Measurement Uncertainty

Item	Uncertainty
Frequency Tolerance	$U = 60.80 \text{ Hz}, k=1.96$
20dB Bandwidth	$U = 77 \text{ Hz}, k=2$
Radiated Emissions (<1GHz)	$U = 5.16 \text{ dB}, k=2$
Radiated Emissions (>1GHz)	$U = 5.44 \text{ dB}, k=2$
Conducted emission	$U = 3.08 \text{ dB}, k=2$



ANNEX A: EUT parameters

/

ANNEX B: Detailed Test Results

B.1. Electric Field Strength of Fundamental and Outside the Allocated bands

B.1.1. Reference

See Clause 4, Clause 5 of ANSI C63.10-2013 generally.

B.1.2. Measurement Methods

The transmitter carrier output levels (E-Field) from the EUT are measured in a semi-anechoic chamber. The EUT is placed on a non-conductive stand of 80cm high, and at a measurement distance of 3m from the receiving antenna. The center of the receiving loop antenna is 1.0 meter above the ground. The E-field is measured with a shielded loop antenna connected to a measurement receiver. Detected E-field was maximized by rotating the EUT through 360° and adjusting the receiving antenna polarizations. The maximization processes were repeated with the EUT positioned respectively in its three orthogonal axes. The measurements were performed with the peak detector and if required, the quasi-peak detector.

The measurement bandwidth is:

Table B-1: Measurement bandwidth

Frequency of Emission (MHz)	RBW/VBW
12.56-14.56	10/30 kHz

The E-field measured at 3m is calculated as:

$$\text{E-field (dB}\mu\text{V/m)} = \text{Rx (dB}\mu\text{V)} + \text{Cable Loss (dB)} + \text{AF@3m (dB/m)}$$

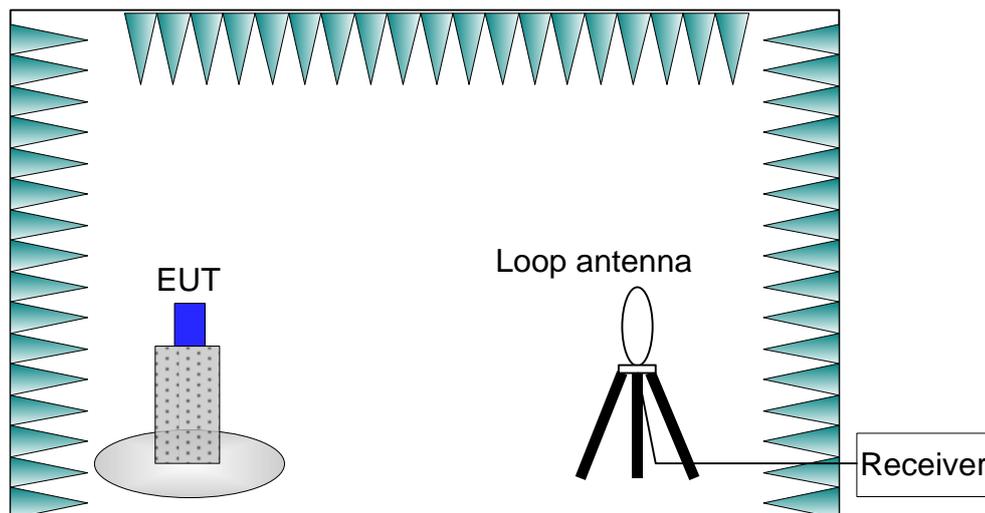


Figure B-1: Measurement Setup

B.1.3. EUT Operating Mode and Test Conditions

The measurement of EUT is carried out under the transmit state of NFC(See 3.4).

The EUT is powered by a travel adapter.

During the measurements, the ambient temperature of the electromagnetic anechoic chamber is in the range of 15 ~ 25 °C.

B.1.4. Limits

Table B-2: Limits

Frequency Range (MHz)	E-field Strength Limit @ 30 m (μV/m)	E-field Strength Limit @ 3 m (dBμV/m)
13.560 ± 0.007	+15,848	124
13.410 to 13.553 13.567 to 13.710	+334	90
13.110 to 13.410 13.710 to 14.010	+106	81

Note: Where the limits have been defined at one distance, and a signal level measured at another, the limits have been extrapolated using the following formula:

$$\text{Extrapolation (dB)} = 40 \log_{10} \left(\frac{\text{Measurement Distance}}{\text{Specification Distance}} \right)$$

B.1.5. Measurement Results

Measurement results of normal conditions see Figure B-2 for different set-ups of EUT. The results displayed take into account applicable antenna factors and cable losses.

Conclusions: Set.NFC02, **PASS**.

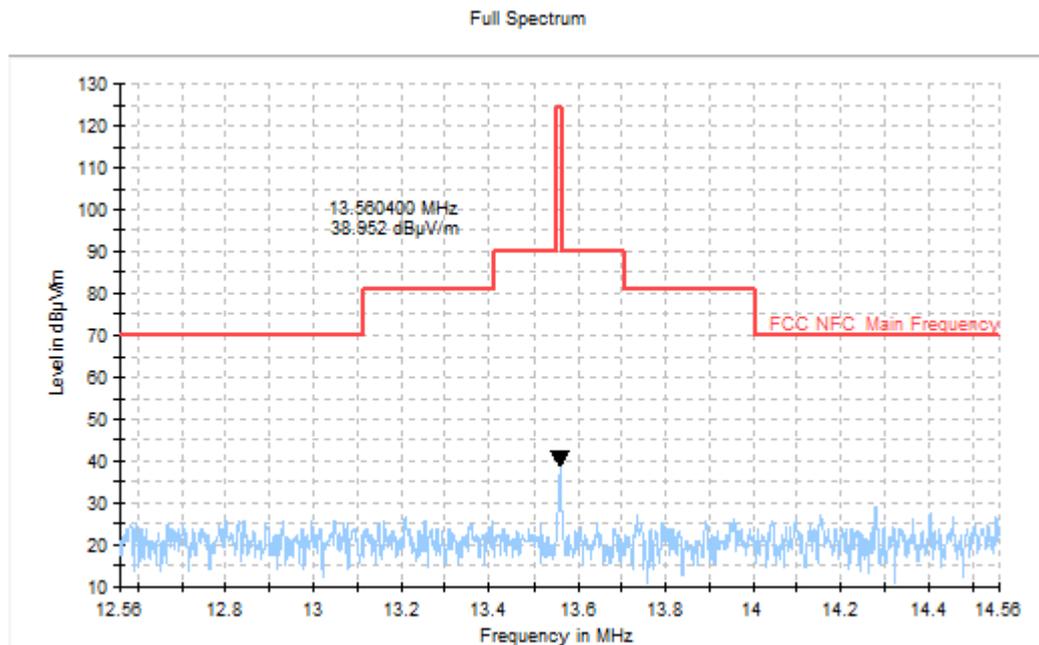


Figure B-2: Measurement results for Electric Field Strength of Fundamental and Outside the Allocated bands

B.2. Electric Field Radiated Emissions (< 30MHz)

B.2.1. Reference

See Clause 6.4 of ANSI C63.10-2013 specifically.

See Clause 4 and Clause 5 of ANSI C63.10-2013 generally.

B.2.2. Measurement Methods

The transmitter carrier output levels (E-Field) from the EUT are measured in a semi-anechoic chamber. The EUT is placed on a non-conductive stand of 80cm high, and at a measurement distance of 3m from the receiving antenna. The center of the receiving loop antenna is 1.0 meter above the ground. The E-field is measured with a shielded loop antenna connected to a measurement receiver. Detected E-field was maximized by rotating the EUT through 360° and adjusting the receiving antenna polarizations. The maximization processes were repeated with the EUT positioned respectively in its three orthogonal axes. The measurements were performed with the peak detector and if required, the quasi-peak detector.

The measurement bandwidth is:

Table B-3: Measurement bandwidth

Frequency of Emission (MHz)	RBW/VBW
0.009-0.15	100/300 Hz
0.15-30	10/30 kHz

The E-field measured at 3m is calculated as:

$$\text{E-field (dB}\mu\text{V/m)} = \text{Rx (dB}\mu\text{V)} + \text{Cable Loss (dB)} + \text{AF@3m (dB/m)}$$

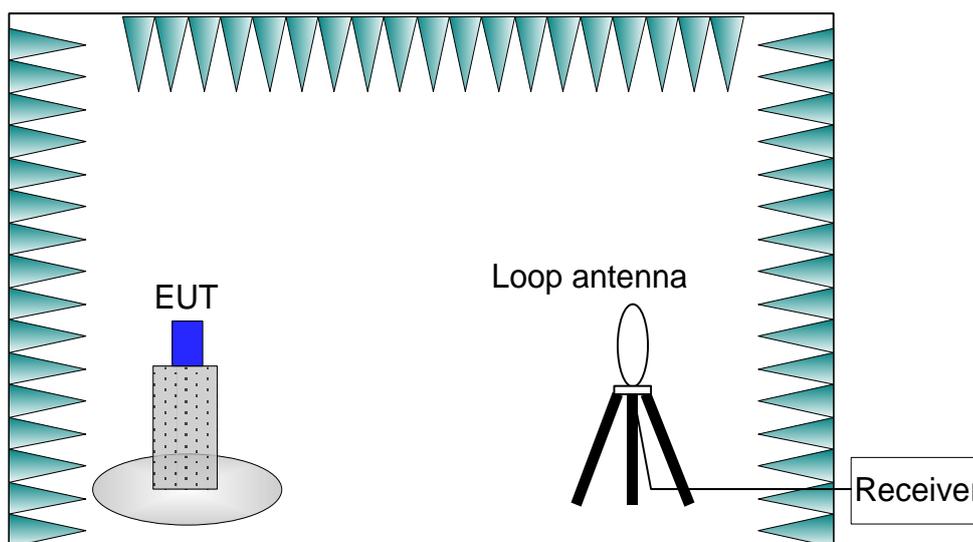


Figure B-3: Measurement Setup

B.2.3. EUT Operating Mode and Test Conditions

The measurement of EUT is carried out under the transmit state of NFC(See 3.4).

The EUT is powered by a travel adapter.

During the measurements, the ambient temperature of the electromagnetic anechoic chamber is in the range of 15 ~ 25 °C.

B.2.4. Limits

Table B-4: Limits

Frequency Range (MHz)	E-field Strength Limit @ 30m (mV/m)	E-field Strength Limit @ 3m (dB μ V/m)
0.009-0.490	2400/F(kHz)	129-94
0.490-1.705	24000/F(kHz)	74-63
1.705-30	30	70

Note: Where the limits have been defined at one distance, and a signal level measured at another, the limits have been extrapolated using the following formula:

$$\text{Extrapolation(dB)} = 40\log_{10}\left(\frac{\text{Measurement Distance}}{\text{Specification Distance}}\right)$$

B.2.5. Measurement Results

Measurement results of normal conditions see Figure B-4 for different set-ups of EUT. The results displayed take into account applicable antenna factors and cable losses.

Conclusions: Set.NFC01, **PASS**.

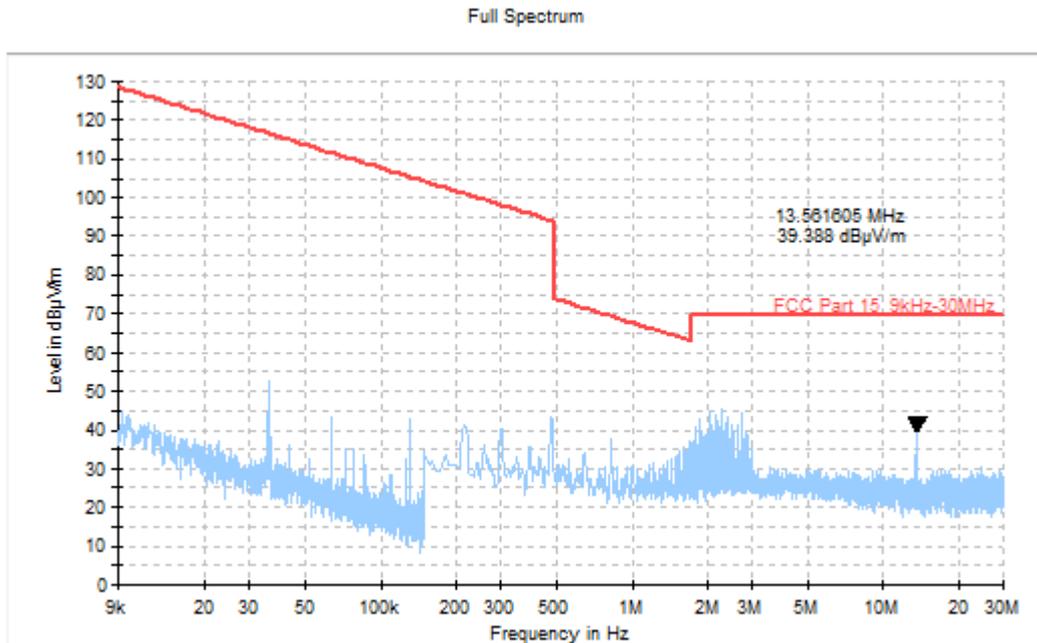


Figure B-4: Measurement results for Electric Field Radiated Emissions (< 30MHz)

B.3. Electric Field Radiated Emissions ($\geq 30\text{MHz}$)

B.3.1. Reference

See Clause 6.5 of ANSI C63.10-2013 specifically.

See Clause 4 and Clause 5 of ANSI C63.10-2013 generally.

B.3.2. Measurement Methods

The electric field radiated emissions from the EUT are measured in a semi-anechoic chamber. The EUT is placed on a non-conductive stand of 80cm high, and at a measurement distance of 10m from the receiving antenna. The receiving antennas connected to a measurement receiver. In order to search for maximum field strength emitted from the EUT, the receiving antenna can be moved between the height of 1.0 m to 4.0 m. Detected E-field was maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna positions for both vertical and horizontal antenna polarizations. The maximization processes were repeated with the EUT positioned respectively in its three orthogonal axes. The measurements were performed with the peak detector and if required, the quasi-peak detector.

The measurement bandwidth is:

Table B-5: Measurement bandwidth

Frequency of Emission (MHz)	RBW/VBW
30-1000	120kHz

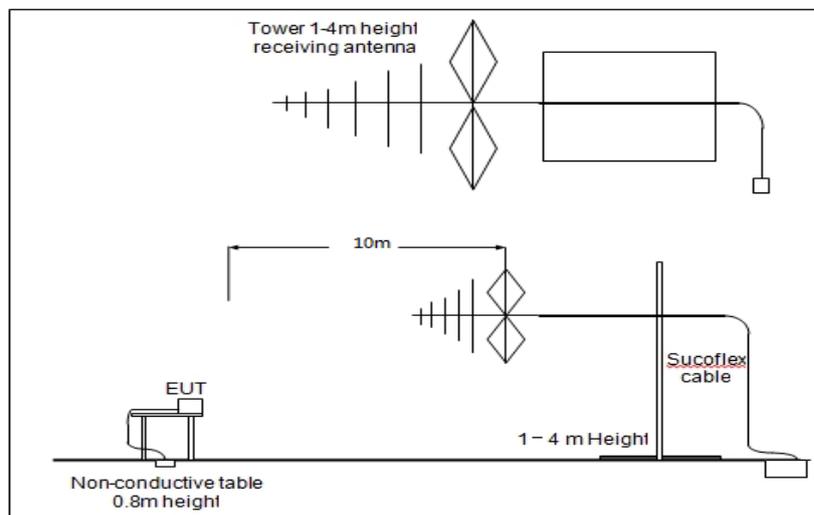


Figure B-5: Measurement Setup

B.3.3. EUT Operating Mode and Test Conditions

The measurement of EUT is carried out under the transmit state of NFC(See 3.4).

The EUT had been connected to a travel adapter.

During the measurements, the ambient temperature of the electromagnetic anechoic chamber is in the range of 15 ~ 25 °C.

B.3.4. Limits

Table B-6: Limits

Frequency Range (MHz)	E-field Strength Limit @ 3m (mV/m)	E-field Strength Limit @ 3m (dB μ V/m)	E-field Strength Limit @ 10m (dB μ V/m)
30-88	100	40	30
88-216	150	43.5	33.5
216-960	200	46	36
960-1000	500	54	44

B.3.5. Measurement Results

Measurement results of normal conditions see Figure B-6 for different set-ups of EUT. The results displayed take into account applicable antenna factors and cable losses.

Conclusions: Set.NFC01, **PASS.**

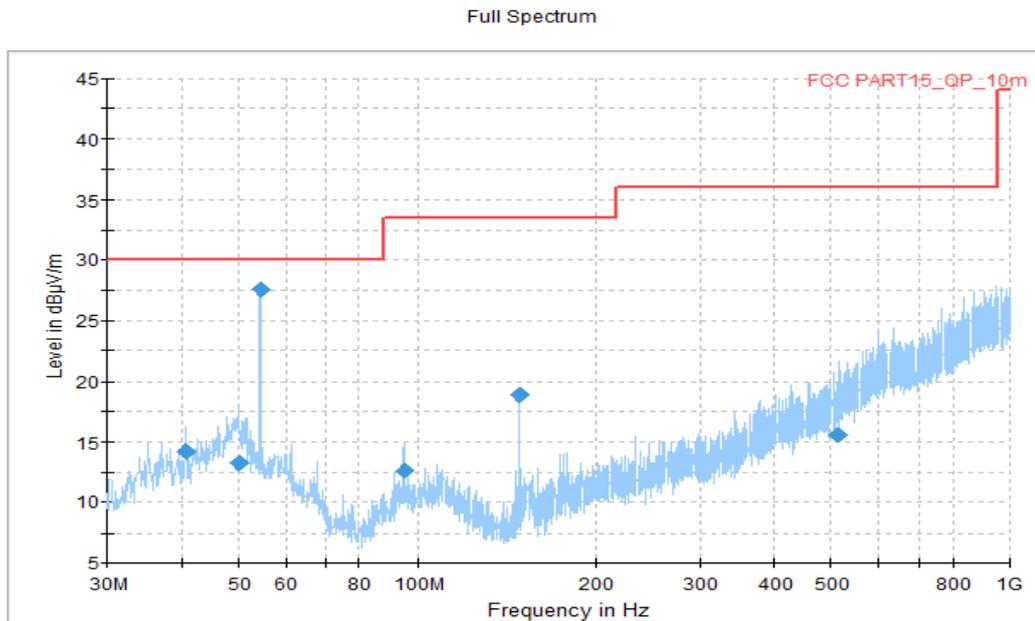


Figure B-6: Measurement results for Electric Field Radiated Emissions (≥ 30 MHz)

Final Result

Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
40.670000	14.19	30.00	15.81	1000.0	120.000	307.0	V	288.0
49.982000	13.22	30.00	16.78	1000.0	120.000	125.0	V	265.0
54.250000	27.56	30.00	2.44	1000.0	120.000	110.0	V	295.0
94.893000	12.60	33.50	20.92	1000.0	120.000	105.0	V	254.0
149.17600	18.84	33.50	14.68	1000.0	120.000	120.0	V	-9.0
512.71400	15.58	36.00	20.44	1000.0	120.000	118.0	V	300.0

B.4. Frequency Tolerance

B.4.1. Reference

See Clause 6.8 of ANSI C63.10-2013 specifically.

See Clause 4 and Clause 5 of ANSI C63.10-2013 generally.

B.4.2. Measurement Methods

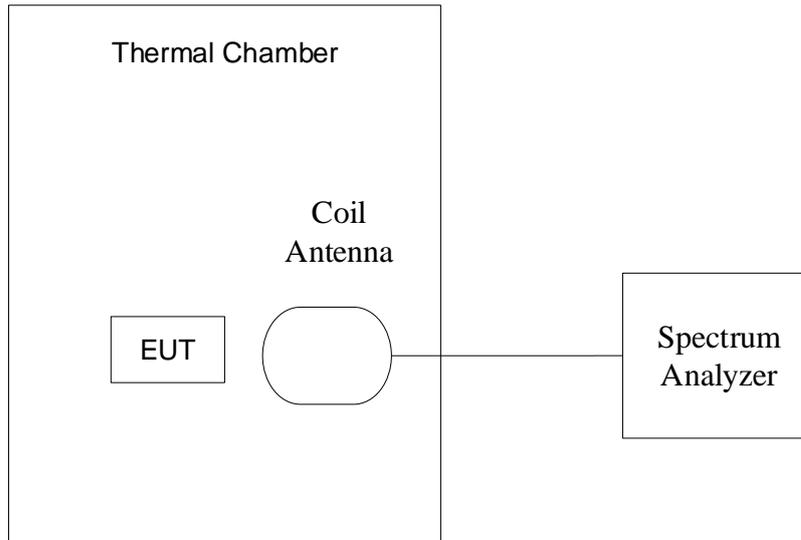


Figure B-7: Measurement Setup

The transmitter output signal was picked up by coil antenna connected to the spectrum analyzer. The center frequency was measured with 30Hz RBW and 1kHz span.

During the test, the EUT was placed in a thermal chamber until thermal balance and lasting appropriate time.

B.4.3. EUT Operating Mode and Test Conditions

The measurement of EUT was carried out under the transmit state of without modulation(See 3.4). EUT had not been connected to a travel adapter. The frequency stability was measured with the different voltage and temperature combinations:

- a) The nominal voltage 3.85V(See 3.1)was used and the temperature was varied from -20°C to +50°C in 10°C increments using an environmental chamber.
- b) The 20°C was used and the voltages were 3.6V, 3.85V and 4.2V (The extreme low voltage ,the nominal voltage and the extreme high voltage defined in section 3.1).

The details were as following:

Table B-7: Combinations of Voltage andTemperature

Test items	Voltage	Temperature
Frequency stability with respect to ambient temperature	3.85V	-20°C
		-10°C
		0°C
		10°C

		20°C
		30°C
		40°C
		50°C
Frequency stability when varying supply voltage	3.6V	20°C
	3.85V	
	4.2V	

B.4.4. Test Layouts

See B.4.2.

B.4.5. Limits

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency.

B.4.6. Measurement Results

Measurement results see Table B-8 for different test conditions.

Conclusions: Set.NFC03, **PASS.**

Table B-8: Measurement results for Frequency Tolerance

Temperature	Voltage	Frequency (MHz)			
		Startup	2 Min Later	5 Min Later	10 Min Later
-20°C	3.85V	13.560096875	13.56008625	13.56008375	13.56008375
-10°C	3.85V	13.56009875	13.560105625	13.560109375	13.56011125
0°C	3.85V	13.560116875	13.560116875	13.560116875	13.56011625
10°C	3.85V	13.5601125	13.560108125	13.56010375	13.56010125
20°C	3.85V	13.560093125	13.560081875	13.560076875	13.5600725
30°C	3.85V	13.560060625	13.560049375	13.560040625	13.560035
40°C	3.85V	13.560018125	13.560009375	13.56000125	13.559995625
50°C	3.85V	13.55998	13.559973125	13.559966875	13.559963125
20°C	3.6V	13.56002875	13.560045	13.560051875	13.560055
20°C	3.85V	13.560064375	13.56006625	13.560065625	13.560064375
20°C	4.2 V	13.560054375	13.5600575	13.560056875	13.5600575

Temperature	Voltage	Frequency Error (%)			
		Startup	2 Min Later	5 Min Later	10 Min Later
-20°C	3.85V	0.001	0.001	0.001	0.001
-10°C	3.85V	0.001	0.001	0.001	0.001
0°C	3.85V	0.001	0.001	0.001	0.001
10°C	3.85V	0.001	0.001	0.001	0.001
20°C	3.85V	0.001	0.001	0.001	0.001
30°C	3.85V	0.000	0.000	0.000	0.000
40°C	3.85V	0.000	0.000	0.000	0.000

50°C	3.85V	0.000	0.000	0.000	0.000
20°C	3.6V	0.000	0.000	0.000	0.000
20°C	3.85V	0.000	0.000	0.000	0.000
20°C	4.2V	0.000	0.000	0.000	0.000

B.4.7. Measurement Uncertainty

Measurement uncertainty: $U = 60.80 \text{ Hz}$, $k=1.96$

B.5. 20dB Bandwidth

B.5.1. Reference

See Clause 6.9 of ANSI C63.10-2013 specifically.

See Clause 4 and Clause 5 of ANSI C63.10-2013 generally.

B.5.2. Measurement Methods

The transmitter output signal was picked up by coil antenna connected to the spectrum analyzer. The bandwidth of the center frequency was measured with 140Hz RBW, 420Hz VBW and 14kHz span.

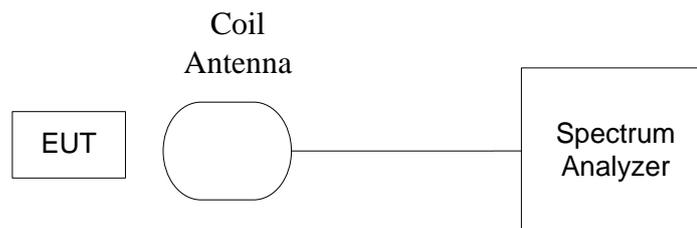


Figure B-8: Measurement Setup

B.5.3. EUT Operating Mode and Test Conditions

The measurement of EUT was carried out under the transmit state of NFC (See 3.4). EUT had not been connected to a travel adapter.

During the measurements, the ambient temperature was in the range of 15 ~ 25 °C.

B.5.4. Test Layouts

See B.5.2.

B.5.5. Limits

The 20dB bandwidth shall be less than 80% of the permitted frequency band. For 13.56 MHz NFC, the permitted frequency band is 14kHz, so the limit is 11.2 kHz.

B.5.6. Measurement Results

Measurement results see Figure B-9.

Conclusions: Set.NFC04, **PASS**.

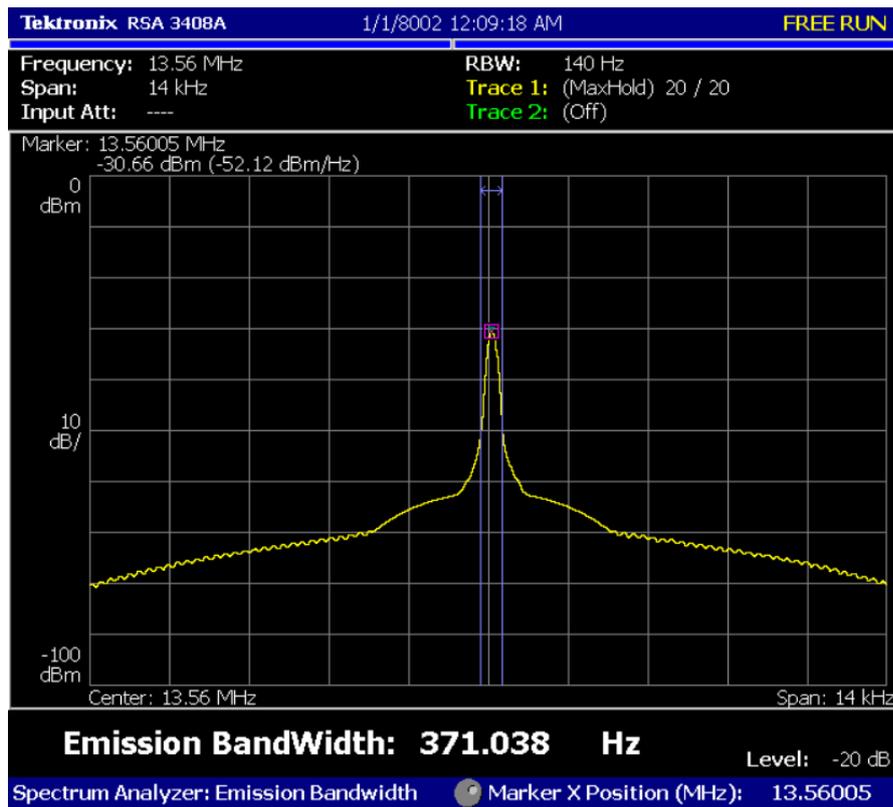


Figure B-9: Measurement results for 20dB Bandwidth

B.5.7. Measurement Uncertainty

Measurement uncertainty: $U = 77 \text{ Hz}$, $k=2$

B.6. Conducted emission

B.6.1. Reference

See Clause 6.2 of ANSI C63.10-2013 specifically.

See Clause 4 and Clause 5 of ANSI C63.10-2013 generally.

B.6.2. Measurement Methods

The conducted emissions from the AC port of the EUT are measured in a shielding room. The EUT is connected to a Line Impedance Stabilization Network (LISN). An overview sweep with peak detection was performed. The measurements were performed with a quasi-peak detector and if required, an average detector.

The conducted emission measurements were made with the following detector of the test receiver: Quasi-Peak / Average Detector.

The measurement bandwidth is:

Table B-9: Measurement Bandwidth

Frequency of Emission (MHz)	RBW/VBW
0.15-30	9kHz

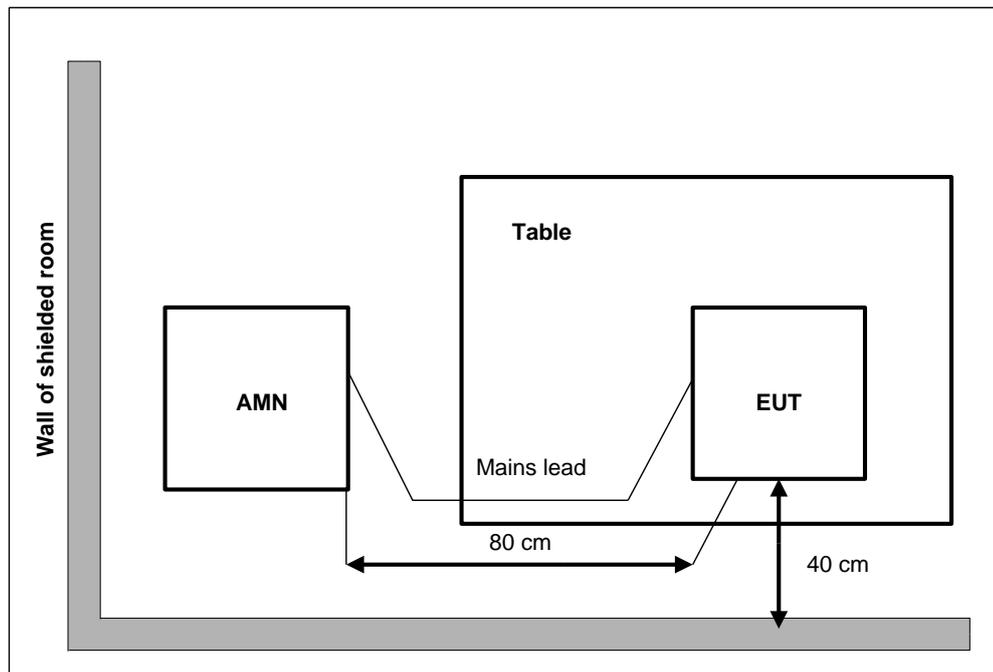


Figure B-10: Measurement Setup

B.6.3. EUT Operating Mode and Test Conditions

The measurement of EUT is carried out under the transmit state of NFC(See 3.4).

The EUT is powered by a travel adapter.

During the measurements, the ambient temperature is in the range of 15 ~ 25 °C.

B.6.4. Limits

Table B-10: Limits

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Average Limit (dB μ V)
0.15 to 0.5	66 to 56	56 to 46
0.5 to 5	56	46
5 to 30	60	50

B.6.5. Measurement Results

Measurement results see Figure B-11.

Conclusions: Set.NFC01, PASS.

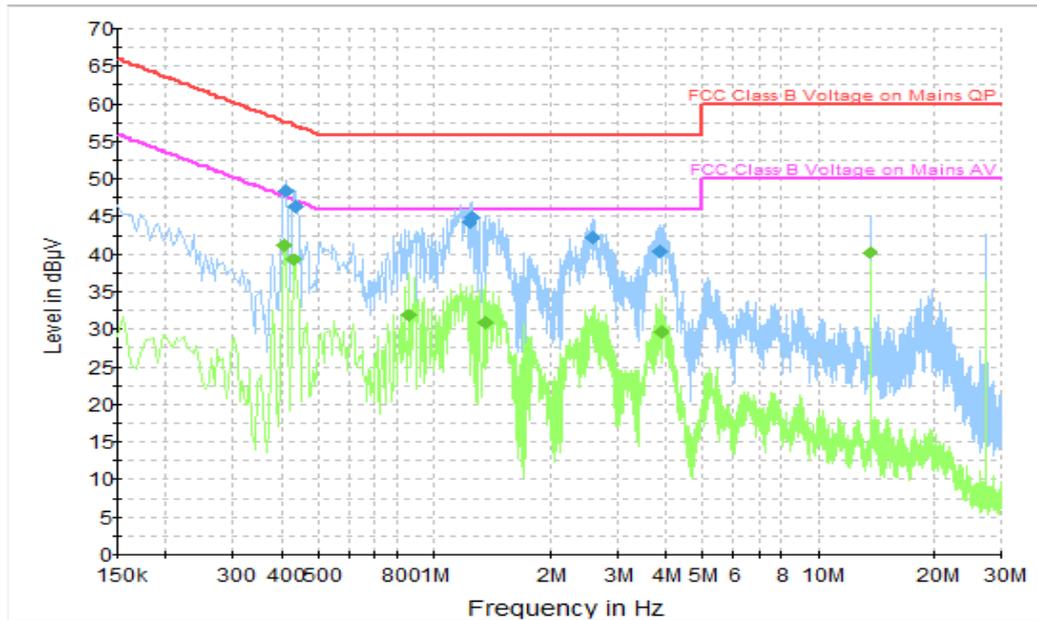


Figure B-11: Measurement results for Conducted Emission

Final Result 1

Table B-11: Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.411000	48.5	1000.	9.000	On	L1	19.8	9.1	57.6
0.438000	46.3	1000.	9.000	On	L1	19.8	10.8	57.1
1.230000	44.3	1000.	9.000	On	L1	19.8	11.7	56.0
1.257000	44.9	1000.	9.000	On	L1	19.8	11.1	56.0
2.571000	42.3	1000.	9.000	On	L1	19.8	13.7	56.0
3.844500	40.4	1000.	9.000	On	L1	19.8	15.6	56.0

Final Result 2

Table B-12: Final Result 2

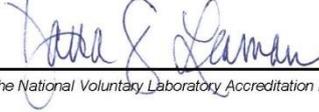
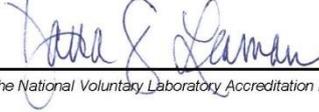
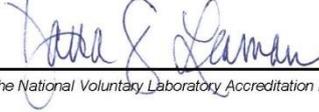
Frequency (MHz)	Average (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.406500	41.3	1000.	9.000	On	L1	19.8	6.5	47.7
0.433500	39.2	1000.	9.000	On	L1	19.8	7.9	47.2
0.861000	31.9	1000.	9.000	On	L1	19.8	14.1	46.0
1.369500	30.9	1000.	9.000	On	L1	19.8	15.1	46.0
3.889500	29.8	1000.	9.000	On	L1	19.8	16.2	46.0
13.560000	40.3	1000.	9.000	On	L1	19.9	9.7	50.0

ANNEX C: Persons involved in this testing

Table C-1: Persons involved

Test Item	Tester
20dB Bandwidth	Pang shuai
Frequency Tolerance	Pang shuai
Electric Field Strength of Fundamental and Outside the Allocated bands	LiPengfei
Electric Field Radiated Emissions (< 30MHz)	LiPengfei
Electric Field Radiated Emissions (≥ 30 MHz)	LiPengfei
Conducted Emissions	Shisuolan

ANNEX D: Accreditation Certificate

<p>United States Department of Commerce National Institute of Standards and Technology</p>  <hr/> <p>Certificate of Accreditation to ISO/IEC 17025:2005</p> <hr/> <p>NVLAP LAB CODE: 600118-0</p> <p>Telecommunication Technology Labs, CAICT Beijing China</p> <p><i>is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:</i></p> <p>Electromagnetic Compatibility & Telecommunications</p> <p><i>This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated January 2009).</i></p> <hr/> <table border="0" style="width: 100%;"><tr><td style="width: 40%; text-align: center;"><p>2019-09-26 through 2020-09-30 <i>Effective Dates</i></p></td><td style="width: 20%; text-align: center;"></td><td style="width: 40%; text-align: center;"> <i>For the National Voluntary Laboratory Accreditation Program</i></td></tr></table>		<p>2019-09-26 through 2020-09-30 <i>Effective Dates</i></p>		 <i>For the National Voluntary Laboratory Accreditation Program</i>
<p>2019-09-26 through 2020-09-30 <i>Effective Dates</i></p>		 <i>For the National Voluntary Laboratory Accreditation Program</i>		

END OF REPORT