



EMC TEST REPORT

Applicant Huawei Technologies Co., Ltd.
FCC ID QISKSA-LX3
Product Smart Phone
Model KSA-LX3
Report No. R1907H0136-E1
Issue Date August 27, 2019

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC Code CFR47 Part15B (2018)/ ANSI C63.4 (2014)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Wei Liu

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Summary of measurement results

Number	Test Case	Clause in FCC Rules	Conclusion
1	Radiated Emission	FCC Part15.109, ANSI C63.4-2014	PASS
2	Conducted Emission	FCC Part15.107, ANSI C63.4-2014	Refer to the Original
Test Date: March 17, 2019 ~ March 21, 2019 and June 8, 2019~ June 17, 2019 and July 30, 2019~ August 2, 2019			

AMN-LX3 (Report No.: R1906H0117-E1) is a variant model of AMN-LX3 (Report No.: R1904H0043-E1). Test values partial duplicated from Original for variant. There is only tested Radiated Emission for variant in this report. The detailed product change description please refers to the ANNEX A.

KSA-LX3 (Report No:R1907H0136-E1) is a variant model of AMN-LX3 (Report No.: R1906H0117-E1). Test values partial duplicated from Original for variant. There is only tested Radiated Emission for variant in this report. The detailed product change description please refers to the ANNEX B.

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2 Test facility

CNAS (accreditation number: L2264)

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.



1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
City: Shanghai
Post code: 201201
Country: P. R. China
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Fax: +86-021-50791141/2/3-8000
Website: <http://www.ta-shanghai.com>
E-mail: xukai@ta-shanghai.com

2 General Description of Equipment under Test

2.1 Client Information

Applicant	Huawei Technologies Co., Ltd.
Applicant address	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District Shenzhen 518129 P.R.China
Manufacturer	Huawei Technologies Co., Ltd.
Manufacturer address	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District Shenzhen 518129 P.R.China

2.2 General information

EUT Description			
Device Type:	Portable Device		
Model:	KSA-LX3		
SN:	FBKNU19528100094		
HW Version:	HL1AMNM		
SW Version:	5.0.1.37(C900E20R1P2)		
Antenna Type:	Internal Antenna		
Frequency:	Band	Tx (MHz)	Rx (MHz)
	GSM 850	824 ~ 849	869 ~ 894
	GSM 1900	1850 ~ 1910	1930 ~ 1990
	WCDMA Band II	1850 ~ 1910	1930 ~ 1990
	WCDMA Band IV	1710 ~ 1755	2110 ~ 2155
	WCDMA Band V	824 ~ 849	869 ~ 894
	LTE Band 2	1850 ~ 1910	1930 ~ 1990
	LTE Band 4	1710 ~ 1755	2110 ~ 2155
	LTE Band 5	824 ~ 849	869 ~ 894
	LTE Band 7	2500 ~ 2570	2620 ~ 2690
	Bluetooth:	2402 ~ 2480	2402 ~ 2480
	WIFI 2.4G:	2412 ~ 2462	2412 ~ 2462
Modulation:	GSM: GMSK GPRS: GMSK EGPRS: GMSK/8PSK WCDMA RMC: QPSK HSDPA: QPSK		



	HSUPA: QPSK DC-HSDPA: 64QAM LTE: QPSK / 16QAM Bluetooth: GFSK, $\pi/4$ -DQPSK, 8-DPSK Bluetooth v5.0 LE: GFSK WLAN 802.11b: DSSS WLAN 802.11g/n: OFDM
EUT Accessory	
Adapter	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-050100U01
Battery 1	Manufacturer: Huawei Technologies Co., Ltd. (Sunwoda Electronic Co., LTD) Model: HB405979ECW
Battery 2	Manufacturer: Huawei Technologies Co., Ltd. (SCUD (Fujian) Electronics Co., LTD.) Model: HB405979ECW
Battery 3	Manufacturer: Huawei Technologies Co., Ltd. (Desay Battery Electronic Co., LTD) Model: HB405979ECW
Earphone 1	Manufacturer: Jiangxi Lianchuang Hongsheng Electronic Co., LTD Model: MEND1532B528A02
Earphone 2	Manufacturer: Boluo County Quancheng Electronic Co., Ltd. Model: 1293-3283-3.5MM-322
Earphone 3	Manufacturer: FOXCONN INTERCONNECT TECHNOLOGY LIMITED Model: EPAB542-2WH05-DH
USB Cable 1	Manufacturer: HONGLIN TECHNOLOGY CO., LTD. Model: 130-26654
USB Cable 2	Manufacturer: Dongguan Ming Ji Electronics Co., Ltd. Model: 203-0786-0
USB Cable 3	Manufacturer: Luxshare Precision industry Co., Ltd. Model: L99U2013-CS-H
USB Cable 4	Manufacturer: NingBo Broad Telecommunication Co., Ltd. Model: WA0007
Auxiliary test equipment	
PC	PC Manufacturer: Microsoft corporation Model: Microsoft corporation (SN : 032324771953)
Note: 1. The information of the EUT is declared by the manufacturer. 2. There are more than one Adapter, Battery, Earphone and USB Cable, each one should be applied throughout the compliance test respectively, however, only the worst case (Battery2, Earphone 1 and USB Cable 2) will be recorded in this report.	



2.3 Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards

FCC Code CFR47 Part15B (2018)

ANSI C63.4 (2014)

2.4 Test Mode

Test Mode for RE	
Mode 1:	USB Copy(EUT with PC) + USB cable + earphone + rear camera On + MP3 +Idle
Mode 2:	USB Copy(EUT with PC) + USB cable + earphone +front camera On + MP3 +Idle
Mode 3:	Adapter +USB cable+ earphone + front camera On +Idle
Mode4:	Adapter +USB cable + earphone + rear camera On +Idle
Mode 5:	Adapter + USB cable+ earphone + Mp3 +Idle
Mode 6:	Adapter + USB cable+ earphone +play video+Idle
Mode 7:	Front camera On +earphone + Idle
Mode 8:	Rear camera On + earphone + Idle
Mode 9:	Earphone+MP3+Idle
Mode 10:	Earphone +Play video+Idle

During the test, the preliminary test was performed in all modes with all adapters, USB and batteries, mode 1 with Battery 1 and USB cable 2 is selected as the worst condition. The test data of the worst-case condition was recorded in this report.

Test Mode for CE	
Mode 1:	USB Copy(EUT with PC) + USB cable + earphone + rear camera On + MP3 +Idle
Mode 2:	USB Copy(EUT with PC) + USB cable + earphone +front camera On + MP3 +Idle
Mode 3:	Adapter +USB cable+ earphone + front camera On +Idle
Mode4:	Adapter +USB cable + earphone + rear camera On +Idle
Mode 5:	Adapter + USB cable+ earphone + Mp3 +Idle
Mode 6:	Adapter + USB cable+ earphone +play video+Idle

During the test, the preliminary test was performed in all modes with all adapters, USB and batteries, mode 1 with Battery 1 and USB cable 2 is selected as the worst condition. The test data of the worst-case condition was recorded in this report.

3 Test Case Results

3.1 Radiated Emission

Ambient condition

Temperature	Relative humidity	Pressure
24°C~26°C	45%~50%	102.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The distance between EUT and receive antenna should be 3 meters. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2014. Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier. During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum of radiated signal level.

The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing. During the test, the EUT is worked at maximum output power.

Set the spectrum analyzer in the following:

Below 1GHz:

RBW=100 kHz / VBW=300 kHz / Sweep=AUTO

Above 1GHz:

(a) PEAK: RBW=1MHz / VBW=3MHz/ Sweep=AUTO

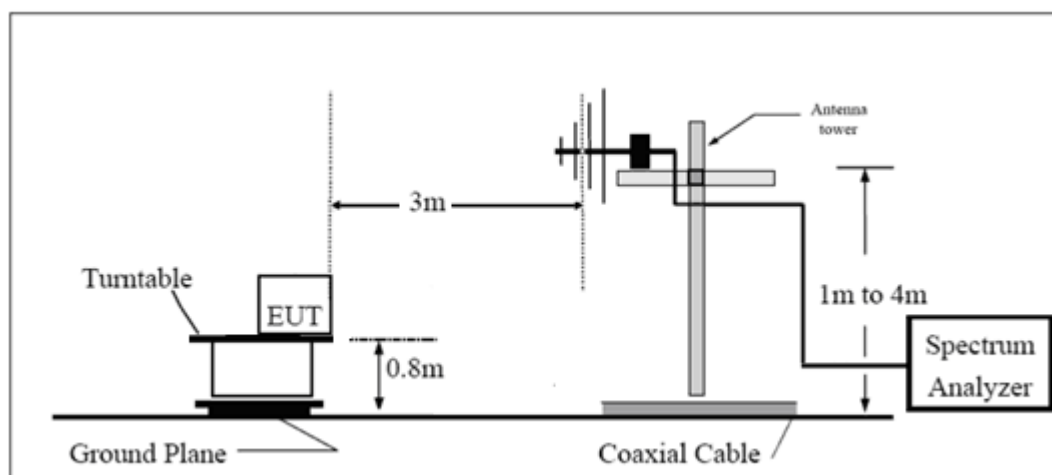
(b) AVERAGE: RBW=1MHz / VBW=3MHz / Sweep=AUTO

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

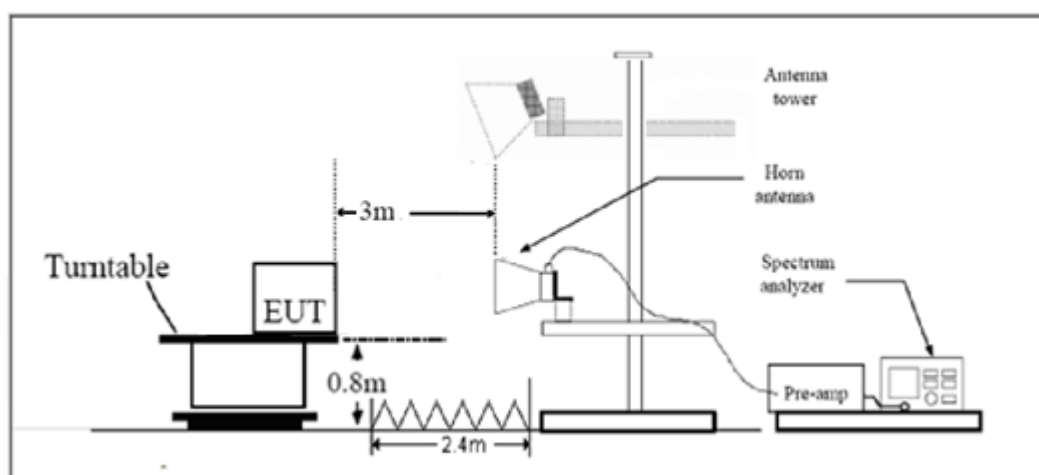
During the test, EUT is connected to a laptop via a USB cable in the case of Transfer Data mode. The EUT is used as the peripheral equipment of the PC. The data is transferred from EUT to PC;

Test Setup

Below 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

Antenna Tower meets ANSI C63.4 requirements for measurements above 1 GHz by keeping the antenna aimed at the EUT during the antenna's ascent/ descent along the antenna mast.

Limits

Frequency (MHz)	Field Strength (dB μ V/m)	Detector
30 -88	40.0	Quasi-peak
88-216	43.5	Quasi-peak
216 – 960	46.0	Quasi-peak
960-1000	54.0	Quasi-peak
1000-5 th harmonic of the highest frequency or 40GHz, which is lower	54 74	Average Peak

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
30MHz~200MHz	4.02 dB
200MHz~1000MHz	3.28 dB
1GHz~18GHz	3.70 dB
18GHz~26.5GHz	5.78 dB
26.5GHz~40GHz	5.82 dB

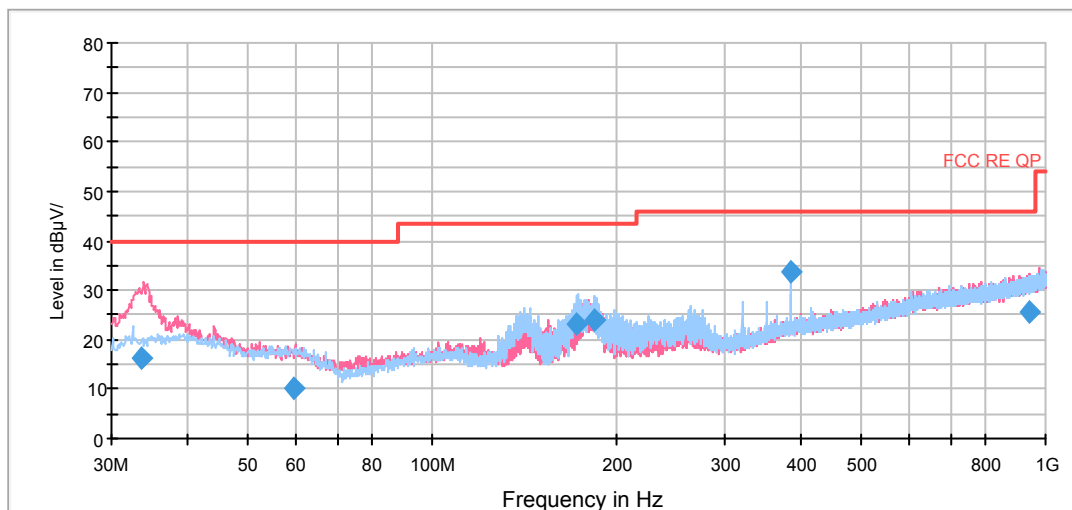
Test Results

Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier, the Emissions in the frequency band 18GHz- 40GHz is more than 20dB below the limit are not reported.

The following graphs display the maximum values of horizontal and vertical by software.

For above 1GHz, Blue trace uses the peak detection, Green trace uses the average detection.

Variant

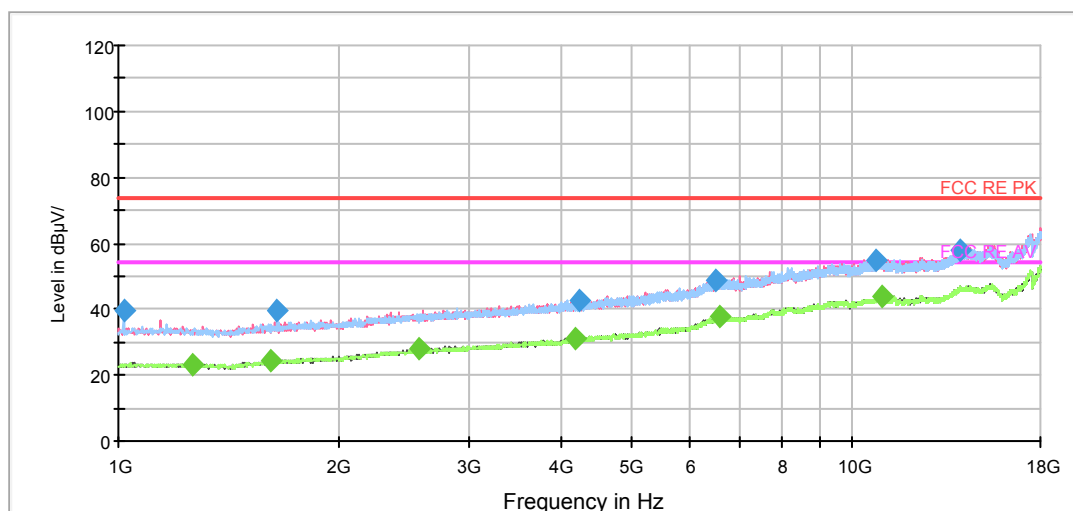


Radiated Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
33.480000	16.4	100.0	V	0.0	15.7	23.6	40.0
59.307500	10.3	125.0	V	0.0	14.0	29.7	40.0
172.510000	23.1	189.0	H	244.0	10.7	20.4	43.5
183.866250	23.9	217.0	H	270.0	11.2	19.6	43.5
384.010000	33.6	100.0	H	11.0	18.9	12.4	46.0
940.062500	25.6	207.0	V	256.0	26.9	20.4	46.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

2. Margin = Limit – Quasi-Peak

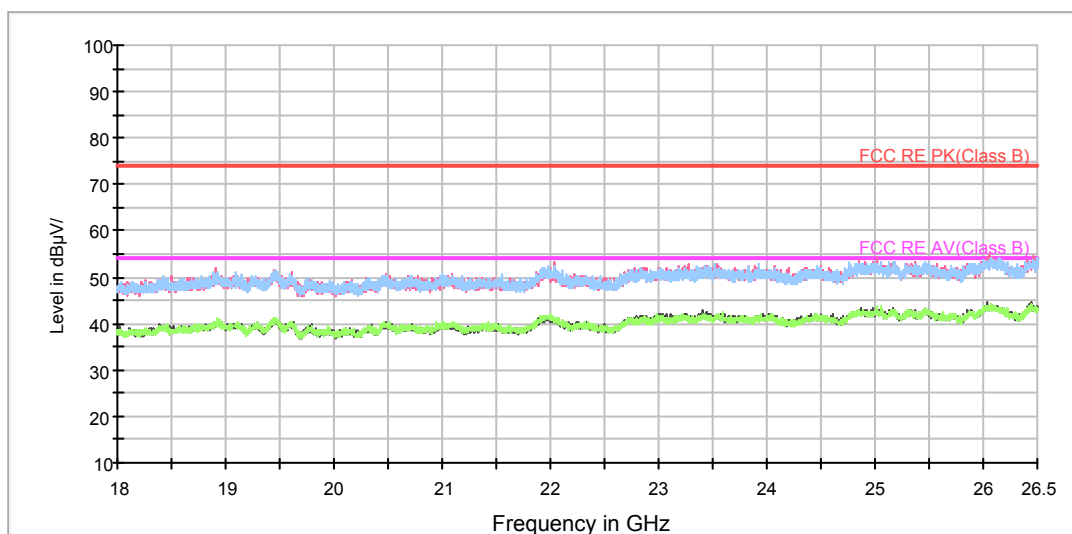


Radiated Emission from 1GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1017.000000	39.6	200.0	H	358.0	-11.8	34.4	74.0
1646.000000	39.7	200.0	H	350.0	-9.8	34.3	74.0
4236.375000	42.9	100.0	V	59.0	-2.0	31.1	74.0
6488.875000	49.0	200.0	V	3.0	4.8	25.0	74.0
10775.000000	54.8	200.0	V	92.0	13.4	19.2	74.0
13968.875000	57.9	100.0	V	232.0	16.6	16.1	74.0

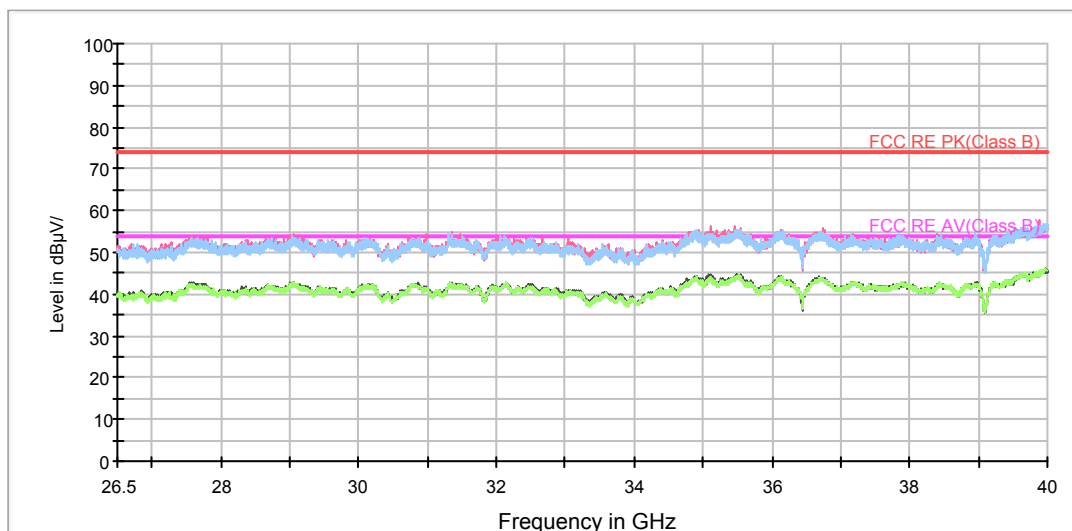
Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1261.375000	22.9	200.0	V	73.0	-11.1	31.1	54.0
1616.250000	24.2	200.0	V	0.0	-10.0	29.8	54.0
2559.750000	27.7	200.0	H	262.0	-6.3	26.3	54.0
4179.000000	31.1	200.0	V	323.0	-2.3	22.9	54.0
6597.250000	37.8	200.0	V	92.0	5.0	16.2	54.0
10964.125000	43.7	100.0	H	120.0	13.5	10.3	54.0

RE 18-26.5GHz PK+AV



Radiates Emission from 18GHz to 26.5GHz

RE 26.5-40GHz PK+AV



Radiates Emission from 26.5GHz to 40GHz

3.2 Conducted Emission

Ambient condition

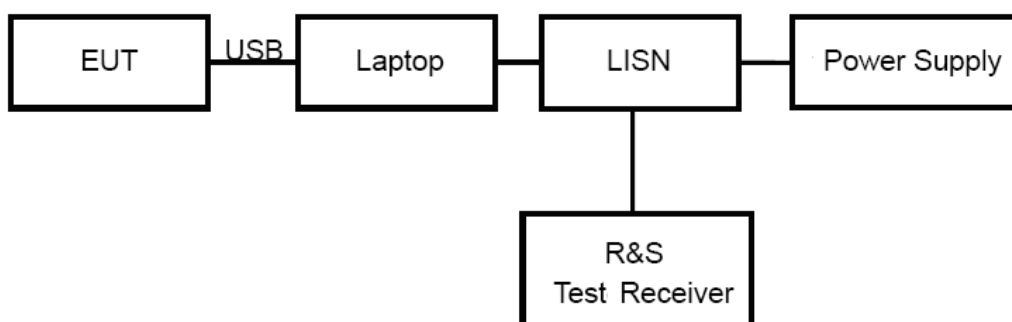
Temperature	Relative humidity	Pressure
24°C ~26°C	50%~55%	102.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2014. Connect the AC power line of the EUT to the L.I.S.N. Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9 kHz, VBW is set to 30kHz. The measurement result should include both L line and N line.

During the test, EUT is connected to a laptop via a USB cable in the case of Transfer Data mode. The EUT is used as the peripheral equipment of the PC. The data is transferred from EUT to PC;

Test Setup



Note: Power Supply is AC Power source and it is used to change the voltage 120V/60Hz.

Limits

Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46 *
0.5 - 5	56	46
5 - 30	60	50

*: Decreases with the logarithm of the frequency.

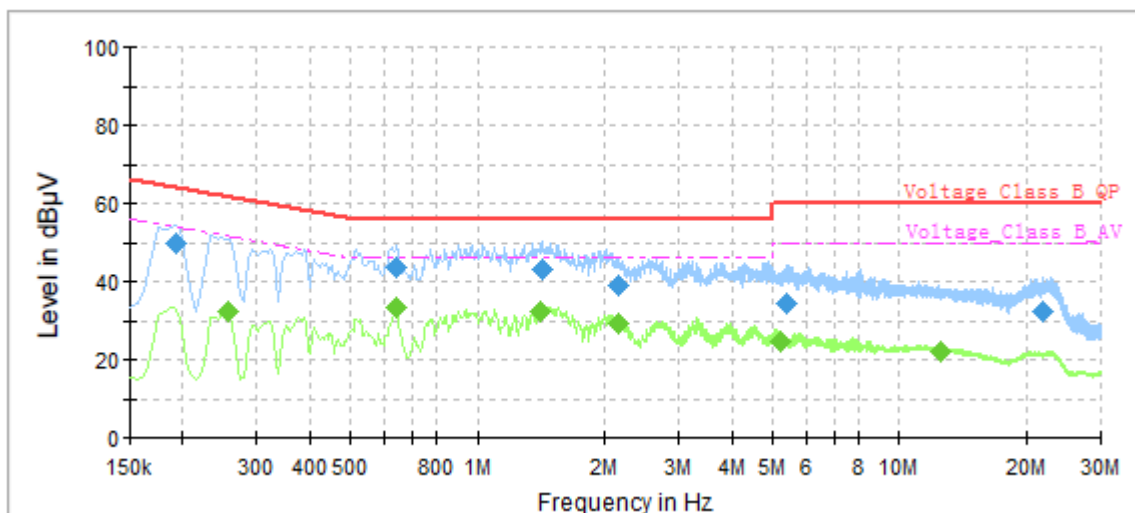
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$. $U = 2.57$ dB.

Test Results

Following plots, Blue trace uses the peak detection; Green trace uses the average detection.

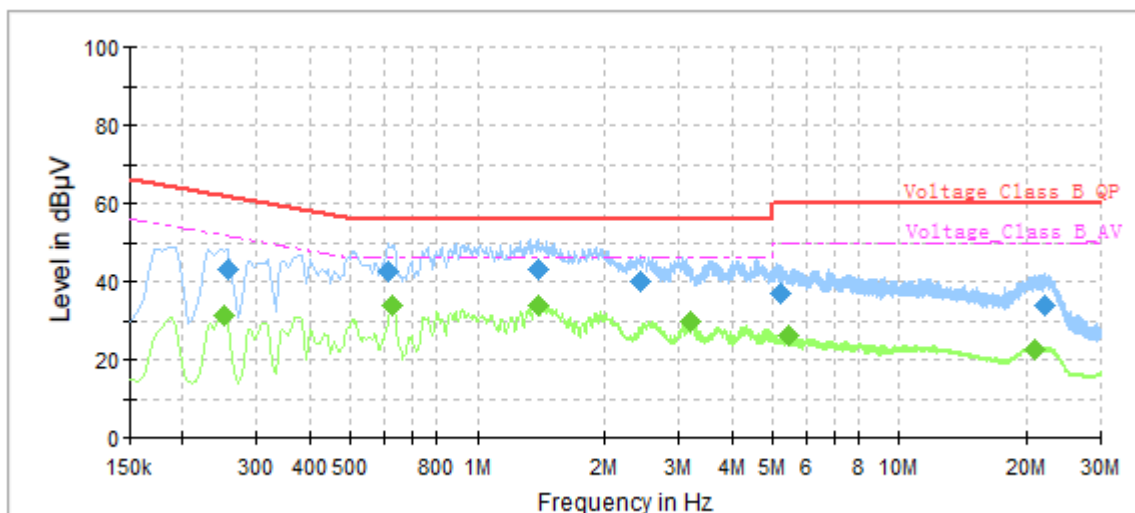
Original



Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.19	49.95	---	63.92	13.97	1000.0	9.000	L1	ON	19.18
0.26	---	32.50	51.57	19.07	1000.0	9.000	L1	ON	19.13
0.64	---	33.37	46.00	12.63	1000.0	9.000	L1	ON	19.28
0.64	43.57	---	56.00	12.43	1000.0	9.000	L1	ON	19.28
1.41	---	32.47	46.00	13.53	1000.0	9.000	L1	ON	19.18
1.42	42.88	---	56.00	13.12	1000.0	9.000	L1	ON	19.18
2.15	---	29.13	46.00	16.87	1000.0	9.000	L1	ON	19.07
2.15	38.77	---	56.00	17.23	1000.0	9.000	L1	ON	19.07
5.21	---	24.67	50.00	25.33	1000.0	9.000	L1	ON	19.09
5.39	34.45	---	60.00	25.55	1000.0	9.000	L1	ON	19.10
12.48	---	21.93	50.00	28.07	1000.0	9.000	L1	ON	19.44
21.80	32.33	---	60.00	27.67	1000.0	9.000	L1	ON	19.51

L line

Conducted Emission from 150 KHz to 30 MHz



Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.25	---	31.70	51.72	20.02	1000.0	9.000	N	ON	19.11
0.26	42.75	---	61.57	18.82	1000.0	9.000	N	ON	19.13
0.63	---	33.83	46.00	12.17	1000.0	9.000	N	ON	19.27
0.63	44.52	---	56.00	11.48	1000.0	9.000	N	ON	19.27
1.39	43.31	---	56.00	12.69	1000.0	9.000	N	ON	19.18
1.43	---	34.06	46.00	11.94	1000.0	9.000	N	ON	19.18
2.55	---	29.68	46.00	16.32	1000.0	9.000	N	ON	19.02
4.65	37.73	---	56.00	18.27	1000.0	9.000	N	ON	19.09
5.15	36.63	---	60.00	23.37	1000.0	9.000	N	ON	19.09
5.52	---	25.78	50.00	24.22	1000.0	9.000	N	ON	19.11
21.00	---	22.73	50.00	27.27	1000.0	9.000	N	ON	19.67
21.59	34.17	---	60.00	25.83	1000.0	9.000	N	ON	19.56

N line

Conducted Emission from 150 KHz to 30 MHz

4 Main Test Instrument

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Time
Spectrum Analyzer	R&S	FSV40	15195-01-00	2019-05-19	2020-05-18
EMI Test Receiver	R&S	ESCI	100948	2019-05-19	2020-05-18
Trilog Antenna	SCHWARZBECK	VULB 9163	9163-201	2017-11-18	2019-11-17
Horn Antenna	R&S	HF907	100126	2018-07-07	2020-07-06
Standard Gain Horn	ETS-Lindgren	3160-09	00102643	2018-06-20	2020-06-19
Standard Gain Horn	STEATITE	QSH-SL-26-40-K-15	16779	2017-07-20	2019-07-19
EMI Test Receiver	R&S	ESR	101667	2019-05-19	2020-05-18
LISN	R&S	ENV216	101171	2016-12-16	2019-12-15
Bore Sight Antenna mast	ETS	2171B	00058752	/	/
Test software	EMC32	R&S	9.26.0	/	/

*****END OF REPORT *****

ANNEX A: Product Change Description 1



Huawei Technologies Co., Ltd.

Difference Declaration Letter

Article 1: Difference description:

The difference of model AMN-LX3 is show in the below table:

	Model	AMN-LX3	AMN-LX3
		Origin	modified
Licensed Frequency	LTE BAND	the same	LTE B2/B4/B7/B28 duplexer Changed
	UMTS BAND	the same	WCDMA B2/B4 duplexer Changed
	GSM	the same	GSM B2 duplexer Changed
	IC	the same	the same
	Antenna	the same	the same
Unlicensed Frequency	Antenna tuner 4SPST	47140285	47140338
	RF conducted power	the same	the same
	Bluetooth	the same	the same
	2.4G Wi-Fi	the same	the same
	IC	the same	the same
Hardware	Antenna	the same	the same
	Ram / Rom	the same	the same
	Camera	the same	the same
	PCB	the same	the same
	USB Port	the same	the same
Appearance	SIM	the same	the same
	Dimension	the same	the same
	Color	the same	the same
Accessory	Battery	the same	the same
	Charger	the same	the same
	USB label	the same	the same
	Earphone	22040150	22040322

ANNEX B: Product Change Description 2

Huawei Technologies Co., Ltd.

Difference Declaration Letter

Article 1: Difference description:

The difference between model AMN-LX3 and model KSA-LX3 is show in the below table:

	Model	AMN-LX3	KSA-LX3
Licensed Frequency	LTE BAND	the same	the same
	UMTS BAND	the same	the same
	GSM	the same	the same
	IC	the same	the same
	Antenna	the same	the same
	RF conducted power	the same	the same
Unlicensed Frequency	Bluetooth	the same	the same
	2.4G Wi-Fi	the same	the same
	IC	the same	the same
	Antenna	the same	the same
Hardware	NFC	Not support	Not support
	MIC	the same	the same
	Ram / Rom	the same	the same
	Camera	the same	the same
	PCB	the same	the same
	USB Port	the same	the same
	SIM	the same	the same
RF	RF	the same	the same
Appearance	Dimension	the same	Only the rear camera has a different curved appearance
	Color	the same	the same
Accessory	Battery	the same	the same
	Charger	the same	the same
	USB label	the same	the same
	Earphone	the same	the same