



RF TEST REPORT

Applicant Huawei Technologies Co., Ltd.
FCC ID QISLIO-LX9
Product Smart Phone
Model LIO-L29, LIO-L09
Report No. R1907H0137-R12V1
Issue Date January 20, 2020

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 18 (2018)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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Summary of measurement results

Number	Test Case	Clause in FCC rules	Verdict
1	Radiated Emissions	18.305	PASS
2	Conducted Emissions	18.307	PASS
Date of Testing: August 9, 2019 ~ August 11, 2019			

Note: This revised report (Report No.: R1907H0137-R12V1) supersedes and replaces the previously issued report (Report No.: R1907H0137-R12). Please discard or destroy the previously issued report and dispose of it accordingly.



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. This report must not be used by the client to claim product certification, approval, or endorsement by any government agencies.

1.2. Test facility

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
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Post code: 201201
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E-mail: xukai@ta-shanghai.com

2. General Description of Equipment under Test

Client Information

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

General information

EUT Description	
Model:	LIO-L29, LIO-L09
SN:	YDM0119625000032
Hardware Version:	HL1LIONM
Software Version:	5.0.1.103M(C432E103R4P1)
Antenna Type:	Loop Antenna
Modulation Type:	ASK
Operating Frequency Range(s)	110KHz ~148KHz
State DC voltage:	3.8 V
EUT Accessory	
Adapter 1	Manufacturer: HUAWEI Technologies Co., Ltd. Model: HW-100400E00
Adapter 2	Manufacturer: HUAWEI Technologies Co., Ltd. Model: HW-100400B00
Adapter 3	Manufacturer: HUAWEI Technologies Co., Ltd. Model: HW-100400U00
Adapter 4	Manufacturer: HUAWEI Technologies Co., Ltd. Model: HW-100400A00
Adapter 5	Manufacturer: HUAWEI Technologies Co., Ltd. Model: HW-100400J00
Adapter 6	Manufacturer: HUAWEI Technologies Co., Ltd. Model: HW-100400R00
Adapter 7	Manufacturer: HUAWEI Technologies Co., Ltd. Model: HW-100400Z00
Adapter 8	Manufacturer: HUAWEI Technologies Co., Ltd. Model: HW-100400I00



Adapter 9	Manufacturer: HUAWEI Technologies Co., Ltd. Model: HW-100400E01
Adapter 10	Manufacturer: HUAWEI Technologies Co., Ltd. Model: HW-100400B01
Adapter 11	Manufacturer: HUAWEI Technologies Co., Ltd. Model: HW-100400U01
Adapter 12	Manufacturer: HUAWEI Technologies Co., Ltd. Model: HW-100400A01
Adapter 13	Manufacturer: HUAWEI Technologies Co., Ltd. Model: HW-100400J01
Adapter 14	Manufacturer: HUAWEI Technologies Co., Ltd. Model: HW-100400K01
Battery 1	Manufacturer: HUAWEI Technologies Co., Ltd. (Sunwoda, Murata) Model: HB555591EEW
Battery 2	Manufacturer: HUAWEI Technologies Co., Ltd. (Sunwoda, ATL) Model: HB555591EEW
Battery 3	Manufacturer: HUAWEI Technologies Co., Ltd. (SCUD) Model: HB555591EEW
USB Cable 1	Manufacturer: Ningbo Broad Telecommunication Co., Ltd Model: WA0009
USB Cable 2	Manufacturer: LUXSHARE Precision Industry Co., Ltd. Model: L99UC117-CS-H
USB Cable 3	Manufacturer: HUIZHOU DEHONG TECHNOLOGY CO.,LTD. Model: 330-50465
USB Cable 4	Manufacturer: FOXCONN INTERCONNECT TECHNOLOGY LIMITED Model: CUDU01B-HC350-EH
Wireless charging base	Model: CP61
Note: The information of the EUT is declared by the manufacturer.	

LIO-L29 is dual SIM smart phone. LIO-L09 is single SIM smart phone. The model LIO-L29 and LIO-L09 are identical except for LIO-L09 support single SIM card which deleted by software.



3. Applied Standards

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

Test standards

- **FCC CFR47 Part 18 (2018)**
- **ANSI C63.10 (2013)**

4. Test Configuration

Test Mode

Test Mode for Reverse charging	
Mode 1:	base station in stand-by, idle mode
Mode 2:	Communication before charging, adjustment charging mode / position
Mode 3:	Communication
Mode 4:	energy transmission
Test Mode for Positive charging	
Mode 5:	Communication before charging, adjustment charging mode / position
Mode 6:	Communication
Mode 7:	energy transmission

During the test, the preliminary test was performed in all modes with all adapters, USB and batteries, mode 4 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.

5. Test Case Results

5.1. Radiates Emission

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	102.5kPa

Method of Measurement

The test set-up was made in accordance to the general provisions of ANSI C63.10-2013. The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The radiated emissions measurements were made in a typical installation configuration. Sweep the whole frequency band through the range from 9 kHz to the 10th harmonic of the carrier, and the emissions less than 20 dB below the permissible value are reported.

During the test, below 30MHz, the center of the loop shall be 1 meters; above 30MHz, 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 turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.

Set the spectrum analyzer in the following:

Out-of-band

Below 30MHz

RBW=9KHz, VBW=30KHz, detector=peak;

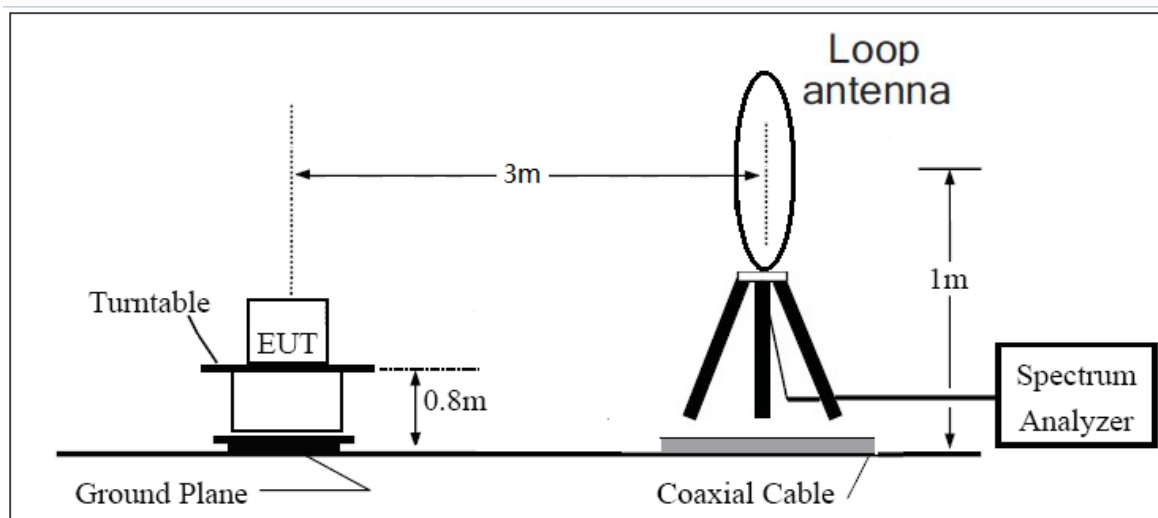
In-band

RBW=9KHz, VBW=30KHz, detector=peak;

The field strength of spurious 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 loop antenna is vertical, the other antennas are vertical and horizontal.

Test setup

9kHz~~~ 30MHz



Note: Area side:2.4mX3.6m

Limits

(b) The field strength levels of emissions which lie outside the bands specified in §18.301, unless otherwise indicated, shall not exceed the following:

Equipment	Operating frequency	RF Power generated by equipment (watts)	Field strength limit (uV/m)	Distance (meters)
Any type unless otherwise specified (miscellaneous)	Any ISM frequency	Below 500 500 or more	25 $25 \times \text{SQRT}(\text{power}/500)$	300 ¹ 300
	Any non-ISM frequency	Below 500 500 or more	15 $15 \times \text{SQRT}(\text{power}/500)$	300 ¹ 300
Industrial heaters and RF stabilized arc welders	On or below 5,725 MHz Above 5,725 MHz	Any Any	10 (²)	1,600 (²)
Medical diathermy	Any ISM frequency Any non-ISM frequency	Any Any	25 15	300 300
Ultrasonic	Below 490 kHz	Below 500 500 or more	$2,400/F(\text{kHz})$ $2,400/F(\text{kHz}) \times \text{SQRT}(\text{power}/500)$	300 ³ 300
	490 to 1,600 kHz Above 1,600 kHz	Any Any	$24,000/F(\text{kHz})$ 15	30 30
Induction cooking ranges	Below 90 kHz On or above 90 kHz	Any Any	1,500 300	⁴ 30 ⁴ 30

¹Field strength may not exceed 10 uV/m at 1600 meters. Consumer equipment operating below 1000 MHz is not permitted the increase in field strength otherwise permitted here for power over 500 watts.

²Reduced to the greatest extent possible.



³Field strength may not exceed 10 $\mu\text{V/m}$ at 1600 meters. Consumer equipment is not permitted the increase in field strength otherwise permitted here for over 500 watts.

⁴Induction cooking ranges manufactured prior to February 1, 1980, shall be subject to the field strength limits for miscellaneous ISM equipment.

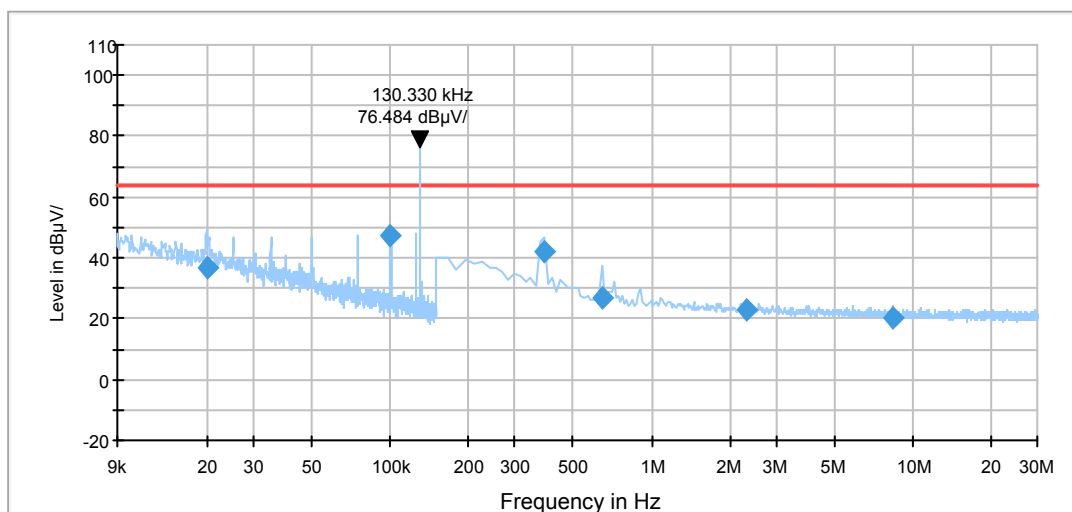
Measurement Uncertainty

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

Frequency	Uncertainty
9KHz-30MHz	3.55 dB

Test result

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.



Radiates Emission from 9kHz to 30MHz

Note: This graph displays the maximum values of horizontal and vertical by software

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
0.019857	36.5	0.200	100.0	168.0	19.0	27.0	63.5
0.100330	47.6	9.000	100.0	328.0	19.0	15.9	63.5
0.388200	42.0	9.000	100.0	0.0	19.0	21.5	63.5
0.642525	26.7	9.000	100.0	0.0	19.0	36.8	63.5
2.299200	22.9	9.000	100.0	0.0	19.0	40.6	63.5
8.388600	20.1	9.000	100.0	0.0	19.0	43.4	63.5

5.2. Conducted Emission

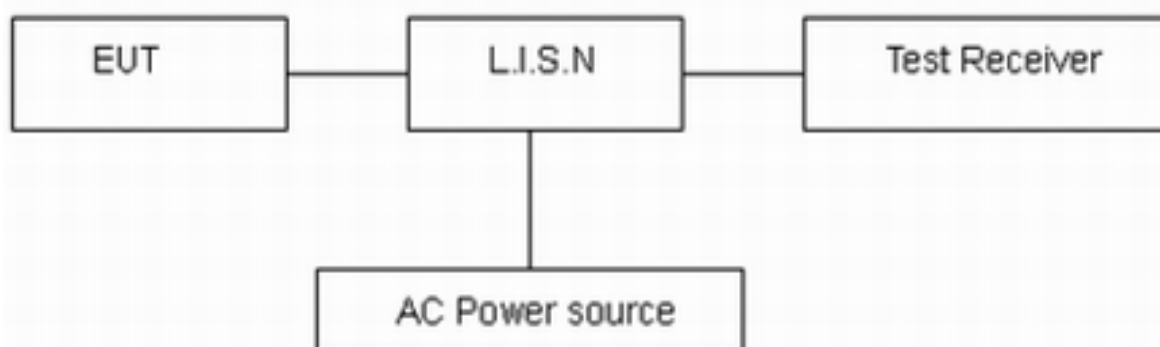
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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 C63.10-2013. 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.
The test is in transmitting mode.

Test Setup



Note: AC Power source is used to change the voltage 110V/60Hz.

Limits

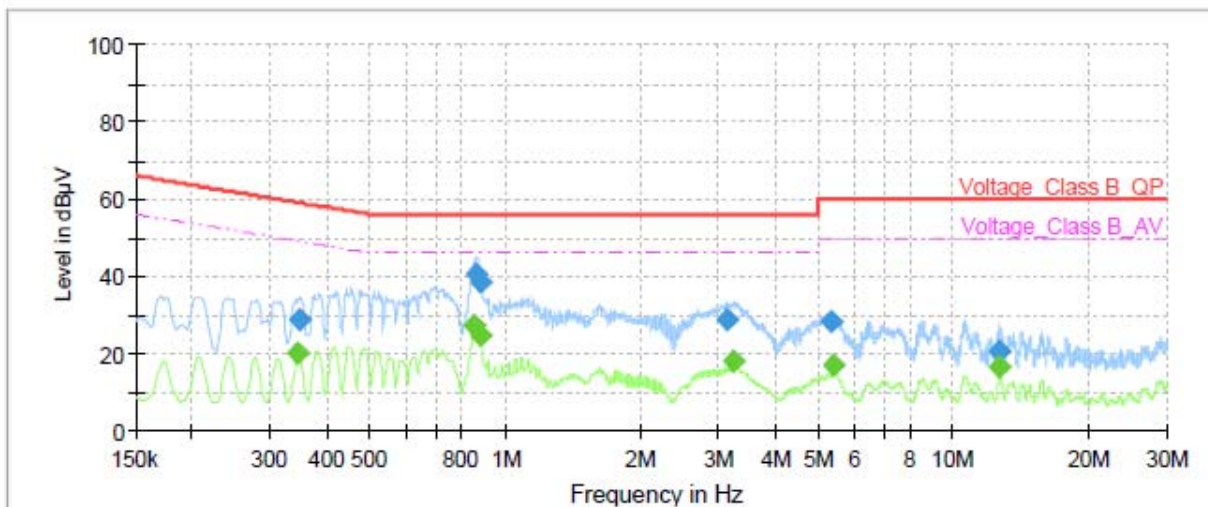
Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46*
0.5 - 5	56	46
5 - 30	60	50
*: Decreases with the logarithm of the frequency.		

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U = 2.69$ dB.

Test Results:

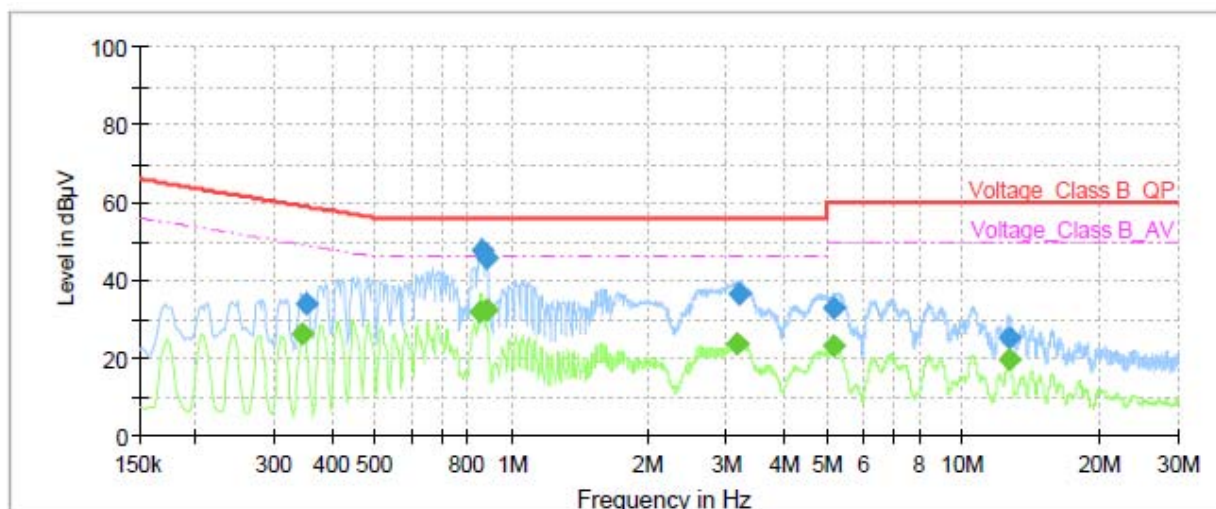
Following plots, Blue trace uses the peak detection and Green trace uses the average detection.



Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.35	---	19.80	49.06	29.26	1000.0	9.000	L1	ON	19.18
0.35	28.69	---	59.01	30.32	1000.0	9.000	L1	ON	19.17
0.85	---	26.95	46.00	19.05	1000.0	9.000	L1	ON	19.24
0.87	40.69	---	56.00	15.31	1000.0	9.000	L1	ON	19.24
0.88	---	24.81	46.00	21.19	1000.0	9.000	L1	ON	19.24
0.88	38.23	---	56.00	17.77	1000.0	9.000	L1	ON	19.24
3.12	28.55	---	56.00	27.45	1000.0	9.000	L1	ON	19.09
3.24	---	18.02	46.00	27.98	1000.0	9.000	L1	ON	19.07
5.33	28.24	---	60.00	31.76	1000.0	9.000	L1	ON	19.10
5.42	---	16.99	50.00	33.01	1000.0	9.000	L1	ON	19.10
12.69	20.36	---	60.00	39.64	1000.0	9.000	L1	ON	19.47
12.70	---	16.21	50.00	33.79	1000.0	9.000	L1	ON	19.47

Remark: Correct factor=cable loss + LISN factor

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)
0.34	---	26.23	49.12	22.89	1000.0	9.000	N	ON	19.18
0.35	33.75	---	58.90	25.15	1000.0	9.000	N	ON	19.18
0.86	---	31.75	46.00	14.25	1000.0	9.000	N	ON	19.24
0.86	47.90	---	56.00	8.10	1000.0	9.000	N	ON	19.24
0.88	---	32.15	46.00	13.85	1000.0	9.000	N	ON	19.24
0.88	45.44	---	56.00	10.56	1000.0	9.000	N	ON	19.24
3.17	---	23.52	46.00	22.48	1000.0	9.000	N	ON	19.08
3.21	36.44	---	56.00	19.56	1000.0	9.000	N	ON	19.07
5.18	33.00	---	60.00	27.00	1000.0	9.000	N	ON	19.09
5.18	---	23.00	50.00	27.00	1000.0	9.000	N	ON	19.09
12.64	---	19.58	50.00	30.42	1000.0	9.000	N	ON	19.44
12.66	25.34	---	60.00	34.66	1000.0	9.000	N	ON	19.44

Remark: Correct factor=cable loss + LISN factor

N line Conducted Emission from 150 KHz to 30 MHz



6. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Time
Spectrum Analyzer	R&S	FSV30	100815	2018-12-16	2019-12-15
EMI Test Receiver	R&S	ESCI	100948	2019-05-19	2020-05-18
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2017-09-26	2019-09-25
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-201	2017-11-18	2019-11-17
EMI Test Receiver	R&S	ESR	101667	2019-05-19	2020-05-18
LISN	R&S	ENV216	101171	2016-12-16	2019-12-15
Spectrum Analyzer	Agilent	N9020A	MY52330084	2019-05-19	2020-05-18
TEMPERATURE CHAMBER	WEISS	VT4002	582261194500 10	2018-12-16	2019-12-15
RF Cable	Agilent	SMA 15cm	0001	2019-06-14	2019-09-13
Software	R&S	EMC32	9.26.0	/	/

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