EMC Test Report

Product Name: Smart Phone

Model Number: ELE-L04m

Report No: SYBH(Z-EMC)20190401017001-2

FCC ID: QISELE-L04M
IC：6369A-ELEL04M

Reliability Laboratory of Huawei Technologies Co., Ltd.

(Global Compliance and Testing Center of Huawei Technologies Co., Ltd)

No.2, New City Avenue, Songshan Lake Sci. & Tech. Industry Park, Dongguan, 523808, P.R.C

Tel: +86 769 23830808 Fax: +86 769 23837628

Notice

1. **The laboratory has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: L0310.**
2. **The laboratory has passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01**
3. **The laboratory has been recognized by the Innovation, Science and Economic Development Canada (ISED) to test to Canadian radio equipment requirements. The CAB identifier is CN0003, and the ISED# is 21741.**
4. **The laboratory (Reliability Lab of Huawei Technologies Co., Ltd) is also named as "Global Compliance and Testing Center of Huawei Technologies Co., Ltd", the both names have coexisted since 2009.**
5. **The laboratory has been recognized by the US Federal Communications Commission (FCC) to perform compliance testing subject to the Commission's Certification rules. The Designation Number is CN1173, and the Test Firm Registration Number is 294140.**
6. **The test report is invalid if not marked with the stamps or the signatures of the persons responsible for performing, revising and approving the test report.**
7. **The test report is invalid if there is any evidence of erasure and/or falsification.**
8. **If there is any dissidence for the test report, please file objection to the test centre within 15 days from the date of receiving the test report.**
9. **Normally, the test report is only responsible for the samples that have undergone the test.**
10. **Context of the test report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of the laboratory.**
11. **If any question about this report, please contact the laboratory(PublicGCTC@huawei.com).**

Applicant:	Huawei Technologies Co., Ltd.
Address:	No.2 New City Avenue Songshan Lake Sci. &Tech. Industry Park, Dongguan, Guangdong, P.R.C
Date of Receipt Test Item:	2019-04-15
Start Date of Test:	2019-04-16
End Date of Test:	2019-04-27
Test Result:	Pass

Approved By (Lab Manager)	**2019-04-29**	**He Hao**	He Hao
	Date	**Name**	**Signature**
Prepared by (Test Engineer)	**2019-04-28**	**Chang Lina**	Chang Lina
	Date	**Name**	**Signature**

Modification Record

No.	Last Report No.	Modification Description
1	NA	First Report.

TABLE OF CONTENT

1 General Information

1.1 EUT Description

EUT Description	
Product Name	Smart Phone
Model Number	ELE-L04m
Input voltage	3.8V
TX Frequency	GSM 850: 824MHz to 849MHz PCS 1900: 1850MHz to 1910MHz WCDMA Band II: 1850MHz to 1910MHz WCDMA Band IV: 1710MHz to 1755MHz WCDMA Band V: 824MHz to 849MHz LTE BAND 2: 1850MHz to 1910MHz LTE BAND 4: 1710MHz to 1755MHz LTE BAND 5: 824MHz to 849MHz LTE BAND 7: 2500MHz to 2570MHz LTE BAND 12: 699MHz to 716MHz LTE BAND 17: 704MHz to 716MHz LTE BAND 26: 814MHz to 849MHz(only for FCC) LTE BAND 38: 2570MHz to 2620MHz LTE BAND 40: 2305 MHz ~2315 MHz(only for IC) 2350 MHz ~2360 MHz(only for IC) LTE BAND 41: 2535MHz to 2655MHz LTE BAND 66: 1710MHz to 1780MHz 2.4G WIFI: 2400MHz to 2462 MHz Bluetooth: 2400MHz to 2483.5MHz 5G WIFI:5150MHz to 5350MHz 5470MHz to 5725MHz 5725MHz to 5850MHz NFC: 13.56MHz
RX Frequency	GSM 850: 869MHz to 894MHz GSM 1900: 1930MHz to 1990MHz WCDMA Band II: 1930MHz to 1990MHz WCDMA Band IV: 2110MHz to 2155MHz WCDMA Band V: 869MHz to 894MHz LTE BAND 2: 1930MHz to 1990MHz LTE BAND 4: 2110MHz to 2155MHz LTE BAND 5: 869MHz to 894MHz LTE BAND 7: 2620MHz to 2690MHz LTE BAND 12: 729MHz to 746MHz LTE BAND 17: 704MHz to 716MHz LTE BAND 26: 859MHz to 894MHz(only for FCC) LTE BAND 38: 2570MHz to 2620MHz LTE BAND 40: 2305 MHz ~2315 MHz(only for IC) 2350 MHz ~2360 MHz(only for IC) LTE BAND 41: 2535MHz to 2655MHz LTE BAND 66: 2110MHz to 2200MHz 2.4G WIFI: 2400MHz to 2472 MHz Bluetooth: 2400MHz to 2483.5MHz 5G WIFI:5150MHz to 5350MHz 5470MHz to 5725MHz

	5725MHz to 5850MHz GPS/ Galileo: 1575.42MHz/1176.45MHz BDS: 1561.098MHz GLONASS: 1602.5625MHz NFC: 13.56MHz
S/N	6RE0119330000039
HW Version	HL3ELLEM
SW Version	5.0.1.130（SP3C792E1R1P11）
EUT Accessory	
USB	Data Cable USB A Male to Type C ,Shield Manufacturer: LUXSHARE Precision Industry Co., Ltd. HUIZHOU DEHONG TECHNOLOGY CO.,LTD. Ningbo Broad Telecommunication Co., Ltd.
Adapter	Manufacturer: Huawei Technologies Co.,Ltd. Model: HW-050450B00 Input voltage: 100-240V 50/60Hz ,0.75A Output voltage: 5V ⎓ 2A OR 5V ⎓ 4.5A OR 4.5V ⎓ 5A Rated Power: 10W/22.5W SN: H82922H3J31705; K82971H3R11886; C829Y7J7201630;
Adapter	Manufacturer: Huawei Technologies Co.,Ltd. Model: HW-050450E00 Input voltage: 100-240V 50/60Hz ,0.75A Output voltage: 5V ⎓ 2A OR 5V ⎓ 4.5A OR 4.5V ⎓ 5A Rated Power: 10W/22.5W SN: H8301OH7412711; K83059H4V07826; C83002H9V04052;
Adapter	Manufacturer: Huawei Technologies Co.,Ltd. Model: HW-050450U00 Input voltage: 100-240V 50/60Hz ,0.75A Output voltage: 5V ⎓ 2A OR 5V ⎓ 4.5A OR 4.5V ⎓ 5A Rated Power: 10W/22.5W SN: H828K8H3V05002; K8281OH6920035; C82802J1503731;
Adapter	Manufacturer: Huawei Technologies Co.,Ltd. Model: HW-050450A00 Input voltage: 100-240V 50/60Hz ,0.75A Output voltage: 5V ⎓ 2A OR 5V ⎓ 4.5A OR 4.5V ⎓ 5A Rated Power: 10W/22.5W SN:H83111H3S04782 K83171H4J05584

Adapter	Manufacturer: Huawei Technologies Co.,Ltd. Model: HW-050450E01 Input voltage: 100-240V 50/60Hz ,0.75A Output voltage: 5V ⎓ 2A OR 5V ⎓ 4.5A OR 4.5V ⎓ 5A Rated Power: 10W/22.5W SN: CA37Y9J7J00262
Adapter	Manufacturer: Huawei Technologies Co.,Ltd. Model: HW-050450A01 Input voltage: 100-240V 50/60Hz ,0.75A Output voltage: 5V ⎓ 2A OR 5V ⎓ 4.5A OR 4.5V ⎓ 5A Rated Power: 10W/22.5W SN: CA37Y6J6H01746
Rechargeable Li-ion	Manufacturer:Huawei Technologies Co.,Ltd. Battery Model: HB436380ECW Rated capacity: 3550mAh Nominal Voltage: ⎓ +3.85V Charging Voltage: ⎓ +4.43V SN: 201810256BYJSIIA25X0011E; 201809106ECDAII1910X00308; 201809196BYCAYI1919X00333;
Earphone(22040229)	Model: MEMD1632B580C00 Manufacturer: Jiangxi Lianchuang Hongsheng Electronic Co. ,LTD
Earphone(22040229)	Model: EMC309-001 Manufacturer: MERRY ELECTRONICS (SHENZHEN) CO., LTD.
Earphone(22040229)	Model: 1311-3291-3.5mm-229 Manufacturer: Boluo County Quancheng Electronic Co.,ltd

Remark: The above EUT's information is declared by manufacturer. Please refer to the specifications or user's manual for more detailed information.

1.2 Test Site Information

Test Site 1:	Reliability Laboratory of Huawei Technologies Co., Ltd. Global Compliance and Testing Center of Huawei Technologies Co., Ltd.
Test Site Location:	No.2, New City Avenue, Songshan Lake Sci. & Tech. Industry Park, Dongguan, 523808, P.R.C

1.3 Applied Standards

APPLIED STANDARD

47 CFR FCC Part 15, Subpart B
ICES-003 Issue 6

2 Summary of Results

Summary of Results				
Test Items	**Test Mode**	**Performance Class & Required Performance Criteria**	**Result**	**Site**
Radiated Emissions Enclosure Port	Mode2~ Mode7	CLASS B	Pass	Site1
Conducted Emissions ☐DC Power Port ☒AC Power Port ☐Telecommunication Ports	Mode1~ Mode7	CLASS B	Pass	Site1
Note: 1, Measurement taken is within the uncertainty of test system. 2, ☒ The item has been tested; ☐ The item has not been tested.				

During the measurement, the environmental conditions complied with the range listed as below.

Item	**Required**
Ambient temperature	15°C～35°C
Relative humidity	25%～75%
Atmospheric pressure	86kPa～106kPa

3 System Configuration during EMC Test

3.1 Test Mode

The EUT was configured, installed, arranged and operated in a manner consistent with typical application. The following mode(s) were applied during the compliance test.

Test Mode	
Mode 1:	Charging +traffic +WIFI+BT+NFC+GNSS On +Earphone
Mode 2:	Charging + Camera On+ Earphone +idle
Mode 3:	Charging +Video Playing+ Earphone +idle
Mode 4:	Charging + Wireless Charging Case+ Video Playing + Earphone +idle
Mode 5:	Charging +Wireless charging charger+ Wireless Charging Case +Video Playing+ Earphone +idle
Mode 6:	USB Copy(EUT with PC) +Earphone
Mode 7:	USB&DP+ Earphone +Display

Remark:

1) If there is one kind of accessories with different models, each one should be applied throughout the compliance test respectively, however, only the worst case will be recorded in this report.
2) If EUT has more than one typical operation, only the worst test mode will be recorded in this report.

Traffic Mode:
When the EUT state is switched on and with Radio Resource Control (RRC) connection established.

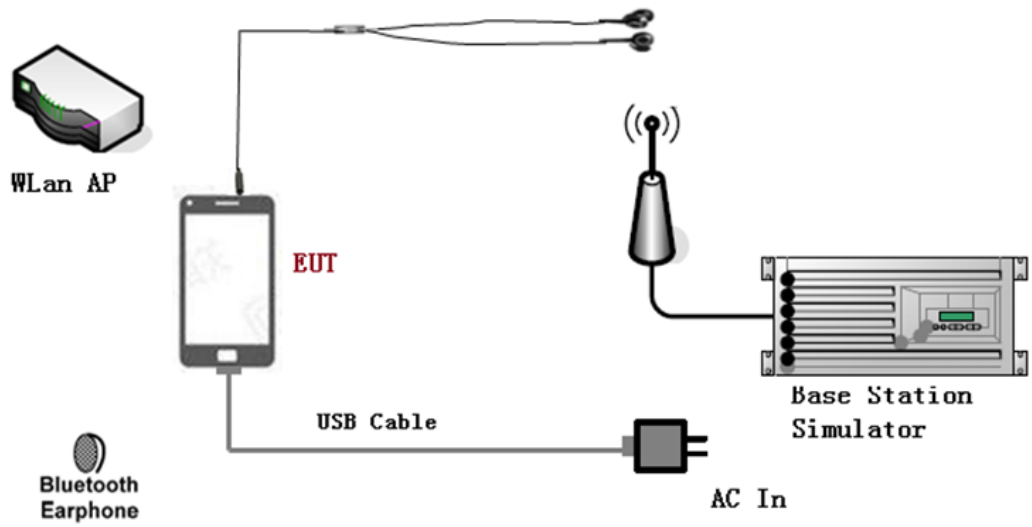
Idle Mode:
When the EUT state is switched on but without Radio Resource Control (RRC) connection.

Worst Case:
Radiated Emission:
Adapter (Model: HW-050450E01, SN: CA37Y9J7J00262) + Charging + Wireless Charging Case+ Video Playing+ Earphone +idle
the result is the worst (30MHz~1GHz).
Adapter (Model: HW-050450E01, SN: CA37Y9J7J00262) + Charging + Wireless Charging Case+ Video Playing+ Earphone +idle
the result is the worst (1GHz~40GHz).

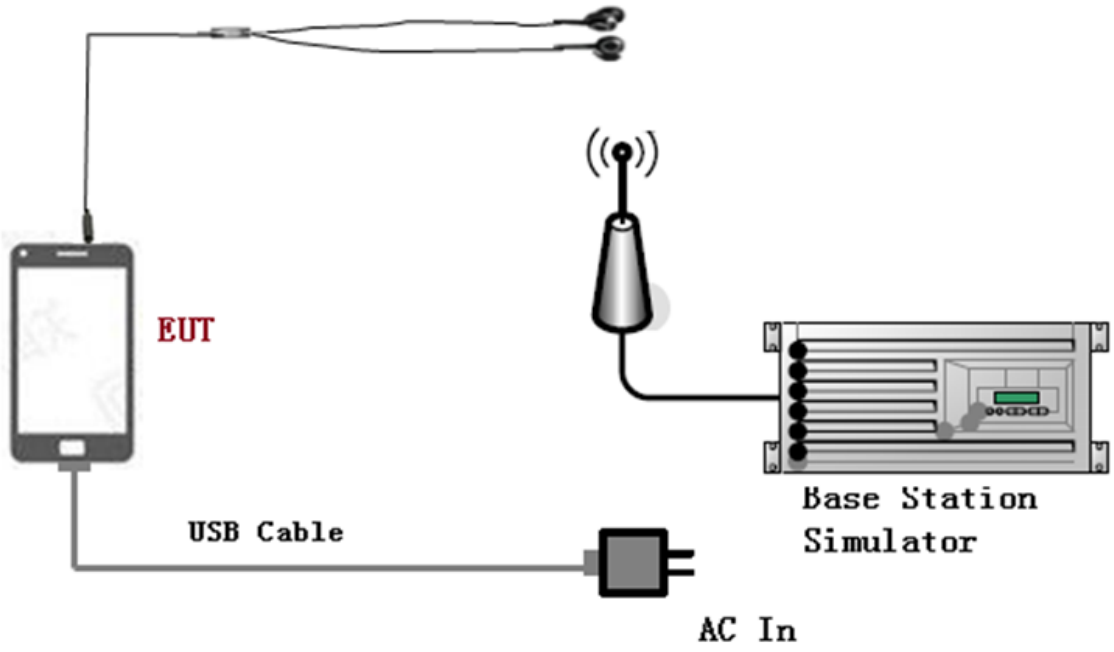
Conducted Emission:
Adapter (Model: HW-050450E01, SN: CA37Y9J7J00262) + Charging +Video Playing+ Earphone +idle
the result is the worst.

3.2 Test System Configuration

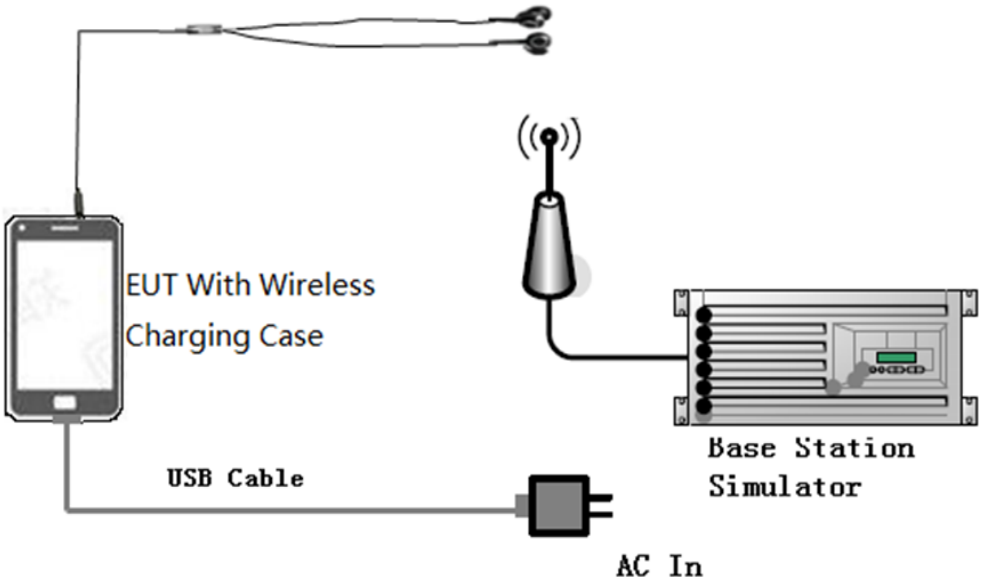
Connection Diagram (Mode 1)



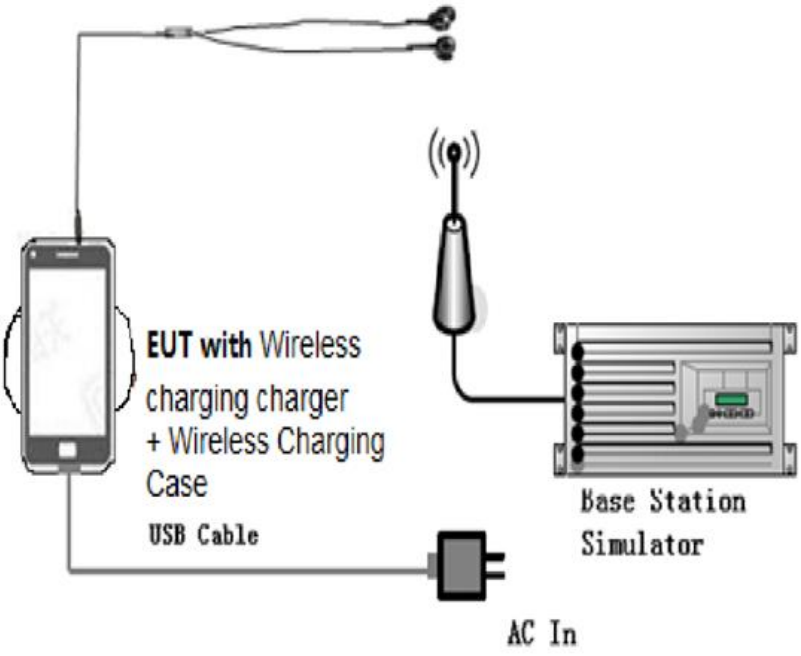
Connection Diagram (Mode 2~3)



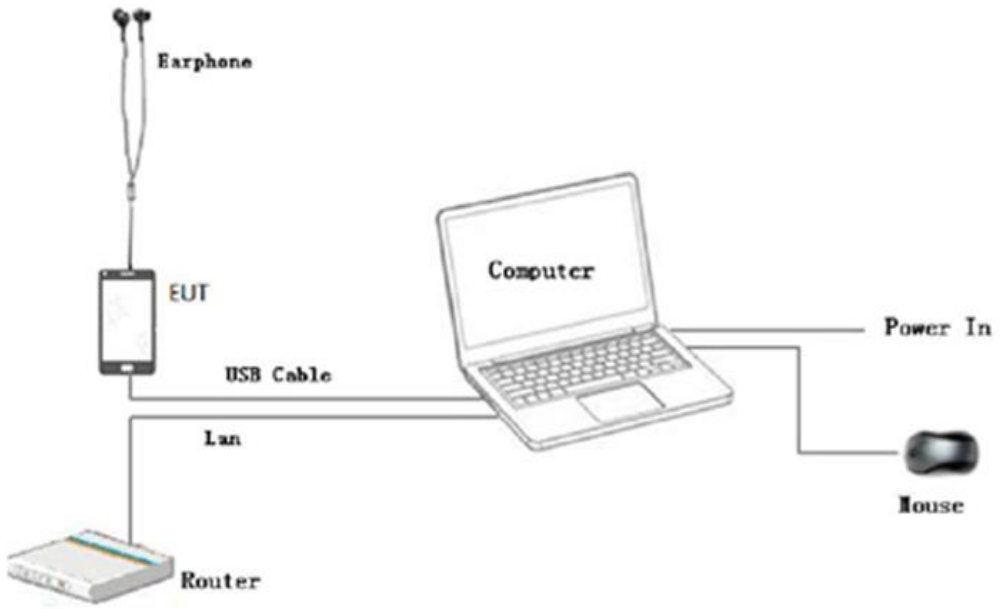
Connection Diagram (Mode 4)



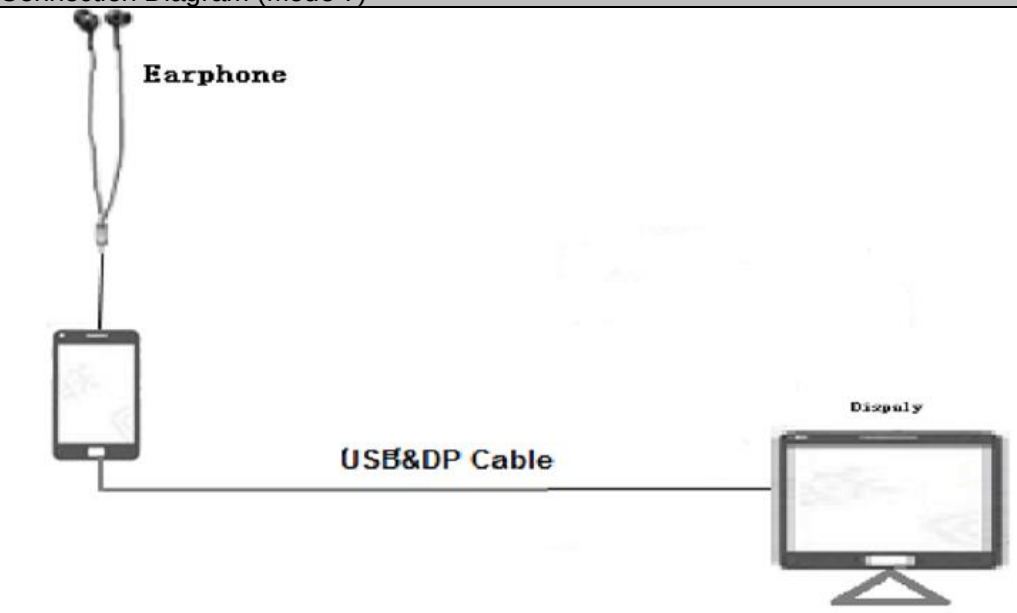
Connection Diagram (Mode 5)



Connection Diagram (Mode 6)



Connection Diagram (Mode 7)



3.3 Cables Used during Test

Cable	Quantity	Length	Type of Cable
USB	1	<3m	Shielded
Earphone	1	<3m	Unshielded
USB&DP cable	1	<3m	Shielded

3.4 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Calibrated Deadline	Cal interval
Radio Communication Tester	CMU200	R&S	3608082535	2019-05-07	12
Radio Communication Tester	MT8820C	Anritsu	A110518805	2019-05-08	12
Notebook	S3	ThinkPad	A140714638	/	/
Mouse	M-U0025-O	Lenovo	HS423HB22TB	/	/
display	L197	Lenovo	8M03373A0956983	/	/
Wireless charging charger	CP60	Huawei Technologies Co.,Ltd.	2155030314C088000033	/	/

Wireless charging case	Manufacturer: Huawei Technologies Co., Ltd. Wireless charging power: 10W max S/N :2155030684TR91000017 Charging efficiency：>75% Working temperature: 10 ℃～40 ℃ Storage temperature: -40 ℃～70℃ RX:110KHz to 140KHz

4 Electromagnetic Interference (EMI)

4.1 Radiated Disturbance 30MHz to 40GHz

4.1.1 Test Procedure

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANCI C63.4: 2014. The test distance was 3m.The set-up and test methods were according to ANCI C63.4: 2014.
A preliminary scan and a final scan of the emissions were made from 30 MHz to 40 GHz by using test script of software; The emissions were measured using Quasi-Peak Detector (30MHz~1GHz) and AV/PK detector (above 1GHz). The maximal emission value was acquired by adjusting the antenna height, polarisation and turntable azimuth in accordance with the software setup. Normally, the height range of antenna was 1m to 4m. The azimuth range of turntable was 0°to 360°. The receiving antenna has two polarizations V and H.
Measurement bandwidth (RBW) for 30MHz to 1000 MHz: 120 kHz;
Measurement bandwidth (RBW) for 1000MHz to 40000 MHz: 1MHz;
EUT was configured in idle mode and the test performed at worst emission state.

4.1.2 Test setup

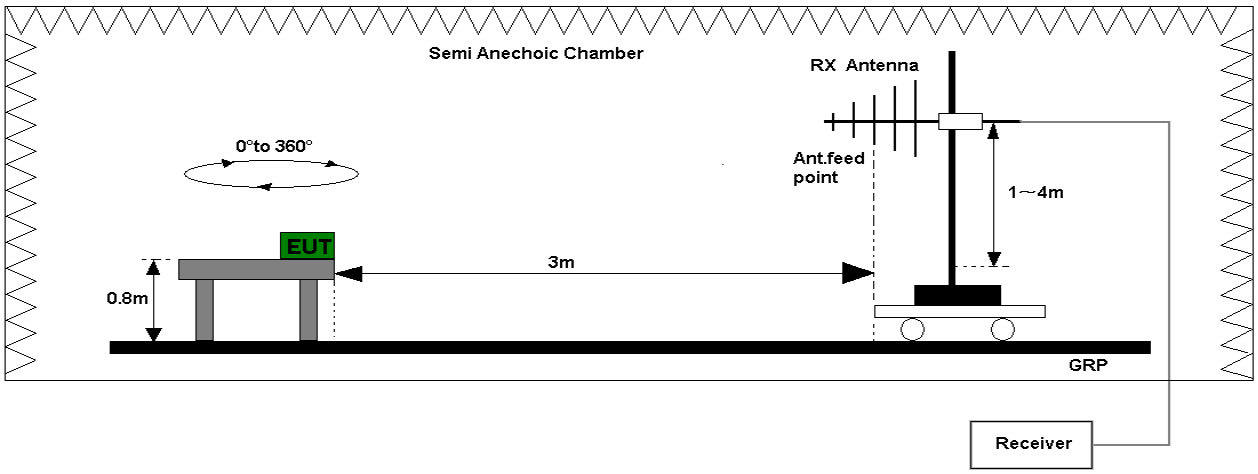


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

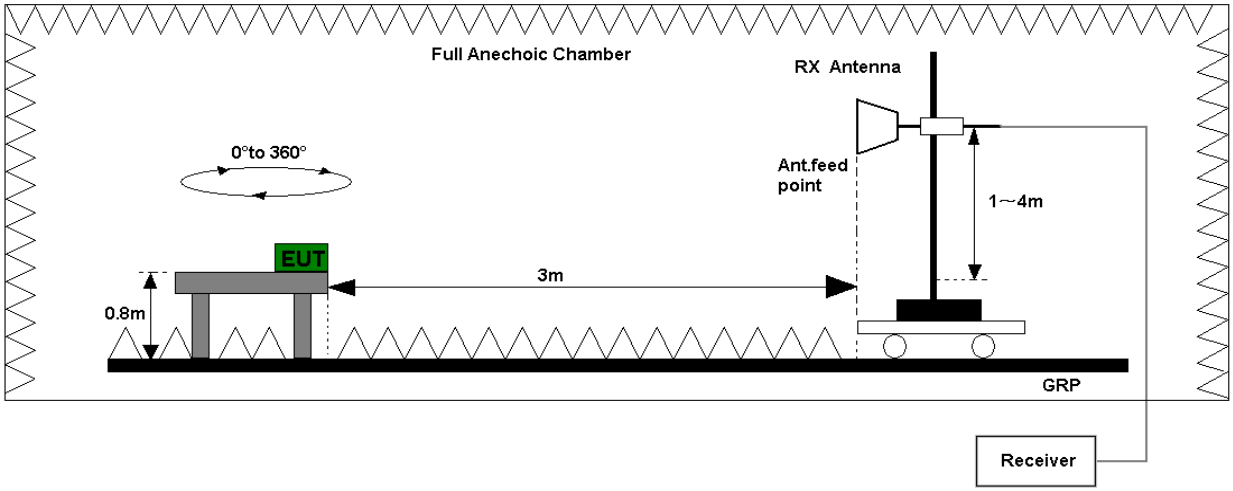


Figure 2. Test set-up of radiated disturbance(above 1GHz)

4.1.3 Test Results

The EUT has met the requirements for Radiated Emission of enclosure port.
Refer to the section 7.1.1 of this report for test data.

Test Limits (Class B)				
Frequency of Emission (MHz)	Radiated Limit			
	Unit(μV/m)		Unit(dBμV/m)	
30-88	100		40	
88-216	150		43.5	
216-960	200		46	
Above 960	500		54	
Above 1000	AV	PK	AV	PK
	500	5000	54	74

4.2 Conducted Disturbance 0.15 MHz to 30MHz

4.2.1 Test Procedure

The Table-top EUT was placed upon a non-metallic table 0.8 m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm away from LISN. The set-up and test methods were according to ANCI C63.4: 2014 Conducted Disturbance at AC Port measurements were undertaken on the L and N Lines. The emissions were measured using a Quasi-Peak Detector and Average Detector.
EUT was communicated with the simulator through Air interface, the simulator controls the EUT to transmitter the maximum power which defined in specification of product. The EUT operated on the typical channel.
Measurement bandwidth (RBW) for 150 kHz to 30 MHz: 9 kHz;
The EUT was set in the shielded chamber and operated under nominal conditions.

4.2.2 Test Setup

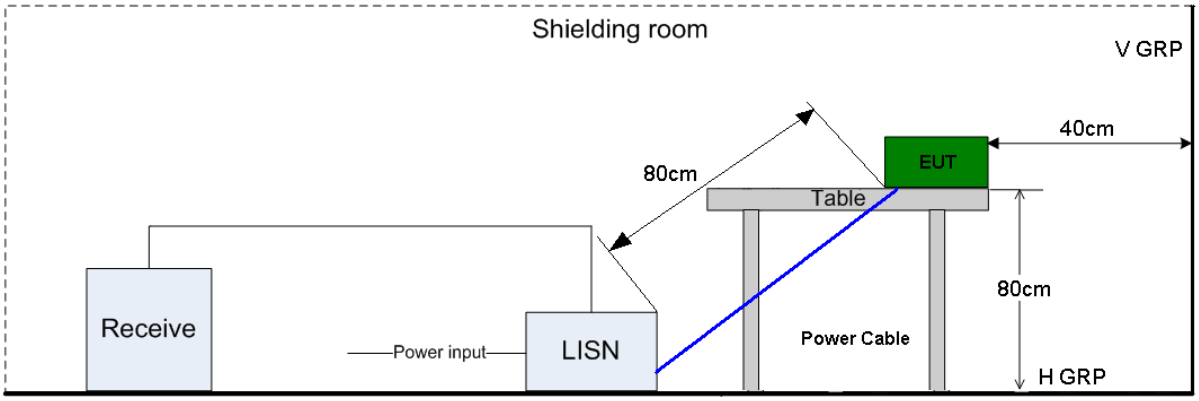


Figure 3. Test Set-up of conducted disturbance

4.2.3 Test Results

The EUT has met requirements for Conducted disturbance of power lines.
Refer to the section 7.2.1 of this report for test data.

Test Limit of AC Power Port		
Frequency range	150kHz ~ 30MHz	
Frequency	Voltage limits	
	QP (dBμV)	AV (dBμV)
0.15MHz~0.5MHz	66-56	56-46
0.5MHz-5MHz	56	46
5MHz~30MHz	60	50

5 Main Test Instruments

Main Test Equipments						
Test item	**Test Instrument**	**Model**	**S/N**	**Manufacturer**	**Calibrated Deadline**	**Cal interval**
RE	EMI Test receiver	ESU26	100387	R&S	Jan. 14, 2020	12
	Spectrum Analyzer	FSU43	100144	R&S	Jan. 14, 2020	12
	Broadband Antenna	VULB 9163	9163-491	SCHWARZBECK	Feb. 21, 2021	24
	Horn Antenna (1-18G)	HF907	100305	R&S	Mar. 15, 2021	24
	Horn Antenna (18-26.5G)	3160-09	00206665	ETS-Lindgren	Apr.20,2020	24
	Horn Antenna(26.5G-40G)	3160-10	00205695	ETS-Lindgren	Apr.20,2020	24
CE	EMI Test receiver	ESCI	101163	R&S	Jan. 14, 2020	12
	Artificial Mains Network	ENV216	100382	R&S	Feb. 29, 2020	12

Software Information			
Test Item	Software Name	Manufacturer	Version
RE	EMC32	R&S	V9.25.0
CE	EMC32	R&S	V9.25.0

6 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty		
Items		**Extended Uncertainty**
RE(30MHz-1GHz)	Field strength (dBμV/m)	U=5.24dB; k=2
RE(1GHz-18GHz)	Field strength (dBμV/m)	U=4.84dB; k=2
RE(18 GHz-26.5GHz)	Field strength (dBμV/m)	U=4.62dB; k=2
RE (26.5 GHz- 40GHz)	Field strength (dBμV/m)	U=5.12dB; k=2
CE	Disturbance Voltage (dBμV)	U=2.3dB; k=2

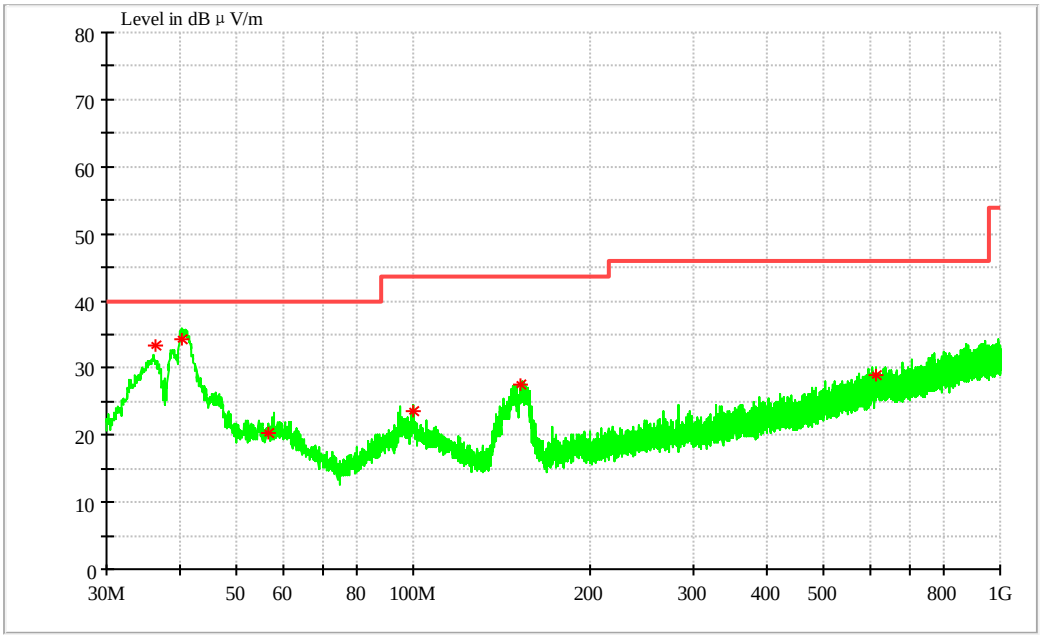
7 Test Data and Graph

Only the worst test results were shown

7.1 Radiated Disturbance

7.1.1 30MHz~1GHz

Test Mode 4: Charging + Wireless Charging Case+ Video Playing + Earphone +idle



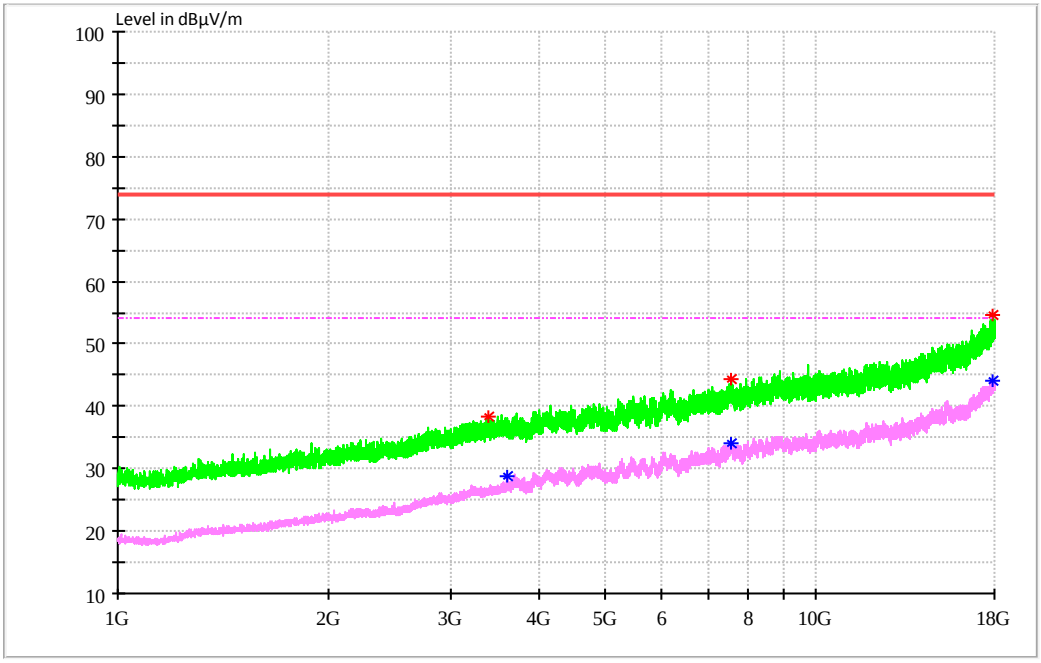
MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
36.233040	33.25	13.2	40.00	6.75	101.0	4.0	V
40.195680	34.27	14.4	40.00	5.73	100.0	24.0	V
56.778920	20.35	13.5	40.00	19.65	101.0	1.0	V
99.980220	23.49	14.0	43.50	20.01	101.0	309.0	V
152.053700	27.41	9.3	43.50	16.09	101.0	251.0	V
614.073020	28.87	20.7	46.00	17.13	200.0	151.0	V

Note:
Level =Reading level by receiver + Transd (Antenna factor + cable loss - preamplifier gain)
The reading level is calculated by software which is not shown in the sheet.

7.1.2 1GHz~18GHz

Test Mode 4: Charging + Wireless Charging Case+ Video Playing + Earphone +idle



MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
3386.800000	38.22	-7.2	74.00	35.78	100.0	239.0	V
7572.200000	44.40	1.1	74.00	29.60	100.0	309.0	V
17938.233333	54.57	14.6	74.00	19.43	100.0	56.0	H

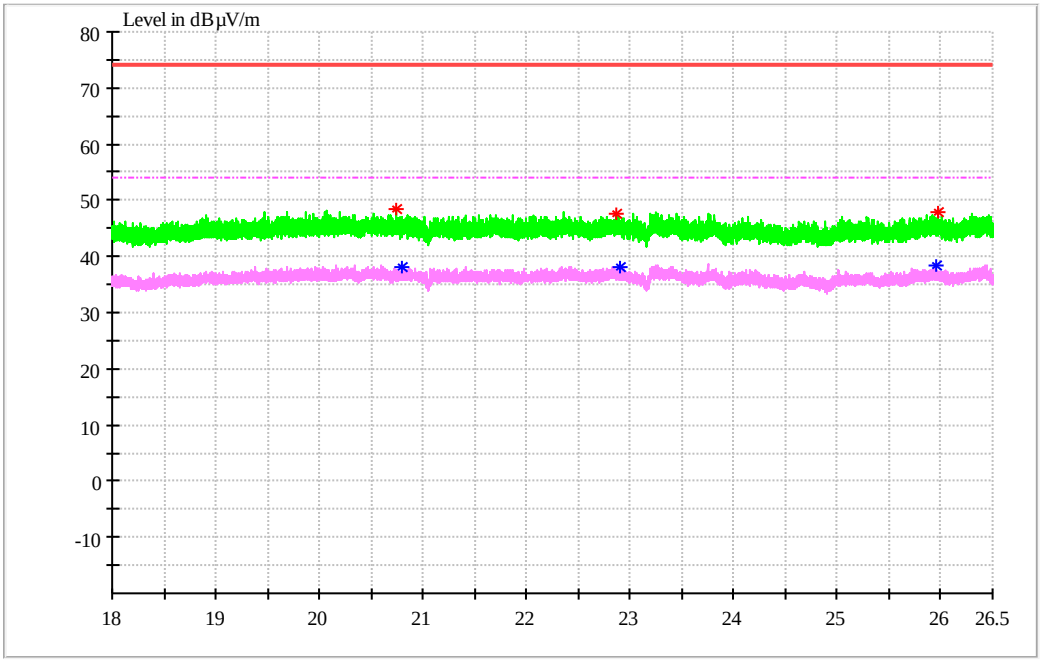
MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
3599.866667	28.86	-6.5	54.00	25.14	100.0	96.0	V
7548.400000	34.13	1.1	54.00	19.87	100.0	305.0	H
17922.366667	44.12	14.6	54.00	9.88	100.0	24.0	H

Note:
Level =Reading level by receiver + Transd (Antenna factor + cable loss - preamplifier gain)
The reading level is calculated by software which is not shown in the sheet.

7.1.3 18GHz~26.5GHz

Test Mode 4: Charging + Wireless Charging Case+ Video Playing + Earphone +idle



MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
20742.1	48.49	-4.7	74	25.51	101	77	V
22861.15	47.73	-3.4	74	26.27	156	2	V
25973.85	47.81	-2.5	74	26.19	121	146	V

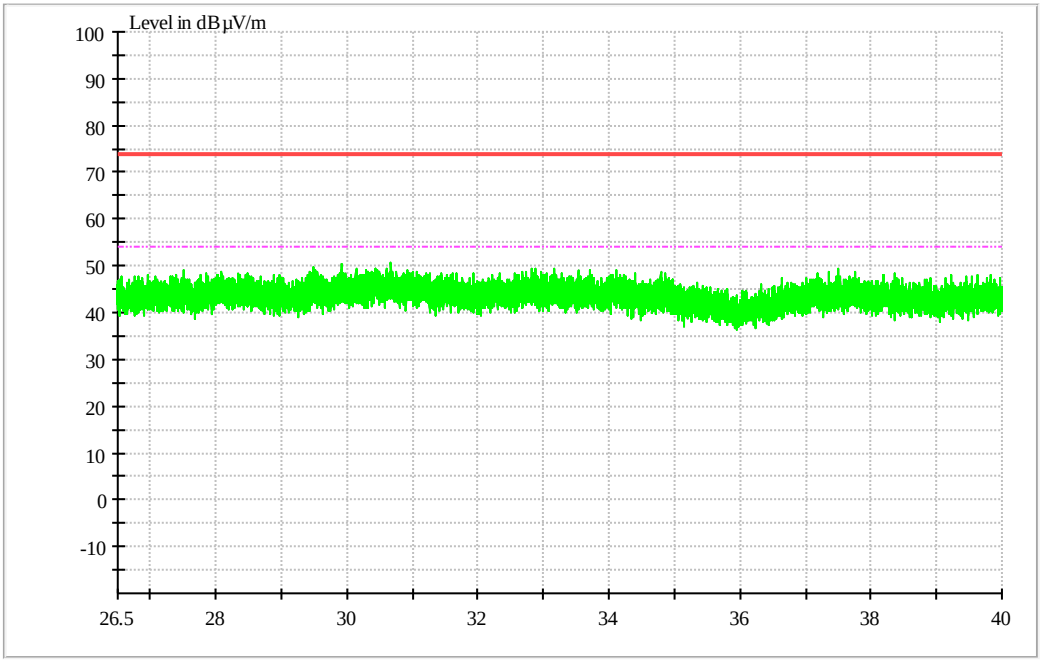
MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
20799.9	37.98	-4.7	54	16.02	100	216	V
22901.525	38.23	-3.3	54	15.77	251	277	V
25959.4	38.49	-2.5	54	15.51	200	123	V

Note:
Level =Reading level by receiver + Transd (Antenna factor + cable loss - preamplifier gain)
The reading level is calculated by software which is not shown in the sheet.

7.1.4 26.5GHz~40GHz

Test Mode 4: Charging + Wireless Charging Case+ Video Playing + Earphone +idle

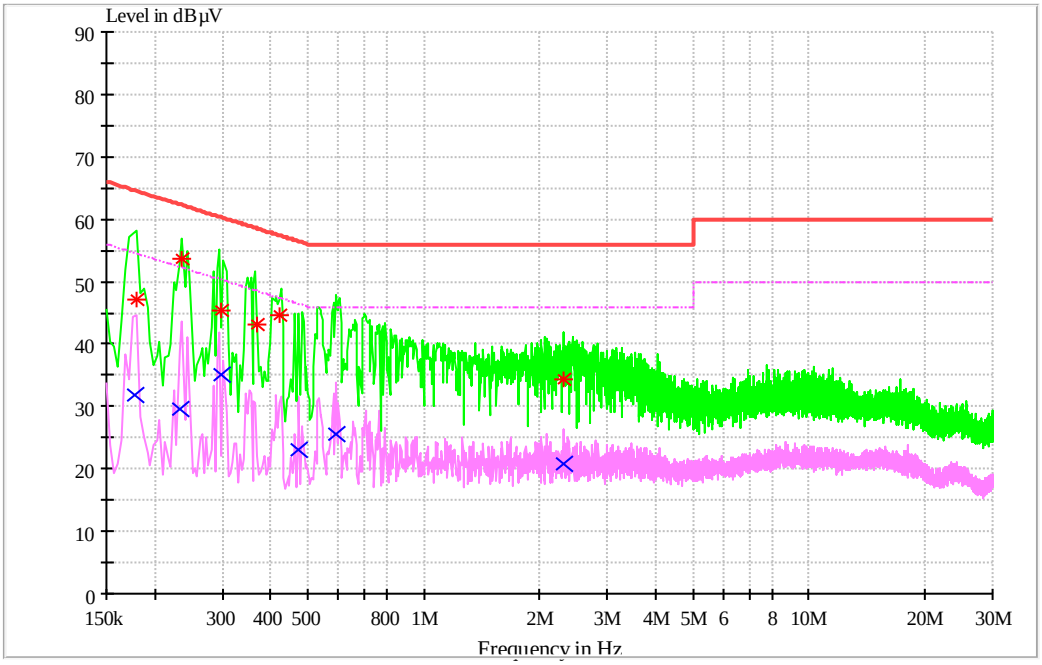


Note 1: The data was measured by Peak detector.
Note 2: No peak found in the Test Range of “26.5 GHz to 40GHz”

7.2 Conducted Disturbance

7.2.1 AC Port Test Data

Test Mode 3: Charging +Video Playing+ Earphone +idle



MEASUREMENT RESULT: QP Detector

Frequency	Level	Line	Transd	Margin	Limit	PE
MHz	dBµV		dB	dB	dBµV	
0.179366	47.01	N	9.7	17.51	64.52	FLO
0.2347	53.54	N	9.7	8.74	62.28	FLO
0.298194	45.45	N	9.7	14.84	60.29	FLO
0.368093	43.23	N	9.7	15.31	58.54	FLO
0.421624	44.7	N	9.7	12.72	57.42	FLO
2.301645	34.4	L1	9.8	21.6	56	FLO

MEASUREMENT RESULT: AV Detector

Frequency	Level	Line	Transd	Margin	Limit	PE
MHz	dBµV		dB	dB	dBµV	
0.177486	31.74	N	9.7	22.86	54.6	FLO
0.233422	29.63	N	9.7	22.7	52.33	FLO
0.298887	35.07	N	9.7	15.2	50.27	FLO
0.471533	23	N	9.7	23.48	46.48	FLO
0.593463	25.66	N	9.7	20.34	46	FLO
2.296702	20.77	L1	9.8	25.23	46	FLO

----------END----------